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IMT cellular networks - Harmonised Standard covering the essential requirements of article 3.2 of the Radio Equipment Directive 2014/53/EU - Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)

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ETSI EN 301 908-13 V11.1.1 (2016-07)



**IMT cellular networks;
Harmonised Standard covering the essential requirements
of article 3.2 of the Directive 2014/53/EU;
Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA)
User Equipment (UE)**

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Foreword

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For non EU countries the present document may be used for regulatory (Type Approval) purposes.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.9] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A-1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

The present document is part 13 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.12].

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Modal verbs terminology

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Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the Radio Equipment Directive [i.2]. The present document is produced following the guidance in ETSI EG 203 336 [i.3] as applicable.

1 Scope

The present document applies to the following radio equipment type:

- User Equipment for Evolved Universal Terrestrial Radio Access (E-UTRA).

This radio equipment type is capable of operating in all or any part of the frequency bands given in tables from 1-1 through 1-5.

Table 1-1: E-UTRA UE operating bands

E-UTRA Band	Direction of UE transmission	E-UTRA operating bands
1	Transmit	1 920 MHz to 1 980 MHz
	Receive	2 110 MHz to 2 170 MHz
3	Transmit	1 710 MHz to 1 785 MHz
	Receive	1 805 MHz to 1 880 MHz
7	Transmit	2 500 MHz to 2 570 MHz
	Receive	2 620 MHz to 2 690 MHz
8	Transmit	880 MHz to 915 MHz
	Receive	925 MHz to 960 MHz
20	Transmit	832 MHz to 862 MHz
	Receive	791 MHz to 821 MHz
22	Transmit	3 410 MHz to 3 490 MHz
	Receive	3 510 MHz to 3 590 MHz
28	Transmit	703 MHz to 748 MHz
	Receive	758 MHz to 803 MHz
32 (note)	Transmit	N/A
	Receive	1 452 MHz to 1 496 MHz
33	Transmit and Receive	1 900 MHz to 1 920 MHz
34	Transmit and Receive	2 010 MHz to 2 025 MHz
38	Transmit and Receive	2 570 MHz to 2 620 MHz
40	Transmit and Receive	2 300 MHz to 2 400 MHz
42	Transmit and Receive	3 400 MHz to 3 600 MHz
43	Transmit and Receive	3 600 MHz to 3 800 MHz

NOTE: Restricted to E-UTRA operation when carrier aggregation is configured. The downlink operating band is paired with the uplink operating band (external) of the carrier aggregation configuration that is supporting the configured Pcell.

Table 1-2: E-UTRA UE Intra-band contiguous CA operating bands

E-UTRA CA Band	E-UTRA Band	Direction of UE transmission	E-UTRA operating bands
CA_1	1	Transmit	1 920 MHz to 1 980 MHz
		Receive	2 110 MHz to 2 170 MHz
CA_3	3	Transmit	1 710 MHz to 1 785 MHz
		Receive	1 805 MHz to 1 880 MHz
CA_7	7	Transmit	2 500 MHz to 2 570 MHz
		Receive	2 620 MHz to 2 690 MHz
CA_38	38	Transmit and Receive	2 570 MHz to 2 620 MHz
CA_40	40	Transmit and Receive	2 300 MHz to 2 400 MHz
CA_42	42	Transmit and Receive	3 400 MHz to 3 600 MHz

Table 1-3: E-UTRA UE Inter-band CA operating bands (two bands)

E-UTRA CA Band	E-UTRA Band	UL operating band		DL operating band	
		BS receive/UE transmit		BS transmit/UE receive	
		$F_{UL_low} - F_{UL_high}$		$F_{DL_low} - F_{DL_high}$	
CA_1-3	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
CA_1-7	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	7	2 500 MHz to 2 570 MHz		2 620 MHz to 2 690 MHz	
CA_1-8	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	8	880 MHz to 915 MHz		925 MHz to 960 MHz	
CA_1-20	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	20	832 MHz to 862 MHz		791 MHz to 821 MHz	
CA_1-42	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	42	3 400 MHz to 3 600 MHz		3 400 MHz to 3 600 MHz	
CA_3-7	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	7	2 500 MHz to 2 570 MHz		2 620 MHz to 2 690 MHz	
CA_3-8	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	8	880 MHz to 915 MHz		925 MHz to 960 MHz	
CA_3-20	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	20	832 MHz to 862 MHz		791 MHz to 821 MHz	
CA_3-28	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	28	703 MHz to 748 MHz		758 MHz to 803 MHz	
CA_3-42	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	42	3 400 MHz to 3 600 MHz		3 400 MHz to 3 600 MHz	
CA_7-20	7	2 500 MHz to 2 570 MHz		2 620 MHz to 2 690 MHz	
	20	832 MHz to 862 MHz		791 MHz to 821 MHz	
CA_7-28	7	2 500 MHz to 2 570 MHz		2 620 MHz to 2 690 MHz	
	28	703 MHz to 748 MHz		758 MHz to 803 MHz	
CA_8-20	8	880 MHz to 915 MHz		925 MHz to 960 MHz	
	20	832 MHz to 862 MHz		791 MHz to 821 MHz	
CA_8-40	8	880 MHz to 915 MHz		925 MHz to 960 MHz	
	40	2 300 MHz to 2 400 MHz		2 300 MHz to 2 400 MHz	
CA_20-32	20	832 MHz to 862 MHz		791 MHz to 821 MHz	
	32	N/A		1 452 MHz to 1 496 MHz	

Table 1-4: E-UTRA UE Inter-band CA operating bands (three bands)

E-UTRA CA Band	E-UTRA Band	UL operating band		DL operating band	
		BS receive/UE transmit		BS transmit/UE receive	
		$F_{UL_low} - F_{UL_high}$		$F_{DL_low} - F_{DL_high}$	
CA_1-3-8	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	8	880 MHz to 915 MHz		925 MHz to 960 MHz	
CA_1-3-20	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	20	832 MHz to 862 MHz		791 MHz to 821 MHz	
CA_1-7-20	1	1 920 MHz to 1 980 MHz		2 110 MHz to 2 170 MHz	
	7	2 500 MHz to 2 570 MHz		2 620 MHz to 2 690 MHz	
	20	832 MHz to 862 MHz		791 MHz to 821 MHz	
CA_3-7-20	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
	7	2 500 MHz to 2 570 MHz		2 620 MHz to 2 690 MHz	
	20	832 MHz to 862 MHz		791 MHz to 821 MHz	

Table 1-5: Intra-band non-contiguous CA operating bands (with two sub-blocks)

E-UTRA CA Band	E-UTRA Band	Uplink (UL) operating band		Downlink (DL) operating band	
		BS receive/UE transmit		BS transmit/UE receive	
		$F_{UL_low} - F_{UL_high}$		$F_{DL_low} - F_{DL_high}$	
CA_3-3	3	1 710 MHz to 1 785 MHz		1 805 MHz to 1 880 MHz	
CA_7-7	7	2 500 MHz to 2 570 MHz		2 620 MHz to 2 690 MHz	
CA_42-42	42	3 400 MHz to 3 600 MHz		3 400 MHz to 3 600 MHz	

The present document covers requirements for E-UTRA FDD and E-UTRA TDD User Equipment from 3GPP™ Releases 8, 9, 10 and 11 defined in ETSI TS 136 101 [3]. This includes the requirements for E-UTRA UE operating bands and E-UTRA CA operating bands from 3GPP™ Release 12 defined in ETSI TS 136 101 [i.13].

NOTE: For Band 20:

- For user equipment designed to be mobile or nomadic, the requirements in the present document measured at the antenna port also show conformity to the corresponding requirement defined as TRP (total radiated power), as described in Commission Decision 2010/267/EU [i.6], ECC Decision (09)03 [i.7] and CEPT Report 30 [i.8].
- For user equipment designed to be fixed or installed, the present document does not address the requirements described in Commission Decision 2010/267/EU [i.6], ECC Decision (09)03 [i.7] and CEPT Report 30 [i.8].

The present document contains requirements to demonstrate that radio equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 136 521-1 (V12.7.0) (10-2015): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing (3GPP TS 36.521-1 version 12.7.0 Release 12)".
- [2] ETSI TS 136 508 (V12.7.0) (10-2015): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing (3GPP TS 36.508 version 12.7.0 Release 12)".
- [3] ETSI TS 136 101 (V11.14.0) (10-2015): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception (3GPP TS 36.101 version 11.14.0 Release 11)".
- [4] IEC 60068-2-1 (2007): "Environmental testing - Part 2-1: Tests - Test A: Cold".
- [5] IEC 60068-2-2 (2007): "Environmental testing - Part 2-2: Tests - Test B: Dry heat".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] Void.
- [i.2] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.
- [i.3] ETSI EG 203 336 (V1.1.1) (08-2015) "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".
- [i.4] Recommendation ITU-R SM.329-12 (2012): "Unwanted emissions in the spurious domain".
- [i.5] ETSI TR 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.6] Commission Decision 2010/267/EU of 6 May 2010 on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union.
- [i.7] ECC Decision (09)03 of 30 October 2009 on harmonised conditions for mobile/fixed communications networks (MFCN) operating in the band 790 - 862 MHz.
- [i.8] CEPT Report 30 of 30 October 2009 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".
- [i.9] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.
- [i.10] ETSI TS 136 509 (V10.3.0) (09-2014): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Special conformance testing functions for User Equipment (UE) (3GPP TS 36.509 version 10.3.0 Release 10)".
- [i.11] ETSI TR 103 288 (V1.1.1) (05-2015): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Report of the CENELEC/ETSI Joint Working Group in response to the EC letter ENTRP/F5/DP/MM/entr.f5.(2013)43164 to the ESOs".
- [i.12] ETSI EN 301 908-1 (V11.1.1): "IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Radio Equipment Directive 2014/53/EU; Part 1: Introduction and common requirements".
- [i.13] ETSI TS 136 101 (V12.9.0) (10-2015): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception (3GPP TS 36.101 version 12.9.0 Release 12)".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

aggregated Channel Bandwidth: RF bandwidth in which a UE transmits and receives multiple contiguously aggregated carriers

aggregated Transmission Bandwidth Configuration: number of resource block allocated within the aggregated channel bandwidth

carrier aggregation: aggregation of two or more component carriers in order to support wider transmission bandwidths

carrier aggregation band: set of one or more operating bands across which multiple carriers are aggregated with a specific set of technical requirements

carrier aggregation bandwidth class: class defined by the aggregated transmission bandwidth configuration and maximum number of component carriers supported by a UE

Table 3.1-1: CA bandwidth classes and corresponding nominal guard bands

CA Bandwidth Class	Aggregated Transmission Bandwidth Configuration	Number of contiguous CC	Nominal Guard Band BW_{GB}
A	$N_{RB,agg} \leq 100$	1	$a_1 BW_{Channel(1)} - 0,5\Delta f_1$ (note 2)
B	$N_{RB,agg} \leq 100$	2	$0,05 \max(BW_{Channel(1)}, BW_{Channel(2)}) - 0,5\Delta f_1$
C	$100 < N_{RB,agg} \leq 200$	2	$0,05 \max(BW_{Channel(1)}, BW_{Channel(2)}) - 0,5\Delta f_1$

NOTE 1: $BW_{Channel(j)}$, $j = 1, 2, 3$, is the channel bandwidth of an E-UTRA component carrier according to table 5.4.2-1 and $\Delta f_1 = \Delta f$ for the downlink with Δf the subcarrier spacing while $\Delta f_1 = 0$ for the uplink.

NOTE 2: $a_1 = 0,16/1,4$ for $BW_{Channel(1)} = 1,4$ MHz whereas $a_1 = 0,05$ for all other channel bandwidths.

carrier aggregation configuration: combination of CA operating band(s) and CA bandwidth class(es) supported by a UE

channel bandwidth: RF bandwidth supporting a single E-UTRA RF carrier with the transmission bandwidth configured in the uplink or downlink of a cell

NOTE 1: The channel bandwidth is measured in MHz and is used as a reference for transmitter and receiver RF requirements.

NOTE 2: Channel Bandwidth and Transmission Bandwidth Configuration for one E-UTRA carrier are described in figure 3.1-1 as in ETSI TS 136 101 [3].

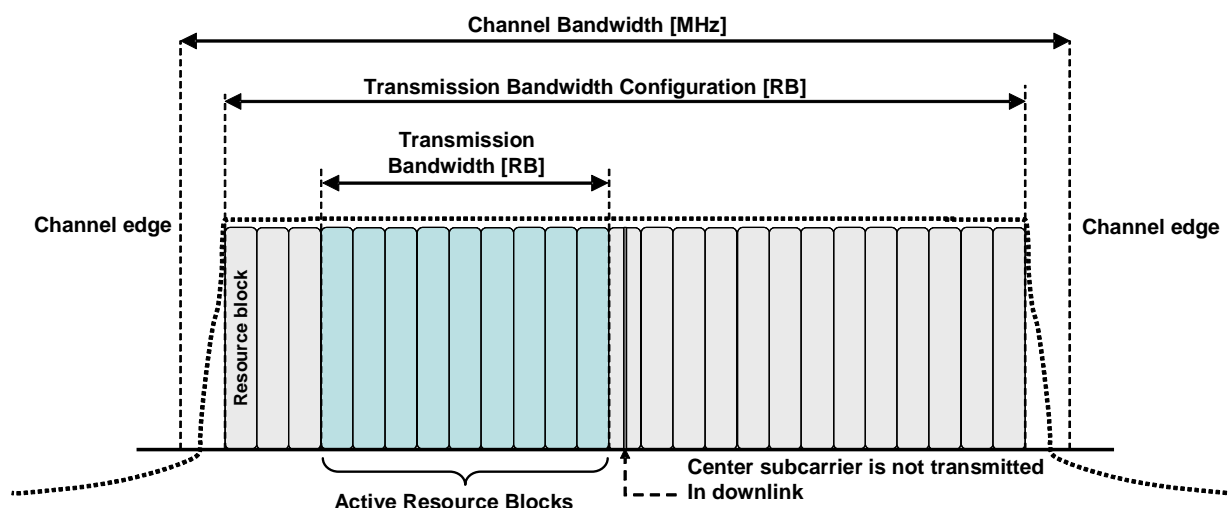


Figure 3.1-1: Channel Bandwidth and Transmission Bandwidth Configuration for one E-UTRA carrier