

3GPP TR 36.810 V9.0.0 (2010-03)

Technical Report

**3rd Generation Partnership Project;
Technical Specification Group Radio Access Network;
Universal Terrestrial Radio Access (UTRA) and Evolved
Universal Terrestrial Radio Access (E-UTRA);
UMTS / LTE in 800 MHz for Europe
(Release 9)**



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Keywords

UMTS, LTE, Radio

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Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- x the first digit:
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1 Scope

The present document is a technical report of the "UMTS/LTE in 800 MHz for Europe" work item which was approved at TSG RAN #43 [2]. The purpose of this work item is to provide specification support for LTE and UMTS with paired channel arrangement in the band 790-862 MHz.

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-090156, "UMTS/LTE in 800 MHz for Europe"
- [3] ECC/DEC/(09)03 "Harmonised conditions for MFCN in the band 790-862 MHz", 30 Oct. 2009
- [4] CEPT Report 30: Report from CEPT to the European Commission in response to the Mandate on "The identification of common and minimal (least restrictive) technical conditions for 790 862 MHz for the digital dividend in the European Union" 2009-11-11

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [x] 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 [x].

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 [x] 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 [x].

CEPT:	European Conference of Postal and Telecommunications Administrations
DTT:	Digital Terrestrial Television
ECC:	European Communications Committee (of CEPT). See www.eco.dk
EU:	European Union

4 Background

4.1 Task description

The purpose of this work item is to provide specification support for LTE and UMTS with paired channel arrangement in the band 790-862 MHz. The following tasks should be done:

- a) Study UMTS/LTE in upper UHF band for a potential deployment in ITU Region 1. Generate a new technical report based on study results. The specific band to be studied is 790-862 MHz with FDD arrangements.
- b) Develop channel arrangement in line with the pending ECC decision.
- c) Generate CR's to update the appropriate documents
- d) TSG RAN WG2: Study signalling issues related to UMTS/LTE in the UHF band (FDD only).
- e) Study any additional related issues.

4.2 Regulatory framework for the band

4.2.1 Background

The 2007 ITU-R World Radiocommunication Conference (WRC-07) allocated the band 790-862MHz to the mobile service in ITU-R Region 1 (broadly; Europe, Middle East and Africa) and identified it for IMT. These provisions come fully into effect on 17th June 2015, although many countries already have national allocations to the mobile service in this frequency range by footnote.

In April 2008, the European Commission issued a mandate to CEPT on the digital dividend (second Mandate to CEPT on technical considerations regarding harmonisation options for the digital dividend in the European Union). In this Mandate:

"CEPT is mandated to carry out the technical investigations to define the technical conditions applicable for the sub-band 790-862 MHz optimised for, but not limited to, fixed/mobile communications networks (two-way). The CEPT is requested to study more specifically:

- 1) The identification of common and minimal (least restrictive) technical conditions....
- 2) The development of the most appropriate channelling arrangement: in addition to (1), the CEPT is requested to develop channelling arrangements that are sufficiently precise for the development of EU-wide equipment, but at the same time allow Member States to adapt these to national circumstances and market demand...."

The results of these studies are documented in CEPT Reports 30 and 31, which were approved at the 23rd meeting of ECC, in June 2009.

The 22nd meeting of ECC decided to develop an ECC Decision "on harmonised conditions for Mobile/Fixed Communications Networks operating in the band 790-862 MHz", with the same frequency arrangement and technical conditions as are described in CEPT Reports 30 and 31. This decision ECC/DEC/(09)03 was approved by the 23rd meeting of ECC to be submitted for public comment, and was finally approved by the 24th meeting of ECC in October 2009.

5 Study of UTRA requirements

5.1 Band and channel arrangement

For the band 790-862 MHz the band arrangement for Europe is detailed in subclause 4.2. The band is arranged as 2x30 MHz with 11 MHz duplex gap:

- FDD Uplink: 832 – 862 MHz

- FDD Downlink: 791 – 821 MHz

Note the reverse duplex arrangement to protect broadcast receivers below the band.

The band is given number XX

The band is expected to be allocated in blocks of 5 MHz. Thus there does not seem to be a need for additional channel numbers beside the default 200 kHz channel raster. UARFCN definitions are given in table 5.1-1 and 5.1-2

Table 5.1-1: UARFCN definition (general)

Band	UPLINK (UL) UE transmit, Node B receive			DOWNLINK (DL) UE receive, Node B transmit		
	UARFCN formula offset F_{UL_Offset} [MHz]	Carrier frequency (F_{UL}) range [MHz]		UARFCN formula offset F_{DL_Offset} [MHz]	Carrier frequency (F_{DL}) range [MHz]	
		F_{UL_low}	F_{UL_high}		F_{DL_low}	F_{DL_high}
XX	-23	834.4	859.6	-109	793.4	818.6

Table 5.1-2: UARFCN definition (additional channels)

Band	UPLINK (UL) UE transmit, Node B receive		DOWNLINK (DL) UE receive, Node B transmit	
	UARFCN formula offset F_{UL_Offset} [MHz]	Carrier frequency [MHz]	UARFCN formula offset F_{DL_Offset} [MHz]	Carrier frequency [MHz]
		(F_{UL})		(F_{DL})
XX	-	-	-	-

5.2 Specific UE requirements

The UE requirements for LTE are based on band 8 performance, see subclause 6.2. Likewise the UE requirements for band XX can be based on band VIII requirements.

5.3 BS specific requirements

The BS requirements for LTE are based on band 8 performance, see subclause 6.3. Likewise the BS requirements for band XX can be based on band VIII requirements.

6 Study of E-UTRA requirements

6.1 Band and channel arrangement

For the band 790-862 MHz the band arrangement for Europe is detailed in subclause 4.2. The band is arranged as 2x30 MHz with 11 MHz duplex gap:

- FDD Uplink: 832 – 862 MHz

- FDD Downlink: 791 – 821 MHz

Note the reverse duplex arrangement to protect broadcast receivers below the band.

The band is given number 20. EARFCN definitions are given in table 6.1-1.

Table 6.1-1 EARFCN definition for band 20. Band 17-19 shown for reference.

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}
...						
17	734	5730	5730 – 5849	704	23730	23730 – 23849
18	860	5850	5850 – 5999	815	23850	23850 – 23999
19	875	6000	6000 – 6149	830	24000	24000 – 24149
20	791	6150	6150 – 6449	832	24150	24150 – 24449

6.1.1 Channel bandwidths specified for Band 20

For Band [20] specification of radio requirements are considered for the bandwidths shown in Table 6.1.X-1. Some other bands below 1 GHz are also shown for reference.

Table 5.6.1-1: E-UTRA channel bandwidth

E-UTRA Band	E-UTRA band / channel bandwidth					
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
5	Yes	Yes	Yes	Yes		
6			Yes	Yes		
8	Yes	Yes	Yes	Yes		
12	Yes	Yes	Yes	Yes		
13			Yes	Yes		
14			Yes	Yes		
...						
17			Yes	Yes		
20			Yes	Yes	Yes	Yes

6.2 Coexistence with other technologies

The technical conditions defined in Annex 3 of the ECC Decision are intended to provide coexistence between mobile technologies deployed within the 791-821MHz and 832-862MHz bands.

Studies have been conducted within ECC on coexistence with services in neighbouring frequency bands (in particular digital terrestrial television broadcasting), which are documented in CEPT Report 30 [4].

For the preferred harmonised frequency arrangement, there will be some interleaved spectrum in the FDD duplex gap. Several uses can be envisaged (e.g. low power applications such as PMSE) on a non protected/ non interfering basis in this interleaved spectrum. The technical conditions defined in Annex 3 of the Decision are intended to prevent interference from these applications to UE and BS operating in the preferred harmonised frequency arrangement.

6.3 UE specific requirements

6.3.1 Spurious emissions

Band 20 is intended for deployment in Europe, so Category B spurious emissions will apply. Annex 3 of the Decision states that the out-of-band requirements:

"apply without prejudice to spurious emission requirements (which continue to apply). This document (i.e. the Decision) does not address spurious emission levels; this is the responsibility of the standards development organisations (SDOs). The technical conditions for these terminals are defined relative to the channel edge to enable them to be taken into account by the SDOs."

The spurious emission limit for protecting DTV shall be -65 dBm/8MHz measured with the filter centered on 786 MHz. The requirement shall be applicable to band 20 only.

The method for including the requirement in TS 36.101 is FFS.

6.3.2 Reference sensitivity level

Table 7.3.1-1 in TS 36.101 defines the reference sensitivity for the receiver and Table 7.3.1-2 specifies the minimum number of allocated uplink resource blocks for which the reference receive sensitivity requirement must be met. For band 20 the following values applies:

Table 7.3.1-1: Reference sensitivity QPSK P_{REFSENS}

Channel bandwidth							
E-UTRA Band	1.4 MHz (dBm)	3 MHz (dBm)	5 MHz (dBm)	10 MHz (dBm)	15 MHz (dBm)	20 MHz (dBm)	Duplex Mode
20			[-97]	[-94]	[TBD]	[TBD]	FDD

Table 7.3.1-2: 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
20			[25]	[25]	[TBD]	[TBD]	FDD

6.3.3 Blocking characteristics

The working assumption for blocking levels is outlined below:

Table 7.6.2.1-2: Out of band blocking

E-UTRA band	Parameter	Units	Frequency			
			range 1	range 2	range 3	range 4
	$P_{\text{Interferer}}$	dBm	[-44]	[-30]	[-15]	-15
1, 2, 3, 4, 5 6, 7, 8, 9, 10,11,12, 13, 17, 18, 19, 20, 33,34, 35, 36, 37, 38, 39, 40	$F_{\text{Interferer}}$ (CW)	MHz	$F_{\text{DL_low}} -15$ to $F_{\text{DL_low}} -60$	$F_{\text{DL_low}} -60$ to $F_{\text{DL_low}} -85$	$F_{\text{DL_low}} -85$ to 1 MHz	-
			$F_{\text{DL_high}} +15$ to $F_{\text{DL_high}} +60$	$F_{\text{DL_high}} +60$ to $F_{\text{DL_high}} +85$	$F_{\text{DL_high}} +85$ to +12750 MHz	-
2, 5, 12, 17	$F_{\text{Interferer}}$	MHz	-	-	-	$F_{\text{UL_low}} - F_{\text{UL_high}}$

• Note:

6.3.4 Maximum Output power, MPR and A-MPR

6.3.4.1 Maximum Output Power

The ECC Decision [aa] defines the maximum mean in-block power for mobile terminals to be 23dBm, measured as TRP (total radiated power). A footnote to this value states:

It is recognised that this value is subject to a tolerance of up to +2 dB, to take account of operation under extreme environmental conditions and production spread.

This is consistent with the definition of UE Power Class 3 for other E-UTRA bands.

The UE power class 3 for Band 20 should have the same maximum output power of 23dBm and tolerance of ± 2 dB. However, the ECC Decision [3] only defines the upper boundary of the tolerance, because the lower boundary is not relevant for regulatory purposes.

Administrations may relax this limit in certain situations, for example fixed TS in rural areas, providing that protection of other services, networks and applications is not compromised and cross-border obligations are fulfilled. This will allow the future definition of UE power classes with higher output powers for this band.

By measure of Relative Duplex Gap (Gap Width/Gap Centre Freq) Band 20 is 4th challenging the relative duplex Gap = 1.33% (11 MHz/826.5 MHz). Based on previous RAN4 decisions bands having relative duplex gap smaller than 1.75% were entitled to have band edge Tx tolerance relaxation. However band 20 shall also be entitled to the relaxation.

Table 6.2.2-1: UE Power Class

EUTRA band	Class 1 (dBm)	Tolerance (dB)	Class 2 (dBm)	Tolerance (dB)	Class 3 (dBm)	Tolerance (dB)	Class 4 (dBm)	Tolerance (dB)
20					23	$\pm 2^c$		
Note 2: For transmission bandwidths (Figure 5.6-1) confined within F_{UL_low} and $F_{UL_low} + 4$ MHz or $F_{UL_high} - 4$ MHz and F_{UL_high} , the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB								

6.3.4.2 Maximum Power Reduction (MPR)

The existing band-independent requirements for MPR in section 6.2.3 also apply to the UE power class for Band 20.

6.4 BS specific requirements

The regulatory requirements are based on EIRP, i.e. radiated power from the antenna. The BS requirements are based on conducted power at the antenna connector. The EIRP will depend both on the emissions at the antenna connector as well as feeder losses, antenna gain and number of antennas.

To incorporate the regulatory requirements into the specifications the following steps are done:

- The manufacturer declares the maximum emission level in each TV channel.
- The requirement is written so that the emissions shall not exceed the levels requirements specified by the manufacturer, see subsection 6.4.1. The corresponding test is introduced in the test specification.
- An informative annex is introduced that explains how the requirements outlined in section 6.4.2 may be used to assess compliance with the regulatory requirements.

6.4.1 Specification text for DTT protection requirements

In certain regions the following requirement may apply for protection of DTT. For E-UTRA BS operating in Band 20, the level of emissions in the band 470-790 MHz, measured in an 8MHz filter bandwidth on centre frequencies F_{filter} according to Table 6.6.3.3-4, shall not exceed the maximum emission level $P_{EM,N}$ declared by the manufacturer. This requirement also applies for the frequency range 470-780 MHz.

Table 6.6.3.3-4: Declared emissions levels for protection of DTT

Filter centre frequency, F_{filter}	Measurement bandwidth	Declared emission level [dBm]
$F_{filter} = 8 \cdot N + 306$ (MHz); $21 \leq N \leq 60$	8 MHz	$P_{EM,N}$

Note: The regional requirement is defined in terms of EIRP (effective isotropic radiated power), which is dependent on both the BS emissions at the antenna connector and the deployment (including antenna gain and feeder loss). The requirement defined above provides the characteristics of the basestation needed to verify compliance with the regional requirement. Compliance with the regional requirement can be determined using the method outlined in Annex G.

6.4.2 Informative text to explain how regulatory compliance can be assessed

The European Communications Committee (ECC) has adopted the "ECC Decision on harmonised conditions for Mobile/Fixed Communications Networks operating in the band 790-862 MHz" applicable for BS operating in band 20. The decision defines a requirement for "Out-of-block BEM baseline requirements for 'mobile/fixed communications network' (MFCN) base stations within the spectrum allocated to the broadcasting (DTT) service", where three different cases A, B, and C for protecting broadcasting DTT are defined. These cases can be applied on a per-channel and/or per-region basis, i.e. for the same channel different cases can be applied in different geographic areas (e.g. area related to DTT coverage) and different cases can be applied to different channels in the same geographic area.

For band 20, compliance with the regulatory requirements in Europe referenced above can be assessed based on the manufacturer's declaration of $P_{EM,N}$ specified in subclause 6.6.3.3, together with the deployment characteristics. Maximum output Power in 10 MHz (P_{10MHz}) is also declared by the manufacturer. The parameters G_{ant} and N_{ant} are deployment specific parameters related to the deployment of the BS, where G_{ant} is the antenna gain and N_{ant} is the number of antennas.

For each channel (N) the EIRP level is calculated using: $P_{EIRP,N} = P_{EM,N} + G_{ant} + 10 \cdot \log(N_{ant})$. The regulatory requirement in [x] limits the EIRP level to the Maximum level in Table X-1 for the protection case(s) defined in the regulation.

Table X-1: EIRP limits for protection of broadcasting (DTT) service

Case	Measurement filter centre frequency	Condition on BS maximum aggregate EIRP / 10 MHz, P_{EIRP_10MHz} (Note)	Maximum Level $P_{EIRP,N,MAX}$	Measurement Bandwidth
A: for DTT frequencies where broadcasting is protected	$N \cdot 8 + 306$ MHz, $21 \leq N \leq 60$	$P_{EIRP_10MHz} \geq 59$ dBm	0 dBm	8 MHz
	$N \cdot 8 + 306$ MHz, $21 \leq N \leq 60$	$36 \leq P_{EIRP_10MHz} < 59$ dBm	$P_{EIRP_10MHz} - 59$ dBm	8 MHz
	$N \cdot 8 + 306$ MHz, $21 \leq N \leq 60$	$P_{EIRP_10MHz} < 36$ dBm	-23 dBm	8 MHz
B: for DTT frequencies where broadcasting is subject to an intermediate level of protection	$N \cdot 8 + 306$ MHz, $21 \leq N \leq 60$	$P_{EIRP_10MHz} \geq 59$ dBm	10 dBm	8 MHz
	$N \cdot 8 + 306$ MHz, $21 \leq N \leq 60$	$36 \leq P_{EIRP_10MHz} < 59$ dBm	$P_{EIRP_10MHz} - 49$ dBm	8 MHz
	$N \cdot 8 + 306$ MHz, $21 \leq N \leq 60$	$P_{EIRP_10MHz} < 36$ dBm	-13 dBm	8 MHz
C: for DTT frequencies where broadcasting is not protected	$N \cdot 8 + 306$ MHz, $21 \leq N \leq 60$	N.A.	22 dBm	8 MHz
NOTE: P_{EIRP_10MHz} (dBm) is defined by the expression $P_{EIRP_10MHz} = P_{10MHz} + G_{ant} + 10 \cdot \log_{10}(N_{ant})$				

7. Summary of changes to UTRA specifications

Table 7-1 required changes to TS 25.101

Clause	Description	Description of change
5.2	Frequency bands	The frequency range of band XX is added to table 5.0
5.3	TX-RX frequency separation	The frequency separation of band XX is added 5.0A
5.4.3	Channel number	The channel numbers in clause 5 are added to tables 5.1 and 5.1A
6.2.1	UE maximum output power	The band is added to table 6.1
6.6.3.1	Spurious emission requirements	Protection of band XX is added for UEs supporting band I, III, VII and VIII. Band XX need to protect these band as well.
6.6.3.1A	Additional spurious emission requirement for DC-HSUPA	See above
7.3.1	Reference sensitivity	The band is added to table 7.2
7.3.2	Reference sensitivity for DC-HSDPA	The band is added to table 7.2A
7.6.1	In-band blocking	The band is added to table 7.6
7.6.1A	Additional requirement for DC-HSDPA and DB-DC-HSDPA	The band is added to table 7.6A
7.6.2	Out of band blocking	The band is added to table 7.7
7.6.2A	Additional requirement for DC-HSDPA	The band is added to table 7.7AA
7.9.1	Receiver spurious emission requirements	Protection of band XX is added for UEs supporting band I, III, VII and VIII. Band XX need to protect these band as well
B.2.2	Multi-path fading propagation conditions	The band is added to table B.1, B.1.B, B.1.C, B.1.D and B.1.E
B.2.6.1	MIMO Single Stream Fading Conditions	The band is added to table B.4
B.2.6.2	MIMO Dual Stream Fading Conditions	The band is added to table B.5
E.2	List of UARFCN used for UTRA FDD bands	The channel numbers in clause 5 are added to table E.1

Table 7-2 required changes to TS 25.104

Clause	Description	Description of change
2	References	A reference to ECC decision covering the band is added.
3.2	Abbreviations	DTT is added
5.2	Frequency bands	The frequency range of band XX is added to table 5.0
5.3	TX-RX frequency separation	The frequency separation of band XX is added 5.0A
5.4.3	Channel number	The channel numbers in clause 5 are added to tables 5.1 and 5.1A
6.6.2	Out of band emission	An extra requirement is added for DTT protection
6.6.3.2	Protection of the BS receiver of own or different BS	The band is added to tables: 6.10, 6.10A, 6.10B and 6.10C
6.6.3.3	Co-existence with other systems in the same geographical area	The band is added to table 6.11
6.6.3.4	Co-existence with co-located and co-sited base stations	The band is added to tables: 6.12, 6.13 and 6.14
6.6.3.9	Co-existence with Home BS operating in other bands	The band is added to table 6.20
7.5.1	Blocking characteristics	The band is added to tables: 7.4, 7.4A and 7.4B
7.5.2	Co-location blocking requirements	The band is added to tables: 7.5C, 7.5D and 7.5E
7.7	Receiver Spurious emissions	The band is added to table 7.7A
B.2	Multi-path fading propagation conditions	The band is added to table B.2
B.5	Multipath fading propagation conditions for E DPDCH and E-DPCCH	The band is added to table B.5
D	Regional requirement for protection of DTT (informative)	Clause is added to explain how regulatory compliance can be assessed.

Table 7-3 required changes to TS 25.113

Clause	Description	Description of change
4.5.2	Receiver exclusion band	The receiver exclusion range is added for the band

Table 7-4 required changes to TS 25.133

Clause	Description	Description of change
4.2.2.5a	Measurements of inter-RAT E-UTRA cells	Band 20 is added using the same levels as band 8
8.1.2.6.1	Identification of a new cell	Band 20 is added using the same levels as band 8
9.1.1.1.1	CPICH_RSCP Intra frequency absolute accuracy	Band XX is added using the same levels as band VIII
9.1.1.1.2	CPICH_RSCP Intra frequency relative accuracy	Band XX is added using the same levels as band VIII
9.1.1.2.1	CPICH_RSCP Inter frequency relative accuracy	Band XX is added using the same levels as band VIII
9.1.2.1.1	CPICH_Ec/lo Intra frequency absolute accuracy	Band XX is added using the same levels as band VIII
9.1.2.1.2	CPICH_Ec/lo Intra frequency relative accuracy	Band XX is added using the same levels as band VIII
9.1.2.2.1	CPICH_Ec/lo Inter frequency absolute accuracy	Band XX is added using the same levels as band VIII
9.1.2.2.2	CPICH_Ec/lo Inter frequency relative accuracy	Band XX is added using the same levels as band VIII
9.1.3.1	RSSI Inter frequency absolute accuracy	Band XX is added using the same levels as band VIII
9.1.3.2	RSSI Inter frequency relative accuracy	Band XX is added using the same levels as band VIII
9.1.7.1	CELL_DCH Intra frequency measurement requirement	Band XX is added using the same levels as band VIII
9.1.7.2	CELL_DCH Inter frequency measurement requirement	Band XX is added using the same levels as band VIII
9.1.8.1.1	Measurement requirement	Band XX is added using the same levels as band VIII
9.1.8.2.1	Intra frequency measurement requirement accuracy without IPDL period active	Band XX is added using the same levels as band VIII
9.1.8.2.2	Intra frequency measurement requirement accuracy with IPDL period active	Band XX is added using the same levels as band VIII
9.1.8.2.3	Inter frequency measurement requirement accuracy	Band XX is added using the same levels as band VIII
A.9.1.1.1.1	Intra frequency test parameters	Band XX is added using the same levels as band VIII
A.9.1.1.1.2	Inter frequency test parameters	Band XX is added using the same levels as band VIII
A.9.1.2.1.1	Intra frequency test parameters	Band XX is added using the same levels as band VIII
A.9.1.2.1.2	Inter frequency test parameters	Band XX is added using the same levels as band VIII
A.9.1.2.2	CPICH Ec/lo Test Requirements	Band XX is added using the same levels as band VIII
A.9.1.3.1	Test Purpose and Environment	Band XX is added using the same levels as band VIII
A.9.1.3.2	Test Requirements	Band XX is added using the same levels as band VIII
A.9.1.4.1.1	Intra frequency test parameters	Band XX is added using the same levels as band VIII
A.9.1.4.1.2	Inter frequency test parameters	Band XX is added using the same levels as band VIII
A.9.1.5.1.1	Test Purpose and Environment	Band XX is added using the same levels as band VIII
A.9.1.5.2.1	Test Purpose and Environment	Band XX is added using the same levels as band VIII
A.9.1.6.1.1	Test Purpose and Environment	Band XX is added using the same levels as band VIII
A.9.1.6.2.1	Test Purpose and Environment	Band XX is added using the same levels as band VIII

Table 7-5 required changes to TS 25.141

Clause	Description	Description of change
3.3	Abbreviations	DTT is added
3.4.1	Frequency bands	The frequency range of band XX is added to table 3.0
3.4.2	TX-RX frequency separation	The frequency separation of band XX is added 3.0A
3.5.3	Channel number	The channel numbers in clause 5 are added to tables 3.1 and 3.1A
6.5.2.1.5	Out of band emission	An extra requirement is added for DTT protection
6.5.3.7.3	Protection of the BS receiver of own or different BS	The band is added to tables: 6.37, 6.37A, 6.37B and 6.37C
6.5.3.7.4	Co-existence with other systems in the same geographical area	The band is added to table 6.38
6.5.3.7.5	Co-existence with co-located and co-sited base stations	The band is added to tables: 6.39, 6.40 and 6.41
6.5.3.7.10	Co-existence with Home BS operating in other bands	The band is added to table 6.47
7.5.5	Blocking characteristics	The band is added to tables: 7.4K, 7.4L and 7.4M, 7.4N, 7.4P, 7.4Q
7.7.5	Receiver Spurious emissions	The band is added to table 7.7A
D.2	Multi-path fading propagation conditions	The band is added to table D.1
D.5	Multipath fading propagation conditions for E DPDCH and E-DPCCH	The band is added to table D.3

Table 7-6 required changes to TS 34.101

Clause	Description	Description of change
4.4	Receiver exclusion band	The receiver exclusion range is added for the band

8. Summary of changes to E-UTRA specifications

The necessary changes to the specifications are shown in Table 8-1 to 8-6

Table 8-1 Required changes to TS 36.101

Clause	Description	Description of change
5.5	Frequency band (Operating bands)	A new row for the band in table 5.5-1
5.6.1	Channel bandwidths per operating band	Channel bandwidths 5-20 MHz are added to Table 5.6.1-1.
5.7.3	Channel number (EARFCN)	A new channel numbering for the band in table 5.7.3-1
5.7.4	TX-RX frequency separation	A new row for the band in table 5.7.4-1
6.2.2	UE Maximum Output Power	A new row for the band in table 6.6.2-1
6.2.4	UE Maximum Output Power with additional requirements	A new NS _{xx} value is defined for use with reference sensitivity in Table 6.2.4-1. A new table is added for NS ₁₀ outlining A-MPR regions.
6.6.3.2	Spurious emission band UE co-existence	The band is added to table 6.6.3.2-1 protecting E-UTRA Band 1, 3, 7, 8, 33, 34, 38, 39, 40
7.3.1	Reference sensitivity	The reference sensitivity is added to tables Table 7.3.1-1 and the UL allocation of 25 RB in table 7.3.1-2. The reference sensitivity for 20 MHz is measured using NS ₁₀ , noted in table 7.3.1-3
7.3.2	Requirement for large transmission configurations	The band is added to Table 7.3.2-1
7.6.1	In-band blocking	The band is added to Table 7.6.1.1-2
7.6.2	Out-of-band blocking	The band is added to Table 7.6.2.1-2

Table 8-2 Required changes to TS 36.104

Clause	Description	Description of change
3.2	Symbols	Add new symbols for the DTT requirements
3.3	Abbreviations	Add DTT abbreviation
5.5	Frequency band (Operating bands)	A new row for the band in table 5.5-1
5.7.3	Channel number (EARFCN)	A new channel numbering for the band in table 5.7.3-1
6.6.3.2	Operating band unwanted emissions category B	Add the band to category B option 1
6.6.3.3	Additional requirements (operating band unwanted emissions)	Add new subsection to capture the requirements for DTT protection.
6.6.4.3	Coexistence spurious emission requirements	Add new band to table 6.6.4.3.1-1
6.6.4.4	Co-location spurious emission requirements	Add new band to table 6.6.4.4.1-1
7.6.1	Blocking requirements	Add new band to table 7.6.1.1-1
7.6.2	Colocation blocking requirements	Add new band to table 7.6.2.1-1
Annex G	Regional requirement for protection of DTT	Add new annex explaining how to use the declared values in 6.6.3.3 to assess compliance with regulatory requirements.

Table 8-3 Required changes to TS 36.113

Clause	Description	Description of change
4.5.2	Receiver exclusion band	Add new line for the band

Table 8-4 Required changes to TS 36.124

Clause	Description	Description of change
4.4	Receiver exclusion band	Add new line for the band

Table 8-5 Required changes to TS 36.133

Clause	Description	Description of change
3.2	Symbols	Add new symbols for the DTT requirements
4.2.2.3	Measurements of intra-frequency E-UTRAN cells	The band is added using the same parameters as band 8
4.2.2.4	Measurements of inter-frequency E-UTRAN cells	The band is added using the same parameters as band 8
8.1.2	UE Measurements Procedures in RRC_CONNECTED State	The band is added using the same parameters as band 8
9.1	E-UTRAN measurements performance requirements	The band is added using the same parameters as band 8
A.9.1	Test parameters for performance requirements	The band is added using the same parameters as band 8

Table 8-6 Required changes to TS 36.141

Clause	Description	Description of change
3.2	Symbols	Add new symbols for the DTT requirements
3.3	Abbreviations	Add DTT abbreviation
4.6.5	Additional operating band unwanted emissions	Add declared parameters to the subclause.
5.5	Frequency band (Operating bands)	A new row for the band in table 5.5-1
5.7.3	Channel number (EARFCN)	A new channel numbering for the band in table 5.7.3-1
6.6.3.5.2	Operating band unwanted emissions category B	Add the band to category B option 1
6.6.3.5.3	Additional requirements (operating band unwanted emissions)	Add new subsection to capture the requirements for DTT protection.
6.6.4.5.4	Coexistence spurious emission requirements	Add new band to table 6.6.4.5.4.1-1
6.6.4.5.5	Co-location spurious emission requirements	Add new band to table 6.6.4.5.5.1-1
7.6.5.1	Blocking requirements	Add new band to table 7.6-2
7.6.5.2	Colocation blocking requirements	Add new band to table 7.6-3
Annex G.1	Measurement of transmitter	Add test tolerance to table G.1-1

Annex A: Change history

ate	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2009-05	RAN4-51	R4-091832			Skeleton	N/A	0.0.1
2009-07	RAN4-51bis	R4-092542			The following Text proposals have been implemented: R4-092381 TP on Scope R4-092583 EU800 TP on channel numbers for E-UTRA	0.0.1	0.1.0
2009-08	RAN4-52	R4-093399			The following text proposals have been implemented: R4-092963 EU800 Band arrangement for UTRA R4-092992 TP for EU800 TR: supported bandwidths for the EU800 band in Europe R4-093276 TP on Regulatory status In addition the following editorial changes have been made: Change of document number and title after guidance from MCC Square brackets around band number removed	0.1.0	0.2.0
2009-10	RAN4-52bis	R4-094069			The following text proposals have been implemented: R4-093783 TP on UARFCN for band XX R4-093937 TP for EU800 TR: Update and general information R4-094049 TP for EU800 TR: UE Maximum output power and MPR R4-094068 TP for 36.810 on UE requirements agreed in ad-hoc	0.2.0	0.3.0
2009-11	RAN4-53	R4-094952			The following text proposals have been implemented: R4-094950 TP on required changes to LTE specifications R4-094951 TP for protection of DTT in Band 20 Transmitter DTT w as added to the list of abbreviations	0.3.0	0.4.0
2010-02	RAN4-54	R4-101032			The following text proposals have been implemented: R4-101031 TP for 36.810 on Additional UTRA aspects on band XX R4-101032 TP for 36.810 on Additional LTE aspects on band 20 R4-101033 Editorial cleanup of TR 36.810 v 0.4.0 In addition the following editorial changes have been made: Added TR report number to the front page	0.4.0	0.5.0
2010-03	RAN-47	RP-100117			Document presented for approval	0.5.0	2.0.0
2010-03	RAN-47	RP-100117			Approved by RAN	2.0.0	9.0.0