

# 3GPP TR ab.cde v0.23.0 (2008-0805)

*Technical Report*

**3rd Generation Partnership Project;  
Technical Specification Group TSG RAB;  
UMTS 2300MHz Work Item Technical Report (LCR TDD);  
(Release 8)**



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## Foreword

This Technical Report has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

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## 1 Scope

This document is the technical report of the UMTS 2300MHz WI which was approved in TSG RAN meeting #38 [1].

The purpose of this TR is to summarize a study of radio requirements for UTRA TDD— 1.28Mcps TDD in the 2300MHz Band:

- 2300-2400 MHz: Up-link and Down-link (UE transmit and receive, Node B transmit and receive)

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## 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] RP-071016, "Proposal for new WI: UMTS 2300MHz TDD"
- [2] 3GPP TS 25.102, "User Equipment (UE) radio transmission and reception (TDD)".
- [3] 3GPP TS 25.105, "Base Station (BS) radio transmission and reception (TDD)"
- [4] 3GPP TR 25.945, "Radio Frequency (RF) System Scenarios (TDD)"
- [5] R4-080393, Technical Conditions for UMTS 2300MHz BS in China, RAN4#46
- [6] R4-080496, Technical Conditions for UMTS 2300MHz UE in China, RAN4#46
- [7] R4-080534, TP for UMTS 2300 TR Section 5.2, RAN4#46
- [8] R4-080644, 2.3 GHz TDD New Band Introduction for 1.28 Mcps TS 25.102, RAN4#46bis
- [9] R4-080645, 2.3 GHz TDD UE transmitter Characteristics for 1.28 Mcps, RAN4#46bis
- [10] R4-080646, 2.3 GHz TDD UE Receiver Characteristics & propagation conditions for 1.28Mcps TDD, RAN4#46bis
- [11] R4-080667, UMTS 2300MHz New band introduction for 1.28Mcps TDD, RAN4#46bis
- [12] R4-080668, UMTS 2300MHz Transmitter performance analysis for 1.28Mcps TDD, RAN4#46bis
- [13] R4-080669, UMTS 2300MHz Receiver performance analysis for 1.28Mcps TDD, RAN4#46bis
- [14] R4-080670, UMTS 2300MHz propagation channel model analysis for 1.28Mcps TDD, RAN4#46bis

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

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## 3.2 Symbols

.....

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

|      |  |
|------|--|
| UTRA | UMTS Terrestrial Radio Access  |
| TDD  | Time Division Duplexing  |
| UMTS | Universal Mobile Telecommunications System, often used synonymously with WCDMA   |
| GSM  | Mobile cellular system (throughout this document, this acronym is generally to also mean the services GPRS and EDGE, both enhancements to GSM, unless not applicable to the discussion.) |
| UE   | User Equipment, also cellular terminal   |
| BS   | Cellular system base station   |
| TX   | Transmitter  |
| RX   | Receiver   |

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## 4 Introduction

In China the band 2300MHz - 2400MHz had been allocated to TD-SCDMA system and has been introduced in TDSCDMA industry standard in CCSA. More recently at WRC 07 this band has been allocated to the mobile service on a primary basis and identified for IMT. The proponent of this work item believes that it would be deployed in the near future (at least in China).

It is proposed that the requirements for this band be introduced into 3GPP specifications based on the study in 3GPP as well as the information from CCSA standard.

### 4.1 Task Description

The purpose of this work item is to generate necessary information for 1.28Mcps TDD system operation in the band 2300-2400MHz.

- Generate a technical report summarizing a study of radio requirements for LCR TDD in the band 2300-2400MHz
- Generate CR's to update the appropriate specifications.
- TSG RAN WG2 – to study any signalling issues related to UMTS 2300 TDD.
- TSG RAN WG5 - study UE conformance testing issues related to UMTS 2300 TDD.
- Any additional related issues.

The WI was approved at RAN#38 meeting [1].

## 5 Study of the RF requirements

### 5.1 Co-existence with other technologies

This band has been specified in the CCSA industry standards in which there are no additional requirements defined for protection of other systems. The system operating adjacent to the lower end of this band is remote sensing service which is not used in large scale. The frequency adjacent to the upper end of this band is licence-free band. So currently no need to define Co-existence requirements for the adjacent service.

### 5.2 Technical conditions for UMTS2300

The technical conditions for UMTS2300 in China were derived based on the requirements for 1900-1920 and 2010-2025MHz bands (UMTS TDD band a). Necessary changes such as the spurious emission requirements and the blocking requirements were made. Those changes and its rationale are summarized in the following sub sections. Revised parts compared with requirements for UMTS band a are coloured yellow and underlined.

#### a) Transmission power

##### UE:

The UE transmission power for UMTS2300 is the same as that of UMTS TDD band a.

**Table 1: UE power classes**

| Power Class | Nominal maximum output power | Tolerance     |
|-------------|------------------------------|---------------|
| 1           | +33 dBm                      | +1 dB / -3 dB |
| 2           | +24 dBm                      | +1 dB / -3 dB |
| 3           | +21 dBm                      | +2 dB / -2 dB |
| 4           | +27 dBm                      | +1 dB / -3 dB |

##### BS:

Maximum output power for UMTS2300 are specified same as other Bands.

In normal conditions, the Base station maximum output power shall remain within +2.7dB and -2.7dB of the manufacturer's rated output power.

#### b) Spectrum emission mask

##### UE:

The spectrum emission mask for UMTS2300 UE is the same as that of UMTS TDD band a.



Table 2: spectrum emission mask requirement

| $\Delta f^*$ in MHz | Minimum requirement   | Measurement bandwidth |
|---------------------|---|-----------------------|
| 0.8                 | -35 dBc   | 30 kHz                |
| 0.8-1.8             | $\left\{ -35 - 14 \cdot \left( \frac{\Delta f}{\text{MHz}} - 0.8 \right) \right\} \text{dBc}$ | 30 kHz                |
| 1.8-2.4             | $\left( -49 - 17 \cdot \left( \frac{\Delta f}{\text{MHz}} - 1.8 \right) \right) \text{dBc}$   | 30 kHz                |
| 2.4 - 4.0           | -44 dBc   | 1MHz                  |

**BS:**

Spectrum emission mask for UMTS2300 BS are specified same as other Bands shown following tables:

Table 3: Spectrum emission mask values, BS maximum output power  $P \geq 34$  dBm

| Frequency offset of measurement filter -3dB point, $\Delta f$ | Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$ | Maximum level   | Measurement bandwidth |
|---|--|---|-----------------------|
| $0.8 \text{ MHz} \leq \Delta f < 1.0 \text{ MHz}$             | $0.815 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$               | -20 dBm   | 30 kHz                |
| $1.0 \text{ MHz} \leq \Delta f < 1.8 \text{ MHz}$             | $1.015 \text{ MHz} \leq f_{\text{offset}} < 1.815 \text{ MHz}$               | $-20 \text{ dBm} - 10 \cdot \left( \frac{f_{\text{offset}}}{\text{MHz}} - 1.015 \right) \text{ dB}$ | 30 kHz                |
| See note  | $1.815 \text{ MHz} \leq f_{\text{offset}} < 2.3 \text{ MHz}$                 | -28 dBm   | 30 kHz                |
| $1.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$    | $2.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$    | -13 dBm   | 1 MHz                 |

Table 4: Spectrum emission mask values, BS maximum output power  $26 \leq P < 34$  dBm

| Frequency offset of measurement filter -3dB point, $\Delta f$ | Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$ | Maximum level   | Measurement bandwidth |
|---|--|---|-----------------------|
| $0.8 \text{ MHz} \leq \Delta f < 1.0 \text{ MHz}$             | $0.815 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$               | $P - 54 \text{ dB}$   | 30 kHz                |
| $1.0 \text{ MHz} \leq \Delta f < 1.8 \text{ MHz}$             | $1.015 \text{ MHz} \leq f_{\text{offset}} < 1.815 \text{ MHz}$               | $P - 54 \text{ dB} - 10 \cdot \left( \frac{f_{\text{offset}}}{\text{MHz}} - 1.015 \right) \text{ dB}$ | 30 kHz                |
| See note  | $1.815 \text{ MHz} \leq f_{\text{offset}} < 2.3 \text{ MHz}$                 | $P - 62 \text{ dB}$   | 30 kHz                |
| $1.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$    | $2.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$    | $P - 47 \text{ dB}$   | 1 MHz                 |

Table 5: Spectrum emission mask values, BS maximum output power P &lt; 26 dBm

| Frequency offset of measurement filter - 3dB point, $\Delta f$ | Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$ | Maximum level   | Measurement bandwidth |
|--|--|---|-----------------------|
| $0.8 \text{ MHz} \leq \Delta f < 1.0 \text{ MHz}$              | $0.815 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$               | -28 dBm   | 30 kHz                |
| $1.0 \text{ MHz} \leq \Delta f < 1.8 \text{ MHz}$              | $1.015 \text{ MHz} \leq f_{\text{offset}} < 1.815 \text{ MHz}$               | $-28 \text{ dBm} - 10 \cdot \left( \frac{f_{\text{offset}}}{\text{MHz}} - 1.015 \right) \text{ dB}$ | 30 kHz                |
| See note   | $1.815 \text{ MHz} \leq f_{\text{offset}} < 2.3 \text{ MHz}$                 | -36 dBm   | 30 kHz                |
| $1.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$     | $2.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$    | -21 dBm   | 1 MHz                 |

NOTE: This frequency range ensures that the range of values of  $f_{\text{offset}}$  is continuous.

### c) Adjacent channel leakage ratio

#### UE:

The adjacent channel leakage ratio for UMTS2300 UE is the same as that of UMTS TDD band a.

Table 6: UE ACLR

| Power class | Adjacent channel                 | ACLR  |
|-------------|----------------------------------|-------|
| 2, 3        | UE-channel $\pm 1.6 \text{ MHz}$ | 33 dB |
| 2, 3        | UE-Channel $\pm 3.2 \text{ MHz}$ | 43 dB |

#### BS:

Adjacent Channel Leakage power Ratio (ACLR) requirements for UMTS2300 BS are specified same as other Bands shown following;

Table 7: ACLR requirements for UMTS2300

| BS adjacent channel offset below the first or above the last carrier frequency used | ACLR limit |
|---|------------|
| 1.6 MHz   | 40 dB      |
| 3.2 MHz   | 45 dB      |

### d) Spurious emission

#### UE:

The spurious emission for 2300-2400MHz band are defined as following.

**Table 8: General Spurious emissions requirements**

| Frequency Bandwidth                        | Measurement Bandwidth | Minimum requirement |
|--|-----------------------|---------------------|
| $9 \text{ kHz} \leq f < 150 \text{ kHz}$   | 1 kHz                 | -36 dBm             |
| $150 \text{ kHz} \leq f < 30 \text{ MHz}$  | 10 kHz                | -36 dBm             |
| $30 \text{ MHz} \leq f < 1000 \text{ MHz}$ | 100 kHz               | -36 dBm             |
| $1 \text{ GHz} \leq f < 12.75 \text{ GHz}$ | 1 MHz                 | -30 dBm             |

**Table 9: Additional Spurious emissions requirements**

| Frequency Bandwidth                             | Measurement Bandwidth | Minimum requirement |
|---|-----------------------|---------------------|
| $925 \text{ MHz} \leq f \leq 935 \text{ MHz}$   | 100 kHz               | -67 dBm (note)      |
| $935 \text{ MHz} < f \leq 960 \text{ MHz}$      | 100 kHz               | -79 dBm (note)      |
| $1805 \text{ MHz} \leq f \leq 1850 \text{ MHz}$ | 100 kHz               | -71 dBm (note)      |
|   |                       |                     |

**BS:**

Spurious emissions requirements for UMTS2300 UE include general requirement and additional requirement when co-existence with other systems. The requirements are specified as in Table 10 and Table 11.

**Table 10: Spurious emission requirements for UMTS2300**

| Band   | Maximum Level  | Notes  |
|--|----------------|--------|
| 9kHz – 150kHz  | -36 dBm/1kHz   | Note 1 |
| 150kHz – 30MHz   | -36 dBm/10kHz  | Note 1 |
| 30MHz – 1GHz   | -36 dBm/100kHz | Note 1 |
| 1GHz ↔<br>Fc1-19.2 MHz or 2290 MHz<br><i>whichever is the higher</i>   | -30 dBm/1MHz   | Note 1 |
| Fc1 – 19.2 MHz or 2290MHz<br><i>whichever is the higher</i><br>↔<br>Fc1 - 16 MHz or 2200 MHz<br><i>whichever is the higher</i> | -25 dBm/1MHz   | Note 2 |
| Fc1 - 16 MHz or 2290 MHz<br><i>whichever is the higher</i><br>↔<br>Fc2 + 16 MHz or 2410 MHz<br><i>whichever is the lower</i>   | -15 dBm/1MHz   | Note 2 |
| Fc2 + 16 MHz or 2410MHz<br><i>whichever is the lower</i><br>↔<br>Fc2 +19.2 MHz or 2410MHz<br><i>whichever is the lower</i>     | -25 dBm/1MHz   | Note 2 |
| Fc2 + 19.2 MHz or 2410MHz<br><i>whichever is the lower</i><br>↔<br>12,5 GHz  | -30 dBm/1MHz   | Note 3 |
| NOTE 1: Bandwidth as in ITU SM.329 [1], §4.1   |                |        |
| NOTE 2: Specification in accordance with ITU-R SM.329 [1], §4.3 and Annex 7  |                |        |
| NOTE 3: Bandwidth as in ITU-R SM.329 [1], §4.3 and Annex 7. Upper frequency as in ITU-R SM.329 [1], §2.5 table 1               |                |        |

Note: The requirement will be changed as the latest specification of TS25.105

**Table 11: Additional spurious emission requirements for UMTS2300**

| Band            | Maximum Level   | Notes                      |
|-----------------|-----------------|----------------------------|
| 876 – 915 MHz   | -61 dBm/100kHz  | Co-existence with GSM900   |
| 930 – 960MHz    | - 57 dBm/100kHz |                            |
| 876– 915 MHz    | -98 dBm/100kHz  | Co-located with GSM900     |
| 1710 – 1755 MHz | -61 dBm/100kHz  | Co-existence with DCS1800  |
| 1805 – 1850MHz  | - 47 dBm/100kHz |                            |
| 1710 – 1755 MHz | -98 dBm/100kHz  | Co-located with DCS1800    |
| 1920 – 1980 MHz | -43 dBm/3.84MHz | Co-existence with UTRA-FDD |
| 2110 – 2170 MHz | -52 dBm/1MHz    |                            |
| 1920 – 1980 MHz | -80 dBm/3.84MHz | Co-located with UTRA-FDD   |
| 2110 – 2170 MHz | -52 dBm/1MHz    |                            |

#### e) Reference sensitivity

##### UE:

The reference sensitivity for 2300-2400MHz band is defined the same as that of UMTS band a. The BER shall not exceed 0.001 for the parameters specified in Table 12.

**Table 12: Test parameters for reference sensitivity**

| Parameter                         | Level | Unit         |
|-----------------------------------|-------|--------------|
| $\frac{\Sigma DPCH_{Ec}}{I_{or}}$ | 0     | dB           |
| $\hat{I}_{or}$                    | -108  | dBm/1.28 MHz |

##### BS:

The reference sensitivity levels are set as table 13, the BER shall not exceed 0.1%.

**Table 13: BS reference sensitivity levels**

| BS Class     | Reference measurement channel data rate | BS reference sensitivity level | BER                        |
|--------------|---|--------------------------------|----------------------------|
| Wide Area BS | 12.2 kbps                               | -110 dBm                       | BER shall not exceed 0.001 |

#### f) Adjacent Channel Selectivity

##### UE:

The ACS requirement is the same as that specified in UMTS TDD band a. The ACS shall be better than the value indicated in Table 14 for the test parameters specified in Table 15 where the BER shall not exceed 0.001

**Table 14: Adjacent Channel Selectivity**

| Power Class | Unit | ACS |
|-------------|------|-----|
| 2           | dB   | 33  |
| 3           | dB   | 33  |

**Table 15: Test parameters for Adjacent Channel Selectivity**

| Parameter                        | Unit        | Level        |
|----------------------------------|-------------|--------------|
| $\Sigma DPCH - Ec$               | dB          | 0            |
| $I_{or}$                         | dBm/1.28MHz | -91          |
| $I_{oac}$ mean power (modulated) | dBm         | -54          |
| $F_{uw}$ offset                  | MHz         | +1.6 or -1.6 |

**BS:**

With the conditions described in Table 16, the BER shall not exceed 0.1%.

**Table 16: Test conditions for Adjacent channel selectivity**

|   |      |      |
|---|------|------|
| Reference measurement channel data rate | 12.2 | kbps |
| Wanted signal mean power                | -104 | dBm  |
|   | -90  | dBm  |
| Interfering signal mean power           | -55  | dBm  |
|   | -41  | dBm  |
| $F_{uw}$ offset (Modulated)             | 1.6  | MHz  |

**g) blocking characteristics****UE:**

The blocking characteristic is defined for UMTS2300 MHz band as following.

The BER shall not exceed 0.001 for the parameters specified in table 17 and table 18.

Table 17: In-band blocking for 2300-2400MHz band

| Parameter                         | Level                                      |  | Unit         |
|-----------------------------------|--|--|--------------|
| $\frac{\Sigma DPCCH\_Ec}{I_{or}}$ | 0  |  | dB           |
| $\hat{I}_{or}$                    | -105                                       |  | dBm/1.28 MHz |
| $I_{ouw}$ mean power (modulated)  | -61<br>(for $F_{uw}$ offset $\pm 3.2$ MHz) | -49<br>(for $F_{uw}$ offset $\pm 4.8$ MHz) | dBm          |

Table 18: Out of band blocking for 2300-2400MHz band

| Parameter                                      | Band 1   | Band 2   | Band 3   | Unit         |
|--|--|--|--|--------------|
| $\frac{\Sigma DPCCH\_Ec}{I_{or}}$              | 0  | 0  | 0  | dB           |
| $\hat{I}_{or}$                                 | -105   | -105   | -105   | dBm/1.28 MHz |
| $I_{ouw}$ (CW)                                 | -44  | -30  | -15  | dBm          |
| $F_{uw}$<br>For operation in 2300-2400MHz band | 2240 <f < 2295.2MHz<br>2404.8 <f < 2460MHz<br><br>1840 <f < 1895.2<br>1924.8 <f < 2005.2<br>2029.8 <f < 2085   | 2215 <f < 2240<br>2460 <f < 2485<br><br>1815 <f < 1840<br>2085 <f < 2110 | 1 <f < 2215<br>2485 <f < 12750<br><br>1 <f < 1815<br>2110 <f < 12750 | MHz          |
| 1.   | For operation in 2300-2400MHz band, from 2295.2MHz <f < 2404.8MHz the appropriate in-band blocking in table 9 or adjacent channel selectivity in Table 6 shall be applied. |  |  |              |

**BS:**

With the conditions described in Table 19 and Table 20, the BER shall not exceed 0.1%.

Table 19: Blocking requirements for 2300MHz

| Center Frequency of Interfering Signal | Interfering Signal Mean Power | Wanted Signal Mean Power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 2300 – 2400 MHz                        | -40dBm                        | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 2280 – 2300 MHz,<br>2400 – 2420 MHz    | -40 dBm                       | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1 – 2280 MHz,<br>2420 – 12750 MHz      | -15 dBm                       | -104 dBm                 | —                                    | CW carrier                            |

Table 20: Additional Blocking requirements for 2300MHz

| Center Frequency of Interfering Signal | Interfering Signal Mean Power | Wanted Signal Mean Power |
|--|-------------------------------|--------------------------|
| 930 – 960 MHz                          | +16 dBm                       | -104 dBm                 |
| 1805 – 1850 MHz                        | +16 dBm                       | -104 dBm                 |

## h) Receiver spurious emission

UE:

The receiver spurious emission is defined for UMTS2300 MHz band as following.

**Table 21: receiver spurious emission requirements for 2300-2400MHz**

| Band  | Maximum level | Measurement Bandwidth | Note   |
|---|---------------|-----------------------|--|
| 30 MHz – 1 GHz  | -57 dBm       | 100 kHz               |  |
| 1 GHz - 1.9 GHz and<br>1.92 GHz - 2.01 GHz and<br>2.025 GHz - 2.11 GHz<br>and<br>2.17GHz – 2.3GHz and<br>2.4GHz-2.57GHz       | -47           | 1 MHz                 | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the UE. |
| 1.9 GHz - 1.92 GHz and<br>2.01 GHz - 2.025 GHz<br>and<br>2.11 GHz - 2.170 GHz<br>and 2.3GHz - 2.4GHz and<br>2.57GHz - 2.69GHz | -64           | 1.28                  | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the UE. |
| 2.4 GHz - 12.75 GHz   | -47 dBm       | 1 MHz                 |  |

BS:

Receiver Spurious emissions requirements for UMTS2300 are specified as in Table 22.

**Table 22: Receiver spurious emission requirements for UMTS2300**

| Band  | Maximum level | Measurement Bandwidth | Note   |
|---|---------------|-----------------------|--|
| 30 MHz – 1 GHz  | -57 dBm       | 100 kHz               |  |
| 1 GHz – 1.88GHz and<br>1.98 GHz – 2.01 GHz and<br>2.025 GHz – 2.30 GHz  | -47 dBm       | 1 MHz                 | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS. |
| 1.88 GHz – 1.98 GHz and<br>2.01 GHz – 2.025 GHz and<br>2.3 GHz – 2.4GHz | -83 dBm       | 1.28 MHz              | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS. |
| 2.4 GHz – 12.75 GHz   | -47 dBm       | 1 MHz                 | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS. |

### 5.3 Specific UE requirements for UMTS2300

The requirements for operations in 2 GHz TDD have been determined by system simulations performed at 2 GHz models in TR25.945 [4]. The path loss difference between 2.3 and 2.0 GHz was estimated to be 2 dB assuming a  $10 \cdot \log_{10}(f^{3.39})$  dependency. However, some of this loss may be compensated by higher antenna gains across the 2.3 GHz band. Assuming the same physical size for the antennas, antenna gains in 2.3 GHz are expected to be increased by 1.2 dB (scaling with  $10 \cdot \log_{10}(f^2)$ ). Therefore, the simulations performed and the resultant RF requirements (e.g. ACLR/ACS) in TR25.945 [4] are applicable and can be re-used for operations in 2.3 GHz band. So, for those requirements defined in a way without addressing difference between frequency bands, no changes are needed. Changes are only needed for those requirements defined in a band-specific way.

### 5.3.1 UE Transmitter Characteristics

No changes are needed for UE maximum and power dynamics, frequency stability, transmit ON/OFF time mask, SEM, ACLR, General spurious emission requirements, Transmit intermodulation and EVM. The only required change for transmitter is the additional spurious emission requirement.

The minimum requirement of UE transmission power Currently in 25.102 additional spurious emission requirements for protection of GSM 900, DCS 1800 UE and 2.6GHz FDD UE (when TDD operates in the 2.6GHz centre GAP) are also applicable for 2.3GHz. But they are defined in the same table without distinguish between different scenarios and different operating bands. But actually different operating band may be used in different region or country, thus facing different co-existence deployment scenario, it is propose to define the additional requirements separately for each operating band. Also, additional requirement between TDD bands should also be complemented, for which the emission level can generally be determined by,

$$-174\text{dBm/Hz} + 60\text{dB (1MHz)} + 9\text{dB (NF)} + 40\text{dB (MCL)} = -65\text{dBm/MHz}$$

Although this emission level is already satisfied between different TDD bands in the current implementation, it is still needed to make the specification complementary and preclude potential co-existence issues between existing and newly introduced bands.

#### 5.3.1.1 Additional spurious emission

The UE additional spurious emission requirements are described in the form of a text change [9] to TS 25.102 in section 6.6.3.1.2. The changes are highlighted in yellow.

#### 6.6.3.1.2 1.28 Mcps TDD Option

These requirements are only applicable for frequencies which are greater than 4 MHz away from the UE center carrier frequency.

**Table 6.7C: General Spurious emissions requirements (1.28 Mcps TDD Option)**

| Frequency Bandwidth                      | Measurement Bandwidth | Minimum requirement |
|--|-----------------------|---------------------|
| $9\text{ kHz} \leq f < 150\text{ kHz}$   | 1 kHz                 | -36 dBm             |
| $150\text{ kHz} \leq f < 30\text{ MHz}$  | 10 kHz                | -36 dBm             |
| $30\text{ MHz} \leq f < 1000\text{ MHz}$ | 100 kHz               | -36 dBm             |
| $1\text{ GHz} \leq f < 12.75\text{ GHz}$ | 1 MHz                 | -30 dBm             |



**Table 6.7D: Additional Spurious emissions requirements (1.28 Mcps TDD Option)**

| Operating Band | Frequency Bandwidth   | Measurement Bandwidth | Minimum requirement |
|----------------|---|-----------------------|---------------------|
| a              | 921 MHz ≤ f < 925 MHz   | 100 kHz               | -60 dBm (note1)     |
|                | 925 MHz ≤ f ≤ 935 MHz   | 100 kHz               | -67 dBm (note1)     |
|                | 935 MHz < f ≤ 960 MHz   | 100 kHz               | -79 dBm (note1)     |
|                | 1805 MHz ≤ f ≤ 1880 MHz   | 100 kHz               | -71 dBm (note1)     |
|                | 2010 MHz ≤ f ≤ 2025 MHz   | 1MHz                  | -65 dBm (Note2)     |
|                | 1900 MHz ≤ f ≤ 1920 MHz   | 1MHz                  | -65 dBm (Note 3)    |
| b              | 1850 MHz ≤ f ≤ 1910 MHz   | 1 MHz                 | -65 dBm (Note 4)    |
|                | 1930 MHz ≤ f ≤ 1990 MHz   | 1 MHz                 | -65 dBm (Note 5)    |
|                | 2010 MHz ≤ f ≤ 2025 MHz   | 1MHz                  | -65 dBm             |
| c              | 2010 MHz ≤ f ≤ 2025 MHz   | 1 MHz                 | -65 dBm             |
| d              | 1900 MHz ≤ f ≤ 1920 MHz   | 1 MHz                 | -65 dBm             |
|                | 2010 MHz ≤ f ≤ 2025 MHz   | 1 MHz                 | -65 dBm             |
|                | 2620 MHz ≤ f ≤ 2690 MHz   | 3.84 MHz              | -37 dBm             |
| e              | 921 MHz ≤ f < 925 MHz   | 100 kHz               | -60 dBm (note1)     |
|                | 925 MHz ≤ f ≤ 935 MHz   | 100 kHz               | -67 dBm (note1)     |
|                | 935 MHz < f ≤ 960 MHz   | 100 kHz               | -79 dBm (note1)     |
|                | 1805 MHz ≤ f ≤ 1880 MHz   | 100 kHz               | -71 dBm (note1)     |
|                | 1900 MHz ≤ f ≤ 1920 MHz   | 1 MHz                 | -65 dBm             |
|                | 2010 MHz ≤ f ≤ 2025 MHz   | 1 MHz                 | -65 dBm             |
| Note 1         | The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 6.7c are permitted for each UARFCN used in the measurement. |                       |                     |
| Note 2         | This requirement is only applicable when UE operating in 1900-1920MHz of band a.  |                       |                     |
| Note 3         | This requirement is only applicable when UE operating in 2010-2025MHz of band a.  |                       |                     |
| Note 4         | This requirement is only applicable when UE operating in 1930-1990MHz of band b.  |                       |                     |
| Note 5         | This requirement is only applicable when UE operating in 1850-1910MHz of band b.  |                       |                     |

## 5.3.2 UE Receiver Characteristics

No changes are required for reference sensitivity, maximum input level, ACS, spurious response and intermodulation characteristics. Changes for blocking and spurious emission requirements are needed since they are band specific requirement.

### 5.3.2.1 Blocking characteristics

The UE blocking characteristic requirements are described in the form of a text change [10] to TS 25.102 in section 7.6.1.2. The changes are highlighted in yellow.

### 7.6.1.2 1.28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.6A and table 7.7A. For table 7.7A up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size.

**Table 7.6A: In-band blocking (1.28 Mcps TDD Option)**

| Parameter                        | Level                                 |                                       | Unit         |
|----------------------------------|---------------------------------------|---------------------------------------|--------------|
| $\frac{\Sigma DPCH\_Ec}{I_{or}}$ | 0                                     |                                       | dB           |
| $\hat{I}_{or}$                   | -105                                  |                                       | dBm/1.28 MHz |
| $I_{ouw}$ mean power (modulated) | -61<br>(for $F_{uw}$ offset ±3.2 MHz) | -49<br>(for $F_{uw}$ offset ±4.8 MHz) | dBm          |

Table 7.7A: Out of band blocking (1.28 Mcps TDD Option)

| Parameter   | Band 1   | Band 2                             | Band 3                           | Unit         |
|---|--|------------------------------------|----------------------------------|--------------|
| $\frac{\Sigma DPCH - Ec}{I_{or}}$   | 0  | 0                                  | 0                                | dB           |
| $\hat{I}_{or}$  | -105   | -105                               | -105                             | dBm/1.28 MHz |
| $I_{ouw}$ (CW)  | -44  | -30                                | -15                              | dBm          |
| $F_{uw}$<br>For operation in frequency bands as defined in subclause 5.2(a) | 1840 < f < 1895.2<br>1924.8 < f < 2005.2<br>2029.8 < f < 2085  | 1815 < f ≤ 1840<br>2085 < f < 2110 | 1 < f ≤ 1815<br>2110 ≤ f < 12750 | MHz          |
| $F_{uw}$<br>For operation in frequency bands as defined in subclause 5.2(b) | 1790 < f < 1845.2<br>1914.8 < f < 1925.2<br>1994.8 < f < 2050  | 1765 < f ≤ 1790<br>2050 ≤ f < 2075 | 1 < f ≤ 1765<br>2075 ≤ f < 12750 | MHz          |
| $F_{uw}$<br>For operation in frequency bands as defined in subclause 5.2(c) | 1850 < f < 1905.2<br>1934.8 < f < 1990   | 1825 < f ≤ 1850<br>1990 ≤ f < 2015 | 1 < f ≤ 1825<br>2015 ≤ f < 12750 | MHz          |
| $F_{uw}$<br>For operation in frequency bands as defined in subclause 5.2(d) | 2510 < f < 2565.2<br>2624.8 < f < 2680   | 2485 < f ≤ 2510<br>2680 ≤ f < 2705 | 1 < f ≤ 2485<br>2705 ≤ f < 12750 | MHz          |
| $F_{uw}$<br>For operation in frequency bands as defined in subclause 5.2(e) | 2240 < f < 2295.2<br>2404.8 < f < 2460   | 2215 < f ≤ 2240<br>2460 ≤ f < 2485 | 1 < f ≤ 2215<br>2485 ≤ f < 12750 | MHz          |
| 1.  | For operation referenced in 5.2(a), from 1895.2 < f ≤ 1924.8 MHz, 2005.2 < f ≤ 2029.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2 shall be applied.     |                                    |                                  |              |
| 2.  | For operation referenced in 5.2(b), from 1845.2 ≤ f < 1914.8 MHz, and 1925.2 < f < 1994.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2 shall be applied. |                                    |                                  |              |
| 3.  | For operation referenced in 5.2(c), from 1905.2 ≤ f ≤ 1934.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2 shall be applied.                              |                                    |                                  |              |
| 4.  | For operation referenced in 5.2(d), from 2565.2 ≤ f ≤ 2624.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1 shall be applied.                                |                                    |                                  |              |
| 5.  | For operation referenced in 5.2(e), from 2295.2 ≤ f ≤ 2404.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1 shall be applied.                                |                                    |                                  |              |

### 5.3.2.2 Spurious emission

The UE receiver spurious emission requirements are described in the form of a text change [10] to TS 25.102 in section 7.9.1.2. The changes are highlighted in yellow.

### 7.9.1.2 1.28 Mcps TDD Option

The power of any spurious emission shall not exceed:

**Table 7.10A: Receiver spurious emission requirements (1.28 Mcps TDD Option)**

| Band   | Maximum level | Measurement Bandwidth | Note |
|--|---------------|-----------------------|------|
| 30 MHz - 1 GHz   | -57 dBm       | 100 kHz               |      |
| 1 GHz - 1.9 GHz and<br>1.92 GHz - 2.01 GHz and<br>2.025 GHz - 2.11 GHz and<br>2.17GHz-2.30 GHz and<br>2.40 GHz- 2.57GHz    | -47 dBm       | 1 MHz                 |      |
| 1.9 GHz - 1.92 GHz and<br>2.01 GHz - 2.025 GHz and<br>2.11 GHz - 2.170 GHz and<br>2.30GHz-2.40GHz and<br>2.57GHz - 2.69GHz | -64 dBm       | 1.28 MHz              |      |
| 2.69 GHz - 12.75 GHz   | -47 dBm       | 1 MHz                 |      |

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## 5.4 Specific BS requirements for UMTS2300

As it is analyzed in section 5.3, the simulations performed and the resultant RF requirements (e.g. ACLR/ACS) in TR25.945 [4] and 25.105 are applicable and can be re-used for operations in 2.3 GHz band. Changes are only made for those requirements defined in a band-specific way.

### 5.4.1 BS Transmitter Characteristics

No changes are needed for BS output power and power dynamics, frequency stability, transmit ON/OFF time mask, SEM, ACLR, Category A and B spurious emission requirements, Transmit intermodulation and EVM. The only required change for transmitter is the additional spurious emission requirement for unsynchronized TDD operation.

#### 5.4.1.1 Co-existence with unsynchronised TDD

The additional spurious emission requirements are described in the form of a text change [12] to TS 25.105 in section 6.6.3.5. The changes are highlighted in yellow.

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#### 6.6.3.5 Co-existence with unsynchronised TDD

##### 6.6.3.5.1 Operation in the same geographic area

This requirement shall apply in case the equipment is operated in the same geographic area with unsynchronised TDD BS.

##### 6.6.3.5.1.1 Minimum Requirement

##### 6.6.3.5.1.1.2 1.28 Mcps TDD option

In geographic areas where only 1.28 Mcps TDD is deployed, the RRC filtered mean power of any spurious emission shall not exceed the limits specified in table 6.19, otherwise the limits in table 6.20 shall apply.

**Table 6.19: BS Spurious emissions limits for operation in same geographic area with unsynchronised 1,28 Mcps TDD**

| BS Class      | Band            | Maximum Level | Measurement Bandwidth |
|---------------|-----------------|---------------|-----------------------|
| Wide Area BS  | 1900 - 1920 MHz | -39 dBm       | 1,28 MHz              |
| Wide Area BS  | 2010 - 2025 MHz | -39 dBm       | 1,28 MHz              |
| Wide Area BS  | 2570 - 2620 MHz | -39 dBm       | 1,28 MHz              |
| Wide Area BS  | 2300 - 2400 MHz | -39 dBm       | 1,28 MHz              |
| Local Area BS | 1900 - 1920 MHz | -36 dBm       | 1,28 MHz              |
| Local Area BS | 2010 - 2025 MHz | -36 dBm       | 1,28 MHz              |
| Local Area BS | 2570 - 2620 MHz | -36 dBm       | 1,28 MHz              |
| Local Area BS | 2300 - 2400 MHz | -36 dBm       | 1,28 MHz              |

**Table 6.20: BS Spurious emissions limits for operation in same geographic area with unsynchronised TDD**

| BS Class      | Band            | Maximum Level | Measurement Bandwidth |
|---------------|-----------------|---------------|-----------------------|
| Wide Area BS  | 1900 - 1920 MHz | -39 dBm       | 3,84 MHz              |
| Wide Area BS  | 2010 - 2025 MHz | -39 dBm       | 3,84 MHz              |
| Wide Area BS  | 2570 - 2620 MHz | -39 dBm       | 3,84 MHz              |
| Local Area BS | 1900 - 1920 MHz | -36 dBm       | 3,84 MHz              |
| Local Area BS | 2010 - 2025 MHz | -36 dBm       | 3,84 MHz              |
| Local Area BS | 2570 - 2620 MHz | -36 dBm       | 3,84 MHz              |

NOTE: The requirements in Table 6.19 and 6.20 for the Wide Area BS are based on a minimum coupling loss of 67 dB between unsynchronised TDD base stations. The requirements in Table 6.19 and 6.20 for the Local Area BS are based on a coupling loss of 70 dB between unsynchronised Wide Area and Local Area TDD base stations. The scenarios leading to these requirements are addressed in TR25.942 [4].

### 6.6.3.5.2 Co-located base stations

This requirement shall apply in case of co-location with unsynchronised TDD BS.

#### 6.6.3.5.2.1 Minimum Requirement

##### 6.6.3.5.2.1.2 1.28 Mcps TDD option

In geographic areas where only 1,28 Mcps TDD is deployed, the RRC filtered mean power of any spurious emission in case of co-location shall not exceed the limits specified in table 6.22, otherwise the limits in table 6.23 shall apply.

**Table 6.22: BS Spurious emissions limits for co-location with unsynchronised 1,28 Mcps TDD**

| BS Class      | Band            | Maximum Level | Measurement Bandwidth |
|---------------|-----------------|---------------|-----------------------|
| Wide Area BS  | 1900 - 1920 MHz | -76 dBm       | 1,28 MHz              |
| Wide Area BS  | 2010 - 2025 MHz | -76 dBm       | 1,28 MHz              |
| Wide Area BS  | 2570 - 2620 MHz | -76 dBm       | 1,28 MHz              |
| Wide Area BS  | 2300 - 2400 MHz | -76 dBm       | 1,28 MHz              |
| Local Area BS | 1900 - 1920 MHz | -37 dBm       | 1,28 MHz              |
| Local Area BS | 2010 - 2025 MHz | -37 dBm       | 1,28 MHz              |
| Local Area BS | 2570 - 2620 MHz | -37 dBm       | 1,28 MHz              |
| Local Area BS | 2300 - 2400 MHz | -37 dBm       | 1,28 MHz              |

**Table 6.23: BS Spurious emissions limits for co-location with unsynchronised TDD**

| BS Class      | Band            | Maximum Level | Measurement Bandwidth |
|---------------|-----------------|---------------|-----------------------|
| Wide Area BS  | 1900 - 1920 MHz | -76 dBm       | 3,84 MHz              |
| Wide Area BS  | 2010 - 2025 MHz | -76 dBm       | 3,84 MHz              |
| Wide Area BS  | 2570 - 2620 MHz | -76 dBm       | 3,84 MHz              |
| Local Area BS | 1900 - 1920 MHz | -36 dBm       | 3,84 MHz              |
| Local Area BS | 2010 - 2025 MHz | -36 dBm       | 3,84 MHz              |
| Local Area BS | 2570 - 2620 MHz | -36 dBm       | 3,84 MHz              |

NOTE: The requirements in Table 6.22 and 6.23 for the Wide Area BS are based on a minimum coupling loss of 30 dB between unsynchronised TDD base stations. The requirements in Table 6.22 and 6.23 for the Local Area BS are based on a minimum coupling loss of 45 dB between unsynchronised Local Area base stations. The co-location of different base station classes is not considered.

## 5.4.2 BS Receiver Characteristics

No changes are required for reference sensitivity, maximum input level, ACS, and intermodulation characteristics. Changes for blocking and spurious emission requirements are proposed for 2300MHz band in the next 2 sections.

### 5.4.2.1 Blocking characteristics

The BS blocking characteristic requirements are described in the form of a text change [13] to TS 25.105 in section 7.5.0.2. The changes are highlighted in yellow.

## 7.5 Blocking characteristics

The blocking characteristic 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 adjacent channels. The blocking performance requirement applies to interfering signals with centre frequency within the ranges specified in the tables below, using a 1MHz step size.

### 7.5.0 Minimum requirement

The static reference performance as specified in clause 7.2.1 shall be met with a wanted and an interfering signal coupled to BS antenna input using the parameters as specified in table 7.4-1 for the Wide Area BS and as specified in table 7.4-2 for the Local Area BS.

#### 7.5.0.2 1,28 Mcps TDD Option

**Table 7.4A1 (a): Blocking requirements for Wide Area BS in operating bands defined in 5.2(a)**

| Center Frequency of Interfering Signal                  | Interfering Signal Mean Power | Wanted Signal Mean Power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|---|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 1900 - 1920 MHz,<br>2010 - 2025 MHz                     | -40 dBm                       | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1880 - 1900 MHz,<br>1990 - 2010 MHz,<br>2025 - 2045 MHz | -40dBm                        | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1920 - 1980 MHz   | -40dBm                        | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1 - 1880 MHz,<br>1980 - 1990 MHz,<br>2045 - 12750 MHz   | -15dBm                        | -104 dBm                 | —                                    | CW carrier                            |

**Table 7.4A1 (b): Blocking requirements for Wide Area BS in operating bands defined in 5.2(b)**

| Center Frequency of Interfering Signal | Interfering Signal Mean Power | Wanted Signal Mean Power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 1850 - 1990 MHz                        | -40dBm                        | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1830 - 1850 MHz,<br>1990 - 2010 MHz    | -40 dBm                       | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1 - 1830 MHz,<br>2010 - 12750 MHz      | -15 dBm                       | -104 dBm                 | —                                    | CW carrier                            |

**Table 7.4A1(c): Blocking requirements for Wide Area BS in operating bands defined in 5.2(c)**

| Center Frequency of Interfering Signal | Interfering Signal Mean Power | Wanted Signal Mean Power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 1910 - 1930 MHz                        | -40dBm                        | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1890 - 1910 MHz,<br>1930 - 1950 MHz    | -40dBm                        | -104 dBm                 | 3.2 MHz                              | Narrow band CDMA signal with one code |
| 1 - 1890 MHz,<br>1950 - 12750 MHz      | -15 dBm                       | -104 dBm                 | —                                    | CW carrier                            |

**Table 7.4A1 (d): Blocking requirements for Wide Area BS in operating bands defined in 5.2(d)**

| Center Frequency of Interfering Signal | Interfering Signal Mean Power | Wanted Signal Mean Power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 2570 - 2620 MHz                        | -40dBm                        | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 2500 - 2570 MHz,<br>2620 - 2690 MHz    | -40dBm                        | -104 dBm                 | 3.2 MHz                              | Narrow band CDMA signal with one code |
| 1 - 2500 MHz,<br>2690 - 12750 MHz      | -15 dBm                       | -104 dBm                 | —                                    | CW carrier                            |

**Table 7.4A1 (e): Blocking requirements for Wide Area BS in operating bands defined in 5.2(e)**

| Center Frequency of Interfering Signal | Interfering Signal Mean Power | Wanted Signal Mean Power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 2300 - 2400 MHz                        | -40dBm                        | -104 dBm                 | 3.2MHz                               | Narrow band CDMA signal with one code |
| 2280 - 2300 MHz,<br>2400 - 2420 MHz    | -40dBm                        | -104 dBm                 | 3.2 MHz                              | Narrow band CDMA signal with one code |
| 1 - 2280 MHz,<br>2420 - 12750 MHz      | -15 dBm                       | -104 dBm                 | —                                    | CW carrier                            |

**Table 7.4A2 (a): Blocking requirements for Local Area BS in operating bands defined in 5.2(a)**

| Center Frequency of Interfering Signal                  | Interfering Signal mean power | Wanted Signal mean power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|---|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 1900 - 1920 MHz,<br>2010 - 2025 MHz                     | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1880 - 1900 MHz,<br>1990 - 2010 MHz,<br>2025 - 2045 MHz | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1920 - 1980 MHz   | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1 - 1880 MHz,<br>1980 - 1990 MHz,<br>2045 - 12750 MHz   | -15dBm                        | -90 dBm                  | —                                    | CW carrier                            |

**Table 7.4A2 (b): Blocking requirements for Local Area BS in operating bands defined in 5.2(b)**

| Center Frequency of Interfering Signal | Interfering Signal mean power | Wanted Signal mean power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 1850 - 1990 MHz                        | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1830 - 1850 MHz,<br>1990 - 2010 MHz    | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1 - 1830 MHz,<br>2010 - 12750 MHz      | -15 dBm                       | -90 dBm                  | —                                    | CW carrier                            |

**Table 7.4A2(c): Blocking requirements for Local Area BS in operating bands defined in 5.2(c)**

| Center Frequency of Interfering Signal | Interfering Signal mean power | Wanted Signal mean power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 1910 - 1930 MHz                        | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 1890 - 1910 MHz,<br>1930 - 1950 MHz    | -30 dBm                       | -90 dBm                  | 3.2 MHz                              | Narrow band CDMA signal with one code |
| 1 - 1890 MHz,<br>1950 - 12750 MHz      | -15 dBm                       | -90 dBm                  | —                                    | CW carrier                            |

**Table 7.4A2 (d): Blocking requirements for Local Area BS in operating bands defined in 5.2(d)**

| Center Frequency of Interfering Signal | Interfering Signal mean power | Wanted Signal mean power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 2570 - 2620 MHz                        | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 2500 - 2570 MHz,<br>2620 - 2690 MHz    | -30 dBm                       | -90 dBm                  | 3.2 MHz                              | Narrow band CDMA signal with one code |
| 1 - 2500 MHz,<br>2690 - 12750 MHz      | -15 dBm                       | -90 dBm                  | —                                    | CW carrier                            |

**Table 7.4A2 (e): Blocking requirements for Local Area BS in operating bands defined in 5.2(e)**

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| Center Frequency of Interfering Signal | Interfering Signal mean power | Wanted Signal mean power | Minimum Offset of Interfering Signal | Type of Interfering Signal            |
|--|-------------------------------|--------------------------|--------------------------------------|---------------------------------------|
| 2300 - 2400 MHz                        | -30 dBm                       | -90 dBm                  | 3.2MHz                               | Narrow band CDMA signal with one code |
| 2280 - 2300 MHz<br>2400 - 2420 MHz     | -30 dBm                       | -90 dBm                  | 3.2 MHz                              | Narrow band CDMA signal with one code |
| 1 - 2280 MHz<br>2420 - 12750 MHz       | -15 dBm                       | -90 dBm                  | —                                    | CW carrier                            |

### 5.4.2.2 Spurious emission

The BS receiver spurious emission requirements are described in the form of a text change [13] to TS 25.105 in section 7.7.1.2. The changes are highlighted in yellow.

## 7.7 Spurious emissions

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS 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

#### 7.7.1.2 1,28 Mcps TDD Option

The power of any spurious emission shall not exceed:

**Table 7.6A: Receiver spurious emission requirements**

| Band   | Maximum level | Measurement Bandwidth | Note   |
|--|---------------|-----------------------|--|
| 30 MHz - 1 GHz   | -57 dBm       | 100 kHz               |  |
| 1 GHz - 1.9 GHz and<br>1.98 GHz - 2.01 GHz and<br>2.025 GHz - 2.3GHz and<br>2.4GHz - 2.50 GHz  | -47 dBm       | 1 MHz                 | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS. |
| 1.9 GHz - 1.98 GHz and<br>2.01 GHz - 2.025 GHz and<br>2.3GHz - 2.4GHz and<br>2.5 GHz - 2.62GHz | -83 dBm       | 1.28 MHz              | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS. |
| 2.62 GHz - 12.75 GHz   | -47 dBm       | 1 MHz                 | With the exception of frequencies between 4MHz below the first carrier frequency and 4MHz above the last carrier frequency used by the BS. |

In addition to the requirements in table 7.6A, the co-existence requirements for co-located base stations specified in sub clause 6.6.3.2.2, 6.6.3.3.2 and 6.6.3.4.2 may also be applied.

## 5.4 Propagation conditions

For 2.3 GHz TDD operation, the multipath fading channels described in Annex B of TS25.102 and TS 25.105 shall employ the velocity scaling technique in order to reuse the demodulation test cases defined for the 2.0GHz band UE and BS. To summarize, the total propagation channel model with applicable velocity is shown in table 5.4-1, 2, 3 respectively.



Table 5.4-1: Propagation Conditions for Multi-Path Fading Environments operations

| Case 1                                 |                          | Case 2                                 |                          | Case 3                                 |                          |
|--|--------------------------|--|--------------------------|--|--------------------------|
| Speed for operating band e:<br>2.6km/h |                          | Speed for operating band e:<br>2.6km/h |                          | Speed for operating band e:<br>102km/h |                          |
| Relative Delay [ns]                    | Relative Mean Power [dB] | Relative Delay [ns]                    | Relative Mean Power [dB] | Relative Delay [ns]                    | Relative Mean Power [dB] |
| 0                                      | 0                        | 0                                      | 0                        | 0                                      | 0                        |
| 2928                                   | -10                      | 2928                                   | 0                        | 781                                    | -3                       |
|  |                          | 12000                                  | 0                        | 1563                                   | -6                       |
|  |                          |  |                          | 2344                                   | -9                       |

Table 5.4-2: Propagation Conditions for Multi-Path Fading Environments for HSDPA or HSUPA Performance test

| ITU Pedestrian A                       |                          | ITU Pedestrian B                       |                          | ITU vehicular A                       |                          | ITU vehicular A                        |                          |
|--|--------------------------|--|--------------------------|---------------------------------------|--------------------------|--|--------------------------|
| Speed for operating band e:<br>2.6km/h |                          | Speed for operating band e:<br>2.6km/h |                          | Speed for operating band e:<br>26km/h |                          | Speed for operating band e:<br>102km/h |                          |
| Relative Delay [ns]                    | Relative Mean Power [dB] | Relative Delay [ns]                    | Relative Mean Power [dB] | Relative Delay [ns]                   | Relative Mean Power [dB] | Relative Delay [ns]                    | Relative Mean Power [dB] |
| 0                                      | 0                        | 0                                      | 0                        | 0                                     | 0                        | 0                                      | 0                        |
| 110                                    | -9.7                     | 200                                    | -0.9                     | 310                                   | -1.0                     | 310                                    | -1.0                     |
| 190                                    | -19.2                    | 800                                    | -4.9                     | 710                                   | -9.0                     | 710                                    | -9.0                     |
| 410                                    | -22.8                    | 1200                                   | -8.0                     | 1090                                  | -10.0                    | 1090                                   | -10.0                    |
|  |                          | 2300                                   | -7.8                     | 1730                                  | -15.0                    | 1730                                   | -15.0                    |
|  |                          | 3700                                   | -23.9                    | 2510                                  | -20                      | 2510                                   | -20                      |

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**Table 5.4-2: Propagation Conditions for Multi-Path Fading Environments for MBSFN Demodulation Performance Requirements**

| MBSFN channel model 1        |                          | MBSFN channel model 2       |                          |
|------------------------------|--------------------------|-----------------------------|--------------------------|
| Speed for Band e:<br>26 km/h |                          | Speed for Band e:<br>26km/h |                          |
| Relative Delay [ns]          | Relative Mean Power [dB] | Relative Delay [ns]         | Relative Mean Power [dB] |
| 0                            | 0.0                      | 0                           | 0.0                      |
| 310                          | -1.0                     | 310                         | -1.0                     |
| 710                          | -9.0                     | 710                         | -9.0                     |
| 1090                         | -10.0                    | 1090                        | -10.0                    |
| 1730                         | -15.0                    | 1730                        | -15.0                    |
| 2510                         | -20.0                    | 2510                        | -20.0                    |
| 2734                         | -6.6                     | 5859                        | -6.8                     |
| 3044                         | -7.6                     | 6169                        | -7.8                     |
| 3444                         | -15.6                    | 6569                        | -15.8                    |
| 3824                         | -16.6                    | 6949                        | -16.8                    |
| 4464                         | -21.6                    | 7589                        | -21.8                    |
| 5469                         | -8.5                     | 10938                       | -13.3                    |
| 5779                         | -9.5                     | 11248                       | -14.3                    |
| 6179                         | -17.5                    | 11648                       | -22.3                    |
| 6559                         | -18.5                    | 12028                       | -23.3                    |
| 8428                         | -12.6                    | 15459                       | -15.0                    |
| 8738                         | -13.6                    | 15769                       | -16.0                    |
| 9138                         | -21.6                    | 16169                       | -24.0                    |

## 6 Summary of contributions to set requirements

### 6.1 Required changes for TS 25.105

Required changes in specification TS 25.105 are discussed in Table 1. Requirements which are not shown are applicable to UMTS 2.3 GHz without any modifications from the existing Band a specifications.

**Table 1. Required Changes in TS 25.105**

| Section | Requirement                         | CR status  | Discussion / Required Changes in TS 25.105   |
|---------|-------------------------------------|--|--|
| 5.2     | Frequency bands                     | <a href="#">Proposed at RAN4#47 as CR0223 in Tdoc R4-081192.</a> | A new 100 MHz frequency band is added as band e) <b>2300-2400MHz</b> : Uplink and Downlink |
| 6.6.3.5 | Coexistence with unsynchronized TDD | <a href="#">Proposed at RAN4#47 as CR0224 in Tdoc R4-080876.</a> | Add requirement of coexistence with TDD system at 2300-2400MHz                             |
| 7.5.0   | Blocking Characteristics            | <a href="#">Proposed at RAN4#47 as CR0225 in Tdoc R4-080877.</a> | Add Minimum requirement for 2300 – 2400MHz TDD band  |

|         |                        |  |  |
|---------|------------------------|--|--|
| 7.7     | Spurious Emissions     | <a href="#">Proposed at RAN4#47 as CR0225 in Tdoc R4-080877.</a> | Add requirement to include operations in 2300 – 2400 MHz TDD band                        |
| Annex B | Propagation Conditions | <a href="#">Proposed at RAN4#47 as CR0226 in Tdoc R4-081193.</a> | <ul style="list-style-type: none"> <li>Add 2300-2400MHz propagation condition</li> </ul> |
|         |                        |  |  |

## 6.2 Required changes for TS 25.102

Required changes in specification TS 25.102 are discussed in Table 2. Requirements which are not shown are applicable to UMTS 2.6 GHz without any modifications from the existing Band a specifications.

**Table 2. Required Changes in TS 25.102**

| Section   | Requirement  | CR status   | Discussion / Required Changes in TS 25.102   |
|-----------|--|---|--|
| 5.2       | Frequency bands  | <a href="#">Proposed at RAN4#47 as CR0258 in Tdoc. R4-080910.</a> | A new 100 MHz frequency band is added as band e)<br><b>2300-2400MHz</b> : Uplink and Downlink  |
| 5.4.4     | UARFCN   | <a href="#">Proposed at RAN4#47 as CR0258 in Tdoc. R4-080910.</a> | Addition of UARFCN for Uplink and Downlink transmission for <b>2300-2400</b> MHz band in Table 5.1.  |
| 6.6.3.1.2 | Spurious Emission – Additional Spurious emissions requirements | <a href="#">Proposed at RAN4#47 as CR0259 in Tdoc R4-080911.</a>  | <ul style="list-style-type: none"> <li>Re-write Table 6.7D for additional spurious emission requirement</li> <li>Adding additional spurious emission requirement between TDD bands</li> </ul> Adding additional spurious emission requirement for 2.3GHz band    |
| 7.6.1.2   | Blocking Characteristics                                       | <a href="#">Proposed at RAN4#47 as CR0260 in Tdoc R4-080912.</a>  | Add requirement for 2.3 GHz TDD band in Table 7.7  |
| 7.9.1.2   | Spurious Emissions   | <a href="#">Proposed at RAN4#47 as CR0260 in Tdoc R4-080912.</a>  | Add requirement to include operations in 2.3 GHz TDD band in Table 7.10  |
| Annex B   | Propagation Conditions   | <a href="#">Proposed at RAN4#47 as CR0260 in Tdoc R4-080912.</a>  | <ul style="list-style-type: none"> <li>Merge table B.3 and B.3A to table B.2 and B.2A respectively in a more readable way and define UE velocity for each operating band a, b, c, d, e</li> <li>Introduce scaled UE velocity for 2.3GHz in table B.3B</li> </ul> |

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|---------|-----------------------------|--|---|
| Annex D | Terminal capabilities (TDD) |  | Information of UE RF access capabilities needs to be updated according to 25.306. |
|---------|-----------------------------|--|---|

### 6.3 Required changes for TS 25.142

| Section   | Requirement                              | CR status  | Discussion / Required Changes in TS 25.142   |
|-----------|--|--|--|
| 4.2       | Frequency bands                          | <a href="#">Proposed at RAN4#47 as CR0230 in Tdoc R4-081194.</a> | Alignment with 25.105 to define a new 100 MHz frequency band e) 2300-2400MHz   |
| 6.6.3.2.5 | Co-existence with unsynchronised TDD     | <a href="#">Proposed at RAN4#47 as CR0231 in Tdoc R4-081195.</a> | Additional spurious emission requirements alignment with those defined in 25.105.  |
| 7.5       | Blocking characteristics                 | <a href="#">Proposed at RAN4#47 as CR0232 in Tdoc R4-081196.</a> | <ul style="list-style-type: none"> <li>Blocking requirement alignment with those introduced in 25.105.</li> <li>Specify test related aspects.</li> </ul> |
| 7.7       | Spurious emission                        | <a href="#">Proposed at RAN4#47 as CR0232 in Tdoc R4-081196.</a> | <ul style="list-style-type: none"> <li>Spurious emission alignment with those introduced in 25.105.</li> <li>Specify test related aspects.</li> </ul>    |
| B.2       | Multi-path fading propagation conditions | <a href="#">Proposed at RAN4#47 as CR0233 in Tdoc R4-081197.</a> | Alignment with 25.105.   |
|           |  |  |  |

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### 6.4 Required changes for TS 25.113

| Section | Requirement             | CR status   | Discussion / Required Changes in TS 25.113          |
|---------|-------------------------|---|---|
| 4.5.2   | Receiver exclusion band | <a href="#">Proposed at RAN4#47 as CR039 in Tdoc R4-080913.</a> | Define exclusion band for BS supporting 2.3GHz band |

### 6.5 Required changes for TS 34.124

| Section | Requirement             | CR status   | Discussion / Required Changes in TS 25.124          |
|---------|-------------------------|---|---|
| 4.4     | Receiver exclusion band | <a href="#">Proposed at RAN4#47 as CR031 in Tdoc R4-080914.</a> | Define exclusion band for UE supporting 2.3GHz band |

## 6.6 Required changes for TS 25.331

| Section                    | Requirement                       | CR status  | Discussion / Required Changes in TS 25.331  |
|----------------------------|-----------------------------------|--|---|
| <a href="#">10.3.3.33b</a> | <a href="#">RF capability TDD</a> | <a href="#">Proposed at RAN2#62 as CR3322 in Tdoc R2-082790.</a> | <a href="#">Change the method of reporting bands which UE supported.<br/>In order to make it more flexible to add new band, extension IE is added.<br/>The ASN.1 is modified accordingly.</a> |
|                            |                                   |  |   |

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## 6.7 Required changes for TS 25.306

| Section | Requirement | CR status | Discussion / Required Changes in TS 25.306 |
|---------|-------------|-----------|--|
|         |             |           |  |
|         |             |           |  |

# 7 Project Plan

## 7.1 Schedule

Table 7.1.1 summarises the schedule plan for UMTS2300.

**Table 7.1.1: Schedule plan [3]**

| Item# | Effort Required   | Schedule   |
|-------|---|------------|
| 1     | TR draft outline<br>Technical conditions for BS and UE specification  | RAN4#46    |
| 2     | Study and check necessary changes for the relevant specifications and collect appropriate information into a TR | RAN4#46bis |
| 3     | Generate CRs to update the appropriate specifications and other documents.                                      | RAN4#47    |
| 4     | Study any signalling issues related to UMTS2300MHz  | RAN2#62    |

## 7.2 Work Task Status

Table 7.2.1 summarises the work task status for UMTS2300.

Table 7.2.1: Work task status

| Item# | Effort Required   | Status           |
|-------|---|------------------|
| 1     | TR draft outline<br>Technical conditions for BS and UE specification  | completed        |
| 2     | Study and check necessary changes for the relevant specifications and collect appropriate information into a TR | Completed        |
| 3     | Generate CRs to update the appropriate specifications and other documents.                                      | <u>Completed</u> |
| 4     | Study any signalling issues related to UMTS2300MHz  |                  |

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## 8 Open issues

[Editor's note] To be filled in, if necessary.

## 9 Annex <X>: Change history

| Date    | TSG #      | Subject/Comment   | New   |
|---------|------------|---|-------|
| 2008-02 | WG4#46     | TR created  | 0.0.1 |
| 2008-03 | WG4#46 bis | Technical condition for UMTS2300MHz introduced                                    | 0.1.0 |
| 2008-05 | WG4#47     | Update section 5 and section 6 according to the approved documents in RAN4#46bis. | 0.2.0 |
| 2008-05 | WG4#48     | Update section 6 according the approved documents in RAN4#47                      | 0.3.0 |
|         |            |   |       |
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