3GPP TS 36.212 V8.5.0 (2008-12)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 8)

The present document has been developed within the 3rd Generation Partnership Project (3GPP ™) 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.

DOCKET ALARM

Find authenticated court documents without watermarks at docketalarm.com.

Keywords
<keyword[, keyword]>

3GPP

Postal address

3GPP support office address
650 Route des Luc o es – Soph a Ant po s
Va bonne – France
Te . : +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 written permission.
The copyright and the foregoing restriction extend to reproduction in 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

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

Contents

Foreword 5
1 Scope 6
2 References 6
3 Definitions, symbols and abbreviations 6
3.1 Definitions 6
3.2 Symbols 6
3.3 Abbreviations 7
4 Mapping to physical channels 7
4.1 Uplink 7
4.2 Downlink 7
5 Channel coding, multiplexing and interleaving 8
5.1 Generic procedures 8
5.1.1 CRC calculation 8
5.1.2 Code block segmentation and code block CRC attachment 9
5.1.3 Channel coding 10
5.1.3.1 Tail biting convolutional coding 11
5.1.3.2 Turbo coding 12
5.1.3.2.1 Turbo encoder 12
5.1.3.2.2 Trellis termination for turbo encoder 13
5.1.3.2.3 Turbo code internal interleaver 13
5.1.4 Rate matching 15
5.1.4.1 Rate matching for turbo coded transport channels 15
5.1.4.1.1 Sub-block interleaver 15
5.1.4.1.2 Bit collection, selection and transmission 16
5.1.4.2 Rate matching for convolutionally coded transport channels and control information 18
5.1.4.2.1 Sub-block interleaver 18
5.1.4.2.2 Bit collection, selection and transmission 19
5.1.5 Code block concatenation 20
5.2 Uplink transport channels and control information 20
5.2.1 Random access channel 20
5.2.2 Uplink shared channel 20
5.2.2.1 Transport block CRC attachment 21
5.2.2.2 Code block segmentation and code block CRC attachment 22
5.2.2.3 Channel coding of UL-SCH 22
5.2.2.4 Rate matching 22
5.2.2.5 Code block concatenation 22
5.2.2.6 Channel coding of control information 22
5.2.2.6.1 Channel quality information formats for wideband CQI reports 27
5.2.2.6.2 Channel quality information formats for higher layer configured subband CQI reports 28
5.2.2.6.3 Channel quality information formats for UE selected subband CQI reports 28
5.2.2.6.4 Channel coding for CQI/PMI information in PUSCH 29
5.2.2.7 Data and control multiplexing 30
5.2.2.8 Channel interleaver 31
5.2.3 Uplink control information on PUCCH 33
5.2.3.1 Channel coding for UCI HARQ-ACK 33
5.2.3.2 Channel coding for UCI scheduling request 33
5.2.3.3 Channel coding for UCI channel quality information 33
5.2.3.3.1 Channel quality information formats for wideband reports 34
5.2.3.3.2 Channel quality information formats for UE-selected sub-band reports 35
5.2.3.4 Channel coding for UCI channel quality information and HARQ-ACK 36
5.2.4 Uplink control information on PUSCH without UL-SCH data 37
5.2.4.1 Channel coding of control information 37
5.2.4.2 Control information mapping 37
5.2.4.3 Channel interleaver 38

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

5.3 Downlink transport channels and control information 38
5.3.1 Broadcast channel 38
5.3.1.1 Transport block CRC attachment 38
5.3.1.2 Channel coding 39
5.3.1.3 Rate matching 39
5.3.2 Downlink shared channel, Paging channel and Multicast channel 39
5.3.2.1 Transport block CRC attachment 40
5.3.2.2 Code block segmentation and code block CRC attachment 40
5.3.2.3 Channel coding 41
5.3.2.4 Rate matching 41
5.3.2.5 Code block concatenation 41
5.3.3 Downlink control information 41
5.3.3.1 DCI formats 42
The fields defined in the DCI formats below are mapped to the information bits a_0 to a_{A-1} as follows. 42
5.3.3.1.1 Format 0 42
5.3.3.1.2 Format 1 43
5.3.3.1.3 Format 1A 44
5.3.3.1.3A Format 1B 45
5.3.3.1.4 Format 1C 46
5.3.3.1.4A Format 1D 47
5.3.3.1.5 Format 2 48
5.3.3.1.5A Format 2A 51
5.3.3.1.6 Format 3 53
5.3.3.1.7 Format 3A 53
5.3.3.2 CRC attachment 54
5.3.3.3 Channel coding 54
5.3.3.4 Rate matching 54
5.3.4 Control format indicator 54
5.3.4.1 Channel coding 55
5.3.5 HARQ indicator 55
5.3.5.1 Channel coding 55

Annex A (informative): Change history 57

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

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 ALARM Find authenticated court documents without watermarks at docketalarm.com.

DOCKET ALARM

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.