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Technical Report

3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); LTE TDD 2600MHz In US Work Item Technical Report (Release 10)



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Foreword

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

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1 Scope

The present document is a technical report of the LTE TDD in 2600MHz for US work item which was approved at TSG RAN #47 [2]. The objective of this work item is to provide specification support for LTE TDD in the 2496 to 2690MHz band in the US.

The report provides motivation for requirements and a list of recommended changes to the specifications.

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] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] RP-100374, "Work item proposal for 2600MHz LTE TDD frequency band for the US (Region 2)", Clearwire
- [3] FCC Part 27.5, "Miscellaneous Wireless Communications Services: Frequencies", http://edocket.access.gpo.gov/cfr_2008/octqtr/pdf/47cfr27.5.pdf
- [4] FCC Part 27.53, "Miscellaneous Communications Services: Emissions limits", http://edocket.access.gpo.gov/cfr_2008/octqtr/pdf/47cfr27.53.pdf
- [5] WCAI Inc, National ITFS Association and Catholic Television Network, "A Proposal For Revising The MDS And ITFS Regulatory Scheme", FCC Proceeding RM-10586, Filed 10/07/2002 (<http://fjallfoss.fcc.gov/ecfs/comment/view?id=5508447414>)
- [6] FCC Part 1.924, "Practice and procedure: Quiet Zones", http://edocket.access.gpo.gov/cfr_2008/octqtr/pdf/47cfr1.924.pdf
- [7] R4-071235, "E-UTRA UE RF Spectrum Emissions", Motorola
- [8] R4-102727, "TP for LTE_TDD_2600_US TR, band and channel arrangement", Clearwire, Sprint, NII Holdings
- [9] R4-102681, "TP for LTE_TDD_2600_US TR, UE spurious emissions", Clearwire, CMCC, Motorola, Huawei
- [10] R4-080696, "TP 36.101: REFSSENS and associated requirements", Ericsson
- [11] R4-080899, "REFSENS requirement for TDD", CATT
- [12] R4-081117, "Side conditions for UE RSRP Accuracy requirements", Nokia, Nokia Siemens Networks
- [13] R4-102724, "A-MPR aspects for LTE_TDD_2600_US WI", Clearwire
- [14] R4-102725, "A-MPR simulation results and TP proposal on A-MPR value", Clearwire, Huawei
- [15] R1-084666, "Clarification to enable reuse of non-active PUCCH CQI RBs for PUSCH", Motorola, Alcatel-Lucent, Nortel, Nokia, NSN, Ericsson, Samsung, LGE, Texas Instruments, Qualcomm

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

3.2 Symbols

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

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

4 Background

The FCC designates the 2600MHz band in the US for, amongst other things, provision of broadband services. This 2496–2690MHz band is comprised of three sub-bands or segments:

Lower band segment (LBS): 2496 to 2572MHz

Middle band segment (MBS): 2572 to 2614MHz

Upper band segment (UBS): 2614 to 2690MHz

During the most recent reorganisation of the band, the FCC revised the regulations governing the use of this band to provide sufficient protection for the allowed services in adjacent allocations within the band, as well as for services adjacent to the lower edge of the LBS and upper edge of the UBS.

The band is divided into a number of channels, which in some cases are concatenated into blocks. Licensing is on a geographical basis, meaning that each block can potentially have a different owner within a specific geographic area and, in certain areas, the availability of EBS channels (mainly in the LBS) is limited sometimes to the extent that there are no EBS channels available to lease. Consequently the amount of spectrum and exact channels vary not only on a market-by-market basis, but also on a site-by-site basis. This makes deployment by anything other than a TDD system challenging as it is difficult or impossible to pair up spectrum to deploy FDD systems. This has led to operators to opt to use TDD technologies in this band. With the advent of LTE and its inherent support for both FDD and TDD modes of operation, it is now possible for operators to consider deploying LTE in this band operating in TDD mode.

Thus, the proponents of this work item propose to introduce a new TDD band compatible with the appropriate US regulations to enable deployment of 3GPP LTE TDD technology in the 2496-2690 MHz band in the US. Accordingly corresponding necessary work to introduce LTE 2.6GHz TDD band in the US is proposed.

4.1 Task description

The purpose of this work item is to:

- a) Study LTE TDD in 2600MHz band for a potential deployment in US, generating a new technical report based on study results. The specific band to be studied is 2496 to 2690MHz with TDD channel arrangement for the US and region 2 only.
- b) Generate CR's to update the appropriate documents.
- c) TSG RAN WG5 – study UE conformance testing issues related to LTE TDD 2600MHz US band.

d) Any additional related issues.

The Work Item description for LTE TDD 2600MHz US was approved in RAN#47 [2].

4.2 Regulatory framework

In the United States the 2.6GHz band is designated by Part 27 of the FCC rules and regulations, as specified in Title 47 of the Code of Federal Regulations [3]. The arrangement of the 2496 – 2690MHz band is shown below in Figure 4.2-1.

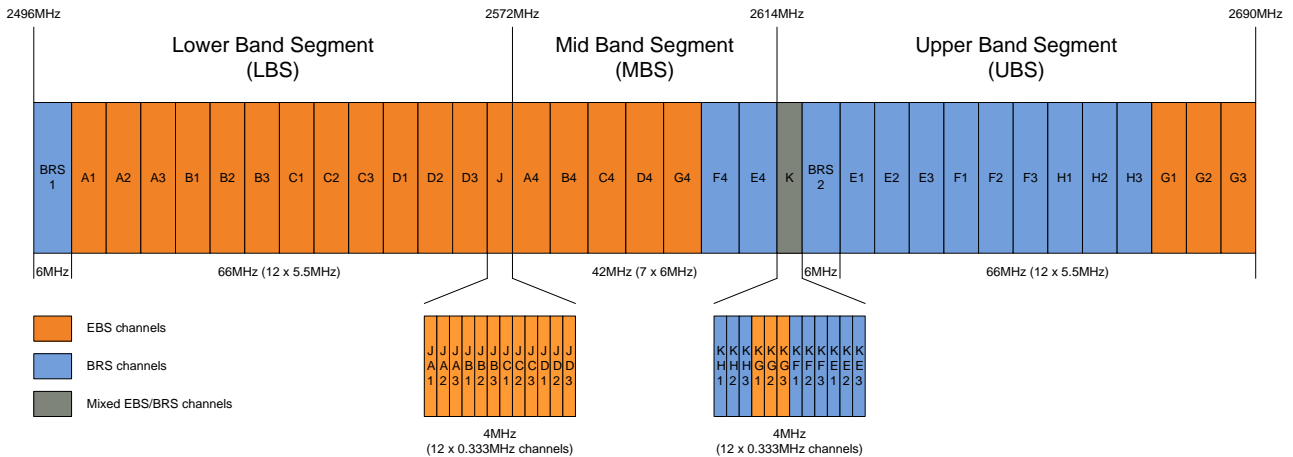


Figure 4.2-1: BRS/EBS channel plan and LBS/MBS/UBS band segmentation

As shown in Figure 4.2-1, the band is comprised of three sub-bands or segments [3]:

- Lower band segment (LBS): 2496 to 2572MHz
- Middle band segment (MBS): 2572 to 2614MHz
- Upper band segment (UBS): 2614 to 2690MHz

This band was originally used for Instructional Television Fixed Service (ITFS) based on 6MHz channels to distribute educational content to remote locations using broadcast technology. The band has since been rearranged and the legacy ITFS stations that are still in operation are now re-located into the MBS band segment, leaving the LBS and the UBS band segment free to provide broadband wireless access services along with the MBS in areas where there are no remaining broadcast stations.

Wireless broadband operators in the US use, or intend to use, much of the LBS and UBS, and in limited cases, where no legacy broadcaster exists, the MBS to provide fixed and mobile wireless broadband internet access.

Commercial operators can own the BRS blocks or lease EBS blocks (commercial operators cannot own EBS blocks, only non-commercial operators such as churches or educational institutions can) across various markets in order to make up their spectrum holding. Due to the fragmented nature of ownership, each block can potentially have a different owner within a specific geographic area and, in certain areas, the availability of EBS blocks (mainly in the LBS) is limited. As a result, in some cases there are no blocks available to lease. The consequence of this ownership structure is that the amount of spectrum and exact channels vary not only on a market-by-market basis, but sometimes on a site-by-site basis.

This has led to operators in the US preferring to operate TDD based systems in order to make best use of the spectrum available

In terms of emissions, Part 27.53 of the FCC regulations [4] requires that:

- UEs with an output power (P) Watts must have an attenuation factor of $43 + 10 \log (P)$ dB at the channel edge and $55 + 10 \log (P)$ dB at 5.5MHz from the channel edge;

- eNBs with an output power (P) Watts must have an attenuation factor not less than $43 + 10 \log (P)$ dB at the channel edge, unless a documented complaint is received, in which case stricter requirements will be imposed if the complaint cannot be resolved;
- Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified)

At the time of reorganisation of the band, these FCC measures were specified following extensive study of coexistence issues [4, 5 and 6] in order to afford proper protection to adjacent services.

5 Study of E-UTRA requirements

5.1 Band and channel arrangement

Technical aspects related to band definition of Band [41] have been studied in [8] and as a result it is proposed that the frequency band for US 2.6G TDD LTE band starts from 2496 to 2690MHz.

5.1.1 Operating bands

An unpaired arrangement for TDD is defined for E-UTRA TDD in 2496-2690 MHz. The band allocation for E-UTRA is referred to as Band [41].

E-UTRA is designed to operate in the operating bands defined in Table 5.1-1.

Table 5.1-1: E-UTRA frequency bands for Band [41]

E-UTRA Operating Band	Uplink (UL) operating band BS receive UE transmit		Downlink (DL) operating band BS transmit UE receive		Duplex Mode
	F_{UL_low}	F_{UL_high}	F_{DL_low}	F_{DL_high}	
[41]	2496 MHz	2690 MHz	2496 MHz	2690 MHz	TDD

5.1.2 Carrier frequency and EARFCN

The carrier frequency in the uplink and downlink is designated by the E-UTRA Absolute Radio Frequency Channel Number (EARFCN) in the range 0 - 65535. The relation between EARFCN and the carrier frequency in MHz for the downlink is given by the following equation, where F_{DL_low} and $N_{Offs-DL}$ are given in table 5.1.2-1 and N_{DL} is the downlink EARFCN.

$$F_{DL} = F_{DL_low} + 0.1(N_{DL} - N_{Offs-DL})$$

The relation between EARFCN and the carrier frequency in MHz for the uplink is given by the following equation where F_{UL_low} and $N_{Offs-UL}$ are given in table 5.1.2-1 and N_{UL} is the uplink EARFCN.

$$F_{UL} = F_{UL_low} + 0.1(N_{UL} - N_{Offs-UL})$$

E-UARFCN can be defined as in Table 5.1.2-1, by reserving a part of the unused numbers that follow the band 40 allocation.

Table 5.1.2-1: EARFCN allocated for E-UTRA Band [41]

E-UTRA Operating Band	Downlink			Uplink		
	F _{DL_low} [MHz]	N _{offs-DL}	Range of N _{DL}	F _{UL_low} [MHz]	N _{offs-UL}	Range of N _{UL}
[41]	2496	[39650]	[39650 – 41589]	2496	[39650]	[39650 – 41589]

5.1.3 Channel bandwidths per operating band

The 2496-2690MHz band in US is divided into a number of channels, and the majority of channel bandwidths are either 5.5MHz or 6MHz as shown in Figure 4.2-1. The minimum operating bandwidth of Band [41] is, therefore, proposed to be 5MHz so as to fully utilize the spectrum in a channel with either 5.5MHz or 6MHz bandwidth. Furthermore, since multiple channels can be concatenated into larger blocks, it is proposed that integer multiples of 5MHz channel bandwidths, namely 10, 15 and 20MHz, are enabled for Band [41] as well.

For Band [41] specification of radio requirements are considered for the bandwidths shown in Table 5.1-3. The transmission bandwidth configuration in Table 5.1-3 shall be supported for each of the specified channel bandwidths. The same (symmetrical) channel bandwidth is specified for both the TX and RX path.

Table 5.1-3: E-UTRA channel bandwidth

E-UTRA band / channel bandwidth						
E-UTRA Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
33			Yes	Yes	Yes	Yes
...						
40			Yes	Yes	Yes	Yes
41 [added]			Yes	Yes	Yes	Yes

5.2 Specific UE RF requirements

5.2.1 Maximum output power with additional requirements

The UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth. The period of measurement shall be at least one sub frame (1ms). As other TDD bands, the maximum output power for Class 3 Band [41] UE is defined to be 23dBm with ± 2 dB tolerance.

Additional ACLR and spectrum emission requirements for Band [41] can be signalled by the network to indicate that the UE shall also meet additional requirements in a specific deployment scenario. To meet these additional requirements, Additional Maximum Power Reduction A-MPR is allowed for the output power.

For UE Power Class 3 the specific requirements and identified sub-clauses are specified in Table 5.2.1-1 along with the allowed A-MPR values that may be used to meet these requirements. The allowed A-MPR values specified below in Table 5.2.1.-1 and 5.2.1-2 are in addition to the allowed MPR requirements specified in clause 6.2.3 of TS36.101. These requirements are based on an analysis provided in [13] and the value of ≤ 2 dB A-MPR for bandwidths greater than 5MHz is based on simulation results presented in [14].

Table 5.2.1-1 Proposed A-MPR requirements for NS_04

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_04	6.6.2.2.2	Band [41]	5	>6	≤ 1
			10, 15, 20	See Table 5.2.1-2	

Table 5.2.1-2: Proposed A-MPR requirements for NS_04 with bandwidth >5MHz

Channel BW	Parameters	Region A	Region B	Region C
10	RB_start ¹	0 – 12	13 – 36	37 – 49
	RB_start ¹ + L_CRB ² [RBs]	n/a ³	>37	n/a ³
	A-MPR [dB]	≤3dB	≤2dB	≤3dB
15	RB_start ¹	0 – 18	19 – 55	56 – 74
	RB_start ¹ + L_CRB ² [RBs]	n/a ³	>56	n/a ³
	A-MPR [dB]	≤3dB	≤2dB	≤3dB
20	RB_start ¹	0 – 24	25 – 74	75 – 99
	RB_start ¹ + L_CRB ² [RBs]	n/a ³	>75	n/a ³
	A-MPR [dB]	≤3dB	≤2dB	≤3dB
Note				
1	RB_start indicates the lowest RB index of transmitted resource blocks			
2	L_CRB is the length of a contiguous resource block allocation			
3	Any RB allocation that starts in Region A or C is allowed the specified A-MPR			
4	For intra-subframe frequency hopping which intersects regions, notes 1 and 2 apply on a per slot basis			
5	For intra-subframe frequency hopping which intersects regions, the larger A-MPR value may be applied for both slots in the subframe			

Note that it is assumed that in order to maintain PUCCH link budget that over allocation of PUCCH resources will be applied in the case of bandwidths greater than 5MHz to enable the PUCCH allocations to fall into RBs where no A-MPR will be applied. The over allocated PUCCH resources can be reused for PUSCH allocation to UEs where the application of an A-MPR is acceptable. This operation was clarified as being allowed in [15].

5.2.2 Spurious emissions

In addition to the existing spurious emissions requirements specified in clause 6.6.3 of TS36.101, the requirements in Table 5.2.2-1 for spurious emissions band UE coexistence, as specified in clause 6.6.3.2 of TS36.101, are required to provide protection to and from existing bands. Note that the additional protection levels proposed are based on a study provided in [9].

Table 5.2.2-1: Requirements for spurious emission band coexistence

E-UTRA Band	Spurious emission						
	Protected band	Frequency range (MHz)		Maximum Level (dBm)	MBW (MHz)	Comment	
2	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, [41]	FDL_low	-	FDL_high	-50	1	
4	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, [41]	FDL_low	-	FDL_high	-50	1	
5	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	-	FDL_high	-50	1	
	E-UTRA Band [41]	FDL_low	-	FDL_high	-50	1	Note ^z
10	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, [41]	FDL_low	-	FDL_high	-50	1	
12	E-UTRA Band 2, 5, 12, 13, 14, 17, [41]	FDL_low	-	FDL_high	-50	1	
	E-UTRA Band 4, 10	FDL_low	-	FDL_high	-50	1	Note ^z
13	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, [41]	FDL_low	-	FDL_high	-50	1	
	Frequency range	763	-	775	-35	0.00625	
14	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, [41]	FDL_low	-	FDL_high	-50	1	
	Frequency range	763	-	775	-35	0.00625	
17	E-UTRA Band 2, 5, 12, 13, 14, 17, [41]	FDL_low	-	FDL_high	-50	1	
	E-UTRA Band 4, 10	FDL_low	-	FDL_high	-50	1	Note ^z
...							
[41]	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	-	FDL_high	-50	1	

Note

1 FDL_low and FDL_high refer to each E-UTRA frequency band specified in Table 5.5-1

2 As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd or 3rd harmonic spurious emissions. An exception is allowed if there is at least one individual RE within the transmission bandwidth (see Figure 5.6-1) for which the 2nd or 3rd harmonic, i.e. the frequency equal to two or three times the frequency of that RE, is within the measurement bandwidth (MBW).

3 To meet these requirements some restriction will be needed for either the operating band or protected band

4 N/A

5 For non synchronised TDD operation to meet these requirements some restriction will be needed for either the operating band or protected band

6 Applicable when NS_05 in section 6.6.3.3.1 is signalled by the network.

7 Applicable when co-existence with PHS system operating in 1884.5-1919.6MHz.

8 Applicable when co-existence with PHS system operating in 1884.5-1915.7MHz.

5.2.3 Reference sensitivity power level

The reference sensitivity power level REFSENS is the minimum mean power applied to both the UE antenna ports at which the throughput shall meet or exceed the requirements for the specified reference measurement channel. In E-UTRA, band specific RF receiver sensitivity is determined by the theoretical thermal noise floor, receiver noise figure and implementation margin plus SINR requirement to achieve reference throughput. The detailed analysis of REFSENS for TDD bands was presented in [11], and it was agreed that the same 2dB implementation margin (including Tx noise) applies to all TDD bands. The 2dB implementation margin is consequently adopted to derive REFSENS for TDD bands in TS36.101. Therefore, thanks to the same theoretical thermal noise floor and receiver noise figure, the band agnostic implementation margin results in the same UE REFSENS in same bandwidth for all TDD bands. Thus, the reference sensitivity of Band [41] is defined to be the same as other TDD bands and is given in Table 5.2.3-1.

Table 5.2.3-1: Reference sensitivity QPSK P_{REFSENS}

E-UTRA Band	Channel bandwidth						Duplex Mode
	1.4 MHz (dBm)	3 MHz (dBm)	5 MHz (dBm)	10 MHz (dBm)	15 MHz (dBm)	20 MHz (dBm)	
41			-99	-96	-94.2	-93	TDD

In consideration of stringent filtering requirements for in-device ISM coexistence, 1dB reference sensitivity relaxation is proposed for a Band 41 UE and the reference sensitivity level of Band 41 is thus updated accordingly in Table 7.3.1-1 in TS 36.101. However, no explicit requirement for ISM coexistence or for filter rejection performance is specified by 3GPP. Yet, it is worth noting that the minimum performance specification for reference sensitivity may be exceeded. In particular, for devices which are not required to facilitate in-device ISM coexistence, the sensitivity level could be 1 dB better.

Also, with regard to minimum uplink configuration for reference sensitivity, since Band 41 supports the operating bandwidths of 5, 10, 15 and 20MHz, it is defined in alignment with other TDD bands in Table 5.2.3-2.

Table 5.2.3-2: Minimum uplink configuration for reference sensitivity

E-UTRA Band / Channel bandwidth / NRB / Duplex mode							
E-UTRA Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Duplex Mode
[41]			25	50	75	100	TDD

5.2.4 Blocking characteristics

The blocking characteristic is a measure of the receiver's 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 except those at which a spurious response occur.

5.2.4.1 In-band blocking

In-band blocking is defined for an unwanted interfering signal falling into the UE receive band or into the first 15 MHz below or above the UE receive band at which the relative throughput shall meet or exceed the minimum requirement for the specified measurement channels.

5.2.4.1.1 Minimum requirements

The throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 of TS36.101 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1 of TS36.101) with parameters specified in Tables 5.2.4.1.1-1 and 5.2.4.1.1-2.

Table 5.2.4.1.1-1: In band blocking parameters

Rx Parameter	Units	Channel bandwidth					
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Wanted signal mean power	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9
$BW_{\text{Interferer}}$	MHz	1.4	3	5	5	5	5
$F_{\text{offset, case 1}}$	MHz	$2.1+0.0125$	$4.5+0.0075$	$7.5+0.0125$	$7.5+0.0025$	$7.5+0.0075$	$7.5+0.0125$
$F_{\text{offset, case 2}}$	MHz	$3.5+0.0075$	$7.5+0.0075$	$12.5+0.0075$	$12.5+0.0125$	$12.5+0.0025$	$12.5+0.0075$
Note 1:	The transmitter shall be set to 4dB below P_{UMAX} at the minimum uplink configuration specified in Table 7.3.1-2.						
Note 2:	The interferer consists of the Reference measurement channel specified in Annex A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1 and set-up according to Annex C.3.1						

Table 5.2.4.1.1-2: In-band blocking

E-UTRA band	Parameter	Units	Case 1	Case 2	Case 3
	$P_{\text{Interferer}}$		dBm	-56	-44
	$F_{\text{Interferer}}$ (Offset)	MHz	$= -BW/2 - F_{\text{offset, case 1}}$ & $= +BW/2 + F_{\text{offset, case 1}}$	$\leq -BW/2 - F_{\text{offset, case 2}}$ & $\geq +BW/2 + F_{\text{offset, case 2}}$	$-BW/2 - 9 \text{ MHz}$ & $-BW/2 - 15 \text{ MHz}$
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 18, 19, 20, 21, 33, 34, 35, 36, 37, 38, 39, 40, 41	$F_{\text{Interferer}}$	MHz	(Note 2)	$F_{\text{DL,low}} -15$ to $F_{\text{DL,high}} +15$	
17	$F_{\text{Interferer}}$	MHz	(Note 2)	$F_{\text{DL,low}} -9.0$ to $F_{\text{DL,high}} +15$	$F_{\text{DL,low}} -15$ and $F_{\text{DL,low}} -9.0$ (Note 3)
Note					
1	For certain bands, the unwanted modulated interfering signal may not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.				
2	For each carrier frequency the requirement is valid for two frequencies: a. the carrier frequency $-BW/2 - F_{\text{offset, case 1}}$ and b. the carrier frequency $+BW/2 + F_{\text{offset, case 1}}$.				
3	$F_{\text{Interferer}}$ range values for unwanted modulated interfering signal are interferer center frequencies.				
4	Case 3 only applies to assigned UE channel bandwidth of 5 MHz.				

5.2.4.2 Out-of-band blocking

Out-of-band band blocking is defined for an unwanted CW interfering signal falling more than 15 MHz below or above the UE receive band. For the first 15 MHz below or above the UE receive band the appropriate in-band blocking or adjacent channel selectivity in sub-clause 7.5.1 and sub-clause 7.6.1 of TS36.101 shall be applied.

5.2.4.2.1 Minimum requirements

The throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 of TS36.101 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1 of TS36.101) with parameters specified in Tables 5.2.4.2.1-1 and 5.2.4.2.1-2.

For Table 5.2.4.2.1-2 in frequency range 1, 2 and 3, up to $\max(24, 6 \cdot \lceil N_{RB} / 6 \rceil)$ exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size, where N_{RB} is the number of resource blocks in the downlink transmission bandwidth configuration (see Figure 5.4.2-1). For these exceptions the requirements of clause 7.7 spurious response of TS36.101 are applicable.

For Table 5.2.4.2.1-2 in frequency range 4, up to $\max(8, \lceil (N_{RB} + 2 \cdot L_{CRBs}) / 8 \rceil)$ exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size, where N_{RB} is the number of resource blocks in the downlink transmission bandwidth configurations (see Figure 5.4.2-1) and L_{CRBs} is the number of resource blocks allocated in the uplink. For these exceptions the requirements of clause 7.7 spurious response of TS36.101 are applicable.

Table 5.2.4.2.1-1: Out-of-band blocking parameters

Rx Parameter	Units	Channel bandwidth					
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Wanted signal mean power	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9

Note 1: The transmitter shall be set to 4dB below P_{UMAX} at the minimum uplink configuration specified in Table 7.3.1-2.
 Note 2: Reference measurement channel is specified in Annex A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.

Table 5.2.4.2.1-2: Out of band blocking

E-UTRA band	Parameter	Units	Frequency			
			range 1	range 2	range 3	range 4
	$P_{Interferer}$	dBm	-44	-30	-15	-15
1, 2, 3, 4, 5 6, 7, 8, 9, 10,11,12, 13, 17, 18, 19, 20, 21, 33,34, 35, 36, 37, 38, 39, 40, 41	$F_{Interferer}$ (CW)	MHz	$F_{DL_low} -15$ to $F_{DL_low} -60$	$F_{DL_low} -60$ to $F_{DL_low} -85$	$F_{DL_low} -85$ to 1 MHz	-
			$F_{DL_high} +15$ to $F_{DL_high} + 60$	$F_{DL_high} +60$ to $F_{DL_high} +85$	$F_{DL_high} +85$ to +12750 MHz	-
2, 5, 12, 17	$F_{Interferer}$	MHz	-	-	-	F_{UL_low} - F_{UL_high}
Note: For the UE which supports both Band 11 and Band 21 the out of blocking is FFS.						

5.2.4.3 Narrow band blocking

This requirement is measure of a receiver's ability to receive a E-UTRA signal at its assigned channel frequency in the presence of an unwanted narrow band CW interferer at a frequency, which is less than the nominal channel spacing.

5.2.4.3.1 Minimum requirements

The relative throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 of TS36.101 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1 of TS36.101) with parameters specified in Table 5.2.4.3.1-1

Table 5.2.4.3.1-1: Narrow-band blocking

Parameter	Unit	Channel Bandwidth					
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
P_w	dBm	$P_{REFSENS}$ + channel-bandwidth specific value below					
		22	18	16	13	14	16
P_{uw} (CW)	dBm	-55	-55	-55	-55	-55	-55
F_{uw} (offset for $\Delta f = 15$ kHz)	MHz	0.9075	1.7025	2.7075	5.2125	7.7025	10.2075
F_{uw} (offset for $\Delta f = 7.5$ kHz)	MHz						
Note 1: The transmitter shall be set a 4 dB below P_{UMAX} at the minimum uplink configuration specified in Table 7.3.1-2.							
Note 2: Reference measurement channel is specified in Annex A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1 .							

5.2.5 Additional Spectrum Emission Mask

The additional spectrum emission mask requirements provided in 6.6.2.2.2 of TS36.101 were intended to support this band [7]; however an editorial error occurred in the definition of the requirements in Table 6.6.2.2.2-1. It is therefore proposed that the table be corrected as shown in Table 5.2.5-1 in order to properly specify the requirements as associated with the band.

Table 5.2.5-1: Additional requirements

Δf_{OoB} (MHz)	Spectrum emission limit (dBm)/ Channel bandwidth						Measurement bandwidth
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
$\pm 0-1$	-10	-13	-15	-18	-20	-21	30 kHz
$\pm 1-2.5$	-13	-13	-13	-13	-13	-13	1 MHz
$\pm 2.5-5.5$	-25	-13	-13	-13	-13	-13	1 MHz
$\pm 5.5-6$		-25	-25	-25	-25	-25	1 MHz
$\pm 6-10$			-25	-25	-25	-25	1 MHz
$\pm 10-15$				-25	-25	-25	1 MHz
$\pm 15-20$					-25	-25	1 MHz
$\pm 20-25$						-25	1 MHz

5.3 Specific BS RF requirements

5.3.1 Operating band unwanted emissions

The applicable operating band unwanted emissions requirements for E-UTRA TDD in 2496-2690 MHz are those for Category A or Category B (Option 1) as in TS 36.104 (or TS 36.141), Clause 6.6.3.

5.3.1.1 Minimum requirements for Wide Area BS (Category A)

For E-UTRA BS operating in Band [41], emissions shall not exceed the maximum levels specified in Tables 5.3.1-1 through 5.3.1-3.

Table 5.3.1-1: General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands >1GHz) for Category A

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-1 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-11 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

Table 5.3.1-2: General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands >1GHz) for Category A

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-15 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

Table 5.3.1-3: General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands >1GHz) for Category A

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-7 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-14 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm (Note 5)	1MHz

5.3.1.2 Minimum requirements for Wide Area BS (Category B, Option 1)

For E-UTRA BS operating in Band [41], emissions shall not exceed the maximum levels specified in Tables 5.3.1.2-1 to 5.3.1.2-3:

Table 5.3.1.2-1: General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands >1GHz) for Category B

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-1 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-11 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm	1MHz

Table 5.3.1.2-2: General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands >1GHz) for Category B

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-15 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm	1MHz

Table 5.3.1.2-3: General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands >1GHz) for Category B

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-7 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-14 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm (Note 5)	1MHz

5.3.1.3 Additional requirements

These requirements may be applied for the protection of other systems operating inside or near the E-UTRA BS downlink operating band. The limits may apply as an optional protection of such systems that are deployed in the same geographical area as the E-UTRA BS, or they may be set by local or regional regulation as a mandatory requirement for

an E-UTRA operating band. It is in some cases not stated in the present document whether a requirement is mandatory or under what exact circumstances that a limit applies, since this is set by local or regional regulation. An overview of regional requirements in the present document is given in subclause 4.3 of TS 36.104.

In certain regions the following requirement may apply. For E-UTRA BS operating in Band [41], emissions shall not exceed the maximum levels specified in Table 5.3.1.3-1.

Table 5.3.1.3-1: Additional operating band unwanted emission limits for E-UTRA bands >1GHz

Channel bandwidth	Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 3)
1.4 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.005 \text{ MHz} \leq f_{\text{offset}} < 0.995 \text{ MHz}$	-14 dBm	10 kHz
3 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	-13 dBm	30 kHz
5 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	-15 dBm	30 kHz
10 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	-13 dBm	100 kHz
15 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	-15 dBm	100 kHz
20 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	-16 dBm	100 kHz
All	$1 \text{ MHz} \leq \Delta f < \Delta f_{\text{max}}$	$1.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

5.3.2 Transmitter spurious emissions

The transmitter spurious emission limits toward Band [41] follow those existing in TS 36.104, specifically Clause 6.6.4.1, “Mandatory requirements”, and 6.6.4.2, “Protection of the BS receiver of own or different BS”. Exceptions to these apply for Band [41], the requirements for which are detailed in Table 5.3.2-1 below.

5.3.2.1 Additional spurious emissions requirements; minimum requirement

These are based on the minimum additional spurious emission requirements of TS 36.104, Clause 6.6.4.3, “Additional spurious emissions requirements; minimum requirement”.

The power of any spurious emission shall not exceed the limits of Table 5.3.2.1-1 for a BS where requirements for co-existence with the system listed in the first column apply.

Table 5.3.2.1-1: BS Spurious emissions limits for E-UTRA BS for co-existence with systems operating in other frequency bands

System type for E-UTRA to co-exist with	Frequency range for co-existence requirement	Maximum Level	Measurement Bandwidth	Note
E-UTRA Band [41]	2496 - 2690MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band [41]

The power of any spurious emission shall not exceed the limits of Table 5.3.2.1-2 for a Home BS where requirements for co-existence with a Home BS type listed in the first column apply.

Table 5.3.2.1-2: Home BS Spurious emissions limits for co-existence with Home BS operating in other frequency bands

Type of coexistence BS	Frequency range for co-location requirement	Maximum Level	Measurement Bandwidth	Note
E-UTRA Band [41]	2496 - 2690MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band [41]

5.3.2.2 Co-location with other base stations

These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850, UTRA FDD, UTRA TDD and/or E-UTRA BS are co-located with an E-UTRA BS. The requirements assume

a 30 dB coupling loss between transmitter and receiver and are based on co-location with base stations of the same class.

The power of any spurious emission shall not exceed the limits of Table 5.3.2.2-1 for a Wide Area BS where requirements for co-location with a BS type listed in the first column apply.

Table 5.3.2.2-1: BS Spurious emissions limits for Wide Area BS co-located with another BS

Type of co-located BS	Frequency range for co-location requirement	Maximum Level	Measurement Bandwidth	Note
WA E-UTRA Band [41]	2496 - 2690MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band [41]

The power of any spurious emission shall not exceed the limits of Table 5.3.2.2-2 for a Local Area BS where requirements for co-location with a BS type listed in the first column apply.

Table 5.3.2.2-2: BS Spurious emissions limits for Local Area BS co-located with another BS

Type of co-located BS	Frequency range for co-location requirement	Maximum Level	Measurement Bandwidth	Note
LA E-UTRA Band [41]	2496 - 2690MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band [41]

5.3.3 General blocking requirement

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel in the presence of an unwanted interferer, which are either a 1.4MHz, 3MHz or 5MHz E-UTRA signal for in-band blocking or a CW signal for out-of-band blocking. The interfering signal shall be an E-UTRA signal as specified in TS 36.104 Annex C.

The throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channel, with a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 5.3.3-1, 5.3.3-1a, 5.3.3-1b and 5.3.3-2. The reference measurement channel for the wanted signal is identified in TS 36.104 Table 7.2.1-1, Table 7.2.1-2, and 7.2.1-3 for each channel bandwidth and further specified in TS 36.104 Annex A.

Table 5.3.3-1: Blocking performance requirement for Wide Area BS

Operating Band	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Interfering signal centre frequency minimum frequency offset from the channel edge of the wanted signal [MHz]	Type of Interfering Signal
[41]	(F _{UL_low} -20) to (F _{UL_high} +20)	-43	P _{REFSENS} +6dB*	See table 5.3.3-2	See table 5.3.3-2
	1 to (F _{UL_low} -20) (F _{UL_high} +20) to 12750	-15	P _{REFSENS} +6dB*	—	CW carrier

Note*: P_{REFSENS} depends on the channel bandwidth as specified in TS 36.104 Table 7.2.1-1.

Table 5.3.3-1a: Blocking performance requirement for Local Area BS

Operating Band	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Interfering signal centre frequency minimum frequency offset from the channel edge of the wanted signal [MHz]	Type of Interfering Signal
[41]	(F _{UL_low} -20) to (F _{UL_high} +20)	-35	P _{REFSENS} +6dB*	See table 5.3.3-2	See table 5.3.3-2
	1 to (F _{UL_low} -20) (F _{UL_high} +20) to 12750	-15	P _{REFSENS} +6dB*	—	CW carrier
	(F _{UL_high} +20) to				
Note*: P _{REFSENS} depends on the channel bandwidth as specified in TS 36.104 Table 7.2.1-2					

Table 5.3.3-1b: Blocking performance requirement for Home BS

Operating Band	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Interfering signal centre frequency minimum frequency offset from the channel edge of the wanted signal [MHz]	Type of Interfering Signal
[41]	(F _{UL_low} -20) to (F _{UL_high} +20)	-27	P _{REFSENS} +14dB*	See table 5.3.3-2	See table 5.3.3-2
	1 to (F _{UL_low} -20) (F _{UL_high} +20) to 12750	-15	P _{REFSENS} +14dB*	—	CW carrier
Note*: P _{REFSENS} depends on the channel bandwidth as specified in TS 36.104 Table 7.2.1-3.					

Table 5.3.3-2: Interfering signals for blocking performance requirement

E-UTRA channel BW [MHz]	Interfering signal centre frequency minimum offset to the channel edge of the wanted signal [MHz]	Type of interfering signal
1.4	2.1	1.4MHz E-UTRA signal
3	4.5	3MHz E-UTRA signal
5	7.5	5MHz E-UTRA signal
10	7.5	5MHz E-UTRA signal
15	7.5	5MHz E-UTRA signal
20	7.5	5MHz E-UTRA signal

5.3.4 Multi-standard radio (MSR) requirements

5.3.4.1 Required changes to TS 37.104

In TS 37.104, section 4.5 “Operating bands and Band Categories” and corresponding Table 4.5-2 “Unpaired bands in E-UTRA and UTRA” of TS 37.104 require alteration to accommodate the new LTE_TDD_2600_US frequency band parameters, as follows. Section 6.11 of this TR for the Work Item summarizes this change.

Table 5.3.4.1-1: Unpaired bands in E-UTRA and UTRA

MSR and E-UTRA Band number	UTRA Band number	Uplink (UL) BS receive UE transmit	Downlink (DL) BS transmit UE receive	Band category
[41]	-	2496 MHz – 2690 MHz	2496 MHz – 2690 MHz	3

In TS 37.104, section 7.4.1 “General blocking minimum requirement” with corresponding Table 7.4.1-1, along with Section 7.4.5 “Additional BC3 blocking minimum requirement” with corresponding Table 7.4.5-1, on in-band selectivity and blocking performance requirements of TS 37.104, require alteration to accommodate the new LTE_TDD_2600_US frequency band, as follows. The requirements are aligned with those of other 3GPP TDD frequency bands as concluded in TR 25.889 and as recommended in TR 25.811. F_{UL_low} below refers to the lower edge of the operating band, or 2496 MHz, while F_{UL_high} below refers to the upper edge of the operating band, or 2690 MHz. Section 6.11 of this TR for the Work Item summarizes these changes.

Table 5.3.4.1-2: General blocking requirement

Operating Band Number	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Interfering signal centre frequency minimum frequency offset from the RF bandwidth edge [MHz]
[41]	$(F_{UL_low} - 20)$ to $(F_{UL_high} + 20)$	-40	$P_{REFSENS} + X$ dB*	± 7.5

Table 5.3.4.1-3: Additional blocking requirement for Band Category 3

Operating Band	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Interfering signal centre frequency minimum frequency offset from the RF bandwidth edge [MHz]
[41]	$(F_{UL_low} - 20)$ to $(F_{UL_high} + 20)$	-40	$P_{REFSENS} + 6$ dB*	± 2.4

In TS 37.104, section 7.5.1 “General minimum requirement” with corresponding Table 7.5.1-1, along with Section 7.5.2 “Co-location minimum requirement” with corresponding Table 7.5.2-1, on out-of-band blocking performance requirements of TS 37.104, require alteration to accommodate the new LTE_TDD_2600_US frequency band, as follows. The requirements are aligned with those of other 3GPP TDD frequency bands as concluded in TR 25.889 and as recommended in TR 25.811. Section 6.11 of this TR for the Work Item summarizes these changes.

Table 5.3.4.1-4: Blocking performance requirement

Operating Band Number	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Type of Interfering Signal
[41]	1 to $(F_{UL_low} - 20)$ $(F_{UL_high} + 20)$ to 12750	-15	$P_{REFSENS} + X$ dB*	CW carrier

Table 5.3.4.1-5: Blocking requirement for when co-located with BS in other frequency bands.

Type of co-located BS	Centre Frequency of Interfering Signal (MHz)	Interfering Signal mean power (dBm)	Wanted Signal mean power (dBm)	Type of Interfering Signal
E-UTRA in Band [41]	2496-2690	+16	$P_{REFSENS} + X$ dB*	CW carrier

In TS 37.104, section 6.6.1.3.1 “Minimum requirement” for additional spurious emissions, with corresponding Table 6.6.1.3.1-1, along with Section 6.6.1.4.1 “Minimum requirement” for co-location with other base stations, with corresponding Table 6.6.1.4.1-1, of TS 37.104, require alteration to accommodate the new LTE_TDD_2600_US frequency band, as follows. The requirements are aligned with those of other 3GPP TDD frequency bands as concluded in TR 25.889 and as recommended in TR 25.811. F_{UL_low} below refers to the lower edge of the operating band, or 2496 MHz, while F_{UL_high} below refers to the upper edge of the operating band, or 2690 MHz. Section 6.11 of this TR for the Work Item summarizes these changes.

Table 5.3.4.1-6: BS Spurious emissions limits for co-existence with systems operating in other frequency bands

System type to co-exist with	Frequency range for co-existence requirement	Maximum Level	Measurement Bandwidth	Note
E-UTRA Band [41]	2496 – 2690 MHz	-52 dBm	1 MHz	This is not applicable to BS operating in Band [41]

Table 5.3.4.3-7: BS Spurious emissions limits for BS co-located with another BS

Type of co-located BS	Frequency range for co-location requirement	Maximum Level	Measurement Bandwidth	Note
E-UTRA Band [41]	2496 – 2690 MHz	-96 dBm	100 kHz	This is not applicable to BS operating in Band [41]

5.3.4.2 Required changes to TS 37.113

In TS 37.113, section 4.4.2 “Receiver exclusion band” and corresponding Table 4.4-3 “Receiver exclusion band for base stations (unpaired bands)” of TS 37.113 require alteration to accommodate the new LTE_TDD_2600_US frequency band parameters, as follows. The exclusion applies to 20 MHz below the lower frequency band edge, to 20 MHz above the upper frequency band edge. Section 6.12 of this TR for the Work Item summarizes this change.

Table 5.3.4.2-1: Receiver exclusion band for base stations (unpaired bands)

MSR and E-UTRA Band number	UTRA Band number	Receiver exclusion band
[41]	-	2476 MHz – 2710 MHz

5.3.4.3 Required changes to TS 37.141

In TS 37.141, section 4.4 “Operating bands and Band Categories” and corresponding Table 4.4-2 “Unpaired bands in E-UTRA and UTRA” of TS 37.141 require alteration to accommodate the new LTE_TDD_2600_US frequency band parameters, as follows. Section 6.11 of this TR for the Work Item summarizes this change.

Table 5.3.4.3-1: Unpaired bands in E-UTRA and UTRA.

MSR and E-UTRA Band number	UTRA Band number	Uplink (UL) BS receive UE transmit	Downlink (DL) BS transmit UE receive	Band category
[41]	-	2496 MHz – 2690 MHz	2496 MHz – 2690 MHz	3

In TS 37.141, section 7.4.5.1 “General blocking test requirement” with corresponding Table 7.4.5.1-1, along with Section 7.4.5.5 “Additional BC3 blocking test requirement” with corresponding Table 7.4.5.5-1, on in-band selectivity and blocking test requirements of TS 37.141, require alteration to accommodate the new LTE_TDD_2600_US frequency band, as follows. The requirements are aligned with those of other 3GPP TDD frequency bands as concluded in TR 25.889 and as recommended in TR 25.811. F_{UL_low} below refers to the lower edge of the operating band, or

2496 MHz, while F_{UL_high} below refers to the upper edge of the operating band, or 2690 MHz. Section 6.13 of this TR for the Work Item summarizes these changes.

Table 5.3.4.3-2: General blocking test requirement

Operating Band Number	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Interfering signal centre frequency minimum frequency offset from the RF bandwidth edge [MHz]
[41]	$(F_{UL_low} - 20)$ to $(F_{UL_high} + 20)$	-40	$P_{REFSENS} + X$ dB*	± 7.5

Table 5.3.4.3-3: Additional blocking requirement for Band Category 3

Operating Band	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Interfering signal centre frequency minimum frequency offset from the RF bandwidth edge [MHz]
[41]	$(F_{UL_low} - 20)$ to $(F_{UL_high} + 20)$	-40	$P_{REFSENS} + 6$ dB*	± 2.4

In TS 37.141, section 7.5.5.1 “General out-of-band blocking test requirements” with corresponding Table 7.5.5.1-1, along with Section 7.5.5.2 “Co-location test requirements” with corresponding Table 7.5.5.2-1, on out-of-band blocking test requirements of TS 37.141, require alteration to accommodate the new LTE_TDD_2600_US frequency band, as follows. The requirements are aligned with those of other 3GPP TDD frequency bands as concluded in TR 25.889 and as recommended in TR 25.811. Section 6.13 of this TR for the Work Item summarizes these changes.

Table 5.3.4.3-4: Blocking performance requirement

Operating Band Number	Centre Frequency of Interfering Signal [MHz]	Interfering Signal mean power [dBm]	Wanted Signal mean power [dBm]	Type of Interfering Signal
[41]	1 to $(F_{UL_low} - 20)$ $(F_{UL_high} + 20)$ to 12750	-15	$P_{REFSENS} + X$ dB*	CW carrier

Table 5.3.4.3-5: Blocking requirement for when co-located with BS in other frequency bands.

Type of co-located BS	Centre Frequency of Interfering Signal (MHz)	Interfering Signal mean power (dBm)	Wanted Signal mean power (dBm)	Type of Interfering Signal
E-UTRA in Band [41]	2496-2690	+16	$P_{REFSENS} + X$ dB*	CW carrier

In TS 37.141, section 6.6.1.5.5 “Additional spurious emissions requirements”, with corresponding Table 6.6.1.5.5-1, along with Section 6.6.1.5.6 “Co-location with other base stations”, with corresponding Table 6.6.1.5.6-1, of TS 37.141, require alteration to accommodate the new LTE_TDD_2600_US frequency band, as follows. The requirements are aligned with those of other 3GPP TDD frequency bands as concluded in TR 25.889 and as recommended in TR 25.811. F_{UL_low} below refers to the lower edge of the operating band, or 2496 MHz, while F_{UL_high} below refers to the upper edge of the operating band, or 2690MHz. Section 6.13 of this TR for the Work Item summarizes these changes.

Table 5.3.4.3-6: BS Spurious emissions limits for co-existence with systems operating in other frequency bands

System type to co-exist with	Frequency range for co-existence requirement	Maximum Level	Measurement Bandwidth	Note
E-UTRA Band [41]	2496 – 2690 MHz	-52 dBm	1 MHz	This is not applicable to BS operating in Band [41]

Table 5.3.4.3-7: BS Spurious emissions limits for BS co-located with another BS

Type of co-located BS	Frequency range for co-location requirement	Maximum Level	Measurement Bandwidth	Note
E-UTRA Band [41]	2496 – 2690 MHz	-96 dBm	100 kHz	This is not applicable to BS operating in Band [41]

5.3.5 UTRAN requirements

5.3.5.1 Required changes to TS 25.461

In TS 25.461, section 4.3.7 “Operating bands” and corresponding Table 4.3.7.1 “Frequency bands” of TS 25.461 require alteration to accommodate the new LTE_TDD_2600_US frequency band parameters, as follows. Section 6.9 of this TR for the Work Item summarizes these changes.

Table 5.3.5.1-1: Frequency bands

UTRA Operating Band	E-UTRA Operating Band	UL operating band UE transmit, BS receive	DL operating band UE receive, BS transmit
–	[41]	2496 – 2690 MHz	2496 – 2690 MHz

5.3.5.2 Required changes to TS 25.466

In TS 25.466, Annex B “Assigned fields for additional data” and corresponding Table B.2-2 “Coding for operating bands in field 0x09” of TS 25.466 require alteration to accommodate the new LTE_TDD_2600_US frequency band parameters, as follows. Section 6.10 of this TR for the Work Item summarizes these changes.

Table 5.3.5.2-1: Coding for operating bands in field 0x09

Bit no	15	14...9	8	7	6	5	4	3	2	1	0
Operating band	Res.	Spare	[41]	e40	f39	d38	c37	b36	b35	a34	a33

5.4 Specific UE RRM requirements

The relevant changes to be made to TS 36.133 on RRM can be summarized into the following four categories:

- RSRP and SCH_RP threshold to decide whether a cell is considered detectable
- PRP threshold to decide whether the UE physical layer shall be capable of reporting RSTD for positioning
- Side conditions for relative and absolute RSRP/RSRQ accuracy
- Introduction of US 2.6GHz band as test parameters for RSRP/RSRQ accuracy requirement test cases.

The minimum level of RSRP and SCH_RP of certain cell to be considered as detectable can be derived from RSRP/SCH \hat{E}_s / I_{ot} level and band specific UE receiver sensitivity. In E-UTRAN, such band specific UE RF receiver sensitivity defined in TS 36.101 is determined by the theoretical thermal noise floor, receiver noise figure and implementation margin plus SINR requirement to achieve reference throughput [10]. Unlike FDD's band specific implementation margin caused by different Tx noise as a result of band specific Rx-Tx duplexer isolation [11], the implementation margin for TDD band is the same for all bands, which is also the current implementation margin assumption to define receiver sensitivity requirement in specifications TS 36.101. Therefore, thanks to the same theoretical thermal noise floor and receiver noise figure, the band agnostic implementation margin results in the same UE RF receiver sensitivity for all TDD bands. In conclusion, the same RSRP/SCH_RP minimum requirement as other TDD bands for certain cell considered as detectable is applicable to US TDD 2.6GHz band.

The minimum level of PRP can be derived from PRS $(\hat{E}_s/I_{ot})_{ref}$ level and band specific UE receiver sensitivity. It is determined similar to that for RSRP and SCH_RP. Thus the same PRP minimum requirement as other TDD bands is also applicable to US TDD 2.6GHz band.

The side conditions of RSRP/RSRQ measurement accuracy are defined as RSRP and I_0 level in E-UTRAN. Regarding to the RSRP side conditions, as aforementioned, US 2.6GHz TDD band has no additional requirement compared to other TDD bands in terms of receiver sensitivity. Therefore, the existing RSRP side conditions for TDD bands is applicable for US 2.6GHz band as well. Regarding to I_0 level, as in [12], I_0 conditions for US 2.6GHz band is also the same as other TDD bands. Thus, the same RSRP and I_0 side conditions as other TDD bands for RSRP/RSRQ absolute and relative accuracy are applicable for US 2.6GHz TDD band.

Regarding to test parameters, since RSRP and I_0 side conditions are the same as other TDD Band for RSRP/RSRQ absolute and relative accuracy, US 2.6GHz band can also be introduced as an applicable band for test parameters N_{OC} , RSRP and I_0 in RSRP/RSRQ measurement accuracy test cases. As a result, US 2.6GHz band is added as an applicable band in the test parameters N_{OC} , RSRP and I_0 in TS 36.133 section A9.1.2.2, A9.1.4.2 and A9.2.4.2.

6 Summary of required changes to E-UTRA specifications

6.1 Required changes to TS36.101

Required changes in UE RF specification TS 36.101 are shown in Table 6.1-1.

Table 6.1-1: Required changes in TS 36.101

Section	Description	Required Changes in TS 36.101
5.5	Operating bands	A new row is expected to be added in Table 5.5-1. E.g. [41]) 2496-2690MHz Uplink and Downlink
5.6.1	Channel bandwidths per operating band	A new row is expected to be added in Table 5.6.1-1. The transmission bandwidth configuration shall be specified based on operator's requirement.
5.7.3	Carrier frequency and EARFCN	A new row is expected to be added in Table 5.7.3-1. E.g. F_{DL_low} (MHz): 2496, $N_{Offs-DL}$: 39650, Range of N_{DL} : 39650 – 41589.
6.2.2	UE Maximum Output Power	A new row is expected to be added in Table 6.2.2-1. It's proposed to evaluate the appropriate requirement to support the broad bandwidth.
6.2.4	UE Maximum Output Power with additional requirements	It's proposed to evaluate the appropriate A-MPR requirement for Band 41.
6.6.2.2	Additional Spectrum Emission Mask	It's proposed to evaluate the appropriate additional spectrum emission mask requirement for Band 41.
6.6.3.2	Spurious emission band UE co-existence	Appropriate changes are expected in Table 6.6.3.2-1 for coexistence with UEs operating in Band 2, 4, 5, 10, 12, 13, 14 and 17. The requirement may reuse the existing value (-50dBm/MHz).
7.3	Reference sensitivity power level	A new row is expected to be added in Table 7.3.1-1 and 7.3.1-2 respectively. The appropriate reference sensitivity requirements shall be specified for each supported channel bandwidth.
7.6.1	In-band blocking	Appropriate changes are expected in Table 7.6.1.1-2. It's proposed to evaluate if the existing general in-band blocking requirement is valid for the new band or not.
7.6.2	Out-of-band blocking	Appropriate changes are expected in Table 7.6.2.1-2. It's proposed to evaluate if the existing general out-of-band blocking requirement is valid for the new band or not.

6.2 Required changes to TS36.104

Required changes in BS RF specification TS 36.104 are shown in Table 6.2-1.

Table 6.2-1: Required changes in TS 36.104

Section	Description	Required Changes in TS 36.104	Proposed changes
5.5	Operating bands	A new row is expected to be added in Table 5.5-1. E.g. [41]) 2496-2690MHz Uplink and Downlink	R4-102228
5.7.3	Carrier frequency and EARFCN	A new row is expected to be added in Table 5.7.3-1. E.g. F _{DL_low} (MHz): 2496, N _{Offs-DL} : 39650, Range of N _{DL} : 39650 – 41589.	R4-102228
6.6.3	Operating band unwanted emissions	Appropriate changes are expected in this section to support the new band. The new band is expected to be included in Section 6.6.3.1 (Category A), Section 6.6.3.2.1 (Category B, Option 1), and Section 6.6.3.3 (Additional requirements).	R4-102097
6.6.4.3	Additional spurious emissions requirements	A new row is expected to be added in Table 6.6.4.3.1-1 and 6.6.4.3.1-1x respectively for coexistence with systems operating in other frequency bands.	R4-102097
6.6.4.4	Co-location with other base stations	A new row is expected to be added in Table 6.6.4.4.1-1 and 6.6.4.4.1-2 respectively for co-location with other base stations.	R4-102097
7.6.1	General blocking requirement	A new row is expected to be added in Table 7.6.1.1-1, 7.6.1.1-1a and 7.6.1.1-1b respectively. The appropriate centre frequency of interfering signal should be studied to support the new band.	R4-101972
7.6.2	Co-location with other base stations	The blocking requirements for co-location with other base stations are expected to be added Table 7.6.2.1-1 and 7.6.2.1-2 respectively.	R4-101972

6.3 Required changes to TS36.113

Required changes in TS 36.113 are shown in Table 6.3-1.

Table 6.3-1: Required changes in TS 36.113

Section	Description	Required Changes in TS 36.113
4.5.2	Receiver exclusion band	A new bullet is expected to be added, E.g. - 2476 MHz to 2710 MHz (Band [41])

6.4 Required changes to TS36.124

Required changes in TS 36.124 are shown in Table 6.4-1.

Table 6.4-1: Required changes in TS 36.124

Section	Description	Required Changes in TS 36.124
4.4	Receiver exclusion band	A new bullet is expected to be added, E.g. - 2411 MHz to 2775 MHz (Band [41])

6.5 Required changes to TS36.133

Required changes in TS 36.133 are shown in Table 6.5-1.

Table 6.5-1: Required changes in TS 36.133

Section	Description	Required Changes in TS 36.133
4.2.2.3	Measurement of intra-frequency E-UTRAN cells	RSRP and SCH_RP thresholds to decide whether an intra frequency cell is considered detectable. It's proposed to evaluate the appropriate RSRP and SCH_RP requirements for determining whether an intra frequency E-UTRAN cell is detectable for Band [41].
4.2.2.4	Measurement of inter-frequency E-UTRAN cells	RSRP and SCH_RP thresholds to decide whether an inter frequency cell is considered detectable. It's proposed to evaluate the appropriate RSRP and SCH_RP requirements for determining whether an inter frequency E-UTRAN cell is detectable for Band [41].
8.1.2.2.2.1	E-UTRAN intra frequency measurements when no DRX is used	It's proposed to evaluate the appropriate RSRP and SCH_RP requirements for determining whether an intra frequency TDD E-UTRAN cell is detectable when no DRX is used for Band [41].
8.1.2.2.2.2	E-UTRAN intra frequency measurements when DRX is used	It's proposed to evaluate the appropriate RSRP and SCH_RP requirements for determining whether an intra frequency TDD E-UTRAN cell is detectable when DRX is used for Band [41].
8.1.2.2.4	E-UTRAN TDD intra frequency measurements with autonomous gaps	RSRP and SCH_RP thresholds to decide whether an TDD intra frequency cell is considered detectable when identifying a new CGI of E-UTRA cell in BAND [41]
8.1.2.3.2.1	E-UTRAN TDD-TDD inter frequency measurements when no DRX is used	It's proposed to evaluate the appropriate RSRP and SCH_RP requirements for determining whether an inter frequency TDD E-UTRAN cell is detectable when no DRX is used for Band [41].
8.1.2.3.2.2	E-UTRAN TDD-TDD inter frequency measurements when DRX is used	It's proposed to evaluate the appropriate RSRP and SCH_RP requirements for determining whether an inter frequency TDD E-UTRAN cell is detectable when DRX is used for Band [41].
8.1.2.3.7	E-UTRAN TDD-TDD inter frequency measurements with autonomous gaps	RSRP and SCH_RP thresholds to decide whether an TDD intra frequency cell is considered detectable when identifying a new CGI of E-UTRA cell in BAND [41]
8.1.2.5.2	E-UTRAN TDD Intra-Frequency OTDOA Measurements	PRP threshold in Band [41]
8.1.2.6.3	E-UTRAN TDD-TDD Inter-Frequency OTDOA Measurements	PRP threshold in Band [41]
9.1.2.1	Absolute RSRP Accuracy	It's proposed to evaluate the appropriate RSRP intra frequency absolute accuracy for Band [41] in the text and Table 9.1.2.1-1.
9.1.2.2	Relative Accuracy of RSRP	It's proposed to evaluate the appropriate RSRP intra frequency relative accuracy for Band [41] in the text and Table 9.1.2.2-1.
9.1.3.1	Absolute RSRP Accuracy	It's proposed to evaluate the appropriate RSRP inter frequency absolute accuracy for Band [41] in the text and Table 9.1.3.1-1.
9.1.3.2	Relative Accuracy of RSRP	It's proposed to evaluate the appropriate RSRP inter frequency relative accuracy for Band 41 in the text and Table 9.1.3.2-1.
9.1.5.1	Absolute RSRQ Accuracy	It's proposed to evaluate the appropriate RSRQ intra frequency absolute accuracy for Band [41] in the text and Table 9.1.5.1-1.
9.1.6.1	Absolute RSRQ Accuracy	It's proposed to evaluate the appropriate RSRQ inter frequency absolute accuracy for Band 41 in the text and Table 9.1.6.1-1.
9.1.6.2	Relative Accuracy of RSRQ	It's proposed to evaluate the appropriate RSRQ inter frequency relative accuracy for Band [41] in the text and Table 9.1.6.2-1.
9.1.9	UE Rx – Tx time	RSRP and lo side condition in Band [41]

	difference	
9.1.10	Reference Signal Time Difference (RSTD)	RSRP and lo side condition in Band [41]
A.9.1.2.2	Test parameters	Band [41] is expected to be added to Bands defined for the rows of N_{oc} , RSRP, lo in Table A.9.1.2.2-1.
A.9.1.4.2	Test parameters	Band [41] is expected to be added to Bands defined for the rows of N_{oc} , RSRP, lo in Table A.9.1.4.2-1.
A.9.2.2.2	Test parameters	Band [41] is expected to be added to Bands defined for the rows of N_{oc} , RSRP, lo in Table A.9.2.2.2-1.
A.9.2.4.2	Test parameters	Band [41] is expected to be added to Bands defined for the rows of N_{oc} , RSRP, lo in Table A.9.2.4.2-1.

6.6 Required changes to TS36.141

Required changes in BS test specification TS 36.141 are shown in Table 6.6-1.

Table 6.6-1: Required changes in TS 36.141

Section	Description	Required Changes in TS 36.141	Proposed changes
5.5	Operating bands	A new row is expected to be added in Table 5.5-1 E.g. [41]) 2496-2690MHz Uplink and Downlink	R4-102228
5.7.3	Carrier frequency and EARFCN	A new row is expected to be added in Table 5.7.3-1. E.g. F_{DL_low} (MHz): 2496, $N_{Offs-DL}$: 39650, Range of N_{DL} : 39650 – 41589.	R4-102228
6.6.3	Operating band unwanted emissions	Appropriate changes are expected in this section to support the new band. The new band is expected to be included in Section 6.6.3.5.1 (Category A), Section 6.6.3.5.2.1 (Category B, Option 1), and Section 6.6.3.5.3 (Additional requirements).	R4-102097
6.6.4.5.4	Co-existence with other systems in the same geographical area	A new row is expected to be added in Table 6.6.4.5.4-1 and 6.6.4.5.4-1x respectively.	R4-102097
6.6.4.5.5	Co-location with other base stations	A new row is expected to be added in Table 6.6.4.5.5-1 and 6.6.4.5.5-2 respectively.	R4-102097
7.6.5.1	General requirement	A new row is expected to be added in Table 7.6-1, Table 7.6-1a and Table 7.6-1x respectively.	R4-101972
7.6.2	Co-location with other base stations	A new row is expected to be added in Table 7.6-3 and Table 7.6.2.1-2 respectively.	R4-101972

6.7 Required changes to TS36.307

Changes are expected to indicate that the new band should be supported for both Release 8 and Release 9.

6.8 Required changes to TS36.331

Since there is no specific band referred in TS 36.331, no required changes for this specification.

6.9 Required changes to TS25.461

Required changes in TS 25.461 are shown in Table 6.9-1.

Table 6.9-1: Required changes in TS 25.461

Section	Description	Required Changes in TS 25.461
4.3.7	Operating bands	A new row on Band [41] is expected to be added in Table 4.3.7.1.

6.10 Required changes to TS25.466

Required changes in TS 25.466 are shown in Table 6.10-1.

Table 6.10-1: Required changes in TS 25.466

Section	Description	Required Changes in TS 25.466
Annex B	Assigned fields for additional data	It's proposed to evaluate coding for supporting Band [41], e.g, add bit field indicator coding to Table B.2-2.

6.11 Required changes to TS 37.104

Required changes in TS 37.104 are shown in Table 6.11-1.

Table 6.11-1: Required changes in TS 37.104

Section	Description	Required Changes in TS 37.104
4.5	Operating bands and band categories	A new row is expected to be added in Table 4.5-2.
6.6.1.3.1	BS spurious emissions limits for co-existence with systems operating in other frequency bands	A new row is expected to be added in Table 6.6.1.3.1-1. It is proposed to evaluate the appropriate requirement of Band [41] for BS spurious emissions limits for co-existence with systems operating in other frequency bands.
6.6.1.4.1	BS spurious emissions limits for BS co-located with another BS	A new row is expected to be added in Table 6.6.1.4.1-1. It is proposed to evaluate the appropriate requirement of Band [41] for BS spurious emissions limits for co-located with another BS.
7.4.1	General blocking minimum requirement	It's proposed to evaluate the appropriate general blocking minimum requirement for Band [41] and make corresponding changes in Table 7.4.1-1.
7.4.5	Additional BC3 blocking minimum requirement	It's proposed to evaluate the appropriate additional BC3 blocking minimum requirement for Band [41] and make corresponding changes in Table 7.4.5-1.
7.5.1	General minimum requirement for out-of-band blocking	It's proposed to evaluate the appropriate out-of-band blocking requirement for when co-located with BS in other frequency bands for Band [41] and make corresponding changes in Table 7.5.1-1.
7.5.2	Co-location minimum requirement for out-of-band blocking	A new row is expected to be added in Table 7.5.2-1. It's proposed to evaluate the appropriate out-of-band blocking performance requirement for Band [41].

6.12 Required changes to TS 37.113

Required changes in TS 37.113 are shown in Table 6.12-1.

Table 6.12-1: Required changes in TS 37.113

Section	Description	Required Changes in TS 37.113
4.4.2	Receiver exclusion band	A new row is expected to be added in Table 4.4-3

6.13 Required changes to TS 37.141

Required changes in TS 37.141 are shown in Table 6.13-1.

Table 6.13-1: Required changes in TS 37.141

Section	Description	Required Changes in TS 37.141
4.4	Operating bands and band categories	A new row is expected to be added in Table 4.4-2.
6.6.1.5.5	Additional spurious emissions requirement for co-existence with systems operating in other frequency bands	A new row is expected to be added in Table 6.6.1.5.5-1. It is proposed to evaluate the appropriate requirement of Band [41] for additional spurious emissions limits for co-existence with systems operating in other frequency bands.
6.6.1.5.6	Spurious emissions limits for BS co-located with another BS	A new row is expected to be added in Table 6.6.1.5.6-1. It is proposed to evaluate the appropriate requirement of Band [41] for BS spurious emissions limits for co-located with another BS.
7.4.5.1	General blocking test requirement	It's proposed to evaluate the appropriate general blocking test requirement for Band [41] and make corresponding changes in Table 7.4.5.1-1.
7.4.5.5	Additional BC3 blocking test requirement	It's proposed to evaluate the appropriate additional BC3 blocking test requirement for Band [41] and make corresponding changes in Table 7.4.5.5-1.
7.5.5.1	General minimum requirement for out-of-band blocking	It's proposed to evaluate the appropriate out-of-band blocking requirement for when co-located with BS in other frequency bands for Band [41] and make corresponding changes in Table 7.5.5.1-1.
7.5.5.2	Co-location test requirement	A new row is expected to be added in Table 7.5.5.2-1. It's proposed to evaluate the appropriate co-location test requirement for when co-located with BS in other frequency bands for Band [41].

7 Project plan

7.1 Schedule and Work Task Status

Table 7.1-1 summarises the schedule and work task status for LTE_TDD_2600_US WI.

Table 7.1-1: Schedule and work task status

Item#	Necessary work	Responsibility	Schedule	Status
1	Provide and approve skeleton TR	Clearwire	RAN4#55	100%
2	Provide details on regulatory framework for the band in the TR	Clearwire	RAN4#55	100%
3	Study band and channel arrangement	RAN4	RAN4 AH2010-03	100%
4	Study channel bandwidths	RAN4	RAN4#55	100%
5	Study UE RF & RRM requirements	RAN4	RAN4#56	100%
6	Study eNB RF requirements	RAN4	RAN4#55	100%
7	Study MSR requirements	RAN4	RAN4 AH2010-03	100%
8	Summary of required changes to specifications	RAN4	RAN4#56	100%
9	Generate CRs to update appropriate specifications	RAN4	RAN4 AH2010-04	100%

Annex A (Informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2010-05	RAN4#55	R4-101516			Skeleton	N/A	0.0.1
2010-08	RAN4#56	R4-102814			Update based on agreed input documents in RAN4#55	0.0.1	0.1.0
2010-08	RAN4#56	R4-102815			Update based on agreed input documents in RAN4 AH# 2010-03	0.1.0	0.2.0
2010-08	RAN4#56	R4-102817			Update based on agreed input documents in RAN4#56	0.2.0	0.3.0
2010-09	RAN#49	RP-100945			TSG-RAN for approval	0.3.0	1.0.0
2010-09	RAN#49	RP-100945			Approved by TSG RAN	1.0.0	10.0.0
2010-12	RAN#50	RP-101349	001	2	CR Removing brackets of Band 41 reference sensitivity to TR 36.812	10.0.0	10.1.0