

**TSG-RAN Meeting #20**  
**Hämeenlinna, Finland, 03-06 June 2003**

**RP-030305**

**Title:** CRs on Variable Tx/Rx frequency separation (linked with RAN4 CRs)  
**Source:** TSG-RAN WG2  
**Agenda item:** 7.2.6

| Spec   | CR   | Rev | Phase | Subject                             | Cat | Version-Current | Version-New | Doc-2nd-Level | Workitem |
|--------|------|-----|-------|-------------------------------------|-----|-----------------|-------------|---------------|----------|
| 25.306 | 071  | -   | Rel-5 | Variable Tx/Rx frequency separation | F   | 5.4.0           | 5.5.0       | R2-031418     | TEI5     |
| 25.307 | 005  | -   | R99   | Variable Tx/Rx frequency separation | F   | 3.1.0           | 3.2.0       | R2-031419     | TEI      |
| 25.307 | 006  | -   | Rel-4 | Variable Tx/Rx frequency separation | A   | 4.1.0           | 4.2.0       | R2-031420     | TEI      |
| 25.331 | 1962 |     | Rel-5 | Variable Tx/Rx frequency separation | F   | 5.4.0           | 5.5.0       | R2-031391     | TEI5     |

## CHANGE REQUEST

# **25.306 CR 071** # rev # Current version: **5.4.0** #

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the # symbols.

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

|                        |  |                 |   |
|------------------------|--|-----------------|---|
| <b>Title:</b>          | # Variable Tx/Rx frequency separation  |                 |   |
| <b>Source:</b>         | # RAN WG2  |                 |   |
| <b>Work item code:</b> | # TEI5   | <b>Date:</b>    | # May 2003                                |
| <b>Category:</b>       | # <b>F</b>   | <b>Release:</b> | # Rel-5                                   |
|                        | Use <u>one</u> of the following categories:  |                 | Use <u>one</u> of the following releases: |
|                        | <b>F</b> (correction)  | 2               | (GSM Phase 2)                             |
|                        | <b>A</b> (corresponds to a correction in an earlier release)                                   | R96             | (Release 1996)                            |
|                        | <b>B</b> (addition of feature),  | R97             | (Release 1997)                            |
|                        | <b>C</b> (functional modification of feature)  | R98             | (Release 1998)                            |
|                        | <b>D</b> (editorial modification)  | R99             | (Release 1999)                            |
|                        | Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> . | Rel-4           | (Release 4)                               |
|                        |  | Rel-5           | (Release 5)                               |
|                        |  | Rel-6           | (Release 6)                               |

|                                      |   |
|--------------------------------------|---|
| <b>Reason for change:</b>            | # Variable duplex is signalled with the IE "Tx/Rx frequency separation". The value range for this IE is only done taking the 2100 MHz band into account as also indicated in the Note in 10.3.3.33. In case variable duplex is signalled also for 1800 MHz or 1900 MHz band, the current value range is not applicable.   |
| <b>Summary of change:</b>            | # <ol style="list-style-type: none"> <li>1. The value range of the IE "Tx/Rx frequency separation" is changed to "default", "medium variable" and "full variable".</li> <li>2. An extra sentence is added to parameter "Tx/Rx frequency separation" and "UE power class" to reflect that this is per frequency band. This is aligning with current signalling in 25.331.</li> <li>3. Instead of stating that "Tx/Rx frequency separation" is only applicable for band a, the applicability is according to reference [4] 25.101 instead.</li> </ol> <p>Isolated impact analysis:</p> <p>For a 2100 MHz UE there is no difference if this CR is implemented or not. The behaviour will also be the same independent if UTRAN have implemented the CR or not.</p> <p>For a 1800 MHz or 1900 MHz UE this CR should be implemented in order to have the possibility to introduce medium variable and full variable Tx/Rx frequency separation also for 1800 MHz and 1900 MHz.</p> |
| <b>Consequences if not approved:</b> | # Variable Tx/Rx frequency separation for 1800 MHz and 1900 MHz is not possible to introduce in the future using the existing information element since it is not clear which value a legacy UE will signal. Instead a message extension with a   |

new information element would need to be added.

| <b>Clauses affected:</b> | ⌘ | 4.5.7, 5.1, 5.2.1   |   |   |   |   |   |  |
|--------------------------|---|---|---|---|---|---|---|--|
| <b>Other specs</b>       | ⌘ | <table border="1"><thead><tr><th>Y</th><th>N</th></tr></thead><tbody><tr><td>X</td><td></td></tr></tbody></table> | Y | N | X |   | Other core specifications                 | ⌘ CR 71 to 25.306<br>CR 5 and 6 to 25.307<br>CR 1962 to 25.331<br>25.101 |
|                          |   | Y   | N |   |   |   |   |  |
| X                        |   |   |   |   |   |   |   |  |
|                          |   |   |   |   |   |   |   |  |
| <b>affected:</b>         |   | <table border="1"><tbody><tr><td></td><td>X</td></tr><tr><td></td><td>X</td></tr></tbody></table>                 |   | X |   | X | Test specifications<br>O&M Specifications |  |
|                          |   | X   |   |   |   |   |   |  |
|                          | X |   |   |   |   |   |   |  |
| <b>Other comments:</b>   | ⌘ |   |   |   |   |   |   |  |

### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 4.5.7 RF parameters

### UE power class

Indicates the UE power class as defined in [4] for FDD and [5] for TDD. [There are separate parameters for each frequency band.](#)

### Radio frequency bands

This parameter is only applicable for TDD. It defines the uplink and downlink frequency bands supported by the UE as defined in [5].

### Tx/Rx frequency separation

This parameter is only applicable for FDD and only if the UE is operating in [a frequency band-a](#) as defined in [4]. It defines the uplink/downlink frequency separations supported by the UE. [There are separate parameters for each frequency band.](#)

## 5.1 Value ranges

**Table 5.1: UE radio access capability parameter value ranges**

|                           |  | UE radio access capability parameter  | Value range  |
|---------------------------|--|---|--|
| PDCP parameters           |  | Support for RFC 2507  | Yes/No   |
|                           |  | Support for RFC 3095  | Yes/No   |
|                           |  | Support for RFC 3095 context relocation   | Yes/No   |
|                           |  | Support for loss-less SRNS relocation   | Yes/No   |
|                           |  | Maximum header compression context space  | 512, 1024, 2048, 4096, 8192 bytes  |
|                           |  | Maximum number of ROHC context sessions   | 2, 4, 8, 12, 16, 24, 32, 48, 64, 128, 256, 512, 1024, 16384  |
|                           |  | Support for Reverse Decompression   | Not supported, 1..65535  |
| RLC and MAC-hs parameters |  | Total RLC AM and MAC-hs buffer size   | 2, 10, 50, 100, 150, 200, 300, 400, 500, 750, 1000 kBytes  |
|                           |  | Maximum number of AM entities   | 3, 4, 5, 6, 8, 16, 30  |
|                           |  | Maximum RLC AM window size  | 2047, 4095   |
| PHY parameters            | Transport channel parameters in downlink | Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant                       | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840                    |
|                           |  | Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840                    |
|                           |  | Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant           | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840                    |
|                           |  | Maximum number of simultaneous transport channels   | 4, 8, 16, 32   |
|                           |  | Maximum number of simultaneous CCTrCH   | 1, 2, 3, 4, 5, 6, 7, 8   |
|                           |  | Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval                   | 4, 8, 16, 32, 48, 64, 96, 128, 256, 512  |
|                           |  | Maximum number of TFC   | 16, 32, 48, 64, 96, 128, 256, 512, 1024  |
|                           |  | Maximum number of TF  | 32, 64, 128, 256, 512, 1024  |
|                           |  | Support for turbo decoding  | Yes/No   |
|                           |  | Transport channel parameters in   | Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant |

|   |        | UE radio access capability parameter   | Value range   |  |  |
|---|--------|--|---|--|--|
|   | uplink | Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840               |  |  |
|   |        | Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant           | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840               |  |  |
|   |        | Maximum number of simultaneous transport channels  | 2, 4, 8, 16, 32   |  |  |
|   |        | Maximum number of simultaneous CCTrCH of DCH type (TDD only)   | 1, 2, 3, 4, 5, 6, 7, 8  |  |  |
|   |        | Maximum total number of transport blocks transmitted within TTIs that start at the same time                               | 2, 4, 8, 16, 32, 48, 64, 96, 128, 256, 512  |  |  |
|   |        | Maximum number of TFC  | 4, 8, 16, 32, 48, 64, 96, 128, 256, 512, 1024   |  |  |
|   |        | Maximum number of TF   | 32, 64, 128, 256, 512, 1024   |  |  |
|   |        | Support for turbo encoding   | Yes/No  |  |  |
| FDD Physical channel parameters in downlink           |        | Maximum number of DPCH/PDSCH codes to be simultaneously received   | 1, 2, 3, 4, 5, 6, 7, 8  |  |  |
|   |        | Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH)                              | 600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 48000, 57600, 67200, 76800 |  |  |
|   |        | Support for SF 512   | Yes/No  |  |  |
|   |        | Support of PDSCH   | Yes/No  |  |  |
|   |        | Support of HS-PDSCH  | Yes/No  |  |  |
|   |        | Simultaneous reception of SCCPCH and DPCH  | Yes/No  |  |  |
|   |        | Simultaneous reception of SCCPCH, DPCH and PDSCH   | Yes/No  |  |  |
|   |        | Maximum number of simultaneous S-CCPCH radio links   | 1<br>NOTE: Only the value 1 is part of this release of the specification                        |  |  |
|   |        | Support of dedicated pilots for channel estimation   | Yes   |  |  |
|   |        | Support of dedicated pilots for channel estimation of HS-DSCH  | Yes/No  |  |  |
|   |        | FDD Physical channel parameters in uplink  |   | Maximum number of DPDCH bits transmitted per 10 ms | 600, 1200, 2400, 4800, 9600, 19200, 28800, 38400, 48000, 57600 |
|   |        |  |   | Support of PCPCH                                   | Yes/No   |
|   |        | TDD 3.84 Mcps physical channel parameters in downlink  |   | Maximum number of timeslots per frame              | 1..14  |
|   |        |  |   | Maximum number of physical channels per frame      | 1, 2, 3..224   |
| Minimum SF  | 16, 1  |  |   |  |  |
| Support of PDSCH                                      | Yes/No |  |   |  |  |
| Support of HS-PDSCH                                   | Yes/No |  |   |  |  |
| TDD 3.84 Mcps physical channel parameters in uplink   |        | Maximum number of physical channels per timeslot   | 1..16   |  |  |
|   |        | Maximum Number of timeslots per frame  | 1..14   |  |  |
|   |        | Maximum number of physical channels per timeslot   | 1, 2  |  |  |
|   |        | Minimum SF   | 16, 8, 4, 2, 1  |  |  |
|   |        | Support of PUSCH   | Yes/No  |  |  |
| TDD 1.28 Mcps physical channel parameters in downlink |        | Maximum number of timeslots per subframe   | 1..6  |  |  |
|   |        | Maximum number of physical channels per subframe   | 1, 2, 3, ..., 96  |  |  |
|   |        | Minimum SF   | 16, 1   |  |  |
|   |        | Support of PDSCH   | Yes/No  |  |  |
|   |        | Support of HS-PDSCH  | Yes/No  |  |  |

|   |                             | UE radio access capability parameter   | Value range   |      |
|---|-----------------------------|--|---|------|
|   |                             | Maximum number of physical channels per timeslot                                   | 1..16   |      |
|   |                             | Support 8PSK   | Yes/No  |      |
|   |                             | TDD 1.28 Mcps physical channel parameters in uplink                                | Maximum number of timeslots per subframe  | 1..6 |
|   |                             | Maximum number of physical channels per timeslot                                   | 1, 2  |      |
|   |                             | Minimum SF   | 16, 8, 4, 2, 1  |      |
|   |                             | Support of 8PSK  | Yes/No  |      |
| RF parameters                             | FDD RF parameters           | Support of PUSCH   | Yes/No  |      |
|   |                             | UE power class   | 3, 4<br>NOTE: Only power classes 3 and 4 are part of this release of the specification  |      |
|   |                             | Tx/Rx frequency separation   | <a href="#">190 MHz default</a><br><a href="#">174.8 MHz to 205.2 MHz medium variable</a><br><a href="#">134.8 MHz to 245.2 MHz full variable</a> |      |
| RF parameters                             | TDD 3.84 Mcps RF parameters | UE power class   | 2, 3<br>NOTE: Only power classes 2 and 3 are part of this release of the specification  |      |
|   |                             | Radio frequency bands  | a), b), c), a+b), a+c), b+c), a+b+c)  |      |
|   | TDD 1.28 Mcps RF parameters | UE power class   | 2, 3  |      |
|   |                             | Radio frequency bands  | a), b), c), a+b), a+c), b+c), a+b+c)  |      |
| Multi-mode related parameters             |                             | Support of UTRA FDD  | Yes/No  |      |
|   |                             | Support of UTRA TDD 3.84 Mcps  | Yes/No  |      |
|   |                             | Support of UTRA TDD 1.28 Mcps  | Yes/No  |      |
| Multi-RAT related parameters              |                             | Support of GSM   | Yes/No (per GSM frequency band)   |      |
|   |                             | Support of multi-carrier   | Yes/No  |      |
| Security parameters                       |                             | Support of ciphering algorithm UEA0  | Yes   |      |
|   |                             | Support of ciphering algorithm UEA1  | Yes   |      |
|   |                             | Support of integrity protection algorithm UIA1                                     | Yes   |      |
| UE positioning related parameters         |                             | Standalone location method(s) supported  | Yes/No  |      |
|   |                             | Network assisted GPS support   | Network based / UE based / Both/ None   |      |
|   |                             | GPS reference time capable   | Yes/No  |      |
|   |                             | Support for IPDL   | Yes/No  |      |
|   |                             | Support for OTDOA UE based method  | Yes/No  |      |
|   |                             | Support for Rx-Tx time difference type 2 measurement                               | Yes/No  |      |
|   |                             | Support for UE Positioning measurement validity in CELL_PCH and URA_PCH RRC states | Yes/No  |      |
| Measurement related capabilities          |                             | Need for downlink compressed mode  | Yes/No (per frequency band, UTRA mode and RAT)  |      |
|   |                             | Need for uplink compressed mode  | Yes/No (per frequency band, UTRA mode and RAT)  |      |
| General capabilities                      |                             | Access Stratum release indicator   | R99, REL-4, REL-5   |      |
| DL capabilities with simultaneous HS-DSCH |                             | DL capability with simultaneous HS-DSCH configuration                              | 32 kbps, 64 kbps, 128 kbps, 384 kbps  |      |

### 5.2.1 Combinations of common UE Radio Access Parameters for UL and DL

NOTE: Measurement-related capabilities are not included in the combinations. These capabilities are independent from the supported RABs.

**Table 5.2.1.1: UE radio access capability parameter combinations, parameters common for UL and DL**

| Reference combination of UE Radio Access capability parameters common for UL and DL | 32 kbps class                                   | 64 kbps class       | 128 kbps class      | 384 kbps class      | 768 kbps class      | 2048 kbps class     |
|---|---|---------------------|---------------------|---------------------|---------------------|---------------------|
| <b>PDCP parameters</b>  |   |                     |                     |                     |                     |                     |
| Support for RFC 2507  | No  | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    |
| Support for RFC 3095  | No/Yes<br>NOTE 1                                | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    |
| Support for RFC 3095 context relocation   | No/Yes<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support for loss-less SRNS relocation   | No/Yes<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Maximum header compression context space  | Not applicable for conformance testing          |                     |                     |                     |                     |                     |
| Maximum number of ROHC context sessions   | Not applicable for conformance testing          |                     |                     |                     |                     |                     |
| Support for Reverse decompression   | No/Yes<br>NOTE 1                                |                     |                     |                     |                     |                     |
| <b>RLC parameters</b>   |   |                     |                     |                     |                     |                     |
| Total RLC AM buffer size (kbytes)   | 10  | 10                  | 50                  | 50                  | 100                 | 500                 |
| Maximum number of AM entities   | 4   | 4                   | 5                   | 6                   | 8                   | 8                   |
| Maximum RLC AM window size  | 2047/4095<br>NOTE 1                             | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 |
| <b>Multi-mode related parameters</b>  |   |                     |                     |                     |                     |                     |
| Support of UTRA FDD   | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support of UTRA TDD 3.84 Mcps   | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support of UTRA TDD 1.28 Mcps   | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| <b>Multi-RAT related parameters</b>   |   |                     |                     |                     |                     |                     |
| Support of GSM  | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support of multi-carrier  | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| <b>Security parameters</b>  |   |                     |                     |                     |                     |                     |
| Support of ciphering algorithm UEA0   | Yes   |                     |                     |                     |                     |                     |
| Support of ciphering algorithm UEA1   | Yes   |                     |                     |                     |                     |                     |
| Support of integrity protection algorithm UIA1                                      | Yes   |                     |                     |                     |                     |                     |
| <b>UE positioning related parameters</b>  |   |                     |                     |                     |                     |                     |
| Standalone location method(s) supported   | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Network assisted GPS support  | Network based / UE based / Both/ None<br>NOTE 1 |                     |                     |                     |                     |                     |
| GPS reference time capable  | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support for IPDL  | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support for OTDOA UE based method   | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support for Rx-Tx time difference type 2 measurement                                | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| Support for UE Positioning measurement validity in CELL_PCH and URA_PCH RRC states  | Yes/No<br>NOTE 1                                |                     |                     |                     |                     |                     |
| <b>RF parameters for FDD</b>  |   |                     |                     |                     |                     |                     |
| UE power class  | 3 / 4<br>NOTE 1                                 |                     |                     |                     |                     |                     |
| Tx/Rx frequency separation  | 190-MHz default                                 |                     |                     |                     |                     |                     |
| <b>RF parameters for TDD 3.84 Mcps</b>  |   |                     |                     |                     |                     |                     |

| Reference combination of UE Radio Access capability parameters common for UL and DL | 32 kbps class                                 | 64 kbps class | 128 kbps class | 384 kbps class | 768 kbps class | 2048 kbps class |
|---|---|---------------|----------------|----------------|----------------|-----------------|
| Radio frequency bands   | A / b / c / a+b / a+c / b+c / a+b+c<br>NOTE 1 |               |                |                |                |                 |
| UE power class  | 2 / 3<br>NOTE 1                               |               |                |                |                |                 |
| <b>RF parameters for TDD 1.28 Mcps</b>  |   |               |                |                |                |                 |
| Radio frequency bands   | A / b / c / a+b / a+c / b+c / a+b+c<br>NOTE 1 |               |                |                |                |                 |
| UE power class  | 2 / 3<br>NOTE 1                               |               |                |                |                |                 |

NOTE 1: Options represent different combinations that should be supported with Conformance Tests.



## CHANGE REQUEST

# 25.307 CR 005 # rev # Current version: 3.1.0 #

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the # symbols.

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

|                        |  |                 |   |
|------------------------|--|-----------------|---|
| <b>Title:</b>          | # Variable Tx/Rx frequency separation  |                 |   |
| <b>Source:</b>         | # RAN WG2  |                 |   |
| <b>Work item code:</b> | # TEI  | <b>Date:</b>    | # May 2003                                |
| <b>Category:</b>       | # <b>F</b>   | <b>Release:</b> | # R99                                     |
|                        | Use <u>one</u> of the following categories:  |                 | Use <u>one</u> of the following releases: |
|                        | <b>F</b> (correction)  | 2               | (GSM Phase 2)                             |
|                        | <b>A</b> (corresponds to a correction in an earlier release)                                   | R96             | (Release 1996)                            |
|                        | <b>B</b> (addition of feature),  | R97             | (Release 1997)                            |
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|                        | Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> . | Rel-4           | (Release 4)                               |
|                        |  | Rel-5           | (Release 5)                               |
|                        |  | Rel-6           | (Release 6)                               |

|                                      |   |
|--------------------------------------|---|
| <b>Reason for change:</b>            | # Variable duplex is signalled with the IE "Tx/Rx frequency separation". The value range for this IE is only done taking the 2100 MHz band into account as also indicated in the Note in 10.3.3.33.<br>In case variable duplex is signalled also for 1800 MHz or 1900 MHz band, the current value range is not applicable.  |
| <b>Summary of change:</b>            | # 1. Reference to "default", "medium variable" and "full variable" for 1800 MHz<br>2. Reference to "default", "medium variable" and "full variable" for 1900 MHz<br><br>Isolated impact analysis:<br>For a 2100 MHz UE there is no difference if this CR is implemented or not. The behaviour will also be the same independent if UTRAN have implemented the CR or not.<br>For a 1800 MHz or 1900 MHz UE this CR should be implemented in order to have the possibility to introduce medium variable and full variable Tx/Rx frequency separation also for 1800 MHz and 1900 MHz |
| <b>Consequences if not approved:</b> | # Variable Tx/Rx frequency separation for 1800 MHz and 1900 MHz is not possible to introduce in the future using the existing information element since it is not clear which value a legacy UE will signal. Instead a message extension with a new information element would need to be added.   |

|                          |   |   |   |   |  |                           |  |
|--------------------------|---|---|---|---|--|---------------------------|--|
| <b>Clauses affected:</b> | # 4.1.2, 5.1.2  |   |   |   |  |                           |  |
| <b>Other specs</b>       | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> | Y | N | X |  | Other core specifications | # CR 71 to 25.306<br>CR 5 and 6 to 25.307<br>CR 1962 to 25.331 |
| Y                        | N   |   |   |   |  |                           |  |
| X                        |   |   |   |   |  |                           |  |

|                        |                                     |                          |        |                     |
|------------------------|-------------------------------------|--------------------------|--------|---------------------|
| <b>affected:</b>       | <input type="checkbox"/>            | <input type="checkbox"/> | 25.101 |                     |
|                        | <input checked="" type="checkbox"/> | X                        |        | Test specifications |
|                        | <input checked="" type="checkbox"/> | X                        |        | O&M Specifications  |
| <b>Other comments:</b> | ⌘                                   |                          |        |                     |

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Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

---

## 4 UMTS 1800 Independent of Release

UMTS 1800 is specified in Release 5 but is defined as a release-independent frequency band. This approach aligns the UMTS 1800 band with other frequency bands when considering features that have to be supported in different releases.

### 4.1 UMTS 1800 UE

UEs that conform to Release '99 and support the 1800 MHz frequency band shall support the following requirements in Release 5.

#### 4.1.1 RF Requirements

The UE shall comply with the RF requirements for the 1800 MHz band specified in [2]. These requirements are:

Section 5: Frequency bands and channel arrangement;

Section 6: Transmitter characteristics;

Section 7: Receiver characteristics.

Other requirements for radio reception and transmission requirements are defined in [5].

The UE shall comply with the Radio Resource Management requirements for the 1800 MHz band specified in [7]. These requirements are:

Section 9.1: Measurement Performances for UE.

Other requirements for radio resource management are defined in [6].

#### 4.1.2 Signalling Requirements

The UE shall support the following RRC extensions specified in [3]:

- The parameter value "UMTS1800" for the IE "FDD frequency band" contained within the IEs "UE radio access capability extension" and "Measurement capability extension". The UE shall use this parameter value in order to signal its radio access capabilities relating to the 1800 MHz band.

[The UE shall support the following setting of IE "Tx/Rx frequency separation" in section 10.3.3.33a according to \[3\]](#)

- [The parameter value "Tx/Rx frequency separation" shall be set to "default", "medium variable" or "full variable" as defined in \[2\] and according to the UE capability.](#)

---

## 5 UMTS 1900 Independent of Release

UMTS 1900 is specified in Release 5 but is defined as a release-independent frequency band. This approach aligns the UMTS 1900 band with other frequency bands when considering features that have to be supported in different releases.

### 5.1 UMTS 1900 UE

UEs that conform to Release '99 and support the 1900 MHz frequency band shall support the following requirements in Release 5

#### 5.1.1 RF Requirements

The UE shall comply with the RF requirements for the 1900 MHz band specified in [2]. These requirements are:

Section 5: Frequency bands and channel arrangement;

Section 6: Transmitter characteristics;

Section 7: Receiver characteristics.

Other requirements for radio reception and transmission requirements are defined in [5].

The UE shall comply with the Radio Resource Management requirements for the 1900 MHz band specified in [7].  
These requirements are:

Section 9.1: Measurement Performances for UE.

Other requirements for radio resource management are defined in [6].

## 5.1.2 Signalling Requirements

~~Release '99 contains the necessary signalling for the 1900 MHz frequency band [4].~~

The UE shall support the following setting of IE “Tx/Rx frequency separation” in section 10.3.3.33a according to [3]

- The parameter value “Tx/Rx frequency separation” shall be set to “default”, “medium variable” or “full variable” as defined in [2] and according to the UE capability.

## CHANGE REQUEST

# **25.307 CR 006** # rev # Current version: **4.1.0** #

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the # symbols.

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

|                        |  |                 |   |
|------------------------|--|-----------------|---|
| <b>Title:</b>          | # Variable Tx/Rx frequency separation  |                 |   |
| <b>Source:</b>         | # RAN WG2  |                 |   |
| <b>Work item code:</b> | # TEI  | <b>Date:</b>    | # May 2003                                |
| <b>Category:</b>       | # <b>A</b>   | <b>Release:</b> | # REL-4                                   |
|                        | Use <u>one</u> of the following categories:  |                 | Use <u>one</u> of the following releases: |
|                        | <b>F</b> (correction)  |                 | 2 (GSM Phase 2)                           |
|                        | <b>A</b> (corresponds to a correction in an earlier release)                                   |                 | R96 (Release 1996)                        |
|                        | <b>B</b> (addition of feature),  |                 | R97 (Release 1997)                        |
|                        | <b>C</b> (functional modification of feature)  |                 | R98 (Release 1998)                        |
|                        | <b>D</b> (editorial modification)  |                 | R99 (Release 1999)                        |
|                        | Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> . |                 | Rel-4 (Release 4)                         |
|                        |  |                 | Rel-5 (Release 5)                         |
|                        |  |                 | Rel-6 (Release 6)                         |

|                                      |   |
|--------------------------------------|---|
| <b>Reason for change:</b>            | # Variable duplex is signalled with the IE "Tx/Rx frequency separation". The value range for this IE is only done taking the 2100 MHz band into account as also indicated in the Note in 10.3.3.33.<br>In case variable duplex is signalled also for 1800 MHz or 1900 MHz band, the current value range is not applicable.  |
| <b>Summary of change:</b>            | # 1. Reference to "default", "medium variable" and "full variable" for 1800 MHz<br>2. Reference to "default", "medium variable" and "full variable" for 1900 MHz<br><br>Isolated impact analysis:<br>For a 2100 MHz UE there is no difference if this CR is implemented or not. The behaviour will also be the same independent if UTRAN have implemented the CR or not.<br>For a 1800 MHz or 1900 MHz UE this CR should be implemented in order to have the possibility to introduce medium variable and full variable Tx/Rx frequency separation also for 1800 MHz and 1900 MHz |
| <b>Consequences if not approved:</b> | # Variable Tx/Rx frequency separation for 1800 MHz and 1900 MHz is not possible to introduce in the future using the existing information element since it is not clear which value a legacy UE will signal. Instead a message extension with a new information element would need to be added.   |

|                          |   |   |   |   |  |   |  |
|--------------------------|---|---|---|---|--|---|--|
| <b>Clauses affected:</b> | # 4.1.2, 5.1.2  |   |   |   |  |   |  |
| <b>Other specs</b>       | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> Other core specifications | Y | N | X |  | # | CR 71 to 25.306<br>CR 5 and 6 to 25.307<br>CR 1962 to 25.331 |
| Y                        | N   |   |   |   |  |   |  |
| X                        |   |   |   |   |  |   |  |

|                        |                                     |                          |        |                     |
|------------------------|-------------------------------------|--------------------------|--------|---------------------|
| <b>affected:</b>       | <input type="checkbox"/>            | <input type="checkbox"/> | 25.101 |                     |
|                        | <input checked="" type="checkbox"/> | X                        |        | Test specifications |
|                        | <input checked="" type="checkbox"/> | X                        |        | O&M Specifications  |
| <b>Other comments:</b> | ⌘                                   |                          |        |                     |

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>.

Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

---

## UMTS 1800 Independent of Release

UMTS 1800 is specified in Release 5 but is defined as a release-independent frequency band. This approach aligns the UMTS 1800 band with other frequency bands when considering features that have to be supported in different releases.

### 4.1 UMTS 1800 UE

UEs that conform to Release 4 and support the 1800 MHz frequency band shall support the following requirements in Release 5.

#### 4.1.1 RF Requirements

The UE shall comply with the RF requirements for the 1800 MHz band specified in [2]. These requirements are:

Section 5: Frequency bands and channel arrangement;

Section 6: Transmitter characteristics;

Section 7: Receiver characteristics.

Other requirements for radio reception and transmission requirements are defined in [5].

The UE shall comply with the Radio Resource Management requirements for the 1800 MHz band specified in [7]. These requirements are:

Section 9.1: Measurement Performances for UE.

Other requirements for radio resource management are defined in [6].

#### 4.1.2 Signalling Requirements

The UE shall support the following RRC extensions specified in [3]:

- The parameter value "UMTS1800" for the IE "FDD frequency band" contained within the IEs "UE radio access capability extension" and "Measurement capability extension". The UE shall use this parameter value in order to signal its radio access capabilities relating to the 1800 MHz band.

[The UE shall support the following setting of IE "Tx/Rx frequency separation" in section 10.3.3.33a according to \[3\]](#)

- [The parameter value "Tx/Rx frequency separation" shall be set to "default", "medium variable" or "full variable" as defined in \[2\] and according to the UE capability.](#)

---

## 5 UMTS 1900 Independent of Release

UMTS 1900 is specified in Release 5 but is defined as a release-independent frequency band. This approach aligns the UMTS 1900 band with other frequency bands when considering features that have to be supported in different releases.

### 5.1 UMTS 1900 UE

UEs that conform to Release 4 and support the 1900 MHz frequency band shall support the following requirements in Release 5

#### 5.1.1 RF Requirements

The UE shall comply with the RF requirements for the 1900 MHz band specified in [2]. These requirements are:

Section 5: Frequency bands and channel arrangement;

Section 6: Transmitter characteristics;

Section 7: Receiver characteristics.

Other requirements for radio reception and transmission requirements are defined in [5].

The UE shall comply with the Radio Resource Management requirements for the 1900 MHz band specified in [7].  
These requirements are:

Section 9.1: Measurement Performances for UE.

Other requirements for radio resource management are defined in [6].

## 5.1.2 Signalling Requirements

~~Release 4 contains the necessary signalling for the 1900 MHz frequency band [4].~~

The UE shall support the following setting of IE “Tx/Rx frequency separation” in section 10.3.3.33a according to [3]

- The parameter value “Tx/Rx frequency separation” shall be set to “default”, “medium variable” or “full variable” as defined in [2] and according to the UE capability.

---



## CHANGE REQUEST

# **25.331 CR 1962** # rev - # Current version: **5.4.0** #

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the # symbols.

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

|                        |  |                 |   |
|------------------------|--|-----------------|---|
| <b>Title:</b>          | # Variable Tx/Rx frequency separation  |                 |   |
| <b>Source:</b>         | # RAN WG2  |                 |   |
| <b>Work item code:</b> | # TEI5   | <b>Date:</b>    | # May 2003                                |
| <b>Category:</b>       | # <b>F</b>   | <b>Release:</b> | # Rel-5                                   |
|                        | Use <u>one</u> of the following categories:  |                 | Use <u>one</u> of the following releases: |
|                        | <b>F</b> (correction)  | 2               | (GSM Phase 2)                             |
|                        | <b>A</b> (corresponds to a correction in an earlier release)                                   | R96             | (Release 1996)                            |
|                        | <b>B</b> (addition of feature),  | R97             | (Release 1997)                            |
|                        | <b>C</b> (functional modification of feature)  | R98             | (Release 1998)                            |
|                        | <b>D</b> (editorial modification)  | R99             | (Release 1999)                            |
|                        | Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> . | Rel-4           | (Release 4)                               |
|                        |  | Rel-5           | (Release 5)                               |
|                        |  | Rel-6           | (Release 6)                               |

|                                      |  |
|--------------------------------------|--|
| <b>Reason for change:</b>            | # Variable duplex is signalled with the IE "Tx/Rx frequency separation". The value range for this IE is only done taking the 2100 MHz band into account as also indicated in the Note in 10.3.3.33.<br>In case variable duplex is signalled also for 1800 MHz or 1900 MHz band, the current value range is not applicable.   |
| <b>Summary of change:</b>            | # 1. The value range of the IE "Tx/Rx frequency separation" is changed to "default", "medium variable" and "full variable".<br>2. Everything except the reference to 25.101 is removed from the semantics description. Only in 25.101 the explanation of what "default", "medium variable" and "full variable" means for the different bands.<br><br>Isolated impact analysis:<br>For a 2100 MHz UE there is no difference if this CR is implemented or not. The behaviour will also be the same independent if UTRAN have implemented the CR or not.<br>For a 1800 MHz or 1900 MHz UE this CR should be implemented in order to have the possibility to introduce medium variable and full variable Tx/Rx frequency separation also for 1800 MHz and 1900 MHz |
| <b>Consequences if not approved:</b> | # Variable Tx/Rx frequency separation for 1800 MHz and 1900 MHz is not possible to introduce in the future using the existing information element since it is not clear which value a legacy UE will signal. Instead a message extension with a new information element would need to be added.  |

|                          |  |   |   |
|--------------------------|--|---|---|
| <b>Clauses affected:</b> | # 10.3.3.33, 10.3.3.33a, 11.3  |   |   |
|                          | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">Y</td> <td style="padding: 2px 5px;">N</td> </tr> </table> | Y | N |
| Y                        | N  |   |   |

|                        |   |   |                           |   |  |
|------------------------|---|---|---------------------------|---|--|
| <b>Other specs</b>     | ⌘ | X | Other core specifications | ⌘ | CR 71 to 25.306<br>CR 5 and 6 to 25.307<br>CR 1962 to 25.331<br>25.101 |
| <b>affected:</b>       |   |   |                           |   |  |
|                        |   | X | Test specifications       |   |  |
|                        |   | X | O&M Specifications        |   |  |
| <b>Other comments:</b> | ⌘ |   |                           |   |  |

**How to create CRs using this form:**

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Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
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10.3.3.33 RF capability FDD

| Information Element/Group name | Need | Multi | Type and Reference  | Semantics description   | Version |
|--------------------------------|------|-------|---|---|---------|
| UE power class                 | MP   |       | Enumerated(1..4)  | as defined in [21]  |         |
| Tx/Rx frequency separation     | MP   |       | Enumerated( <del>190</del> default, <del>174.8</del> , <del>205.2</del> medium variable, <del>134.8</del> , <del>245.2</del> full variable) | <del>In-MHz</del> as defined in [21].<br><del>NOTE:—</del> <del>Not applicable if UE is not operating in frequency band a (as defined in [21]).</del> |         |

10.3.3.33a RF capability FDD extension

| Information Element/Group name | Need | Multi | Type and Reference  | Semantics description   |
|--------------------------------|------|-------|---|---|
| UE power class extension       | MP   |       | Enumerated(1..4)  | as defined in [21]. Four spare values are needed  |
| Tx/Rx frequency separation     | MP   |       | Enumerated( <del>190</del> default, <del>174.8</del> , <del>205.2</del> medium variable, <del>134.8</del> , <del>245.2</del> full variable) | <del>In-MHz</del> as defined in [21].<br><del>NOTE:—</del> <del>Not applicable if UE is not operating in frequency band a (as defined in [21]).</del> |

11.3 Information element definitions

```

-- *****
--
-- USER EQUIPMENT INFORMATION ELEMENTS (10.3.3)
--
-- *****

AccessStratumReleaseIndicator ::= ENUMERATED {
    rel-4, rel-5, spare14, spare13,
    spare12, spare11, spare10, spare9, spare8,
    spare7, spare6, spare5, spare4, spare3,
    spare2, spare1 }

-- TABULAR : for ActivationTime, value 'now' always appear as default, and is encoded
-- by absence of the field
ActivationTime ::= INTEGER (0..255)

BackoffControlParams ::= SEQUENCE {
    n-AP-RetransMax N-AP-RetransMax,
    n-AccessFails N-AccessFails,
    nF-BO-NoAICH NF-BO-NoAICH,
    ns-BO-Busy NS-BO-Busy,
    nF-BO-AllBusy NF-BO-AllBusy,
    nF-BO-Mismatch NF-BO-Mismatch,
    t-CPCH T-CPCH
}

C-RNTI ::= BIT STRING (SIZE (16))
    
```

```

CapabilityUpdateRequirement ::= SEQUENCE {
    ue-RadioCapabilityFDDUpdateRequirement-FDD BOOLEAN,
    -- ue-RadioCapabilityTDDUpdateRequirement-TDD is for 3.84Mcps TDD update requirement
    ue-RadioCapabilityTDDUpdateRequirement-TDD BOOLEAN,
    systemSpecificCapUpdateReqList      SystemSpecificCapUpdateReqList      OPTIONAL
}

CapabilityUpdateRequirement-r4-ext ::= SEQUENCE {
}

CapabilityUpdateRequirement-r4 ::= SEQUENCE {
    ue-RadioCapabilityFDDUpdateRequirement-FDD BOOLEAN,
    ue-RadioCapabilityTDDUpdateRequirement-TDD384 BOOLEAN,
    ue-RadioCapabilityTDDUpdateRequirement-TDD128 BOOLEAN,
    systemSpecificCapUpdateReqList      SystemSpecificCapUpdateReqList      OPTIONAL
}

CellUpdateCause ::= ENUMERATED {
    cellReselection,
    periodicalCellUpdate,
    uplinkDataTransmission,
    utran-pagingResponse,
    re-enteredServiceArea,
    radiolinkFailure,
    rlc-unrecoverableError,
    spare1 }

ChipRateCapability ::= ENUMERATED {
    mcps3-84, mcps1-28 }

CipheringAlgorithm ::= ENUMERATED {
    uea0, uea1 }

CipheringModeCommand ::= CHOICE {
    startRestart          CipheringAlgorithm,
    dummy                 NULL
}

CipheringModeInfo ::= SEQUENCE {
    -- TABULAR: The ciphering algorithm is included in the CipheringModeCommand.
    cipheringModeCommand      CipheringModeCommand,
    activationTimeForDPCH     ActivationTime                OPTIONAL,
    rb-DL-CiphActivationTimeInfo RB-ActivationTimeInfoList          OPTIONAL
}

CN-DRX-CycleLengthCoefficient ::= INTEGER (6..9)

CN-PagedUE-Identity ::= CHOICE {
    imsi-GSM-MAP             IMSI-GSM-MAP,
    tmsi-GSM-MAP             TMSI-GSM-MAP,
    p-TMSI-GSM-MAP          P-TMSI-GSM-MAP,
    imsi-DS-41              IMSI-DS-41,
    tmsi-DS-41              TMSI-DS-41,
    spare3                  NULL,
    spare2                  NULL,
    spare1                  NULL
}

CompressedModeMeasCapability ::= SEQUENCE {
    fdd-Measurements         BOOLEAN,
    -- TABULAR: The IEs tdd-Measurements, gsm-Measurements and multiCarrierMeasurements
    -- are made optional since they are conditional based on another information element.
    -- Their absence corresponds to the case where the condition is not true.
    tdd-Measurements         BOOLEAN                OPTIONAL,
    gsm-Measurements         GSM-Measurements       OPTIONAL,
    multiCarrierMeasurements BOOLEAN                OPTIONAL
}

CompressedModeMeasCapability-LCR-r4 ::= SEQUENCE {
    tdd128-Measurements      BOOLEAN                OPTIONAL
}

CompressedModeMeasCapabFDDList ::= SEQUENCE (SIZE (1..maxFreqBandsFDD)) OF
    CompressedModeMeasCapabFDD

CompressedModeMeasCapabFDD ::= SEQUENCE {
    radioFrequencyBandFDD    RadioFrequencyBandFDD    OPTIONAL,

```

```

    dl-MeasurementsFDD          BOOLEAN,
    ul-MeasurementsFDD          BOOLEAN
}

CompressedModeMeasCapabTDDList ::= SEQUENCE (SIZE (1..maxFreqBandsTDD)) OF
    CompressedModeMeasCapabTDD

CompressedModeMeasCapabTDD ::= SEQUENCE {
    radioFrequencyBandTDD      RadioFrequencyBandTDD,
    dl-MeasurementsTDD         BOOLEAN,
    ul-MeasurementsTDD         BOOLEAN
}

CompressedModeMeasCapabGSMList ::= SEQUENCE (SIZE (1..maxFreqBandsGSM)) OF
    CompressedModeMeasCapabGSM

CompressedModeMeasCapabGSM ::= SEQUENCE {
    radioFrequencyBandGSM      RadioFrequencyBandGSM,
    dl-MeasurementsGSM         BOOLEAN,
    ul-MeasurementsGSM         BOOLEAN
}

CompressedModeMeasCapabMC ::= SEQUENCE {
    dl-MeasurementsMC          BOOLEAN,
    ul-MeasurementsMC          BOOLEAN
}

CPCH-Parameters ::= SEQUENCE {
    initialPriorityDelayList    InitialPriorityDelayList          OPTIONAL,
    backoffControlParams        BackoffControlParams,
    -- TABULAR: TPC step size nested inside PowerControlAlgorithm
    powerControlAlgorithm       PowerControlAlgorithm,
    dl-DPCCH-BER                DL-DPCCH-BER
}

DL-CapabilityWithSimultaneousHS-DSCHConfig ::= ENUMERATED{kbps32, kbps64, kbps128, kbps384}

DL-DPCCH-BER ::= INTEGER (0..63)

DL-PhysChCapabilityFDD ::= SEQUENCE {
    maxNoDPCH-PDSCH-Codes      INTEGER (1..8),
    maxNoPhysChBitsReceived    MaxNoPhysChBitsReceived,
    supportForSF-512           BOOLEAN,
    supportOfPDSCH             BOOLEAN,
    simultaneousSCCPCH-DPCH-Reception SimultaneousSCCPCH-DPCH-Reception
}

DL-PhysChCapabilityFDD-v380ext ::= SEQUENCE {
    supportOfDedicatedPilotsForChEstimation SupportOfDedicatedPilotsForChEstimation OPTIONAL
}

SupportOfDedicatedPilotsForChEstimation ::= ENUMERATED { true }

DL-PhysChCapabilityTDD ::= SEQUENCE {
    maxTS-PerFrame             MaxTS-PerFrame,
    maxPhysChPerFrame          MaxPhysChPerFrame,
    minimumSF                  MinimumSF-DL,
    supportOfPDSCH             BOOLEAN,
    maxPhysChPerTS             MaxPhysChPerTS
}

DL-PhysChCapabilityTDD-LCR-r4 ::= SEQUENCE {
    maxTS-PerSubFrame          MaxTS-PerSubFrame-r4,
    maxPhysChPerSubFrame-r4    MaxPhysChPerSubFrame-r4,
    minimumSF                  MinimumSF-DL,
    supportOfPDSCH             BOOLEAN,
    maxPhysChPerTS             MaxPhysChPerTS,
    supportOf8PSK              BOOLEAN
}

DL-TransChCapability ::= SEQUENCE {
    maxNoBitsReceived          MaxNoBits,
    maxConvCodeBitsReceived    MaxNoBits,
    turboDecodingSupport       TurboSupport,
    maxSimultaneousTransChs     MaxSimultaneousTransChsDL,
    maxSimultaneousCCTrCH-Count MaxSimultaneousCCTrCH-Count,
    maxReceivedTransportBlocks MaxTransportBlocksDL,
    maxNumberOfTFC             MaxNumberOfTFC-DL,

```

```

    maxNumberOfTF                MaxNumberOfTF
}

DRAC-SysInfo ::=
    transmissionProbability
    maximumBitRate
}

DRAC-SysInfoList ::=
    SEQUENCE (SIZE (1..maxDRACclasses)) OF
        DRAC-SysInfo

DSCH-RNTI ::=
    BIT STRING (SIZE (16))

ESN-DS-41 ::=
    BIT STRING (SIZE (32))

EstablishmentCause ::=
    ENUMERATED {
        originatingConversationalCall,
        originatingStreamingCall,
        originatingInteractiveCall,
        originatingBackgroundCall,
        originatingSubscribedTrafficCall,
        terminatingConversationalCall,
        terminatingStreamingCall,
        terminatingInteractiveCall,
        terminatingBackgroundCall,
        emergencyCall,
        interRAT-CellReselection,
        interRAT-CellChangeOrder,
        registration,
        detach,
        originatingHighPrioritySignalling,
        originatingLowPrioritySignalling,
        callRe-establishment,
        terminatingHighPrioritySignalling,
        terminatingLowPrioritySignalling,
        terminatingCauseUnknown,
        spare12,
        spare11,
        spare10,
        spare9,
        spare8,
        spare7,
        spare6,
        spare5,
        spare4,
        spare3,
        spare2,
        spare1 }

FailureCauseWithProtErr ::=
    CHOICE {
        configurationUnsupported        NULL,
        physicalChannelFailure          NULL,
        incompatibleSimultaneousReconfiguration
                                        NULL,
        compressedModeRuntimeError     TGPSI,
        protocolError                   ProtocolErrorInformation,
        cellUpdateOccurred              NULL,
        invalidConfiguration            NULL,
        configurationIncomplete         NULL,
        unsupportedMeasurement          NULL,
        spare7                          NULL,
        spare6                          NULL,
        spare5                          NULL,
        spare4                          NULL,
        spare3                          NULL,
        spare2                          NULL,
        spare1                          NULL
    }

FailureCauseWithProtErrTrId ::=
    SEQUENCE {
        rrc-TransactionIdentifier      RRC-TransactionIdentifier,
        failureCause                    FailureCauseWithProtErr
    }

GSM-Measurements ::=
    SEQUENCE {
        gsm900                          BOOLEAN,
        dcs1800                          BOOLEAN,
        gsm1900                          BOOLEAN
    }

```

```

}
H-RNTI ::= BIT STRING (SIZE (16))
HSDSCH-capability-class ::= INTEGER (0..63)
UESpecificBehaviourInformationIdle ::= BIT STRING (SIZE (4))
UESpecificBehaviourInformationInterRAT ::= BIT STRING (SIZE (8))

IMSI-and-ESN-DS-41 ::= SEQUENCE {
    imsi-DS-41          IMSI-DS-41,
    esn-DS-41          ESN-DS-41
}
IMSI-DS-41 ::= OCTET STRING (SIZE (5..7))
InitialPriorityDelayList ::= SEQUENCE (SIZE (1..maxASC)) OF
    NS-IP
InitialUE-Identity ::= CHOICE {
    imsi                IMSI-GSM-MAP,
    tmsi-and-LAI        TMSI-and-LAI-GSM-MAP,
    p-TMSI-and-RAI      P-TMSI-and-RAI-GSM-MAP,
    imei                IMEI,
    esn-DS-41          ESN-DS-41,
    imsi-DS-41          IMSI-DS-41,
    imsi-and-ESN-DS-41 IMSI-and-ESN-DS-41,
    tmsi-DS-41          TMSI-DS-41
}
IntegrityCheckInfo ::= SEQUENCE {
    messageAuthenticationCode MessageAuthenticationCode,
    rrc-MessageSequenceNumber RRC-MessageSequenceNumber
}
IntegrityProtActivationInfo ::= SEQUENCE {
    rrc-MessageSequenceNumberList RRC-MessageSequenceNumberList
}
IntegrityProtectionAlgorithm ::= ENUMERATED {
    uial
}
IntegrityProtectionModeCommand ::= CHOICE {
    startIntegrityProtection SEQUENCE {
        integrityProtInitNumber IntegrityProtInitNumber
    },
    modify                    SEQUENCE {
        dl-IntegrityProtActivationInfo IntegrityProtActivationInfo
    }
}
IntegrityProtectionModeInfo ::= SEQUENCE {
    -- TABULAR: DL integrity protection activation info and Integrity
    -- protection intialisation number have been nested inside
    -- IntegrityProtectionModeCommand.
    integrityProtectionModeCommand IntegrityProtectionModeCommand,
    integrityProtectionAlgorithm   IntegrityProtectionAlgorithm   OPTIONAL
}
IntegrityProtInitNumber ::= BIT STRING (SIZE (32))
MaxHcContextSpace ::= ENUMERATED {
    by512, by1024, by2048, by4096,
    by8192
}
MaxROHC-ContextSessions-r4 ::= ENUMERATED {
    s2, s4, s8, s12, s16, s24, s32, s48,
    s64, s128, s256, s512, s1024, s16384
}
MaximumAM-EntityNumberRLC-Cap ::= ENUMERATED {
    am3, am4, am5, am6,
    am8, am16, am30
}
-- Actual value MaximumBitRate = IE value * 16

```

```

MaximumBitRate ::= INTEGER (0..32)
MaximumRLC-WindowSize ::= ENUMERATED { mws2047, mws4095 }
MaxNoDPDCH-BitsTransmitted ::= ENUMERATED {
    b600, b1200, b2400, b4800,
    b9600, b19200, b28800, b38400,
    b48000, b57600 }
MaxNoBits ::= ENUMERATED {
    b640, b1280, b2560, b3840, b5120,
    b6400, b7680, b8960, b10240,
    b20480, b40960, b81920, b163840 }
MaxNoPhysChBitsReceived ::= ENUMERATED {
    b600, b1200, b2400, b3600,
    b4800, b7200, b9600, b14400,
    b19200, b28800, b38400, b48000,
    b57600, b67200, b76800 }
MaxNoSCCPCH-RL ::= ENUMERATED {
    r11 }
MaxNumberOfTF ::= ENUMERATED {
    tf32, tf64, tf128, tf256,
    tf512, tf1024 }
MaxNumberOfTFC-DL ::= ENUMERATED {
    tfc16, tfc32, tfc48, tfc64, tfc96,
    tfc128, tfc256, tfc512, tfc1024 }
MaxNumberOfTFC-UL ::= ENUMERATED {
    tfc4, tfc8, tfc16, tfc32, tfc48, tfc64,
    tfc96, tfc128, tfc256, tfc512, tfc1024 }
MaxPhysChPerFrame ::= INTEGER (1..224)
MaxPhysChPerSubFrame-r4 ::= INTEGER (1..96)
MaxPhysChPerTimeslot ::= ENUMERATED {
    ts1, ts2 }
MaxPhysChPerTS ::= INTEGER (1..16)
MaxSimultaneousCCTrCH-Count ::= INTEGER (1..8)
MaxSimultaneousTransChsDL ::= ENUMERATED {
    e4, e8, e16, e32 }
MaxSimultaneousTransChsUL ::= ENUMERATED {
    e2, e4, e8, e16, e32 }
MaxTransportBlocksDL ::= ENUMERATED {
    tb4, tb8, tb16, tb32, tb48,
    tb64, tb96, tb128, tb256, tb512 }
MaxTransportBlocksUL ::= ENUMERATED {
    tb2, tb4, tb8, tb16, tb32, tb48,
    tb64, tb96, tb128, tb256, tb512 }
MaxTS-PerFrame ::= INTEGER (1..14)
MaxTS-PerSubFrame-r4 ::= INTEGER (1..6)
-- TABULAR: MeasurementCapability contains dependencies to UE-MultiModeRAT-Capability,
-- the conditional fields have been left mandatory for now.
MeasurementCapability ::= SEQUENCE {
    downlinkCompressedMode          CompressedModeMeasCapability,
    uplinkCompressedMode            CompressedModeMeasCapability
}
MeasurementCapability-v370 ::= SEQUENCE{
    compressedModeMeasCapabFDDList  CompressedModeMeasCapabFDDList,
    compressedModeMeasCapabTDDList  CompressedModeMeasCapabTDDList  OPTIONAL,
    compressedModeMeasCapabGSMLList CompressedModeMeasCapabGSMLList  OPTIONAL,
    compressedModeMeasCapabMC       CompressedModeMeasCapabMC       OPTIONAL
}

```



```

MeasurementCapability-r4-ext ::= SEQUENCE {
    downlinkCompressedMode-LCR          CompressedModeMeasCapability-LCR-r4,
    uplinkCompressedMode-LCR           CompressedModeMeasCapability-LCR-r4
}

MessageAuthenticationCode ::= BIT STRING (SIZE (32))

MinimumSF-DL ::= ENUMERATED {
    sf1, sf16 }

MinimumSF-UL ::= ENUMERATED {
    sf1, sf2, sf4, sf8, sf16 }

MultiModeCapability ::= ENUMERATED {
    tdd, fdd, fdd-tdd }

MultiRAT-Capability ::= SEQUENCE {
    supportOfGSM          BOOLEAN,
    supportOfMulticarrier  BOOLEAN
}

N-300 ::= INTEGER (0..7)

N-301 ::= INTEGER (0..7)

N-302 ::= INTEGER (0..7)

N-304 ::= INTEGER (0..7)

N-308 ::= INTEGER (1..8)

N-310 ::= INTEGER (0..7)

N-312 ::= ENUMERATED {
    s1, s50, s100, s200, s400,
    s600, s800, s1000 }

N-312ext ::= ENUMERATED {
    s2, s4, s10, s20 }

N-312-r5 ::= ENUMERATED {
    s1, s2, s4, s10, s20,
    s50, s100, s200, s400,
    s600, s800, s1000 }

N-313 ::= ENUMERATED {
    s1, s2, s4, s10, s20,
    s50, s100, s200 }

N-315 ::= ENUMERATED {
    s1, s50, s100, s200, s400,
    s600, s800, s1000 }

N-315ext ::= ENUMERATED {
    s2, s4, s10, s20 }

N-315-r5 ::= ENUMERATED {
    s1, s2, s4, s10, s20,
    s50, s100, s200, s400,
    s600, s800, s1000 }

N-AccessFails ::= INTEGER (1..64)

N-AP-RetransMax ::= INTEGER (1..64)

NetworkAssistedGPS-Supported ::= ENUMERATED {
    networkBased,
    ue-Based,
    bothNetworkAndUE-Based,
    noNetworkAssistedGPS }

NF-BO-AllBusy ::= INTEGER (0..31)

NF-BO-NoAICH ::= INTEGER (0..31)

NF-BO-Mismatch ::= INTEGER (0..127)

```

```

NS-BO-Busy ::= INTEGER (0..63)

NS-IP ::= INTEGER (0..28)

P-TMSI-and-RAI-GSM-MAP ::= SEQUENCE {
    p-TMSI P-TMSI-GSM-MAP,
    rai RAI
}

PagingCause ::= ENUMERATED {
    terminatingConversationalCall,
    terminatingStreamingCall,
    terminatingInteractiveCall,
    terminatingBackgroundCall,
    terminatingHighPrioritySignalling,
    terminatingLowPrioritySignalling,
    terminatingCauseUnknown,
    spare
}

PagingRecord ::= CHOICE {
    cn-Identity SEQUENCE {
        pagingCause PagingCause,
        cn-DomainIdentity CN-DomainIdentity,
        cn-pagedUE-Identity CN-PagedUE-Identity
    },
    utran-Identity SEQUENCE {
        u-RNTI U-RNTI,
        cn-OriginatedPage-connectedMode-UE SEQUENCE {
            pagingCause PagingCause,
            cn-DomainIdentity CN-DomainIdentity,
            pagingRecordTypeID PagingRecordTypeID
        }
    }
} OPTIONAL

PagingRecordList ::= SEQUENCE (SIZE (1..maxPage)) OF
    PagingRecord

PDCP-Capability ::= SEQUENCE {
    losslessSRNS-RelocationSupport BOOLEAN,
    supportForRfc2507 CHOICE {
        notSupported NULL,
        supported MaxHcContextSpace
    }
}

PDCP-Capability-r4-ext ::= SEQUENCE {
    supportForRfc3095 CHOICE {
        notSupported NULL,
        supported SEQUENCE {
            maxROHC-ContextSessions MaxROHC-ContextSessions-r4 DEFAULT s16,
            reverseCompressionDepth INTEGER (0..65535) DEFAULT 0
        }
    }
}

PDCP-Capability-r5-ext ::= SEQUENCE {
    supportForRfc3095ContextRelocation BOOLEAN
}

PhysicalChannelCapability ::= SEQUENCE {
    fddPhysChCapability SEQUENCE {
        downlinkPhysChCapability DL-PhysChCapabilityFDD,
        uplinkPhysChCapability UL-PhysChCapabilityFDD
    }
    -- tddPhysChCapability describes the 3.84Mcps TDD physical channel capability
    tddPhysChCapability SEQUENCE {
        downlinkPhysChCapability DL-PhysChCapabilityTDD,
        uplinkPhysChCapability UL-PhysChCapabilityTDD
    }
} OPTIONAL

-- PhysicalChannelCapability-LCR-r4 describes the 1.28Mcps TDD physical channel capability
PhysicalChannelCapability-LCR-r4 ::= SEQUENCE {
    tdd128-PhysChCapability SEQUENCE {
        downlinkPhysChCapability DL-PhysChCapabilityTDD-LCR-r4,
        uplinkPhysChCapability UL-PhysChCapabilityTDD-LCR-r4
    }
}

```

```

    }
    OPTIONAL
}
-- PhysicalChannelCapability-hspdsch-r5 describes the HS-PDSCH physical channel capability
PhysicalChannelCapability-hspdsch-r5 ::= SEQUENCE {
    supportOfDedicatedPilotsForChannelEstimationOfHSDSCH BOOLEAN,
    modeSpecificInfo CHOICE {
        fdd SEQUENCE {
            hspdsch-supported CHOICE {
                supported HSDSCH-capability-class,
                notsupported NULL
            }
        },
        tdd384 SEQUENCE {
            hspdsch-supported CHOICE {
                supported HSDSCH-capability-class,
                notsupported NULL
            }
        },
        tdd128 SEQUENCE {
            hspdsch-supported CHOICE {
                supported HSDSCH-capability-class,
                notsupported NULL
            }
        }
    }
    OPTIONAL
}

PNBSCH-Allocation-r4 ::= SEQUENCE {
    numberOfRepetitionsPerSFNPeriod ENUMERATED {
        c2, c3, c4, c5, c6, c7, c8, c9, c10,
        c12, c14, c16, c18, c20, c24, c28, c32,
        c36, c40, c48, c56, c64, c72, c80 }
}

ProtocolErrorCause ::= ENUMERATED {
    asn1-ViolationOrEncodingError,
    messageTypeNonexistent,
    messageNotCompatibleWithReceiverState,
    ie-ValueNotComprehended,
    informationElementMissing,
    messageExtensionNotComprehended,
    spare2, spare1 }

ProtocolErrorIndicator ::= ENUMERATED {
    noError, errorOccurred }

ProtocolErrorIndicatorWithMoreInfo ::= CHOICE {
    noError NULL,
    errorOccurred SEQUENCE {
        rrc-TransactionIdentifier RRC-TransactionIdentifier,
        protocolErrorInformation ProtocolErrorInformation
    }
}

ProtocolErrorMoreInformation ::= SEQUENCE {
    diagnosticsType CHOICE {
        type1 CHOICE {
            asn1-ViolationOrEncodingError NULL,
            messageTypeNonexistent NULL,
            messageNotCompatibleWithReceiverState
                IdentificationOfReceivedMessage,
            ie-ValueNotComprehended
                IdentificationOfReceivedMessage,
            conditionalInformationElementError
                IdentificationOfReceivedMessage,
            messageExtensionNotComprehended
                IdentificationOfReceivedMessage,
            spare1 NULL,
            spare2 NULL
        },
        spare NULL
    }
}

RadioFrequencyBandFDD ::= ENUMERATED {
    fdd2100,
    fdd1900,
    spare6, spare5, spare4, spare3, spare2, spare1 }

```

```

RadioFrequencyBandTDDList ::=      ENUMERATED {
                                     a, b, c, ab, ac, bc, abc, spare }

RadioFrequencyBandTDD ::=          ENUMERATED {a, b, c, spare}

RadioFrequencyBandGSM ::=          ENUMERATED {
                                     gsm450,
                                     gsm480,
                                     gsm850,
                                     gsm900P,
                                     gsm900E,
                                     gsm1800,
                                     gsm1900,
                                     spare9, spare8, spare7, spare6, spare5,
                                     spare4, spare3, spare2, spare1}

Rb-timer-indicator ::=             SEQUENCE {
                                     t314-expired      BOOLEAN,
                                     t315-expired      BOOLEAN }

Re-EstablishmentTimer ::=          ENUMERATED {
                                     useT314, useT315
                                     }

RedirectionInfo ::=                CHOICE {
                                     frequencyInfo,
                                     interRATInfo
                                     }

RejectionCause ::=                 ENUMERATED {
                                     congestion,
                                     unspecified }

ReleaseCause ::=                   ENUMERATED {
                                     normalEvent,
                                     unspecified,
                                     pre-emptiveRelease,
                                     congestion,
                                     re-establishmentReject,
                                     directedsignallingconnectionre-establishment,
                                     userInactivity,
                                     spare }

RF-Capability ::=                  SEQUENCE {
                                     fddRF-Capability  SEQUENCE {
                                         ue-PowerClass      UE-PowerClass,
                                         txRxFrequencySeparation TxRxFrequencySeparation
                                     } OPTIONAL,
                                     tddRF-Capability  SEQUENCE {
                                         ue-PowerClass      UE-PowerClass,
                                         radioFrequencyBandTDDList RadioFrequencyBandTDDList,
                                         chipRateCapability  ChipRateCapability
                                     } OPTIONAL
                                     }

RF-Capability-r4-ext ::=            SEQUENCE {
                                     tddRF-Capability  SEQUENCE {
                                         ue-PowerClass      UE-PowerClass,
                                         radioFrequencyBandTDDList RadioFrequencyBandTDDList,
                                         chipRateCapability  ChipRateCapability
                                     } OPTIONAL
                                     }

RLC-Capability ::=                 SEQUENCE {
                                     totalRLC-AM-BufferSize TotalRLC-AM-BufferSize,
                                     maximumRLC-WindowSize MaximumRLC-WindowSize,
                                     maximumAM-EntityNumber MaximumAM-EntityNumberRLC-Cap
                                     }

RLC-Capability-r5-ext ::=           SEQUENCE {
                                     totalRLC-AM-BufferSize TotalRLC-AM-BufferSize-r5-ext
                                     }

RRC-MessageSequenceNumber ::=      INTEGER (0..15)

RRC-MessageSequenceNumberList ::=  SEQUENCE (SIZE (4..5)) OF

```

```

RRC-MessageSequenceNumber
RRC-StateIndicator ::= ENUMERATED {
    cell-DCH, cell-FACH, cell-PCH, ura-PCH }
RRC-TransactionIdentifier ::= INTEGER (0..3)
S-RNTI ::= BIT STRING (SIZE (20))
S-RNTI-2 ::= BIT STRING (SIZE (10))
SecurityCapability ::= SEQUENCE {
    cipheringAlgorithmCap BIT STRING {
        spare15(0),
        spare14(1),
        spare13(2),
        spare12(3),
        spare11(4),
        spare10(5),
        spare9(6),
        spare8(7),
        spare7(8),
        spare6(9),
        spare5(10),
        spare4(11),
        spare3(12),
        spare2(13),
        uea1(14),
        uea0(15)
    } (SIZE (16)),
    integrityProtectionAlgorithmCap BIT STRING {
        spare15(0),
        spare14(1),
        spare13(2),
        spare12(3),
        spare11(4),
        spare10(5),
        spare9(6),
        spare8(7),
        spare7(8),
        spare6(9),
        spare5(10),
        spare4(11),
        spare3(12),
        spare2(13),
        uia1(14),
        spare0(15)
    } (SIZE (16))
}
SimultaneousSCCPCH-DPCH-Reception ::= CHOICE {
    notSupported NULL,
    supported SEQUENCE {
        maxNoSCCPCH-RL MaxNoSCCPCH-RL,
        -- simultaneousSCCPCH-DPCH-DPDCH-Reception is applicable only if
        -- the IE Support of PDSCH = TRUE
        simultaneousSCCPCH-DPCH-DPDCH-Reception BOOLEAN
    }
}
SRNC-Identity ::= BIT STRING (SIZE (12))
START-Value ::= BIT STRING (SIZE (20))
STARTList ::= SEQUENCE (SIZE (1..maxCNdomains)) OF
    STARTSingle
STARTSingle ::= SEQUENCE {
    cn-DomainIdentity CN-DomainIdentity,
    start-Value START-Value
}
SystemSpecificCapUpdateReq ::= ENUMERATED {
    gsm }
SystemSpecificCapUpdateReqList ::= SEQUENCE (SIZE (1..maxSystemCapability)) OF
    SystemSpecificCapUpdateReq

```

```

T-300 ::=
    ENUMERATED {
        ms100, ms200, ms400, ms600, ms800,
        ms1000, ms1200, ms1400, ms1600,
        ms1800, ms2000, ms3000, ms4000,
        ms6000, ms8000 }

T-301 ::=
    ENUMERATED {
        ms100, ms200, ms400, ms600, ms800,
        ms1000, ms1200, ms1400, ms1600,
        ms1800, ms2000, ms3000, ms4000,
        ms6000, ms8000, spare }

T-302 ::=
    ENUMERATED {
        ms100, ms200, ms400, ms600, ms800,
        ms1000, ms1200, ms1400, ms1600,
        ms1800, ms2000, ms3000, ms4000,
        ms6000, ms8000, spare }

T-304 ::=
    ENUMERATED {
        ms100, ms200, ms400,
        ms1000, ms2000, spare3, spare2, spare1 }

T-305 ::=
    ENUMERATED {
        noUpdate, m5, m10, m30,
        m60, m120, m360, m720 }

T-307 ::=
    ENUMERATED {
        s5, s10, s15, s20,
        s30, s40, s50, spare }

T-308 ::=
    ENUMERATED {
        ms40, ms80, ms160, ms320 }

T-309 ::=
    INTEGER (1..8)

T-310 ::=
    ENUMERATED {
        ms40, ms80, ms120, ms160,
        ms200, ms240, ms280, ms320 }

T-311 ::=
    ENUMERATED {
        ms250, ms500, ms750, ms1000,
        ms1250, ms1500, ms1750, ms2000 }

-- The value 0 for T-312 is not used in this version of the specification
T-312 ::=
    INTEGER (0..15)

T-313 ::=
    INTEGER (0..15)

T-314 ::=
    ENUMERATED {
        s0, s2, s4, s6, s8,
        s12, s16, s20 }

T-315 ::=
    ENUMERATED {
        s0, s10, s30, s60, s180,
        s600, s1200, s1800 }

T-316 ::=
    ENUMERATED {
        s0, s10, s20, s30, s40,
        s50, s-inf, spare }

T-317 ::=
    ENUMERATED {
        s0, s10, s30, s60, s180,
        s600, s1200, s1800 }

T-CPCH ::=
    ENUMERATED {
        ct0, ct1 }

TMSI-and-LAI-GSM-MAP ::=
    SEQUENCE {
        tmsi
        lai
    }

TMSI-DS-41 ::=
    OCTET STRING (SIZE (2..17))

TotalRLC-AM-BufferSize ::=
    ENUMERATED {
        kb2, kb10, kb50, kb100,

```

```

        kb150, kb500, kb1000, spare }

TotalRLC-AM-BufferSize-r5-ext ::= ENUMERATED {
    kb200, kb300, kb400, kb750}

TotalBufferSize ::= ENUMERATED {
    kb50, kb100, kb150, kb200,
    kb300, spare3, spare2, spare1 }

-- Actual value TransmissionProbability = IE value * 0.125
TransmissionProbability ::= INTEGER (1..8)

TransportChannelCapability ::= SEQUENCE {
    dl-TransChCapability    DL-TransChCapability,
    ul-TransChCapability    UL-TransChCapability
}

TurboSupport ::= CHOICE {
    notSupported           NULL,
    supported              MaxNoBits
}

TxRxFrequencySeparation ::= ENUMERATED {
    mhz190default, mhz174-8-205-2medium-variable,
    mhz134-8-245-2full-variable }

U-RNTI ::= SEQUENCE {
    srnc-Identity          SRNC-Identity,
    s-RNTI                 S-RNTI
}

U-RNTI-Short ::= SEQUENCE {
    srnc-Identity          SRNC-Identity,
    s-RNTI-2              S-RNTI-2
}

UE-ConnTimersAndConstants ::= SEQUENCE {
-- Optional is used also for parameters for which the default value is the last one read in SIB1
-- t-301 and n-301 should not be used by the UE in this version of the specification
    t-301                  T-301                DEFAULT ms2000,
    n-301                  N-301                DEFAULT 2,
    t-302                  T-302                DEFAULT ms4000,
    n-302                  N-302                DEFAULT 3,
    t-304                  T-304                DEFAULT ms2000,
    n-304                  N-304                DEFAULT 2,
    t-305                  T-305                DEFAULT m30,
    t-307                  T-307                DEFAULT s30,
    t-308                  T-308                DEFAULT ms160,
    t-309                  T-309                DEFAULT 5,
    t-310                  T-310                DEFAULT ms160,
    n-310                  N-310                DEFAULT 4,
    t-311                  T-311                DEFAULT ms2000,
    t-312                  T-312                DEFAULT 1,
    -- n-312 shall be ignored if n-312 in UE-ConnTimersAndConstants-v3a0ext is present, and the
    -- value of that element shall be used instead.
    n-312                  N-312                DEFAULT s1,
    t-313                  T-313                DEFAULT 3,
    n-313                  N-313                DEFAULT s20,
    t-314                  T-314                DEFAULT s12,
    t-315                  T-315                DEFAULT s180,
    -- n-315 shall be ignored if n-315 in UE-ConnTimersAndConstants-v3a0ext is present, and the
    -- value of that element shall be used instead.
    n-315                  N-315                DEFAULT s1,
    t-316                  T-316                DEFAULT s30,
    t-317                  T-317                DEFAULT s180
}

UE-ConnTimersAndConstants-v3a0ext ::= SEQUENCE {
    n-312                  N-312ext             OPTIONAL,
    n-315                  N-315ext             OPTIONAL
}

UE-ConnTimersAndConstants-r5 ::= SEQUENCE {
-- Optional is used also for parameters for which the default value is the last one read in SIB1
-- t-301 and n-301 should not be used by the UE in this version of the specification

```

```

t-301          T-301          DEFAULT ms2000,
n-301          N-301          DEFAULT 2,
t-302          T-302          DEFAULT ms4000,
n-302          N-302          DEFAULT 3,
t-304          T-304          DEFAULT ms2000,
n-304          N-304          DEFAULT 2,
t-305          T-305          DEFAULT m30,
t-307          T-307          DEFAULT s30,
t-308          T-308          DEFAULT ms160,
t-309          T-309          DEFAULT 5,
t-310          T-310          DEFAULT ms160,
n-310          N-310          DEFAULT 4,
t-311          T-311          DEFAULT ms2000,
t-312          T-312          DEFAULT 1,
n-312          N-312-r5      DEFAULT s1,
t-313          T-313          DEFAULT 3,
n-313          N-313          DEFAULT s20,
t-314          T-314          DEFAULT s12,
t-315          T-315          DEFAULT s180,
n-315          N-315-r5      DEFAULT s1,
t-316          T-316          DEFAULT s30,
t-317          T-317          DEFAULT s180
}

UE-IdleTimersAndConstants ::= SEQUENCE {
  t-300          T-300,
  n-300          N-300,
  t-312          T-312,
  -- n-312 shall be ignored if n-312 in UE-IdleTimersAndConstants-v3a0ext is present, and the
  -- value of that element shall be used instead.
  n-312          N-312
}

UE-IdleTimersAndConstants-v3a0ext ::= SEQUENCE {
  n-312          N-312ext          OPTIONAL
}

UE-MultiModeRAT-Capability ::= SEQUENCE {
  multiRAT-CapabilityList
  multiModeCapability
}

UE-PowerClass ::= INTEGER (1..4)

UE-PowerClass-v370 ::= ENUMERATED {class1, class2, class3, class4,
  spare4, spare3, spare2, spare1 }

UE-RadioAccessCapability ::= SEQUENCE {
  pdcp-Capability          PDCP-Capability,
  rlc-Capability           RLC-Capability,
  transportChannelCapability TransportChannelCapability,
  rf-Capability            RF-Capability,
  physicalChannelCapability PhysicalChannelCapability,
  ue-MultiModeRAT-Capability UE-MultiModeRAT-Capability,
  securityCapability       SecurityCapability,
  ue-positioning-Capability UE-Positioning-Capability,
  measurementCapability    MeasurementCapability          OPTIONAL
}

UE-RadioAccessCapabilityInfo ::= SEQUENCE {
  ue-RadioAccessCapability          UE-RadioAccessCapability,
  ue-RadioAccessCapability-v370ext UE-RadioAccessCapability-v370ext
}

UE-RadioAccessCapability-v370ext ::= SEQUENCE {
  ue-RadioAccessCapabBandFDDList UE-RadioAccessCapabBandFDDList
}

UE-RadioAccessCapability-v380ext ::= SEQUENCE {
  ue-PositioningCapabilityExt-v380 UE-PositioningCapabilityExt-v380
}

UE-RadioAccessCapability-v3a0ext ::= SEQUENCE {
  ue-PositioningCapabilityExt-v3a0 UE-PositioningCapabilityExt-v3a0
}

UE-PositioningCapabilityExt-v380 ::= SEQUENCE {
  rx-tx-TimeDifferenceType2Capable BOOLEAN
}

```



```

}

UE-PositioningCapabilityExt-v3a0 ::= SEQUENCE {
    validity-CellPCH-UraPCH      ENUMERATED { true }
}

UE-RadioAccessCapabBandFDDList ::= SEQUENCE (SIZE (1..maxFreqBandsFDD)) OF
    UE-RadioAccessCapabBandFDD

UE-RadioAccessCapabBandFDD ::= SEQUENCE{
    radioFrequencyBandFDD      RadioFrequencyBandFDD,
    fddRF-Capability           SEQUENCE {
        ue-PowerClass          UE-PowerClass-v370,
        txRxFrequencySeparation TxRxFrequencySeparation
    } OPTIONAL,
    measurementCapability      MeasurementCapability-v370
}

UE-RadioAccessCapability-r4-ext ::= SEQUENCE {
    pdcp-Capability-r4-ext      PDCP-Capability-r4-ext,
    rf-Capability               RF-Capability-r4-ext,
    physicalChannelCapability-LCR PhysicalChannelCapability-LCR-r4,
    measurementCapability-r4-ext MeasurementCapability-r4-ext OPTIONAL
}

UE-RadioAccessCapability-v4xyext ::= SEQUENCE {
    -- R99 UEs shall include IE "ue-TestLevelIndicator"
    accessStratumReleaseIndicator AccessStratumReleaseIndicator
}

UE-RadioAccessCapability-r5-ext ::= SEQUENCE {
    dl-CapabilityWithSimultaneousHS-DSCHConfig DL-CapabilityWithSimultaneousHS-DSCHConfig
    OPTIONAL,
    pdcp-Capability-r5-ext          PDCP-Capability-r5-ext,
    rlc-Capability-r5-ext           RLC-Capability-r5-ext,
    physicalChannelCapability        PhysicalChannelCapability-hspdsch-r5
}

UL-PhysChCapabilityFDD ::= SEQUENCE {
    maxNoDPDCH-BitsTransmitted      MaxNoDPDCH-BitsTransmitted,
    supportOfPCPCH                  BOOLEAN
}

UL-PhysChCapabilityTDD ::= SEQUENCE {
    maxTS-PerFrame                  MaxTS-PerFrame,
    maxPhysChPerTimeslot            MaxPhysChPerTimeslot,
    minimumSF                       MinimumSF-UL,
    supportOfPUSCH                  BOOLEAN
}

UL-PhysChCapabilityTDD-LCR-r4 ::= SEQUENCE {
    maxTS-PerSubFrame               MaxTS-PerSubFrame-r4,
    maxPhysChPerTimeslot            MaxPhysChPerTimeslot,
    minimumSF                       MinimumSF-UL,
    supportOfPUSCH                  BOOLEAN,
    supportOf8PSK                   BOOLEAN
}

UL-TransChCapability ::= SEQUENCE {
    maxNoBitsTransmitted            MaxNoBits,
    maxConvCodeBitsTransmitted      MaxNoBits,
    turboEncodingSupport            TurboSupport,
    maxSimultaneousTransChs         MaxSimultaneousTransChsUL,
    modeSpecificInfo                CHOICE {
        fdd                          NULL,
        tdd                          SEQUENCE {
            maxSimultaneousCCTrCH-Count MaxSimultaneousCCTrCH-Count
        }
    },
    maxTransmittedBlocks            MaxTransportBlocksUL,
    maxNumberOfTFC                  MaxNumberOfTFC-UL,
    maxNumberOfTF                    MaxNumberOfTF
}

UE-Positioning-Capability ::= SEQUENCE {
    standaloneLocMethodsSupported    BOOLEAN,
    ue-BasedOTDOA-Supported          BOOLEAN,
    networkAssistedGPS-Supported     NetworkAssistedGPS-Supported,
}

```

```
    supportForUE-GPS-TimingOfCellFrames    BOOLEAN,
    supportForIPDL                          BOOLEAN
}

UE-SecurityInformation ::=          SEQUENCE {
    start-CS                               START-Value
}

URA-UpdateCause ::=              ENUMERATED {
    changeOfURA,
    periodicURAUpdate,
    dummy,
    spare1 }

UTRAN-DRX-CycleLengthCoefficient ::= INTEGER (3..9)

WaitTime ::=                       INTEGER (0..15)
```