ETSI TS 136 306 V8.2.0 (2008-11)

Technical Specification

LTE;
Evolved Universal Terrestrial Radio Access (E-UTRA);
User Equipment (UE) radio access capabilities
(3GPP TS 36.306 version 8.2.0 Release 8)

Reference
DTS/TSGR-0236306v820

Keywords
LTE

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification 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:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document defines the E-UTRA UE Radio Access Capability Parameters..

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] 3GPP TS 36.323: "Evolved Universal Terrestrial Radio Access (E-UTRA) Packet Data Convergence Protocol (PDCP) specification".

[3] 3GPP TS 36.322: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Link Control (RLC) specification".

[4] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA) Medium Access Control (MAC) specification".

[5] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC) specification".

[6] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA) radio transmission and reception".

[7] IETF RFC 4995: "The RObust Header Compression (ROHC) Framework".

[8] IETF RFC 4996: "RObust Header Compression (ROHC): A Profile for TCP/IP (ROHC-TCP)".

[9] IETF RFC 3095: "RObust Header Compression (RoHC): Framework and four profiles: RTP, UDP, ESP and uncompressed".

[10] IETF RFC 3843: "RObust Header Compression (RoHC): A Compression Profile for IP".

[11] IETF RFC 4815: "RObust Header Compression (ROHC): Corrections and Clarifications to RFC 3095".

[12] IETF RFC 5225: "RObust Header Compression (ROHC) Version 2: Profiles for RTP, UDP, IP, ESP and UDP Lite'.

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].

***<defined term>**: <definition>.*

3.2 Symbols

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

<symbol> <Explanation>

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].

E-UTRA	Evolved Universal Terrestrial Radio Access
E-UTRAN	Evolved Universal Terrestrial Radio Access Network
MAC	Medium Access Control
PDCP	Packet Data Convergence Protocol
RLC	Radio Link Control
RRC	Radio Resource Control
ROHC	RObust Header Compression
UE	User Equipment

4 UE radio access capability parameters

The following subclauses define the UE radio access capability parameters. Only parameters for which there is the possibility for UEs to signal different values are considered as UE radio access capability parameters. Therefore, mandatory capabilities that are the same for all UEs are not listed here.

E-UTRAN needs to respect the signalled UE radio access capability parameters when configuring the UE and when scheduling the UE.

4.1 UE Categories

The UE Category parameter defines a combined uplink and downlink capability. The parameters set by the UE Category are defined in subclause 4.2. Tables 4.3-1 and 4.3-2 define the downlink and, respectively, uplink physical layer parameter values for each UE Category.

Table 4.1-1: Downlink physical layer parameter values set by UE Category

UE Category	Maximum number of DL-SCH transport block bits received within a TTI	Maximum number of bits of a DL-SCH transport block received within a TTI	Total number of soft channel bits	Maximum number of supported layers for spatial multiplexing in DL
Category 1	10296	10296	250368	1
Category 2	51024	51024	1237248	2
Category 3	102048	75376	1237248	2
Category 4	150752	75376	1827072	2
Category 5	302752	151376	3667200	4

Table 4.1-2: Uplink physical layer parameter values set by UE Category

UE Category	Maximum number of bits of an UL-SCH transport block transmitted within a TTI	Support for 64QAM in UL
Category 1	5160	No
Category 2	25456	No
Category 3	51024	No
Category 4	51024	No
Category 5	75376	Yes

Table 4.1-3: Total layer 2 buffer sizes set by UE Category

UE Category	Total layer 2 buffer size [kBytes]
Category 1	[138]
Category 2	[687]
Category 3	[1373]
Category 4	[1832]
Category 5	[3434]

4.2 Parameters set by UE Category

4.2.1 Transport channel parameters in downlink

4.2.1.1 Maximum number of DL-SCH transport block bits received within a TTI

Defines the maximum number of DL-SCH transport blocks bits that the UE is capable of receiving within a DL-SCH TTI.

In case of spatial multiplexing, this is the sum of the number of bits delivered in each of the two transport blocks.

This number does not include the bits of a DL-SCH transport block carrying BCCH in the same subframe.

4.2.1.2 Maximum number of bits of a DL-SCH transport block received within a TTI

Defines the maximum number of DL-SCH transport block bits that the UE is capable of receiving in a single transport block within a DL-SCH TTI.

4.2.1.3 Total number of DL-SCH soft channel bits

Defines the total number of soft channel bits available for H-ARQ processing.

4.2.2 Transport channel parameters in uplink

4.2.2.1 Maximum number of bits of an UL-SCH transport block transmitted within a TTI

Defines the maximum number of bits of UL-SCH transport block transmitted within an UL-SCH TTI.

4.2.3 Physical channel parameters in downlink (DL)

4.2.3.1 Maximum number of supported layers for spatial multiplexing in DL

Defines the maximum number of supported layers for spatial multiplexing per UE.

4.2.4 Physical channel parameters in uplink (UL)

4.2.4.1 Support for 64QAM in UL

Defines if 64QAM is supported in UL.

4.2.5 Total layer 2 buffer size

This parameter defines the total layer 2 buffer size. The total layer 2 buffer size is defined as the sum of the number of bytes that the UE is capable of storing in the RLC transmission windows and RLC reception and reordering windows for all radio bearers. Whether it should also be possible for the UE to report the UL and DL buffer size separately (no sharing for UL and DL) is FFS.

4.3 Parameters independent of UE Category

4.3.1 PDCP Parameters

4.3.1.1 Supported ROHC profiles

This parameter defines which ROHC profiles from the list below are supported by the UE.

- 0x0000 ROHC uncompressed (RFC 4995)
- 0x0001 ROHC RTP (RFC 3095, RFC 4815)
- 0x0002 ROHC UDP (RFC 3095, RFC 4815)
- 0x0003 ROHC ESP (RFC 3095, RFC 4815)
- 0x0004 ROHC IP (RFC 3843, RFC 4815)
- 0x0006 ROHC TCP (RFC 4996)
- 0x0101 ROHCv2 RTP (RFC 5225)
- 0x0102 ROHCv2 UDP (RFC 5225)
- 0x0103 ROHCv2 ESP (RFC 5225)
- 0x0104 ROHCv2 IP (RFC 5225)

A UE that supports one or more of the listed ROHC profiles shall support ROHC profile 0x0000 ROHC uncompressed (RFC 4995).

'IMS capable UEs supporting voice' shall support ROHC profiles 0x0000, 0x0001, 0x0002, 0x0004.

4.3.1.2 Maximum number of ROHC context sessions (FFS)

This parameter defines the maximum number of header compression context sessions supported by the UE.

Editor's note: It is FFS is this UE capability parameter is required.

4.3.2 RLC parameters

4.3.2.1 Void

4.3.3 Void

4.3.4 Physical layer parameters

4.3.4.1 Support of uplink transmit diversity

This parameter defines whether the UE supports closed-loop antenna selection transmit diversity in uplink.

4.3.4.2 Support of UE specific reference signals for FDD

This parameter defines whether the UE supports UE specific reference signals in downlink for FDD.

4.3.4.3 Void

4.3.5 RF parameters

4.3.5.1 Supported E-UTRA radio frequency bands

This parameter defines which E-UTRA radio frequency bands [6] are supported by the UE. For each band, support for either only half duplex operation, or full duplex operation is indicated.

4.3.6 Measurement parameters

4.3.6.1 Need for measurement gaps

This parameter defines for each supported E-UTRA band whether measurement gaps are required to perform measurements on each other supported E-UTRA radio frequency band and on each supported RAT/band combination.

4.3.7 Inter-RAT parameters

4.3.7.1 Support of UTRA FDD

This parameter defines whether the UE supports UTRA FDD.

A UE that supports UTRAN FDD shall support inter-RAT PS handover to UTRAN.

4.3.7.2 Supported UTRA FDD bands

Only applicable if the UE supports UTRA FDD. This parameter defines which UTRA FDD radio frequency bands are supported by the UE.

4.3.7.3 Support of UTRA TDD 1.28 Mcps

This parameter defines whether the UE supports UTRA TDD 1.28 Mcps.

A UE that supports UTRAN TDD 1.28 Mcps shall support inter-RAT PS handover to UTRAN.

4.3.7.4 Supported UTRA TDD 1.28 Mcps bands

Only applicable if the UE supports UTRA TDD 1.28 Mcps. This parameter defines which UTRA TDD 1.28 Mcps radio frequency bands are supported by the UE.

4.3.7.5 Support of UTRA TDD 3.84 Mcps

This parameter defines whether the UE supports UTRA TDD 3.84 Mcps.

A UE that supports UTRAN TDD 3.84 Mcps shall support inter-RAT PS handover to UTRAN.

4.3.7.6 Supported UTRA TDD 3.84 Mcps bands

Only applicable if the UE supports UTRA TDD 3.84 Mcps. This parameter defines which UTRA TDD 3.84 Mcps radio frequency bands are supported by the UE.

4.3.7.7 Support of UTRA TDD 7.68 Mcps

This parameter defines whether the UE supports UTRA TDD 7.68 Mcps.

A UE that supports UTRAN TDD 7.68 Mcps shall support inter-RAT PS handover to UTRAN.

4.3.7.8 Supported UTRA TDD 7.68 Mcps bands

Only applicable if the UE supports UTRA TDD 7.68 Mcps. This parameter defines which UTRA TDD 7.68 Mcps radio frequency bands are supported by the UE.

4.3.7.9 Support of GERAN

This parameter defines whether the UE supports GERAN.

4.3.7.10 Supported GERAN bands

Only applicable if the UE supports GERAN. This parameter defines which GERAN radio frequency bands are supported by the UE.

4.3.7.11 Support of inter-RAT PS handover to GERAN

Only applicable if the UE supports GERAN. This parameter defines whether the UE supports inter-RAT PS handover to GERAN.

Editor's note: Depending on outcome of VCC discussion in SA2 this parameter may become mandatory

4.3.7.12 Support of HRPD

This parameter defines whether the UE supports HRPD.

4.3.7.13 Supported HRPD bands

Only applicable if the UE supports HRPD. This parameter defines which HRPD radio frequency bands are supported by the UE.

4.3.7.14 UE Transmit Configuration to HRPD

Only applicable if the UE supports HRPD. This parameter defines whether the UE supports single or dual transmitter. With dual transmitter, UE can transmit simultaneously on both E-UTRAN and HRPD.

4.3.7.15 UE Receive Configuration from HRPD

Only applicable if the UE supports HRPD. This parameter defines whether the UE supports single or dual receiver. With dual receiver, UE can receive simultaneously on both E-UTRAN and HRPD.

4.3.7.16 Support of 1xRTT

This parameter defines whether the UE supports 1xRTT.

4.3.7.17 Supported 1xRTT bands

Only applicable if the UE supports 1xRTT. This parameter defines which 1xRTT radio frequency bands are supported by the UE.

4.3.7.18 UE Transmit Configuration to 1xRTT

Only applicable if the UE supports 1xRTT. This parameter defines whether the UE supports single or dual transmitter. With dual transmitter, UE can transmit simultaneously on both E-UTRAN and 1xRTT.

4.3.7.19 UE Receive Configuration from 1xRTT

Only applicable if the UE supports 1xRTT. This parameter defines whether the UE supports single or dual receiver. With dual receiver, UE can receive simultaneously on both E-UTRAN and 1xRTT.

4.3.8 General parameters

4.3.8.1 Access stratum release indicator

This parameter defines the release of the E-UTRA layer 1, 2, and 3 specifications supported by the UE e.g. Rel-8, Rel-9, etc.

4.3.9 MBMS Related parameters

5 MBMS capability requirements

The following aspects of MBMS are optional for the UE to support:

- MBSFN RS and data reception.
- 7.5 kHz sub-carrier separation for MBSFN dedicated carrier.
- Simultaneous reception of unicast and MBMS on a dedicated carrier.

A non-MBSFN capable UE behaves identically on a mixed carrier to an MBSFN-capable UE in all respects other than the reception of MBSFN RS and data.

Editor's note: This section will define UE requirements for the reception of MBMS. Further discussion in RAN2 required to decide if any MBMS related requirements need to be signalling to the E-UTRAN as UE capability parameters .

Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
11/2007	RAN #38	RP-070916			Presented for approval at TSG RAN-38	0.2.0	1.0.0
12/2007		-			Approved at TSG RAN-38 and placed under change control	1.0.0	8.0.0
03/2008	RAN #39	RP-080194	0001	1	CR to 36.306 with Update to E-UTRA UE capabilities	8.0.0	8.1.0
05/2008	RAN #40	RP-080409	0002	1	Update to E-UTRA UE capabilities: CR 0002r1 to 36.306 with status after RAN2 #62	8.1.0	8.2.0

History

Document history		
V8.2.0	November 2008	Publication