**3GPP TSG- Meeting # *R5-255379***

**Bengaluru, India, 25th - 29th August, 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.521-1** | **CR** | **3426** | **rev** | **1** | **Current version:** | **19.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | FR1 MUs up to 7.125GHz - RF single carrier UL SISO Rx tests update | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Keysight Technologies UK Ltd | | | | | | | | | |
| ***Source to TSG:*** | R5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17\_Test, NR\_lic\_bands\_BW\_R17-UEConTest | | | | |  | ***Date:*** | | | 2025-08-12 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Progress has been made in the MU/TT analysis for FR1 test cases for frequencies up to 7.125GHz in R5-254071. Definition of Rx tests should be updated accordingly. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Updated Test defintion for FR1 single carrier Rx test cases for frequency up to 7.125GHz in cases TT is defined per frequency. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Test specification will remain incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.3.2, 7.4, 7.4F, 7.5, 7.6.2, 7.6.3, 7.6.4, 7.7, 7.8.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Revision 1:  -Certain MU and TT values set in [ ] as more time for evaluation is requested by R&S.  -For each test case where MU and TT have been defined for the first time for f>6GHz, with or without [ ], added an editor’s note indicating “*- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available*”. | | | | | | | | |

## <<< START OF CHANGES >>>

### 7.3.2 Reference sensitivity power level

Editor’s note: The following aspects are either missing or not yet determined:

- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< Skip unchanged sections >>>

7.3.2.5 Test requirement

The throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A3.2 with reference receive power level specified in Tables 7.3.2.5-1a and Tables 7.3.2.5-1b for 2 Rx antenna port, Tables 7.3.2.5-2 a and Tables 7.3.2.5-2b for 4 Rx antenna port, Table 7.3.2.5-2c and Table 7.3.2.5-2d for PC2 UE on FDD bands, Table 7.3.2.5-2e and Table 7.3.2.5-2f for 8 Rx antenna ports, and parameters specified Table 7.3.2.4.1-1, Table 7.3.2.4.1-2 and Table 7.3.2.4.1-3.

Table 7.3.2.5-1a: Two antenna port Reference sensitivity QPSK PREFSENS for FDD bands for PC3

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating band / SCS / Channel bandwidth / Duplex-mode | | | | | | | | | | | | | |
| Operating Band | SCS (kHz) | 3  MHz (dBm) | 5  MHz (dBm) | 10  MHz (dBm) | 15  MHz (dBm) | 20  MHz (dBm) | 25  MHz (dBm) | 30 MHz (dBm) | 35 MHz (dBm) | 40  MHz (dBm) | 45  MHz (dBm) | 50  MHz (dBm) | Duplex Mode |
| n1 | 15 |  | -100.0 +TT | -96.8 +TT | -95.0 +TT | -93.8 +TT | -92.7  +TT | -91.9  +TT |  | -90.6 +TT | -90.1 +TT | -89.6 +TT | FDD |
| 30 |  |  | -97.1 +TT | -95.1 +TT | -94.0 +TT | -92.8 +TT | -92.0 +TT |  | -90.7 +TT | -90.2 +TT | -89.7 +TT |
| 60 |  |  | -97.5 +TT | -95.4 +TT | -94.2 +TT | -93.0 +TT | -92.1 +TT |  | -90.9 +TT | -90.3 +TT | -89.7 +TT |
| n2 | 15 |  | -98.0 +TT | -94.8 +TT | -93.0 +TT | -91.8 +TT | -90.7 +TT | -84.1 +TT |  | -81.5 +TT |  |  | FDD |
| 30 |  |  | -95.1 +TT | -93.1 +TT | -92.0 +TT | -90.8 +TT | -84.2 +TT |  | -81.6 +TT |  |  |
| 60 |  |  | -95.5 +TT | -93.4 +TT | -92.2 +TT | -90.9 +TT | -84.3 +TT |  | -81.7 +TT |  |  |
| n3 | 15 |  | -97.0 +TT | -93.8 +TT | -92.0 +TT | -90.8 +TT | -89.7 +TT | -88.9 +TT | -86.2+TT | -82.3 +TT | -81.3+TT | -79.7 +TT | FDD |
| 30 |  |  | -94.1 +TT | -92.1 +TT | -91.0 +TT | -89.8 +TT | -89.0 +TT | -86.3+TT | -82.4 +TT | -81.4+TT | -79.8 +TT |
| 60 |  |  | -94.5 +TT | -92.4 +TT | -91.2 +TT | -90.0 +TT | -89.1 +TT | -86.4+TT | -82.6 +TT | -81.5+TT | -79.9 +TT |
| n5 | 15 |  | -98.0 +TT | -94.8 +TT | -93.0 +TT | -86.8 +TT | -84.8 +TT |  |  |  |  |  | FDD |
| 30 |  |  | -95.1 +TT | -93.1 +TT | -88.6 +TT | -84.9 +TT |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n71 | 15 |  | -98.0 +TT | -94.8 +TT | -93.0 +TT | -91.8 +TT | -90.7 +TT | -89.9 +TT |  | -88.6 +TT |  | -81.5 +TT | FDD |
| 30 |  |  | -95.1 +TT | -93.1 +TT | -92.0 +TT | -90.8 +TT | -90.0 +TT |  | -88.7 +TT |  | -81.5 +TT |
| 60 |  |  | -95.5 +TT | -93.4 +TT | -92.2 +TT | -91.0 +TT | -90.1 +TT |  | -88.9 +TT |  | -81.5 +TT |
| n8 | 15 |  | -97.0 +TT | -93.8 +TT | -91.4 +TT | -85.8 +TT | -83.6+TT | -81.3+TT | -78.4+TT |  |  |  | FDD |
| 30 |  |  | -94.1 +TT | -91.7 +TT | -87.2 +TT | -84.7+TT | -81.4+TT | -78.5+TT |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n12 | 15 |  | -97.0 +TT | -93.8 +TT | -84.0 +TT |  |  |  |  |  |  |  | FDD |
| 30 |  |  | -94.1 +TT | -84.1 +TT |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n13 | 15 |  | -97.0 +TT | -93.8 +TT |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  | -94.1 +TT |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n14 | 15 |  | -97.0 +TT | -93.8 +TT |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  | -94.1 +TT |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n20 | 15 |  | -97.0 +TT | -93.8 +TT | -91.0 +TT | -89.8 +TT |  |  |  |  |  |  | FDD |
| 30 |  |  | -94.1 +TT | -91.1 +TT | -90.0 +TT |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n24 | 15 |  | -100.0 +TT | -96.8 +TT |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  | -97.1 +TT |  |  |  |  |  |  |  |  |
| 60 |  |  | -97.5 +TT |  |  |  |  |  |  |  |  |
| n25 | 15 |  | -96.5 +TT | -93.3 +TT | -91.5 +TT | -90.3 +TT | -89.3 +TT | -82.2 +TT | -81.7 +TT | -79.5 +TT | -77.6+TT |  | FDD |
| 30 |  |  | -93.6 +TT | -91.6 +TT | -90.5 +TT | -89.4 +TT | -82.3 +TT | -81.8 +TT | -79.6 +TT | -77.7 +TT |  |
| 60 |  |  | -94.0 +TT | -91.9 +TT | -90.7 +TT | -89.6 +TT | -82.4 +TT | -81.9 +TT | -79.7 +TT | -77.8 +TT |  |
| n26 | 15 | -99.7 +TT | -97.5 +TT | -94.5 +TT | -92.7 +TT | -87.6 +TT |  |  |  |  |  |  | FDD |
| 30 |  |  | -94.8 +TT | -92.7 +TT | -87.7 +TT |  |  |  |  |  |  |
| n28 | 15 | -100.2 +TT | -98.5 +TT | -95.5 +TT | -93.5 +TT | -90.8 +TT |  | -78.5 +TT |  | -66.3 + TT |  |  | FDD |
| 30 |  |  | -95.6 +TT | -93.6 +TT | -91.0 +TT |  | -78.6 +TT |  | -66.3 + TT |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n30 | 15 |  | -99.0 +TT | -95.8 +TT |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  | -96.1 +TT |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n31 | 15 | -95.7 + TT | -93.5 + TT |  |  |  |  |  |  |  |  |  | FDD |
| n65 | 15 |  | -99.5+TT | -96.3+TT | -94.5+TT | -93.3+TT |  |  |  |  |  |  | FDD |
| 30 |  |  | -96.6+TT | -94.6+TT | -93.5+TT |  |  |  |  |  |  |
| 60 |  |  | -97.0+TT | -94.9+TT | -93.7+TT |  |  |  |  |  |  |
| n66 | 15 |  | -99.5 +TT | -96.3 +TT | -94.5 +TT | -93.3 +TT | -92.2 +TT | -91.4 +TT |  | -90.1 +TT |  |  | FDD |
| 30 |  |  | -96.6 +TT | -94.6 +TT | -93.5 +TT | -92.3 +TT | -91.5 +TT |  | -90.2 +TT |  |  |
| 60 |  |  | -97.0 +TT | -94.9 +TT | -93.7 +TT | -92.5 +TT | -91.6 +TT |  | -90.4 +TT |  |  |
| n70 | 15 |  | -100.0 +TT | -96.8 +TT | -95.0 +TT | -93.8 +TT | -92.7 +TT |  |  |  |  |  | FDD |
| 30 |  |  | -97.1 +TT | -95.1 +TT | -94.0 +TT | -92.8 +TT |  |  |  |  |  |
| 60 |  |  | -97.5 +TT | -95.4 +TT | -94.2 +TT | -93.0 +TT |  |  |  |  |  |
| n71 | 15 |  | -97.2 +TT | -94.0 +TT | -91.6 +TT | -86.0 +TT | -84.17 +TT  -74.88+TT | -82.57 +TT  -67.18+TT | -80.77 +TT  -64.08 +TT |  |  |  | FDD |
| 30 |  |  | -94.3 +TT | -91.9 +TT | -87.4 +TT | -84.27 +TT  -74.98 +TT | -82.67 +TT  -67.28 +TT | -80.87 +TT  -64.18 +TT |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
| n72 | 15 | -95.7 + TT | -93.5 + TT |  |  |  |  |  |  |  |  |  | FDD |
| n74 | 15 |  | -99.53 +TT | -96.33 +TT | -94.53 +TT | -93.33 +TT |  |  |  |  |  |  | FDD |
| 30 |  |  | -96.63 +TT | -94.63 +TT | -93.53 +TT |  |  |  |  |  |  |
| 60 |  |  | -97.03 +TT | -94.93 +TT | -93.73 +TT |  |  |  |  |  |  |
| n85 | 15 | -99.2 +TT | -97.0 +TT | -93.8 +TT | -84.0 +TT |  |  |  |  |  |  |  | FDD |
| 30 |  |  | -94.1 +TT | -84.1 +TT |  |  |  |  |  |  |  |
| n100 | 15 | -102.2 +TT | -100.0 +TT |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |
|  | 15 |  | -97.29 +TT | -94.0 +TT | -91.6 +TT | -86.9 +TT |  |  |  |  |  |  |  |
| n105 | 30 |  |  | -94.3 +TT | -91.9 +TT | -87.9 +TT |  |  |  |  |  |  | FDD |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |
| n106 | 15 | -99.2 +TT |  |  |  |  |  |  |  |  |  |  | FDD |
| NOTE 1: Four Rx antenna ports shall be the baseline for this operating band except for two Rx vehicular UE. Four Rx antenna ports for RedCap UE is not supported for this operating band.  NOTE 2: The transmitter shall be set to PUMAX as defined in subclause 6.2.4  NOTE 3: 3 indicates that the requirement is modified by -0.5 dB when the assigned NR channel bandwidth is confined within 1475.9-1510.9 MHz.  NOTE 4: Void  NOTE 5: Void  NOTE 6: TT for each frequency and channel bandwidth is specified in Table 7.3.2.5-3.  NOTE 7: Applies to UEs that support a maximum uplink BW of 20 MHz in this band.  NOTE 8: Applies to UEs that support optional symmetric UL/DL for this BW.  NOTE 9: DL channels overlapping the 612-617MHz range have 0.5dB added to the REFSENS. | | | | | | | | | | | | | |

<<< Skip unchanged tables >>>

Table 7.3.2.5-2e: Eight antenna port Reference sensitivity QPSK PREFSENS FDD bands

FFS

Table 7.3.2.5-2f: Eight antenna port Reference sensitivity QPSK PREFSENS TDD bands

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operating band / SCS / Channel bandwidth / REFSENS | | | | |
| Operating band | SCS  (kHz) | Channel bandwidth (MHz) | REFSENS (dBm) | Duplex Mode |
| n771,4 | 15 | 10, 15, 20, 25, 30, 40, 50 | -95.3 + 10log10(NRB/52) -4.0 +TT | TDD |
| 30 | 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | -95.6 + 10log10(NRB/24) - 4.0 +TT |
| 60 | 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | -96.0 + 10log10(NRB/11) - 4.0 +TT |
| n781 | 15 | 10, 15, 20, 25, 30, 40, 50 | -95.8 + 10log10(NRB/52) - 4.0 +TT | TDD |
| 30 | 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | -96.1 + 10log10(NRB/24) - 4.0 +TT |
| 60 | 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 | -96.5 + 10log10(NRB/11) - 4.0 +TT |
| NOTE 1: Four Rx antenna ports shall be the baseline for this operating band except for two Rx vehicular UE.  NOTE 2: The transmitter shall be set to PUMAX as defined in clause 6.2.4.  NOTE 3: TT for each frequency and channel bandwidth is specified in Table 7.3.2.5-3.  NOTE 4: The requirement is modified by -0.5 dB when the assigned UE channel bandwidth is confined within 3300 - 3800 MHz. | | | | |

Table 7.3.2.5-3: Test Tolerance (TT) for RX sensitivity level

|  |  |
| --- | --- |
| f ≤ 3.0GHz | 3.0GHz < f ≤ 7.125 GHz |
| 0.7 dB | 1.0 dB |

For the UE which supports CA, SUL or DC band combination, the minimum requirement for reference sensitivity in Table 7.3.2.5-1 a and Table 7.3.2.5-1b shall be increased by the amount given in ΔRIB,c defined in subclause 7.3.3 for the applicable operating bands.

## <<< Skip unchanged sections >>>

## 7.4 Maximum input level

Editor’s note: The following aspects are either missing or not yet determined:

- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< Skip unchanged sections >>>

7.4.5 Test requirement

The throughput measurement derived in test procedure shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A.3.2 and A.3.3 with parameters specified in Tables 7.4.5-1.

Table 7.4.5-1: Maximum input level

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rx Parameter | Units | Channel bandwidth (MHz) | | |
| 3, 5, 10, 15, 20 | 25, 30, 35, 40, 45, 50 | 60, 70, 80, 90, 100 |
| Power in Transmission Bandwidth Configuration4 | dBm | -252 -TT | -25 + 10log10(BWChannel /20)Note 2 -TT | -202 -TT |
|  |  | -273,5 -TT | -27 + 10log10(BWChannel /20)Note 3,5 -TT | -223,5 -TT |
| NOTE 1: The transmitter shall be set to 4 dB below PCMAX\_L,f,c at the minimum uplink configuration specified in Table 7.3.2-3 with PCMAX\_L,f,c as defined in clause 6.2.4.  NOTE 2: Reference measurement channel is A.3.2.3 or A.3.3.3 for 64 QAM.  NOTE 3: Reference measurement channel is A.3.2.4 or A.3.3.4 for 256 QAM.  NOTE 4: 10log10(x) is rounded to the nearest 0.5dB value.  NOTE 5: Reference measurement channel is A.3.2.5 or A.3.3.5 for 1024 QAM.  NOTE 6: TT for each frequency is specified in Table 7.4.5-3. | | | | |

Table 7.4.5-2: Void

Table 7.4.5-3: Test Tolerance (Maximum input level)

|  |  |  |
| --- | --- | --- |
| f ≤ 3.0GHz | 3.0GHz < f ≤ 6.0GHz | 6.0GHz < f ≤ 7.125GHz |
| 0.7 dB | 1.0 dB | [1.5] dB |

## <<< Skip unchanged sections >>>

7.4F.5 Test requirement

The throughput measurement derived in test procedure shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A.3.2 and A.3.3 with parameters specified in Tables 7.4F.5-1.

Table 7.4F.5-1: Maximum input level

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rx Parameter | Units | Channel bandwidth (MHz) | | |
| 5, 10, 15, 20 | 25, 30, 35, 40, 45, 50 | 60, 70, 80, 90, 100 |
| Power in Transmission Bandwidth Configuration4 | dBm | -252 -TT | -25 + 10log10(BWChannel /20)Note 2 -TT | -202 -TT |
|  |  | -273,5 -TT | -27 + 10log10(BWChannel /20)Note 3,5 -TT | -223,5 -TT |
| NOTE 1: The transmitter shall be set to 4 dB below PCMAX\_L,f,c at the minimum uplink configuration specified in Table 7.3.2-3 with PCMAX\_L,f,c as defined in clause 6.2.4.  NOTE 2: Reference measurement channel is A.3.2.3 or A.3.3.3 for 64 QAM.  NOTE 3: Reference measurement channel is A.3.2.4 or A.3.3.4 for 256 QAM.  NOTE 4: 10log10(x) is rounded to the nearest 0.5dB value.  NOTE 5: Reference measurement channel is A.3.2.5 or A.3.3.5 for 1024 QAM. | | | | |

Table 7.4F.5-2: Test Tolerance (Maximum input level)

|  |  |  |
| --- | --- | --- |
| f ≤ 3.0GHz | 3.0GHz < f ≤ 6.0GHz | 6.0GHz < f ≤ 7.125GHz |
| 0.7 dB | 1.0 dB | [1.5] dB |

## <<< Skip unchanged sections >>>

## 7.5 Adjacent channel selectivity

Editor’s note: The following aspects are either missing or not yet determined:

- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< Skip unchanged sections >>>

### 7.6.2 In-band blocking

Editor’s note: The following aspects are either missing or not yet determined:

* The test is incomplete for NR Band n105
* Testability, MU and TT are pending for NR Band n105.
* - MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< Skip unchanged sections >>>

### 7.6.3 Out-of-band blocking

Editor’s note: The following aspects are either missing or not yet determined:

- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< Skip unchanged sections >>>

### 7.6.4 Narrow band blocking

Editor’s note: The following aspects are either missing or not yet determined:

- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< Skip unchanged sections >>>

## 7.7 Spurious response

Editor’s note: The following aspects are either missing or not yet determined:

- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< Skip unchanged sections >>>

### 7.8.2 Wide band Intermodulation

Editor’s note: The following aspects are either missing or not yet determined:

- MU and TT for f>6GHz are working assumption based on analysis of single TE vendor. Values will be revisited once analysis from other TE vendors is available.

## <<< END OF CHANGES >>>