**Third Generation Partnership Project (3GPP™)**

**DRAFT Meeting Report  
for  
TSG RAN WG4  
meeting: 98-e**

**Electronic Meeting, Online, 25/01/2021 to 05/02/2021**

Report generated on Monday, 2021-01-18 22:13 UTC

Contents:

2 Approval of the agenda 14

3 Letters / reports from other groups / meetings 14

4 Rel-15 New radio access technology 19

4.1 System Parameters Maintenance [NR\_newRAT-Core] 19

4.2 UE RF requirements maintenance [NR\_newRAT] 20

4.2.1 [FR1] Maintenance for 38.101-1 [NR\_newRAT-Core] 20

4.2.2 [FR2] Maintenance for 38.101-2 [NR\_newRAT-Core] 30

4.2.3 Maintenance for 38.101-3 [NR\_newRAT-Core] 35

4.3 UE EMC requirements maintenance [NR\_newRAT-Core] 41

4.4 BS RF requirements maintenance [NR\_newRAT-Core] 42

4.4.1 General [NR\_newRAT-Core] 42

4.4.2 TX/RX requirements maintenance (38.104) [NR\_newRAT-Core] 43

4.4.3 MSR specifications maintenance [NR\_newRAT-Core/Perf] 45

4.5 BS conformance testing Maintenance [NR\_newRAT-Perf] 50

4.5.1 General [NR\_newRAT-Perf] 50

4.5.2 Conducted conformance testing (38.141-1) [NR\_newRAT-Perf] 52

4.5.3 Radiated conformance testing (38.141-2) [NR\_newRAT-Perf] 53

4.5.4 eAAS specifications maintenance [NR\_newRAT-Core/Perf] 59

4.6 BS EMC requirements Maintenance [NR\_newRAT-Core] 62

4.6.1 Core requirements [NR\_newRAT-Core] 62

4.6.2 Performance requirements [NR\_newRAT-Perf] 62

4.7 RRM core requirements maintenance (38.133/36.133) [NR\_newRAT-Core] 64

4.8 RRM perf. requirements maintenance (38.133/36.133) [NR\_newRAT-Perf] 72

4.9 Demodulation and CSI requirements maintenance (38.101-4/38.104)[NR\_newRAT-Perf] 93

4.9.1 UE demodulation requirements[NR\_newRAT-Perf] 93

4.9.2 CSI requirements [NR\_newRAT-Perf] 94

4.9.3 BS demodulation requirements [NR\_newRAT-Perf] 95

4.10 Positioning specs maintenance (36.171, 37.171 and 38.171) [NR\_newRAT-Perf or TEI] 98

4.11 Testability Maintenance (38.810) [FS\_NR\_test\_methods] 98

5 LTE maintenance (up to Rel15) [WI code or TEI] 98

5.1 BS RF requirements [WI code or TEI] 98

5.2 UE RF requirements [WI code or TEI] 99

5.3 RRM requirements [WI code or TEI] 102

5.4 Demodulation and CSI requirements [WI code or TEI] 109

5.4.1 UE demodulation and CSI requirements [WI code or TEI] 109

5.4.2 BS demodulation requirements [WI code or TEI] 109

6 Rel-16 Work Items for LTE 109

6.1 Additional MTC enhancements for LTE [LTE\_eMTC5] 109

6.1.1 RF core requirements maintenance [LTE\_eMTC5-Core] 109

6.1.2 RRM requirements maintenance [LTE\_eMTC5-Core/Perf] 109

6.2 Additional enhancements for NB-IoT [NB\_IOTenh3] 110

6.2.1 RF core requirements maintenance [NB\_IOTenh3-Core] 110

6.2.2 RRM requirements maintenance [NB\_IOTenh3-Core/Perf] 110

6.3 Even further Mobility enhancement in E-UTRAN [LTE\_feMob] 111

6.3.1 RRM core requirements maintenance [LTE\_feMob-Core] 111

6.3.2 RRM perf. requirements [LTE\_feMob-Perf] 113

6.3.2.1 General [LTE\_feMob-Perf] 113

6.3.2.2 Test cases [LTE\_feMob-Perf] 113

6.4 R16 LTE maintenance [WI code] 114

6.4.1 BS RF requirements [WI code] 114

6.4.2 UE RF requirements [WI code] 114

6.4.3 RRM requirements [WI code] 115

6.4.4 Demodulation and CSI requirements [WI code] 115

6.4.4.1 UE demodulation and CSI requirements [WI code] 115

6.4.4.2 BS demodulation requirements [WI code] 115

7 Rel-16 non-spectrum related work items for NR 115

7.1 NR-based access to unlicensed spectrum [NR\_unlic] 115

7.1.1 System parameters maintenance [NR\_unlic-Core] 115

7.1.2 UE RF requirements maintenance [NR\_unlic-Core] 117

7.1.2.1 Transmitter characteristics [NR\_unlic-Core] 117

7.1.2.2 Receiver characteristics [NR\_unlic-Core] 118

7.1.3 BS RF requirements maintenance [NR\_unlic-Core] 118

7.1.3.1 General [NR\_unlic-Core] 119

7.1.3.2 Transmitter characteristics [NR\_unlic-Core] 119

7.1.3.3 Receiver characteristics [NR\_unlic-Core] 120

7.1.4 BS conformance testing [NR\_unlic-Perf] 121

7.1.4.1 General [NR\_unlic-Perf] 122

7.1.4.2 Transmitter characteristics [NR\_unlic-Perf] 122

7.1.4.3 Receiver characteristics [NR\_unlic-Perf] 123

7.1.5 RRM core requirements maintenance (38.133) [NR\_unlic-Core] 124

7.1.5.1 General [NR\_unlic-Core] 124

7.1.5.2 RRC connection mobility control [NR\_unlic-Core] 126

7.1.5.3 SCell activation/deactivation (delay and interruption) [NR\_unlic-Core] 129

7.1.5.4 Active TCI state switching [NR\_unlic-Core] 132

7.1.5.5 RLM [NR\_unlic-Core] 132

7.1.5.6 Beam management [NR\_unlic-Core] 133

7.1.5.7 Measurement requirements [NR\_unlic-Core] 134

7.1.5.8 Measurement capability and reporting criteria [NR\_unlic-Core] 136

7.1.5.9 Timing [NR\_unlic-Core] 136

7.1.5.10 Other requirements [NR\_unlic-Core] 137

7.1.6 RRM perf. requirements (38.133) [NR\_unlic-Perf] 139

7.1.6.1 General [NR\_unlic-Perf] 139

7.1.6.2 Common RRM test configuration [NR\_unlic-Perf] 140

7.1.6.3 Test cases [NR\_unlic-Perf] 141

7.1.6.3.1 General [NR\_unlic-Perf] 141

7.1.6.3.2 RRC IDLE, cell re-selection [NR\_unlic-Perf] 142

7.1.6.3.3 HO delay and interruptions [NR\_unlic-Perf] 143

7.1.6.3.4 RRC Re-establishment [NR\_unlic-Perf] 144

7.1.6.3.5 RRC Connection Release with Redirection [NR\_unlic-Perf] 144

7.1.6.3.6 Timing (transmit timing and TA) [NR\_unlic-Perf] 145

7.1.6.3.7 BWP switching delay and interruptions [NR\_unlic-Perf] 146

7.1.6.3.8 PSCell addition/release (delay and interruption) [NR\_unlic-Perf] 146

7.1.6.3.9 Interruptions [NR\_unlic-Perf] 147

7.1.6.3.10 RLM [NR\_unlic-Perf] 147

7.1.6.3.11 Beam management [NR\_unlic-Perf] 148

7.1.6.3.12 Intra-frequency, inter-frequency and inter-RAT measurement requirements [NR\_unlic-Perf] 148

7.1.6.3.13 Accuracy requirements for NR-U intra-frequency, inter-frequency and inter-RAT measurements [NR\_unlic-Perf] 150

7.1.7 Demodulation and CSI requirements (38.101-4/38.104) [NR\_unlic-Perf] 151

7.1.7.1 General [NR\_unlic-Perf] 151

7.1.7.2 UE demodulation requirements [NR\_unlic-Perf] 152

7.1.7.3 CSI requirements [NR\_unlic-Perf] 153

7.1.7.4 BS demodulation requirements [NR\_unlic-Perf] 153

7.1.7.4.1 General [NR\_unlic-Perf] 153

7.1.7.4.2 PUSCH requirements [NR\_unlic-Perf] 154

7.1.7.4.3 PUCCH requirements [NR\_unlic-Perf] 156

7.1.7.4.4 PRACH requirements [NR\_unlic-Perf] 157

7.2 NR mobility enhancement [NR\_Mob\_enh] 159

7.2.1 RRM requirements maintenance (38.133) [NR\_Mob\_enh-Core/Perf] 159

7.3 5G V2X with NR sidelink [5G\_V2X\_NRSL] 161

7.3.1 System parameters maintenance [5G\_V2X\_NRSL-Core] 161

7.3.2 UE RF requirements maintenance [5G\_V2X\_NRSL-Core] 161

7.3.2.1 Transmitter characteristics [5G\_V2X\_NRSL-Core] 161

7.3.2.2 Receiver characteristics [5G\_V2X\_NRSL-Core] 163

7.3.3 Concurrent operation maintenance (scenarios, requirements, etc) [5G\_V2X\_NRSL-Core] 163

7.3.3.1 Transmitter characteristics [5G\_V2X\_NRSL-Core] 163

7.3.3.2 Receiver characteristics [5G\_V2X\_NRSL-Core] 165

7.3.4 RRM core requirements maintenance (38.133) [5G\_V2X\_NRSL-Core] 165

7.3.5 RRM perf. requirements (38.133) [5G\_V2X\_NRSL-Perf] 165

7.3.5.1 General [5G\_V2X\_NRSL-Perf] 166

7.3.5.2 L1 SL-RSRP measurement accuracy [5G\_V2X\_NRSL-Perf] 166

7.3.5.3 Test cases [5G\_V2X\_NRSL-Perf] 166

7.3.5.3.1 UE transmit timing [5G\_V2X\_NRSL-Perf] 166

7.3.5.3.2 Initiation/Cease of SLSS Transmission [5G\_V2X\_NRSL-Perf] 166

7.3.5.3.3 Selection / Reselection of V2X Synchronization Reference Source [5G\_V2X\_NRSL-Perf] 166

7.3.5.3.4 L1 SL-RSRP measurements [5G\_V2X\_NRSL-Perf] 166

7.3.5.3.5 Congestion control measurements [5G\_V2X\_NRSL-Perf] 166

7.3.5.3.6 Interruptions [5G\_V2X\_NRSL-Perf] 167

7.3.5.3.7 Resource Pre-emption [5G\_V2X\_NRSL-Perf] 167

7.3.5.3.8 Resource Re-evaluation [5G\_V2X\_NRSL-Perf] 167

7.3.5.3.9 Others [5G\_V2X\_NRSL-Perf] 167

7.3.6 Demodulation requirements (38.101-4) [5G\_V2X\_NRSL-Perf] 167

7.3.6.1 General [5G\_V2X\_NRSL-Perf] 167

7.3.6.2 Single link test [5G\_V2X\_NRSL-Perf] 167

7.3.6.2.1 PSSCH demodulation test [5G\_V2X\_NRSL-Perf] 168

7.3.6.2.2 PSCCH demodulation test [5G\_V2X\_NRSL-Perf] 169

7.3.6.2.3 PSBCH demodulation test [5G\_V2X\_NRSL-Perf] 170

7.3.6.2.4 PSFCH demodulation test [5G\_V2X\_NRSL-Perf] 171

7.3.6.3 Multiple link test [5G\_V2X\_NRSL-Perf] 171

7.3.6.3.1 Power imbalance requirement [5G\_V2X\_NRSL-Perf] 172

7.3.6.3.2 HARQ soft buffer combing test [5G\_V2X\_NRSL-Perf] 173

7.3.6.3.3 PSFCH decoding capability test [5G\_V2X\_NRSL-Perf] 173

7.3.6.3.4 PSCCH/PSSCH decoding capability [5G\_V2X\_NRSL-Perf] 174

7.3.6.3.5 Others [5G\_V2X\_NRSL-Perf] 174

7.4 Integrated Access and Backhaul for NR [NR\_IAB] 175

7.4.1 General [NR\_IAB-Core] 175

7.4.1.1 System parameters maintenance [NR\_IAB-Core] 175

7.4.1.2 Others [NR\_IAB-Core] 175

7.4.2 RF requirements maintenance [NR\_IAB-Core] 176

7.4.2.1 Transmitter characteristics [NR\_IAB-Core] 176

7.4.2.1.1 Tx Power related requirements [NR\_IAB-Core] 176

7.4.2.1.2 Transmitted signal quality [NR\_IAB-Core] 176

7.4.2.1.3 Unwanted emissions [NR\_IAB-Core] 178

7.4.2.1.4 Others [NR\_IAB-Core] 178

7.4.2.2 Receiver characteristics [NR\_IAB-Core] 178

7.4.2.2.1 Sensitivity and dynamic range requirements [NR\_IAB-Core] 178

7.4.2.2.2 In-band selectivity and blocking requirements [NR\_IAB-Core] 179

7.4.2.2.3 Others [NR\_IAB-Core] 179

7.4.3 RF conformance testing [NR\_IAB-Perf] 180

7.4.3.1 General and work plan [NR\_IAB-Perf] 180

7.4.3.2 Common test issues for conducted and radiated conformance testing [NR\_IAB-Perf] 180

7.4.3.2.1 Test configurations [NR\_IAB-Perf] 180

7.4.3.2.2 Test models [NR\_IAB-Perf] 181

7.4.3.2.3 Others [NR\_IAB-Perf] 182

7.4.3.3 Conducted conformance testing [NR\_IAB-Perf] 183

7.4.3.3.1 Transmitter characteristics [NR\_IAB-Perf] 183

7.4.3.3.2 Receiver characteristics [NR\_IAB-Perf] 184

7.4.3.3.3 Other test issues [NR\_IAB-Perf] 184

7.4.3.4 Radiated conformance testing [NR\_IAB-Perf] 185

7.4.3.4.1 Transmitter characteristics [NR\_IAB-Perf] 185

7.4.3.4.2 Receiver characteristics [NR\_IAB-Perf] 185

7.4.3.4.3 Other test issues [NR\_IAB-Perf] 186

7.4.4 RRM core requirements maintenance [NR\_IAB-Core] 186

7.4.5 RRM perf. requirements [NR\_IAB-Perf] 188

7.4.5.1 General [NR\_IAB-Perf] 188

7.4.5.2 Test cases [NR\_IAB-Perf] 189

7.4.6 EMC core requirements maintenance [NR\_IAB-Core] 191

7.4.6.1 General [NR\_IAB-Core] 191

7.4.6.2 Emission requirements [NR\_IAB-Core] 191

7.4.6.3 Immunity requirements [NR\_IAB-Core] 191

7.4.7 EMC performance requirements [NR\_IAB-Perf] 192

7.4.8 Demodulation and CSI requirements [NR\_IAB-Perf] 193

7.4.8.1 General [NR\_IAB-Perf] 193

7.4.8.2 IAB-DU performance requirements [NR\_IAB-Perf] 193

7.4.8.3 IAB-MT performance requirements [NR\_IAB-Perf] 194

7.5 Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements [LTE\_NR\_DC\_CA\_enh] 195

7.5.1 RF requirements maintenance [LTE\_NR\_DC\_CA\_enh-Core] 195

7.5.2 RRM core requirements maintenance (38.133/36.133) [LTE\_NR\_DC\_CA\_enh-Core] 197

7.5.2.1 Early Measurement reporting [LTE\_NR\_DC\_CA\_enh-Core] 197

7.5.2.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Core] 198

7.5.3 RRM perf. requirements (38.133) [LTE\_NR\_DC\_CA\_enh-Perf] 204

7.5.3.1 Early Measurement reporting [LTE\_NR\_DC\_CA\_enh- Perf] 204

7.5.3.1.1 Accuracy requirements [LTE\_NR\_DC\_CA\_enh-Perf] 204

7.5.3.1.2 Test cases [LTE\_NR\_DC\_CA\_enh-Perf] 205

7.5.3.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Perf] 206

7.5.3.2.1 Test cases for direct SCell activation [LTE\_NR\_DC\_CA\_enh-Perf] 206

7.5.3.2.2 Test case for SCell Dormancy [LTE\_NR\_DC\_CA\_enh-Perf] 208

7.6 UE power saving in NR [NR\_UE\_pow\_sav] 210

7.6.1 RRM requirements maintenance (38.133) [NR\_UE\_pow\_sav-Core/Perf] 210

7.6.2 Demodulation and CSI requirements (38.101-4) [NR\_UE\_pow\_sav-Perf] 213

7.7 NR Positioning Support [NR\_pos] 215

7.7.1 RRM core requirements maintenance (38.133) [NR\_pos-Core] 215

7.7.1.1 PRS-RSTD measurement requirements [NR\_pos-Core] 215

7.7.1.2 PRS-RSRP measurement requirements [NR\_pos-Core] 220

7.7.1.3 UE Rx-Tx time difference measurement requirements [NR\_pos-Core] 221

7.7.1.4 Other requirements [NR\_pos-Core] 225

7.7.2 RRM perf. requirements (38.133) [NR\_pos-Perf] 227

7.7.2.1 General [NR\_pos-Perf] 227

7.7.2.2 UE requirements and test cases [NR\_pos-Perf] 228

7.7.2.2.1 Measurement accuracy requirements [NR\_pos-Perf] 228

7.7.2.2.1.1 PRS RSTD [NR\_pos-Perf] 228

7.7.2.2.1.2 PRS RSRP [NR\_pos-Perf] 229

7.7.2.2.1.3 UE Rx-Tx time difference [NR\_pos-Perf] 231

7.7.2.2.2 Test cases [NR\_pos-Perf] 232

7.7.2.2.3 Measurement requirements [NR\_pos-Perf] 234

7.7.2.2.4 Accuracy requirements [NR\_pos-Perf] 235

7.7.2.2.5 Other [NR\_pos-Perf] 235

7.7.2.3 gNB requirements [NR\_pos-Perf] 235

7.7.2.3.1 General [NR\_pos-Perf] 235

7.7.2.3.2 SRS-RSRP requirements [NR\_pos-Perf] 237

7.7.2.3.3 gNB Rx-Tx time difference requirements [NR\_pos-Perf] 238

7.7.2.3.4 UL RTOA requirements [NR\_pos-Perf] 239

7.8 Physical layer enhancements for NR URLLC [NR\_L1enh\_URLLC-Core] 240

7.8.1 Demodulation and CSI requirements (38.101-4/38.104) [NR\_L1enh\_URLLC-Perf] 240

7.8.1.1 Performance requirements with ultra-low BLER [NR\_L1enh\_URLLC-Perf] 240

7.8.1.1.1 UE demodulation requirements [NR\_L1enh\_URLLC-Perf] 240

7.8.1.1.2 CSI requirements [NR\_L1enh\_URLLC-Perf] 241

7.8.1.1.3 BS demodulation requirements [NR\_L1enh\_URLLC-Perf] 243

7.8.1.2 Performance requirements with higher BLER [NR\_L1enh\_URLLC-Perf] 244

7.8.1.2.1 UE demodulation requirements [NR\_L1enh\_URLLC-Perf] 244

7.8.1.2.2 BS demodulation requirements [NR\_L1enh\_URLLC-Perf] 248

7.9 Enhancements on MIMO for NR [NR\_eMIMO] 253

7.9.1 UE RF core requirements maintenance (38.101) [NR\_eMIMO-Core] 253

7.9.2 RRM core requirements maintenance (38.133) [NR\_eMIMO-Core] 254

7.9.3 RRM perf. requirements (38.133) [NR\_eMIMO-Perf] 257

7.9.3.1 General [NR\_eMIMO-Perf] 258

7.9.3.2 L1-SINR measurement accuracy [NR\_eMIMO-Perf] 258

7.9.3.3 Test cases [NR\_eMIMO-Perf] 260

7.9.3.3.1 L1-SINR measurements [NR\_eMIMO-Perf] 260

7.9.3.3.2 BFR for SCell [NR\_eMIMO-Perf] 261

7.9.3.3.3 DL/UL beam indication with reduced latency and overhead [NR\_eMIMO-Perf] 261

7.9.3.3.4 Others [NR\_eMIMO-Perf] 262

7.9.4 Demodulation and CSI requirements (38.101-4) [NR\_eMIMO-Perf] 263

7.9.4.1 General [NR\_eMIMO-Perf] 263

7.9.4.2 Demodulation requirements [NR\_eMIMO-Perf] 264

7.9.4.2.1 Single-DCI based SDM scheme [NR\_eMIMO-Perf] 264

7.9.4.2.2 Multi-DCI based transmission scheme [NR\_eMIMO-Perf] 265

7.9.4.2.3 Single-DCI based transmission schemes (URLLC) [NR\_eMIMO-Perf] 266

7.9.4.3 CSI requirements [NR\_eMIMO-Perf] 267

7.10 Add support of NR DL 256QAM for FR2 [NR\_DL256QAM\_FR2] 269

7.10.1 Demodulation and CSI requirements (38.101-4) [NR\_DL256QAM\_FR2-Perf] 269

7.10.1.1 UE Demodulation requirements [NR\_DL256QAM\_FR2-Perf] 269

7.10.1.2 CSI requirements [NR\_DL256QAM\_FR2-Perf] 271

7.10.1.3 SDR requirements [NR\_DL256QAM\_FR2-Perf] 273

7.11 RF requirements for NR frequency range 1 (FR1) [NR\_RF\_FR1] 274

7.11.1 RF core requirements maintenance [NR\_RF\_FR1-Core] 274

7.11.1.1 Intra-band UL CA for FR1 power class 3 [NR\_RF\_FR1-Core] 274

7.11.1.2 Others [NR\_RF\_FR1-Core] 275

7.11.2 RRM requirements maintenance (38.133) [NR\_RF\_FR1-Core/Perf] 278

7.12 NR RF requirement enhancements for frequency range 2 (FR2) [NR\_RF\_FR2\_req\_enh] 279

7.12.1 RF core requirements maintenance [NR\_RF\_FR2\_req\_enh-Core] 279

7.12.2 RRM requirements maintenance (38.133) [NR\_RF\_FR2\_req\_enh-Core] 281

7.13 NR RRM requirement enhancement [NR\_RRM\_Enh-Core] 281

7.13.1 RRM core requirements maintenance (38.133) [NR\_RRM\_Enh-Core] 281

7.13.1.1 Multiple Scell activation/deactivation [NR\_RRM\_Enh-Core] 281

7.13.1.2 BWP switching on multiple CCs [NR\_RRM\_Enh-Core] 282

7.13.1.3 Other requirements maintenance [NR\_RRM\_Enh-Core] 284

7.13.2 RRM perf. requirements (38.133) [NR\_RRM\_Enh-Perf] 290

7.13.2.1 General [NR\_RRM\_Enh-Perf] 290

7.13.2.2 Test cases [NR\_RRM\_Enh-Perf] 290

7.13.2.2.1 SRS carrier switching requirements [NR\_RRM\_Enh-Perf] 290

7.13.2.2.2 Multiple Scell activation/deactivation [NR\_RRM\_Enh-Perf] 292

7.13.2.2.3 CGI reading requirements with autonomous gap [NR\_RRM\_Enh-Perf] 292

7.13.2.2.4 BWP switching on multiple CCs [NR\_RRM\_Enh-Perf] 293

7.13.2.2.5 Inter-frequency measurement requirement without MG [NR\_RRM\_Enh-Perf] 294

7.13.2.2.6 Mandatory MG patterns [NR\_RRM\_Enh-Perf] 295

7.13.2.2.7 UE-specific CBW change [NR\_RRM\_Enh-Perf] 296

7.13.2.2.8 Spatial relation switch for uplink [NR\_RRM\_Enh-Perf] 296

7.13.2.2.9 Inter-band CA requirement for FR2 UE measurement capability of independent Rx beam [NR\_RRM\_Enh-Perf] 296

7.14 NR RRM requirements for CSI-RS based L3 measurement [NR\_CSIRS\_L3meas] 297

7.14.1 RRM core requirements maintenance (38.133) [NR\_CSIRS\_L3meas-Core] 297

7.14.2 RRM perf. requirements (38.133) [NR\_CSIRS\_L3meas-Perf] 301

7.14.2.1 General [NR\_CSIRS\_L3meas-Perf] 301

7.14.2.1.1 CSI-RSRP requirements [NR\_CSIRS\_L3meas-Perf] 302

7.14.2.1.2 CSI-RSRQ requirements [NR\_CSIRS\_L3meas-Perf] 304

7.14.2.1.3 CSI-SINR requirements [NR\_CSIRS\_L3meas-Perf] 306

7.14.2.2 Test cases [NR\_CSIRS\_L3meas-Perf] 308

7.14.2.2.1 General [NR\_CSIRS\_L3meas-Perf] 308

7.14.2.2.2 Intra-frequency measurement [NR\_CSIRS\_L3meas-Perf] 309

7.14.2.2.3 Inter-frequency measurement [NR\_CSIRS\_L3meas-Perf] 310

7.14.2.2.4 Measurement performance [NR\_CSIRS\_L3meas-Perf] 311

7.15 NR support for high speed train scenario [NR\_HST] 313

7.15.1 RRM requirements maintenance (38.133) [NR\_HST-Core/Perf] 313

7.15.2 Demodulation and CSI requirements Maintenance (38.101-4 / 38.104) [NR\_HST-Perf] 315

7.15.2.1 UE demodulation and CSI requirements [NR\_HST-Perf] 315

7.15.2.2 BS demodulation requirements [NR\_HST-Perf] 317

7.16 NR performance requirement enhancement [NR\_perf\_enh-Perf] 321

7.16.1 UE demodulation and CSI requirements (38.101-4) [NR\_perf\_enh-Perf] 321

7.16.1.1 NR CA PDSCH requirements [NR\_perf\_enh-Perf] 321

7.16.1.2 PMI reporting requirements with larger number of Tx ports [NR\_perf\_enh-Perf] 323

7.16.1.3 FR1 CA and EN-DC power imbalance requirements [NR\_perf\_enh-Perf] 325

7.16.1.4 NR CA CQI reporting requirements [NR\_perf\_enh-Perf] 325

7.16.1.5 Release independent [NR\_perf\_enh-Perf] 326

7.16.2 BS demodulation requirements (38.104) [NR\_perf\_enh-Perf] 326

7.17 Over the air (OTA) base station (BS) testing TR Maintenance [OTA\_BS\_testing-Perf] 326

7.18 2-step RACH for NR [NR\_2step\_RACH-Perf] 327

7.18.1 RRM requirements maintenance (38.133) [NR\_2step\_RACH-Core/Perf] 327

7.18.2 BS Demodulation requirements maintenance (38.104) [NR\_2step\_RACH-Perf] 329

7.18.3 Others [NR\_2step\_RACH-Perf] 332

7.19 R16 NR maintenance [WI code or TEI16] 332

7.19.1 UE transient period capability [TEI16] 332

7.19.2 Transmit diversity and power class related to UL MIMO [TEI16] 333

7.19.2.1 R16 support of transmit diversity [TEI16] 333

7.19.2.2 Power class related to UL MIMO and other related req. (MPR, SEM, etc) [TEI16 or NR\_newRAT-Core] 336

7.19.3 Other UE RF [WI code or TEI16] 337

7.19.4 BS RF [WI code or TEI16] 349

7.19.5 RRM [WI code or TEI16] 352

7.19.6 Demodulation and CSI [WI code or TEI16] 356

7.19.7 NR MIMO OTA test methods (38.827) [FS\_NR\_MIMO\_OTA\_test] 356

8 Rel-16 UE feature list 358

9 Rel-17 spectrum related Work Items for NR 359

9.1 NR intra band Carrier Aggregation for xCC DL/yCC UL including contiguous and non-contiguous spectrum (x>=y) [NR\_CA\_R17\_intra] 359

9.1.1 Rapporteur Input (WID/TR/CR) [NR\_CA\_R17\_intra-Core /Perf] 359

9.1.2 UE RF for FR1 [NR\_CA\_R17\_intra-Core] 360

9.1.3 UE RF for FR2 [NR\_CA\_R17\_intra-Core] 361

9.2 NR inter-band Carrier Aggregation/Dual Connectivity for 2 bands DL with x bands UL (x=1, 2) [NR\_CADC\_R17\_2BDL\_xBUL] 361

9.2.1 Rapporteur Input (WID/TR/CR) [NR\_CADC\_R17\_2BDL\_xBUL-Core/Perf] 361

9.2.2 NR inter band CA without any FR2 band(s) [NR\_CADC\_R17\_2BDL\_xBUL-Core] 362

9.2.3 NR inter band CA with at least one FR2 band [NR\_CADC\_R17\_2BDL\_xBUL-Core] 368

9.3 DC of 1 LTE band and 1 NR band [DC\_R17\_1BLTE\_1BNR\_2DL2UL] 369

9.3.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core/Perf] 369

9.3.2 EN-DC without FR2 band [DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core] 370

9.3.3 EN-DC with FR2 band [DC\_R17\_1BLTE\_1BNR\_2DL2UL-Core] 373

9.4 DC of 2 LTE band and 1 NR band [DC\_R17\_2BLTE\_1BNR\_3DL2UL] 374

9.4.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_2BLTE\_1BNR\_3DL2UL-Core/Perf] 374

9.4.2 EN-DC without FR2 band [DC\_R17\_2BLTE\_1BNR\_3DL2UL-Core] 374

9.4.3 DMEN-DC with FR2 band [DC\_R17\_2BLTE\_1BNR\_3DL2UL-Core] 383

9.5 DC of 3 LTE band and 1 NR band [DC\_R17\_3BLTE\_1BNR\_4DL2UL] 384

9.5.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_3BLTE\_1BNR\_4DL2UL-Core/Perf] 384

9.5.2 EN-DC without FR2 band [DC\_R17\_3BLTE\_1BNR\_4DL2UL-Core] 384

9.5.3 EN-DC with FR2 band [DC\_R17\_3BLTE\_1BNR\_4DL2UL-Core] 395

9.6 DC of 4 LTE band and 1 NR band [DC\_R17\_4BLTE\_1BNR\_5DL2UL] 395

9.6.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_4BLTE\_1BNR\_5DL2UL-Core/Perf] 395

9.6.2 EN-DC without FR2 band [DC\_R17\_4BLTE\_1BNR\_5DL2UL-Core] 396

9.6.3 EN-DC with FR2 band [DC\_R17\_4BLTE\_1BNR\_5DL2UL-Core] 400

9.7 DC of x bands (x=1,2, 3, 4) LTE inter-band CA and 2 bands NR inter-band CA [DC\_R17\_xBLTE\_2BNR\_yDL2UL] 400

9.7.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_xBLTE\_2BNR\_yDL2UL-Core/Per] 400

9.7.2 EN-DC including NR inter CA without FR2 band [DC\_R17\_xBLTE\_2BNR\_yDL2UL-Core] 401

9.7.3 EN-DC including NR inter CA with FR2 band [DC\_R17\_xBLTE\_2BNR\_yDL2UL-Core] 421

9.8 Band combinations for SA NR supplementary uplink (SUL) 422

9.8.1 Rapporteur Input (WID/TR/CR) [NR\_SUL\_combos\_R17-Core/Per] 422

9.8.2 UE RF [NR\_SUL\_combos\_R17-Core] 423

9.9 NR Inter-band Carrier Aggregation for 3 bands DL with 1 band UL [NR\_CA\_R17\_3BDL\_1BUL] 425

9.9.1 Rapporteur Input (WID/TR/CR) [NR\_CA\_R17\_3BDL\_1BUL-Core/Per] 425

9.9.2 UE RF [NR\_CA\_R17\_3BDL\_1BUL-Core] 425

9.10 NR Inter-band Carrier Aggregation for 4 bands DL with 1 band UL [NR\_CA\_R17\_4BDL\_1BUL] 430

9.10.1 Rapporteur Input (WID/TR/CR) [NR\_CA\_R17\_4BDL\_1BUL-Core/Per] 430

9.10.2 UE RF [NR\_CA\_R17\_4BDL\_1BUL-Core] 431

9.11 NR Inter-band Carrier Aggregation/Dual connectivity for 3 bands DL with 2 bands UL [NR\_CADC\_R17\_3BDL\_2BUL] 431

9.11.1 Rapporteur Input (WID/TR/CR) [NR\_CADC\_R17\_3BDL\_2BUL-Core/Per] 431

9.11.2 UE RF [NR\_CADC\_R17\_3BDL\_2BUL-Core] 432

9.12 DC of x bands (x=1,2) LTE inter-band CA (xDL/xUL) and y bands (y=3-x) NR inter-band CA [DC\_R17\_xBLTE\_yBNR\_3DL3UL] 438

9.12.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_xBLTE\_yBNR\_3DL3UL-Core/Per] 438

9.12.2 UE RF [DC\_R17\_xBLTE\_yBNR\_3DL3UL-Core] 439

9.13 DC of x bands (x=1,2,3) LTE inter-band CA (xDL/1UL) and 3 bands NR inter-band CA (3DL/1UL) [DC\_R17\_xBLTE\_3BNR\_yDL2UL] 439

9.13.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_xBLTE\_3BNR\_yDL2UL -Core/Per] 439

9.13.2 UE RF [DC\_R17\_xBLTE\_3BNR\_yDL2UL-Core] 439

9.14 NR inter-band Carrier Aggregation and Dual connectivity for DL 4 bands and 2UL bands [NR\_CADC\_R17\_4BDL\_2BUL] 446

9.14.1 Rapporteur Input (WID/TR/CR) [NR\_CADC\_R17\_4BDL\_2BUL -Core/Per] 446

9.14.2 UE RF [NR\_CADC\_R17\_4BDL\_2BUL -Core] 446

9.15 NR inter-band CA for 5 bands DL with x bands UL (x=1, 2) [NR\_CADC\_R17\_5BDL\_xBUL\_3DL3UL] 448

9.15.1 Rapporteur Input (WID/TR/CR) [NR\_CADC\_R17\_5BDL\_xBUL -Core/Per] 448

9.15.2 UE RF [NR\_CADC\_R17\_5BDL\_xBUL -Core] 448

9.16 DC of 5 bands LTE inter-band CA (5DL/1L) and 1 NR band (1DL/1UL) [DC\_R17\_5BLTE\_1BNR\_6DL2UL] 448

9.16.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_5BLTE\_1BNR\_6DL2UL-Core/Per] 448

9.16.2 UE RF [DC\_R17\_5BLTE\_1BNR\_6DL2UL-Core] 449

9.17 DC of x bands (x=2,3,4) LTE inter-band CA (xDL/1UL) and 1 NR FR1 band (1DL/1UL) and 1 NR FR2 band (1DL/1UL) [DC\_R17\_xBLTE\_2BNR\_yDL3UL] 449

9.17.1 Rapporteur Input (WID/TR/CR) [DC\_R17\_xBLTE\_2BNR\_yDL3UL-Core/Per] 449

9.17.2 UE RF [DC\_R17\_xBLTE\_2BNR\_yDL3UL-Core] 450

9.18 SAR schemes for UE power class 2 (PC2) for NR inter-band Carrier Aggregation and supplemental uplink (SUL) configurations with 2 bands UL [NR\_SAR\_PC2\_interB\_SUL\_2BUL] 450

9.18.1 General and Rapporteur Input (WID/TR/CR) [NR\_SAR\_PC2\_interB\_SUL\_2BUL-Core/Per] 450

9.18.2 PC2 for inter-band CA [NR\_SAR\_PC2\_interB\_SUL\_2BUL-Core] 451

9.18.3 PC2 for SUL [NR\_SAR\_PC2\_interB\_SUL\_2BUL-Core] 453

9.18.4 Others [NR\_SAR\_PC2\_interB\_SUL\_2BUL-Core] 454

9.19 High power UE (power class 2) for NR inter-band Carrier Aggregation with 2 bands downlink and 2 bands uplink [NR\_PC2\_CA\_R17\_2BDL\_2BUL] 455

9.19.1 Rapporteur Input (WID/TR/CR) [NR\_PC2\_CA\_R17\_2BDL\_2BUL-Core/Per] 455

9.19.2 UE RF [NR\_PC2\_CA\_R17\_2BDL\_2BUL-Core] 455

9.20 High power UE (power class 2) for EN-DC with 1 LTE band + 1 NR TDD band [ENDC\_UE\_PC2\_R17\_NR\_TDD] 456

9.20.1 Rapporteur Input (WID/TR/CR) [ENDC\_UE\_PC2\_R17\_NR\_TDD -Core/Per] 456

9.20.2 UE RF [ENDC\_UE\_PC2\_R17\_NR\_TDD -Core] 457

9.21 Adding channel bandwidth support to existing NR bands [NR\_bands\_R17\_BWs] 458

9.21.1 General and Rapporteur Input (WID/TR/CR) [NR\_bands\_R17\_BWs -Core/Per] 458

9.21.2 UE RF requirement [NR\_bands\_R17\_BWs -Core] 459

9.21.2.1 Reference sensitivity [NR\_bands\_R17\_BWs -Core] 460

9.21.2.2 MPR/A-MPR/NS signaling [NR\_bands\_R17\_BWs -Core] 460

9.21.2.3 others [NR\_bands\_R17\_BWs -Core] 461

9.21.3 BS RF requirement [NR\_bands\_R17\_BWs -Core] 462

9.22 Introduction of channel bandwidths 35MHz and 45MHz for NR [NR\_FR1\_35MHz\_45MHz\_BW] 462

9.22.1 General and Rapporteur Input (WID/TR/CR) [NR\_FR1\_35MHz\_45MHz\_BW-Core/Per] 462

9.22.2 Spectrum utilization [NR\_FR1\_35MHz\_45MHz\_BW-Core] 462

9.22.3 UE RF requirements [NR\_FR1\_35MHz\_45MHz\_BW-Core] 463

9.22.4 BS RF requirements [NR\_FR1\_35MHz\_45MHz\_BW-Core] 465

9.22.5 Others [NR\_FR1\_35MHz\_45MHz\_BW-Core] 467

9.23 Band combinations for Uu and V2X con-current operation [NR\_LTE\_V2X\_PC5\_combos] 467

9.23.1 General and Rapporteur Input (WID/TR/CR) [NR\_LTE\_V2X\_PC5\_combos-Core/Per] 467

9.23.2 UE RF requirement for concurrent operation between NR Uu band and NR PC5 band [NR\_LTE\_V2X\_PC5\_combos-Core] 468

9.23.3 UE RF requirement for concurrent operation between LTE Uu band and NR PC5 band [NR\_LTE\_V2X\_PC5\_combos-Core] 468

9.23.4 UE RF requirement for concurrent operation between NR Uu band and LTE PC5 band [NR\_LTE\_V2X\_PC5\_combos-Core] 469

9.23.5 UE RF requirement for concurrent operation of LTE/NR CA/DC band combinations + PC5 V2X [NR\_LTE\_V2X\_PC5\_combos-Core] 469

9.24 Introduction of FR2 FWA UE with maximum TRP of 23dBm for band n257 and n258 [NR\_FR2\_FWA\_Bn257\_Bn258] 469

9.24.1 UE RF (38.101-2) [NR\_FR2\_FWA\_Bn257\_Bn258-Core] 469

9.24.2 RRM Core requirements (38.133) [NR\_FR2\_FWA\_Bn257\_Bn258-Core] 472

9.24.3 RRM Perf. requirements (38.133) [NR\_FR2\_FWA\_Bn257\_Bn258-Perf] 472

9.24.4 Others [NR\_FR2\_FWA\_Bn257\_Bn258-Core/Perf] 472

9.25 Introduction of NR 47 GHz band [NR\_47GHz\_Band] 473

9.25.1 UE RF (38.101-2) [NR\_47GHz\_Band-Core] 473

9.25.1.1 Peak EIRP and EIRP spherical coverage [NR\_47GHz\_Band-Core] 473

9.25.1.2 Other UE TX requirements [NR\_47GHz\_Band-Core] 474

9.25.1.3 REFSENS and EIS spherical coverage [NR\_47GHz\_Band-Core] 475

9.25.1.4 Other UE RX requirements [NR\_47GHz\_Band-Core] 476

9.25.2 BS RF (38.104) [NR\_47GHz\_Band-Core] 476

9.25.3 RRM (38.133) [NR\_47GHz\_Band-Core] 476

9.25.4 Others [NR\_47GHz\_Band-Core/Perf] 477

9.25.4.1 BS conformance (38.141) [NR\_47GHz\_Band-Perf] 477

9.25.4.2 UE Demod (38.101-4) [NR\_47GHz\_Band-Perf] 478

9.25.4.3 BS Demod (38.104) [NR\_47GHz\_Band-Perf] 479

9.25.4.4 Others [NR\_47GHz\_Band-Core/Perf] 479

9.26 Introduction of NR band n24 [NR\_band\_n24] 480

9.26.1 UE RF (38.101-1) [NR\_band\_n24-Core] 480

9.26.2 BS RF (38.104) [NR\_band\_n24-Core] 480

9.26.3 RRM (38.133) [NR\_band\_n24-Core] 481

9.26.4 Others [NR\_band\_n24-Core/Perf] 481

9.27 Introduction of 1.6 GHz NR SUL band with same uplink frequency range of Band 24 [NR\_SUL\_UL\_n24] 483

9.27.1 UE RF (38.101-1) [NR\_SUL\_UL\_n24-Core] 483

9.27.2 BS RF (38.104) [NR\_SUL\_UL\_n24-Core] 484

9.27.3 RRM (38.133) [NR\_SUL\_UL\_n24-Core] 487

9.27.4 Others [NR\_SUL\_UL\_n24-Core/Perf] 487

9.28 Introduction of NR band n67 [NR\_n67] 487

9.28.1 UE RF (38.101-1) [NR\_n67-Core] 487

9.28.2 BS RF (38.104) [NR\_n67-Core] 487

9.28.3 RRM (38.133) [NR\_n67-Core] 488

9.28.4 Others [NR\_n67-Core/Perf] 488

9.29 Introduction of NR band n85 [NR\_n85] 488

9.29.1 UE RF (38.101-1) [NR\_n85-Core] 488

9.29.2 BS RF (38.104) [NR\_n85-Core] 488

9.29.3 RRM (38.133) [NR\_n85-Core] 489

9.29.4 Others [NR\_n85-Core/Perf] 489

9.30 Introduction of bandwidth combination set 4 (BCS4) for NR [NR\_BCS4] 489

9.30.1 General and Rapporteur Input (WID/TR/CR) [NR\_BCS4-Core] 489

9.30.2 UE RF requirements [NR\_BCS4-Core] 489

9.30.2.1 MSD [NR\_BCS4-Core] 489

9.30.2.2 Others (in case MPR/A-MPR is needed) [NR\_BCS4-Core] 490

9.30.3 Signalling [NR\_BCS4-Core] 490

9.31 Band combination specific requirements for NR intra band UL Carrier Aggregation [] 491

9.31.1 General and Rapporteur Input (WID/TR/CR) [-Core] 491

9.31.2 PC2 UE RF requirements [-Core] 492

9.31.2.1 Maximum output power [-Core] 492

9.31.2.2 A-MPR [-Core] 492

9.31.2.3 others [-Core] 492

9.31.3 PC3 UE RF requirements [-Core] 492

9.32 Additional NR bands for UL-MIMO [NR\_bands\_UL\_MIMO\_PC3\_R17] 492

9.32.1 General and Rapporteur Input (WID/TR/CR) [NR\_bands\_UL\_MIMO\_PC3\_R17-Core] 492

9.32.2 MPR/A-MPR requirement [NR\_bands\_UL\_MIMO\_PC3\_R17-Core] 492

9.32.3 Others [NR\_bands\_UL\_MIMO\_PC3\_R17-Core/Perf] 492

9.33 Down link interruption for band combinations to conduct dynamic Tx Switching [DL\_intrpt\_combos\_TxSW\_R17] 493

9.33.1 General and Rapporteur Input (WID/TR/CR) [DL\_intrpt\_combos\_TxSW\_R17-Core] 493

9.33.2 Determination of inter-band uplink CA and EN-DC combinations for which DL interruption is not allowed [DL\_intrpt\_combos\_TxSW\_R17-Core] 493

9.33.3 Others [DL\_intrpt\_combos\_TxSW\_R17-Core/Perf] 495

9.34 High-power UE operation for use cases in Band n77 and n78 [HPUE\_PC1\_5\_n77\_n78] 495

9.34.1 General [HPUE\_PC1\_5\_n77\_n78-Core] 495

9.34.2 PC1.5 UE RF requirements [HPUE\_PC1\_5\_n77\_n78-Core] 495

9.34.2.1 A-MPR [HPUE\_PC1\_5\_n77\_n78-Core] 496

9.34.2.2 others [HPUE\_PC1\_5\_n77\_n78-Core] 496

9.35 Introduction of lower 6GHz NR unlicensed operation for Europe [NR\_6GHz\_unlic\_EU] 496

9.35.1 General [NR\_6GHz\_unlic\_EU-Core] 496

9.35.2 UE RF requirements [NR\_6GHz\_unlic\_EU-Core] 498

9.35.3 BS RF requirements [NR\_6GHz\_unlic\_EU-Core] 498

9.35.4 Others [NR\_6GHz\_unlic\_EU-Core] 499

10 Reply to ITU-R LS (RP-200042) 499

10.1 Study on IMT parameters for frequency ranges 6.425-7.125GHz and 10.0-10.5GHz [FS\_6425\_10500MHz \_NR] 499

10.1.1 UE parameters 499

10.1.2 BS parameters 501

10.1.3 Coexistence study 502

10.1.3.1 Simulation assumptions 502

10.1.3.2 Downlink 503

10.1.3.3 Uplink 504

10.1.4 Antenna characteristics 505

10.1.5 Relevant information for the sharing and compatibility studies 506

11 Rel-17 non-spectrum related work items for NR 506

11.1 Multiple Input Multiple Output (MIMO) Over-the-Air (OTA) requirements for NR UEs [NR\_MIMO\_OTA] 506

11.1.1 General [NR\_MIMO\_OTA] 506

11.1.2 Performance Requirements [NR\_MIMO\_OTA-Core] 507

11.1.2.1 Performance Requirements for FR1 [NR\_MIMO\_OTA-Core] 507

11.1.2.2 Performance Requirements for FR2 [NR\_MIMO\_OTA-Core] 507

11.1.3 Testing methodologies [NR\_MIMO\_OTA-Core] 508

11.1.3.1 Testing parameters for Performance [NR\_MIMO\_OTA-Core] 508

11.1.3.2 Optimization of test methodologies [NR\_MIMO\_OTA-Core] 509

11.1.3.3 Channel model validation [NR\_MIMO\_OTA-Core] 509

11.2 RF requirements enhancement for NR frequency range 1 (FR1) [NR\_RF\_FR1\_enh] 510

11.2.1 General and work plan [NR\_RF\_FR1\_enh-Core] 510

11.2.2 RF core requirements [NR\_RF\_FR1\_enh-Core] 510

11.2.2.1 UL MIMO configuration for SUL band configurations [NR\_RF\_FR1\_enh-Core] 511

11.2.2.2 2Tx switching between carrier 1 and carrier 2 [NR\_RF\_FR1\_enh-Core] 511

11.2.2.3 Tx switching between 1 carrier on band A and 2 contiguous aggregated carriers on band B [NR\_RF\_FR1\_enh-Core] 512

11.2.2.4 HPUE for TDD intra-band contiguous UL CA [NR\_RF\_FR1\_enh-Core] 513

11.2.2.5 HPUE for TDD intra-band non-contiguous UL CA [NR\_RF\_FR1\_enh-Core] 515

11.3 NR RF requirement enhancements for frequency range 2 (FR2) [NR\_RF\_FR2\_req\_enh2] 516

11.3.1 General and work plan [NR\_RF\_FR2\_req\_enh2-Core] 516

11.3.2 RF core requirements [NR\_RF\_FR2\_req\_enh2-Core] 517

11.3.2.1 Inter-band DL CA enhancements [NR\_RF\_FR2\_req\_enh2-Core] 517

11.3.2.1.1 Applicability of CBM/IBM for different CA configurations [NR\_RF\_FR2\_req\_enh2-Core] 517

11.3.2.1.2 UE requirements for CA configurations CA\_n258A-n260A and CA\_n257A-n259A based on IBM [NR\_RF\_FR2\_req\_enh2-Core] 519

11.3.2.1.3 UE requirements for CA configurations within the same frequency group based on CBM [NR\_RF\_FR2\_req\_enh2-Core] 520

11.3.2.2 Inter-band UL CA [NR\_RF\_FR2\_req\_enh2-Core] 521

11.3.2.2.1 UE requirements for CA configuration CA\_n257A-n259A based on IBM [NR\_RF\_FR2\_req\_enh2-Core] 521

11.3.3 Feasibility study [NR\_RF\_FR2\_req\_enh2-Core] 522

11.3.3.1 Inter-band DL CA enhancements [NR\_RF\_FR2\_req\_enh2-Core] 522

11.3.3.1.1 Feasibility study for CA configurations within same frequency group based on IBM [NR\_RF\_FR2\_req\_enh2-Core] 522

11.3.3.1.2 Feasibility study for CA configurations between different frequency groups based on CBM [NR\_RF\_FR2\_req\_enh2-Core] 522

11.3.3.2 Inter-band UL CA [NR\_RF\_FR2\_req\_enh2-Core] 523

11.3.3.2.1 Feasibility study for CA configurations within same frequency group based on IBM and CBM [NR\_RF\_FR2\_req\_enh2-Core] 523

11.3.3.2.2 Feasibility study for CA configurations between different frequency groups based on CBM [NR\_RF\_FR2\_req\_enh2-Core] 523

11.3.4 UL gaps for self-calibration and monitoring [NR\_RF\_FR2\_req\_enh2-Core] 523

11.3.4.1 Gap use cases and performance evaluation [NR\_RF\_FR2\_req\_enh2-Core] 524

11.3.4.2 Others [NR\_RF\_FR2\_req\_enh2-Core] 525

11.3.5 RRM core requirements [NR\_RF\_FR2\_req\_enh2-Core] 525

11.3.5.1 Inter-band DL CA enhancements [NR\_RF\_FR2\_req\_enh2-Core] 526

11.3.5.2 Inter-band UL CA [NR\_RF\_FR2\_req\_enh2-Core] 527

11.4 Further RRM enhancement for NR and MR-DC [NR\_RRM\_enh2] 528

11.4.1 General and work plan [NR\_RRM\_enh2-Core] 528

11.4.2 RRM core requirements [NR\_RRM\_enh2-Core] 528

11.4.2.1 SRS antenna port switching [NR\_RRM\_enh2-Core] 528

11.4.2.2 HO with PSCell [NR\_RRM\_enh2-Core] 530

11.4.2.3 PUCCH SCell activation/deactivation [NR\_RRM\_enh2-Core] 532

11.5 NR and MR-DC measurement gap enhancements [NR\_MG\_enh] 534

11.5.1 General and work plan [NR\_MG\_enh-Core] 534

11.5.2 RRM core requirements [NR\_MG\_enh-Core] 534

11.5.2.1 Pre-configured MG pattern(s) [NR\_MG\_enh-Core] 534

11.5.2.2 Multiple concurrent and independent MG patterns [NR\_MG\_enh-Core] 537

11.5.2.3 Network Controlled Small Gap [NR\_MG\_enh-Core] 539

11.6 Enhancement for NR high speed train scenario in FR1 [NR\_HST\_FR1\_enh-Core] 541

11.6.1 General and work plan [NR\_HST\_FR1\_enh-Core] 541

11.6.2 RRM core requirements [NR\_HST\_FR1\_enh-Core] 541

11.6.2.1 UE RRM core requirements for CA scenario [NR\_HST\_FR1\_enh-Core] 541

11.6.3 UE demodulation requirements (38.101-4) [NR\_HST\_FR1\_enh-Perf] 543

11.6.3.1 General [NR\_HST\_FR1\_enh-Perf] 543

11.6.3.2 PDSCH requirements for CA scenarios [NR\_HST\_FR1\_enh-Perf] 543

11.6.3.3 Enhanced transmission schemes [NR\_HST\_FR1\_enh-Perf] 544

11.7 NR support for high speed train scenario in FR2 [NR\_HST\_FR2\_enh] 545

11.7.1 General and work plan [NR\_HST\_FR2\_enh-Core] 545

11.7.2 High speed train deployment scenario in FR2 [NR\_HST\_FR2\_enh-Core] 546

11.7.3 UE RF core requirements [NR\_HST\_FR2\_enh-Core] 547

11.7.4 RRM core requirements [NR\_HST\_FR2\_enh-Core] 548

11.8 Solutions for NR to support non-terrestrial networks (NTN) [NR\_NTN\_solutions] 550

11.8.1 General and work plan [NR\_NTN\_solutions-Core] 550

11.8.2 Use cases, deployment scenarios, and regulatory information [NR\_NTN\_solutions-Core] 550

11.8.3 Coexistence aspects [NR\_NTN\_solutions-Core] 552

11.8.3.1 Simulation assumptions [NR\_NTN\_solutions-Core] 552

11.8.3.2 UE requirements aspects [NR\_NTN\_solutions-Core] 553

11.8.3.3 BS requirements aspects [NR\_NTN\_solutions-Core] 553

11.8.4 RRM core requirements [NR\_NTN\_solutions-Core] 554

11.8.4.1 General [NR\_NTN\_solutions-Core] 555

11.8.4.2 Timing requirements [NR\_NTN\_solutions-Core] 555

11.8.4.3 Measurement requirements [NR\_NTN\_solutions-Core] 556

11.9 UE Power Saving Enhancements [NR\_UE\_pow\_sav\_enh] 557

11.9.1 General and work plan [NR\_UE\_pow\_sav\_enh-Core] 557

11.9.2 UE measurements relaxation for RLM and/or BFD [NR\_UE\_pow\_sav\_enh-Core] 558

11.10 NR Sidelink enhancement [NRSL\_enh] 561

11.10.1 General and work plan [NRSL\_enh] 561

11.10.2 Spectrum request for SL operation [NRSL\_enh-Core] 561

11.10.3 UE RF requirements for NR SL enhancement [NRSL\_enh-Core] 562

11.10.3.1 TX requirements [NRSL\_enh-Core] 562

11.10.3.2 RX requirements [NRSL\_enh-Core] 562

11.10.4 Partially used SL operation with NR Uu operating bands [NRSL\_enh-Core] 563

11.10.4.1 Operating scenarios for partially used SL operation [NRSL\_enh-Core] 563

11.10.4.2 Synchronous operation between NR Uu and NR SL in an operating band [NRSL\_enh-Core] 563

11.10.4.3 Others [NRSL\_enh-Core] 564

11.10.5 High power UE(PC2) for SL [NRSL\_enh-Core] 564

11.10.5.1 TX requirements [NRSL\_enh-Core] 565

11.10.5.2 RX requirements [NRSL\_enh-Core] 565

11.10.6 Other RF/general requirements for New SL enhancement [NRSL\_enh-Core] 565

11.11 NR repeater 566

11.11.1 General and work plan [NR\_repeaters-Core] 566

11.11.2 Conductive RF core requirements [NR\_repeaters-Core] 568

11.11.2.1 Transmitted power related requirements [NR\_repeaters-Core] 568

11.11.2.2 Emission requirements [NR\_repeaters-Core] 569

11.11.2.3 Others [NR\_repeaters-Core] 569

11.11.3 Radiated RF core requirements 570

11.11.3.1 Transmitted power related requirements [NR\_repeaters-Core] 570

11.11.3.2 Emission requirements [NR\_repeaters-Core] 571

11.11.3.3 Others [NR\_repeaters-Core] 571

11.11.4 EMC core requirements [NR\_repeaters-Core] 571

12 Rel-17 Study Items for NR 573

12.1 Study on enhanced test methods for FR2 in NR [FS\_FR2\_enhTestMethods] 573

12.1.1 General [FS\_FR2\_enhTestMethods] 573

12.1.2 Test methodology for high DL power and low UL power test cases [FS\_FR2\_enhTestMethods] 573

12.1.3 Polarization basis mismatch [FS\_FR2\_enhTestMethods] 574

12.1.4 Enhanced test methods for inter-band (FR2+FR2) CA [FS\_FR2\_enhTestMethods] 575

12.1.5 Extreme temperature conditions [FS\_FR2\_enhTestMethods] 576

12.1.6 Enhanced test methods for FR2 DL 256QAM RF [FS\_FR2\_enhTestMethods] 577

12.1.7 Test time reduction [FS\_FR2\_enhTestMethods] 577

12.1.8 Testability for band n262 [FS\_FR2\_enhTestMethods] 579

12.1.8.1 Extension of frequency applicability of permitted methods in 38.810 [FS\_FR2\_enhTestMethods] 579

12.1.8.2 Extension of frequency applicability of enhancement objectives 1-6 [FS\_FR2\_enhTestMethods] 579

12.2 Study on supporting NR from 52.6 GHz to 71 GHz [FS\_NR\_52\_to\_71GHz] 579

12.2.1 Numerology, Channel BW [FS\_NR\_52\_to\_71GHz] 579

12.2.1.1 General [FS\_NR\_52\_to\_71GHz] 580

12.2.1.2 General [FS\_NR\_52\_to\_71GHz] 581

12.2.1.3 Phase noise [FS\_NR\_52\_to\_71GHz] 582

12.2.2 BS aspect [FS\_NR\_52\_to\_71GHz] 583

12.2.3 UE aspect [FS\_NR\_52\_to\_71GHz] 584

12.2.4 Others [FS\_NR\_52\_to\_71GHz] 585

12.3 Study on Efficient utilization of licensed spectrum that is not aligned with existing NR channel bandwidths [FS\_NR\_eff\_BW\_util] 587

12.3.1 General and work plan [FS\_NR\_eff\_BW\_util] 587

12.3.2 Input on operator licensed channel bandwidths in FR1 that do not align with existing NR channel bandwidths [FS\_NR\_eff\_BW\_util] 587

12.3.3 Evaluation of use of larger channel bandwidths than operator licensed bandwidth [FS\_NR\_eff\_BW\_util] 587

12.3.4 Evaluation of use of overlapping UE channel bandwidths (from both UE and network perspective) [FS\_NR\_eff\_BW\_util] 588

12.3.4.1 UE perspective [FS\_NR\_eff\_BW\_util] 588

12.3.4.2 Network perspective [FS\_NR\_eff\_BW\_util] 589

12.3.5 Others [FS\_NR\_eff\_BW\_util] 589

12.4 Study on extended 600MHz NR band [FS\_NR\_600MHz\_ext] 589

12.4.1 General 589

12.4.2 Regulatory study 590

12.4.3 Coexistence study 590

12.4.4 Study on frequency arrangements (such as options B1 and B2) 591

12.4.5 Others 594

12.5 Study on high power UE (power class 2) for one NR FDD band [FS\_NR\_PC2\_UE\_FDD] 594

12.5.1 General 594

12.5.2 Scheme(s) to comply with the SAR limits 595

12.5.3 Interference issues 596

12.5.4 UE implementation issues 596

12.5.5 System performance evaluations 596

13 Rel-17 Work Items for LTE 597

13.1 LTE inter-band Carrier Aggregation for 2 bands DL with 1 band UL [LTE\_CA\_R17\_2BDL\_1BUL] 597

13.1.1 Rapporteur Input (WID/TR/CR) [LTE\_CA\_R17\_2BDL\_1BUL-Core/Perf] 597

13.1.2 UE RF with harmonic, close proximity and isolation issues [LTE\_CA\_R17\_2BDL\_1BUL-Core] 598

13.1.3 UE RF without specific issues [LTE\_CA\_R17\_2BDL\_1BUL-Core] 598

13.2 LTE inter-band Carrier Aggregation for 3 bands DL with 1 band UL [LTE\_CA\_R17\_3BDL\_1BUL] 599

13.2.1 Rapporteur Input (WID/TR/CR) [LTE\_CA\_R17\_3BDL\_1BUL-Core/Perf] 599

13.2.2 UE RF with harmonic, close proximity and isolation issues [LTE\_CA\_R17\_3BDL\_1BUL-Core] 600

13.2.3 UE RF without specific issues [LTE\_CA\_R17\_3BDL\_1BUL-Core] 601

13.3 LTE inter-band Carrier Aggregation for x bands DL (x=4, 5) with 1 band UL [LTE\_CA\_R17\_xBDL\_1BUL] 602

13.3.1 Rapporteur Input (WID/TR/CR) [LTE\_CA\_R17\_xBDL\_1BUL-Core] 603

13.3.2 UE RF with 4 LTE bands CA [LTE\_CA\_R17\_xBDL\_1BUL-Core] 603

13.3.3 UE RF with 5 LTE bands CA [LTE\_CA\_R17\_xBDL\_1BUL-Core] 607

13.4 LTE inter-band Carrier Aggregation for 2 bands DL with 2 band UL [LTE\_CA\_R17\_2BDL\_2BUL] 608

13.4.1 Rapporteur Input (WID/TR/CR) [LTE\_CA\_R17\_2BDL\_2BUL-Core] 608

13.4.2 UE RF with harmonic, close proximity and isolation issues [LTE\_CA\_R17\_2BDL\_2BUL-Core] 609

13.4.3 UE RF without specific issues [LTE\_CA\_R17\_2BDL\_2BUL-Core] 609

13.5 LTE inter-band Carrier Aggregation for x bands DL (x= 3, 4, 5) with 2 band UL [LTE\_CA\_R17\_xBDL\_2BUL] 609

13.5.1 Rapporteur Input (WID/TR/CR) [LTE\_CA\_R17\_xBDL\_2BUL-Core] 609

13.5.2 UE RF with MSD [LTE\_CA\_R17\_xBDL\_2BUL-Core] 610

13.5.3 UE RF without MSD [LTE\_CA\_R17\_xBDL\_2BUL-Core] 610

13.6 RRM for LTE CA basket WIs [LTE\_CA\_R17\_xxxx] 611

13.6.1 RRM Core (36.133) [LTE\_CA\_R17\_xxxx-Core] 611

13.6.2 RRM Perf (36.133) [LTE\_CA\_R17\_xxxx-Perf] 611

13.7 New WID on Additional LTE bands for UE category M1&M2 and/or NB1&NB2 in Rel-17 [LTE\_bands\_R17\_M1\_M2\_NB1\_NB2] 611

13.7.1 Rapporteur Input (WID/TR/CR) [LTE\_bands\_R17\_M1\_M2\_NB1\_NB2-Core] 611

13.7.2 RF [LTE\_bands\_R17\_M1\_M2\_NB1\_NB2-Core] 614

13.7.3 Others [LTE\_bands\_R17\_M1\_M2\_NB1\_NB2-Perf] 614

13.8 Modification of LTE Band 24 specifications to comply with updated regulatory emission limits [LTE\_B24\_mod] 615

13.8.1 General and rapporteur input [LTE\_B24\_mod-Core] 615

13.8.2 UE RF [LTE\_B24\_mod-Core] 615

13.8.3 BS RF [LTE\_B24\_mod-Core] 617

13.8.4 RRM and others [LTE\_B24\_mod-Core/Perf] 621

14 Rel-17 Study Items for LTE 626

14.1 High-power UE operation for fixed-wireless/vehicle-mounted use cases in LTE bands 5 and 12 and NR band n71 [FS\_LTE\_NR\_HPUE\_FWVM] 626

14.1.1 General 626

14.1.2 Coexistence study 627

14.1.3 UE RF 627

15 Liaison and output to other groups 628

15.1 R17 related 628

15.2 Others 631

16 Revision of the Work Plan 631

16.1 Simplification of band combinations in RAN4 specifications 631

16.2 R17 new proposals 633

16.2.1 Spectrum related 633

16.2.2 Non-spectrum related 635

16.3 Others 637

17 Any other business 637

18 Close of the E-meeting 638

## 1 Opening of the E-meeting

The Chairman Steven Chen (Apple) opened the meeting on RAN4 reflector on 25/01/2021.

**Intellectual Property Rights Policy**

The attention of the delegates to the meeting of this Technical Specification Group was drawn to the fact that 3GPP Individual Members have the obligation under the IPR Policies of their respective Organizational Partners to inform their respective Organizational Partners of Essential IPRs they become aware of.

The delegates were asked to take note that they were thereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.

- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Information Statement and the Licensing declaration forms.

**Statement regarding competition law**

The attention of the delegates to the meeting was drawn to the fact that 3GPP activities were subject to all applicable antitrust and competition laws and that compliance with said laws was therefore required by any participant of the meeting, including the Chairman and Vice-Chairmen and were invited to seek any clarification needed with their legal counsel. The leadership would conduct the present meeting with impartiality and in the interests of 3GPP. Delegates were reminded that timely submission of work items in advance of TSG/WG meetings was important to allow for full and fair consideration of such matters.

**Meeting Arrangements**

The meeting was conducted on three parallel sessions; Main session, RRM session and BS RF Test Demod session. The Main session was chaired by RAN4 Chairman Steven Chen (Apple), RRM session was chaired by RAN4 Vice Chairman Andrey Chervyakov (Intel) and BS RF Test Demod session was chaired by RAN4 ViceChairman Haijie Qiu (Samsung). The sessions were further broken down into separate email threads to address specific technical topics lead by assigned discussion moderators. Webinar sessions were used to summarize progress, resolve controversial issues and decide way forward.

## 2 Approval of the agenda

## 3 Letters / reports from other groups / meetings

## 4 Rel-15 New radio access technology

### 4.3 UE EMC requirements maintenance [NR\_newRAT-Core]

**R4-2103742 Email discussion summary for [98e][303] NR\_EMC**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103922 (from R4-2103742).**

**R4-2103922 Email discussion summary for [98e][303] NR\_EMC**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103770 WF on single carrier NR FR2 UE EMC requirement**

*Type: other For: Approval  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2100890 CR to TS38.124 on radiated emissions**

*Type: CR For: Agreement  
 38.124 v15.4.0 CR-0029 Cat: F (Rel-15)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2100891 CR to TS38.124 on radiated emissions**

*Type: CR For: Agreement  
 38.124 v16.1.0 CR-0030 Cat: A (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2101872 on FR2 UE EMC requirement**

*Type: discussion For: (not specified)  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102398 CR for TS 38.124: Correction of FR1 radiated spurious emissions (R15)**

*Type: CR For: Agreement  
 38.124 v15.4.0 CR-0031 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon, Bureau Veritas*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103771 (from R4-2102398).**

**R4-2103771 CR for TS 38.124: Correction of FR1 radiated spurious emissions (R15)**

*Type: CR For: Agreement  
 38.124 v15.4.0 CR-0031 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon, Bureau Veritas,Samsung*

**Discussion:**

[report of discussion]

Session chair note: please correct the coverpage error as MCC pointed out!

**Decision: Return to.**

**R4-2102399 CR for TS 38.124: Correction of FR1 radiated spurious emissions (R16)**

*Type: CR For: Agreement  
 38.124 v16.1.0 CR-0032 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon, Bureau Veritas, Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102576 CR to TS 38.124: correction of the lower frequency range of the RSE, Rel-15**

*Type: CR For: Agreement  
 38.124 v15.4.0 CR-0033 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

Lower spurious range limit for RSE is corrected to 30 MHz, to align with SM.329 and other UE EMC specifications.

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102577 CR to TS 38.124: correction of the lower frequency range of the RSE, Rel-16**

*Type: CR For: Agreement  
 38.124 v16.1.0 CR-0034 Cat: A (Rel-16)  
  
 Source: Huawei*

**Abstract:**

Lower spurious range limit for RSE is corrected to 30 MHz, to align with SM.329 and other UE EMC specifications.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 4.4 BS RF requirements maintenance [NR\_newRAT-Core]

#### 4.4.1 General [NR\_newRAT-Core]

**R4-2103740 Email discussion summary for [98e][301] BSRF\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103923 (from R4-2103740).**

**R4-2103923 Email discussion summary for [98e][301] BSRF\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**--------------------------GTW agenda on Jan.29th for email thread [301] -----------------------**

**Topic 1 Japan regulation for 2.5GHz**

**Summary from moderator based on 1st round discussion:**

There were no objections to the overall proposal to introduce the Japanese regulation in LTE and NR specs.

On the specific CRs, several issues were raised in discussions:

1. The definition of limits “per cell”, which is not a concept defined in 3GPP. Proposed to consider the use of “sum over antenna connectors”.
2. The use of “unless stated differently in regional regulations”, which should be avoided. It was argued that it is better to state specific exceptions.
3. Specifically, the general spurious emission limits (Category A) should be left unchanged and should not be regional. Exceptions could be added in relation to the reference point, since it is now 250% of NB.
4. Keeping the sentence “In certain regions, additional regional requirements may apply, since it is general and concerns not only Japan.

All CRs need to be revised and the detailed text is for further discussion.

Discussion:

NEC: We are fine to accept all the issues and fixed in the revised CRs. We are using the generic limit not on emission limits.

For LTE spec CRs, the situation is different. We are fine to keep the text in LTE as it’s. The only changes to LTE spec changes is OBUE and spurious emission.

Softbank: Concerning with LTE handling, we have discussion with Nokia together within Japanese party, and the agreement is we would like to avoid the heavy maintenance work on LTE specifications.

Topic #2: AAS capability set and support for NR+UTRA

Summary from moderator for 1st round

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#2-1** | There is no objection to applying Option 2 in Rel-16.  Agreements: As a Way-Forward, applying Option 1 in Rel-15 and Option 2 in Rel-16 seems to be agreeable. |

**---------------------------------------End -------------------------------------------**

**R4-2101016 Support of Japan regulation for 2.5GHz(BWA) in NR BS**

*Type: other For: Information  
 Source: SoftBank Corp., KDDI Corporation, NEC Corporation*

**Abstract:**

This paper provides background info for the proposals to support n41/n90 in BS for Japan.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102844 CR to 37.105 on NR+UTRA support for AAS**

*Type: CR For: Agreement  
 37.105 v15.11.0 CR-0224 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Presently, it is not explicitly explained in TS 37.105 what RATs and RAT combinations that are not supported by AAS BS. This is clarified by the CR.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103785 (from R4-2102567).**

**R4-2103785 CR to 37.105 on NR+UTRA support for AAS**

*Type: CR For: Agreement  
 37.105 v15.11.0 CR-0224 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Presently, it is not explicitly explained in TS 37.105 what RATs and RAT combinations that are not supported by AAS BS. This is clarified by the CR.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102845 CR to 37.105 on NR+UTRA support for AAS**

*Type: CR For: Agreement  
 37.105 v16.6.0 CR-0225 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Presently, it is not explicitly explained in TS 37.105 what RATs and RAT combinations that are not supported by AAS BS. This is clarified by the CR.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102846 CR to 37.105 on NR+UTRA support for AAS**

*Type: CR For: Agreement  
 37.105 v17.0.0 CR-0226 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Presently, it is not explicitly explained in TS 37.105 what RATs and RAT combinations that are not supported by AAS BS. This is clarified by the CR.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

#### 4.4.2 TX/RX requirements maintenance (38.104) [NR\_newRAT-Core]

**R4-2101088 CR to TS 38.104: Additions of regional requirements for n41 in Japan, Rel-15**

*Type: CR For: Agreement  
 38.104 v15.12.0 CR-0271 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103777 (from R4-2101088).**

**R4-2103777 CR to TS 38.104: Additions of regional requirements for n41 in Japan, Rel-15**

*Type: CR For: Agreement  
 38.104 v15.12.0 CR-0271 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101089 CR to TS 38.104: Additions of regional requirements for n41 and n90 in Japan, Rel-16**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0272 Cat: F (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103958 (from R4-2101089).**

**R4-2103958 CR to TS 38.104: Additions of regional requirements for n41 and n90 in Japan, Rel-16**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0272 Cat: F (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101090 CR to TS 38.104: Additions of regional requirements for n41 and n90 in Japan, Rel-17**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0273 Cat: A (Rel-17)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101091 CR to TS 38.141-1: Additions of regional requirements for n41 in Japan, Rel-15**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0182 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.2 to treat together with the changes to core specification.

**Decision: Revised to R4-2103778 (from R4-2101091).**

**R4-2103778 CR to TS 38.141-1: Additions of regional requirements for n41 in Japan, Rel-15**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0182 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.2 to treat together with the changes to core specification.

**Decision: Return to.**

**R4-2101092 CR to TS 38.141-1: Additions of regional requirements for n41 and n90 in Japan, Rel-16**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0183 Cat: F (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.2 to treat together with the changes to core specification.

**Decision: Revised to R4-2103779 (from R4-2101092).**

**R4-2103779 CR to TS 38.141-1: Additions of regional requirements for n41 and n90 in Japan, Rel-16**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0183 Cat: F (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.2 to treat together with the changes to core specification.

**Decision: Return to.**

**R4-2101093 CR to TS 38.141-1: Additions of regional requirements for n41 and n90 in Japan, Rel-17**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0184 Cat: A (Rel-17)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.2 to treat together with the changes to core specification.

**Decision: Return to.**

**R4-2101094 CR to TS 38.141-2: Additions of regional requirements for n41 in Japan, Rel-15**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0277 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Revised to R4-2103780 (from R4-2101094).**

**R4-2103780 CR to TS 38.141-2: Additions of regional requirements for n41 in Japan, Rel-15**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0277 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Return to.**

**R4-2101095 CR to TS 38.141-2: Additions of regional requirements for n41 and n90 in Japan, Rel-16**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0278 Cat: F (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Revised to R4-2103781 (from R4-2101095).**

**R4-2103781 CR to TS 38.141-2: Additions of regional requirements for n41 and n90 in Japan, Rel-16**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0278 Cat: F (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Return to.**

**R4-2101096 CR to TS 38.141-2: Additions of regional requirements for n41 and n90 in Japan, Rel-17**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0279 Cat: A (Rel-17)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Return to.**

**R4-2101994 CR to TS 38.104: EESS protection requirement correction**

*Type: CR For: Agreement  
 38.104 v15.12.0 CR-0287 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101995 CR to TS 38.104: EESS protection requirement correction**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0288 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101996 CR to TS 38.104: EESS protection requirement correction**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0289 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101997 CR to TS 38.141-2: EESS protection requirement correction**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0296 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Agreed.**

**R4-2101998 CR to TS 38.141-2: EESS protection requirement correction**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0297 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Agreed.**

**R4-2101999 CR to TS 38.141-2: EESS protection requirement correction**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0298 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from AI 4.5.3 to treat together with the changes to core specification.

**Decision: Agreed.**

#### 4.4.3 MSR specifications maintenance [NR\_newRAT-Core/Perf]

**R4-2102441 CR to 37.141: Correction to ACLR limit in non-contiguous spectrum (Rel-15)**

*Type: CR For: Agreement  
 37.141 v15.13.0 CR-0961 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102442 CR to 37.141: Correction to ACLR limit in non-contiguous spectrum (Rel-16)**

*Type: CR For: Agreement  
 37.141 v16.8.0 CR-0962 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102443 CR to 37.141: Correction to ACLR limit in non-contiguous spectrum (Rel-17)**

*Type: CR For: Agreement  
 37.141 v17.0.0 CR-0963 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102841 CR to 37.145-1 on Removal of additional limit for Band 7**

*Type: CR For: Agreement  
 37.145-1 v15.8.0 CR-0248 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

In CRs to RAN4#97-E, additional limits for Bands 1 and 7 were removed, triggered by an LS from ETSI TFES. Limits for Band 7 however remain in TS 37.145-1. Those are removed with this CR to ensure that all specifications are aligned.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102842 CR to 37.145-1 on Removal of additional limit for Band 7**

*Type: CR For: Agreement  
 37.145-1 v16.5.0 CR-0249 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

In CRs to RAN4#97-E, additional limits for Bands 1 and 7 were removed, triggered by an LS from ETSI TFES. Limits for Band 7 however remain in TS 37.145-1. Those are removed with this CR to ensure that all specifications are aligned.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102843 CR to 37.145-1 on Removal of additional limit for Band 7**

*Type: CR For: Agreement  
 37.145-1 v17.0.0 CR-0250 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

In CRs to RAN4#97-E, additional limits for Bands 1 and 7 were removed, triggered by an LS from ETSI TFES. Limits for Band 7 however remain in TS 37.145-1. Those are removed with this CR to ensure that all specifications are aligned.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102847 CR to 37.104 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.104 v15.12.0 CR-0934 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not complete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103883 (from R4-2102847).**

**R4-2103883 CR to 37.104 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.104 v15.12.0 CR-0934 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not complete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102848 CR to 37.104 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.104 v16.8.0 CR-0935 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102849 CR to 37.104 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.104 v17.0.0 CR-0936 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102850 CR to 37.141 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.141 v15.13.0 CR-0973 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103884 (from R4-2102850).**

**R4-2103884 CR to 37.141 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.141 v15.13.0 CR-0973 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102851 CR to 37.141 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.141 v16.8.0 CR-0974 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102852 CR to 37.141 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.141 v17.0.0 CR-0975 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102853 CR to 37.105 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.105 v15.11.0 CR-0227 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103885 (from R4-2102853).**

**R4-2103885 CR to 37.105 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.105 v15.11.0 CR-0227 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102854 CR to 37.105 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.105 v16.6.0 CR-0228 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102855 CR to 37.105 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.105 v17.0.0 CR-0229 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102856 CR to 37.145-1 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-1 v15.8.0 CR-0251 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103886 (from R4-2102856).**

**R4-2103886 CR to 37.145-1 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-1 v15.8.0 CR-0251 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102857 CR to 37.145-1 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-1 v16.5.0 CR-0252 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102858 CR to 37.145-1 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-1 v17.0.0 CR-0253 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102859 CR to 37.145-2 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0288 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103887 (from R4-2102859).**

**R4-2103887 CR to 37.145-2 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0288 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102860 CR to 37.145-2 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0289 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102861 CR to 37.145-2 on OBUE table headings and applicability**

*Type: CR For: Agreement  
 37.145-2 v17.0.0 CR-0290 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The OBUE applicability tables headings are ambiguous, and sometimes not cmoplete or fully aligned with the intended applicability. The CR corrects the headings to align.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 4.5 BS conformance testing Maintenance [NR\_newRAT-Perf]

#### 4.5.1 General [NR\_newRAT-Perf]

**R4-2103741 Email discussion summary for [98e][302] NR\_Conformance\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103924 (from R4-2103741).**

**R4-2103924 Email discussion summary for [98e][302] NR\_Conformance\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103787 WF on adjacent channel co-location**

*Type: other For: Approval  
 Source: Huawei2100*

**Abstract:**

**Discussion:**

**Decision: Return to.**

-------------------------------GTW agenda on Jan.29th for email thread [303] ---------------------

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1-1**  **CLTA Height** | *Tentative agreements:* The contents of the table seem acceptable to all with the contents of the note describing the use of the 2 definitions requiring work  *Candidate options:*  Option 1: CATT:  NOTE 2: Only applicable when the vertical radiating dimension of out-of-band CLTAs is smaller than the test object vertical radiating length.  NOTE 3: Applicable when the vertical radiating dimension of out-of-band CLTAs derived by equal vertical beam width method is larger than the test object vertical radiating length.  Option 2:  Huawei: NOTE 2: Both definitions demonstrate compliance to the requirement, either vertical radiating dimension or vertical beam width definition may be used depending on the availability of CLTA  Option 3:  Nokia: NOTE 2: Beam width definition may be used in combination with vertical radiating dimension definition and vice versa to determine suitable CLTA.  *Recommendations for 2nd round:* Continue to work on wording of the note. Hopefully we can do this by working on CR, resort to another WF only if we cannot get resolution.  Possible approach is to state the height match definition is only used when the test chamber dimensions limit the use of the existing definition.  Nokia: First priority is existing one, if not feasible then go with the alternative method?  Huawei: Yes  Nokia: We are fine with the approach and continue to work on the texts.  CATT: General is OK with this approach, need to work together in 2nd for the exact wording.  Agreements:  Using the approach “State the height match definition is only used when the test chamber dimensions limit the use of the existing definition”. Further work in 2nd round for texting into specifications. |
| **Sub topic#1-2**  **Co-location adjacent operating bands** | *Tentative agreements:* The issue seems to be accepted but the proposed solution is not. Further work needed to find an acceptable solution  *Candidate options:*  *Recommendations for 2nd round:* Continue to discuss, there is some time allocated to NR conformance on Friday GTW meeting. WF is best approach to try to capture companies’ views on a solution.  Huawei: We have a WF in last meeting to describe this issue which require companies to find possible solutions to resolve this issue.  With AAS, we could do more useful for this scenario. We think we need to find a proper solution to address this issue.  For non-AAS, the solution is adding a note using site engineering. For AAS, we can consider similar solution.  Nokia: We have a question for clarification. We would like to resolve the issue without the modification of existing requirements.  E///: We should maintain the requirements as it’s, we should avoid to change the requirements; also site engineering is deployment issue, usually not specified into spec, we prefer to keep the spec as it is.  NEC: This is not related to positioning accuracy requirements. If we can take the emission requirements at it is, then we are open to discuss the candidate solution. The changes into colocation table is not a proper place to address this issue.  DoCoMo: We have similar view with E///, we can’t accept the changes to test requirements.  Huawei: I understand the current proposed solution from our side is not acceptable for companies.  For adjacent system, the requirements are not feasible. We try to offer solutions to make requirements for adjacent system with co-location.  There is benefit to keep the note into test specification to make it testable.  Further work on 2nd round on possible solutions. |

-------------------------End -------------------------------------

**R4-2101568 Further discussion on PN23 sequence generation for NR test models**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we further continue discussion on PN23 sequence generator for NR test models that was initiated during RAN4#97 meeting.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101569 CR to TS 38.141-1 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0192 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103789 (from R4-2101569).**

**R4-2103789 CR to TS 38.141-1 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0192 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101570 CR to TS 38.141-1 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0193 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101571 CR to TS 38.141-2 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0288 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103790 (from R4-2101571).**

**R4-2103790 CR to TS 38.141-2 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0288 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101572 CR to TS 38.141-2 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0289 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101878 CR to TS 38.141-1 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0194 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101879 CR to TS 38.141-2 clarification on PN23 sequence generation**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0295 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 4.5.2 Conducted conformance testing (38.141-1) [NR\_newRAT-Perf]

**R4-2102000 CR to TS 38.141-1: Receiver requirement corrections**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0198 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103793 (from R4-2102000).**

**R4-2103793 CR to TS 38.141-1: Receiver requirement corrections**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0198 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102001 CR to TS 38.141-1: Receiver requirement corrections**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0199 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102002 CR to TS 38.141-1: Receiver requirement corrections**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0200 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 4.5.3 Radiated conformance testing (38.141-2) [NR\_newRAT-Perf]

**R4-2100385 Further discussion on out-of-band CLTA definition**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100386 CR for TS 38.141-2: Correction on definition for the out-of-band CLTA(Rel-15)**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0263 Cat: F (Rel-15)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103794 (from R4-2100386).**

**R4-2103794 CR for TS 38.141-2: Correction on definition for the out-of-band CLTA(Rel-15)**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0263 Cat: F (Rel-15)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100387 CR for TS 38.141-2: Correction on definition for the out-of-band CLTA(Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0264 Cat: A (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100388 CR for TS 38.141-2: Correction on definition for the out-of-band CLTA(Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0265 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101730 TS 38.141-2: Correction of additional spurious emission limits for bands 50, 51, 75, 76**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0290 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Correction of the unwanted emission limit as it is not aligned with core specifications

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103795 (from R4-2101730).**

**R4-2103795 TS 38.141-2: Correction of additional spurious emission limits for bands 50, 51, 75, 76**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0290 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Correction of the unwanted emission limit as it is not aligned with core specifications

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101731 TS 38.141-2: Correction of additional spurious emission limits for bands 50, 51, 75, 76**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0291 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction of the unwanted emission limit as it is not aligned with core specifications

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101732 TS 38.141-2: Correction of additional spurious emission limits for bands 50, 51, 75, 76**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0292 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of the unwanted emission limit as it is not aligned with core specifications

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102003 CR to TS 38.141-2: Receiver requirement corrections**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0299 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102004 CR to TS 38.141-2: Receiver requirement corrections**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0300 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102005 CR to TS 38.141-2: Receiver requirement corrections**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0301 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102429 Further discussion on CLTA maximum height**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Further discussion on how to define a practical height restriction for the CLTA

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102430 Further discussion on co-location for adjacent bands**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Further discussion on the co-location scenarios for adjacent band systems based on the issues raised I the WF

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102434 CR to TS 38.141-2 - Update CLTA definition, Rel-15**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0306 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

CR to update the CLTA definition in the NR conformance specification

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102435 CR to TS 38.141-2 - Update CLTA definition, Rel-16**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0307 Cat: A (Rel-16)  
  
 Source: Huawei*

**Abstract:**

CR to update the CLTA definition in the NR conformance specification

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102436 CR to TS 38.141-2 - Update CLTA definition, Rel-17**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0308 Cat: A (Rel-17)  
  
 Source: Huawei*

**Abstract:**

CR to update the CLTA definition in the NR conformance specification

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102897 On Two orthogonal cuts with pattern multiplication procedures and CLTA maximum height**

*Type: other For: Discussion  
 38.141-2 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This contribution further discusses the open issues related to the two orthogonal cuts with pattern multiplication procedure and CLTA maximum height.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102898 CR to TS 38.141-2: Updating the orthogonal cut procedure**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0310 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Numerical expressions for the two orthogonal cut procedure for TRP computation are included.

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102899 CR to TS 38.141-2: Updating the orthogonal cut procedure**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0311 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Numerical expressions for the two orthogonal cut procedure for TRP computation are included.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

#### 4.5.4 eAAS specifications maintenance [NR\_newRAT-Core/Perf]

**R4-2100389 CR for TS 37.145-2: Correction on definition for the out-of-band CLTA(Rel-15)**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0271 Cat: F (Rel-15)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2100390 CR for TS 37.145-2: Correction on definition for the out-of-band CLTA(Rel-16)**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0272 Cat: A (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2100391 CR for TS 37.145-2: Correction on definition for the out-of-band CLTA(Rel-17)**

*Type: CR For: Agreement  
 37.145-2 v17.0.0 CR-0273 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2102423 CR to TS 37.145-1, Corrections to conformance requirements, Rel-15**

*Type: CR For: Agreement  
 37.145-1 v15.8.0 CR-0243 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103791 (from R4-2102423).**

**R4-2103791 CR to TS 37.145-1, Corrections to conformance requirements, Rel-15**

*Type: CR For: Agreement  
 37.145-1 v15.8.0 CR-0243 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102424 CR to TS 37.145-1, Corrections to conformance requirements, Rel-16**

*Type: CR For: Agreement  
 37.145-1 v16.5.0 CR-0244 Cat: A (Rel-16)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102425 CR to TS 37.145-1, Corrections to conformance requirements, Rel-17**

*Type: CR For: Agreement  
 37.145-1 v17.0.0 CR-0245 Cat: A (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102426 CR to TS 37.145-2: Corrections to conformance requirements, Rel-15**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0280 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103792 (from R4-2102426).**

**R4-2103792 CR to TS 37.145-2: Corrections to conformance requirements, Rel-15**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0280 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102427 CR to TS 37.145-2: Corrections to conformance requirements, Rel-16**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0281 Cat: A (Rel-16)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102428 CR to TS 37.145-2: Corrections to conformance requirements, Rel-17**

*Type: CR For: Agreement  
 37.145-2 v17.0.0 CR-0282 Cat: A (Rel-17)  
  
 Source: Huawei*

**Abstract:**

Corrections to conformance specification based on errors identified while drafting the European harmonized standard

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102431 CR to TS 37.145-2 - Update CLTA definition, Rel-15**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0283 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

CR to update the CLTA definition in the AAS conformance specification

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103788 (from R4-2102431).**

**R4-2103788 CR to TS 37.145-2 - Update CLTA definition, Rel-15**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0283 Cat: F (Rel-15)  
  
 Source: Huawei*

**Abstract:**

CR to update the CLTA definition in the AAS conformance specification

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102432 CR to TS 37.145-2 - Update CLTA definition, Rel-16**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0284 Cat: A (Rel-16)  
  
 Source: Huawei*

**Abstract:**

CR to update the CLTA definition in the AAS conformance specification

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102433 CR to TS 37.145-2 - Update CLTA definition, Rel-17**

*Type: CR For: Agreement  
 37.145-2 v17.0.0 CR-0285 Cat: A (Rel-17)  
  
 Source: Huawei*

**Abstract:**

CR to update the CLTA definition in the AAS conformance specification

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102895 CR to TS 37.145-2: Updating the orthogonal cut procedure**

*Type: CR For: Agreement  
 37.145-2 v15.9.0 CR-0291 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Numerical expressions for the two orthogonal cut procedure for TRP computation are included.

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102896 CR to TS 37.145-2: Updating the orthogonal cut procedure**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0292 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Numerical expressions for the two orthogonal cut procedure for TRP computation are included.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 4.6 BS EMC requirements Maintenance [NR\_newRAT-Core]

#### 4.6.1 Core requirements [NR\_newRAT-Core]

#### 4.6.2 Performance requirements [NR\_newRAT-Perf]

**R4-2100354 CR to TS 38.113 on Performance criteria for transient phenomena, Release 15**

*Type: CR For: Agreement  
 38.113 v15.12.0 CR-0031 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

CR updating performance criteria for transient phenomena in TS 38.113 Rel 15

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100355 CR to TS 38.113 on Performance criteria for transient phenomena, Release 16**

*Type: CR For: Agreement  
 38.113 v16.2.0 CR-0032 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR mirroring update in performance criteria for transient phenomena in 38.113 Rel 16

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102127 CR to TS 38.113: Radiated emission test method**

*Type: CR For: Agreement  
 38.113 v15.12.0 CR-0033 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

**R4-2102128 CR to TS 38.113: Radiated emission test method**

*Type: CR For: Agreement  
 38.113 v16.2.0 CR-0034 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

**R4-2102178 CR to TS 38.113: Radiated emission test method**

*Type: CR For: Agreement  
 38.113 v15.12.0 CR-0035 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103772 (from R4-2102178).**

**R4-2103772 CR to TS 38.113: Radiated emission test method**

*Type: CR For: Agreement  
 38.113 v15.12.0 CR-0035 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102179 CR to TS 38.113: Radiated emission test method**

*Type: CR For: Agreement  
 38.113 v16.2.0 CR-0036 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

### 4.9 Demodulation and CSI requirements maintenance (38.101-4/38.104)[NR\_newRAT-Perf]

#### 4.9.1 UE demodulation requirements[NR\_newRAT-Perf]

**R4-2103753 Email discussion summary for [98e][314] Demod\_R15\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103925 (from R4-2103753).**

**R4-2103925 Email discussion summary for [98e][314] Demod\_R15\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2101441 Correction of CQI test parameters and FRC for UE demodulation test**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0157 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This CR fix the errors in CQI test parameters and FRC in UE demodulation tests.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103796 (from R4-2101441).**

**R4-2103796 Correction of CQI test parameters and FRC for UE demodulation test**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0157 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This CR fix the errors in CQI test parameters and FRC in UE demodulation tests.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101442 Correction of CQI test parameters and FRC for UE demodulation test**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0158 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR fix the errors in CQI test parameters and FRC in UE demodulation tests.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102824 CR on corrections for LTE-NR Co-existence tests and OCNG pattern**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0167 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103797 (from R4-2102824).**

**R4-2103797 CR on corrections for LTE-NR Co-existence tests and OCNG pattern**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0167 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102828 CR on corrections for LTE-NR Co-existence tests and OCNG pattern**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0168 Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 4.9.2 CSI requirements [NR\_newRAT-Perf]

**R4-2101945 CR on FRC for NR RI requirements (Rel-15)**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0161 Cat: F (Rel-15)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103798 (from R4-2101945).**

**R4-2103798 CR on FRC for NR RI requirements (Rel-15)**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0161 Cat: F (Rel-15)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101946 CR on FRC for NR RI requirements (Rel-16)**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0162 Cat: A (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102870 CR to 38.101-4 on update to CSI reporting test parameters for Aperiodic reporting (R15)**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0169 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103799 (from R4-2102870).**

**R4-2103799 CR to 38.101-4 on update to CSI reporting test parameters for Aperiodic reporting (R15)**

*Type: CR For: Agreement  
 38.101-4 v15.8.0 CR-0169 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102871 CR to 38.101-4 on update to CSI reporting test parameters for Aperiodic reporting (R16)**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0170 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 4.9.3 BS demodulation requirements [NR\_newRAT-Perf]

**R4-2100548 CR for 38.141-1: BS demodulation synchronization in test setup**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0170 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Include the sentence “In tests performed with signal generators a synchronization signal may be provided from the BS to the signal generator, to enable correct timing of the wanted signal” from the radiated test specificaiton also in the conducted test sp

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103800 (from R4-2100548).**

**R4-2103800 CR for 38.141-1: BS demodulation synchronization in test setup**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0170 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Include the sentence “In tests performed with signal generators a synchronization signal may be provided from the BS to the signal generator, to enable correct timing of the wanted signal” from the radiated test specificaiton also in the conducted test sp

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100549 CR for 38.141-1: BS demodulation synchronization in test setup**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0171 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100550 CR for 38.141-1: BS demodulation synchronization in test setup**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0172 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100551 CR for 38.141-1: BS demodulation different channel bandwidths applicability rules**

*Type: CR For: Agreement  
 38.141-1 v15.7.0 CR-0173 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Modify the first sentence of the various “Applicability of requirements for different channel bandwidths” clauses, to clarify that test requirements apply for all supported CBWs.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100552 CR for 38.141-1: BS demodulation different channel bandwidths applicability rules**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0174 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100553 CR for 38.141-1: BS demodulation different channel bandwidths applicability rules**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0175 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100554 CR for 38.141-2: BS demodulation different channel bandwidths applicability rules**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0266 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Modify the first sentence of the various “Applicability of requirements for different channel bandwidths” clauses, to clarify that test requirements apply for all supported CBWs.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103801 (from R4-2100554).**

**R4-2103801 CR for 38.141-2: BS demodulation different channel bandwidths applicability rules**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-0266 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Modify the first sentence of the various “Applicability of requirements for different channel bandwidths” clauses, to clarify that test requirements apply for all supported CBWs.

**Discussion:**

**Session Chair: Pay attention on cover page error pointed out by MCC !**

[report of discussion]

**Decision: Return to.**

**R4-2100555 CR for 38.141-2: BS demodulation different channel bandwidths applicability rules**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0267 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100556 CR for 38.141-2: BS demodulation different channel bandwidths applicability rules**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0268 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100557 On BS demodulation different channel bandwidths applicability rules and synchronization in test setup**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution, we have explained and motivated our CRs introducing BS demodulation specification text changes pertaining to the applicability of requirements for different channel bandwidths and synchronization signals in conducted test setups.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2103802 CR for 38.141-2: BS demodulation synchronization in test setup**

*Type: CR For: Agreement  
 38.141-2 v15.8.0 CR-? Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Session Chair Note: Contact with MCC to get CR number

**Discussion:**

**Decision: Return to.**

**R4-2103803 CR for 38.141-2: BS demodulation synchronization in test setup**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-? Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Session Chair Note: Contact with MCC to get CR number

**Discussion:**

**Decision: Return to.**

**R4-2103804** **CR for 38.141-2: BS demodulation synchronization in test setup**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-? Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Session Chair Note: Contact with MCC to get CR number

**Discussion:**

**Decision: Return to.**

### 4.11 Testability Maintenance (38.810) [FS\_NR\_test\_methods]

## 5 LTE maintenance (up to Rel15) [WI code or TEI]

### 5.1 BS RF requirements [WI code or TEI]

**R4-2101082 CR to TS 36.104: Additions of regional requirements for band 41 in Japan, Rel-15**

*Type: CR For: Agreement  
 36.104 v15.10.0 CR-4922 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103775 (from R4-2101082).**

**R4-2103775 CR to TS 36.104: Additions of regional requirements for band 41 in Japan, Rel-15**

*Type: CR For: Agreement  
 36.104 v15.10.0 CR-4922 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101083 CR to TS 36.104: Additions of regional requirements for band 41 in Japan, Rel-16**

*Type: CR For: Agreement  
 36.104 v16.8.0 CR-4923 Cat: A (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101084 CR to TS 36.104: Additions of regional requirements for band 41 in Japan, Rel-17**

*Type: CR For: Agreement  
 36.104 v17.0.0 CR-4924 Cat: A (Rel-17)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101085 CR to TS 36.141: Additions of regional requirements for band 41 in Japan, Rel-15**

*Type: CR For: Agreement  
 36.141 v15.11.0 CR-1290 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103776 (from R4-2101085).**

**R4-2103776 CR to TS 36.141: Additions of regional requirements for band 41 in Japan, Rel-15**

*Type: CR For: Agreement  
 36.141 v15.11.0 CR-1290 Cat: F (Rel-15)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101086 CR to TS 36.141: Additions of regional requirements for band 41 in Japan, Rel-16**

*Type: CR For: Agreement  
 36.141 v16.8.0 CR-1291 Cat: A (Rel-16)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101087 CR to TS 36.141: Additions of regional requirements for band 41 in Japan, Rel-17**

*Type: CR For: Agreement  
 36.141 v17.0.0 CR-1292 Cat: A (Rel-17)  
  
 Source: NEC, SoftBank, KDDI*

**Discussion:**

[report of discussion]

**Decision: Return to.**

### 5.4 Demodulation and CSI requirements [WI code or TEI]

#### 5.4.1 UE demodulation and CSI requirements [WI code or TEI]

#### 5.4.2 BS demodulation requirements [WI code or TEI]

## 6 Rel-16 Work Items for LTE

### 6.4 R16 LTE maintenance [WI code]

#### 6.4.1 BS RF requirements [WI code]

#### 6.4.4 Demodulation and CSI requirements [WI code]

##### 6.4.4.1 UE demodulation and CSI requirements [WI code]

##### 6.4.4.2 BS demodulation requirements [WI code]

## 7 Rel-16 non-spectrum related work items for NR

### 7.1 NR-based access to unlicensed spectrum [NR\_unlic]

#### 7.1.3 BS RF requirements maintenance [NR\_unlic-Core]

**R4-2103743 Email discussion summary for [98e][304] NR\_unlic\_BSRF\_Conformance**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103926 (from R4-2103743).**

**R4-2103926 Email discussion summary for [98e][304] NR\_unlic\_BSRF\_Conformance**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

------------------------------GTW agenda of Jan.29th for email thread [304] (45miniutes) ------------------

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  ***Issue 1-2 and 2-2:***  *Agreement: It is agreed to remove the NB-IoT note for NR-U.*  *Discussion:*  *Nokia: we can further discuss in 2nd round, and these bands are adjacent, we should have a note into the specification.*  *Nokia: These notes not needed for MSR and AAS specifications.*  *Huawei: There are two issues:*  *Issue 1: MSR specifications: not needed since bands not specified there*  *Issue 2: for 38 series, we need to do further discuss. This should in spurious domain, not in OBUE domain, we would like to further discuss in 2nd round.*  *Issue 2: whether Tx co-location requirement exception for n96 should be applied for n46 and vice versa*  Agreements:  Remove the note of band n96, n46 from TS 37.104 and 37.105 specification  Tx co-location requirement exception needed for band n96/n46 in 38.104 |

**Issue 3-1: MU and TT for n46 and n96**

* Proposals
  + Option 1: propose to extend NR upper frequency from 6GHz to 7.125GHz; [ZTE, R4-2101982]
  + Option 2: reuse LAA MU requirements for n46 and n96; [Nokia, R4-2101566]
  + Option 3: other
* Recommended WF
  + TBA

Discussion:

ZTE: we didn’t get information from TE vendors.

Nokia: TE vendors’ feedback are encouraged.

I review the history of eLAA phase, we used the values from previous. The difference among option 1 and option 2 maybe no big difference. We think with band n96, more reasonable to use values from LAA as it’s unlicensed operation.

ZTE: Usually we have a calculation tables taking into account all the major contributors for Rel-15 NR which different with LTE LAA.

Question 1: What’s the major contributors?

Question 2: What’s the procedure to derive MU values?

Huawei: We are fine to keep options open, for both options the frequency extend need to be extended from 6GHz to 7.125GHz.

For LTE LAA, we don’t BS type 1-H, this need to be considered when define MU.

Keep above options open, further discuss in 2nd round and future meeting if needed.

TE vendors input are encouraged.

--------------------------------End -----------------------------

**R4-2101972 CR to TS 36.104: corrections of NR-U BS RF requirements**

*Type: CR For: Agreement  
 36.104 v16.8.0 CR-4925 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101973 CR to TS 36.104: corrections of NR-U BS RF requirements**

*Type: CR For: Agreement  
 36.104 v17.0.0 CR-4926 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101974 CR to TS 37.104: corrections of NR-U BS RF requirements**

*Type: CR For: Agreement  
 37.104 v16.8.0 CR-0922 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101975 CR to TS 37.104: corrections of NR-U BS RF requirements**

*Type: CR For: Agreement  
 37.104 v17.0.0 CR-0923 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101976 CR to TS 37.105: corrections of NR-U BS RF requirements**

*Type: CR For: Agreement  
 37.105 v16.6.0 CR-0220 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101977 CR to TS 37.105: corrections of NR-U BS RF requirements**

*Type: CR For: Agreement  
 37.105 v17.0.0 CR-0221 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.1.3.1 General [NR\_unlic-Core]

##### 7.1.3.2 Transmitter characteristics [NR\_unlic-Core]

**R4-2101978 CR to TS 38.104: corrections of NR-U BS Tx requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0283 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103888 (from R4-2101978).**

**R4-2103888 CR to TS 38.104: corrections of NR-U BS Tx requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0283 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101979 CR to TS 38.104: corrections of NR-U BS Tx requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0284 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102835 CR to TS 38.104 corrections to NR-U BS RF Tx requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0296 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103889 (from R4-2102835).**

**R4-2103889 CR to TS 38.104 corrections to NR-U BS RF Tx requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0296 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102836 CR to TS 38.104 corrections to NR-U BS RF Tx requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0297 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.1.3.3 Receiver characteristics [NR\_unlic-Core]

**R4-2101980 CR to TS 38.104: corrections of NR-U BS Rx requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0285 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101981 CR to TS 38.104: corrections of NR-U BS Rx requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0286 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102837 CR to TS 38.104 corrections to NR-U BS RF Rx requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0298 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102838 CR to TS 38.104 corrections to NR-U BS RF Rx requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0299 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

#### 7.1.4 BS conformance testing [NR\_unlic-Perf]

**R4-2101982 CR to TS 38.141-1: introduction of NR-U BS**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0195 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101983 CR to TS 38.141-1: introduction of NR-U BS**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0196 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101984 CR to TS 36.141: introduction of NR-U BS**

*Type: CR For: Agreement  
 36.141 v16.8.0 CR-1293 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101985 CR to TS 36.141: introduction of NR-U BS**

*Type: CR For: Agreement  
 36.141 v17.0.0 CR-1294 Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.1.4.1 General [NR\_unlic-Perf]

**R4-2101566 On NR-U measurement uncertainties for BS conformance tests**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we continue discussion on NR-U measurement uncertainties for BS conformance tests.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102444 Draft CR to 37.141: Introduction of NR-U co-existence requirements**

*Type: draftCR For: Endorsement  
 37.141 v17.0.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.1.4.2 Transmitter characteristics [NR\_unlic-Perf]

**R4-2101567 Draft CR to TS 37.107 With NR-U intorduction for performance part**

*Type: draftCR For: Endorsement  
 37.107 v16.2.0  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This is draft CR to TS 37.107 with updates related to NR-U introduction for perfromance part.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101733 TS 37.145-2: Tx spurious limits for co-existence and co-location with of NR-based access to unlicensed spectrum (NR-U)**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0276 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Introduction of tx spurious emission limits for co-existence and co-location with NR-U in bands n46 and n96

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101734 TS 37.145-2: Tx spurious limits for co-existence and co-location with of NR-based access to unlicensed spectrum (NR-U)**

*Type: CR For: Agreement  
 37.145-2 v17.0.0 CR-0277 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Introduction of tx spurious emission limits for co-existence and co-location with NR-U in bands n46 and n96

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101735 TS 38.141-2: Tx spurious limits for co-existence and co-location with of NR-based access to unlicensed spectrum (NR-U)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0293 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Introduction of tx spurious emission limits for co-existence and co-location with NR-U in bands n46 and n96

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101736 TS 38.141-2: Tx spurious limits for co-existence and co-location with of NR-based access to unlicensed spectrum (NR-U)**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0294 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Introduction of tx spurious emission limits for co-existence and co-location with NR-U in bands n46 and n96

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.1.4.3 Receiver characteristics [NR\_unlic-Perf]

**R4-2102144 TS 37.145-2: Rx blocking limits for co-existence and co-location with of NR-based access to unlicensed spectrum (NR-U)**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0278 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Introduction of rx blocking limits for co-existence and co-location with NR-U in bands n46 and n96

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102145 TS 37.145-2: RX blocking limits for co-existence and co-location with of NR-based access to unlicensed spectrum (NR-U)**

*Type: CR For: Agreement  
 37.145-2 v17.0.0 CR-0279 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Introduction of rx blocking limits for co-existence and co-location with NR-U in bands n46 and n96

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 7.1.7 Demodulation and CSI requirements (38.101-4/38.104) [NR\_unlic-Perf]

##### 7.1.7.1 General [NR\_unlic-Perf]

**R4-2103755 Email discussion summary for [98e][316] NR\_unlic\_Demod\_UE**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103933 (from R4-2103755).**

**R4-2103933 Email discussion summary for [98e][316] NR\_unlic\_Demod\_UE**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103805 Way Forward on NR-U UE demodulation requirements**

*Type: other For: Approval  
 Source: QUALCOMM*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**------------------------------GTW Notes for Jan.27th email thread [316] (45 minutes) ----------------**

**List following treatment orders**

General Test Scope (discussion can apply to both PDSCH and CQI)

**Issue 3-1-1: Discuss how to define PDSCH requirements for UEs with no support for optional capabilities related to CSI-RS validation (DCI 2-0, csi-RS-Validation With-DCI);**

* Proposals
  + Option 1: No applicable test cases for such UEs (Huawei)
  + ~~Option 2: NO TRS~~
  + ~~Option 3: UE validation~~
  + Option 4: Always TRS with LBT modelling modifications if needed (MTK,Apple, Qualcomm)
* Recommended WF
  + TBA

Discussion:

Apple: For UE not supporting these optional capabilities, we believe always on TRS is only feasible option.

UE validation is not RAN1 assumption which belongs to UE implementation issues.

No TRS will bring performance degradation.

Huawei: We share similar view as Apple. Not feasible for no TRS and UE validation.

MTK: According to RAN1 LS, UE not mandate to implement UE validation. We support always TRS for test set-up.

E///: We share same understanding with MTK for RAN1 LS. It’s better to check with RAN1 for SSB/TRS detection assumption.

Huawei: Question for option 4, how to employ LBT model with option 4.

QC: we can make exceptions for such specific UEs with LBT modelling.

Apple: Do we need to differentiate test set-up for two kinds of UEs or we can have one generic test set-up applicable for all types of UE?

Huawei: We agree to focus on this question first.

MTK: We have same concern as Apple and Huawei.

Question: Whether to have different test set-up/requirements according to UE capability of supporting CSI-validation features?

* Option 1: One generic LBT modelling for all test cases
  + Option 1a , no applicable test cases for UE which not support CSI-validation features
  + Option 1b: pack SSB and TRS in same discovery burst (check with UE assumption for implementation if any agreements in RAN1 for this case); the same requirements applied for both UE types
  + Option 1c: for UE which not CSI-validation feature, with LBT failure probability as 0. Separate requirements will be introduced.
* Option 2: Different test set-up/[performance requirements] for UE with different UE capability
  + Test set1: LBT modelling which applied for UE support CSI validation feature
  + Test set2: Test set-up for UE not support CSI-validation feature
    - FFS how to enable TRS always on considering LBT failure

**Issue 3-1-2: Whether to define a requirement based on the optional capability *‘csi-RS-ValidationWith-DCI’:***

* Proposals
  + Option 1: Yes, if Always TRS or No TRS are chosen the Issue 3-1-1 (Qualcomm);
* Recommended WF
  + TBA

**Issue 3-1-3: Include PDCCH DCI 2-0 in PDSCH Simulations;**

* Proposals
  + Option 1: No (MediaTek, Ericsson, Huawei);
    - Option 1a: No, define PDSCH tests with DCI 2-0 with lower priority (Qualcomm);
  + Option 2: Yes (Apple);
* Recommended WF
  + TBA

Discussion:

QC: We can define requirements based on CSI-validation capability since UE which support DCI2-0, can also support

the optional capability ‘csi-RS-Validation With-DCI’.

Huawei: We share the view from QC.

MTK: We think both mechanism for CSI-validation. We think we need to first discuss the first issue.

**--------------------------------End ------------------------------**

**R4-2103756 Email discussion summary for [98e] [317] NR\_unlic\_Demod\_BS**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103934 (from R4-2103756).**

**R4-2103934 Email discussion summary for [98e] [317] NR\_unlic\_Demod\_BS**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103806 Way forward on NR-U BS demodulation requirements for general part and PUSCH**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103807 Way Forward on NR-U PUCCH demodulation requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103808 Way forward on NR-U PRACH demodulation requirements**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103809 Summary of simulation results for NR-U**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**------------------------------GTW Notes for Jan.27th email thread [317] (45 minutes) ----------------**

**Test set-up for PUSCH**

**Issue 2-1-1: Bandwidth(s) for requirement definition and test applicability rules**

* Proposals
  + Option 1: Define the requirements for single carrier with 20MHz and reuse Rel-15 applicability rule for different channel bandwidths. (Huawei, Samsung, Ericsson)
  + Option 2: Define PUSCH performance requirements for 20MHz, 40MHz, 60MHz and 80MHz and reuse Rel-15 applicability rule for different channel bandwidths. (Nokia)
* Recommended WF

Discussion:

Nokia: If we define with option 2, the same applicable rules can be reused, BS can only be verified by largest bandwidth which BS declared. In fact, the performance among CHBW is similar, but we still lost the test coverage for wider channel bandwidth with option1.

Samsung: For NR-U, 20MHz is basic channel bandwith. For option 1, we also cover test coverage with saving test effort. Similar as NR, we can placed 20MHz RB allocations in the centre of larger CHBW which solve Nokia concern. Larger CHBW only available wideband operation 2, 20MHz is basic CHBW apply for all options.

E///: Share similar view as Samsung.

Huawei: We understand the concern, there is similar situation in NR Rel-15 phase, it’s impossible to introduce requirements covering all the CHBW sets. Another approach is defining requirements as bandwidth agonistic.

Nokia: Does companies means to have 20MHz inside 40MHz CHBW?

Samsung: For 20MHz, 40MHz is both available for 15kHz and 30kHz.

Define the requirements for single carrier with 20MHz and reuse Rel-15 applicability rule for different channel bandwidths:

* Based on BS declaration to choose maximum CHBW BS supported, the RB allocation is as 20MHz within the BS test maximum supported CHBW. (most closed to channel centre following Channel arrangement)
* FFS for the detailed text proposal of test applicable rules

**Issue 2-2-1: PUSCH mapping type and test applicability rules**

* Proposals
  + Option 1: Only type B (Huawei, Samsung)
  + Option 2: Both type A and type B and reuse Rel-15 applicability rules.(Nokia, Ericsson)
* Recommended WF

Discussion:

Nokia: Type B typically more feasible for NR-U meanwhile type-A still can be used and no test effort based on BS declaration.

E///: The requirements should be based on BS declaration, we shouldn’t exclude both type A and type B . We agree type B more flexible. For FBE scenario, we also see the possibility of using type A.

Samsung: From test effort aspect, option 1 and option 2 no difference. In Rel-15 NR, we already cover both type A and type B. For NR-U, due to LBT, even with type A we can’t guarantee always available symbols in first slots. For LTE LAA, we have similar type as type B. Work load and simulation effort also need to be considered.

Huawei: All the companies have same observations that type B is more typical scenario. For comprise, we can accept with option with test applicable rules.

Samsung: For progress, we can comprise to option 2.

Agreements:

Both type A and type B and reuse Rel-15 applicability rules.

**Issue 2-3-1: MCS**

* Proposals
  + Option 1: MCS 2 and MCS 20 (Nokia)
  + Option 2: MCS 20 (Huawei, Ericsson, Samsung)
* Recommended WF

Discussion:

Nokia: There are different scenarios for NR-U deployment, for some scenarios with stand-alone, with cell edge, low MCS level would be possible case.

Samsung: The test purpose to verify interlace design with non-contiuous RB allocation. The test purpose already be covered by high MCS level.

E///: We already verify MCS 2 in Rel-15, we don’t need to duplicate the test effort for NR-U.

Huawei: We also think the verification of different modulation orders already covered by Rel-15 test cases, we need to focus the delta of specific feature introduced under this WI, MCS 20 enough.

Agreements: MCS 20.

**Issue 2-4-1: RV sequence**

* Proposals
  + Option 1: {0,2,3,1} (Nokia, Ericsson)
  + Option 2: {0,2,0,2} (Huawei, Samsung)
* Recommended WF

Discussion:

Nokia: option 2 used in eLAA, why option 2 used in eLAA ?

E///: similar question. These two options have similar performance. Apply option for type A. option 2 for type B.

Samsung: We can consider to keep two options.

Huawei: option 2 aims for multi-TB operation.

Agreement:

Using {0,2,3,1} for RV sequence

**Issue 2-5-1: Whether to introduce the requirements for CG-UCI multiplexed on PUSCH with interlace allocation.**

* Proposals
  + Option 1: No (Nokia, Samsung)
  + Option 2: Yes (Huawei, Ericsson)
    - Option 2a: Introduce requirement for HARQ-ACK multiplexed on interlacing PUSCH with more than 2 bits information, without CSI-1/2, and the test metric use BLER <=1%.(Ericsson)
    - Option 2b: Introduce performance requirements for CG-UCI multiplexed on PUSCH with interlaced resource allocation and without HARQ-ACK, CSI part 1 and CSI part 2 and use following Table as assumptions: (Huawei)
      * The test cases introduced based on BS declaration (Nokia)
* Recommended WF

Discussion:

Samsung: we believe mapping rules similar as existing NR performance requirements. Then only difference is interlacing we should focus on that.

Nokia: We are fine with option 1 or option 2b with BS declaration basis.

E///: We would more time check the assumption: “CSI cases can be covered the scenario for HARQ-ACK.”

Huawei: We would like to focus on NR-U scenario. CG-UCI would be more specific for NR-U,and what E/// proposed is out of this WI scope.

**Issue 2-6-1: Whether to configure CG-UCI for PUSCH test.**

* Proposals
  + Option 1: Configure CG-UCI for PUSCH test with interlace structure. (Huawei)
  + Option 2: Not configure CG-UCI for PUSCH test with interlace structure (Samsung, Nokia, Ericsson)
* Recommended WF

Discussion:

Huawei: Using CG-UCI more close to real NW configuration.

Samsung: In Rel-15, we didn’t configure UCI in PUSCH test cases. If test purpose is to verify interlace, we already coverd. For rate-matching can also verified in another test cases, no need to combine them together with a single test case.

Nokia: CG-UCI is not mandatory UE feature, no need to be configured with PUSCH test cases. If need to be verified, we prefer to have a separate dedicated test cases.

E///: Share similar view as Nokia and Samsung, we should not combine them together.

Huawei: We consider NR-U with LBT to improve the performance, CG-UCI together with PUSCH would be more useful case.

We are willing to comprise with respect of majority.

Agreements: Not configure CG-UCI for PUSCH test with interlace structure.

**--------------------------------End ------------------------------**

**R4-2100995 discussion on general issues in NR-U UE and CSI performance requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

discussion on general issues in NR-U UE and CSI performance requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101343 Discussion on LBT transmission burst model**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102082 Discussion on performance requirements for NR-U**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.1.7.2 UE demodulation requirements [NR\_unlic-Perf]

**R4-2100197 Discussion on demodulation requirements for NR-U**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100996 discussion on NR-U PDSCH demodulation**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

discussion on NR-U PDSCH demodulation

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101264 Discussion on NR-U PDSCH requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101344 Discussion on NRU UE performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102585 Discussion on NR-U PDSCH Demodulation Performance Tests and related Simulation Assumptions**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

This paper will present our views on the points still under discussion related to NR-U PDSCH Demod Performance Tests and the proposed set of the simulation parameters. The simulation parameters are based on our company’s contribution to the previous meeti

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.1.7.3 CSI requirements [NR\_unlic-Perf]

**R4-2100997 discussion on NR-U CQI report demodulation**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

discussion on NR-U CQI report demodulation

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101345 Discussion on NRU CSI requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102586 Discussion on NR-U CQI Performance Tests**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

This paper will present our views on the points under discussion for NR-U CQI Performance Tests.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.1.7.4 BS demodulation requirements [NR\_unlic-Perf]

###### 7.1.7.4.1 General [NR\_unlic-Perf]

**R4-2100573 General issues on BS demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100998 discussion on general issues in NR-U BS demodulation requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

discussion on general issues in NR-U BS demodulation requirements

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102270 General issues on BS demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

###### 7.1.7.4.2 PUSCH requirements [NR\_unlic-Perf]

**R4-2100574 PUSCH Demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100575 NR-U PUSCH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100919 View on PUSCH demodulation requirement for NR-U**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100999 discussion on NR-U PUSCH demodulation assumptions**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

discussion on NR-U PUSCH demodulation assumptions

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101000 simulation results on NR-U PUSCH demodulation**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

simulation results on NR-U PUSCH demodulation

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101346 Simualtion results on NRU PUSCH performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101347 Discussion on NRU PUSCH performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102271 PUSCH Demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102272 NR-U PUSCH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

###### 7.1.7.4.3 PUCCH requirements [NR\_unlic-Perf]

**R4-2100576 PUCCH Demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100577 NR-U PUCCH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100920 View on PUCCH demodulation requirement for NR-U**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101001 discussion on NR-U PUCCH demodulation assumptions**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

discussion on NR-U PUCCH demodulation assumptions

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101002 simulation results on NR-U PUCCH demodulation**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

simulation results on NR-U PUCCH demodulation

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101348 Simualtion results on NRU PUCCH performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101349 Discussion on NRU PUCCH performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102273 PUCCH Demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

**R4-2102274 NR-U PUCCH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

###### 7.1.7.4.4 PRACH requirements [NR\_unlic-Perf]

**R4-2100578 PRACH Demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100579 NR-U PRACH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100921 View on PRACH demodulation requirement for NR-U**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101003 discussion on NR-U PRACH demodulation assumptions**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

discussion on NR-U PRACH demodulation assumptions

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101004 simulation results on NR-U PRACH demodulation**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

simulation results on NR-U PRACH demodulation

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101265 Discussion on NR-U PRACH requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101350 Simualtion results on NRU PRACH performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101351 Discussion on NRU PRACH performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102275 PRACH Demodulation performance requirements for operation in unlicensed bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

**R4-2102276 NR-U PRACH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

### 7.3 5G V2X with NR sidelink [5G\_V2X\_NRSL]

#### 7.3.6 Demodulation requirements (38.101-4) [5G\_V2X\_NRSL-Perf]

##### 7.3.6.1 General [5G\_V2X\_NRSL-Perf]

**R4-2103757 Email discussion summary for [98e][318] V2X\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103927 (from R4-2103757).**

**R4-2103927 Email discussion summary for [98e][318] V2X\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103810 WF on single link tests for NR V2X demodulation performance**

*Type: other For: Approval  
 Source: LGE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103811 Summary of simulation results for V2X single link demodulation**

*Type: other For: Information  
 Source: LGE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103812 Updated simulation assumption for NR V2X single link test cases**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**-------------------------------GTW Notes for [318] on Jan.27th (46 minutes) ---------------------------**

Sub-topic 1-1 : Test cases for PSSCH demodulation

**Issue 1-1-1: Additional test cases based on GNSS sync source**

* Proposals
  + Option 1: 16QAM for 260km/h relative velocity (Huawei)
  + Option 2: 64QAM for 30km/h relative velocity (LG, Qualcomm, MediaTek,CATT)
  + Option 3: 16QAM for 260km/h relative velocity and 64QAM for 30km/h relative velocity (Intel, Huawei, CATT)
* Recommended WF
  + Need further discussion.

Discussion:

QC: LLR quality need to be guarantee with high mobility and high modulation order. Considering the existing test coverage from Rel-16 performance requirements, we think low speed with high order and medium speed with medium modulation already been verified. No coverage issue with option2.

LG: Similar view as QC. Option 2 already cover worst cases, also PSCCH already cover the combination in option 1.

Intel: Typically, we shall cover all modulation orders to ensure the performance, with this we are fine with option 3 to cover all the scenarios considering 16QAM with 260km/h could be one of typical scenarios.

MTK: We support option 2, our concern on test effort and work load. Similar view as LG.

Huawei: We share the view from Intel, 16QAM is mandatory and typical scenarios and we should introduce test cases for this scenario.

**Issue 1-1-2: Other test cases: 256QAM modulation**

* Proposals:
  + Option 1: Do not define 256QAM demodulation requirements in Rel-16 (Intel, Huawei, LG, MediaTek, CATT)
  + Option 2: Define 256QAM demodulation requirements in Rel-16 (Qualcomm)
* Recommended WF
  + Need further discussion
  + But based on majority views, option 1 is recommended, and continue discussion in future release

Discussion:

QC: In order to save work load, we can resue test configuration from high MCS test cases (64QAM/16QAM) with replacement of MCS as 256QAM.

We also bring simulation results, the SNR and performance is achieveable. We see the deployment scenario.

LG: 256QAM is feature which support for this WI, as rapportenur we see the urgency to make conclusion since no consensus over several meetings and we sugguet to postpone the related discussion in future release.

**Issue 1-1-3: Other test cases: demodulation based on gNB sync source**

* Proposals:
  + Option 1: Do not define demodulation requirements based on gNB sync source in Rel-16 (Huawei, LG, MediaTek)
  + Option 2: Define demodulation requirements based on gNB sync source with applicability rule (Intel,  CATT)
* Recommended WF

Need further discussion

Discussion:

Intel: Cocurrent operation is one of typical feature in Rel-16 V2X WI, gNB sync source is mandated for this operation.

For save test effort, we can discuss test applicable rules. And we also think gNB sync source have higher FOE and TOE.

LG: gNSS sync source is mandatory and typical case for rel-16 V2x. As rapportenur we propose to postpone this to future release.

QC: This is performance test case other than functionality test case. From performance aspect, the differencet is FOE and TOE value, the difference is relative small for tracking BW aspect, we think no performance impact.

Regarding test applciable rules, if UE has gNSS based tests, then no need gNB test cases, test applicables should based on mandatory feature.

Huawei: gNB based on sync source is a optional UE feature. The only difference is CFO, we don’t think big difference.

MTK: We agree with Huawei comments.

Agreements: Considering RAN4 work load and timelimation in Rel-16

Issue 1-1-1: Two options

* Option 1: Introduce 64QAM for 30km/h relative velocity for PSSCH (majority supporting option)
* Option 2: Introduce 64QAM for 30km/h relative velocity and 16QAM with 260km/h for PSSCH

Issue 1-1-2: Do not define 256QAM demodulation requirements in Rel-16

* RAN4 can further discuss and define corresponding requirements if needed in Rel-17 timeframe i.e. Rel-17 side-link enhancement WI.

Issue 1-1-3: Do not define demodulation requirements based on gNB sync source in Rel-16

* RAN4 can further discuss and define corresponding requirements if needed in Rel-17 timeframe i.e. Rel-17 side-link enhancement WI.

Intel: we are also supporting to introduce 16QAM test cases.

Huawei: we have concern on not introducing 16QAM test cases.

QC: We also have concern on test effort not only on RAN4 work load.

**-----------------------End -----------------------------------**

**R4-2103758 Email discussion summary for [98e][319] V2X\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103928 (from R4-2103758).**

**R4-2103928 Email discussion summary for [98e][319] V2X\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103819 WF on multiple link tests for NR V2X demodulation performance**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103820 Simulation assumptions for NR V2X multiple link test case**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**-------------------------------------GTW Notes for [319] on Jan.27th (45 minutes) ----------------------------**

**Topic #4: PSCCH/PSSCH decoding capability test**

**Issue 4-1: CBW/SCS**

          Previous meeting agreement

 o    Need to further check on the supporting CHBW sets on V2X band, mandatory or optional and typical deployment scenarios, RAN4 planned to make decision among 40MHz and 20MHz in RAN4#98e.

          Proposals

 o    Option 1 (~~MTK,~~ CATT, QC, Intel,LG): 40 MHz, 30 kHz with AT command.

~~o    Option 2 (Huawei): 20 MHz, 30 kHz~~

* Option 3 (LG, Huawei as compromise, MTK is fine to take this option as a baseline and further discuss): Flexibly CBW depending on psfch-TxNumber capability:
  + 40MHz channel bandwidth is for the UE supporting psfch-TxNumber =n16, 20MHz/30MHz channel bandwidth is for the UE supporting psfch-TxNumber =n8, and 10MHz channel bandwidth is for the UE supporting psfch-TxNumber =n4.

          Recommended WF

 o    Collect comments on options above with detailed description of UE capability

 Discussion:

QC: From UE capability 40MHz is mandatory supporting on band n47. With option 3, we introduce test cases pending on another UE capability which not test cases purpose. With option 1, psfch-TxNumber =n16 works. For other UE capability FFS.

LG: RAN4 already agreed using PSFCH for reporting to collect the feedback. Which feedback mode we used to AT command vs PSFCH feedback.

Intel: We agreed to use PSFCH instead of AT command. We also realized for this case AT command coulde be another option.

Huawei: In previous meeting, we already agree to use PSFCH instead of AT command which different to LTE phase.

A unified test method preferred to save test complexity. We can agree 40MHz is mandatory feature. We think option 3 reasonable.

QC: We don’t think unified method needed, AT command is TE implementation. Using PSFCH just for test cases stat. purpose which not really match all the deployment scenarios.

Intel: Agree with QC. We also agree to consider different options for different cases.

MTK: We don’t agree to use AT command following previous agreements. We support option 3.

QC:

For UE which supporting psfch-TxNumber =n16, 40MHz/30kHz can be used.

For UE which supporting psfch-TxNumber =n8 or n4, CHBW is FFS pending on whether AT command can be used or not

Huawei: we think we already have agreements for feedback mode.

Further discuss the feedback mode for PSCCH/PSSCH decoding capability test:

-Option1: AT command with 40 MHz, 30 kHz

- Option2: Using PSFCH with PSFCH with periodicity 1, Flexibly CBW depending on psfch-TxNumber capability:

* 40MHz channel bandwidth is for the UE supporting psfch-TxNumber =n16, 20MHz/30MHz channel bandwidth is for the UE supporting psfch-TxNumber =n8, and 10MHz channel bandwidth is for the UE supporting psfch-TxNumber =n4.

Further check with TE vendors to get their feedback regarding feasibility and test complexity.

**Issue 4-2: PSFCH configuration**

          Agreement RAN4 #96e

 o    Feedback loop for test method

* + - PSFCH feedback instead of AT commands can be used to test NR V2X UE’s performance

          Agreement RAN4 #97e

 o    Option 1: No PSFCH

 o    Option 2: PSFCH with periodicity 1

          Proposals

 o    Option 1 (MTK, CATT, Huawei): Set PSFCH periodicity to 1.

 o    Option 2 (LGE, Intel, QC): Use AT command for only PSCCH/PSSCH decoding capability test

 o    Option 3 (LGE): Use PSFCH feedback for PSCCH/PSSCH decoding capability test and introduce different test configuration depending on capability of psfch-TxNumber

* + - For example, 40MHz channel bandwidth is for the UE supporting psfch-TxNumber =n16, 20MHz/30MHz channel bandwidth is for the UE supporting psfch-TxNumber =n8, and 10MHz channel bandwidth is for the UE supporting psfch-TxNumber =n4.

          Recommended WF

 o   Collect comments on options above

**Topic #5: SDR with active sidelink test**

**Issue 5-1: Whether to define the SDR test with active sidelink**

          Proposals

 o    Option 1 (MTK, Huawei, QC, LG): No

 o    Option 2 (CATT, Intel): Yes

          Recommended WF

 o    Collect more comments on this issue with detailed justification why one or another option is supported.

 Discussion:

Intel: We prefer to have test cases for co-current operation.

Agreements:

Not define the SDR test cases with active sidelink in Rel-16 V2X WI.

-RAN4 also realize with such agreements, the co-current operation has not be verified by Rel-16 RAN4 demodulation requirements. RAN4 can further discuss and define corresponding test cases if needed in Rel-17 timeframe i.e. Rel-17 side-link enhancement WI.

**Topic #1: Power imbalance test**

**Issue 1-2: Distance between the two links and UEs allocation**

          Previous meeting agreement

 o    Option 1: 10 PRBs

 o    Option 2: 30 PRBs

 o    Companies are encouraged to check the impact of IBE for options above for the next RAN4 meeting.

          Proposals

 o    Option 1 (LGE, MTK slight preference): 10 PRBs, UE1 PRBs 0-9, UE2 PRBs 20-29

 o    Option 2 (Intel, Huawei, QC, LG, MTK): 20 PRBs, UE1 PRBs 0-9, UE2 PRBs 30-39

 o    Option 3 (Huawei, QC, LG, MTK): 20 PRBs, UE1 PRBs 10-19, UE2 PRBs 40-49

          Recommended WF

* Collect comments on options above

Agreements: Option2: 20 PRBs, UE1 PRBs 0-9, UE2 PRBs 30-39

------------------------------------End--------------------------

**R4-2101065 Discussion on NR V2X Demod test cases**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101942 Draft CR on General section of NR V2X requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103813 (from R4-2101942).**

**R4-2103813 Draft CR on General section of NR V2X requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.3.6.2 Single link test [5G\_V2X\_NRSL-Perf]

**R4-2100407 Discussion on single link demodulation test for NR V2X**

*Type: discussion For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100409 Simulation results of NR V2X single link demodulation test**

*Type: discussion For: Approval  
 Source: CATT, GOHIGH*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100411 DraftCR for 38.101-4, Introduce PSBCH performance requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: CATT, GOHIGH*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103814 (from R4-2100411).**

**R4-2103814 DraftCR for 38.101-4, Introduce PSBCH performance requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: CATT, GOHIGH*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100628 V2X single link demod discussion**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.2.1 PSSCH demodulation test [5G\_V2X\_NRSL-Perf]

**R4-2100656 Draft CR for PSSCH demodulation requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103815 (from R4-2100656).**

**R4-2103815 Draft CR for PSSCH demodulation requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100657 Discussion and simulation results for PSSCH single link test in NR V2X**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101068 Simulation results for NR V2X PSSCH test case**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101232 Discussion on NR V2X Single Link PSSCH requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101352 Discussion on PSSCH requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101353 Simulation results on PSSCH requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.2.2 PSCCH demodulation test [5G\_V2X\_NRSL-Perf]

**R4-2100658 Discussion and simulation results for PSCCH single link test in NR V2X**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101067 Simulation results for NR V2X PSCCH test case**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101233 Discussion on NR V2X Single Link PSCCH requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101234 Draft CR on NR V2X Single Link PSCCH requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103816 (from R4-2101234).**

**R4-2103816 Draft CR on NR V2X Single Link PSCCH requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101354 Discussion and simulation results on PSCCH performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.2.3 PSBCH demodulation test [5G\_V2X\_NRSL-Perf]

**R4-2100659 Simulation results for PSBCH single link test in NR V2X**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101066 Simulation results for NR V2X PSBCH**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101235 Simulation results for NR V2X Single Link PSBCH requirements**

*Type: other For: Information  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101355 Simulation results on PSBCH performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.2.4 PSFCH demodulation test [5G\_V2X\_NRSL-Perf]

**R4-2100661 Simulation results for PSFCH single link test in NR V2X**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101069 draftCR on NR V2X PSFCH demodulation requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103817 (from R4-2101069).**

**R4-2103817 draftCR on NR V2X PSFCH demodulation requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101236 Simulation results for NR V2X Single Link PSFCH requirements**

*Type: other For: Information  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101356 Simulation results on PSFCH performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.3.6.3 Multiple link test [5G\_V2X\_NRSL-Perf]

**R4-2100408 Discussion on multiple link demodulation test for NR V2X**

*Type: discussion For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100410 Simulation results of NR V2X multiple link demodulation test**

*Type: discussion For: Approval  
 Source: CATT, GOHIGH*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100629 V2X multiple link demod discussion**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100662 Discussion and simulation results for multiple link tests in NR V2X**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.3.1 Power imbalance requirement [5G\_V2X\_NRSL-Perf]

**R4-2101237 Discussion on NR V2X Multiple Link Power Imbalance requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101357 Draft CR: Introduction on Power imbalance requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103818 (from R4-2101357).**

**R4-2103818 Draft CR: Introduction on Power imbalance requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101358 Discussion on V2X Power imbalance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.3.2 HARQ soft buffer combing test [5G\_V2X\_NRSL-Perf]

**R4-2100630 V2X demod HARQ buffer CR**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Qualcomm, Inc.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101238 Discussion on NR V2X Multiple Link HARQ soft buffer combing requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101359 Discussion on V2X Soft-buffer test**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.3.3 PSFCH decoding capability test [5G\_V2X\_NRSL-Perf]

**R4-2101239 Discussion on NR V2X Multiple Link PSFCH decoding capability requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101360 Draft CR: Introduction on PSFCH decoding capability requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101361 Discussion on V2X PSFCH decoding capability test**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.3.4 PSCCH/PSSCH decoding capability [5G\_V2X\_NRSL-Perf]

**R4-2101240 Discussion on NR V2X Multiple Link PSCCH/PSSCH decoding capability requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101362 Draft CR: Introduction on PSSCH/PSCCH decoding capability requirements for NR V2X**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101363 Discussion on V2X PSSCH/PSCCH decoding capability test**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.3.6.3.5 Others [5G\_V2X\_NRSL-Perf]

**R4-2101364 Discussion on V2X multilink SDR test**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101943 Discussion on NR V2X Multiple Link SDR requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 7.4 Integrated Access and Backhaul for NR [NR\_IAB]

#### 7.4.1 General [NR\_IAB-Core]

**R4-2103744 Email discussion summary for [98e][305] NR\_IAB\_RF\_Maintenance**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103929 (from R4-2103744).**

**R4-2103929 Email discussion summary for [98e][305] NR\_IAB\_RF\_Maintenance**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103849 WF on IAB-MT EVM measurement in core spec**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Return to.**

------------------------------ **GTW Notes for Jan.26th (45 minutes) –Email thread 305) -----------------------------------**

**EVM measurement procedure**

**Issue 1-1: Does IAB-MT measurement procedure refer UE spec or follow BS procedure?**

* Proposals
  + Option 1: Refer UE R15 spec with some necessary modifications. (CATT)
  + Option 2: The same as BS approach with some necessary modifications if needed. (Ericsson, Nokia, ZTE)
* Recommended WF
  + Option 1

Discussion:

CATT: With option 2, we believe BS approach, there are many deltas compared to IAB-MT, these required lots of changes i.e. equalizer.

Nokia: We prefer option 2, both options required the modifications; in the end the output will be same. We prefer to align DU and MT as much as possible. We think option 2 may not need modifications.

E///: We make some analysis between UE like or BS like approach, we believe no changes needed using BS approach.

The TE for BS conformance can be reused without modifications.

ZTE: We prefer option 2, but we have some different understanding for the necessary changes with BS approach. It’s premature to conclude now. The configurations i.e. physical channels etc.

CATT: We already discussed several meetings, we need to conclude right now. But we would like to further discuss the details to understand which parts need to be modified.

Agreements:

Using BS approach as basis, further discuss on the details required and the modifications not precluded if necessary

**Issue 1-2: If all of the UL physical channels should be tested?**

* Proposals
  + Option 1: BS approach (CATT, ZTE, Samsung, Ericsson, Nokia, Huawei)
  + Option 2: Following UE that PUSCH, PUCCH, DMRS and PRACH should be tested.
  + Option 3: No need to describe physical channel in EVM measurement procedure in core spec, Test modes will be introduced in conformance spec (Nokia)
* Recommended WF
  + Option 1

Discussion:

Nokia: We have core requirements for averaging EVM, no separate for individual physical channels. We will introduce test modes for requirements.

ZTE: We prefer option 1.

Samsung: we support option 1, we can use BS spec approach to update IAB core spec, EVM (modulation schemes) only specified for PDSCH.

E///: We support option 1 with BS approach.

QC: How to ensure DMRS performance as receiver need to use DMRS for decoding?

Nokia: we are fine with BS approach. For DMRS should not have impact the performance in the end.

QC: For UE side, we verify everything.

E///: From performance wise, existing BS approach already verified it works.

Huawei: We prefer to verify PUSCH only.

Agreement:

Using BS approach:

1. Core spec: clarify that the EVM (modulation orders) specify for PUSCH
2. Introduce test modes in conformance spec with PUSCH channel

**Issue 1-3: Should PTRS be used IAB-MT EVM measurement?**

* Proposals
  + Option 1: yes for FR2 and optional (Nokia, Ericsson, Samsung,ZTE,Huawei)
  + Option 2: No, as the current UE spec
* Recommended WF
  + Option 1

*Moderator: It’s moderator’s understanding that the proposal is for FR2 not FR1.*

Discussion:

QC: Why DMRS not enough? In real NW, we can’t guarantee PTRS always configured.

Samsung: What’s the meaning for optional? Declaration basis?

E///: In FR2 EVM measurement procedure for BS, PTRS can be configured optional.

ZTE: FR2 PTRS is key and considering future with further extending frequency ranges PTRS also important. Current in BS FRC, PTRS also exists.

Nokia: Having PTRS in FR2 optional aligned with BS spec.

Huawei: We support option 1. We can use same BS approach.

Agreement:

Follow BS approach to configure PTRS in FR2 with optional

Further discuss the test mode and how to the clarify the optional in conformance specification if needed

**Issue 1-4: How to modify IAB-MT measurement diagram?**

* Proposals
  + Option 1: As proposed in R4-2100365 (CATT)
  + Option 2: As proposes in R4-2100826 (CMCC)
  + Option 3: As BS diagram (Ericsson)
  + Option 4: Other proposal
* Recommended WF
  + To be discussed

Discussion:

CATT: Using BS diagram as basis, further modifications not precluded.

E///: EVM should be same BS and UE including reference points with different methodologies.

Agreements:

Using BS diagram as basis, further modifications not precluded if necessary.

**Issue 1-6: The basic EVM measurement interval (if time allowed)**

* Proposals
  + Option 1: The same as UE for PUSCH (10 ms) (CATT)
  + Option 2: The same as UE (CMCC)
  + Option 3: The same as BS (Ericsson)
* Recommended WF
  + To be discussed

Discussion:

Agreements: The same as BS approach.

---------------------------------------------End --------------------------------------------------------

##### 7.4.1.1 System parameters maintenance [NR\_IAB-Core]

**R4-2100368 Draft CR for TS 38.174: Correction of clause 5**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103957 (from R4-2100368).**

**R4-2103957 Draft CR for TS 38.174: Correction of clause 5**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.4.1.2 Others [NR\_IAB-Core]

**R4-2100910 Big CR for update on TR38.809**

*Type: CR For: Agreement  
 38.809 v16.1.0 CR-0002 Cat: F (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision:** For Email approval

**R4-2102422 draft CR to TR 38.174 - correction to clause 6**

*Type: draftCR For: Endorsement  
 38.809 v16.1.0  
 Source: Huawei*

**Abstract:**

The word "hannon" seems to have replaced existing text in some locations making the text unreadable.

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

#### 7.4.2 RF requirements maintenance [NR\_IAB-Core]

##### 7.4.2.1 Transmitter characteristics [NR\_IAB-Core]

###### 7.4.2.1.1 Tx Power related requirements [NR\_IAB-Core]

**R4-2102335 IAB-MT TX dynamic range**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on IAB-MT TX dynamic requirement modification.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102336 CR on Tx Power related requirements in TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, The TX power dyanmic reference condition is updated

**Discussion:**

[report of discussion]

**Decision: Return to.**

###### 7.4.2.1.2 Transmitted signal quality [NR\_IAB-Core]

**R4-2100365 Discussion on IAB-MT EVM measurement process**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100366 Draft CR for TS 38.174: IAB-MT EVM measurement**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2100367 Draft CR for TR 38.809: IAB-MT EVM measurement**

*Type: draftCR For: Endorsement  
 38.809 v16.1.0  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2100826 Discussion on EVM measurement methodology for IAB-MT**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102012 IAB EVM procedure**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102333 IAB-EVM procedure**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on the EVM procedure which should be captured in the TS 38.174.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102337 CR on Transmitted signal quality in TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, Add EVM detailed procedure is in Annex D

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

###### 7.4.2.1.3 Unwanted emissions [NR\_IAB-Core]

###### 7.4.2.1.4 Others [NR\_IAB-Core]

**R4-2100369 Draft CR for TS 38.174: Correction of clause 6,7 and 9**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103850 (from R4-2100369).**

**R4-2103850 Draft CR for TS 38.174: Correction of clause 6,7 and 9**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102334 IAB-MT interference signal characteristic**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our proposal on IAB-MT characteristic of interference signal.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102338 CR on Transmitter characteristics- Others TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, Annex F for interference charateristic is added

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103851 (from R4-2102338).**

**R4-2103851 CR on Transmitter characteristics- Others TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, Annex F for interference charateristic is added

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.4.2.2 Receiver characteristics [NR\_IAB-Core]

###### 7.4.2.2.1 Sensitivity and dynamic range requirements [NR\_IAB-Core]

**R4-2102341 CR on Sensitivity and dynamic range requirements TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, format is corrected and bracket is removed

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.4.2.2.2 In-band selectivity and blocking requirements [NR\_IAB-Core]

**R4-2102339 CR on In-band selectivity and blocking requirements in TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, more typo is corrected

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

###### 7.4.2.2.3 Others [NR\_IAB-Core]

**R4-2100909 Draft CR to align the general clause of radiated and conducted requirement**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102011 DraftCR to TS 38.174: Receiver requirement corrections**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Endorsed.**

**R4-2102340 CR on Rx Charateristic other related requirements**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, OOB requriement is updated

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103852 (from R4-2102340).**

**R4-2103852 CR on Rx Charateristic other related requirements**

*Type: draftCR For: Endorsement  
 38.174 v16.1.0  
 Source: Ericsson*

**Abstract:**

in this CR, OOB requriement is updated

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 7.4.3 RF conformance testing [NR\_IAB-Perf]

##### 7.4.3.1 General and work plan [NR\_IAB-Perf]

**R4-2103745 Email discussion summary for [98e][306] NR\_IAB\_Conformance\_Part1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103930 (from R4-2103745).**

**R4-2103930 Email discussion summary for [98e][306] NR\_IAB\_Conformance\_Part1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103853 WF on IAB-MT test environment**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103854 WF on test configurations, models and Rx FRC**

*Type: other For: Approval  
 Source:* Nokia, Nokia Shanghai Bell

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103855 WF on manufacturer declarations**

*Type: other For: Approval  
 Source:*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103856 WF on IAB conformance specification work split and drafting guidelines**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**--------------------------------------GTW Notes for Jan.26th Email thread [306] -------------------------**

**Topics from email thread [306] (1H)**

**Issue 1-1-1: Synchronization**

Based on the contributions there seems to be good alignment to leave synchronization between DUT and test equipment up to implementation

* Proposals:
  + Option 1: synchronization between DUT and test equipment is left up to implementation
  + Option 2: TBA
* Recommended WF
  + Option 1

Discussion:

QC: How we can ensure that IAB-MT can sync with parent properly in real network with test set-up?

Huawei: We are referring to RF requirements with feasible TE implementation.

ZTE: We don’t have strong opinion, for test modes, how to transmit SSB/PTRS, this will increase test conformance spec work-load. We are not sure whether this generic approach applied for every test cases or with some exception cases.

E///: GPS can be used as IAB internal sync source. IAB-MT can be directly sync with IAB\_DU if MT and DU both rely with GPS.

Keysight: From TE aspect, IAB-MT have sync with IAB-DU or IAB-MT can have sync source themselves, we don’t have preference on the options, but we would like to see clear common understanding for the sync methods.

QC: The behavior of testing and real network difference. BS is different as BS no need to sync with others.

Nokia: We are not clear which RF requirements mandated to use sync-signals from IAB-DU. We would like to align with BS approach using same test set-up.

ZTE: Add a note in test mode section, IAB-MT sync with IAB-DU with DL signal configuration also allowed.

Agreement:

Using same BS approach (no detailed synchronization configuration in conformance specifications; meanwhile add a note in conformance specs to clarify (IAB-MT sync with IAB-DU with DL signal configuration not precluded).

**Issue 1-1-2: Two-way communication in IAB-MT tests**

One company proposes not to specify two-way communication for RF tests. One company proposes to write the specification in a manner which does not preclude the existence of DL signals

* Proposals:
  + Option 1: Two-way communication is not specified
  + Option 2: Two-way communication is not specified, specification shall not preclude DL signals to be used e.g. for timing and frequency reference purposes during the test
* Recommended WF
  + TBA

Discussion:

Huawei: We already have agreements; notes can be applied to clarify. But the clarification in general section or happened in many places?

Agreement:

Two-way communication is not specified for RF conformance tests, specification shall not preclude DL signals to be used e.g. for timing and frequency reference purposes during the test.

Companies further work on the clarification notes to conformance specifications for topic 1-1.

**Issue 1-1-3: Description of connection/measurement setup in specification annex**

One company notes that the specification annexes capturing the measurement setups are informative in UE and BS specification and proposes to use the same practice in IAB specification

* Proposals:
  + Option 1: Flexibility in connection / measurement setup is allowed by keeping the specified setup informative
  + Option 2: TBA
* Recommended WF
  + Option 1

Discussion:

Agreements:Option 1: Flexibility in connection / measurement setup is allowed by keeping the specified setup informative

**Issue 1-1-4: MU/TT**

Two companies prefer to adopt BS measurement uncertainties and test tolerances by default, but are open to allow modification if using UE test equipment requires this. One company prefers to adopt the higher of UE and BS values, but does not propose specific numbers. It should be noted that UE specifications do not cover radiated testing in FR1, which may cause difficulties if UE MU is considered.

* Proposals:
  + Option 1: BS MU/TT will be adopted
  + Option 2: The higher value of BS and UE MU/TT are adopted
  + Option 3: The higher value of BS and UE MU/TT are adopted only regarding the individual contribution of system simulator
  + Option 4: Chapter 4.1.3 in 38.141-1 can be re-used for IAB.
* Recommended WF
  + TBA

Discussion:

Keysight: We prefer to try to avoid the situation that some of TE functionality can’t work well. We prefer with option 3.

Huawei: Hard to have a generic approach. There are some requirements TT with zero considering the regulatory, but the MU still important.

QC: Due to test set-up difference, UE MU probably can’t easily applied for IAB-MT. Better to check with TE vendors.

Nokia: I agree with Huawei comments, some requirements with TT with zero, we would like to further check as UE side and BS side different. We didn’t detailed values till now. We encourage companies to bring more detailed/ specific values for which cases MU/TT can’t be used from BS side.

Keysight: I plan to bring more details in next meeting; test MU depending on test set-up and RF requirements themselves.

Samsung: What’s the plan of completing conformance part for Rel-16 IAB WI.

Agreements:

Choosing higher values of MU/TT among available methods only regarding the individual contribution of system simulator as generic approach:

* some exceptions not excluded considering regulatory requirements impact.

**Issue 2-2-1: Re-use of NR test models (Pending on time)**

There is a proposal that NR BS test models can be re-used for both IAB-MT and IAB-DU, but re-using all physical layer parameters may need further consideration

* Proposals: *Note: multiple options can be selected*
  + Option 1: reuse NR FR1 test models and NR FR2 test models for IAB-DU using NR details for physical channel parameters.
  + Option 2: It is proposed to reuse NR FR1 test models and NR FR2 test models for IAB-MT taking into account respective physical channel parameters, i.e. TM design for IAB-MT shall follow same framework as BS, delta to BS spec to be agreed
  + Option 3: Common physical channel parameters can refer to TS 38.521 with the clarification that only the information for the used CBW is referred
* Recommended WF
  + TBA

Discussion:

ZTE: We support option 1, whether we need to reuse all the test modes for BS specifications? This is only related to current dynamic range conformance test discussion.

Nokia: IAB-DU we could almost all from BS specs, for IAB-MT we need to some update for test modes i.e. boosting.

We need to further discuss whether we need to include full set of test modes for IAB-DU/IAB-MT?

E///: Option 2 is our preference. Some modifications required.

Samsung: We also agree with option1 for IAB-DU which already agreed. For Option 2 IAB-MT we also agree the ieal in general. We prefer to use reference approach for IAB-DU to BS spec with note which part not applicable. For IAB-MT, we prefer to specify the test modes in conformance specs independently.

Nokia: For IAB-DU, option 1 OK. The only question how to draft the specs.

Huawei: We agree with Nokia; we may refer to BS specs to have alignment description. For shared arch, test applicable rules among IAB-DU and IAB-MT need to be further discussed and how to naming.

ZTE: We support option 2 for IAB-MT also. We think not feasible for IAB-MT and IAB-DU with common test modes.

Agreement:

For IAB\_DU: reuse NR FR1 test models and NR FR2 test models for IAB-DU using NR details for physical channel parameters.

For IAB-MT: It is proposed to reuse NR FR1 test models and NR FR2 test models for IAB-MT taking into account respective physical channel parameters, i.e. TM design for IAB-MT shall follow same framework as BS, delta to BS spec to be agreed

FFS for the spec drafting of structures for IAB-DU and IAB-MT Test modes

**Issue 2-2-2: TDD pattern for IAB-MT (Pending on time)**

Legacy BS NR test model includes TDD patterns (in FR1 and FR2) that are different compare to UE test specification. TDD pattern for IAB-MT needs to be agreed.

* Proposals: *Note: multiple options can be selected*
  + Option 1: Apply BS FR1 TDD configuration for IAB-MT in FR1
  + Option 2: Apply BS FR2 TDD configuration for IAB-MT in FR2
  + Option 3: Update the measurement duration due to changed UL-DL split
  + Option 4: Special slot configuration is left for implementation
* Recommended WF
  + TBA

Discussion:

E///: Whether TDD configurations needed for conformance test cases? TE vendors’ feedback appreciated for the feasible of change TDD pattern.

ZTE: Support option 1 and option 2. We should avoid cross-link interference during test.

Key sight: The equalizer on EVM related TDD pattern, we need to further check.

Samsung: option 1 is OK as FR1 both UE and BS aligned. For FR2, it’s DL heavy pattern. The core requirement is per slot basis if we go with option 2 for FR2 since this conflicted with IAB-MT core requirements.

Huawei：For shared architecture DU and MT can share the same pattern and how impact the test MU/TT need to be further studied.

Nokia: For IAB-DU we use DL heavy pattern and for IAB-MT we use UL heavy pattern.

ZTE: In Rel-15, the TDD pattern come from operators’ demand. Better to align with BS approach.

Agreements:

Apply BS FR1 TDD configuration for IAB-MT in FR1 (Baseline)

FFS for BS FR2 TDD configuration considering available DL/UL slots during tests

-Option 1: BS FR2 TDD configurations

-Other options not excluded

**-------------------------------------End ------------------------------------**

**R4-2103746 Email discussion summary for [98e][307] NR\_IAB\_Conformance\_Part2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103931 (from R4-2103746).**

**R4-2103931 Email discussion summary for [98e][307] NR\_IAB\_Conformance\_Part2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103857 WF on IAB-MT test coverage and IAB node test burden reduction**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**--------------------------------------GTW Notes for Jan.26th Email thread [307] -------------------------**

**Topics from email thread [307] (45 minutes)**

**Issue 1-1: Dynamic range Test point**

* Proposals
  + Option 1:Consider two test points for IAB-MT dynamic range as below:
  + Maximum output power with full RB allocation and maximum output power(Test point 1 in last meeting WF)
  + single RB allocation with 5/10 dB lower PSD as used in test point 1) (Updated Test point 3 in last meeting WF)
  + ~~Option 2: consider dynamic range on full RB allocation only and update core requirement~~
  + Option 3:
  + Maximum output power with full RB allocation(Test point 1 in WF)
  + ~~Maximum output power with 1/4 RB allocation(belongs other proposal in WF)~~
  + Minimum output power (as set by 5/10 dB dynamic range requirement) with full RB allocation.(Test point 2 in WF)
* Recommended WF
  + It’s encouraged companies share preference on the options on test points selection. And it would be appreciated if companies can share opinion on whether Dynamic PSD(X) and constant PSD(Y) we agreed last year should be applied for IAB-MT.

Discussion:

Both X and Y need to be covered in conformance test cases

Option 1(Samsung, Nokia, CATT, ZTE):

* Test points 1: Maximum output power with full RB allocation and maximum output power
* Test points 2: single RB allocation with 5/10 dB lower PSD as used in test point 1)
* Test point 1- test point 2 = X+Y （+/- uncertainty FFS ）

Option 2 (E///, ZTE):

* Test points 1: Maximum output power with full RB allocation and maximum output power
* Test points 3: Minimum output power (as set by 5/10 dB dynamic range requirement) with full RB allocation.
* Test point 4: Sing PRB transmission with same PSD as test point 1
* Test point 1- test point3 = X (+/- uncertainty FFS)
* Test point 1 – test point4 =Y (+/- uncertainty FFS)

FFS for test applicability along with other conformance requirements

Candidate agreements: Option 1 pending on further check by E/// and make decision in this meeting.

E///: Power accuracy need to be considered. Y can be considered to be verified in power control requirements.

Nokia: Prefer option 1, we can follow majority among option 1 and option2. Not prefer to merger test cases with power control requirements.

Samsung: We prefer option 1 considering test burden, power control only defined for local-IAB-MT, prefer not to merge them together.

ZTE: The power control requirements not applicable for dynamic range requirements.

E///: We prefer option 2.

**-------------------------------------End ------------------------------------**

**--------------------------------------GTW agenda on Jan.29th for email thread [307] (45 minutes) -------------------**

|  |  |  |
| --- | --- | --- |
| **Sub-topic 1-2: power control for local Area IAB- MT** | *Tentative agreements:*  **Issue 1-2-1: Power control test points**  4 companies prefer to have explicit test case defined for power control and   * One company prefers option 3 as proponent * Other 3 companies fine with either option 2 or option 3.   2 companies have no strong opinion on whether to have the test since the power control step is rather small  2 companies also see the possibility to merge power control in dynamic range.  However, it seems all discussion and input would mainly for relative power control tolerance. But not concrete proposal on aggregated power control tolerance.  **Issue 1-2-2: Test set-up**  As pointed by companies, the both options abstracted from contribution should not exclude each other. Furthermore, on 26th Jan GTW meeting it is agreed in [306] as below. It’s assumed the test set-up for this specific requirement can be covered by below common agreement. And further discussion on test set-up for power control can be megered into issue 1-1-2 of [306].   |  | | --- | | **Issue 1-1-2: Two-way communication in IAB-MT tests in [306]**  Two-way communication is not specified for RF conformance tests, specification shall not preclude DL signals to be used e.g. for timing and frequency reference purposes during the test.  Companies further work on the clarification notes to conformance specifications for topic 1-1. |   CATT: For relative power control two-way communication not needed.  For aggregated power control, I guess we need to discuss whether need command from TE.  QC: For generic test set-up, we can follow the agreements we have, for specific test cases we may need to discuss the details.  E///: we believe we still can use test modes; the generic approach should be applied as well.  ZTE: we also this power control can be covered by power dynamic range.  *Candidate options:*  **For relative power control accuracy:**  Considering the majority view, the test condition on this requirement can be discussed based on “Option 3: Partial PRB allocation to be considered in Test model design if to reuse the similar test configuration as UE.”  **For relative power control accuracy** Agreements:  Option 3: Partial PRB allocation to be considered in Test model design if to reuse the similar test configuration as UE.”  E///: We consider to simplify test mode be reused for dynamic range test cases as well.  Nokia: we can further check the possibility for test mode.  **For aggregated power control accuracy**:  It’s recommended to provide companies view on conformance testing this requirement.  E///: This is to verify the out power capability. We would like to see combine with output power requirements. We want to further check. UE will rely on TPC command, we prefer not mention this and leave it to implementation.  Nokia: we are fine to have dynamic range and power control combined together. For shared RF architecture, we see this test case probably less meaning; we are open to discuss the combined with other test cases. We believe power dynamic ranges test cases more important.  ZTE: The BS and UE implementation for output power is different. We proposed not needed.  QC: We are flexible for this as well as we need to verify IAB-MT transmit min and max power with power changes.  CATT: Support ZTE this one can be covered by other test cases.  Samsung: We share similar comments with CATT, ZTE and Nokia.  **For aggregated power control accuracy agreements**:  NO detailed conformance test cases for this requirement, FFS whether can be jointly verified or covered by dynamic range conformance test cases. |
| **Sub-topic 1-3: frequency error** | *Tentative agreements:*  As commented by companies, the both options abstracted from contribution should be enabled with the target to allow TE flexibility. Furthermore, on 26th Jan GTW meeting it is agreed in [306] as below on synchronization and measurement setup aspect.   |  | | --- | | **Topics from email thread [306]**  **Issue 1-1-1: Synchronization**  Agreement:  Using same BS approach (no detailed synchronization configuration in conformance specifications; meanwhile add a note in conformance specs to clarify (IAB-MT sync with IAB-DU with DL signal configuration not precluded).  **Issue 1-1-3: Description of connection/measurement setup in specification annex**  Agreements:Option 1: Flexibility in connection / measurement setup is allowed by keeping the specified setup informative |   It’s suggested to apply above agreement for frequency error.  QC: If we have outside source which provide sync, how to ensure IAB-MT tracking sync properly.  E///: We already have discussed in general section, for specific test case of FOE, IAB-MT can use GNSS sync. FOE is verified in EVM procedure in BS side also verified in in-band measurement in EVM procedure in UE side. We have separate discussion for fine-sync in demod AI.  We think to take this agreements as generic approach as it is.  CATT: How to verify FOE together with EVM. EVM applied for absolute frequency, we need to differentiate IAB-MT and IAB-DU.  In future with mobile IAB-MT, then we need to discuss this again.  ZTE: As mentioned by E///, SSB and GNSS sync source both allowed. Usually GNSS based can offer better performance better than SSB.  Nokia: Mobile IAB-MT is out of scope for this discussion. We have the requirements what’s the step following, we can guarantee the performance. We can work on the details for TP drafting, we can do two measurements for absolute frequency and relative frequency.  QC: Requirements on IAB\_MT is 0.1 ppm. The point refers to frequency of DL signals, how to guarantee the performance of outsource of sync.  Nokia: We have a statement, we are not excluded DL signals; also not exclude other solutions and leave it to implementation.  E///: We don’t want to mandate any implementation during test set-up.  ZTE: In test mode, we can add a note for the frequency error definition.  Agreements: Above agreement from [306] applied for frequency error test as well.  QC: We have concern on this agreement. The test set-up is artificial. |

**----------------------------End ------------------------**

**R4-2102321 On IAB test case dependency**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on the test burden reduction.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.4.3.2 Common test issues for conducted and radiated conformance testing [NR\_IAB-Perf]

###### 7.4.3.2.1 Test configurations [NR\_IAB-Perf]

**R4-2100906 View on IAB-MT RF Test configuration**

*Type: other For: Approval  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101565 Discussion on IAB RF conformance test configurations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution, we continue discussions on details for IAB test configurations.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101960 Discussion on IAB test configurations**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102322 IAB Common test issue on test Configuration-Conducted**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on test configuration for IAB RF conformance test work and also propose the TP for the test configuration

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102323 IAB Common test issue on test configuration-OTA**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on test configuration for IAB RF conformance test work and also propose the TP for the test configuration

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.4.3.2.2 Test models [NR\_IAB-Perf]

**R4-2100371 Discussion on IAB-MT test model**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100907 Configuration on reference channel for IAB-MT**

*Type: other For: Approval  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101564 Discussion on IAB test models for conformance specifications**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution, we continue discussions on details for IAB test models.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101961 Discussion on IAB test model**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102324 IAB Common test issue on test model-Conducted**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our investigation on how the IAB-MT test model should be defined.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102325 IAB Common test issue on test model-OTA**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our investigation on how the IAB-MT OTA test model should be defined.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.4.3.2.3 Others [NR\_IAB-Perf]

**R4-2100908 View on IAB manufacturer declaration**

*Type: other For: Approval  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101418 Testing of IAB-MT Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101962 Discussion on IAB conformance testing**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102016 Manufacturer declaration framework**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102087 IAB-MT conformance Test setup and Test Equipment choice**

*Type: discussion For: Agreement  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102326 On IAB-MT synchronization test setup for conformance testing**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on this aspect for rel-16 IAB RF conformance test work.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102421 IAB declarations format**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Discussion on the BS declarations format and its suitability for the IAB nodes.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.4.3.3 Conducted conformance testing [NR\_IAB-Perf]

###### 7.4.3.3.1 Transmitter characteristics [NR\_IAB-Perf]

**R4-2100370 Discussion on IAB-MT specfic Tx requirements test**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102013 Dynamic range test points**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102327 IAB conducted transmitter test**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our investigation on how the IAB-MT conducted transmitter test could be defined.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.4.3.3.2 Receiver characteristics [NR\_IAB-Perf]

**R4-2102017 Receiver RF testing considerations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102328 TP example for Conducted receiver characteristic test**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our investigation on how the IAB-MT conducted receiver test could be defined.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.4.3.3.3 Other test issues [NR\_IAB-Perf]

**R4-2102329 General conducted test conditions and declarations**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on IAB generic conducted test conditions and declarations and the corresponding TP is proposed.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.4.3.4 Radiated conformance testing [NR\_IAB-Perf]

**R4-2102420 IAB conformance test burden**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Investigating the number or test conditions the OTA BS is tested under to see if this ban be reduced for an IAB node

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.4.3.4.1 Transmitter characteristics [NR\_IAB-Perf]

**R4-2102015 Test setup considerations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102330 On IAB-MT frequency error tests**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our investigation on this frequency error test on IAB-MT specifically.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.4.3.4.2 Receiver characteristics [NR\_IAB-Perf]

**R4-2102331 TP example for OTA receiver characteristic test**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our investigation on how the IAB-MT OTA receiver test could be defined.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.4.3.4.3 Other test issues [NR\_IAB-Perf]

**R4-2102014 IAB RF conformance testing burden considerations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102332 General test conditions and declarations-OTA**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on IAB generic OTA test conditions and declarations and the corresponding TP is proposed.

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 7.4.6 EMC core requirements maintenance [NR\_IAB-Core]

##### 7.4.6.1 General [NR\_IAB-Core]

**R4-2103773 WF on IAB EMC RI testing with spatial exclusions**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2100356 Definition of Exclusion Bands for IAB EMC nodes**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion paper on Exclusion bands for IAB EMC testing

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100357 CR to TS 38.175 on Exclusion Bands**

*Type: CR For: Agreement  
 38.175 v16.1.0 CR-0008 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR on Excclusion Bands for IAB EMC testing

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

##### 7.4.6.2 Emission requirements [NR\_IAB-Core]

##### 7.4.6.3 Immunity requirements [NR\_IAB-Core]

**R4-2100358 Discussion on Spatial Exclusion for IAB EMC RI test**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion paper on Spatial Exclusion for IAB EMC Radiated Immunity Testing

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100359 CR to TS 38.175 on Spatial Exclusion for IAB EMC Radiated Immunity test**

*Type: CR For: Agreement  
 38.175 v16.1.0 CR-0009 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR on spatial exclusion for IAB EMC Radiated Immunity testing

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

#### 7.4.7 EMC performance requirements [NR\_IAB-Perf]

**R4-2100360 CR to TS 38.175 on IAB EMC test configuratins and performance requirements**

*Type: CR For: Agreement  
 38.175 v16.1.0 CR-0010 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR on IAB EMC Performance requirements

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103774 (from R4-2100360).**

**R4-2103774 CR to TS 38.175 on IAB EMC test configuratins and performance requirements**

*Type: CR For: Agreement  
 38.175 v16.1.0 CR-0010 Cat: B (Rel-16)  
  
 Source: Ericsson, ZTE*

**Abstract:**

CR on IAB EMC Performance requirements

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102126 CR to TS 38.175: Performance criteria for IAB**

*Type: CR For: Agreement  
 38.175 v16.1.0 CR-0011 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

**R4-2102177 CR to TS 38.175: Performance criteria for IAB**

*Type: CR For: Agreement  
 38.175 v16.1.0 CR-0012 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102578 Spatial exclusion zone for IAB node**

*Type: discussion For: Agreement  
 Source: Huawei*

**Abstract:**

In this contribution we provide analysis of the challenges with the application of the spatial exclusion for the EMC RI testing of the IAB.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102581 CR to TS 38.175: Spatial Exclusion for EMC RI test for IAB**

*Type: CR For: Agreement  
 38.175 v16.1.0 CR-0013 Cat: B (Rel-16)  
  
 Source: Huawei*

**Abstract:**

Based on the discussion paper on the analysis of spatial exclusion challenges, in this CR provides addittional text for the completion of the spatial exclusion feature in the IAB EMC specification.

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

#### 7.4.8 Demodulation and CSI requirements [NR\_IAB-Perf]

##### 7.4.8.1 General [NR\_IAB-Perf]

**R4-2103759 Email discussion summary for [98e][320] NR\_IAB\_Demod**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103935 (from R4-2103759).**

**R4-2103935 Email discussion summary for [98e][320] NR\_IAB\_Demod**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103921 WF on Rel-16 NR IAB demodulation requirements**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2102105 IAB demodulation general considerations**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Proposals for remaining general/test issues

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.4.8.2 IAB-DU performance requirements [NR\_IAB-Perf]

**R4-2101262 Views on NR IAB-DU demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101293 Discussion on NR IAB DU demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102092 On NR IAB-DU demodulation requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102106 IAB demodulation DU considerations**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Proposals for remaining DU issues

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.4.8.3 IAB-MT performance requirements [NR\_IAB-Perf]

**R4-2101263 Views on NR IAB-MT demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101294 Discussion on NR IAB MT demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102097 On NR IAB-MT testing setup and demodulation requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102107 IAB demodulation MT considerations**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Proposals for remaining MT issues

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 7.6 UE power saving in NR [NR\_UE\_pow\_sav]

#### 7.6.2 Demodulation and CSI requirements (38.101-4) [NR\_UE\_pow\_sav-Perf]

**R4-2103760 Email discussion summary for [98e][321] NR\_UE\_pow\_sav\_Demod**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103936 (from R4-2103760).**

**R4-2103936 Email discussion summary for [98e][321] NR\_UE\_pow\_sav\_Demod**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103821 WF on remaining issue for UE power saving**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**------------------ GTW agenda for Jan.28th email thread [321] (30miniutes) --------------------------**

**Issue 1-1-1: DCI length (excluding 24bits CRS) + Aggregation level （FR1 FDD）**

* + Option 1: 12 bits, AL=8（CATT，vivo, Qualcomm，Apple，intel，MediaTek，Huawei）
  + Option 2: 36bits, AL=16 (CATT，CMCC)

Agreement:Option 1: 12 bits, AL=8

*CMCC: We prefer to have separate configuration for duplex mode and the performance is similar but WUS payload flexible and with different DCI size can cover more cases.*

*Intel: We have same configurations for FR1. We need to align the set-up. Not seen any specific technical issue with same DCI size.*

*QC: Similar as Intel, the SNR values with AL=8 good enough why NW to configure AL 16 without performance benefits.*

*CATT: We are fine for both options. Both options can fulfil test purpose, we agree with CMCC for test coverage.*

*CMCC: The configurations not always same for FDD and TDD; PDCCH configuration is different for PDSCH test cases.*

*We can agree with option 1 with FDD 10MHz, for FR1 TDD with 40MHz, AL 16 can be used.*

*Huawei: Share similar view as QC, from UE performance aspect, if UE can achieve performance with low AL 8, then should no problem for AL 16.*

*CMCC: The payload size also important. We think option 2 in TDD more reasonable.*

*CATT: We would like to complete this WI in time, even we understand the concern from companies.*

**Issue 1-1-2: DCI length (excluding 24bits CRS) + Aggregation level （FR1 TDD）**

* + Option 1: 12 bits, AL=8 (CATT，vivo，Qualcomm，Apple，Intel，CMCC，MediaTek, Huawei)
  + Option 2: 36 bits, AL 16 (CATT)

Agreement: Option 1: 12 bits, AL=8

*CMCC: We have concern for this considering test coverage issue, we can comprise for progress.*

**Issue 1-1-3: DCI length (excluding 24bits CRS) + Aggregation level （FR2 TDD）**

* + Option 1: 12 bits, AL=8 (Qualcom，Apple，Intel，CMCC，MediaTek, Huawei)
  + Option 2: 36 bits, AL=8 (Intel，CMCC，CATT)

*Agreement: 12 bits, AL =8*

**Issue 1-2-1: where to capture UE power saving requirements？**

* + Option 1: separate section under 2Rx/4Rx requirements
  + Option 2: separate section under 1Tx requirements（QC）
    - Option 2a: put the requirements in 1Tx section without new clauses
  + Option 3: separate section at the level of 2Rx/4Rx requirements （CATT，~~QC~~，Apple，vivo，CMCC）
    - E.g. new sub-clause 5.3.4/7.3.4 for power saving
  + Option 4: Create sub-clauses ~~5.3A/7.3A~~ or 5.6/7.6（Ericsson）
  + Option 5: Create sub-clauses 5.3.2.1.3/5.3.2.2.3/5.3.3.1.3/5.3.3.2.3/7.3.2.2.3 Minimum requirements for power saving （Huawei，CMCC， MediaTek, Intel,QC）
  + Option 6: Restructure of normal PDCCH and joint PDCCH/PDCCH-WUS (CMCC), e.g.
* 5.3 PDCCH demodulation requirements
* 5.3.1 PDCCH demodulation requirements for normal PDCCH
* 5.3.2 PDCCH demodulation requirements for power saving

Intel: We think option 5 aligned with draft structure.

QC: We are fine option 2 and option 5. But for option 5, 1Tx is not feature. But Option 5 not strictly follow the structure properly.

CATT: we think option 5 could work, we put joint performance in parallel with 1Tx. Can we consider option 4?

Samsung (Spec editor): if new section needed for this feature, then this should be paced in deepest level sub-section.

Agreements:

Option 5, Create sub-clauses 5.3.2.1.3/5.3.2.2.3/5.3.3.1.3/5.3.3.2.3/7.3.2.2.3 Minimum requirements for power saving

Session chair note: Whether separate sub-clauses need or not for requirements introduced for specific features in future will be discussed in case by case manner with the consideration of maintaining the consistent of spec structure; if sub-clauses generated, it’s recommended placed in deepest sub-clause level if feasible

**Issue 1-2-2: where to put the applicability rules “UE fulfilling the power saving test cases can skip the corresponding normal PDCCH test cases”**

* + Option 1: In General clause （CATT，vivo，Huawei，QC，Apple，CMCC，MediaTek）
  + Option 2: In each section together with the PDCCH/PDCCH-WUS requirements. （CATT，vivo，CMCC）

Agreements: Option 1 in general clause

Companies are encouraged to further work on the texts for applicable rules introduced into specification.

----------------------------End --------------------------------------

**R4-2100397 Discussion on power saving demodulation test**

*Type: discussion For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100398 CR for TS38.101-4, test for FR2 PDCCH DCI format 2\_6 demodulation**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0129 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103822 (from R4-2100398).**

**R4-2103822 CR for TS38.101-4, test for FR2 PDCCH DCI format 2\_6 demodulation**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0129 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100541 Views on UE Power Saving Test Cases**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100817 Simulation results summary for R16 power saving demodulation**

*Type: other For: Information  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100818 CR for TS38.101-4, test for FR1 TDD PDCCH DCI format 2\_6 demodulation**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0131 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103823 (from R4-2100818).**

**R4-2103823 CR for TS38.101-4, test for FR1 TDD PDCCH DCI format 2\_6 demodulation**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0131 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100820 Demodulation on UE power saving**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101241 Discussion on PDCCH-WUS requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101295 Discussion and simulation results on the performance requirements for NR power saving**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101387 CR on Fixed reference channel for power saving performance**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0154 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103824 (from R4-2101387).**

**R4-2103824 CR on Fixed reference channel for power saving performance**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0154 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102085 Simulation results on PDCCH-WUS for power saving**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102086 CR for TS38.101-4, test for FR1 FDD PDCCH DCI format 2\_6 demodulation**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

**R4-2103932 CR for TS38.101-4, test for FR1 FDD PDCCH DCI format 2\_6 demodulation**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-? Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

Session chair Note: contact with MCC to get CR number

**Decision: Return to.**

### 7.8 Physical layer enhancements for NR URLLC [NR\_L1enh\_URLLC-Core]

#### 7.8.1 Demodulation and CSI requirements (38.101-4/38.104) [NR\_L1enh\_URLLC-Perf]

##### 7.8.1.1 Performance requirements with ultra-low BLER [NR\_L1enh\_URLLC-Perf]

**R4-2103761 Email discussion summary for [98e][322] NR\_URLLC\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103937 (from R4-2103761).**

**R4-2103937 Email discussion summary for [98e][322] NR\_URLLC\_Demod\_Part1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103897 LS on Test Methodology for UE URLLC Ultra Low BLER CQI requirements**

*Type: LSout For: Approval*

*To: RAN5  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103898 Summary of simulation results for 0.001% BLER UE requirement**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103899 Summary of simulation results for 0.001% BLER BS requirement**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**------------------------------------------GTW agenda Jan.28th for email thread [322] (30 minutes) -------------------**

**CQI test cases**

**Recommendation from moderators based on 1st round discussion:**

Assume early termination method for CQI test

*Confidence level 99% for CQI test*

*Do not include X=0.5dB in CQI test*

*No applicability rule for CQI test*

*SNR defined for one pair 1dB apart*

*CQI value must be >=1*

**Issue 1-5: Number of SNR points for requirement definition**

Note: This is a separate issue to whether SNR pairs are defined. Each SNR point may or may not have a pair of SNRs and pass at either. The UE would be required to pass all SNR points.

* Proposals
  + Option 1: One SNR point
  + Option 2: Two SNR points
* Recommended WF
  + TBA

**Issue 1-6: Lower bound**

* Proposals
  + Option 1: No lower bound
  + Option 2: CQI 0 cannot be reported as median CQI
  + Option 3: Another lower bound that is >CQI0
* Recommended WF
  + TBA

Huawei: We should still test both high coding rate and low coding rate for test coverage.

Intel: For high coding rate, we already verified by existing CQI table test cases.

**Issue 1-7: SNR point(s) for 1x2**

* Proposals
  + Option 1:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Test 1** | | **Test 2** | |
| **FDD (SNR)** | -4 | -3 | 7 | 8 |
| **TDD (SNR)** | -4 | -3 | 7 | 8 |

* + Option 2: One SNR pair, same SNR as used for the FMCS requirement (should this be the upper or lower of the pair ?)
  + Option 3: Other value(s) (please state)
* Recommended WF
  + Discuss further in GTW and 2nd round which SNR values to select (1 pair 1dB apart)

Discussion:

Choosing SNR points corresponding to low coding rate

QC: We can’t take too low SNR points similar reason as fixed MCS test cases.

1x2: 1/2 dB, 1x4: -1/-2 dB

Candidate options: (1X2 test):

Option 1: -4/-3 dB (Huawei)

Option 2: 1/2 dB (QC, Intel)

Option 3: 2/3 dB (Apple)

By default, the 1x4 test will have -3 dB offset compared to 1X2 SNR test points.

**----------------------------------End -------------------------------------------------------------**

###### 7.8.1.1.1 UE demodulation requirements [NR\_L1enh\_URLLC-Perf]

**R4-2101018 CR to 38.101-4 on FRC table update for URLLC ultra low BLER requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0137 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102120 CR to TS 38.101-4: Performance requirements for URLLC PDSCH 0.001% BLER**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0164 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Finalize the requirements

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103890 (from R4-2102120).**

**R4-2103890 CR to TS 38.101-4: Performance requirements for URLLC PDSCH 0.001% BLER**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0164 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Finalize the requirements

**Discussion:**

[report of discussion]

**Decision: Return to.**

###### 7.8.1.1.2 CSI requirements [NR\_L1enh\_URLLC-Perf]

**R4-2100169 Views on URLLC Ultra-low BLER CSI Reporting Test Cases**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100198 CQI Reporting requirements for URLLC**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100199 CR to 38-101-4 on CQI reporting requirements for URLLC**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0126 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103891 (from R4-2100199).**

**R4-2103891 CR to 38-101-4 on CQI reporting requirements for URLLC**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0126 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101242 Discussion on URLLC Ultra-low BLER CQI requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101327 Discussion on CSI requireements with ultra low-BLER**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101331 Simulation for CQI reporting test**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101338 CR to TS38.101-4 Applicability rules for URLLC CSI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0152 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103892 (from R4-2101338).**

**R4-2103892 CR to TS38.101-4 Applicability rules for URLLC CSI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0152 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101944 CR on FRC for Ultra low BLER UE CQI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0160 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103893 (from R4-2101944).**

**R4-2103893 CR on FRC for Ultra low BLER UE CQI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0160 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102116 Discussions on URLLC UE CQI reporting requirements for CQI table 3**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Remaining open issues for CQI

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102118 Simulation results on URLLC UE CQI reporting requirements for CQI table 3**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Results for CQI

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.8.1.1.3 BS demodulation requirements [NR\_L1enh\_URLLC-Perf]

**R4-2100563 CR for 38.104: Ultra high reliability BS demodulation requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0267 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

It was announced that one company has discovered that their simulation results need to be updated.

This CR will incorporate the resulting change of SNR requirements for ultra high reliability using a revision, once the results are available during the mee

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103894 (from R4-2100563).**

**R4-2103894 CR for 38.104: Ultra high reliability BS demodulation requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0267 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

It was announced that one company has discovered that their simulation results need to be updated.

This CR will incorporate the resulting change of SNR requirements for ultra high reliability using a revision, once the results are available during the mee

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100564 CR for 38.104: Ultra high reliability BS demodulation requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0268 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102122 CR to TS 38.141-1 Update of 0.001% BLER test requirements**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0201 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Captures updated requirement values

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103895 (from R4-2102122).**

**R4-2103895 CR to TS 38.141-1 Update of 0.001% BLER test requirements**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0201 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Captures updated requirement values

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102123 CR to TS 38.141-1 Update of 0.001% BLER test requirements**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0202 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Captures updated requirement values

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102124 CR to TS 38.141-2 Update of 0.001% BLER test requirements**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0302 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Captures updated requirement values

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103896 (from R4-2102124).**

**R4-2103896 CR to TS 38.141-2 Update of 0.001% BLER test requirements**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0302 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Captures updated requirement values

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102125 CR to TS 38.141-2 Update of 0.001% BLER test requirements**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0303 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Captures updated requirement values

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.8.1.2 Performance requirements with higher BLER [NR\_L1enh\_URLLC-Perf]

**R4-2103762 Email discussion summary for [98e][323] NR\_URLLC\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103938 (from R4-2103762).**

**R4-2103938 Email discussion summary for [98e][323] NR\_URLLC\_Demod\_Part2**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103955 WF for URLLC UE with higher BLER**

*Type: other For: Approval  
 Source:Intel*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103956 WF for URLLC BS with higher BLER**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**---------------------------------GTW agenda Jan.28th for email thread [323] (30 minutes) ---------------------**

Sub-topic 1-2: UE demodulation requirements for high reliability for FR2

**Issue 1-2-1: MCS**

* Proposals
  + Option 1: MCS19 from Table 3 (QC)
  + Option 2: MCS17 from Table 3 (Ericsson)
  + Option 3: MCS16 from Table 3 (QC, Apple, Huawei, Ericsson)
  + Option 4: MCS13 from Table 3 (Apple, Intel)
  + Higher or equal to -4 dB for final 2 Rx requirement definition (average ideal SNR alignment result + IM).
* Recommended WF
  + Based on the simulation results submitted by companies, the real SNR for MCS13 is around -5.5dB for most companies and below -6 dB for one company. As MCS16 is acceptable by majority companies, the moderator recommends MCS16 from Table 3 as the agreement.
  + Option 3.

Agreements: MCS16 from Table 3

Sub-topic 2-3: UE demodulation requirements for pre-emption

*Open issues and candidate options before e-meeting:*

**Issue 2-3-1: Simulation results observation (based on R4-2101333):**

The gain between with and without buffer flushing is

MCS4 with 10% and 20% probability: For majority companies, the gain is very small, less than 0.1 dB.

MCS13 with 20% probability: the span between companies are very large, larger than 4 dB.

MCS 16 with 20 % probability: For majority companies, the maximum throughput cannot reach 70%.

* Recommended WF
  + Consider MCS13 or MCS16 with 10% probability.
  + As indicated by Intel, the average gain for MCS13 with 10% is 0.6dB, which is not testable.
  + According to the simulation results, MCS16 with 10% is a proper test setup (Ericson, Apple, Intel, Huawei)
  + Please fill your impairment results for MCS16 with 10% probability for both of FDD and TDD. (a new table for impairment results is added in R4-2101333)

**Issue 2-3-1a: MCS**

* Proposals
  + Option 1: MCS16 from Table 1. (Apple, Intel, Huawei)
  + Option 2: MCS13 from Table 1 (MTC, Ericsson)
  + Option 3: MCS 4 from Table 1 (QC)
* Recommended WF
  + Option 1

**Issue 2-3-1b: Pre-emption probability**

* Proposals
  + Option 1: 20%. (,
  + Option 2: 10% (Intel, Ericsson, QC, Apple, Huawei)
* Recommended WF
  + Option 2

Agreements: MCS 16 with 10% Pre-emption probability

* **Issue 2-3-4: This issue is proposed as initial transmission and its retransmission is always pre-empted with current simulation assumption. By changing the pre-emption pattern rather than modify the TDD HARQ timeline can solve the problem:** Recommended WF
  + Pre-emption pattern for TDD:

10% probability: change from (0 1 0 0 0 0 0 0 0 0) to (0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0).

20% probability: change from (0 1 1 0 0 0 0 0 0 0) to (0 1 1 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0)

Agreements: Pre-emption pattern for TDD:

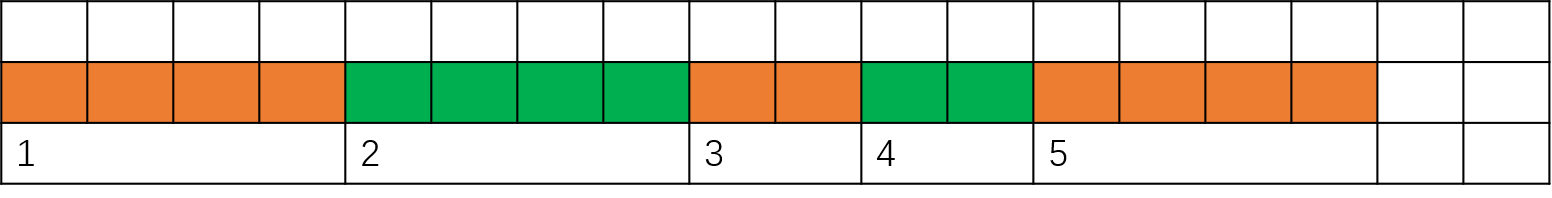
10% probability: change from (0 1 0 0 0 0 0 0 0 0) to (0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0).

Sub-topic 4-1: Rel-16 URLLC PUSCH repetition Type B

**Issue 4-2-1: Typical scenarios for PUSCH repetition type B:**

For PUSCH repetition Type B, different scenarios existed as shown in figure below, in order to simplifying the discussion, we treat figure 1 as scenario 1, figure 2 as scenario 2 and figure 3 as scenario 3:

1. Scenario 3:
2. Scenario 1:
3. Scenario 2:



1. 4 symbols, 4 nominal repetitions
2. Slot boundary

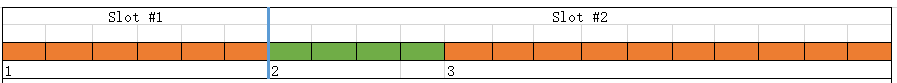


1. 4 symbols, 2 repetitions
2. Slot boundary



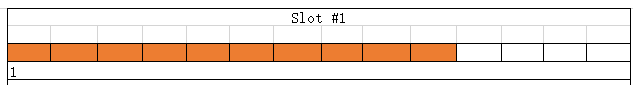
1. 14 symbols, 1 nominal repetition
2. Slot boundary
3. Note: this case requires S+L>14.

10 symbols, 2 nominal repetitions



1. Scenario 4:

10 symbols, 1 repetition



1. Scenario 5:

* Proposals
  + Option 1: Scenario 1 (S+L < 14, K > 1), within slot. (Intel, Samsung, Nokia)
  + Option 2: Scenario 2 (S+L < 14, K >1), across slot boundary. (Huawei, CTC, Ericsson(a simple setup based on scenario 2), Samsung, Nokia, Intel, DoCoMo)
  + Option 3: Scenario 3 (S+L >14, K = 1) (Samsung, Nokia, Intel)
  + Option 4: Scenario 4 (S+L > 14, K >1). (Nokia, Intel)
  + Option 5: Scenario 5 (S+L <14, K = 1) (Samsung)
* Recommended WF
  + Note: As Intel indicated that usually TDD requirements are defined in unified manner, i.e. applicable to different TDD UL/DL patterns. Two consecutive slots are required for option 2-4 scenarios. If option 2-4 is considered, requirements will be applicable to FDD and TDD with certain UL/DL configurations.

Intel: It’s beneficial to cover several scenarios within slot and across slot boundaries. For TDD, with scenario 2-4, test applicable rules with TDD pattern would be issue, does mean this only applied for FDD only?

Requirements will be applicable to FDD and TDD with certain UL/DL configurations.

E///: On the timeline, in SR report of Dec –plenary with 90% completion, and now we open a new scenario and much workload expected. We should respect RAN-P decision with management work load on rest issues. One alternative was to further discuss in Rel-17 performance enhancement WI with more available times.

For the detailed scenarios, in general we need to further evaluate with more feasible test set-up and that will be need more time.

Nokia: We understand Intel raised issue, which not aligned with current BS demod test structure and further study needed.

We don’t think only focus on single slot scenario reflect the real deployment scenarios, also loss test coverage for BS implementation with other cases.

China Telecomm: For the scenario, we need to concentrate on one simple scenario. From BS demod aspect, the repetition with mini-slot, and the repetition across several slots; above two are key purpose to define requirements.

We define requirements in Rel-17 which means these features can be verified in Rel-17, same story for Rel-15 URLLC features.

We still pick one simple scenario in Rel-16 with manageable work load.

Samsung: For timeline, we have similar concern as E/// considering overall RAN4 workload. We need to bring further analysis for the applicable scenarios taking into account Intel mentioned issues. All of these will be time consuming.

Huawei: We already 12 test cases, this is additional one, 90% should be reflect the status.

Scenario 2 is reasonable to be taken as starting points with the purpose as China Telecomm mentioned.

Nokia:

What’s the target? Are you going release by release approach i.e. simple test cases in Rel-16 and more in Rel-17. We think not feasible as this is single feature, we should take this a whole. We also agree with Samsung for this aspect.

E///: We don’t think this will impact implementation timeline even introduced in Rel-17 timeframe.

FRC and TDD pattern need to take more time for further study.

China Telecomm: Response to Nokia, we are thinking pick one test scenario to cover this feature and no further test cases in future release for this feature. In WI summary, scenario 2 is captured in there.

Samsung: ALL the scenarios with in Rel-16 TR, and all of them are feasible and supported. We don’t think scenario 2 is typical scenario considering BS performance.

Option 1: Further discuss and introduce corresponding test cases in Rel-16 URLLC WI with WI extension in next RAN-P

Option 2: No further discussion in Rel-16 URLLC WI, and further discuss this feature and introduce corresponding test cases if needed in Rel-17 timeframe i.e Rel-17 performance enhancement WI.

Note: Final decision for whether this WI can be further extended or whether this feature can be further discussed in Rel-17 WIs would pending on RAN-P decision and confirmation.

-----------------------------End ------------------------------------

###### 7.8.1.2.1 UE demodulation requirements [NR\_L1enh\_URLLC-Perf]

**R4-2100170 Views on URLLC High BLER Demodulation Test Cases**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100171 Correction CR on URLLC Higher BLER Performance Requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0125 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Merged with revision of R4-2102121**

**R4-2100200 UE demodulation requirements with higher BLER**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100201 CR to 38.101-4 on requirements with slot aggreagation in FR2**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0127 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103900 (from R4-2100201).**

**R4-2103900 CR to 38.101-4 on requirements with slot aggreagation in FR2**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0127 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101243 Discussion on URLLC UE demodulation requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101244 Simulation results for URLLC UE demodulation requirements**

*Type: other For: Information  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101245 CR on FRC for URLLC UE Higher BLER requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0139 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103901 (from R4-2101245).**

**R4-2103901 CR on FRC for URLLC UE Higher BLER requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0139 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101328 Discussion on URLLC UE demodulation requirements with higher BLER and low latency**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101330 Simulation results on UE PDSCH demodulation reuqirements with higher BLER and low latency**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101333 Summary of simulation results for UE URLLC demodulation performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101337 CR to TS 38.101-4 Correction of UE performance requirements for FR1 URLLC PDSCH repetitions over multiple slots.**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0151 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103902 (from R4-2101337).**

**R4-2103902 CR to TS 38.101-4 Correction of UE performance requirements for FR1 URLLC PDSCH repetitions over multiple slots.**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0151 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102084 Simulation results for URLLC pre-emption**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102117 Simulation results on UE URLLC demodulation performance requirements with higher BLER**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Results for high BLER

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102119 Discussion on UE URLLC demodulation performance requirements with higher BLER**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Remaining open issues for high BLER demod

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102121 CR to TS 38.101-4: Performance requirements for URLLC High BLER feature tests**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0165 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Needed to finalize pre-emption requirements

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103903 (from R4-2102121).**

**R4-2103903 CR to TS 38.101-4: Performance requirements for URLLC High BLER feature tests**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0165 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Needed to finalize pre-emption requirements

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102822 CR on FR1 PDSCH Mapping Type B and Processing Capability 2 Requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0166 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103904 (from R4-2102822).**

**R4-2103904 CR on FR1 PDSCH Mapping Type B and Processing Capability 2 Requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0166 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Return to.**

###### 7.8.1.2.2 BS demodulation requirements [NR\_L1enh\_URLLC-Perf]

**R4-2100560 On NR Rel-16 BS demodulation performance requirements with higher BLER and simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have provided our views on PUSCH repetition type B in the context of the NR\_L1enh\_URLLC WI. We have furthermore provided the last remaining simulation results.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100561 CR for 38.104: Low latency FR1 BS demodulation requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0265 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Removal of remaining square brackets, following the stable nature of the simulation summary from last meeting [R4-2015629].

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103905 (from R4-2100561).**

**R4-2103905 CR for 38.104: Low latency FR1 BS demodulation requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0265 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Removal of remaining square brackets, following the stable nature of the simulation summary from last meeting [R4-2015629].

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100562 CR for 38.104: Low latency FR1 BS demodulation requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0266 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100796 On BS demodulation requirements for Rel-16 PUSCH repetition type B**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100923 Discussion and simulation results for BS URLLC requirement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100927 CR on PUSCH repetition type A and PUSCH mapping type B radiated performance requirement for TS 38.104**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0269 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103906 (from R4-2100927).**

**R4-2103906 CR on PUSCH repetition type A and PUSCH mapping type B radiated performance requirement for TS 38.104**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0269 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100928 CR on PUSCH repetition type A and PUSCH mapping type B radiated performance requirement for TS 38.104**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0270 Cat: A (Rel-17)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100929 CR on FRC for URLLC BS radiated performance requirement for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0269 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103907 (from R4-2100929).**

**R4-2103907 CR on FRC for URLLC BS radiated performance requirement for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0269 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100930 CR on FRC for URLLC BS radiated performance requirement for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0270 Cat: A (Rel-17)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101044 CR for TS 38.141-2 Updates of performance requirements of PUSCH repetition type A and PUSCH mapping type B for URLLC**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0275 Cat: B (Rel-16)  
  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103908 (from R4-2101044).**

**R4-2103908 CR for TS 38.141-2 Updates of performance requirements of PUSCH repetition type A and PUSCH mapping type B for URLLC**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0275 Cat: B (Rel-16)  
  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101045 CR for TS 38.141-2 Updates of performance requirements of PUSCH repetition type A and PUSCH mapping type B for URLLC**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0276 Cat: A (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101246 Discussion on URLLC BS demodulation requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101247 Simulation results for URLLC BS demodulation requirements**

*Type: other For: Information  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101248 CR on FR2 requirements for PUSCH mapping Type B with low number of symbols (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0280 Cat: F (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103909 (from R4-2101248).**

**R4-2103909 CR on FR2 requirements for PUSCH mapping Type B with low number of symbols (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0280 Cat: F (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101249 CR on FR2 requirements for PUSCH mapping Type B with low number of symbols (Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0281 Cat: A (Rel-17)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101329 Discussion on URLLC BS demodulation requirements with higher BLER and low latency**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101332 Simulation results on FR2 PUSCH demodulation reuqirements with higher BLER and low latency**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101334 Summary of simulation results for BS URLLC demodulation performance requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101335 CR to TS38.141-2 Correction of BS conformance testing for FR2 URLLC PUSCH repetition Type A (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0286 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103910 (from R4-2101335).**

**R4-2103910 CR to TS38.141-2 Correction of BS conformance testing for FR2 URLLC PUSCH repetition Type A (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0286 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101336 CR to TS38.141-2 Correction of BS conformance testing for FR2 URLLC PUSCH repetition Type A (Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0287 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101339 CR to TS38.141-1 Correction of BS conformance testing for URLLC demodulation requirements with higher BLER (Rel-16)**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0189 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103911 (from R4-2101339).**

**R4-2103911 CR to TS38.141-1 Correction of BS conformance testing for URLLC demodulation requirements with higher BLER (Rel-16)**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0189 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101340 CR to TS38.141-1 Correction of BS conformance testing for URLLC demodulation requirements with higher BLER (Rel-17)**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0190 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101341 CR to TS38.104 Correction of BS performance requirements for URLLC FR1 PUSCH repetition Type A (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0278 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103912 (from R4-2101341).**

**R4-2103912 CR to TS38.104 Correction of BS performance requirements for URLLC FR1 PUSCH repetition Type A (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0278 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101342 CR to TS38.104 Correction of BS performance requirements for URLLC FR1 PUSCH repetition Type A (Rel-17)**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0279 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102115 Simulation results for BS URLLC high BLER**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Results for additional bandwidths added last meeting

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102285 Correction on requirements for PUSCH repetition Type A**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0304 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Merged with revision of R4-2101044**

**R4-2102286 Correction on requirements for PUSCH repetition Type A**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0305 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 7.9 Enhancements on MIMO for NR [NR\_eMIMO]

#### 7.9.4 Demodulation and CSI requirements (38.101-4) [NR\_eMIMO-Perf]

##### 7.9.4.1 General [NR\_eMIMO-Perf]

**R4-2103763 Email discussion summary for [98e][324] NR\_eMIMO\_Demod**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103939 (from R4-2103763).**

**R4-2103939 Email discussion summary for [98e][324] NR\_eMIMO\_Demod**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103825 WF on NR eMIMO demodulation and CSI requirements**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103832 Simulation results for single and multi-DCI based transmission scheme**

*Type: other For:Discussion  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**-----------------------------------GTW agenda Jan.28th for [324] (30 minutes) -----------------------**

**eType II codebook test cases**

**Issue 2-1-1: Test Metric for eType II codebook**

* Proposals
  + Option 1: Only introduce relative TP between following eType-II/random PMI with Type I codebook (Samsung, Huawei, Ericsson, QC, Apple)
  + Option 2 (Nokia): Besides relative TP ratio, introduce one additional test metric as following
* Introduce a performance requirement for eType II PMI reporting that ,, for any rank V= 1,2,3,4
* Introduce an additional test requirement in performance testing if. In this case a UE fails the test if all the following conditions are satisfied with probability p>ϵ (for example )
* **, for**
* **, for , and one value of**
* Recommended WF

Result observations

From the simulation results from all the companies’ results, we can see that eType II show enough performance gap over than Type I with test metric of TP ratio between following eType II and random Type I, which is enough to discriminate UE behaviour to ensure proper UE processing for eType II.

Therefore, it is feasible to introduce proper test requirements to ensure UE reporting eType II properly, i.e UE reporting Type I codebook only will fail the test cases. There is no need additional test metric to check UE reported codebook not only within Type I codebook set.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cases | TP ratio (Following PMI/Rand PMI) | Samsung | Qualcomm | Huawei | Ericsson | Apple |  |
| FDD 16x2 | eType II/ Random Type I at 90% point | 6.5 | 6.16 | 7.4 | 2.3 | 3.41 |  |
| Type I/ Random Type I at 90% point | 2.1 | 2.19 | 2.1 | 1.5 | 2.01 |  |
| FDD 16x4 | eType II/ Random Type I at 90% point | 6.05 | 3.69 | 7.1 | 2.3 | 2.85 |  |
| Type I/ Random Type I at 90% point | 2.01 | 2.12 | 2.12 | 1.7 | 2.11 |  |
| TDD 16x2 | eType II/ Random Type I at 90% point | 4.05 | 4.18 | 5.82 | 3 | 3.49 |  |
| Type I/ Random Type I at 90% point | 1.83 | 2.05 | 2.2 | 2.2 | 2.03 |  |
| TDD 16x4 | eType II/ Random Type I at 90% point | 4.15 | 3.1 | 5.73 | 2.4 | 3 |  |
| Type I/ Random Type I at 90% point | 1.76 | 2.01 | 2.3 | 2.2 | 2.31 |  |

As recommended WF:

* + Introduce Rel-16 Type II codebook requirements with test metric as following PMI (eType II)/Random PMI (Type I codebook)

Agreement: Introduce Rel-16 Type II codebook requirements with test metric as following PMI (eType II)/Random PMI (Type I codebook)

**Issue 2-1-2: MIMO Correlation**

* Proposals
  + Option 1: XP Medium (Samsung, QC, Apple, [Huawei])
  + Option 2: XP low (Ericsson)
* Recommended WF

From most of companies’ results, the performance gap between following eType II and Type I is more obvious under MIMO-Medium correlation compared with MIMO-Custom Low correlation. Based on majority view

As recommended WF:

* + Option 1: XP Medium

Agreement: XP medium

**Issue 2-1-3: Test point**

* Proposals
  + Option 1: 70% of TP (Ericsson)
  + Option 2: 90% of TP (Samsung, Apple, Qc)
  + Option 3: 95% of TP (Huawei)
* Recommended WF

From most of companies results submitted, the performance under 90% relative TP point is more stable to introduce requirement. Based on majority view

As recommended WF:

* + Option 2: 90% of TP

Agreement: 90% of TP

**Issue 2-1-4: gamma value**

* Proposals
  + Option 1(Samsung): With XP medium and 90% relative TP ratio point preference
* FDD
* 2Rx: 3.0
* 4Rx: 3.0
* TDD
* 2Rx: 2.5
* 4Rx: 2.5
  + Option 2(Ericsson): With XP low and 70% relative TP ratio point preference
* FDD
* 2Rx: 2.5
* 4Rx: 1.9
* TDD
* 2Rx: 2.8
* 4Rx: 1.9
* Recommended WF

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cases | TP ratio (Following PMI/Rand PMI) | Samsung | Qualcomm | Huawei | Ericsson | Apple |  |
| FDD 16x2 | eType II/ Random Type I at 90% point | 6.5 | 6.16 | 7.4 | 2.3 | 3.41 | 2.2 |
| Type I/ Random Type I at 90% point | 2.1 | 2.19 | 2.1 | 1.5 | 2.01 |  |
| FDD 16x4 | eType II/ Random Type I at 90% point | 6.05 | 3.69 | 7.1 | 2.3 | 2.85 | 2.2 |
| Type I/ Random Type I at 90% point | 2.01 | 2.12 | 2.12 | 1.7 | 2.11 |  |
| TDD 16x2 | eType II/ Random Type I at 90% point | 4.05 | 4.18 | 5.82 | 3 | 3.49 | 2.2 |
| Type I/ Random Type I at 90% point | 1.83 | 2.05 | 2.2 | 2.2 | 2.03 |  |
| TDD 16x4 | eType II/ Random Type I at 90% point | 4.15 | 3.1 | 5.73 | 2.4 | 3 | 2.2 |
| Type I/ Random Type I at 90% point | 1.76 | 2.01 | 2.3 | 2.2 | 2.31 |  |

Agreement:

FDD: 16X2 ->[2.2] ,16x4 -> [2.2]

TDD: 16x2->[2.2], 16x4->[ 2.2]

Companies are encouraged to further align the results and aims to introduce requirements with gamma values in [ ] in this meeting, Further update the results and the values in future RAN4 meetings not excluded.

PDSCH requirements

**Issue 1-1-1: FRC for single-DCI for FDM scheme A**

       Proposals

o   Option 1: Add a note in FRC of single-DCI for FDM scheme A to clarify the TBS determinate

o   Option 2: TBA

       Recommended WF

o   Encourage feedback from companies for solution of FRC definition for FDM scheme A

 Agreement:

It’s RAN4 common understanding, TBS determination for FRC of single DCI FDM scheme A based on full resource allocation BW.

-FFS for how to introduce the test set-up into specification with clear differentiation of multi-TRP and single-TRP, companies will further discuss based on drafting CR

Apple: Not obvious how to set-up the tests.

**Issue 1-1-2: FRC for single-DCI for inter-slot TDM scheme**

       Proposals

o   Option 1: Apply the same FRC table as Rel-16 URLLC aggregation factor 2, with additional note to differentiate Rel-16 URLLC with single TRP transmission and Rel-16 NR eMIMO with single-DCI based inter-slot TDM scheme as

         Option 1a: Note 4: Throughput is calculated under assumption of repetition number 2 (Samsung)

         Option 1b: Note 3: Throughput is calculated under assumption of aggregation factor 2 or repetition number 2 depending on Tx scheme (Intel, Samsung )

o   Option 2: TBA

       Recommended WF

Agreement: Throughput is calculated under the assumption of aggregation factor 2 for URLLC slot aggregation schemes or repetition number 2 for inter-slot repetition scheme.

**Issue 1-3-1: Requirements definition for 38.101-4**

* Proposals
  + Option 1: SNR = average of IM results +extra margin
* extra margin
* 64QAM 0.8 dB
* 16QAM 0.5 dB
* Recommended WF
  + Define tentative SNR requirements for the agreed test cases as much as possible and update CR including SNR requirements for test cases with []
  + Introduce requirement as table summarized for test cases which the ideal results span among companies’ results within [2.5dB] (mark with blue color), using the same extra margin values
  + For test cases which the span among companies’ results larger [2.5dB] (mark with yellow colour) further checking the details of simulation assumptions and results and extra margin cases by cases if needed

Agreement:

* + Option 1: SNR = average of IM results +extra margin
* extra margin
* 64QAM 0.8 dB
* 16QAM 0.5 dB

Companies are encouraged to further align the results and aims to introduce requirements with SNR values in [ ] in this meeting, Further update the results and the values in future RAN4 meetings not excluded.

**----------------------------------------- End ------------------------------------------**

**R4-2100210 CR to 38.101-4 for eMIMO demod requirements - General and Applicability rule**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0128 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103826 (from R4-2100210).**

**R4-2103826 CR to 38.101-4 for eMIMO demod requirements - General and Applicability rule**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0128 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100903 Simulation results summary for eMIMO performance requirements**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101448 CR: FRC for eMIMO sDCI/mDCI-based PDSCH transmission**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0159 Cat: B (Rel-16)  
  
 Source: Ericsson, Huawei, HiSilicon, Intel, Samsung*

**Abstract:**

This CR provides the FRCs used for sDCI/mDCI-based PDSCH transmission.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103830 (from R4-2101448).**

**R4-2103830 CR: FRC for eMIMO sDCI/mDCI-based PDSCH transmission**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0159 Cat: B (Rel-16)  
  
 Source: Ericsson, Huawei, HiSilicon, Intel, Samsung*

**Abstract:**

This CR provides the FRCs used for sDCI/mDCI-based PDSCH transmission.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101449 Simulation assumption for PDSCH requirement with mDCI/sDCI-based transmission schemes**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution provides the updated simulation assumption for PDSCH requirement with mDCI/sDCI-based transmission schemes.

**Discussion:**

[report of discussion]

**Decision: Approved.**

##### 7.9.4.2 Demodulation requirements [NR\_eMIMO-Perf]

###### 7.9.4.2.1 Single-DCI based SDM scheme [NR\_eMIMO-Perf]

**R4-2100898 Simulation results for Single-DCI based SDM scheme**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101256 Simulation results for single-DCI based multi-TRP SDM Tx scheme**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101313 Simulation results of PDSCH requirements for Single-DCI SDM scheme**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103960 (from R4-2101313).**

**R4-2103960 Simulation results of PDSCH requirements for Single-DCI SDM scheme**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101315 CR for 38.101-4 Introduction of PDSCH requirement with Single-DCI based SDM scheme**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0147 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103828 (from R4-2101315).**

**R4-2103828 CR for 38.101-4 Introduction of PDSCH requirement with Single-DCI based SDM scheme**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0147 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101450 Simulation results of sDCI-based SDM transmission**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution shows our PDSCH simulation results with sDCI-based SDM transmission.

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.9.4.2.2 Multi-DCI based transmission scheme [NR\_eMIMO-Perf]

**R4-2100899 Simulation results for multi-DCI based transmsision scheme**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101257 Simulation results for multi-DCI based multi-TRP Tx scheme**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101312 Simulation results of PDSCH requirements for Multi-DCI transmission scheme**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101316 CR for 38.101-4 Introduction of PDSCH requirement with Multi-DCI based multi-TRP transmission schemes**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0148 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103829 (from R4-2101316).**

**R4-2103829 CR for 38.101-4 Introduction of PDSCH requirement with Multi-DCI based multi-TRP transmission schemes**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0148 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101451 Simulation results of mDCI-based transmission**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution shows our PDSCH simulation results with mDCI-based transmission.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102083 Simulation results on PDSCH performance requirements for multi-DCI based multi-TRP transmission**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

###### 7.9.4.2.3 Single-DCI based transmission schemes (URLLC) [NR\_eMIMO-Perf]

**R4-2100211 Simulation results for multi-DCI based transmission scheme**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100900 Simulation results for URLLC schemes**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103831 (from R4-2100900).**

**R4-2103831 Simulation results for URLLC schemes**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101258 Simulation results for single-DCI based multi-TRP Repetition Tx schemes**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101259 CR to TS 38.101-4: Performance requirements single-DCI based multi-TRP Repetition Tx schemes**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0143 Cat: B (Rel-16)  
  
 Source: Intel Corporation, Samsung, Ericsson, Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103827 (from R4-2101259).**

**R4-2103827 CR to TS 38.101-4: Performance requirements single-DCI based multi-TRP Repetition Tx schemes**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0143 Cat: B (Rel-16)  
  
 Source: Intel Corporation, Samsung, Ericsson, Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101314 Simulation results of PDSCH requirements for Single-DCI URLLC schemes**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101452 Simulation results of sDCI-based FDM/TDM transmission**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution shows our PDSCH simulation results with sDCI-based FDMSchemeA and inter-slot TDM.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.9.4.3 CSI requirements [NR\_eMIMO-Perf]

**R4-2100212 PMI reporting requirements with eType II codebook**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103961 (from R4-2100212).**

**R4-2103961 PMI reporting requirements with eType II codebook**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100585 On PMI reporting requirements for enhanced Type II codebooks**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100622 Views on CSI Reporting test cases for eMIMO**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103962 (from R4-2100622).**

**R4-2103962 Views on CSI Reporting test cases for eMIMO**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100896 Introduction of PMI test cases with Rel-16 eType II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0135 Cat: B (Rel-16)  
  
 Source: Samsung*

**Abstract:**

Introduction of eType II codebook PMI test cases

**Discussion:**

[report of discussion]

**Decision:** The document was **revised to R4-2102938**.

**R4-2102938 Introduction of PMI test cases with Rel-16 eType II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0135 Cat: B (Rel-16)  
  
 Source: Samsung*

**Abstract:**

Introduction of eType II codebook PMI test cases

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103833 (from R4-2102938).**

**R4-2103833 Introduction of PMI test cases with Rel-16 eType II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0135 Cat: B (Rel-16)  
  
 Source: Samsung*

**Abstract:**

Introduction of eType II codebook PMI test cases

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100901 Discussion and simulation results for Rel-16 eType II codebook test cases**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101310 Discussion on the test metric of eType II codebook based PMI reporting test**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101311 Simulation results for eType II codebook based PMI reporting test**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103963 (from R4-2101311).**

**R4-2103963 Simulation results for eType II codebook based PMI reporting test**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101323 CR for 38.101-4 Applicablity of PMI reporting test of eType II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0150 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103954 (from R4-2101323).**

**R4-2103954 CR for 38.101-4 Applicablity of PMI reporting test of eType II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0150 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101443 Simulation results for Rel-16 eType II PMI reporting test**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution shows our simulation results of Rel-16 eType-II PMI reporting.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101444 Evaluation of Rel-16 eType-II PMI reporting test**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the requirements of Rel-16 eType-II PMI reporting.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102282 On PMI reporting requirements for enhanced Type II codebooks**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 7.10 Add support of NR DL 256QAM for FR2 [NR\_DL256QAM\_FR2]

#### 7.10.1 Demodulation and CSI requirements (38.101-4) [NR\_DL256QAM\_FR2-Perf]

##### 7.10.1.1 UE Demodulation requirements [NR\_DL256QAM\_FR2-Perf]

**R4-2103764 Email discussion summary for [98e][325] NR\_DL256QAM\_FR2\_Demod**

*Type: other For: Information  
 Source: Moderator (China Telecomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103940 (from R4-2103764).**

**R4-2103940 Email discussion summary for [98e][325] NR\_DL256QAM\_FR2\_Demod**

*Type: other For: Information  
 Source: Moderator (China Telecomm)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**------------------------------GTW agenda on Jan.28th for email thread (325) (30 minutes) ------------**

**Topic #3: CQI reporting requirements**

**Issue 3-1: SNR testing points for FR2 CQI Table 2 test**

* Higher SNR point without impairment margin
  + Summary of simulation results on Percentage of reported CQI index > 11 @ SNR 17/18/19 dB

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SNR (dB) |  | 17 | 18 | 19 |
| Percentage of reported CQI index > 11 (%) | CTC | 47.00 | 59.00 | 71.00 |
| HW | 33.56 | 42.91 | 52.66 |
| QC | 22.17 | 29.84 | 39.22 |
| ZTE | 28.88 | 62.15 | 87.65 |

* + Option1: 17/18 dB (CTC, ZTE, E///, HW)
  + Option2: 18/19 dB (QC)

Discussion:

QC: We are running to show 256QAM gain table over 64QAM table. If companies no such intention, we are also fine with option1.

Huawei: This results is alignment results, not taking into account impairment. Does this value aims to specify the value into specification.

CTC: We have issue 3-4 for that.

Huawei: It’s not logic to separate the discussion. We need to decide the final test points into specification considering alignment results and margin if any.

Spark: share similar view as QC, we would see the gain over 64QAM.

Huawei: From performance testing, it’s better to verify 256QAM through test cases with high SNR points to ensure the reporting probability of 256QAM during test cases.

CTC: We think the extra margin didn’t consider in existing test cases for 64QAM tables.

QC: SNR point with 64QAM, the impairment margin not big issue. For 256QAM, with much high SNR points, the implementation margin does impact.

E///: Depending on the purpose of such test cases, it’s to verify 256QAM table index, then 17/18 should be OK. If we want to ensure CQI index with reporting 256QAM index in some probability, then margin we can consider. We have concern on test feasibility with test SNR points over than 20dB.

CTC: We are fine extra margin with some note:

The extra margin is introduced due to high SNR points with 256QAM reporting enable.

Huawei: We share similar view as QC.

Options for high SNR points into specification:

Option 1: 17/18dB (CTC, ZTE, E///)

Option 2: 20/21dB (Huawei)

Option 3: 21/22dB (QC)

Agreements:

[20/21] dB

Note: Above SNR test points agreed with the consideration of impairment margin due to high SNR points with 256QAM reporting configuration

* Lower SNR point without impairment margin
  + Summary of simulation results on TP ratio with following CQI and Median CQI @ SNR 6/7/8 dB

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SNR (dB) |  | 6 | 7 | 8 |
| TP ratio with following CQI and Median CQI | CTC | 1.23 | 1.37 | 1.23 |
| E/// | 1.24 | 1.24 | 1.14 |
| HW | 1.16 | 1.24 |  |
| QC | 0.93 | 0.98 | 1.10 |
| ZTE | 1.27 | 1.13 |  |

* + Option 1: 6/7 dB (Agreed parameter in the last meeting in R4-2017536)
  + Option 2: 7/8 dB (QC)

Discussion:

QC: we are not OK with option 1 based on our simulation results.

Agreements: [7/8] dB

**Issue 3-3: Test requirement for FR2 CQI Table 2 test**

* Candidate options:

|  |  |  |
| --- | --- | --- |
| **Test metric** | | |
|  | Option 1 (slightly preferred by CTC) | Option 2 (Existing test requirements in Rel-15 FR2 CQI table 1 Test with 100MHz CBW, E///, CTC, HW, ZTE) |
| α: Minimum percentage (%) of reported CQI not in {median CQI – 1, median CQI, median CQI + 1} | 20% | [2]% |
| γ: Minimum TP ratio of followed CQI and fixed median CQI | 1.1 | [1.05] |
| Minimum PDSCH BLER with followed CQI | 0.02 | [0.01] |

* Check if we can go with option 2 after high and low SNR points in issue 3-1 are decided.

Agreements: Option 2 with values in [ ].

**Topic #2: SDR requirements**

**Issue 2-1: Applicability of SDR requirements for UE capable of 256QAM in certain band(s)**

* Candidate options:
  + Option 1: Add following applicability in Table 7.1.1.3-1 and no additional change is needed to the test requirement in clause 7.5A.1 in TS 38.101-4 (CTC)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 7.1.1.3-1: Requirements applicability for optional UE features   |  |  |  |  |  | | --- | --- | --- | --- | --- | | UE feature/capability [14] | Test type | | Test list | Applicability notes | | 256QAM for PDSCH  (*pdsch-256QAM-FR2*) | FR2 TDD | SDR | Clause 7.5A.1 | For UE capable of PDSCH 256QAM for certain band(s), the MCS table is configured to ‘*64QAM*’ for SDR test, i.e., no additional SDR test for UE capable of PDSCH 256QAM feature. | |  |  |  |  |  | |

* + Option 2: Add following notes in Table 7.5A.1-3 in the test requirement in clause 7.5A.1 in TS 38.101-4 (HW)
    - Note 1: MCS Index is based on MCS index Table 1 defined in clause 5.1.3.1 of TS 38.214 [12].
    - Note 2: For the band(s) on which UE supporting “Maximum modulation format” of 8, the MCS index is derived from the rows with “Maximum modulation format” of 6.
  + Both option 1 and note 2 in option 2 (Intel)
  + Both option 1 and option 2 (QC)
* Companies to check whether ‘option 1 and note 2 in option 2’ can be agreeable, i.e.,
  + Add applicability of option 1 in Table 7.1.1.3-1: Requirements applicability for optional UE features.
  + Add Note2 in option2 in Table 7.5A.1-3: MCS indexes for indicated UE capabilities.
  + No additional change is needed.

Discussion:

Huawei: We think option 1, plus note 1, note 2 needed.

Intel: Note 1 is reductant, as already capture in tables.

CTC: we share similar view as Intel.

Option 1 + note 2 in option 2, and FFS whether note 1 needed or not

FFS further offline for CR drafting whether note 1 needed or not

**-------------------------------End ---------------------**

**R4-2100880 Offline e-mail discussion summary on the TDLD30 channel simplification**

*Type: discussion For: Information  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100881 Simulation results for PDSCH normal demodulation for FR2 DL 256QAM**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101250 Discussion on FR2 DL 256QAM UE demodulation requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101251 Summary of simulation results for FR2 DL 256QAM demodulation requirements**

*Type: other For: Information  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101252 CR on simplified TDL-D channel model for FR2 DL 256QAM demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0140 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103835 (from R4-2101252).**

**R4-2103835 CR on simplified TDL-D channel model for FR2 DL 256QAM demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0140 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101296 Simulation results on PDSCH requirements for NR DL 256QAM for FR2**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101297 CR on applicability and FRC for PDSCH normal demodulation for DL 256QAM for FR2**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0144 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101369 Views on 256QAM UE requirements for FR2**

*Type: discussion For: Discussion  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101419 Simulation results of PDSCH with 256QAM in FR2**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution shows our PDSCH simulation results with 256QAM in FR2.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101420 Open issues on FR2 256QAM PDSCH demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discussion the open issues on PDSCH demodulation requirements with 256QAM in FR2.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102373 Simulation results for FR2 256QAM PDSCH Test Cases**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.10.1.2 CSI requirements [NR\_DL256QAM\_FR2-Perf]

**R4-2100882 On CQI reporting requirements for FR2 DL 256QAM**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100883 Summary of CQI reporting simulation results for FR2 DL 256QAM (TDD)**

*Type: discussion For: Information  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100884 CR on adding applicability, requirements and measurement channel for FR2 DL 256QAM CQI reporting test under fading condition**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0133 Cat: B (Rel-16)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103837 (from R4-2100884).**

**R4-2103837 CR on adding applicability, requirements and measurement channel for FR2 DL 256QAM CQI reporting test under fading condition**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0133 Cat: B (Rel-16)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101114 Simulation For CQI reporting requirements for FR2 DL 256QAM**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101116 CR on demodulation performance requirements for DL 256QAM for FR2**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0138 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103834 (from R4-2101116).**

**R4-2103834 CR on demodulation performance requirements for DL 256QAM for FR2**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0138 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101298 Simulation results on CQI requirements for NR DL 256QAM for FR2**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101421 Simulation results of CQI table 2 reporting in FR2**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution provides our simulation results of CQI reporting with CQI table 2.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101422 Open issues on CQI table 2 reporting test in FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues on CQI table 2 reporting test in FR2.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101848 Simulation results on CQI requirements for NR DL 256QAM for FR2**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102406 Views on FR2 256QAM CQI Reporting Test Cases**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.10.1.3 SDR requirements [NR\_DL256QAM\_FR2-Perf]

**R4-2100885 Updating on CR for SDR requirements for FR2 DL 256QAM capable band**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101253 CR on applicability rules and FRC for FR2 DL 256QAM CQI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0141 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103838 (from R4-2101253).**

**R4-2103838 CR on applicability rules and FRC for FR2 DL 256QAM CQI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0141 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101299 CR on SDR requirements for DL 256QAM for FR2**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0145 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103836 (from R4-2101299).**

**R4-2103836 CR on SDR requirements for DL 256QAM for FR2**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0145 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

### 7.15 NR support for high speed train scenario [NR\_HST]

#### 7.15.2 Demodulation and CSI requirements Maintenance (38.101-4 / 38.104) [NR\_HST-Perf]

##### 7.15.2.1 UE demodulation and CSI requirements [NR\_HST-Perf]

**R4-2103754 Email discussion summary for [98e][315] Demod\_R16\_Maintenance**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103941 (from R4-2103754).**

**R4-2103941 Email discussion summary for [98e][315] Demod\_R16\_Maintenance**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2100168 CR on FDD HST Single-Tap and Multipath Fading Requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0124 Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100848 CR on HST-SFN requirements for TDD**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0132 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103858 (from R4-2100848).**

**R4-2103858 CR on HST-SFN requirements for TDD**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0132 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100854 CR on release independent for Rel.16 NR HST UE demodulation requirements**

*Type: CR For: Agreement  
 38.307 v15.7.0 CR-0046 Cat: F (Rel-15)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100855 CR on release independent for Rel.16 NR HST UE demodulation requirements**

*Type: CR For: Agreement  
 38.307 v16.5.0 CR-0047 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103859 (from R4-2100855).**

**R4-2103859 CR on release independent for Rel.16 NR HST UE demodulation requirements**

*Type: CR For: Agreement  
 38.307 v16.5.0 CR-0047 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100856 CR on release independent for Rel.16 NR HST UE demodulation requirements**

*Type: CR For: Agreement  
 38.307 v17.0.0 CR-0048 Cat: A (Rel-17)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101300 CR on update TRS and CSI-RS transmission for HST DPS requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0146 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon, Ericsson, Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101301 Summary of ideal and impairment results for NR HST demodulation requirements**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Abstract:**

Include updated simulation results

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101438 Simulation results for HST-DPS**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution updates our PDSCH simulation results for HST-DPS scenario.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.15.2.2 BS demodulation requirements [NR\_HST-Perf]

**R4-2100380 Summary of ideal and impairment results for NR HST demodulation requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100381 CR for TS 38.141-2: Introduction of NR PUSCH UL TA performance requirement**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0261 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103860 (from R4-2100381).**

**R4-2103860 CR for TS 38.141-2: Introduction of NR PUSCH UL TA performance requirement**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0261 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100382 CR for TS 38.141-2: Introduction of NR PUSCH UL TA performance requirement(Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0262 Cat: A (Rel-17)  
  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100558 CR for 38.104: HST PUSCH demodulation requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0263 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Update of square bracketed SNR values according to the simulation summary of last meeting [R4-2017557].

Removal of all remaining square brackets.

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103861 (from R4-2100558).**

**R4-2103861 CR for 38.104: HST PUSCH demodulation requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0263 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Update of square bracketed SNR values according to the simulation summary of last meeting [R4-2017557].

Removal of all remaining square brackets.

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100559 CR for 38.104: HST PUSCH demodulation requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0264 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100922 Updated simulation results for NR HST PUSCH**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100925 CR on UL timing adjustment conducted performance requirement for TS 38.141-1**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0178 Cat: F (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103862 (from R4-2100925).**

**R4-2103862 CR on UL timing adjustment conducted performance requirement for TS 38.141-1**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0178 Cat: F (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100926 CR on UL timing adjustment conducted performance requirement for TS 38.141-1**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0179 Cat: A (Rel-17)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100993 remove SNR brackets for HST PUSCH in TS38.141-2**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0273 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

remove SNR brackets for HST PUSCH

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103863 (from R4-2100993).**

**R4-2103863 remove SNR brackets for HST PUSCH in TS38.141-2**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0273 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

remove SNR brackets for HST PUSCH

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100994 remove SNR brackets for HST PUSCH in TS38.141-2**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0274 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

remove SNR brackets for HST PUSCH

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103953 (from R4-2100994).**

**R4-2103953 remove SNR brackets for HST PUSCH in TS38.141-2**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0274 Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

remove SNR brackets for HST PUSCH

**Discussion:**

Session Chair: Next time, please don’t upload CAT A CR before corresponding CAT F CR agreed!

**Decision: Return to.**

**R4-2101042 CR for TS 38.141-1 Updates of NR PUSCH performance requirements for HST**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0180 Cat: F (Rel-16)  
  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103864 (from R4-2101042).**

**R4-2103864 CR for TS 38.141-1 Updates of NR PUSCH performance requirements for HST**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0180 Cat: F (Rel-16)  
  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101043 CR for TS 38.141-1 Updates of NR PUSCH performance requirements for HST**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0181 Cat: A (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101319 CR for 38.104 Cleanup of performance requirements for NR HST PRACH under fading channel (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0276 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103865 (from R4-2101319).**

**R4-2103865 CR for 38.104 Cleanup of performance requirements for NR HST PRACH under fading channel (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0276 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101320 CR for 38.141-1 Cleanup of conformance testing for NR HST PRACH under fading channel (Rel-16)**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0187 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103866 (from R4-2101320).**

**R4-2103866 CR for 38.141-1 Cleanup of conformance testing for NR HST PRACH under fading channel (Rel-16)**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0187 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101321 CR for 38.141-2 Cleanup of conformance testing for NR HST PRACH under fading channel (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0284 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103867 (from R4-2101321).**

**R4-2103867 CR for 38.141-2 Cleanup of conformance testing for NR HST PRACH under fading channel (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0284 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101324 CR for 38.104 Cleanup of performance requirements for NR HST PRACH under fading channel (Rel-17)**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0277 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101325 CR for 38.141-1 Cleanup of conformance testing for NR HST PRACH under fading channel (Rel-17)**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0188 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101326 CR for 38.141-2 Cleanup of conformance testing for NR HST PRACH under fading channel (Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0285 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101849 CR to TS 38.104 Update on UL timing adjustment performance requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0280 Cat: F (Rel-16)  
  
 Source: ZTE Wistron Telecom AB*

**Discussion:**

[report of discussion]

Session Chair: Rel-17 mirror CR missing?

**Decision: Revised to R4-2103868 (from R4-2101849).**

**R4-2103868 CR to TS 38.104 Update on UL timing adjustment performance requirements**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0280 Cat: F (Rel-16)  
  
 Source: ZTE Wistron Telecom AB*

**Discussion:**

[report of discussion]

Session Chair: Rel-17 mirror CR missing?

**Decision: Return to.**

**R4-2103964 CR to TS 38.104 Update on UL timing adjustment performance requirements**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-? Cat: A (Rel-17)*

**Abstract:**

**Session Chair: Contact with MCC to get CR number**

**Discussion:**

**Decision: Return to.**

### 7.16 NR performance requirement enhancement [NR\_perf\_enh-Perf]

#### 7.16.1 UE demodulation and CSI requirements (38.101-4) [NR\_perf\_enh-Perf]

**R4-2103765 Email discussion summary for [98e][326] NR\_perf\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (China Telecomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103942 (from R4-2103765).**

**R4-2103942 Email discussion summary for [98e][326] NR\_perf\_enh\_Demod**

*Type: other For: Information  
 Source: Moderator (China Telecomm)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103846 Simulation assumptions for NR PMI reporting requirements for more than 8 Tx ports**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103847 Summary of simulation results of Rel-15 Type-II UE PMI test**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**----------------------------------GTW agenda for Jan.28th email thread [326] (30 minutes) -----------------**

**Issue 2-1: Section numbering for PDSCH CA demodulation requirements**

*Candidate options:*

* Option 1: Update the section numbering for PDSCH CA normal requirements, with “void” for the originally used sections (Intel, QC, E///)
* ~~Option 2: Update the section numbering for PDSCH CA normal requirements, by changing the originally used sections~~
* Option 3: Keep TS structure as it is. (Intel, HW)

*Recommendations for 2nd round:*

* Option 2 is precluded since it is not allowed by TS drafting rule.
* Decide whether to go with Option 1 or Option 3 in the GTW.

Samsung (spec editor of 38.101-4): From spec structure consistent aspect, we prefer to maintain the section structure alignment as much as possible, unless we see some specific technical reason, we can consider some exception cases carefully.

QC: When we start with inter-working scenarios, these structure maybe not feasible. There are UEs equipped with 2Rx, and 4Rx on different CCs, from single test aspect, cross different sections needed.

We usually focused on feature by features from RAN4, for CA test cases, readability aspect for CA, placed 2Rx, 4Rx in low level sections.

For single CC test cases, only 2Rx or 4Rx need to be verified.

Huawei: Share similar view as Samsung, in NR Rel-15, we spent lots of time to define the structure with feature basis vs Rx antennas as 3nd level sections; in the end we come up existing structures considering features themselves not stable and involved release by release which make specification not stable and uncontrollable.

E///: For CA, power imbalance test cases, with mixed sections. We also think “void sections“ not good from specification aspect.

FFS for 2nd round discussion, if no consensus reached in this meeting and then no further discussion for renumbering issue.

**Issue 2-2-1: Antenna connection for CA tests with 4 RX**

*Candidate options:*

* Option 1, i.e., reuse the same antenna connection for CA tests with 4RX in LTE (CMCC, CTC,  Intel, ZTE)
  + If any of the Pcell and/or the Scells is a 4 RX supported RF band, all 4 RX should be connected with data source from system simulator.
  + If any of the Pcell and/or the Scells is a 2 RX supported RF band, ~~2 out of the 4 RX should be connected with data source from system simulator, and the other~~ the corresponding 2 RX are connected based on UE declaration ~~with zero input.~~
* Option 2: Reuse the test applicability rule defined for single carrier for CA tests with 2Rx and 4Rx, i.e. (HW)
  + Only conducted CA tests with 2Rx for UE only supports 2Rx
  + Only conducted CA tests with 4Rx for UE only supports 4Rx
  + Only conducted CA tests with 4Rx for UE supports both 2Rx and 4Rx
  + Not conducted CA test with 4Rx for UE only supports 2Rx

*Recommendations for 2nd round:*

* The main difference between the two options is on how to test UE supporting 2Rx in some bands and supporting 4Rx in the other bands (see the 3rd bullet in option 2).
* Further check can we go with Option 1 by following majority companies’ view? Any additional clarification questions to Option 1?

QC: For op1, why do we need to test UE with 4Rx for 2Rx test set-up?

Huawei: For op1 with 2nd bullet, it’s misunderstanding. If UE support 2Rx and 4Rx in different CCs, 2Rx CC pass 2Rx and 4Rx CC pass 4Rx requirements.

Intel: how to apply for UE under 2Rx CC? our understanding as captured in option1.

China Telecomm: CA test cases different with single CC cases. Both 2Rx CC and 4Rx CC need to be verified with corresponding requirements.

Huawei: Need to improve the wording for option 1.

Question: How to apply test set-up for UE which support 2Rx and 4Rx in different CCs?

**Agreements:**

* Reuse the same antenna connection for CA tests with 4RX in LTE (CMCC, CTC,  Intel, ZTE)
  + If any of the Pcell and/or the Scells is a 4 RX supported RF band, all 4 RX should be connected with data source from system simulator.
  + If any of the Pcell and/or the Scells is a 2 RX supported RF band, the corresponding 2 RX are connected based on UE declaration

Further work on the details texts into specification for above agreements.

**Topic #3: Rel-15 Type II reporting requirements**

**Issue 3-1: Test metric for type II codebook**

*Tentative agreement:*

* Following PMI (Type II)/Random PMI (Type I codebook) (gamma values) (Samsung, QC, Apple, HW, CTC, E/// - fine if tighter gamma compared to Type I codebook)
  + E///:  Generally fine with Option 1, if the final gamma of Rel-15 Type-II (TP ratio of following Rel-15 Type-II and random Type-I) becomes tighter than the TP ratio of following Type-I and random Type-I)

**Issue 3-2: SNR point for type II PMI codebook**

*Tentative agreement:*

* 90% max TP (Apple, QC, CTC, Samsung, E/// - fine if tighter gamma compared to Type I codebook)
  + E///: Propose to review the simulation summary after the 1st round. If we observe the gamma with Rel-15 Type-II is tighter than gamma with Type-I, we are also fine to set SNR to 90%.

Agreements: 90% max TP

**Issue 3-3: MIMO correlation for type II codebook**

*Tentative agreement:*

* XP Medium (Samsung, QC, Apple, CTC, E///, HW)

Agreements: XP Medium

**Topic #4: UE power imbalance requirements**

**Issue 4-1: Test applicability rule for UE power imbalance for EN-DC**

*Recommendations for 2nd round:*

Check if it is agreeable to use the table and notes suggested by E///, with the modified Note 2 from DCM:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Inter-band scenarios are not upported | UE indicates “interBandContiguousMRDC” (Note 1, Note 2) | UE does not indicate “interBandContiguousMRDC” (Note 1, Note 3) |
| Intra-band scenarios are not supported | N/A | Clause 9.5B.1.1 is executed for inter-band EN-DC scenarios | Clause 9.5B.1.2 is executed for inter-band EN-DC scenarios |
| UE does not indicate “*intraBandENDC-Support*” or UE indicates “*both*” in “intraBandENDC-Support” (Note 4) | Clause 9.5B.1.1 is only executed for intra-band EN-DC scenarios | Clause 9.5B.1.1 is executed for both intra-band and inter-band EN-DC scenarios | Clause 9.5B.1.1 is only executed for intra-band EN-DC scenarios |
| UE indicates “*non-contiguous*” in “*intraBandENDC-Support*” (Note 5) | Clause 9.5B.1.2 is only executed for intra-band EN-DC scenarios | Clause 9.5B.1.1 is executed for inter-band EN-DC scenarios | Clause 9.5B.1.2 is executed for both intra-band and inter-band EN-DC scenarios |
| Note 1: Requirements are applicable to intra-band scenarios and only inter-band scenarios from Table 5.5B.4.1-1 of TS 38.101-3 [8] for which Note 4 is applied.  Note 2: UE supports both intra-band contiguous and non-contiguous EN-DC requirements for supported inter-band EN-DC combinations  Note 3: UE supports intra-band non-contiguous EN-DC requirements for supported inter-band EN-DC combinations  Note 4: UE supports intra-band contiguous EN-DC, or both intra-band contiguous and non-contiguous EN-DC for supported intra-band EN-DC combinations  Note 5: UE supports only intra-band non-contiguous EN-DC for supported intra-band EN-DC combinations | | | |

**------------------------------------End-----------------------**

##### 7.16.1.1 NR CA PDSCH requirements [NR\_perf\_enh-Perf]

**R4-2100786 Remaining issues on PDSCH CA test applicability**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100816 CR for NR PDSCH FR1 CA 2Rx performance requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0130 Cat: F (Rel-16)  
  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2100822 Test applicability rule for NR CA PDSCH normal demodulation**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101254 Discussion on NR CA UE demodulation requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101255 CR on applicability rules for Normal NR CA requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0142 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103841 (from R4-2101255).**

**R4-2103841 CR on applicability rules for Normal NR CA requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0142 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101365 Discussion on NR normal CA performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101434 Draft CR: Section numbering for PDSCH CA demodulation requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v16.3.0  
 Source: Ericsson*

**Abstract:**

This draft CR proposes to change the section numbering to align with RAN5 spec.

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102818 Specification Structure for CA Test Cases**

*Type: discussion For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.16.1.2 PMI reporting requirements with larger number of Tx ports [NR\_perf\_enh-Perf]

**R4-2100216 PMI reporting requirements with larger number of TX ports**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100897 Introduction of PMI test cases with Rel-15 Type II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0136 Cat: B (Rel-16)  
  
 Source: Samsung*

**Abstract:**

Introduction of Type II codebook PMI test cases

**Discussion:**

[report of discussion]

**Decision:** The document was **revised to R4-2102939**.

**R4-2102939 Introduction of PMI test cases with Rel-15 Type II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0136 Cat: B (Rel-16)  
  
 Source: Samsung*

**Abstract:**

Introduction of Type II codebook PMI test cases

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103843 (from R4-2102939).**

**R4-2103843 Introduction of PMI test cases with Rel-15 Type II codebook**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0136 Cat: B (Rel-16)  
  
 Source: Samsung*

**Abstract:**

Introduction of Type II codebook PMI test cases

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100902 Discussion and simulation results for Rel-15 Type II codebook test cases**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103844 (from R4-2100902).**

**R4-2103844 Discussion and simulation results for Rel-15 Type II codebook test cases**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101317 Simulation results for Rel-15 Type II codebook PMI reporting test**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101318 Discussion on the test point for Rel-15 Type II codebook PMI reporting test with larger Tx ports**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101322 CR for 38.101-4 Applicablity of PMI reporting test with Tx ports larger than 8 and up to 32**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0149 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103842 (from R4-2101322).**

**R4-2103842 CR for 38.101-4 Applicablity of PMI reporting test with Tx ports larger than 8 and up to 32**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0149 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101435 Simulation results for Rel-15 Type II PMI reporting test**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution shows our simulation results of Rel-15 Type-II PMI reporting.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101436 Evaluation of Rel-15 Type-II PMI reporting test**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the Rel-15 Type-II PMI reporting requirements.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101437 Correction of title on 16Tx port subband PMI reporting**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0156 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the wrong sub-clause titles for 16Tx port subband PMI reporting.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102821 Views on Type II PMI Reporting Tests**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 7.16.1.3 FR1 CA and EN-DC power imbalance requirements [NR\_perf\_enh-Perf]

**R4-2101366 Discussion on test applicability rule for UE power imbalance for EN-DC**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101367 CR: Updates to power imbalance for CA**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0153 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2103845 CR: Update on test applicability rule for EN-DC power imbalance**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-? Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Session Chair: Contact with MCC to get CR number

**Discussion:**

**Decision: Return to.**

##### 7.16.1.4 NR CA CQI reporting requirements [NR\_perf\_enh-Perf]

**R4-2100886 CR: Adding applicability and requirements for FR1 and FR2 CA CQI reporting test**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0134 Cat: B (Rel-16)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 7.16.1.5 Release independent [NR\_perf\_enh-Perf]

**R4-2100787 Draft CR for TS 38.307 on UE demodulation performance requirements (Rel-15)**

*Type: CR For: Agreement  
 38.307 v15.7.0 CR-0043 Cat: B (Rel-15)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103839 (from R4-2100787).**

**R4-2103839 Draft CR for TS 38.307 on UE demodulation performance requirements (Rel-15)**

*Type: CR For: Agreement  
 38.307 v15.7.0 CR-0043 Cat: B (Rel-15)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100788 Draft CR for TS 38.307 on UE demodulation performance requirements (Rel-16)**

*Type: CR For: Agreement  
 38.307 v16.5.0 CR-0044 Cat: B (Rel-16)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103840 (from R4-2100788).**

**R4-2103840 Draft CR for TS 38.307 on UE demodulation performance requirements (Rel-16)**

*Type: CR For: Agreement  
 38.307 v16.5.0 CR-0044 Cat: B (Rel-16)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100789 Draft CR for TS 38.307 on UE demodulation performance requirements (Rel-17)**

*Type: CR For: Agreement  
 38.307 v17.0.0 CR-0045 Cat: A (Rel-17)  
  
 Source: China Telecom*

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 7.16.2 BS demodulation requirements (38.104) [NR\_perf\_enh-Perf]

### 7.17 Over the air (OTA) base station (BS) testing TR Maintenance [OTA\_BS\_testing-Perf]

**R4-2103747 Email discussion summary for [98e][308] OTA\_BS\_Testing\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103943 (from R4-2103747).**

**R4-2103943 Email discussion summary for [98e][308] OTA\_BS\_Testing\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2102492 Relative calibration approach using reference receiver**

*Type: discussion For: Discussion  
 37.941 v..  
 Source: ROHDE & SCHWARZ*

**Abstract:**

This contribution presents the overall description of a relative calibration approach, eventually applicable to all systems, and serves as technical justification for the corresponding CR to implement this option in TR 37.941.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102493 draft CR to TR 37.941: Relative calibration approach**

*Type: draftCR For: Endorsement  
 37.941 v15.2.0  
 Source: ROHDE & SCHWARZ*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103848 (from R4-2102493).**

**R4-2103848 draft CR to TR 37.941: Relative calibration approach**

*Type: draftCR For: Endorsement  
 37.941 v15.2.0  
 Source: ROHDE & SCHWARZ*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102901 CR to TR 37.941: Updating the orthogonal cut procedure**

*Type: CR For: Agreement  
 37.941 v15.2.0 CR-0025 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Numerical expressions for TRP computation are included.

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102902 CR to TR 37.941: Updating the orthogonal cut procedure**

*Type: CR For: Agreement  
 37.941 v16.2.0 CR-0026 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Numerical expressions for TRP computation are included.

**Discussion:**

[report of discussion]

**Decision: Withdrawn.**

### 7.18 2-step RACH for NR [NR\_2step\_RACH-Perf]

#### 7.18.2 BS Demodulation requirements maintenance (38.104) [NR\_2step\_RACH-Perf]

**R4-2103873 Updated simulation results collection on BS demodulation requirements for 2-step RACH**

*Type: other For: Information  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2100582 Corrections on 2-step RACH demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0176 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103869 (from R4-2100582).**

**R4-2103869 Corrections on 2-step RACH demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0176 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100583 Corrections on 2-step RACH demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0177 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100584 2-step RACH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100924 Simulation results for BS 2-step RACH requirement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100931 CR on MsgA PUSCH radiated performance requirement for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0271 Cat: F (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103870 (from R4-2100931).**

**R4-2103870 CR on MsgA PUSCH radiated performance requirement for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0271 Cat: F (Rel-16)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100932 CR on MsgA PUSCH radiated performance requirement for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0272 Cat: A (Rel-17)  
  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101302 CR on correction 2-step RACH performance requirements for FR2 in 38.104 (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0274 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon, Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103959 (from R4-2101302).**

**R4-2103959 CR on correction 2-step RACH performance requirements for FR2 in 38.104 (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.6.0 CR-0274 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon, Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101303 CR on correction 2-step RACH performance requirements for FR2 in 38.104 (Rel-17)**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0275 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon, Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101304 CR on update applicability rule for 2-step RACH in 38.141-1 (Rel-16)**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0185 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103871 (from R4-2101304).**

**R4-2103871 CR on update applicability rule for 2-step RACH in 38.141-1 (Rel-16)**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0185 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101305 CR on update applicability rule for 2-step RACH in 38.141-1 (Rel-17)**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0186 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101306 CR on update applicability rule for 2-step RACH in 38.141-2 (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0282 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103872 (from R4-2101306).**

**R4-2103872 CR on update applicability rule for 2-step RACH in 38.141-2 (Rel-16)**

*Type: CR For: Agreement  
 38.141-2 v16.6.0 CR-0282 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101307 CR on update applicability rule for 2-step RACH in 38.141-2 (Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0283 Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102279 Corrections on 2-step RACH demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v16.6.0 CR-0203 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

**R4-2102280 Corrections on 2-step RACH demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v17.0.0 CR-0204 Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

**R4-2102281 2-step RACH simulation results**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision:** The document was **withdrawn**.

### 7.19 R16 NR maintenance [WI code or TEI16]

#### 7.19.4 BS RF [WI code or TEI16]

**R4-2101180 CR to TR 38.820: Correction of antenna model in subclause 7.2.4**

*Type: CR For: Agreement  
 38.820 v16.0.0 CR-0002 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The correction in this CR align the parameter defintion with gives equations

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103786 (from R4-2101180).**

**R4-2103786 CR to TR 38.820: Correction of antenna model in subclause 7.2.4**

*Type: CR For: Agreement  
 38.820 v16.0.0 CR-0002 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The correction in this CR align the parameter defintion with gives equations

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102563 CR to TS 37.105: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**

*Type: CR For: Agreement  
 37.105 v16.6.0 CR-0222 Cat: F (Rel-16)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Relat

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103782 (from R4-2102563).**

**R4-2103782 CR to TS 37.105: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**

*Type: CR For: Agreement  
 37.105 v16.6.0 CR-0222 Cat: F (Rel-16)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Relat

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102564 CR to TS 37.105: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-17**

*Type: CR For: Agreement  
 37.105 v17.0.0 CR-0223 Cat: A (Rel-17)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Relat

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102565 CR to TS 37.145-1: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**

*Type: CR For: Agreement  
 37.145-1 v16.5.0 CR-0246 Cat: F (Rel-16)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Realt

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103783 (from R4-2102565).**

**R4-2103783 CR to TS 37.145-1: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**

*Type: CR For: Agreement  
 37.145-1 v16.5.0 CR-0246 Cat: F (Rel-16)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Realt

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102566 CR to TS 37.145-1: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-17**

*Type: CR For: Agreement  
 37.145-1 v17.0.0 CR-0247 Cat: A (Rel-17)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Realt

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102567 CR to TS 37.145-2: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0286 Cat: F (Rel-16)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Realt

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103784 (from R4-2102567).**

**R4-2103784 CR to TS 37.145-2: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**

*Type: CR For: Agreement  
 37.145-2 v16.6.0 CR-0286 Cat: F (Rel-16)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Realt

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102568 CR to TS 37.145-2: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-17**

*Type: CR For: Agreement  
 37.145-2 v17.0.0 CR-0287 Cat: A (Rel-17)  
  
 Source: Huawei, China Unicom*

**Abstract:**

Referring to the Rel-16 WI on MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional CS configuration (e.g. UTRA+EUTRA+NR).

WID in RP-190642 captured that only MSR BS specifications are to be affected, i.e. TS 37.104, TS 37.141. Realt

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 7.19.6 Demodulation and CSI [WI code or TEI16]

#### 7.19.7 NR MIMO OTA test methods (38.827) [FS\_NR\_MIMO\_OTA\_test]

**R4-2101821 Uplink Power Control for NR MIMO OTA test**

*Type: CR For: Agreement  
 38.827 v16.1.0 CR-0008 Cat: F (Rel-16)  
  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2101993 Minimum number of slots for FR1 MIMO OTA testing**

*Type: other For: Endorsement  
 Source: CAICT,vivo,OPPO,Huawei,HiSilicon,xiaomi,Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102081 CR to TR38.827 Number of Slots for FR1 MIMO OTA test**

*Type: CR For: Agreement  
 38.827 v16.1.0 CR-0009 Cat: F (Rel-16)  
  
 Source: CAICT,vivo,OPPO,Huawei,HiSilicon,xiaomi,Samsung*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102614 On Remaining Channel Model Topics**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102615 CR on Channel Model Topics**

*Type: CR For: Agreement  
 38.827 v16.1.0 CR-0010 Cat: F (Rel-16)  
  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Agreed.**

**R4-2102817 CR to TR 38.827 on channel model rotations**

*Type: CR For: Agreement  
 38.827 v16.1.0 CR-0011 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

**R4-2102819 CR to 38.827on base station beamforming configuration**

*Type: CR For: Agreement  
 38.827 v16.1.0 CR-0012 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2103916 CR to TR38.827 on the direction of the BS strongest beams**

*Type: CR For: Agreement  
 38.827 v16.1.0 CR-？ Cat: F (Rel-16)*

*Source: Huawei, HiSilicon***Abstract:**

**Discussion:**

*Session Chair Note: Contact with MCC to get CR number*

**Decision: Return to.**

## 8 Rel-16 UE feature list

## 9 Rel-17 spectrum related Work Items for NR

### 9.24 Introduction of FR2 FWA UE with maximum TRP of 23dBm for band n257 and n258 [NR\_FR2\_FWA\_Bn257\_Bn258]

#### 9.24.4 Others [NR\_FR2\_FWA\_Bn257\_Bn258-Core/Perf]

**R4-2101423 Introduction of Noc for PC5 in n257/n258**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0155 Cat: B (Rel-17)  
  
 Source: Ericsson, SoftBank*

**Abstract:**

This CR introduces Noc for PC5 in n257/n258.

**Discussion:**

[report of discussion]

**Decision: Agreed.**

### 9.25 Introduction of NR 47 GHz band [NR\_47GHz\_Band]

#### 9.25.2 BS RF (38.104) [NR\_47GHz\_Band-Core]

**R4-2103748 Email discussion summary for [98e][309] NR\_47GHz\_Band\_BSRF**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103944 (from R4-2103748).**

**R4-2103944 Email discussion summary for [98e][309] NR\_47GHz\_Band\_BSRF**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2102159 CR to TS 38.104 - n262 introduction**

*Type: CR For: Agreement  
 38.104 v17.0.0 CR-0290 Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR specifies band n262 (47GHz band) in TS 38.104

**Discussion:**

[report of discussion]

**Decision: Postponed.**

#### 9.25.4 Others [NR\_47GHz\_Band-Core/Perf]

##### 9.25.4.1 BS conformance (38.141) [NR\_47GHz\_Band-Perf]

**R4-2102049 47GHz band TT for NR BS RF requirement**

*Type: discussion For: Agreement  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102160 47GHz band - Measurement uncertainties for BS requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the measurement uncertainties for BS requirements at 47GHz

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102445 TP to TR 38.847: BS conformance aspects**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103874 (from R4-2102445).**

**R4-2103874 TP to TR 38.847: BS conformance aspects**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102446 CR to 38.141-2: Introduction of n262**

*Type: CR For: Agreement  
 38.141-2 v17.0.0 CR-0309 Cat: B (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Not pursued.**

##### 9.25.4.2 UE Demod (38.101-4) [NR\_47GHz\_Band-Perf]

**R4-2103766 Email discussion summary for [98e][327] NR\_R17\_SpectrumWI\_Demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103945 (from R4-2103766).**

**R4-2103945 Email discussion summary for [98e][327] NR\_R17\_SpectrumWI\_Demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103875 Way forward on UE/BS demodulation on NR 47GHz band**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2102100 CR to TS 38.101-4: n262 demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v16.3.0 CR-0163 Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

CR to introduce demodulation requirements for n262

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102101 pCR to 38.847: UE performance requirements**

*Type: pCR For: Approval  
 38.847 v0.0.2  
 Source: Ericsson*

**Abstract:**

Captures information and rationale behind decision for demodulation requirements

**Discussion:**

[report of discussion]

**Decision: Postponed.**

**R4-2102933 Discussion on NR UE demodulation performance for n262**

*Type: discussion For: (not specified)  
 Source: HUAWEI TECHNOLOGIES Co. Ltd.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 9.25.4.3 BS Demod (38.104) [NR\_47GHz\_Band-Perf]

**R4-2100565 On 47GHZ OTA link budget in Demodulation requirement testing**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we have expressed our views on the 47GHZ band OTA link budget for demodulation requirement testing.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102102 pCR to TR 38.847: BS demodulation requirements**

*Type: pCR For: Approval  
 38.847 v0.0.2  
 Source: Ericsson*

**Abstract:**

Captures information and rationale behind decision for demodulation requirements

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102935 Discussion on NR BS demodulation performance for n262**

*Type: discussion For: Discussion  
 Source: HUAWEI TECHNOLOGIES Co. Ltd.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

## 10 Reply to ITU-R LS (RP-200042)

## 11 Rel-17 non-spectrum related work items for NR

### 11.1 Multiple Input Multiple Output (MIMO) Over-the-Air (OTA) requirements for NR UEs [NR\_MIMO\_OTA]

#### 11.1.1 General [NR\_MIMO\_OTA]

**R4-2103768 Email discussion summary for [98e][329] NR\_MIMO\_OTA**

*Type: other For: Information  
 Source: Moderator (CAICT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103946 (from R4-2103768).**

**R4-2103946 Email discussion summary for [98e][329] NR\_MIMO\_OTA**

*Type: other For: Information  
 Source: Moderator (CAICT)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103913 WF on NR MIMO OTA**

*Type: other For: Approval  
 Source: vivo, CAICT*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103914 WF on TP work split and Work Plan**

*Type: other For: Approval  
 Source: vivo, CAICT, OPPO*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103915 WF on FR2 MIMO OTA simulation assumptions**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2101822 TS 38.151 v0.2.0 NR MIMO OTA requirements**

*Type: draft TS For: Agreement  
 38.151 v0.2.0  
 Source: vivo*

**Abstract:**

New version TS

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101825 TP to TS 38.151 v0.1.0 on Performance metrics for NR MIMO OTA requirements**

*Type: pCR For: Approval  
 38.151 v0.1.0  
 Source: vivo, CAICT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

#### 11.1.2 Performance Requirements [NR\_MIMO\_OTA-Core]

##### 11.1.2.1 Performance Requirements for FR1 [NR\_MIMO\_OTA-Core]

**R4-2101827 Discussions on Channel models mapping for FR1 MIMO OTA requirement**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101941 FR1 MIMO OTA measurement results and channel model mapping**

*Type: discussion For: Approval  
 Source: CAICT,Keysight,ETS-Lindgren*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.1.2.2 Performance Requirements for FR2 [NR\_MIMO\_OTA-Core]

**R4-2101758 Consideration on how to treat the missing orientations for FR2**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101824 TP to TS 38.151 v0.1.0 on FR2 test system for requirements**

*Type: pCR For: Approval  
 38.151 v0.1.0  
 Source: vivo, CAICT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102497 Discussion on FR2 MIMO OTA performance requirements**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102719 Simulation assumption summary for NR FR2 MIMO OTA**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 11.1.3 Testing methodologies [NR\_MIMO\_OTA-Core]

##### 11.1.3.1 Testing parameters for Performance [NR\_MIMO\_OTA-Core]

**R4-2100892 Discussion on FR1 test parameters and Figure of Merit**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101826 Discussion on testing parameters for NR MIMO OTA requirement**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102729 Consideration on FR2 MIMO OTA UE requirement**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.1.3.2 Optimization of test methodologies [NR\_MIMO\_OTA-Core]

**R4-2101757 Consideration on 3D-MPAC probe locations configuration for FR2 MIMO OTA**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102400 Analysis on number of test points vs uncertainty of FR2 MIMO OTA requirements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.1.3.3 Channel model validation [NR\_MIMO\_OTA-Core]

**R4-2100845 Channel Model Validation Bounds**

*Type: other For: Approval  
 Source: Spirent Communications*

**Abstract:**

Proposal 1: FR1 PDP Power = [±0.8 dB]. PDP excess delay = [±11ns].

Proposal 2 and 4: Bounds for FR1 and FR2 Autocorrelation

0.5?, [NonPolarized value +/- 0.1 capped at 1]

1 ?, [NonPolarized value +/- 0.2]

1.5?, [NonPolarized value +/- 0.25]

2?, [NonPolar

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101823 TP to TS 38.151 v0.1.0 on FR2 Channel model and RMC**

*Type: pCR For: Approval  
 38.151 v0.1.0  
 Source: vivo, CAICT*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102613 gNB Beams Usage Criteria for NR FR1 MIMO OTA Channel Model Validation**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd, China Mobile*

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.6 Enhancement for NR high speed train scenario in FR1 [NR\_HST\_FR1\_enh-Core]

#### 11.6.3 UE demodulation requirements (38.101-4) [NR\_HST\_FR1\_enh-Perf]

##### 11.6.3.1 General [NR\_HST\_FR1\_enh-Perf]

**R4-2103767 Email discussion summary for [98e][328] NR\_HST\_FR1\_Demod**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103947 (from R4-2103767).**

**R4-2103947 Email discussion summary for [98e][328] NR\_HST\_FR1\_Demod**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103876 WF on FR1 HST demodulation**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 11.6.3.2 PDSCH requirements for CA scenarios [NR\_HST\_FR1\_enh-Perf]

**R4-2100858 General discussion on NR HST UE demodulation for FR1 CA scenario**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101260 Views on NR HST CA PDSCH performance requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101308 Discussion on PDSCH CA scenarios for NR UE HST FR1 performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101370 Views on HST CA tests for FR1**

*Type: discussion For: Discussion  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101439 PDSCH demodulation requirements for CA with HST-SFN scenario**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution shows our view on the PDSCH demodulation requirements for CA with HST-SFN scenario.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.6.3.3 Enhanced transmission schemes [NR\_HST\_FR1\_enh-Perf]

**R4-2100859 Discussion on NR HST UE demodulation for enhanced transmission scheme**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101261 Views on NR HST PDSCH performance requirements for multi-DCI based Tx scheme**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101309 Discussion on enhanced transmission schemes for NR HST demodulation**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101440 PDSCH demodulation requirements with enhanced transmission schemes in HST scenario**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution shows our view on the PDSCH demodulation requirements with enhanced transmission schemes in HST scenario.

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.8 Solutions for NR to support non-terrestrial networks (NTN) [NR\_NTN\_solutions]

#### 11.8.1 General and work plan [NR\_NTN\_solutions-Core]

**R4-2103749 Email discussion summary for [98e][310] NTN\_Solutions\_Part1**

*Type: other For: Information  
 Source: Moderator (Thales)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103948 (from R4-2103749).**

**R4-2103948 Email discussion summary for [98e][310] NTN\_Solutions\_Part1**

*Type: other For: Information  
 Source: Moderator (Thales)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103877 WF for NTN general part**

*Type: other For: Approval  
 Source: Thales*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103750 Email discussion summary for [98e][311] NTN\_Solutions\_Part2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103949 (from R4-2103750).**

**R4-2103949 Email discussion summary for [98e][311] NTN\_Solutions\_Part2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103878 WF for NTN co-existence study**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103965 Simulation assumption for NTN co-exitence study**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2101813 Discussion on exemplary bands for NTN topic**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102175 NTN Reference model**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution is proposing specification structure for the introduction of NTN

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 11.8.2 Use cases, deployment scenarios, and regulatory information [NR\_NTN\_solutions-Core]

**R4-2100399 Discussion on frequency band and scenarios for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100824 Examplary bands for NTN**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100905 Views on NTN exemplary bands**

*Type: discussion For: Agreement  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101814 General discussion on Network structure on NTN topics**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101858 Criteria for Choosing FR1 Exemplary Band**

*Type: discussion For: Decision  
 Source: THALES*

**Abstract:**

In order to select a proper exemplary MSS FR1 band (in terms in bandwidth, throughput and regulatory requirements) this document proposes the criteria to be taken into account for exemplary FR1 band selection, to be considered by RAN4 work.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101933 NTN - On use cases and deployment scenarios**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102173 NTN - Regulatory and spectrum aspects**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Based on Radio Regulations analysis, this contribution is discussing NTN spectrum aspects

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102374 Discussion on satellite bands outside FR1/FR2 range for NR based satellite networks**

*Type: discussion For: Discussion  
 Source: HUGHES Network Systems, Thales, Inmarsat, Intelsat, Fraunhofer, ESA*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100111 NTN architecture aspects**

*Type: discussion For: Decision  
 Source: THALES*

**Discussion:**

[report of discussion]

Session Chair: Move to this AI from 11.8.3

**Decision: Noted.**

#### 11.8.3 Coexistence aspects [NR\_NTN\_solutions-Core]

**R4-2101859 NTN FR1 Coexistence Scenarios and Related Core Requirements**

*Type: discussion For: Decision  
 Source: THALES*

**Abstract:**

This contribution refers to MSS FR1 band possible interference situations to be considered by RAN4 coexistence studies in adjacent bands.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101880 Simulations for NTN FR1 Coexistence Cases**

*Type: discussion For: Decision  
 Source: THALES*

**Abstract:**

This contribution proposes to down-scope coexistence scenarios to be considered for simulations, e.g. consider only NTN extreme cases.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.8.3.1 Simulation assumptions [NR\_NTN\_solutions-Core]

**R4-2100486 Simulaiton assumptions for NTN co-existence**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100904 Simulation assumption for FR1 coexistence study**

*Type: discussion For: Agreement  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101105 Coexistence study on NR to support non-terrestrial networks**

*Type: other For: Approval  
 Source: Xiaomi*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101812 General discussion on NTN simulation assumptions**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101934 NTN - HAPS simulation assumptions for co-existence study**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101964 Discussion on simulation assumptions for NTN coexistence study**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102174 NTN Simulations assumptions discussion**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution provides an overview of the needed simulations for NTN and initiates related discussions

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102508 Simulation assumptions for NR NTN co-existence study**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.8.3.2 UE requirements aspects [NR\_NTN\_solutions-Core]

##### 11.8.3.3 BS requirements aspects [NR\_NTN\_solutions-Core]

**R4-2100487 Consideration on BS requirement impact for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101935 NTN - HAPS adjacent channel coexistence**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102176 NTN - BS requirements overview**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution is giving an overview of candidate BS RF requirements for NTN

**Discussion:**

[report of discussion]

**Decision: Noted.**

### 11.11 NR repeater

#### 11.11.1 General and work plan [NR\_repeaters-Core]

**R4-2103751 Email discussion summary for [98e][312] NR\_Repeater\_General**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103950 (from R4-2103751).**

**R4-2103950 Email discussion summary for [98e][312] NR\_Repeater\_General**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103881 WF for TDD Repeater**

*Type: other For: Approval  
 Source:CMCC*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103752 Email discussion summary for [98e][313] NR\_Repeater\_RF**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103951 (from R4-2103752).**

**R4-2103951 Email discussion summary for [98e][313] NR\_Repeater\_RF**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103882 WF for NR repeater RF requirenments**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2100375 Discussion on NR repeater general issues**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100635 Discussion on Requirements for NR Repeaters**

*Type: discussion For: Approval  
 Source: CommScope Technologies AG*

**Abstract:**

This NR\_repeaters-Core WI aims to specify the RF and EMC requirements for NR repeaters, including repeaters operating in both the FR1 and FR2 bands, and repeaters that support both FDD and TDD operation.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100832 General parts of NR repeater**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101041 Views on candidate bands for NR repeater**

*Type: other For: Approval  
 Source: NTT DOCOMO, INC.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101156 General views on NR repeater**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101963 Discussion on NR based repeater**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102108 Repeaters WI general considerations**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General considerations, especially test set-up

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102580 Consideration of duplex mode for the frequency bands for NR repeater**

*Type: discussion For: Agreement  
 Source: Huawei*

**Abstract:**

In this contribution we provide analysis on the duplex mode for the NR Repeater frequency bands.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102829 Common understanding of repeaters**

*Type: discussion For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102834 Work plan for NR Repeaters**

*Type: Work Plan For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103880 (from R4-2102834).**

**R4-2103880 Work plan for NR Repeaters**

*Type: Work Plan For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102018 NR repeater considerations**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

[report of discussion]

Session Chair: Move this AI from AI 11.1

**Decision: Noted.**

#### 11.11.2 Conductive RF core requirements [NR\_repeaters-Core]

**R4-2102418 NR repeater requirements**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Study of the existing FDD and TDD repeater specification and how the requirements may be applied to an NR repeater.

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.11.2.1 Transmitted power related requirements [NR\_repeaters-Core]

**R4-2100376 Discussion on NR repeater conducted transmitted power**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100828 Power related conducted requirements for repeaters**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102109 Conducted transmit power**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

FR1 power

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.11.2.2 Emission requirements [NR\_repeaters-Core]

**R4-2100377 Discussion on NR repeater emission requirements for FR1/FR2**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100830 Emission related conducted requirements for repeaters**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102110 Conducted unwanted emissions**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

FR1 emissions

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.11.2.3 Others [NR\_repeaters-Core]

**R4-2100378 Discussion on NR repeater EVM and frequency stability for FR1/FR2**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100827 Discussion on RF architecture and RF requirements scope of repeater**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102111 Conducted other requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Other FR1 issues

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102831 Conducted requirements for NR FR1 repeaters**

*Type: discussion For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 11.11.3 Radiated RF core requirements

**R4-2102419 Considerations for NR repeaters and AAS**

*Type: discussion For: Discussion  
 Source: Huawei*

**Abstract:**

Discussion on the differences between a RF repeater deployed in a AAS BS network compared to the non-AAS BBS network

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.11.3.1 Transmitted power related requirements [NR\_repeaters-Core]

**R4-2100379 Discussion on NR repeater radiated transmitted power**

*Type: other For: Approval  
 Source: CATT*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100829 Power related radiated requirements for repeaters**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102112 Radiated transmit power**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

FR2 power

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.11.3.2 Emission requirements [NR\_repeaters-Core]

**R4-2100831 Emission related radiated requirements for repeaters**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102113 Radiated unwanted emissions**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

FR2 emissions

**Discussion:**

[report of discussion]

**Decision: Noted.**

##### 11.11.3.3 Others [NR\_repeaters-Core]

**R4-2102114 Radiated other requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

other FR2 issues

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 11.11.4 EMC core requirements [NR\_repeaters-Core]

**R4-2103879 WF for NR repeater EMC requirements**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2100361 Discussion on EMC requirements for NR Repeater**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on EMC requirements for NR Repeater

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102129 Proposal on the skeleton of NR Repeaters EMC**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102130 Discussion on NR repeaters EMC**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102180 Proposal on the skeleton of NR Repeaters EMC**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102181 Discussion on NR repeaters EMC**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102579 EMC core requirements for NR repeater**

*Type: discussion For: Agreement  
 Source: Huawei*

**Abstract:**

In this contribution we provide initial analysis of the expected work for EMC requirements for Rel-17 NR Repeaters.

**Discussion:**

[report of discussion]

**Decision: Noted.**

## 12 Rel-17 Study Items for NR

### 12.1 Study on enhanced test methods for FR2 in NR [FS\_FR2\_enhTestMethods]

#### 12.1.1 General [FS\_FR2\_enhTestMethods]

**R4-2103769 Email discussion summary for [98e][330] FR2\_enhTestMethods**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2103952 (from R4-2103769).**

**R4-2103952 Email discussion summary for [98e][330] FR2\_enhTestMethods**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103918 WF on high DL power and low UL power test cases (objective1) and band n262 testability (objective7)**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103919 WF on polarization basis mismatch (objective2)**

*Type: other For: Approval  
 Source: MediaTek*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2103920 WF on ETC (objective4) and test time reduction(objective6)**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Return to.**

#### 12.1.2 Test methodology for high DL power and low UL power test cases [FS\_FR2\_enhTestMethods]

**R4-2100525 TP to TR38.884 on High DL and Low UL power test cases**

*Type: other For: Approval  
 Source: Apple Inc.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2101485 Overview of the Impact of phase variation for Direct NF Method**

*Type: other For: Approval  
 Source: MVG Industries, Sony*

**Abstract:**

During RAN4#e-97, a WF was agreed [1] for enhanced test methods for NR FR2. Specifically, it was agreed on studying further DNF (direct NF). This contribution provides further simulation results for the DNF test method with the aim of comparing 4x1, 8x2 a

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102616 On Test methodology for high DL power and low UL power test cases**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102620 NF based solutions and Enhancement of permitted methods**

*Type: discussion For: Approval  
 38.884 v..  
 Source: ROHDE & SCHWARZ*

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 12.1.3 Polarization basis mismatch [FS\_FR2\_enhTestMethods]

**R4-2100526 TP to TR38.884 on polarization mismatch**

*Type: other For: Approval  
 Source: Apple Inc.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100571 Views on solutions to minimize the impact of polarization basis mismatch**

*Type: other For: Approval  
 Source: Sony, Ericsson*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100664 Discussion on enhanced test method for polarization basis mismatch**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100699 Practical TPMI and 2-port CSI-RS for FR2 SISO test enhancement**

*Type: discussion For: Approval  
 Source: MediaTek Beijing Inc.*

**Abstract:**

Observation1: “practical TPMI” is aligned with network’s capability, and it can further enhance UE performance.

Proposal1: For “TPMI method”, “practical TPMI” shall be further applied.

Observation2: “2-port CSI-RS” is a feasible test method and aligned w

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100894 Discussion on FR2 EIRP measurement enhancement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101759 Solution to minimize the impact of polarization basis mismatch**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101830 TP to TR38.884 v0.1.0 on polarization basis mismatch**

*Type: pCR For: Approval  
 38.884 v0.1.0  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2102090 Discussion on FR2 UL demodulation measurements**

*Type: discussion For: Approval  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102674 FR2 testability enhancement for polarization mismatch**

*Type: other For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

We discuss test mode, 2 port CSIRS and enhancement 'coverage hole'

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 12.1.4 Enhanced test methods for inter-band (FR2+FR2) CA [FS\_FR2\_enhTestMethods]

**R4-2100096 Impact of offset antenna to quiet zone in FR2 OTA chamber**

*Type: discussion For: Discussion  
 Source: Anritsu corporation*

**Abstract:**

In this contribution we discuss some open issues such as an impact of the offset antenna on quality of the quiet zone (QoQZ), UE beam forming, and also the applicability of this system to CBM UE.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100097 TP to TR 38.884 on Inter-band DL CA in FR2**

*Type: pCR For: Approval  
 38.884 v0.1.0  
 Source: Anritsu corporation*

**Abstract:**

TP to TR 38.884 on Inter-band DL CA in FR2

**Discussion:**

[report of discussion]

**Decision: Return to.**

**R4-2100527 Further analysis of the impact of AoA offset on inter-band CA PSD difference**

*Type: discussion For: Discussion  
 Source: Apple Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102673 On impact of non-co-located test antennae for FR2 inter-band testing**

*Type: other For: Agreement  
 Source: Qualcomm Incorporated*

**Abstract:**

We investigate the impact of non-co-located test antennae on CBM UEs

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 12.1.5 Extreme temperature conditions [FS\_FR2\_enhTestMethods]

**R4-2100098 DUT repositioning during ETC measurement in FR2**

*Type: discussion For: Approval  
 Source: Anritsu corporation*

**Abstract:**

In this contribution we discuss restrictions of DUT measurement procedure during the 3D scan under the extreme temperature condition (ETC). We also discuss some proposals which are related to a test time reduction.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100528 Impact of ET on measurement uncertainty and test tolerance of spherical coverage EIRP and EIS**

*Type: discussion For: Discussion  
 Source: Apple Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101828 Discussions on FR2 Extreme temperature conditions**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102617 On extreme temperature condition testing**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102675 FR2 testability in ETC**

*Type: other For: Agreement  
 Source: Qualcomm Incorporated*

**Abstract:**

We discuss TE requirements for ETC testing

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 12.1.6 Enhanced test methods for FR2 DL 256QAM RF [FS\_FR2\_enhTestMethods]

#### 12.1.7 Test time reduction [FS\_FR2\_enhTestMethods]

**R4-2100161 Test time reduction in FR2 using beam sweeping**

*Type: discussion For: Discussion  
 Source: Fraunhofer HHI, Fraunhofer IIS*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100245 Test time reduction in OTA measurement**

*Type: discussion For: Approval  
 Source: Anritsu Corporation*

**Abstract:**

In this contribution we discuss a way to reduce test time of a beam peak search in FR2.

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100665 Discussion on enhance test method to reduce FR2 OTA test time**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2100895 Discussion on FR2 test time reduction**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2101829 Discussions on Test Time Reduction for NR FR2 RF**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102088 Discussion on test time reduction methods**

*Type: discussion For: Approval  
 Source: Rohde & Schwarz*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102401 Analysis on reducing test time**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102618 On Test Time Enhancements based on different Antenna Array Assumptions**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Noted.**

#### 12.1.8 Testability for band n262 [FS\_FR2\_enhTestMethods]

##### 12.1.8.1 Extension of frequency applicability of permitted methods in 38.810 [FS\_FR2\_enhTestMethods]

**R4-2100529 Extending the applicability of permitted methods to band n262**

*Type: discussion For: Discussion  
 Source: Apple Inc.*

**Discussion:**

[report of discussion]

**Decision: Noted.**

**R4-2102619 On Testability for band n262**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Revised to R4-2103917 (from R4-2102619).**

**R4-2103917 On Testability for band n262**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Discussion:**

[report of discussion]

**Decision: Return to.**

##### 12.1.8.2 Extension of frequency applicability of enhancement objectives 1-6 [FS\_FR2\_enhTestMethods]

**R4-2100530 TP to TR38.884 on structure updates related to band n262**

*Type: other For: Approval  
 Source: Apple Inc.*

**Discussion:**

[report of discussion]

**Decision: Return to.**

## 13 Rel-17 Work Items for LTE

## 14 Rel-17 Study Items for LTE

## 15 Liaison and output to other groups

## 16 Revision of the Work Plan

## 17 Any other business

## 18 Close of the E-meeting

## BACKUP

**R4-21AAAAA Email discussion summary for**

*Type: other For: Approval  
 Source: Moderator( )*

**Abstract:**

**Discussion:**

**Decision: Return to.**