**3GPP TSG-WG2 Meeting #110-e *R2-200xxxx***

**E-Meeting, 1st – 12th June, 2020**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.300** | **CR** | **1281** | **rev** | **2** | **Current version:** | **16.1.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Miscellaneous corrections to Rel-16 eMTC enhancements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Intel Corporation | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_eMTC5-Core | | | | |  | ***Date:*** | | | 2020-06-xx |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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:*** | | The CR for Rel-16 eMTC enhancements was agreed in RAN#87, however some miscellaneous corrections are required and missed details.   1. RSS can be used for RSRP measurement. 2. Interworking between Cat. M UE and NR is addressed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. RSS can be used for RSRP measurement. 2. Interworking between Cat M and NR is not supported | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The specification is ambiguous or incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1.8, 10.1.4, 23.7a | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS 36.331 CR 4239  TS 36.321 CR 1473  TS 36.304 CR 0789 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | R2-2003918 agreed in principle in RAN2#109bis e-meeting | | | | | | | | |

|  |
| --- |
| Start of the change |

### 5.1.8 Physical layer measurements definition

The physical layer measurements to support mobility are classified as:

- within E-UTRAN (intra-frequency, inter-frequency);

- between E-UTRAN and GERAN/UTRAN (inter-RAT);

- between E-UTRAN and non-3GPP RAT (Inter 3GPP access system mobility).

For measurements within E-UTRAN two basic UE measurement quantities shall be supported:

- Reference signal received power (RSRP);

- Reference signal received quality (RSRQ).

In addition, the following UE measurement quantity may be supported:

- Received signal strength indicator (RSSI);

- Reference signal signal to noise and interference ratio (RS-SINR).

RSRP measurement is based on the following signals:

- Cell-specific reference signals; or

- CSI reference signals in configured discovery signals; or

- Resynchronization Signal; or

- Narrowband secondary synchronization signal for NB-IoT UEs.

|  |
| --- |
| Next change |

## 23.7a Support of Bandwidth Reduced Low Complexity UEs

A bandwidth reduced low complexity (BL) UE can operate in any LTE system bandwidth but with a limited channel bandwidth of 6 PRBs (corresponding to the maximum channel bandwidth available in a 1.4 MHz LTE system) in downlink and uplink. Interworking with NR is not supported by BL UE (e.g. functions like NR measurement reporting, reselection to NR, handover to NR, redirection to NR are not supported).

To enable higher data rates a BL UE can optionally support a larger maximum PDSCH/PUSCH channel bandwidth of 24 PRBs in downlink and a non-BL UE operating in enhanced coverage can optionally support a larger maximum PDSCH/PUSCH channel bandwidth of 24 or 96 PRBs in downlink, and 24 PRBs in uplink in connected mode for unicast transmission. Table 23.7.a-1 summarizes the maximum PDSCH/PUSCH bandwidth in connected mode for unicast transmission depending on the UE category and enhanced coverage mode (see clause 23.7b). The maximum PDSCH/PUSCH channel bandwidth is configured separately for PDSCH and PUSCH via dedicated RRC signaling.

Table 23.7a-1: Maximum PDSCH/PUSCH bandwidth (in PRBs)

|  |  |  |
| --- | --- | --- |
| UE category/CE mode | CE mode A | CE mode B |
| BL (Category M1) | 6/6 | 6/6 |
| BL (Category M2) | 24/24 | 24/6 |
| Non-BL (Category 0 and higher) | 96 (or 24)/24 | 96 (or 24)/6 |

A Category M2 BL UE supports a larger DL and UL maximum TBS size for unicast compared to a Category M1 BL UE. A Category M1 BL UE may support a larger UL maximum TBS size indicated by a separate UE capability.

A BL UE may access a cell only if the MIB of the cell indicates that scheduling information for SIB1 specific for BL UEs is scheduled. If not, the UE considers the cell as barred.

A BL UE receives a separate occurrence of system information blocks (sent using different time/frequency resources). A BL UE has a transport block size (TBS) limited to 1000 bit for broadcast. The BL UE determines the scheduling information for SIB1 specific for BL UEs based on information in MIB. Scheduling information for other SIBs is given in SIB1 specific for BL UEs. The BCCH modification period for BL UEs is a multiple of the BCCH modification period provided in SIB2. The SIB transmission occasions within an SI-window are provided in the SIB1 specific for BL UEs. A BL UE can acquire SI messages across SI windows. The maximum number of SI messages that can be acquired across SI windows is 4. A BL UE is not required to detect SIB change when in RRC\_CONNECTED.

A BL UE is paged based on paging occasions in time domain, and paging narrowbands in frequency domain. The starting subframe of a paging occasion is determined in the same way as the paging occasion in the legacy paging mechanism.

A set of PRACH resources (e.g. time, frequency, preamble), each associated with BL UEs in normal coverage, is provided in SIB. Number of PRACH repetitions and number of maximum preamble transmission attempts for BL UEs in normal coverage are provided in SIB. Time/frequency resources and repetition factor for random access response messages for BL UEs are derived from the used PRACH resources.

|  |
| --- |
| End of the change |