Exhibit 1004

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

3GPP TS 25.212 V5.2.0 (2002-09)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Radio Access Network;
Multiplexing and channel coding (FDD)
(Release 5)

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 Organisational Partners and shall not be implemented.

DOCKET ALARM

Find authenticated court documents without watermarks at docketalarm.com.

Keywords
UMTS, radio, mux

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 written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© 2002, 3GPP Organizational Partners (ARIB, CWTS, ETSI, T1, TTA, TTC).
All rights reserved.

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

Contents

Foreword 6

1 Scope 7

2 References 7

3 Definitions, symbols and abbreviations 7
3.1 Definitions 7
3.2 Symbols 8
3.3 Abbreviations 8

4 Multiplexing, channel coding and interleaving 9
4.1 General 9
4.2 General coding/multiplexing of TrCHs 9
4.2.1 CRC attachment 13
4.2.1.1 CRC Calculation 13
4.2.1.2 Relation between input and output of the CRC attachment block 13
4.2.2 Transport block concatenation and code block segmentation 14
4.2.2.1 Concatenation of transport blocks 14
4.2.2.2 Code block segmentation 14
4.2.3 Channel coding 15
4.2.3.1 Convolutional coding 15
4.2.3.2 Turbo coding 16
4.2.3.2.1 Turbo coder 16
4.2.3.2.2 Trellis termination for Turbo coder 17
4.2.3.2.3 Turbo code internal interleaver 17
4.2.3.3 Concatenation of encoded blocks 21
4.2.4 Radio frame size equalisation 21
4.2.5 1st interleaving 21
4.2.5.1 Insertion of marked bits in the sequence to be input in first interleaver 21
4.2.5.2 1st interleaver operation 22
4.2.5.3 Relation between input and output of 1st interleaving in uplink 23
4.2.5.4 Relation between input and output of 1st interleaving in downlink 23
4.2.6 Radio frame segmentation 24
4.2.6.1 Relation between input and output of the radio frame segmentation block in uplink 24
4.2.6.2 Relation between input and output of the radio frame segmentation block in downlink 24
4.2.7 Rate matching 24
4.2.7.1 Determination of rate matching parameters in uplink 26
4.2.7.1.1 Determination of SF and number of PhCHs needed 26
4.2.7.2 Determination of rate matching parameters in downlink 29
4.2.7.2.1 Determination of rate matching parameters for fixed positions of TrCHs 30
4.2.7.2.2 Determination of rate matching parameters for flexible positions of TrCHs 33
4.2.7.3 Bit separation and collection in uplink 35
4.2.7.3.1 Bit separation 37
4.2.7.3.2 Bit collection 38
4.2.7.4 Bit separation and collection in downlink 38
4.2.7.4.1 Bit separation 39
4.2.7.4.2 Bit collection 40
4.2.7.5 Rate matching pattern determination 40
4.2.8 TrCH multiplexing 41
4.2.9 Insertion of discontinuous transmission (DTX) indication bits 42
4.2.9.1 1st insertion of DTX indication bits 42
4.2.9.2 2nd insertion of DTX indication bits 42
4.2.10 Physical channel segmentation 43
4.2.10.1 Relation between input and output of the physical segmentation block in uplink 44
4.2.10.2 Relation between input and output of the physical segmentation block in downlink 44
4.2.11 2nd interleaving 44
4.2.12 Physical channel mapping 45
4.2.12.1 Uplink 45

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

4.2.12.2 Downlink 45
4.2.13 Restrictions on different types of CCTrCHs 46
4.2.13.1 Uplink Dedicated channel (DCH) 46
4.2.13.2 Random Access Channel (RACH) 46
4.2.13.3 Common Packet Channel (CPCH) 46
4.2.13.4 Downlink Dedicated Channel (DCH) 47
4.2.13.5 Downlink Shared Channel (DSCH) associated with a DCH 47
4.2.13.6 Broadcast channel (BCH) 47
4.2.13.7 Forward access and paging channels (FACH and PCH) 47
4.2.14 Multiplexing of different transport channels into one CCTrCH, and mapping of one CCTrCH onto physical channels 47
4.2.14.1 Allowed CCTrCH combinations for one UE 48
4.2.14.1.1 Allowed CCTrCH combinations on the uplink 48
4.2.14.1.2 Allowed CCTrCH combinations on the downlink 48
4.3 Transport format detection 48
4.3.1 Blind transport format detection 49
4.3.2 Transport format detection based on TFCI 49
4.3.3 Coding of Transport-Format-Combination Indicator (TFCI) 49
4.3.4 Operation of TFCI in Hard Split Mode 51
4.3.5 Mapping of TFCI words 52
4.3.5.1 Mapping of TFCI word in normal mode 52
4.3.5.2 Mapping of TFCI word in compressed mode 52
4.3.5.2.1 Uplink compressed mode 52
4.3.5.2.2 Downlink compressed mode 52
4.4 Compressed mode 53
4.4.1 Frame structure in the uplink 53
4.4.2 Frame structure types in the downlink 54
4.4.3 Transmission time reduction method 54
4.4.3.1 Compressed mode by puncturing 54
4.4.3.2 Compressed mode by reducing the spreading factor by 2 54
4.4.3.3 Compressed mode by higher layer scheduling 55
4.4.4 Transmission gap position 55
4.5 Coding for HS-DSCH 56
4.5.1 CRC attachment for HS-DSCH 58
4.5.1a Bit scrambling for HS-DSCH 58
4.5.2 Code block segmentation for HS-DSCH 58
4.5.3 Channel coding for HS-DSCH 58
4.5.4 Hybrid ARQ for HS-DSCH 58
4.5.4.1 HARQ bit separation 59
4.5.4.2 HARQ First Rate Matching Stage 59
4.5.4.3 HARQ Second Rate Matching Stage 59
4.5.4.4 HARQ bit collection 60
4.5.5 Physical channel segmentation for HS-DSCH 61
4.5.6 Interleaving for HS-DSCH 61
4.5.7 Constellation re-arrangement for 16 QAM 62
4.5.8 Physical channel mapping for HS-DSCH 62
4.6 Coding for HS-SCCH 62
4.6.1 Overview 63
4.6.2 HS-SCCH information field mapping 64
4.6.2.1 Redundancy and constellation version coding 64
4.6.2.2 Modulation scheme mapping 64
4.6.2.3 Channelization code-set mapping 64
4.6.2.4 UE identity mapping 65
The UE identity is the HS-DSCH Radio Network Identifier (H-RNTI) defined in [13]. This is mapped such that $x_{ue,1}$ corresponds to the MSB and $x_{ue,16}$ to the LSB, cf. [14].4.6.3 Multiplexing of HS-SCCH information 65
4.6.4 CRC attachment for HS-SCCH 65
4.6.5 Channel coding for HS-SCCH 65
4.6.6 Rate matching for HS-SCCH 65
4.6.7 UE specific masking for HS-SCCH 66
4.6.8 Physical channel mapping for HS-SCCH 66
4.7 Coding for HS-DPCCH 66

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.