**3GPP TSG-RAN WG4 Meeting #95-e *R4-2009053***

**Electronic Meeting, 25 May – 5 June, 2020**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.104** | **CR** | **<CR#>** | **rev** |  | **Current version:** | **15.8.0** |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | CR to 36.104 on Removal of FFSs, brackets and TBD (Rel-15) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI15 | | | | |  | ***Date:*** | | | 2020-06-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 3GPP specifications will be included as one part of the ITU-R submission of NR. For this reason, there can be no “ffs”, brackets or TBDs remaining in the specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Remaining “ffs” and brackets are removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | “ffs” and brackets would remain, making the specifications for ITU-R submission ambiguous. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.5, 8.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

## 4.5 Requirements for BS capable of multi-band operation

For BS capable of multi-band operation, the RF requirements in clause 6 and 7 apply for each supported operating band unless otherwise stated. For some requirements it is explicitly stated that specific additions or exclusions to the requirement apply for BS capable of multi-band operation.

For BS capable of multi-band operation, various structures in terms of combinations of different transmitter and receiver implementations (multi-band or single band) with mapping of transceivers to one or more antenna port(s) in different ways are possible. In the case where multiple bands are mapped on an antenna connector, the exclusions or provisions for multi-band capable BS are applicable to this antenna connector. In the case where a single band is mapped on an antenna connector, the following applies:

- Single-band ACLR, operating band unwanted emissions, transmitter spurious emissions, transmitter intermodulation and receiver spurious emissions requirements apply to this antenna connector that is mapped to single-band.

- If the BS is configured for single-band operation, single-band requirements shall apply to this antenna connector configured for single-band operation and no exclusions or provisions for multi-band capable BS are applicable. Single-band requirements are tested separately at the antenna connector configured for single-band operation, with all other antenna connectors terminated.

For a band supported by a Base Station where the transmitted carriers are not processed in active RF components together with carriers in any other band, single-band transmitter requirements shall apply. For a band supported by a Base Station where the received carriers are not processed in active RF components together with carriers in any other band, single-band receiver requirements shall apply.

For a BS capable of multi-band operation supporting bands for TDD, the RF requirements in the present specification assume synchronized operation, where no simultaneous uplink and downlink occur between the supported operating bands.

The RF requirements for multi-band operation supporting bands for both FDD and TDD are not covered by the present release of this specification.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*End of change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next changed section\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 8.2 Performance requirements for PUSCH

### 8.2.1 Requirements in multipath fading propagation conditions

The performance requirement of PUSCH is determined by a minimum required throughput for a given SNR. The required throughput is expressed as a fraction of maximum throughput for the FRCs listed in Annex A. The performance requirements assume HARQ retransmissions. For 2Tx test the HARQ retransmissions for two codewords are independent. The requirements defined based on FRC in Annex A.17 apply to the BS supporting PUSCH with 256QAM. The requirements defined based on FRC in Annex A.18 apply to the BS supporting PUSCH transmission in UpPTS. The requirements defined based on FRC in Annex A.19 apply to the BS supporting both PUSCH transmission in UpPTS and PUSCH with 256QAM. For PUSCH transmission in UpPTS, the special subframe configuration is 10 as specified in 36.211 [10] Table 4.2-1, and during the test only special subframe is scheduled.

Table 8.2.1-1 Test parameters for testing PUSCH

|  |  |
| --- | --- |
| Parameter | Value |
| Maximum number of HARQ transmissions | 4 |
| RV sequence | 0, 2, 3, 1, 0, 2, 3, 1 |
| Uplink-downlink allocation for TDD | Configuration 1 (2:2) |

#### 8.2.1.1 Minimum requirements

The throughput shall be equal to or larger than the fraction of maximum throughput stated in the tables 8.2.1.1-1 to 8.2.1.1-6 at the given SNR for 1Tx and in tables 8.2.1.1-7 to 8.2.1.1-12 for 2Tx two layer spatial multiplexing transmission.

Table 8.2.1.1-1 Minimum requirements for PUSCH, 1.4 MHz Channel Bandwidth, 1Tx

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of RX antennas | Cyclic prefix | Propagation conditions and correlation matrix (Annex B) | FRC (Annex A) | Fraction of maximum throughput | SNR  [dB] |
| 1 | 2 | Normal | EPA 5Hz Low | A3-2 | 30% | -4.1 |
| 70% | 0.1 |
| A4-3 | 70% | 10.6 |
| A5-2 | 70% | 17.7 |
| A17-1 | 70% | 21.4 |
| A18-1 | 70% | 7.4 |
| A19-1 | 70% | 18.1 |
| EVA 5Hz Low | A3-1 | 30% | -2.7 |
| 70% | 1.8 |
| A4-1 | 30% | 4.4 |
| 70% | 11.3 |
| A5-1 | 70% | 18.6 |
| EVA 70Hz Low | A3-2 | 30% | -3.9 |
| 70% | 0.7 |
| A4-3 | 30% | 4.0 |
| 70% | 11.9 |
| ETU 70Hz\* Low | A3-1 | 30% | -2.4 |
| 70% | 2.4 |
| ETU 300Hz\* Low | A3-1 | 30% | -2.2 |
| 70% | 2.9 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 4.8 |
| 70% | 13.5 |
| 4 | Normal | EPA 5Hz Low | A3-2 | 30% | -6.6 |
| 70% | -3.1 |
| A4-3 | 70% | 7.1 |
| A5-2 | 70% | 14.4 |
| A17-1 | 70% | 18.2 |
| A18-1 | 70% | 4.1 |
| A19-1 | 70% | 14.7 |
| EVA 5Hz Low | A3-1 | 30% | -5.0 |
| 70% | -1.3 |
| A4-1 | 30% | 1.3 |
| 70% | 7.8 |
| A5-1 | 70% | 15.4 |
| EVA 70Hz Low | A3-2 | 30% | -6.3 |
| 70% | -2.7 |
| A4-3 | 30% | 0.8 |
| 70% | 8.3 |
| ETU 70Hz\* Low | A3-1 | 30% | -4.8 |
| 70% | -1.0 |
| ETU 300Hz\* Low | A3-1 | 30% | -4.6 |
| 70% | -0.6 |
| ETU 600Hz\*\* Low | A13-1 | 30% | -0.9 |
| 70% | 6.1 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 1.6 |
| 70% | 9.9 |
| 8 | Normal | EPA 5Hz Low | A3-2 | 30% | -9.4 |
| 70% | -6.4 |
| A4-3 | 70% | 4.0 |
| A5-2 | 70% | 10.9 |
| A17-1 | 70% | 15.1 |
| A18-1 | 70% | 1.1 |
| A19-1 | 70% | 11.6 |
| EVA 5Hz Low | A3-1 | 30% | -7.2 |
| 70% | -3.8 |
| A4-1 | 30% | -1.7 |
| 70% | 4.6 |
| A5-1 | 70% | 11.7 |
| EVA 70Hz Low | A3-2 | 30% | -9.0 |
| 70% | -5.8 |
| A4-3 | 30% | -2.5 |
| 70% | 4.8 |
| ETU 70Hz\* Low | A3-1 | 30% | -6.8 |
| 70% | -3.6 |
| ETU 300Hz\* Low | A3-1 | 30% | -6.7 |
| 70% | -3.3 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | -1.1 |
| 70% | 6.4 |
| Note\*: Not applicable for Local Area BS and Home BS.  Note\*\*: Not applicable for Local Area BS and Home BS, and only applicable for BS supporting ETU600. | | | | | | |

Table 8.2.1.1-2 Minimum requirements for PUSCH, 3 MHz Channel Bandwidth, 1Tx

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of RX antennas | Cyclic prefix | Propagation conditions and correlation matrix (Annex B) | FRC (Annex A) | Fraction of maximum throughput | SNR [dB] |
| 1 | 2 | Normal | EPA 5Hz Low | A3-3 | 30% | -4.1 |
| 70% | 0.1 |
| A4-4 | 70% | 10.9 |
| A5-3 | 70% | 18.1 |
| A17-2 | 70% | 22.0 |
| A18-2 | 70% | 7.4 |
| A19-2 | 70% | 17.9 |
| EVA 5Hz Low | A3-1 | 30% | -2.8 |
| 70% | 1.8 |
| A4-1 | 30% | 4.3 |
| 70% | 11.5 |
| A5-1 | 70% | 18.8 |
| EVA 70Hz Low | A3-3 | 30% | -4.0 |
| 70% | 0.6 |
| A4-4 | 30% | 4.7 |
| 70% | 12.5 |
| ETU 70Hz\* Low | A3-1 | 30% | -2.5 |
| 70% | 2.4 |
| ETU 300Hz\* Low | A3-1 | 30% | -2.2 |
| 70% | 2.9 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 4.7 |
| 70% | 13.5 |
| 4 | Normal | EPA 5Hz Low | A3-3 | 30% | -6.8 |
| 70% | -3.4 |
| A4-4 | 70% | 7.7 |
| A5-3 | 70% | 14.4 |
| A17-2 | 70% | 18.7 |
| A18-2 | 70% | 4.0 |
| A19-2 | 70% | 14.0 |
| EVA 5Hz Low | A3-1 | 30% | -5.0 |
| 70% | -1.3 |
| A4-1 | 30% | 1.2 |
| 70% | 7.8 |
| A5-1 | 70% | 15.4 |
| EVA 70Hz Low | A3-3 | 30% | -6.5 |
| 70% | -2.9 |
| A4-4 | 30% | 1.6 |
| 70% | 8.7 |
| ETU 70Hz\* Low | A3-1 | 30% | -4.8 |
| 70% | -0.9 |
| ETU 300Hz\* Low | A3-1 | 30% | -4.6 |
| 70% | -0.6 |
| ETU 600Hz\*\* Low | A13-2 | 30% | -1.1 |
| 70% | 5.8 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 1.5 |
| 70% | 9.9 |
| 8 | Normal | EPA 5Hz Low | A3-3 | 30% | -9.6 |
| 70% | -6.6 |
| A4-4 | 70% | 4.1 |
| A5-3 | 70% | 11.1 |
| A17-2 | 70% | 15.6 |
| A18-2 | 70% | 1.3 |
| A19-2 | 70% | 11.0 |
| EVA 5Hz Low | A3-1 | 30% | -7.1 |
| 70% | -4.0 |
| A4-1 | 30% | -1.6 |
| 70% | 4.4 |
| A5-1 | 70% | 11.7 |
| EVA 70Hz Low | A3-3 | 30% | -9.3 |
| 70% | -5.9 |
| A4-4 | 30% | -2.8 |
| 70% | 4.8 |
| ETU 70Hz\* Low | A3-1 | 30% | -7.0 |
| 70% | -3.7 |
| ETU 300Hz\* Low | A3-1 | 30% | -6.8 |
| 70% | -3.3 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | -1.2 |
| 70% | 6.5 |
| Note\*: Not applicable for Local Area BS and Home BS.  Note\*\*: Not applicable for Local Area BS and Home BS, and only applicable for BS supporting ETU600. | | | | | | |

Table 8.2.1.1-3 Minimum requirements for PUSCH, 5 MHz Channel Bandwidth, 1Tx

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of RX antennas | Cyclic prefix | Propagation conditions a and correlation matrix (Annex B) | FRC (Annex A) | Fraction of maximum throughput | SNR  [dB] |
| 1 | 2 | Normal | EPA 5Hz Low | A3-4 | 30% | -4.7 |
| 70% | -0.7 |
| A4-5 | 70% | 10.4 |
| A5-4 | 70% | 18.0 |
| A17-3 | 70% | 21.9 |
| A18-3 | 70% | 8.3 |
| A19-3 | 70% | 19.4 |
| EVA 5Hz Low | A3-1 | 30% | -2.7 |
| 70% | 1.8 |
| A4-1 | 30% | 4.3 |
| 70% | 11.5 |
| A5-1 | 70% | 18.6 |
| EVA 70Hz Low | A3-4 | 30% | -4.5 |
| 70% | -0.1 |
| A4-5 | 30% | 4.3 |
| 70% | 12.3 |
| ETU 70Hz\* Low | A3-1 | 30% | -2.5 |
| 70% | 2.4 |
| ETU 300Hz\* Low | A3-1 | 30% | -2.2 |
| 70% | 2.9 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 4.8 |
| 70% | 13.5 |
| 4 | Normal | EPA 5Hz Low | A3-4 | 30% | -7.1 |
| 70% | -3.8 |
| A4-5 | 70% | 7.6 |
| A5-4 | 70% | 14.4 |
| A17-3 | 70% | 18.5 |
| A18-3 | 70% | 5.1 |
| A19-3 | 70% | 15.8 |
| EVA 5Hz Low | A3-1 | 30% | -5.1 |
| 70% | -1.4 |
| A4-1 | 30% | 1.2 |
| 70% | 7.9 |
| A5-1 | 70% | 15.5 |
| EVA 70Hz Low | A3-4 | 30% | -6.9 |
| 70% | -3.3 |
| A4-5 | 30% | 1.2 |
| 70% | 8.3 |
| ETU 70Hz\* Low | A3-1 | 30% | -4.8 |
| 70% | -0.9 |
| ETU 300Hz\* Low | A3-1 | 30% | -4.6 |
| 70% | -0.6 |
| ETU 600Hz\*\*  Low | A13-3 | 30% | -0.9 |
| 70% | 6.1 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 1.6 |
| 70% | 9.9 |
| 8 | Normal | EPA 5Hz Low | A3-4 | 30% | -10.1 |
| 70% | -7.2 |
| A4-5 | 70% | 4.0 |
| A5-4 | 70% | 11.3 |
| A17-3 | 70% | 15.3 |
| A18-3 | 70% | 2.0 |
| A19-3 | 70% | 12.5 |
| EVA 5Hz Low | A3-1 | 30% | -7.1 |
| 70% | -3.9 |
| A4-1 | 30% | -1.9 |
| 70% | 4.4 |
| A5-1 | 70% | 11.7 |
| EVA 70Hz Low | A3-4 | 30% | -9.9 |
| 70% | -6.7 |
| A4-5 | 30% | -2.5 |
| 70% | 4.6 |
| ETU 70Hz\* Low | A3-1 | 30% | -6.9 |
| 70% | -3.4 |
| ETU 300Hz\* Low | A3-1 | 30% | -6.9 |
| 70% | -3.3 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | -1.2 |
| 70% | 6.4 |
| Note\*: Not applicable for Local Area BS and Home BS.  Note\*\*: Not applicable for Local Area BS and Home BS, and only applicable for BS supporting ETU600. | | | | | | |

Table 8.2.1.1-4 Minimum requirements for PUSCH, 10 MHz Channel Bandwidth, 1Tx

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of RX antennas | Cyclic prefix | Propagation conditions and correlation matrix (Annex B) | FRC (Annex A) | Fraction of maximum throughput | SNR  [dB] |
| 1 | 2 | Normal | EPA 5Hz Low | A3-5 | 30% | -4.2 |
| 70% | -0.4 |
| A4-6 | 70% | 10.8 |
| A5-5 | 70% | 18.3 |
| A17-4 | 70% | 22.6 |
| A18-4 | 70% | 8.5 |
| A19-4 | 70% | 19.5 |
| EVA 5Hz Low | A3-1 | 30% | -2.7 |
| 70% | 1.9 |
| A4-1 | 30% | 4.3 |
| 70% | 11.4 |
| A5-1 | 70% | 18.8 |
| EVA 70Hz Low | A3-5 | 30% | -4.1 |
| 70% | 0.1 |
| A4-6 | 30% | 4.5 |
| 70% | 12.6 |
| ETU 70Hz\* Low | A3-1 | 30% | -2.5 |
| 70% | 2.4 |
| ETU 300Hz\* Low | A3-1 | 30% | -2.2 |
| 70% | 2.9 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 4.8 |
| 70% | 13.6 |
| 4 | Normal | EPA 5Hz Low | A3-5 | 30% | -6.8 |
| 70% | -3.5 |
| A4-6 | 70% | 7.5 |
| A5-5 | 70% | 14.7 |
| A17-4 | 70% | 19.2 |
| A18-4 | 70% | 5.3 |
| A19-4 | 70% | 15.8 |
| EVA 5Hz Low | A3-1 | 30% | -5.0 |
| 70% | -1.2 |
| A4-1 | 30% | 1.2 |
| 70% | 7.9 |
| A5-1 | 70% | 15.5 |
| EVA 70Hz Low | A3-5 | 30% | -6.7 |
| 70% | -2.9 |
| A4-6 | 30% | 0.7 |
| 70% | 8.0 |
| ETU 70Hz\* Low | A3-1 | 30% | -4.8 |
| 70% | -0.9 |
| ETU 300Hz\* Low | A3-1 | 30% | -4.6 |
| 70% | -0.6 |
| ETU 600Hz\*\* Low | A13-4 | 30% | -1.0 |
| 70% | 6.2 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 1.7 |
| 70% | 10.3 |
| 8 | Normal | EPA 5Hz Low | A3-5 | 30% | -9.8 |
| 70% | -6.7 |
| A4-6 | 70% | 4.2 |
| A5-5 | 70% | 11.5 |
| A17-4 | 70% | 15.9 |
| A18-4 | 70% | 2.1 |
| A19-4 | 70% | 12.5 |
| EVA 5Hz Low | A3-1 | 30% | -6.9 |
| 70% | -3.8 |
| A4-1 | 30% | -1.7 |
| 70% | 4.5 |
| A5-1 | 70% | 11.9 |
| EVA 70Hz Low | A3-5 | 30% | -9.7 |
| 70% | -6.2 |
| A4-6 | 30% | -2.6 |
| 70% | 4.7 |
| ETU 70Hz\* Low | A3-1 | 30% | -6.8 |
| 70% | -3.6 |
| ETU 300Hz\* Low | A3-1 | 30% | -6.8 |
| 70% | -3.3 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | -1.1 |
| 70% | 6.5 |
| Note\*: Not applicable for Local Area BS and Home BS.  Note\*\*: Not applicable for Local Area BS and Home BS, and only applicable for BS supporting ETU600. | | | | | | |

Table 8.2.1.1-5 Minimum requirements for PUSCH, 15 MHz Channel Bandwidth, 1Tx

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of RX antennas | Cyclic prefix | Propagation conditions and correlation matrix (Annex B) | FRC (Annex A) | Fraction of maximum throughput | SNR  [dB] |
| 1 | 2 | Normal | EPA 5Hz Low | A3-6 | 30% | -4.5 |
| 70% | -0.8 |
| A4-7 | 70% | 11.3 |
| A5-6 | 70% | 18.8 |
| A17-5 | 70% | 22.8 |
| A18-5 | 70% | 9.4 |
| A19-5 | 70% | 21.4 |
| EVA 5Hz Low | A3-1 | 30% | -2.8 |
| 70% | 1.8 |
| A4-1 | 30% | 4.2 |
| 70% | 11.4 |
| A5-1 | 70% | 18.7 |
| EVA 70Hz Low | A3-6 | 30% | -4.5 |
| 70% | -0.3 |
| A4-7 | 30% | 4.2 |
| 70% | 12.9 |
| ETU 70Hz\* Low | A3-1 | 30% | -2.5 |
| 70% | 2.4 |
| ETU 300Hz\* Low | A3-1 | 30% | -2.2 |
| 70% | 2.9 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 4.9 |
| 70% | 13.6 |
| 4 | Normal | EPA 5Hz Low | A3-6 | 30% | -7.2 |
| 70% | -3.8 |
| A4-7 | 70% | 7.6 |
| A5-6 | 70% | 15.0 |
| A17-5 | 70% | 18.9 |
| A18-5 | 70% | 5.9 |
| A19-5 | 70% | 17.1 |
| EVA 5Hz Low | A3-1 | 30% | -5.0 |
| 70% | -1.2 |
| A4-1 | 30% | 1.2 |
| 70% | 7.9 |
| A5-1 | 70% | 15.7 |
| EVA 70Hz Low | A3-6 | 30% | -7.0 |
| 70% | -3.3 |
| A4-7 | 30% | 0.7 |
| 70% | 8.5 |
| ETU 70Hz\* Low | A3-1 | 30% | -4.8 |
| 70% | -1.0 |
| ETU 300Hz\* Low | A3-1 | 30% | -4.6 |
| 70% | -0.6 |
| ETU 600Hz\*\* Low | A13-5 | 30% | -0.9 |
| 70% | 6.4 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 1.6 |
| 70% | 10.1 |
| 8 | Normal | EPA 5Hz Low | A3-6 | 30% | -10.4 |
| 70% | -7.3 |
| A4-7 | 70% | 4.4 |
| A5-6 | 70% | 11.8 |
| A17-5 | 70% | 15.5 |
| A18-5 | 70% | 2.8 |
| A19-5 | 70% | 13.8 |
| EVA 5Hz Low | A3-1 | 30% | -7.1 |
| 70% | -4.0 |
| A4-1 | 30% | -1.7 |
| 70% | 4.4 |
| A5-1 | 70% | 11.7 |
| EVA 70Hz Low | A3-6 | 30% | -10.1 |
| 70% | -6.8 |
| A4-7 | 30% | -2.5 |
| 70% | 5.0 |
| ETU 70Hz\* Low | A3-1 | 30% | -7.0 |
| 70% | -3.6 |
| ETU 300Hz\* Low | A3-1 | 30% | -6.9 |
| 70% | -3.3 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | -1.1 |
| 70% | 6.7 |
| Note\*: Not applicable for Local Area BS and Home BS.  Note\*\*: Not applicable for Local Area BS and Home BS, and only applicable for BS supporting ETU600. | | | | | | |

Table 8.2.1.1-6 Minimum requirements for PUSCH, 20 MHz Channel Bandwidth, 1Tx

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of TX antennas | Number of RX antennas | Cyclic prefix | Propagation conditions and correlation matrix (Annex B) | FRC (Annex A) | Fraction of maximum throughput | SNR  [dB] |
| 1 | 2 | Normal | EPA 5Hz Low | A3-7 | 30% | -4.2 |
| 70% | -0.4 |
| A4-8 | 70% | 11.5 |
| A5-7 | 70% | 19.7 |
| A17-6 | 70% | 23.7 |
| A18-6 | 70% | 9.3 |
| A19-6 | 70% | 21.0 |
| EVA 5Hz Low | A3-1 | 30% | -2.7 |
| 70% | 1.8 |
| A4-1 | 30% | 4.3 |
| 70% | 11.5 |
| A5-1 | 70% | 18.7 |
| EVA 70Hz Low | A3-7 | 30% | -4.1 |
| 70% | 0.2 |
| A4-8 | 30% | 4.2 |
| 70% | 13.0 |
| ETU 70Hz\* Low | A3-1 | 30% | -2.4 |
| 70% | 2.4 |
| ETU 300Hz\* Low | A3-1 | 30% | -2.1 |
| 70% | 2.9 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 4.7 |
| 70% | 13.6 |
| 4 | Normal | EPA 5Hz Low | A3-7 | 30% | -6.8 |
| 70% | -3.5 |
| A4-8 | 70% | 7.5 |
| A5-7 | 70% | 15.9 |
| A17-6 | 70% | 19.8 |
| A18-6 | 70% | [5.7] |
| A19-6 | 70% | [16.6] |
| EVA 5Hz Low | A3-1 | 30% | -5.1 |
| 70% | -1.3 |
| A4-1 | 30% | 1.2 |
| 70% | 7.9 |
| A5-1 | 70% | 15.6 |
| EVA 70Hz Low | A3-7 | 30% | -6.7 |
| 70% | -2.9 |
| A4-8 | 30% | 0.7 |
| 70% | 8.6 |
| ETU 70Hz\* Low | A3-1 | 30% | -4.4 |
| 70% | -0.9 |
| ETU 300Hz\* Low | A3-1 | 30% | -4.6 |
| 70% | -0.7 |
| ETU 600Hz\*\* Low | A13-6 | 30% | -0.9 |
| 70% | 6.4 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | 1.6 |
| 70% | 10.0 |
| 8 | Normal | EPA 5Hz Low | A3-7 | 30% | -9.7 |
| 70% | -6.7 |
| A4-8 | 70% | 4.3 |
| A5-7 | 70% | 12.5 |
| A17-6 | 70% | 16.3 |
| A18-6 | 70% | 2.6 |
| A19-6 | 70% | 13.2 |
| EVA 5Hz Low | A3-1 | 30% | -7.0 |
| 70% | -3.9 |
| A4-1 | 30% | -1.7 |
| 70% | 4.6 |
| A5-1 | 70% | 12.0 |
| EVA 70Hz Low | A3-7 | 30% | -9.7 |
| 70% | -6.1 |
| A4-8 | 30% | -2.2 |
| 70% | 4.9 |
| ETU 70Hz\* Low | A3-1 | 30% | -6.9 |
| 70% | -3.5 |
| ETU 300Hz\* Low | A3-1 | 30% | -6.8 |
| 70% | -3.3 |
| Extended | ETU 70Hz\* Low | A4-2 | 30% | -1.2 |
| 70% | 6.5 |
| Note\*: Not applicable for Local Area BS and Home BS.  Note\*\*: Not applicable for Local Area BS and Home BS, and only applicable for BS supporting ETU600. | | | | | | |