Remaining Issues in RAN1 NR UE Features

MediaTek

Remaining Features

- Accept all recommendations from RAN1#95

- Further clarification for 6-2 and 6-3 in RAN1#96

- No signaling structure change going forward

- Continue discussing restriction of parameter range to reduce network/UE implementation complexity

	Remaining *undecided* features	
#	Feature group	**Proposals**
1-8	RLM based on a mix of SS block and CSI-RS signals within active BWP	Optional
2-20	Beam correspondence	Optional (see next slide)
2-21	Periodic beam report	Optional for FR1
2-22	Aperiodic beam report	Optional for FR1
2-30	Uplink beam management	Component 1: mandatory with capability signaling
2-31	Beam failure recovery	Mandatory
2-38	CSI report without PMI	Optional
2-51	component-5 max # of TRS resource sets configured to UE across CCs	UE is mandated to report at least X=16 for FR1 and Y=64 for FR2
5-27a	Dynamic rate-matching control resource set for DL	Mandatory with capability signaling

Beam Correspondence

- Resolution due at RAN#82

  - No agreement in RAN1/RAN4 > LS to RAN

  - RAN4 agreement: definition of FR2 power class (PC) 3 UE RF req for beam correspondence
    - Other PCs FFS

  - Observations: see table below

- **Proposals:**

  - RAN#82 to focus on PC3 UE requirement only

  - Keep the requirement optional (UE implementation flexibility)

  - RAN4 relaxation value is required for this feature to be mandated

Alt	Beam Correspondence as Mandatory/Optional		Extra Relaxation
1	All PCs	Mandatory with capability signalling	No
2	All PCs	Optional with capability signalling	No
3	All PCs	Mandatory with capability signalling	FFS in RAN4
4	PC3 Other PCs	Mandatory Optional	PC3: FFS in RAN4
5	a) BC and uplink beam management cannot be both optional. b) UE needs to report to support either BC or uplink beam management or both		

CSI Capability

Item	Feature name	Components	values	Curent granularity
2-15a	List of association between CSI-RS and SRS (up to 16)	1) Maximum number of Tx ports in one resource across all CCs	2, 4, 8, 12, 16, 24, 32	
		2) Maximum number of resources across CCs	1 to 64	
		3) Total number of Tx ports across CCs	2 to 256	
2-36	List of type I single panel codebook (up to 16)	1) Maximum number of Tx ports in one resource across all CCs	2, 4, 8, 12, 16, 24, 32	
		2) Maximum number of resources across CCs	1 to 64	
		3) Total number of Tx ports across CCs	2 to 256	
		4) Supported codebook mode	Mode 1, Mode 1/2	
		5) Maximum number of CSI-RS resource in a resource set	1 to 8	
2-40	List of type I multi-panel codebook (up to 16)	1) Maximum number of Tx ports in one resource across all CCs	8, 16, 32	
		2) Maximum number of resources across CCs	1 to 64	
		3) Total number of Tx ports across CCs	2 to 256	**Per band per band combination**
		4) Supported codebook mode	Mode 1, 2, both	
		5) Supported number of panels	2, 4	
		6) Maximum number of CSI-RS resource in a resource set	1 to 8	
2-41	List of type II codebook (up to 16)	1) Maximum number of Tx ports in one resource across all CCs	4, 8, 12, 16, 24, 32	
		2) Maximum number of resources across CCs	1 to 64	
		3) Total number of Tx ports across CCs	2 to 256	
		4) Parameter "Lx"	2, 3, 4	
		5) Amplitude scaling type	Wideband, wideband & sub-band	
		6) Amplitude subset restriction level	Supported	
2-43	List of type II codebook with port selection (up to 16)	1) Maximum number of Tx ports in one resource across all CCs	4, 8, 12, 16, 24, 32	
		2) Maximum number of resources across CCs	1 to 64	
		3) Total number of Tx ports across CCs	2 to 256	
		4) Parameter "Lx"	2, 3, 4	
		5) Amplitude scaling type	Wideband, wideband & sub-band	

1. No change
2. No change
3. Per UE
4. No change
5. No change
6. No change
7. Per UE
8. Per UE

Proposed Components		Proposed granularity
CSI-RS resources common to all supported codebook types (common to all or different?) (up to 16 or reduced?)	1) Maximum number of Tx ports in one resource across all CCs	Per band combination
	2) Maximum number of resources across CCs	
	3) Total number of Tx ports across CCs	
Supported codebook type	2-36) Type I single 2-40) Type I multi 2-41) Type II 2-43) Type II with port selection 2-15a) SRS association with CSI-RS	Per band combination
Supported codebook mode (same value for 2-36 and 2-40 or different?)		Per UE (or per band?)
Maximum number of CSI-RS resource in a resource set (same value for 2-36 and 2-40 or different?)		Per UE (or per band?)
Supported number of panels (2-40 only)		Per UE (or per band?)
Parameter "Lx" type (same value for 2-41 & 2-43 or different?)		Per UE (or per band?)
Amplitude scaling type (same value for 2-41 & 2-43 or different?)		Per UE (or per band?)
Amplitude subset restriction level (2-41 only)		Per UE (or per band?)

CSI Capability - Going Forward

- **Proposals**

  - No signaling structure change going forward

  - Avoid adding new features with per band per band combination capability report

  - Continue discussing restriction of parameter range to reduce network & UE implementation complexity

  - Further overhead reduction up to RAN 2

- Example for a backward-compatible change

R1-1814263   Clarification to FG 2-30   Intel

Agreements:

- Add the following clarification to FG 2-30 that limit the number of SRS resource sets per supported time domain behaviour.

Maximum number of SRS resource sets across all time domain behaviour (periodic/semi-persistent/aperiodic) reported in 2-30	Additional constraint on the maximum number of SRS resource sets per supported time domain behaviour (periodic/semi-persistent/aperiodic)
1	1
2	1
3	1
4	2
5	2
6	2
7	4
8	4

No change in reported values   Additional constraints on the reported values