



**SLOVENSKI STANDARD**  
**SIST EN 301 908-14 V6.2.1:2014**  
**01-februar-2014**

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**Celična omrežja IMT - Harmonizirani EN, ki zajema bistvene zahteve člena 3.2  
direktive R&TTE - 14. del: Bazne postaje za razviti prizemni radijski dostop za  
UMTS (E-UTRA)**

IMT cellular networks - Harmonized EN covering the essential requirements of article 3.2  
of the R&TTE Directive - Part 14: Evolved Universal Terrestrial Radio Access (E-UTRA)  
Base Stations (BS)

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**ICS:**

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33.070.99	Druge mobilne storitve	Other mobile services

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# ETSI EN 301 908-14 V6.2.1 (2013-10)



Harmonized European Standard

**IMT cellular networks;  
Harmonized EN covering the essential requirements  
of article 3.2 of the R&TTE Directive;  
Part 14: Evolved Universal Terrestrial Radio Access (E-UTRA)  
Base Stations (BS)**

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## Reference

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## Foreword

This Harmonized European Standard (EN) has been produced by ETSI Technical Committee Mobile Standards Group (MSG).

The present document has been produced by ETSI in response to mandates M/284 and M/406 issued from the European Commission under Directive 98/34/EC [i.1] as amended by Directive 98/48/EC [i.6].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.2].

See article 5.1 of Directive 1999/5/EC [i.2] for information on presumption of conformity and Harmonized Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.2] are summarized in annex A.

The present document is part 14 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

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### National transposition dates

Date of adoption of this EN:	7 October 2013
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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 R&TTE Directive [i.2]. The modular structure is shown in EG 201 399 [i.3].



# 1 Scope

The present document applies to the following radio equipment types:

- 1) Base Station for Evolved Universal Terrestrial Radio Access (E-UTRA).

This radio equipment type is capable of operating in all or any part of the operating bands given in table 1-1.

**Table 1-1: E-UTRA Base Station operating bands**

E-UTRA band	Direction of transmission	E-UTRA Base Station operating bands
1	Transmit	2 110 MHz to 2 170 MHz
	Receive	1 920 MHz to 1 980 MHz
3	Transmit	1 805 MHz to 1 880 MHz
	Receive	1 710 MHz to 1 785 MHz
7	Transmit	2 620 MHz to 2 690 MHz
	Receive	2 500 MHz to 2 570 MHz
8	Transmit	925 MHz to 960 MHz
	Receive	880 MHz to 915 MHz
20	Transmit	791 MHz to 821 MHz
	Receive	832 MHz to 862 MHz
22	Transmit	3 510 MHz to 3 590 MHz
	Receive	3 410 MHz to 3 490 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

The present document covers requirements for E-UTRA Base Stations for 3GPP Release 8, 9 and 10.

The present document is intended to cover the provisions of Directive 1999/5/EC [i.2] (R&TTE Directive), Article 3.2, which states that "..... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive may apply to equipment within the scope of the present document.

NOTE: A list of such ENs is included on the web site <http://www.newapproach.org>.

## 2 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.

## 2.1 Normative references

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

- [1] ETSI EN 301 908-1 (V6.2.1) (04-2013): "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements".
- [2] ETSI TS 136 141 (V10.10.0) (04-2013): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing (3GPP TS 36.141 version 10.10.0 Release 10)".
- [3] Void.
- [4] Recommendation ITU-R SM.329-12 (09-2012): "Unwanted emissions in the spurious domain".
- [5] ETSI TS 125 104 (V10.8.0) (02-2013): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) radio transmission and reception (FDD) (3GPP TS 25.104 version 10.8.0 Release 10)".
- [6] ETSI TS 125 105 (V10.5.0) (10-2012): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) radio transmission and reception (TDD) (3GPP TS 25.105 version 10.5.0 Release 10)".
- [7] ETSI TS 136 104 (V10.10.0) (04-2013): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception (3GPP TS 36.104 version 10.10.0 Release 10)".
- [8] ETSI TS 125 141 (V10.8.0) (02-2013): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) conformance testing (FDD) (3GPP TS 25.141 version 10.8.0 Release 10)".
- [9] ETSI EN 301 908-18 (V6.2.1) (11-2012): "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 18: E-UTRA, UTRA and GSM/EDGE Multi-Standard Radio (MSR) Base Station (BS)".  
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- [10] ETSI TS 136 211 (V10.7.0) (04-2013): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (3GPP TS 36.211 version 10.7.0 Release 10)".
- [11] ETSI TS 136 214 (V10.1.0) (04-2011): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements (3GPP TS 36.214 version 10.1.0 Release 10)".

## 2.2 Informative references

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] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.
- [i.2] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).
- [i.3] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE Directive".
- [i.4] Void.
- [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] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

## 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, measured in MHz, in which a Base Station transmits and receives multiple contiguously aggregated carriers

**Base Station class:** wide area Base Station, local Area Base Station or home Base Station, as declared by the manufacturer

**Base Station RF bandwidth:** bandwidth in which a Base Station transmits and receives multiple carriers simultaneously

**Base Station RF bandwidth edge:** frequency of one of the edges of the Base Station RF bandwidth

**carrier:** modulated waveform conveying the E-UTRA or UTRA (WCDMA) physical channels

**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

NOTE: Carrier aggregation band(s) for an E-UTRA BS is declared by the manufacturer according to the designations in table 4.2.1-3.

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

**channel edge:** lowest and highest frequency of the E-UTRA carrier, separated by the channel bandwidth

**contiguous carriers:** set of two or more carriers configured in a spectrum block where there are no RF requirements based on co-existence for un-coordinated operation within the spectrum block

**downlink operating band:** part of the operating band designated for downlink (BS transmit)

**Downlink Reference Symbol (DL RS) power:** resource element power of Downlink Reference Symbol

**higher edge:** highest frequency in the aggregated channel bandwidth for multiple contiguously aggregated carriers in a specified operating band, or the highest frequency in the channel bandwidth of a single E-UTRA carrier, or the highest frequency in the channel bandwidth of the highest carrier for E-UTRA multi-carrier in a specified operating band; used as a frequency reference point for transmitter and receiver requirements

**highest carrier:** carrier with the highest carrier centre frequency transmitted/received in a specified operating band

**home Base Station:** Base Stations characterized by requirements derived from femtocell scenarios with a BS to UE minimum coupling loss equal to 45 dB

**inter-band carrier aggregation:** carrier aggregation of component carriers in different operating bands

NOTE: Carriers aggregated in each band can be contiguous or non-contiguous.

**intra-band contiguous carrier aggregation:** contiguous carriers aggregated in the same operating band

**intra-band non-contiguous carrier aggregation:** non-contiguous carriers aggregated in the same operating band

**local area Base Station:** Base Stations characterized by requirements derived from picocell scenarios with a BS to UE minimum coupling loss equal to 45 dB

**lower edge:** lowest frequency in the aggregated channel bandwidth for multiple contiguously aggregated carriers in a specified operating band, or the lowest frequency in the channel bandwidth of a single E-UTRA carrier, or the lowest frequency in the channel bandwidth of the lowest carrier for E-UTRA multi-carrier in a specified operating band; used as a frequency reference point for transmitter and receiver requirements

**lowest carrier:** carrier with the lowest carrier centre frequency transmitted/received in a specified operating band

**maximum Base Station RF bandwidth:** maximum RF bandwidth supported by a BS within an operating band

**maximum output power:** mean power level per carrier of the Base Station measured at the antenna connector in a specified reference condition

**maximum throughput:** maximum achievable throughput for a reference measurement channel

**mean power:** when applied to E-UTRA transmission this is the power measured in the channel bandwidth of the carrier where the period of measurement is at least one subframe (1 ms), unless otherwise stated

**multi-carrier transmission configuration:** set of one or more contiguous carriers that a BS is able to transmit simultaneously according to the manufacturer's specification

**operating band:** frequency range (paired or unpaired) that is defined with a specific set of technical requirements, in which E-UTRA operates

NOTE: The operating band(s) for an E-UTRA BS is declared by the manufacturer according to the designations in table 1-1. Operating bands for E-UTRA are designated with Arabic numerals, while the corresponding operating bands for UTRA are designated with Roman numerals.

**output power:** mean power of one carrier of the Base Station, delivered to a load with resistance equal to the nominal load impedance of the transmitter

**rated output power:** rated output power of the Base Station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector

**resource block:** physical resource consisting of a number of symbols in the time domain and a number of consecutive subcarriers spanning 180 kHz in the frequency domain

**synchronized operation:** operation of TDD in two different systems, where no simultaneous uplink and downlink occur

**throughput:** number of payload bits successfully received per second for a reference measurement channel in a specified reference condition

**transmission bandwidth:** bandwidth of an instantaneous transmission from a UE or BS, measured in Resource Block units

**transmission bandwidth configuration:** highest transmission bandwidth allowed for uplink or downlink in a given channel bandwidth, measured in Resource Block units

**transmitter OFF period:** time period during which the BS transmitter is not allowed to transmit

**transmitter ON period:** time period during which the BS transmitter is transmitting data and/or reference symbols, i.e. data subframes or DwPTS

**transmitter transient period:** time period during which the transmitter is changing from the OFF period to the ON period or vice versa

**unsynchronized operation:** operation of TDD in two different systems, where the conditions for synchronized operation are not met

**uplink operating band:** part of the operating band designated for uplink (BS receive)

**wide area Base Station:** Base Stations characterized by requirements derived from Macro Cell scenarios with a BS to UE minimum coupling loss equal to 70 dB

NOTE: This Base Station class has the same requirements as the general purpose Base Station in 3GPP Release 8.

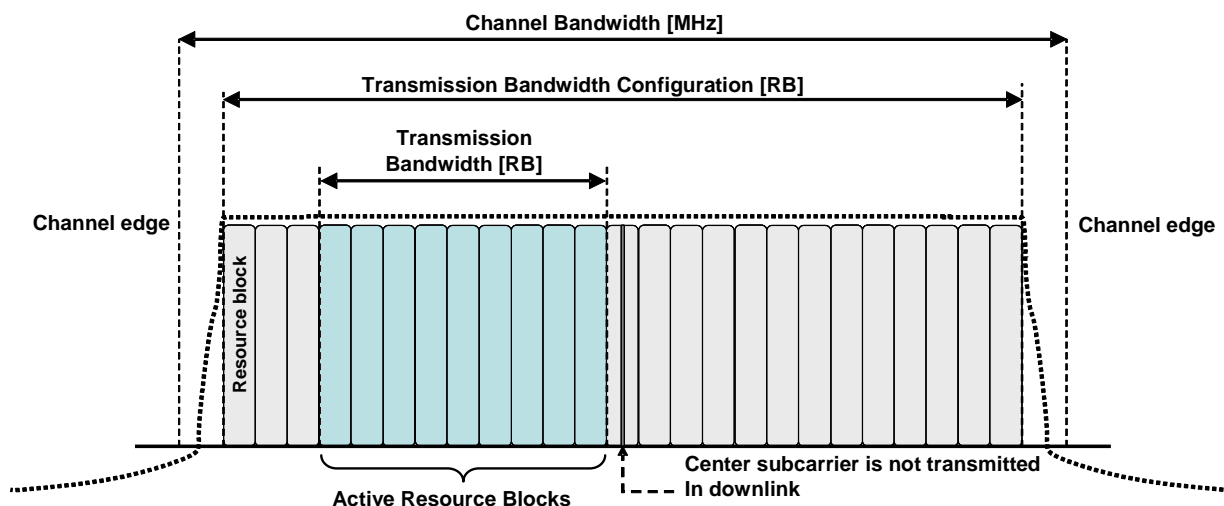


Figure 3.1-1: Definition of Channel Bandwidth and Transmission Bandwidth Configuration for one E-UTRA carrier

Figure 3.1-2 illustrates the aggregated channel bandwidth for intra-band contiguous carrier aggregation.

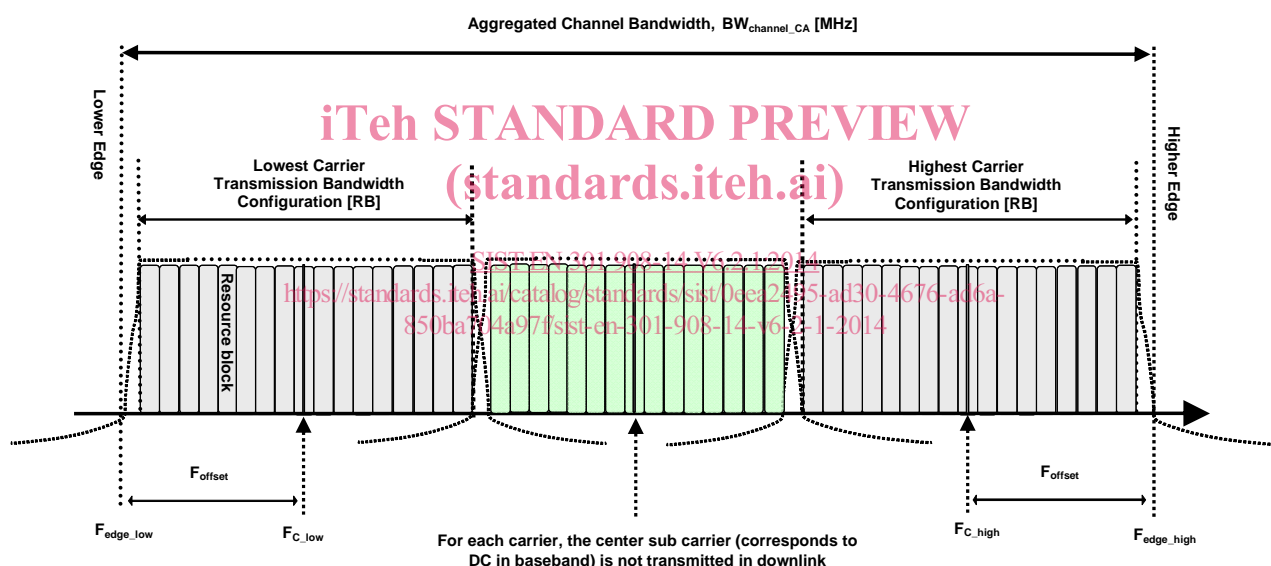


Figure 3.1-2: Definition of aggregated channel bandwidth for intra-band contiguous carrier aggregation

## 3.2 Symbols

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

$BW_{\text{Channel}}$	Channel bandwidth
$BW_{\text{Config}}$	Transmission bandwidth configuration, expressed in MHz, where $BW_{\text{Config}} = N_{\text{RB}} \times 180 \text{ kHz}$ in the uplink and $BW_{\text{Config}} = 15 \text{ kHz} + N_{\text{RB}} \times 180 \text{ kHz}$ in the downlink
$CA_X$	CA for band X where X is the applicable E-UTRA operating band
$CPICH \hat{E}_c$	Common Pilot Channel code power (on the adjacent channel)
$CRS \hat{E}_c$	Reference Signal received power per resource element
$f$	Frequency
$\Delta f$	Separation between the channel edge frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency
$\Delta f_{\text{max}}$	The largest value of $\Delta f$ used for defining the requirement

$F_C$	Carrier centre frequency
$F_{C\_high}$	The carrier centre frequency of the highest carrier, expressed in MHz
$F_{C\_low}$	The carrier centre frequency of the lowest carrier, expressed in MHz
$F_{edge\_low}$	The lower edge of aggregated channel bandwidth, expressed in MHz, $F_{edge\_low} = F_{C\_low} - F_{offset}$
$F_{edge\_high}$	The higher edge of aggregated channel bandwidth, expressed in MHz, $F_{edge\_high} = F_{C\_high} + F_{offset}$
$F_{offset}$	Frequency offset from $F_{C\_high}$ to the higher edge or $F_{C\_low}$ to the lower edge
$F_{filter}$	Filter centre frequency
$f_{interferer}$	Centre frequency of the interfering signal
$f_{offset}$	Separation between the channel edge frequency and the centre of the measuring filter
$f_{offset\_max}$	The maximum value of $f_{offset}$ used for defining the requirement
$F_{DL\_low}$	The lowest frequency of the downlink operating band
$F_{DL\_high}$	The highest frequency of the downlink operating band
$F_{UL\_low}$	The lowest frequency of the uplink operating band (see table 1-1)
$F_{UL\_high}$	The highest frequency of the uplink operating band (see table 1-1)
$I_{oh}$	Total received power density excluding own Home BS signal
$I_{uant}$	E-Node B internal logical interface between the implementation specific O&M function and the RET antennas and TMAs control unit function of the E-Node B
$N_{RB}$	Transmission bandwidth configuration, expressed in units of Resource Blocks
$N_{RB}^{DL}$	The number of downlink resource blocks in the downlink
$N_{sc}^{RB}$	The number of subcarriers in a resource block, $N_{sc}^{RB} = 12$
$p$	Antenna port number
$(P_i)$	Power of the signal at antenna connector $i$
$(P_s)$	Sum of the power for all antenna connectors
$P_{10MHz}$	Maximum output Power in 10 MHz
$P_{EM,N}$	Declared emission level for channel N
$P_{max}$	Maximum output power
$P_{max, c}$	Maximum carrier output power
$P_{REFSENS}$	Reference sensitivity power level

### 3.3 Abbreviations

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

ACLR	Adjacent Channel Leakage Ratio
ACS	Adjacent Channel Selectivity
ATT	Attenuator
AWGN	Additive White Gaussian Noise
B	Bottom RF channel

NOTE: For testing purposes.

BS	Base Station
BTS	Base Transceiver Station

NOTE: For GSM.

BW	Bandwidth
CA	Carrier Aggregation
CSG	Closed Subscriber Group
CW	Continuous Wave
DC	Direct Current
DL	Down Link
DwPTS	Downlink part of the special subframe

NOTE: For TDD operation.

DTT	Digital Terrestrial Television
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
E-TM	E-UTRA Test Model
EUT	Equipment Under Test
E-UTRA	Evolved UMTS Terrestrial Radio Access
ERM	EMC and Radio Spectrum Matters
FDD	Frequency Division Duplex
FRC	Fixed Reference Channel
IMT	International Mobile Telecommunications
ITU-R	International Telecommunication Union - Radiocommunication
M	Middle RF channel

NOTE: For testing purposes.

LTE Long Term Evolution

NOTE: Also known as E-UTRA.

MS Mobile Station

NOTE: For GSM.

MSG	Mobile Standards Group
MSR	Multi-Standard Radio
RB	Resource Block
RF	Radio Frequency
RMS	Root Mean Square
RRC	Root Raised Cosine
RX	Receive
T	Top RF channel

NOTE: For testing purposes.

TFES	Task Force for European Standards for IMT
TDD	Time Division Duplex
TX	Transmit
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
UTRA	UMTS Terrestrial Radio Access

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## 4 Technical requirements specifications

### 4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the supplier. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

For guidance on how a supplier can declare the environmental profile, see annex C.

### 4.2 Conformance requirements

The requirements in the present document are based on the assumption that the operating band (see table 1-1) is shared between systems of the IMT-2000 family (for band 3 and 8 also GSM) or systems having compatible characteristics.