3GPP TS 36.321 V8.4.0 (2008-12)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) Medium Access Control (MAC) protocol specification (Release 8)





Evolved Wireless Exhibit 2005 ZTE/HTC/Samsung v. Evolved Wireless IPR2016-00757

The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP. The present document has not been subject to any approval process by the 3GPP Organizational Partners and shall not be implemented. This Specification is provided for future development work within 3GPP only. The Organizational Partners accept no liability for any use of this Specification.

Find authenticated court documents without watermarks at docketalarm.com.

Δ

Δ

Keywords UMTS, radio

3GPP

Postal address

3GPP support office address 650 Route des Lucioles - Sophia Antipolis Valbonne - FRANCE Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet

http://www.3gpp.org

Copyright Notification

No part may be reproduced except as authorized by writteo permission. The copyright and the foregoiog restriction extend to reproduction io all media.

© 2008, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TTA, TTC). All rights reserved.

UMTS[™] is a Trade Mark of ETSI registered for the benefit of its members 3GPP[™] is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners LTE[™] is a Trade Mark of ETSI currently being registered for the benefit of its Members and of the 3GPP Organizational Partners GSM® and the GSM logo are registered and owned by the GSM Association



Contents

Foreword				
1 Scope				
2	References	6		
3	Definitions and abbreviations	6		
3.1	Definitions	6		
3.2	Abbreviations	7		
A Convert				
4 11	Introduction	0		
4.1	MÅC arabitecture	o		
4.2	MAC architecture	0 Q		
43	Services	U 8		
431	Services provided to upper layers			
4.3.2	Services expected from physical layer	8		
4.4	Functions	9		
4.5	Channel structure	9		
4.5.1	Transport Channels	10		
4.5.2	Logical Channels	10		
4.5.3	Mapping of Transport Channels to Logical Channels	10		
4.5.3.	l Uplink mapping	10		
4.5.3.2	2 Downlink mapping	11		
5	MAC procedures	12		
5.1	Random Access procedure	12		
5.1.1	Random Access Procedure initialization	12		
5.1.2	Random Access Resource selection	12		
5.1.3	Random Access Preamble transmission	13		
5.1.4	Random Access Response reception	14		
5.1.5	Contention Resolution	15		
5.1.6	Completion of the Random Access procedure	16		
5.2	Maintenance of Uplink Time Alignment	16		
5.3	DL-SCH data transfer	17		
5.3.1	DL Assignment reception	17		
5.3.2	HARQ Operation	19		
527		19		
532	Disassembly and demultiplexing	20		
5.5.5	III -SCH data transfer	20		
5.4.1	UT. Grant reception	20		
5.4.2	HARO operation	21		
5.4.2.	HARO entity	21		
5.4.2.2	2 HARQ process	22		
5.4.3	Multiplexing and assembly	24		
5.4.3.	Logical channel prioritization	24		
5.4.3.2	2 Multiplexing of MAC SDUs	25		
5.4.4	Scheduling Request	25		
5.4.5	Buffer Status Reporting	25		
5.4.6	Power Headroom Reporting	26		
5.5	PCH reception	27		
5.6 5.7	BCH reception	27		
3./ 5.9	Discontinuous Reception (DKX)	2/ 20		
J.8 5.0	MAC Recot	4ŏ 20		
5.9	Semi-Persistent Scheduling	27 70		
5,101	Downlink	29		
5.10.2	Uplink	30		
	•			

DOCKET A L A R M Find authenticated court documents without watermarks at <u>docketalarm.com</u>.

5.X	Handling of unknown, unforeseen and erroneous protocol data	30
6	Protocol Data Units, formats and parameters	30
6.1	Protocol Data Units	30
6.1.1	General	30
6.1.2	MAC PDU (DL-SCH and UL-SCH except transparent MAC and Random Access Response)	30
6.1.3	MAC Control Elements	32
6.1.3.1	Buffer Status Report MAC Control Elements	32
6.1.3.2	C-RNTI MAC Control Element	33
6.1.3.3	DRX Command MAC Control Element	34
6.1.3.4	UE Contention Resolution Identity MAC Control Element	34
6.1.3.5	Timing Advance Command MAC Control Element	34
6.1.3.6	Power Headroom MAC Control Element	34
6.1.4	MAC PDU (transparent MAC)	35
6.1.5	MAC PDU (Random Access Response)	35
6.2	Formats and parameters	36
6.2.1	MAC header for DL-SCH and UL-SCH	36
6.2.2	MAC header for Random Access Response	37
6.2.3	MAC payload for Random Access Response	38
7	Variables and constants	
7.1	RNTI values	38
7.2	Backoff Parameter values	38
7.3	PRACH Mask Index values	39
7.4	Subframe_Offset values	39
7.5	TTI_BUNDLE_SIZE value	40
7.6	DELTA_PREAMBLE values	40
7.7	HARQ RTT Timer	40
Anne	x A (informative): Change history	41

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.

DOCKET



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

