**TSG-RAN Meeting #6** *TSGRP#6(99)777*
**Nice, France, 13 – 15 December 1999**

**Title:** **Agreed CRs of category "C" (Modifications) and "F" (Corrections) to TS 25.104**

**Source:** **TSG-RAN WG4**

**Agenda item:** **5.4.3**

| TSG_DOC | SPEC | CR | REV | 3G_PH | SUBJECT | CAT | VERS_CURR | VERS_NEW |
|---|---|---|---|---|---|---|---|---|
| R4-99651 | 25.104 | 001 | | R99 | Correction to Annex B.4 Birth-Death propagation conditions | F | 3.0.0 | 3.1.0 |
| R4-99784 | 25.104 | 003 | | R99 | Measurement channels for uplink | F | 3.0.0 | 3.1.0 |
| R4-99815 | 25.104 | 005 | | R99 | Clarification of ACLR requirement | F | 3.0.0 | 3.1.0 |
| R4-99819 | 25.104 | 006 | | R99 | New Spurious Emission requirement for Category B | F | 3.0.0 | 3.1.0 |
| R4-99827 | 25.104 | 007 | | R99 | Base Station Primary CPICH power accuracy | F | 3.0.0 | 3.1.0 |
| R4-99858 | 25.104 | 008 | | R99 | Correction of Receiver sensitivity | F | 3.0.0 | 3.1.0 |
| R4-99947 | 25.104 | 010 | | R99 | Correction of BS output power definition | F | 3.0.0 | 3.1.0 |
| R4-99949 | 25.104 | 011 | | R99 | Clarification of power control requirements in TS 25.104 | F | 3.0.0 | 3.1.0 |
| R4-99950 | 25.104 | 012 | | R99 | Corrections for BS FDD Blocking Characteristics | F | 3.0.0 | 3.1.0 |
| R4-99967 | 25.104 | 013 | | R99 | Output power accuracies in extreme conditions | F | 3.0.0 | 3.1.0 |
| R4-99970 | 25.104 | 014 | | R99 | Clarification of Antenna Diversity receiver requirements | F | 3.0.0 | 3.1.0 |
| R4-99972 | 25.104 | 015 | | R99 | Spurious Emission in 25.104 | F | 3.0.0 | 3.1.0 |
| R4-99977 | 25.104 | 016 | | R99 | Change of propagation conditions | F | 3.0.0 | 3.1.0 |
| R4-99979 | 25.104 | 017 | | R99 | Clarification of the EVM requirement | F | 3.0.0 | 3.1.0 |
| R4-99996 | 25.104 | 018 | | R99 | Introduction of requirement values in section 8 | F | 3.0.0 | 3.1.0 |
| R4-99997 | 25.104 | 019 | | R99 | Update of ITU Region 2 Specific Specifications and proposed universal channel numbering. | C | 3.0.0 | 3.1.0 |
| R4-99A09 | 25.104 | 020 | | R99 | Corrections for BS FDD RX spurious emission | F | 3.0.0 | 3.1.0 |
| R4-99000 | 25.104 | 021 | | R99 | BS Spurious Emission Requirements for Co-Existence UTRA- | B | 3.0.0 | 3.1.0 |

**3GPP TSG RAN WG4 Meeting #8**
**Sophia Antipolis, France, 26-29 October 1999**

***Document***
*e.g. for 3GPP use the format TP-99xxx*
*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

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| **25.104** | **CR** | **001** | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

| For submission to: | TSG RAN #6 | for approval | X | strategic | | *(for SMG use only)* |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | |

*Form: CR cover sheet, version 2 for 3GPP and SMG* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:** *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

**Source:** Nokia Networks **Date:** 20.10.1999

**Subject:** Correction to Annex B.4 Birth-Death propagation conditions

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | | | | |
|---|---|---|---|---|---|
| F | Correction | X | **Release:** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | | | Release 97 | |
| C | Functional modification of feature | | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

**Reason for change:** Editorial error when incorporating accepted change into the specification; all values should have been changed from +8µs/-8µs to +5µs/-5µs, including text and picture.

**Clauses affected:** Annex B.4

**Other specs affected:**

| | | |
|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: |
| Other GSM core specifications | [ ] | → List of CRs: |
| MS test specifications | [ ] | → List of CRs: |
| BSS test specifications | [ ] | → List of CRs: |
| O&M specifications | [ ] | → List of CRs: |

**Other comments:**

## B.4 Birth-Death propagation conditions

The dynamic propagation conditions for the test of the baseband performance is a non-fading propagation channel with two taps. The moving propagation conditions has two taps, Path1 and Path2 which alternate between 'birth' and 'death'. The positions the paths appear are randomly selected with an equal probability rate and is shown in Figure B.2.

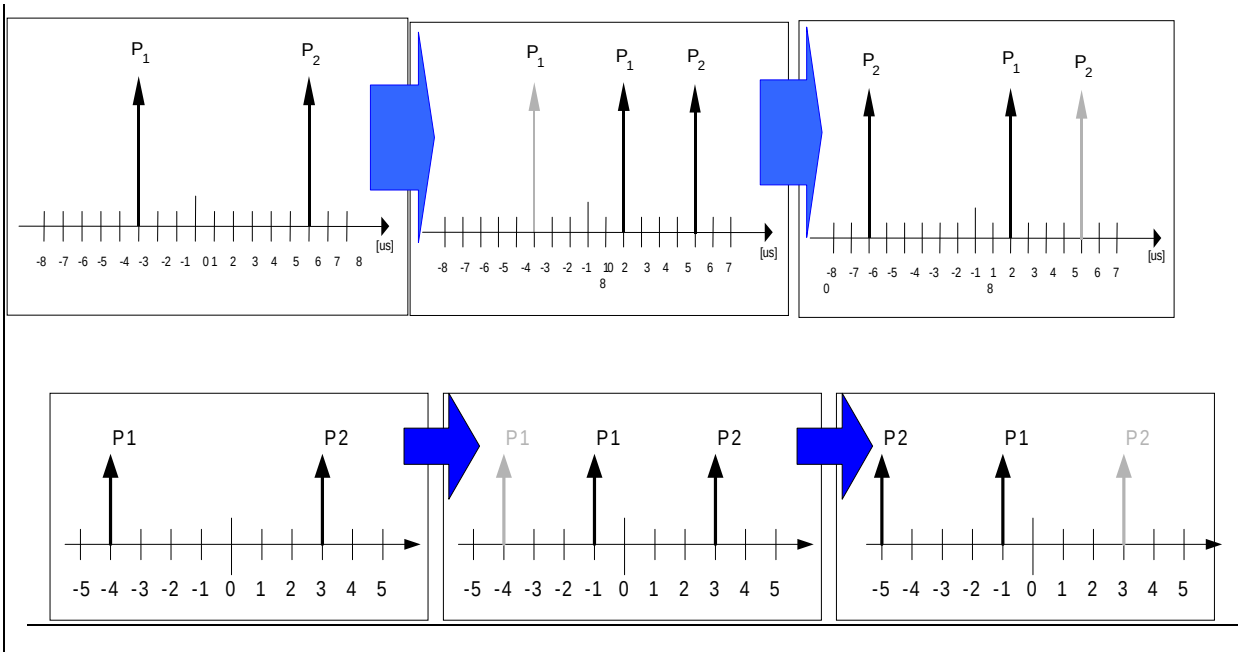


**Figure B.2: Birth death propagation sequence**

Note

1. Two paths, Path1 and Path2 are randomly selected between -5μs and + 5μs.
2. After 191 ms, Path1 vanishes and reappears immediately at a new location randomly selected between ~~-8μs~~ -5μs and ~~+ 8μs~~ +5μs but excludes the point Path2.
3. After an additional 191 ms, Path2 vanishes and reappears immediately at a new location randomly selected between -5μs and + 5μs but excludes the point Path1.
4. The sequence in 2) and 3) is repeated.

**3GPP TSG RAN4 Meeting #9**
**Bath, United Kingdom, 07-10 DEC 1999**

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*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

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| 25.104 | CR | 003 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

| For submission to: | RAN#6 | for approval | X | Strategic | | (for SMG use only) |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | |

*Form: CR cover sheet, version 2 for 3GPP and SMG* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:** *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

**Source:** Fujitsu **Date:** 1999-12-07

**Subject:** Measurement channels for uplink

**Work item:** UTRAN

**Category:** *(only one category shall be marked with an X)*

| | | | | | |
|---|---|---|---|---|---|
| F | Correction | X | **Release:** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | | | Release 97 | |
| C | Functional modification of feature | | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

**Reason for change:**
- To keep consistency with the latest specifications defined in Layer 1 and Layer 2, rate-matching parameters and Transport block sizes, which are used in Uplink measurement channels, are revised.

**Clauses affected:** Annex A

**Other specs Affected:**

| | | |
|---|---|---|
| Other 3G core specifications | | → List of CRs: |
| Other GSM core specifications | | → List of CRs: |
| MS test specifications | | → List of CRs: |
| BSS test specifications | X | → List of CRs: |
| O&M specifications | | → List of CRs: |

**Other comments:**

help.doc

<--------- double-click here for help and instructions on how to create a CR.

# A.1 Summary of UL reference measurement channels

The parameters for the UL reference measurement channels are specified in Table A.1 and the channel coding is detailed in figure A.1 through A.5 respectively. Note that for all cases, one DPCCH shall be attached to DPDCH(s).

**Table A.1: Reference measuremet channels for UL DCH**

| Parameter | | DCH for DTCH / DCH for DCCH | | | | | Unit |
|---|---|---|---|---|---|---|---|
| DPDCH | Information bit rate | 12.2/2.4 | 64/2.4 | 144/2.4 | 384/2.4 | 2048/2.4 | kbps |
| | Physical channel | 60/15 | 240/15 | 480/15 | 960/15 | 960/15 | kbps |
| | Spreading factor | 64 | 16 | 8 | 4 | 4 | |
| | Repetition rate | 2223/221 7 | 19/1917 | 89/90 | -1817/-18 | -16.5/-10 | % |
| | Interleaving | 20 | 40 | 40 | 40 | 80 | ms |
| | Number of DPDCHs | 1 | 1 | 1 | 1 | 6 | |
| DPCCH | Dedicated pilot | 6 | | | | | bit/slot |
| | Power control | 2 | | | | | bit/slot |
| | TFCI | 2 | | | | | bit/slot |
| | Spreading factor | 256 | | | | | |
| Power ratio of DPCCH/DPDCH | | -2.69 | -5.46 | -9.54 | -9.54 | -9.54 | dB |
| Amplitude ratio of DPCCH/DPDCH | | 0.7333 | 0.5333 | 0.3333 | 0.3333 | 0.3333 | |

## A.2 UL reference measurement channel for 12.2 kbps

The parameters for the UL reference measurement channel for 12.2 kbps are specified in Table A.2 and the channel coding is detailed in Figure A.2.

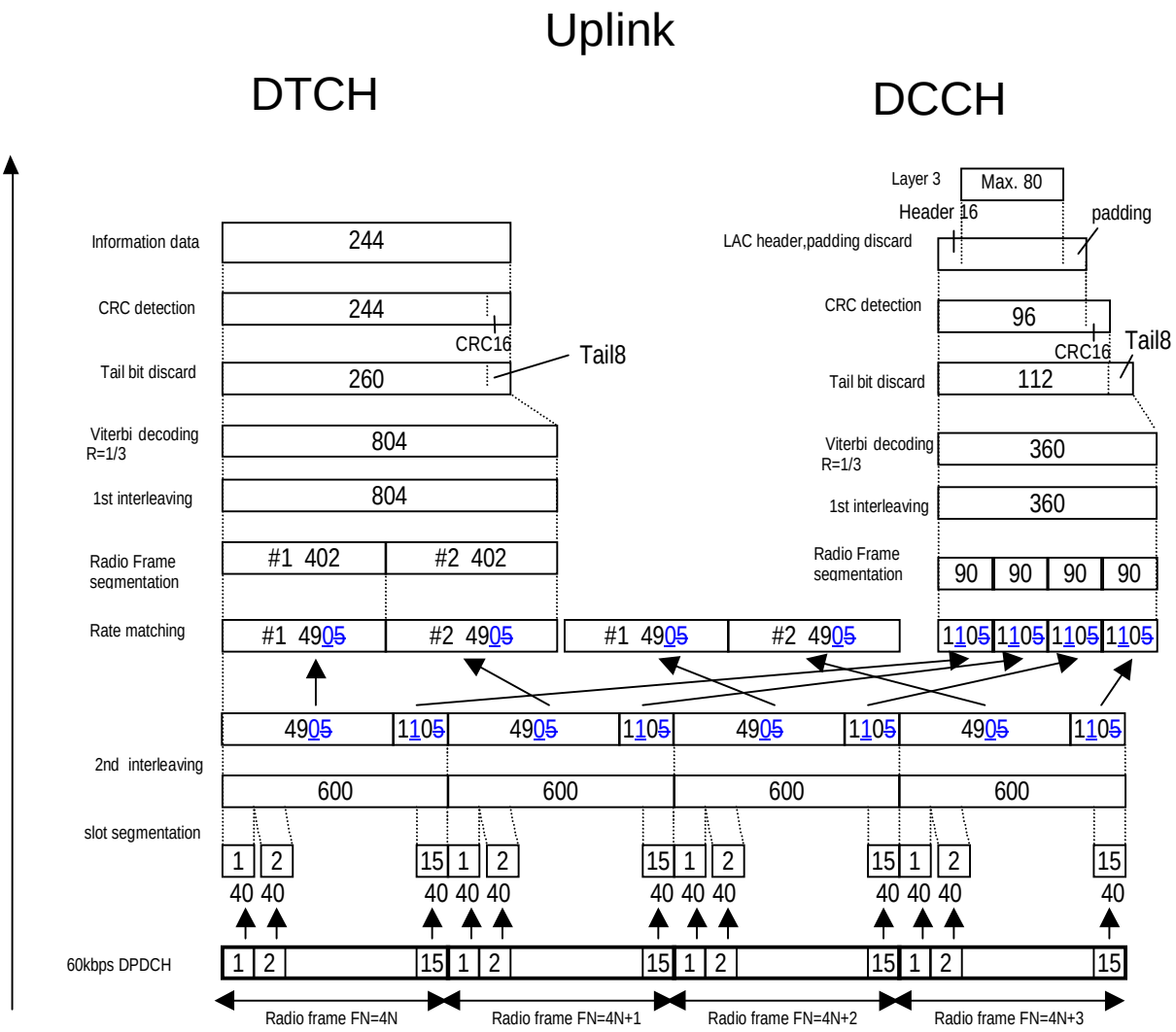


**Table A.2: UL reference measurement channel (12.2 kbps)**

| Parameter | Level | Unit |
|---|---|---|
| Information bit rate | 12.2 | kbps |
| DPCH | 60 | kbps |
| Power control | Off | |
| TFCI | On | |
| Repetition | 223 | % |

## A.3 UL reference measurement channel for 64 kbps

The parameters for the UL reference measurement channel for 64 kbps are specified in Table A.3 and the channel coding is detailed in Figure A.3.

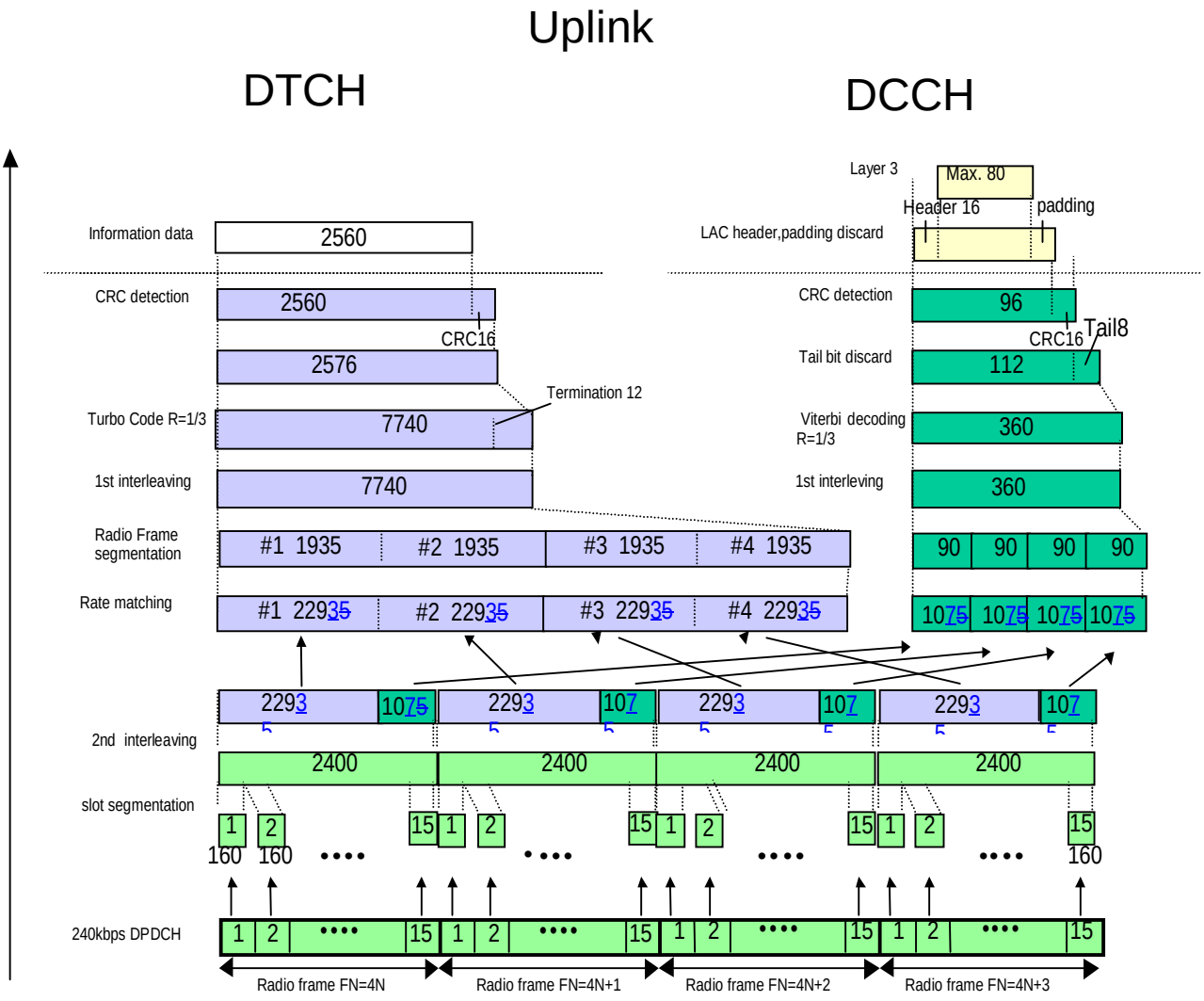


**Table A.3: UL reference measurement channel (64kbps)**

| Parameter | Level | Unit |
|---|---|---|
| Information bit rate | 64 | kbps |
| DPCH | 240 | kbps |
| Power control | Off | |
| TFCI | On | |
| Repetition | 19 | % |

## A.4 UL reference measurement channel for 144 kbps

The parameters for the UL reference measurement channel for 144 kbps are specified in Table A.4 and the channel coding is detailed in Figure A.4.

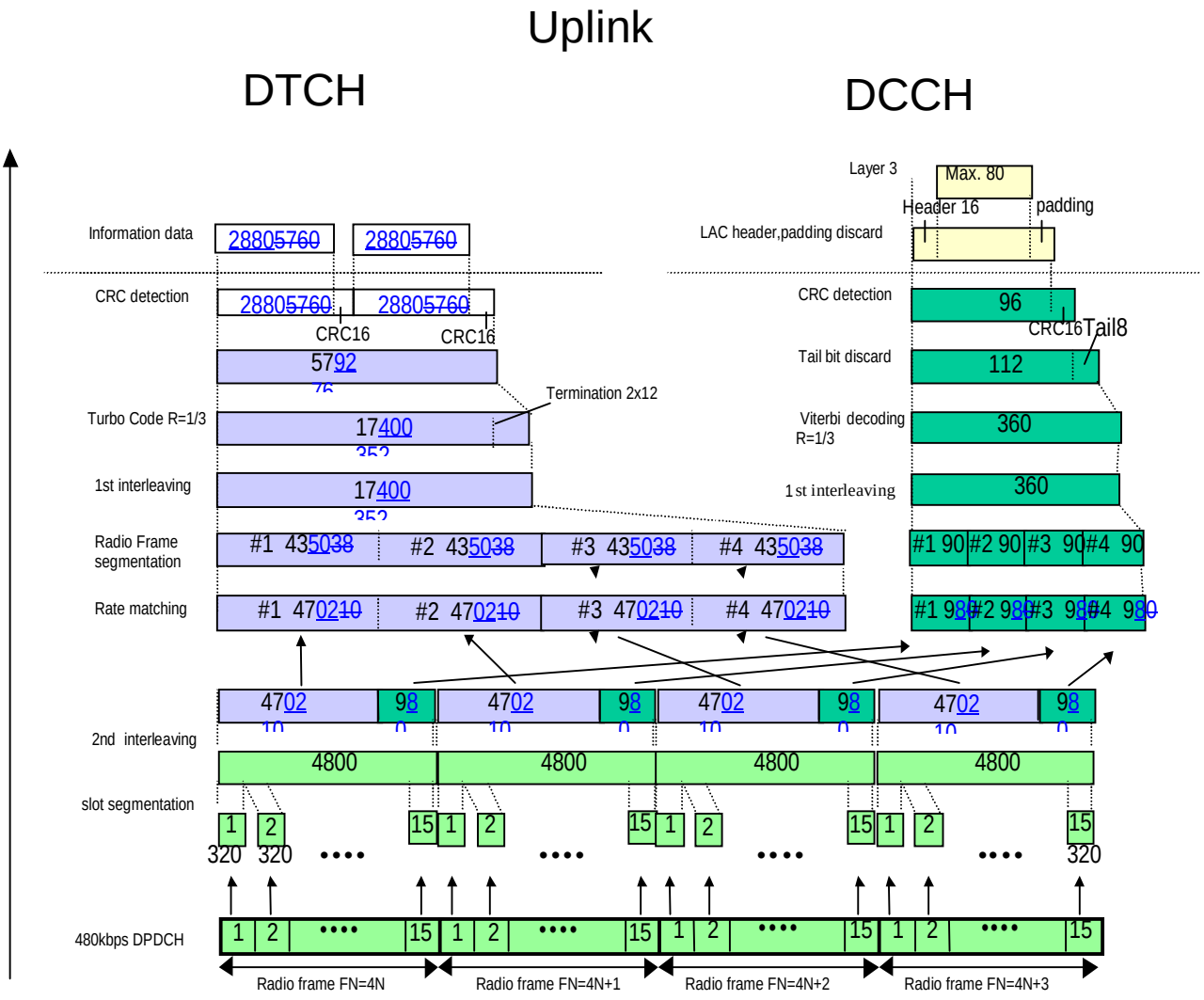


**Table A.4: UL reference measurement channel (144kbps)**

| Parameter | Level | Unit |
|---|---|---|
| Information bit rate | 144 | kbps |
| DPCH | 480 | kbps |
| Power control | Off | |
| TFCI | On | |
| Repetition | 8~~9~~ | % |

## A.5 UL reference measurement channel for 384 kbps

The parameters for the UL reference measurement channel for 384 kbps are specified in Table A.5 and the channel coding is detailed in Figure A.5.

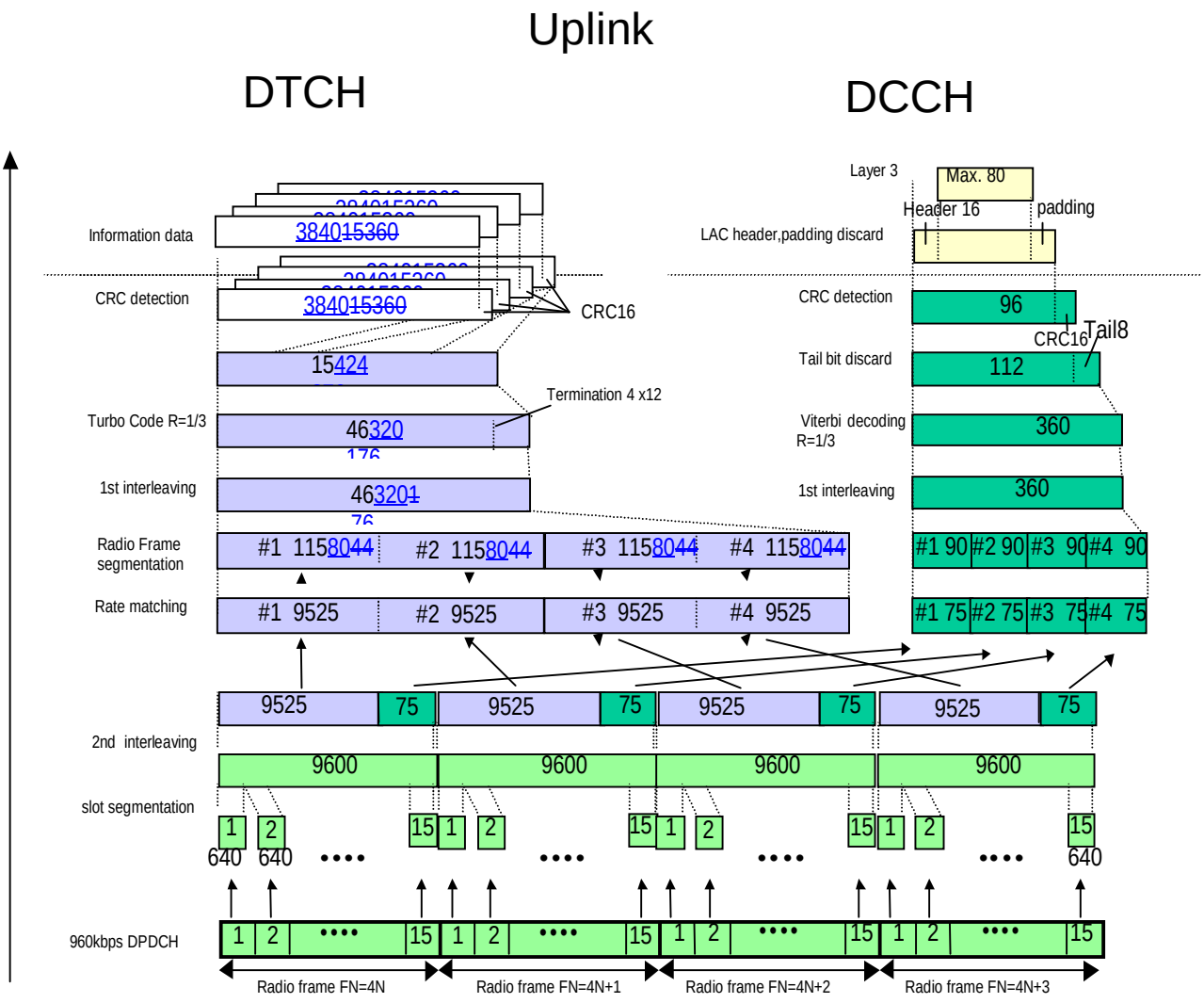


**Table A.5: UL reference measurement channel (384kbps)**

| Parameter | Level | Unit |
|---|---|---|
| Information bit rate | 384 | kbps |
| DPCH | 960 | kbps |
| Power control | Off | |
| TFCI | On | |
| Puncturing | 18~~17~~ | % |

## A.6 UL reference measurement channel for 2048 kbps

The parameters for the UL reference measurement channel for 2048 kbps are specified in Table A.6 and the channel coding is detailed in Figure A.6.

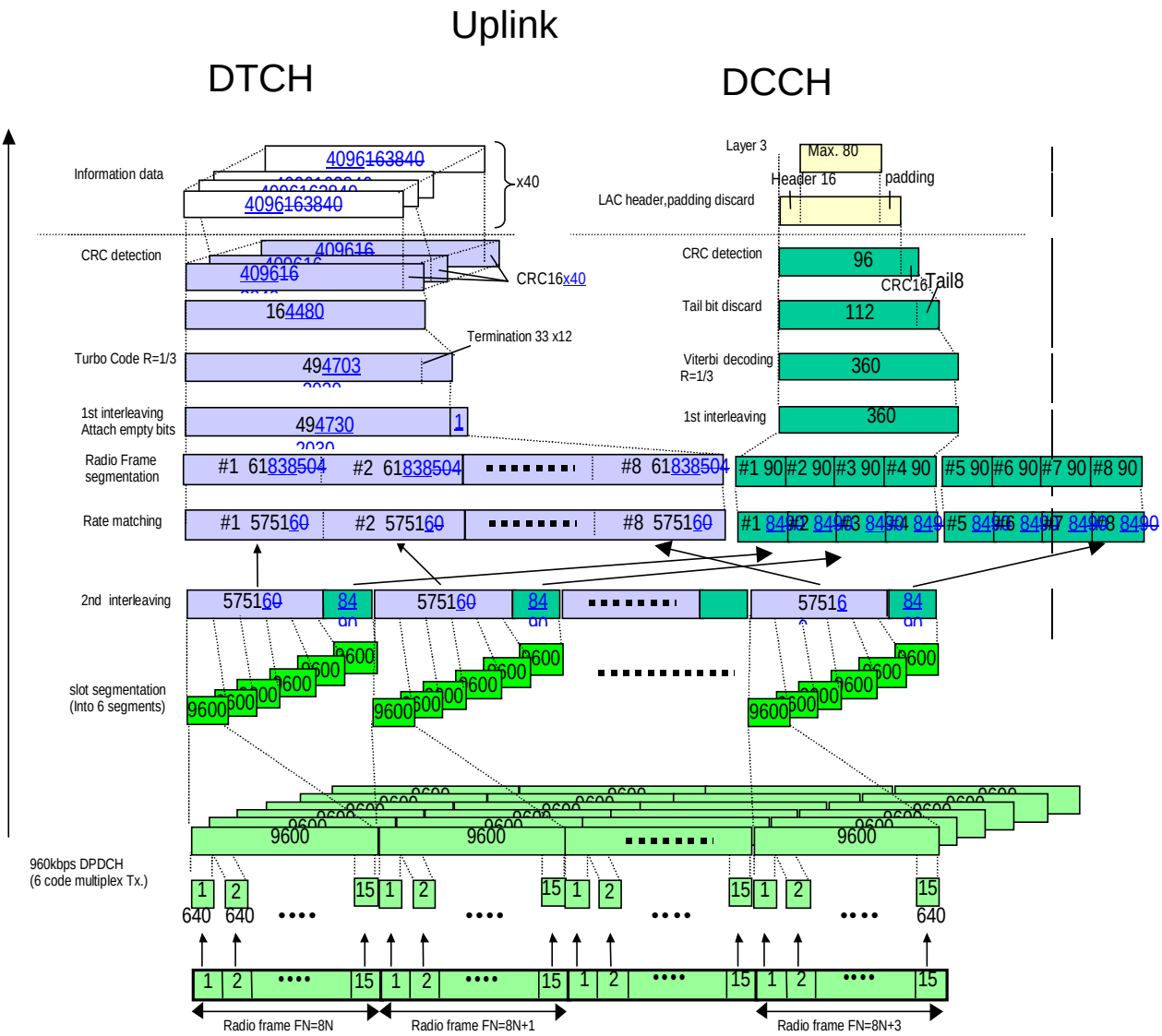


**Table A.6: UL reference measurement channel (2048kbps)**

| Parameter | Level | Unit |
|---|---|---|
| Information bit rate | 2048 | Kbps |
| DPCH | 960 | Kbps |
| Power control | Off | |
| TFCI | On | |
| Puncturing | 16.5 | % |

**3GPP TSG-R4 meeting #9**
**Bath, UK, 7-10 December 1999**

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# 3G CHANGE REQUEST

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**25.104** **CR** **005** Current Version: 3.0.0

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

*(only one box should be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

**Proposed change affects:** *(at least one should be marked with an X)*

USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Ericsson **Date:** 99-11-30

**Subject:** Clarification of ACLR requirement

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** In version 3.0.0, the ACLR requirement is not specified in terms of how many simultaneous carriers it applies to. The proposed correction makes the requirement mandatory for both single- and multi-carrier implementations.

**Clauses affected:** 6.6.2.2

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: | |
| Other 2G core specifications | [ ] | → List of CRs: | |
| MS test specifications | [ ] | → List of CRs: | |
| BSS test specifications | [X] | → List of CRs: | TS 25.141 v2.0.4 |
| O&M specifications | [ ] | → List of CRs: | |

**Other comments:**

### 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s). Both the transmitted power and the received power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

#### 6.6.2.2.1 Minimum requirement

The ACLR shall be better than the value specified in Table 6.7.

**Table 6.7: BS ACLR**

| BS adjacent channel offset below the first or above the last carrier frequency used | ACLR limit |
|---|---|
| ±5 MHz | 45 dB |
| ±10 MHz | 50 dB |

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**Bath, UK, 7-10 December 1999**

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# 3G CHANGE REQUEST

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| **25.104** | **CR** | **006** | Current Version: | 3.0.0 |
|---|---|---|---|---|

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

*(only one box should be marked with an X)*

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**Proposed change affects:** *(at least one should be marked with an X)*

USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Ericsson **Date:** 99-12-02

**Subject:** New Spurious Emission requirement for Category B

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** A revision of the Category B requirements is ongoing in ITU-R. These new requirements are more stringent than the present ones taken from ITU-R SM.329-7.

**Clauses affected:**

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: | |
| Other 2G core specifications | [ ] | → List of CRs: | |
| MS test specifications | [ ] | → List of CRs: | |
| BSS test specifications | [X] | → List of CRs: | TS 25.141 v2.0.4 |
| O&M specifications | [ ] | → List of CRs: | |

**Other comments:**

#### 6.6.3.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-7 [1], are applied.

##### 6.6.3.1.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table 6.9: BS Mandatory spurious emissions limits, Category B**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 9kHz ↔ 150kHz | -36 dBm | 1 kHz | Bandwidth as in ITU-R SM.329-7, s4.1 |
| 150kHz ↔ 30MHz | - 36 dBm | 10 kHz | Bandwidth as in ITU-R SM.329-7, s4.1 |
| 30MHz ↔ 1GHz | -36 dBm | 100 kHz | Bandwidth as in ITU-R SM.329-7, s4.1 |
| 1GHz<br>↔<br>Fc1 - 60 MHz or 2100 MHz<br>*whichever is the higher* | -30 dBm | 1 MHz | Bandwidth as in ITU-R SM.329-7, s4.1 |
| Fc1 – 60 MHz or 2100 MHz *whichever is the higher*<br>↔<br>Fc1 – 50 MHz or 2100 MHz *whichever is the higher* | -25 dBm | 1 MHz | Specification more stringent than ITU-R SM.329-7, s4.1 |
| Fc1 – 50 MHz or 2100 MHz *whichever is the higher*<br>↔<br>Fc2 + 50 MHz or 2180 MHz *whichever is the lower* | -15 dBm | 1 MHz | Specification more stringent than ITU-R SM.329-7, s4.1 |
| Fc2 + 50 MHz or 2180 MHz *whichever is the lower*~~Fc1 – 60 MHz or 2100 MHz~~<br>~~*whichever is the higher*~~<br>↔<br>Fc2 + 60 MHz or 2180 MHz<br>*whichever is the lower* | -25~~13~~ dBm | 1 MHz | Specification more stringent than ITU-R SM.329-7, s4.1~~Specification equal to Cat. A~~<br>~~Bandwidth as in ITU-R SM.329-7, s4.1~~ |

| | | | |
|---|---|---|---|
| Fc2 + 60 MHz or 2180 MHz<br><br>*whichever is the lower*<br><br>↔<br><br>12.75 GHz | -30 dBm | 1 MHz | Bandwidth as in ITU-R SM.329-7, s4.1. Upper frequency as in ITU-R SM.329-7, s2.6 |

Fc1 : Center frequency of first carrier frequency used.

Fc2 : Center frequency of last carrier frequency used.

**3GPP TSG-R4 #9**

**Bath, UK, 6-10 December 1999**

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| 25.104 | CR | 007 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN# 6 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

*(only one box should be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

**Proposed change affects:** *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Ericsson **Date:** 29/11/1999

**Subject:** Base Station Primary CPICH power accuracy

**3G Work item:** UTRAN

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** CPICH power accuracy to be added. The figure 2.1 dB was agreed for TS 25.141 at WG4#8.

**Clauses affected:** 25.104: Sections 6.4.5

**Other specs affected:**

| | | |
|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: |
| Other 2G core specifications | [ ] | → List of CRs: |
| MS test specifications | [ ] | → List of CRs: |
| BSS test specifications | [ ] | → List of CRs: |
| O&M specifications | [ ] | → List of CRs: |

**Other comments:**

### 6.4.5 Primary CPICH power

Primary CPICH power is the transmission power of the Common Pilot Channel averaged over one frame.

Primary CPICH power is indicated on the BCH.

#### 6.4.5.1 Requirement

CPICH power shall be within ~~±TBD~~ 2.1dB of the value indicated by a signaling message.

**3GPP TSG-R4 meeting #9**
**Bath, UK, 7-10 December 1999**

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# 3G CHANGE REQUEST

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| **25.104** | **CR** | **008** | Current Version: | 3.0.0 |
|---|---|---|---|---|

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

*(only one box should be marked with an X)*

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**Proposed change affects:** *(at least one should be marked with an X)*

USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Ericsson **Date:** 99-12-02

**Subject:** Correction of Receiver sensitivity

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** The present value in v3.0.0 is based on a measurement channel different than the one presently in Annex A of TS 25.104. The new proposed value is based on Annex A.

**Clauses affected:** 7.2.1

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: | |
| Other 2G core specifications | [ ] | → List of CRs: | |
| MS test specifications | [ ] | → List of CRs: | |
| BSS test specifications | [X] | → List of CRs: | TS 25.141 v2.0.4 |
| O&M specifications | [ ] | → List of CRs: | |

**Other comments:**

## 7.2 Reference sensitivity level

The reference sensitivity is the minimum receiver input power measured at the antenna connector at which the Bit Error Rate (BER) does not exceed the specific value indicated in section 7.2.1. The signal power is equally applied to each antenna connector for diversity.

### 7.2.1 Minimum requirement

For the measurement channel specified in Annex A, the reference sensitivity level and performance of the BS shall be as specified in Table 7.1.

**Table 7.1: BS reference sensitivity levels**

| Measurement channel | BS reference sensitivity level (dBm) | BER |
|---|---|---|
| 12.2 kbps | ~~-122~~ 121 dBm | BER shall not exceed 0.001 |

**3GPP TSG-R4 meeting #9**
**Bath, UK, 7-10 December 1999**

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| 25.104 | CR | 010 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

*(only one box should be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

**Proposed change affects:** *(at least one should be marked with an X)*

USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Nortel Networks **Date:** 99-12-08

**Subject:** Correction of BS output power definition

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** In version 3.0.0, definition of the output power has an inappropriate mention of the measurement duration.

**Clauses affected:** 6.2

**Other specs affected:**

| | | |
|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: |
| Other 2G core specifications | [ ] | → List of CRs: |
| MS test specifications | [ ] | → List of CRs: |
| BSS test specifications | [ ] | → List of CRs: |
| O&M specifications | [ ] | → List of CRs: |

**Other comments:**

# 6 Transmitter characteristics

## 6.1 General

Unless detailed the transmitter characteristic are specified at the antenna connector.

## 6.2 Base station output power

Output power, Pout, of the base station is the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter ~~during one slot~~.

### 6.2.1 Base station maximum output power

Maximum output power, Pmax, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

#### 6.2.1.1 Minimum requirement

In normal conditions, the Base station maximum output power shall remain within +2 dB and –2dB of the manufacturer's rated power.

In extreme conditions, the Base station maximum output power shall remain within +[ ] and –[ ] of the manufacturer's rated power.

## 6.3 Frequency stability

Frequency stability is ability of the BS to transmit at the assigned carrier frequency.

### 6.3.1 Minimum requirement

The modulated carrier frequency of the BS shall be accurate to within ± 0.05 ppm for RF frequency generation.

## 6.4 Output power dynamics

Power control is used to limit the interference level. The transmitter uses a quality-based power control on both the uplink and downlink.

### 6.4.1 Inner loop power control in the downlink

Inner loop power control in the downlink is the ability of the BS transmitter to adjust its output power in accordance with the TPC symbols received in the uplink.

#### 6.4.1.1 Power control steps

The power control step is the required step change in the DL transmitter output power in response to a power control command.

##### 6.4.1.1.1 Minimum requirement

The BS transmitter shall have the capability of setting the inner loop output power with a step sizes of 1dB mandatory and 0.5 dB optional

(a) The tolerance of the transmitter output power step due to inner loop power control shall be within the range shown in Table 6.1.

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**Bath, UK, 7-10 December 1999**

# 3G CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

**25.104** **CR** **011** Current Version: 3.0.0

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 *list TSG meeting no. here ↑*

for approval [X] for information [ ] *(only one box should be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

**Proposed change affects:** *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Ericsson **Date:** 99-12-08

**Subject:** Clarification of power control requirements in TS 25.104

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** V3.0.0 does not define what entity the power control step tolerance refers to. It is now clarified to refer to code channel power. In addition, the requirement “power control cycles per second” is redundant, since the requirement on power control steps in 6.4.1 tests this. Section 6.4.4 is therefore removed.

**Clauses affected:** 6.4.1, 6.4.4

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: | |
| Other 2G core specifications | [ ] | → List of CRs: | |
| MS test specifications | [ ] | → List of CRs: | |
| BSS test specifications | [X] | → List of CRs: | TS 25.141 v2.0.5 |
| O&M specifications | [ ] | → List of CRs: | |

**Other comments:**

# 6.4 Output power dynamics

Power control is used to limit the interference level. The transmitter uses a quality-based power control on both the uplink and downlink.

## 6.4.1 Inner loop power control in the downlink

Inner loop power control in the downlink is the ability of the BS transmitter to adjust ~~its~~ the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

### 6.4.1.1 Power control steps

The power control step is the required step change in the DL transmitter output power of a code channel in response to ~~a~~ the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

#### 6.4.1.1.1 Minimum requirement

The BS transmitter shall have the capability of setting the inner loop output power with a step sizes of 1dB mandatory and 0.5 dB optional

(a) The tolerance of the ~~transmitter output~~ power control step due to inner loop power control shall be within the range shown in Table 6.1.

(b) The tolerance of the ~~transmitter average~~ combined output power ~~step~~change ~~-~~due to inner loop power control shall be within the range shown in Table 6.2.

**Table 6.1: Transmitter power control step tolerance**

| Power control commands in the down link | Transmitter power control step tolerance | | | |
|---|---|---|---|---|
| | 1 dB step size | | 0.5 dB step size | |
| | Lower | Upper | Lower | Upper |
| Up (TPC command "1") | +0.5 dB | +1.5 dB | +0.25 dB | +0.75 dB |
| Down (TPC command "0") | -0.5 dB | -1.5 dB | -0.25 dB | -0.75 dB |

**Table 6.2: Transmitter ~~average~~ combined ~~power control~~output power ~~step~~ change tolerance**

| Power control commands in the down link | Transmitter combined output power change tolerance ~~Transmitter power control tolerance~~ after 10 consecutive equal commands (up or down) | | | |
|---|---|---|---|---|
| | 1 dB step size | | 0.5dB step size | |
| | Lower | Upper | Lower | Upper |
| Up (TPC command "1") | +8 dB | +12 dB | +4 dB | +6 dB |
| Down (TPC command "0") | -8 dB | -12 dB | -4 dB | -6 dB |

## 6.4.2 Power control dynamic range

The power control dynamic range is the difference between the maximum and the minimum transmit output power of a code channel for a specified reference condition.

### 6.4.2.1 Minimum requirements

Down link (DL) power control dynamic range:

Maximum power: BS maximum output power – 3 dB or greater

Minimum power: BS maximum output power – 28 dB or less

## 6.4.3 Total power dynamic range

The total power dynamic range is the difference between the maximum and the minimum total transmit output power for a specified reference condition.

Note: The upper limit of the dynamic range is the BS maximum output power. The lower limit of the dynamic range is the lowest minimum power from the BS when no traffic channels are activated.

### 6.4.3.1 Minimum requirement

The down link (DL) total power dynamic range shall be 18 dB or greater.

## ~~6.4.4 Power control cycles per second~~

~~This is the maximum rate for the DL transmitter power control steps.~~

~~The down link (DL) rate of power control steps shall be 1.5 kHz.~~

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**Bath, UK, 7-10 December 1999**

***Document***
*e.g. for 3GPP use the format TP-99xxx*
*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| 25.104 | CR | 012 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

For submission to: RAN #6 *list expected approval meeting # here ↑*

| | | | | |
|---|---|---|---|---|
| for approval | X | strategic | | *(for SMG use only)* |
| for information | | non-strategic | | |

*Form: CR cover sheet, version 2 for 3GPP and SMG* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:** *(at least one should be marked with an X)*

| (U)SIM | ME | UTRAN / Radio | Core Network |
|---|---|---|---|
| | | X | |

**Source:** Ericsson **Date:** 8/12/99

**Subject:** Corrections for BS FDD Blocking Characteristics

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in an earlier release | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Release:**

| | |
|---|---|
| Phase 2 | |
| Release 96 | |
| Release 97 | |
| Release 98 | |
| Release 99 | X |
| Release 00 | |

**Reason for change:** Definition of the same frequency step size and a general lower and upper limit of the frequency region for blocking measurements as for UE.

**Clauses affected:** 7.5

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | | → List of CRs: | |
| Other GSM core specifications | | → List of CRs: | |
| MS test specifications | | → List of CRs: | |
| BSS test specifications | X | → List of CRs: | TS 25.141 v2.0.5 |
| O&M specifications | | → List of CRs: | |

**Other comments:**

## 7.5 Blocking characteristics

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels; without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies as specified in the table below, using a 1MHz step size.

### 7.5.1 Minimum requirement

The static reference performance as specified in clause 7.2.1 should be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

**Table 7.3 : Blocking performance requirement**

| Center Frequency of Interfering Signal | Interfering Signal Level | Wanted Signal Level | Minimum Offset of Interfering Signal | Type of Interfering Signal |
|---|---|---|---|---|
| 1920 – 1980 MHz | -40 dBm | <REFSENS> + 6 dB | 10 MHz | WCDMA signal with one code |
| 1900 – 1920 MHz<br>1980 – 2000 MHz | -40 dBm | <REFSENS> + 6 dB | 10 MHz | WCDMA signal with one code |
| 1 MHz - ~~<~~1900 MHz,<br>and<br>~~>~~2000 MHz -12750 MHz | -15 dBm | <REFSENS> + 6 dB | — | CW carrier |

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**Bath, UK, 7-10 December 1999**

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*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

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| 25.104 | CR | 013 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

For submission to: RAN #6 *list expected approval meeting # here ↑*

| | | | |
|---|---|---|---|
| for approval | X | strategic | *(for SMG use only)* |
| for information | | non-strategic | |

*Form: CR cover sheet, version 2 for 3GPP and SMG* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:** *(at least one should be marked with an X)*

| (U)SIM | ME | UTRAN / Radio | Core Network |
|---|---|---|---|
| | | X | |

**Source:** Ericsson **Date:** 8/12/99

**Subject:** Output power accuracies in extreme conditions

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | | | | |
|---|---|---|---|---|---|
| F | Correction | X | **Release:** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | | | Release 97 | |
| C | Functional modification of feature | | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

**Reason for change:** Introduces output power accuracies for requirements of +/- 2.5 dB in extreme conditions.

**Clauses affected:** 6.2

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | | → List of CRs: | |
| Other GSM core specifications | | → List of CRs: | |
| MS test specifications | | → List of CRs: | |
| BSS test specifications | X | → List of CRs: | TS 25.141 v2.0.5 |
| O&M specifications | | → List of CRs: | |

**Other comments:**

## 6.2.1 Base station maximum output power

Maximum output power, Pmax, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

### 6.2.1.1 Minimum requirement

In normal conditions, the Base station maximum output power shall remain within +2 dB and –2dB of the manufacturer's rated power.

In extreme conditions, the Base station maximum output power shall remain within +~~[ ]~~2.5 dB and –~~[ ]~~2.5 dB~~-~~of the manufacturer's rated power.

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**Bath, UK, 7-10 December 1999**

# 3G CHANGE REQUEST

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**25.104** **CR** **014** Current Version: 3.0.0

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 for approval [X] *(only one box should*
*list TSG meeting no. here ↑* for information [ ] *be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

**Proposed change affects:** USIM [ ] ME [ ] UTRAN [X] Core Network [ ]
*(at least one should be marked with an X)*

**Source:** Ericsson **Date:** 99-11-30

**Subject:** Clarification of Antenna Diversity receiver requirements

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** Version 3.0.0 of 25.104 does not clearly express how the requirements in chapter 7 apply to antenna diversity receiver. The requirement in 7.2 is also incorrect in that it is derived without antenna diversity but is stated to be with diversity.

**Clauses affected:** 7.1, 7.2

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: | |
| Other 2G core specifications | [ ] | → List of CRs: | |
| MS test specifications | [ ] | → List of CRs: | |
| BSS test specifications | [X] | → List of CRs: | TS 25.141 v2.0.4 |
| O&M specifications | [ ] | → List of CRs: | |

**Other comments:**

# 7 Receiver characteristics

## 7.1 General

~~Unless detailed the receiver characteristic are specified at each antenna connector of the BS.~~ The requirements in Section 7 assume that the receiver is not equipped with diversity. For receivers with diversity, the requirements apply to each antenna connector separately, with the other one(s) terminated or disabled .The requirements are otherwise unchanged.

## 7.2 Reference sensitivity level

The reference sensitivity is the minimum receiver input power measured at the antenna connector at which the Bit Error Rate (BER) does not exceed the specific value indicated in section 7.2.1. ~~The signal power is equally applied to each antenna connector for diversity.~~

### 7.2.1 Minimum requirement

For the measurement channel specified in Annex A, the reference sensitivity level and performance of the BS shall be as specified in Table 7.1.

**Table 7.1: BS reference sensitivity levels**

| Measurement channel | BS reference sensitivity level (dBm) | BER |
|---|---|---|
| 12.2 kbps | -122 dBm | BER shall not exceed 0.001 |

### 7.2.2 Maximum Frequency Deviation for Receiver Performance

The need for such a requirement is for further study.

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**Bath, UK, 7-10 December 1999**

***Document***

# 3G CHANGE REQUEST

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**25.104** **CR** **015** Current Version: 3.0.0

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

*(only one box should be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

**Proposed change affects:** *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Allgon **Date:** 1999-12-09

**Subject:** CR on Spurious Emission in 25.104

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** Based on the support among the WG4 delegates for a minimum coupling loss value of 30 dB, the proposal is to remove the brackets from the minimum requirements on BS spurious emission limits for the protection of GSM 900 and DCS 1800 receivers in chapter 6 of TS 25.104 v3.0.0.

**Clauses affected:** 6.6.3.3.2 and 6.6.3.4.2

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: | |
| Other 2G core specifications | [ ] | → List of CRs: | |
| MS test specifications | [ ] | → List of CRs: | |
| BSS test specifications | [X] | → List of CRs: | TS 25.141 v2.0.4 |
| O&M specifications | [ ] | → List of CRs: | |

**Other comments:**

### 6.6.3.3 Co-existence with GSM 900

#### 6.6.3.3.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.

##### 6.6.3.3.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table 6.11: BS Spurious emissions limits for BS in geographic coverage area of GSM 900**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 921 – 960 MHz | -47 dBm | 100 kHz | |

#### 6.6.3.3.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located ~~[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.~~

##### 6.6.3.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table 6.12: BS Spurious emissions limits for protection of the BS receiver**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 876-915 MHz | ~~[98]dBm~~ -98 dBm | 100 kHz | |

### 6.6.3.4 Co-existence with DCS 1800

#### 6.6.3.4.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.

[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.

##### 6.6.3.4.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table 6.13: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 1805 – 1880 MHz | -57 dBm | 100 kHz | |

#### 6.6.3.4.2 Co-located base stations

This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.

~~[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.~~

##### 6.6.3.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table 6.14: BS Spurious emissions limits for BS co-located with DCS 1800 BTS**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 1710-1785 MHz | ~~[98]dBm~~<br>-98 dBm | 100 kHz | |

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**Bath, UK, 7-10 December 1999**

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*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

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| 25.104 | CR | 016 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

| For submission to: RAN#6 *list expected approval meeting # here ↑* | for approval | X | strategic | | *(for SMG use only)* |
|---|---|---|---|---|---|
| | for information | | non-strategic | | |

*Form: CR cover sheet, version 2 for 3GPP and SMG* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:** *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

**Source:** Nortel Networks **Date:** 9.12.99

**Subject:** Change of propagation conditions

**Work item:**

**Category:** *(only one category Shall be marked With an X)*

| | | | | | |
|---|---|---|---|---|---|
| F | Correction | X | **Release:** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | | | Release 97 | |
| C | Functional modification of feature | | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

**Reason for change:** Align propagation conditions for FDD and TDD modes

**Clauses affected:** Annex B

**Other specs Affected:**

| | | |
|---|---|---|
| Other 3G core specifications | | → List of CRs: |
| Other GSM core specifications | | → List of CRs: |
| MS test specifications | | → List of CRs: |
| BSS test specifications | | → List of CRs: |
| O&M specifications | | → List of CRs: |

**Other comments:**

# Annex B (normative): Propagation conditions

## B.1 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading or multi-paths exist for this propagation model.

## B.2 Multi-path fading propagation conditions

Table B.1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

**Table B.1: Propagation Conditions for Multi path Fading Environments**

| Case 1, speed 3km/h | | Case 2, speed 3 km/h | | Case 3, 120 km/h | |
|---|---|---|---|---|---|
| **Relative Delay [ns]** | **Average Power [dB]** | **Relative Delay [ns]** | **Average Power [dB]** | **Relative Delay [ns]** | **Average Power [dB]** |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 976 | -10 | 976 | 0 | 260 | -3 |
| | | 12000~~20000~~ | 0 | 521 | -6 |
| | | | | 781 | -9 |

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**Bath, UK, 7-10 December 1999**

***Document***
*e.g. for 3GPP use the format TP-99xxx*
*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

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| 25.104 | CR | 017 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

For submission to: RAN #6 *list expected approval meeting # here ↑*

| | | | | |
|---|---|---|---|---|
| for approval | X | strategic | | *(for SMG use only)* |
| for information | | non-strategic | | |

*Form: CR cover sheet, version 2 for 3GPP and SMG* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:** *(at least one should be marked with an X)*

| (U)SIM | ME | UTRAN / Radio | Core Network |
|---|---|---|---|
| | | X | |

**Source:** Ericsson **Date:** 8/12/99

**Subject:** Clarification of the EVM requirement

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in an earlier release | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Release:**

| | |
|---|---|
| Phase 2 | |
| Release 96 | |
| Release 97 | |
| Release 98 | |
| Release 99 | X |
| Release 00 | |

**Reason for change:** Clarification that the EVM requirement is valid over the power dynamic range.

**Clauses affected:** 7.7

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | | → List of CRs: | |
| Other GSM core specifications | | → List of CRs: | |
| MS test specifications | | → List of CRs: | |
| BSS test specifications | X | → List of CRs: | TS 25.141 v2.0.5 |
| O&M specifications | | → List of CRs: | |

**Other comments:**

## 6.8.2 Modulation Accuracy

The modulation accuracy is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). The requirement is valid over the total power dynamic range as specifed in 6.4.3

### 6.8.2.1 Minimum requirement

The Modulation accuracy shall not be worse than 12.5 %.

**3GPP TSG-R4 meeting #9** ***Document***
**Bath, UK, 7-10 Decmeber 1999**

# 3G CHANGE REQUEST

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**25.104** **CR** **018** Current Version: 3.0.0

*3G specification number ↑* *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #6 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

*(only one box should be marked with an X)*

*Form: 3G CR cover sheet, version 1.0* *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

**Proposed change affects:** *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

**Source:** Uplink Ad Hoc **Date:** 99-12-09

**Subject:** Introduction of requirement values in section 8

**3G Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in a 2G specification | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Reason for change:** Simulation results for the uplink now exists for AWGN and Case 1, 2 and 3 for all measurement channels. The values introduced are based on these simulations as described in Tdoc R4 (99)995..

**Clauses affected:**

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | [ ] | → List of CRs: | |
| Other 2G core specifications | [ ] | → List of CRs: | |
| MS test specifications | [ ] | → List of CRs: | |
| BSS test specifications | [X] | → List of CRs: | TS 25.141 v2.0.5 |
| O&M specifications | [ ] | → List of CRs: | |

**Other comments:**

# 8.2 Demodulation in static propagation conditions

## 8.2.1 Demodulation of DCH

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Rate (BLER ) allowed when the receiver input signal is at a specified $E_b/N_0$ limit. The BLER is calculated for each of the measurement channels supported by the base station.

### 8.2.1.1 Minimum requirement

The BLER should not exceed the limit for the $E_b/N_0$ specified in Table 8.2.

**Table 8.2: Performance requirements in AWGN channel.**

| Measurement channel | Required $E_b/N_0$ BLER < $10^{-1}$ | Required $E_b/N_0$ BLER < $10^{-2}$ |
|---|---|---|
| 12.2 kbps | n.a. | 5.1 dB |
| 64 kbps | 1.5 dB | 1.7 dB |
| 144 kbps | 0.8 dB | 0.9 dB |
| 384 kbps | 0.9 dB | 1.0 dB |

# 8.3 Demodulation of DCH in multipath fading conditions

## 8.3.1 Multipath fading Case 1

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Rate (BLER ) allowed when the receiver input signal is at a specified $E_b/N_0$ limit. The BLER is calculated for each of the measurement channels supported by the base station.

### 8.3.1.1 Minimum requirement

The BLER should not exceed the limit for the $E_b/N_0$ specified in Table 8.3.

**Table 8.3: Performance requirements in multipath Case 1 channel.**

| Measurement channel | Required $E_b/N_0$ BLER < $10^{-1}$ | Required $E_b/N_0$ BLER < $10^{-2}$ |
|---|---|---|
| 12.2 kbps | n.a. | 11.9 dB |
| 64 kbps | 6.2 dB | 9.2 dB |
| 144 kbps | 5.4 dB | 8.4 dB |
| 384 kbps | 5.8 dB | 8.8 dB |

## 8.3.2 Multipath fading Case 2

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER ) allowed when the receiver input signal is at a specified $E_b/N_0$ limit. The BLER is calculated for each of the measurement channels supported by the base station.

### 8.3.2.1 Minimum requirement

The BLER should not exceed the limit for the $E_b/N_0$ specified in Table 8.4.

**Table 8.4: Performance requirements in multipath Case 2 channel.**

| Measurement channel | Required $E_b/N_0$ BLER < $10^{-1}$ | Required $E_b/N_0$ BLER < $10^{-2}$ |
|---|---|---|
| 12.2 kbps | n.a. | 9.0 dB |
| 64 kbps | 4.3 dB | 6.4 dB |
| 144 kbps | 3.7 dB | 5.6 dB |
| 384 kbps | 4.1 dB | 6.1 dB |

## 8.3.3 Multipath fading Case 3

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Rate (BLER ) allowed when the receiver input signal is at a specified $E_b/N_0$ limit. The BLER is calculated for each of the measurement channels supported by the base station.

### 8.3.3.1 Minimum requirement

The BLER should not exceed the limit for the $E_b/N_0$ specified in Table 8.5.

**Table 8.5: Performance requirements in multipath Case 3 channel.**

| Measurement channel | Required $E_b/N_0$ BLER < $10^{-1}$ | Required $E_b/N_0$ BLER < $10^{-2}$ | Required $E_b/N_0$ BLER < $10^{-3}$ |
|---|---|---|---|
| 12.2 kbps | n.a. | 6.7 dB | 7.5 dB |
| 64 kbps | 2.7 dB | 3.2 dB | 3.4 dB |
| 144 kbps | 2.2 dB | 2.5 dB | 2.8 dB |
| 384 kbps | 2.6 dB | 3.0 dB | 3.5 dB |

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**Bath, Avon, UK, Dec 7 – Dec 10, 1999**

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| 25.104 | CR | 019 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

| For submission to: | TSG-RAN #6 | for approval | X | strategic | | (for SMG use only) |
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**Proposed change affects:** *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

**Source:** BellSouth Cellular Corp, Ericsson **Date:** 1999-12-09

**Subject:** Update of ITU Region 2 Specific Specifications and proposed universal channel numbering.

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | | | | |
|---|---|---|---|---|---|
| F | Correction | X | **Release:** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | | | Release 97 | |
| C | Functional modification of feature | X | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

**Reason for change:** Adds the ITU region 2 specific requirements including TX-RX frequency separation, a proposed universal channel numbering scheme, maximum ITU region 2 spurious emissions allowed, rx blocking tables are updated to include ITU region 2 information. The “Protection of BS receiver” requirement is based on –110 dBm at victim receiver and is updated also for the Region 1 and 3 IMT2000 frequency bands.

**Clauses affected:** 5.2, 5.3, 5.4.3, 6.6.3.6, 6.6.3.2.1, 6.6.3.6, 6.6.3.6.1, 7.5.1

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | | → List of CRs: | |
| Other GSM core specifications | | → List of CRs: | |
| MS test specifications | | → List of CRs: | |
| BSS test specifications | X | → List of CRs: | TS 25.141v2.0.5 |
| O&M specifications | | → List of CRs: | |

**Other comments:** This is a merge of the CR on ITU Region 2 specific parameters and the update of “Protection of BS receiver” requirement.

## 5.2 Frequency bands

UTRA/FDD is designed to operate in either of the following paired bands;

(a) 1920 – 1980MHz: Up-link (Mobile transmit, base receive)
2110 – 2170MHz: Down-link (Base transmit, mobile receive)

(b)* 1850 – 1910MHz: Up-link (Mobile transmit, base receive)
1930 – 1990MHz: Down-link (Base transmit, mobile receive)

* Used in Region 2

Additional allocations in ITU region 2 are FFS.

Deployment in other frequency bands is not precluded.

## 5.3 Tx–Rx frequency separation

(a) The minimum transmit to receive frequency separation is 134.8 MHz and the maximum value is 245.2 MHz and all UE(s) shall support a TX –RX frequency separation of 190 MHz when operating in the paired band defined in sub-clause 5.2(a).
(b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.
(c) When operating in the paired band defined in sub-clause 5.2(b), all UE(s) shall support a TX – RX frequency separation of 80 MHz.
(d) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

## 5.4 Channel arrangement

### 5.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimize performance in a particular deployment scenario.

### 5.4.2 Channel raster

The channel raster is 200 kHz, which means that the center frequency must be an integer multiple of 200 kHz.

### 5.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows;

**Table 1: UTRA Absolute Radio Frequency Channel Number**

| | | |
|---|---|---|
| Uplink | $N_u = 5 * (F_{uplink}$ MHz) | 0.0 MHz ≤ $F_{uplink}$ ≤ 3276.6 MHz<br>where $F_{uplink}$ is the uplink frequency in MHz |
| Downlink | $N_d = 5 * (F_{downlink}$ MHz) | 0.0 MHz ≤ $F_{downlink}$ 3276.6 MHz<br>where $F_{downlink}$ is the downlink frequency in MHz |

### 6.6.3.2. Protection of the BS receiver

This requirement may be applied in order to prevent the receiver of the BS being desensitised by emissions from the BS transmitter which are coupled between the antennas of the BS. This is measured at the transmit antenna port.

#### 6.6.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table 6.10: BS Spurious emissions limits for protection of the BS receiver**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 1920 – 1980MHz<br>For operation in Frequency Bands defined in sub-clause 5.2(a) | -96 dBm | 100 kHz | |
| 1850-1910 MHz<br><br>For operation in Frequency Bands defined in sub-clause 5.2(b) | -96 dBm | 100kHz | |

### 6.6.3.6 Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in sub-clause 5.2(a) and 1930-1990 MHz, as defined in sub-clause 5.2(b) in geographic areas in which both an adjacent band service and UTRA are deployed.

#### 6.6.3.6.1 Minimum requirement

The power of any spurious emission shall not exceed:

**Table 6.16: BS spurious emissions limits for protection of adjacent band services**

| Band (f) | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 2100-2105 MHz<br>For operation in frequency bands as defined in sub-clause 5.2(a) | -30 + 3.4 · (f - 2100 MHz) dBm | 1 MHz | |
| 2175-2180 MHz<br>For operation in frequency bands as defined in sub-clause 5.2(a) | -30 + 3.4 · (2180 MHz - f) dBm | 1 MHz | |
| 1920-1925 MHz<br>For operation in frequency bands as defined in sub-clause 5.2(b) | -30 + 3.4 · (f – 1930 MHz) dBm | 1 MHz | |
| 1995-2000 MHz<br>For operation in frequency bands as defined in sub-clause 5.2(b) | -30 +3.4 · (2000 MHz – f) dBm | 1 MHz | |

## 7.5 Blocking characteristics

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels; without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit.

### 7.5.1 Minimum requirement

The static reference performance as specified in clause 7.2.1 should be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

**Table 7.3(a) : Blocking performance requirement for operation in frequency bands in sub-clause 5.2(a)**

| Center Frequency of Interfering Signal | Interfering Signal Level | Wanted Signal Level | Minimum Offset of Interfering Signal | Type of Interfering Signal |
|---|---|---|---|---|
| 1920 – 1980 MHz | -40 dBm | <REFSENS> + 6 dB | 10 MHz | WCDMA signal with one code |
| 1900 – 1920 MHz<br>1980 – 2000 MHz | -40 dBm | <REFSENS> + 6 dB | 10 MHz | WCDMA signal with one code |
| <1900,<br>> 2000 MHz | -15 dBm | <REFSENS> + 6 dB | — | CW carrier |

**Table 7.3(b) : Blocking performance requirement for operation in frequency bands in sub-clause 5.2(b)**

| Center Frequency of Interfering Signal | Interfering Signal Level | Wanted Signal Level | Minimum Offset of Interfering Signal | Type of Interfering Signal |
|---|---|---|---|---|
| 1850 – 1910 MHz | - 40 dBm | <REFSENS> + 6dB | 10 MHz | WCDMA signal with one code |
| 1830 – 1850 MHz<br>1910 – 1930 MHz | -40 dBm | <REFSENS> + 6dB | 10 MHz | WCDMA signal with one code |
| 1 MHz – 1830 MHz<br>1930 MHz – 12750 MHz | -15 dBm | <REFSENS> + 6dB | — | CW carrier |

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|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

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| | | | | |
|---|---|---|---|---|
| for approval | X | strategic | | *(for SMG use only)* |
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**Proposed change affects:** *(at least one should be marked with an X)*

| (U)SIM | ME | UTRAN / Radio | Core Network |
|---|---|---|---|
| | | X | |

**Source:** Ericsson **Date:** 8/12/99

**Subject:** Corrections for BS FDD RX spurious emission

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | |
|---|---|---|
| F | Correction | X |
| A | Corresponds to a correction in an earlier release | |
| B | Addition of feature | |
| C | Functional modification of feature | |
| D | Editorial modification | |

**Release:**

| | |
|---|---|
| Phase 2 | |
| Release 96 | |
| Release 97 | |
| Release 98 | |
| Release 99 | X |
| Release 00 | |

**Reason for change:** Clarification on definition and applicability.

**Clauses affected:** 7.7

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | | → List of CRs: | |
| Other GSM core specifications | | → List of CRs: | |
| MS test specifications | | → List of CRs: | |
| BSS test specifications | X | → List of CRs: | TS 25.141 v2.0.5 |
| O&M specifications | | → List of CRs: | |

**Other comments:**

## 7.7 Spurious emissions

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS receiver antenna connector. The requirements apply to all BS with separate RX and TX antenna port. The test shall be performed when both TX and RX are on with the TX port terminated.

For all BS with common RX and TX antenna port the transmitter spurious emission as specified in section 6.6.3 is valid.

### 7.7.1 Minimum requirement

The spurious emission shall be:

(a) Less than –78 dBm/3.84 MHz at the BS receiver antenna connector, for frequencies from 1900MHz to 1980MHz and from 2010MHz to 2025MHz~~within the BS receive band~~.

(b) Less than –57 dBm/100 kHz at the BS receiver antenna connector, for frequencies band from 9kHz to 1GHz.

(c) Less than –47 dBm/100 kHz at the BS receiver antenna connector, for frequencies band from 1GHz to 12.75 GHz with the exception of frequencies between 12.5MHz below the first carrier frequency used, and 12.5MHz above the last carrier frequency used..

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|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

| For submission to: | RAN #6 | for approval | X | strategic | | (for SMG use only) |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | |

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**Proposed change affects:** *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

**Source:** Ericsson **Date:** 99-12-09

**Subject:** BS Spurious Emission Requirements for Co-Existence UTRA-FDD/ UTRA-TDD

**Work item:**

**Category:** *(only one category shall be marked with an X)*

| | | | | | |
|---|---|---|---|---|---|
| F | Correction | | **Release:** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | X | | Release 97 | |
| C | Functional modification of feature | | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

**Reason for change:** Introduction of spurious emission requirements for FDD in the frequency bands of TDD, based on a interference level at the receiver of 7 dB below the noise floor.

**Clauses affected:** 6.6.3

**Other specs affected:**

| | | | |
|---|---|---|---|
| Other 3G core specifications | | → List of CRs: | |
| Other GSM core specifications | | → List of CRs: | |
| MS test specifications | | → List of CRs: | |
| BSS test specifications | X | → List of CRs: | TS 25.141 v2.0.5 |
| O&M specifications | | → List of CRs: | |

**Other comments:** Based on 3GPP WG4 Tdoc (99)840

## 6.6.3.7 Co-existence with UTRA-TDD

### 6.6.3.7.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

#### 6.6.3.7.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table n: BS Spurious emissions limits for BS in geographic coverage area of UTRA-TDD**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 1900 – 1920 MHz | -52 dBm | 1 MHz | |
| 2010 – 2025 MHz | -52 dBm | 1 MHz | |

### 6.6.3.7.2 Co-located base stations

This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

#### 6.6.3.7.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

**Table n: BS Spurious emissions limits for BS co-located with UTRA-TDD**

| Band | Maximum Level | Measurement Bandwidth | Note |
|---|---|---|---|
| 1900 – 1920 MHz | –86 dBm | 1 MHz | |
| 2010 – 2025 MHz | –86 dBm | 1 MHz | |