

3GPP TS 25.221 V7.0.0 (2006-03)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Radio Access Network;
Physical channels and mapping of transport channels
onto physical channels (TDD)
(Release 7)**



The present document has been developed within the 3rd Generation Partnership Project (3GPPTM) 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. This Specification is provided for future development work within 3GPP only. The Organisational Partners accept no liability for any use of this Specification. Specifications and reports for implementation of the 3GPPTM system should be obtained via the 3GPP Organisational Partners' Publications Offices.

Keywords

UMTS, radio, layer 1

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.

© 2006, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TTA, TTC).
All rights reserved.

Contents

Foreword	10
1 Scope	11
2 References	11
3 Abbreviations	11
4 Services offered to higher layers	13
4.1 Transport channels	13
4.1.1 Dedicated transport channels	13
4.1.2 Common transport channels.....	13
4.1.2.1 BCH - Broadcast Channel	13
4.1.2.2 FACH – Forward Access Channel	13
4.1.2.3 PCH – Paging Channel	13
4.1.2.4 RACH – Random Access Channel	13
4.1.2.5 USCH – Uplink Shared Channel.....	13
4.1.2.6 DSCH – Downlink Shared Channel.....	13
4.1.2.7 HS-DSCH – High Speed Downlink Shared Channel	14
4.2 Indicators	14
5 Physical channels for the 3.84 Mcps option.....	14
5.1 Frame structure.....	14
5.2 Dedicated physical channel (DPCH).....	15
5.2.1 Spreading.....	16
5.2.1.1 Spreading for Downlink Physical Channels	16
5.2.1.2 Spreading for Uplink Physical Channels	16
5.2.2 Burst Types.....	16
5.2.2.1 Burst Type 1	16
5.2.2.2 Burst Type 2	17
5.2.2.3 Burst Type 3	17
5.2.2.4 Transmission of TFCI.....	18
5.2.2.5 Transmission of TPC.....	19
5.2.2.6 Timeslot formats.....	20
5.2.2.6.1 Downlink timeslot formats	20
5.2.2.6.2 Uplink timeslot formats	21
5.2.3 Training sequences for spread bursts.....	23
5.2.4 Beamforming.....	25
5.3 Common physical channels	25
5.3.1 Primary common control physical channel (P-CCPCH).....	25
5.3.1.1 P-CCPCH Spreading	26
5.3.1.2 P-CCPCH Burst Types.....	26
5.3.1.3 P-CCPCH Training sequences	26
5.3.2 Secondary common control physical channel (S-CCPCH).....	26
5.3.2.1 S-CCPCH Spreading	26
5.3.2.2 S-CCPCH Burst Types.....	26
5.3.2.3 S-CCPCH Training sequences	26
5.3.3 The physical random access channel (PRACH).....	26
5.3.3.1 PRACH Spreading.....	26
5.3.3.2 PRACH Burst Type.....	26
5.3.3.3 PRACH Training sequences.....	26
5.3.3.4 PRACH timeslot formats.....	27
5.3.3.5 Association between Training Sequences and Channelisation Codes	27
5.3.4 The synchronisation channel (SCH)	28
5.3.5 Physical Uplink Shared Channel (PUSCH).....	29
5.3.5.1 PUSCH Spreading	29
5.3.5.2 PUSCH Burst Types.....	30
5.3.5.3 PUSCH Training Sequences	30
5.3.5.4 UE Selection	30

5.3.6	Physical Downlink Shared Channel (PDSCH).....	30
5.3.6.1	PDSCH Spreading	30
5.3.6.2	PDSCH Burst Types.....	30
5.3.6.3	PDSCH Training Sequences	30
5.3.6.4	UE Selection	30
5.3.7	The Paging Indicator Channel (PICH).....	30
5.3.7.1	Mapping of Paging Indicators to the PICH bits.....	30
5.3.7.2	Structure of the PICH over multiple radio frames	31
5.3.7.3	PICH Training sequences.....	32
5.3.8	The physical node B synchronisation channel (PNBSCH)	32
5.3.9	High Speed Physical Downlink Shared Channel (HS-PDSCH)	32
5.3.9.1	HS-PDSCH Spreading.....	32
5.3.9.2	HS-PDSCH Burst Types	32
5.3.9.3	HS-PDSCH Training Sequences.....	32
5.3.9.4	UE Selection	32
5.3.9.5	HS-PDSCH timeslot formats	32
5.3.10	Shared Control Channel for HS-DSCH (HS-SCCH)	33
5.3.10.1	HS-SCCH Spreading	33
5.3.10.2	HS-SCCH Burst Types.....	33
5.3.10.3	HS-SCCH Training Sequences	33
5.3.10.4	HS-SCCH timeslot formats.....	33
5.3.11	Shared Information Channel for HS-DSCH (HS-SICH)	33
5.3.11.1	HS-SICH Spreading	33
5.3.11.2	HS-SICH Burst Types	33
5.3.11.3	HS-SICH Training Sequences.....	33
5.3.11.4	HS-SICH timeslot formats	34
5.3.12	The MBMS Indicator Channel (MICH)	34
5.3.12.1	Mapping of MBMS Indicators to the MICH bits	34
5.3.12.2	MICH Training sequences.....	35
5.4	Transmit Diversity for DL Physical Channels	35
5.5	Beacon characteristics of physical channels.....	35
5.5.1	Location of beacon channels.....	35
5.5.2	Physical characteristics of beacon channels	36
5.6	Midamble Allocation for Physical Channels.....	36
5.6.1	Midamble Allocation for DL Physical Channels	36
5.6.1.1	Midamble Allocation by signalling from higher layers.....	37
5.6.1.2	Midamble Allocation by layer 1.....	37
5.6.1.2.1	Default midamble	37
5.6.1.2.2	Common Midamble	37
5.6.2	Midamble Allocation for UL Physical Channels	38
5.7	Midamble Transmit Power	38
5A	Physical channels for the 1.28 Mcps option.....	39
5A.1	Frame structure.....	39
5A.2	Dedicated physical channel (DPCH).....	40
5A.2.1	Spreading	40
5A.2.2	Burst Format.....	41
5A.2.2.1	Transmission of TFCL.....	41
5A.2.2.2	Transmission of TPC.....	42
5A.2.2.3	Transmission of SS.....	45
5A.2.2.4	Timeslot formats.....	47
5A.2.2.4.1	Timeslot formats for QPSK.....	48
5A.2.2.4.2	Time slot formats for 8PSK.....	51
5A.2.3	Training sequences for spread bursts.....	51
5A.2.4	Beamforming.....	53
5A.3	Common physical channels	53
5A.3.1	Primary common control physical channel (P-CCPCH).....	53
5A.3.1.1	P-CCPCH Spreading	53
5A.3.1.2	P-CCPCH Burst Format	53
5A.3.1.3	P-CCPCH Training sequences	53
5A.3.2	Secondary common control physical channel (S-CCPCH).....	53
5A.3.2.1	S-CCPCH Spreading	53

5A.3.2.2	S-CCPCH Burst Format	53
5A.3.2.3	S-CCPCH Training sequences	54
5A.3.3	Fast Physical Access CHannel (FPACH)	54
5A.3.3.1	FPACH burst	54
5A.3.3.1.1	Signature Reference Number	54
5A.3.3.1.2	Relative Sub-Frame Number	54
5A.3.3.1.3	Received starting position of the UpPCH (UpPCH _{POS})	54
5A.3.3.1.4	Transmit Power Level Command for the RACH message	54
5A.3.3.2	FPACH Spreading	54
5A.3.3.3	FPACH Burst Format	55
5A.3.3.4	FPACH Training sequences	55
5A.3.3.5	FPACH timeslot formats	55
5A.3.4	The physical random access channel (PRACH)	55
5A.3.4.1	PRACH Spreading	55
5A.3.4.2	PRACH Burst Format	55
5A.3.4.3	PRACH Training sequences	55
5A.3.4.4	PRACH timeslot formats	55
5A.3.4.5	Association between Training Sequences and Channelisation Codes	55
5A.3.5	The synchronisation channels (DwPCH, UpPCH)	55
5A.3.6	Physical Uplink Shared Channel (PUSCH)	56
5A.3.7	Physical Downlink Shared Channel (PDSCH)	56
5A.3.8	The Page Indicator Channel (PICH)	56
5A.3.8.1	Mapping of Paging Indicators to the PICH bits	56
5A.3.8.2	Structure of the PICH over multiple radio frames	57
5A.3.9	High Speed Physical Downlink Shared Channel (HS-PDSCH)	57
5A.3.9.1	HS-PDSCH Spreading	57
5A.3.9.2	HS-PDSCH Burst Format	57
5A.3.9.3	HS-PDSCH Training Sequences	57
5A.3.9.4	UE Selection	57
5A.3.9.5	HS-PDSCH timeslot formats	57
5A.3.10	Shared Control Channel for HS-DSCH (HS-SCCH)	58
5A.3.10.1	HS-SCCH Spreading	58
5A.3.10.2	HS-SCCH Burst Format	58
5A.3.10.3	HS-SCCH Training Sequences	58
5A.3.10.4	HS-SCCH timeslot formats	58
5A.3.11	Shared Information Channel for HS-DSCH (HS-SICH)	58
5A.3.11.1	HS-SICH Spreading	58
5A.3.11.2	HS-SICH Burst Format	58
5A.3.11.3	HS-SICH Training Sequences	58
5A.3.11.4	HS-SICH timeslot formats	59
5A.3.12	The MBMS Indicator Channel (MICH)	59
5A.3.12.1	Mapping of MBMS Indicators to the MICH bits	59
5A.3.13	Physical Layer Common Control Channel (PLCCH)	59
5A.3.13.1	PLCCH Spreading	60
5A.3.13.2	PLCCH Burst Type	60
5A.3.13.3	PLCCH Training Sequence	60
5A.3.13.4	PLCCH timeslot formats	60
5A.4	Transmit Diversity for DL Physical Channels	60
5A.5	Beacon characteristics of physical channels	60
5A.5.1	Location of beacon channels	60
5A.5.2	Physical characteristics of the beacon function	61
5A.6	Midamble Allocation for Physical Channels	61
5A.6.1	Midamble Allocation for DL Physical Channels	61
5A.6.1.1	Midamble Allocation by signalling from higher layers	61
5A.6.1.2	Midamble Allocation by layer 1	61
5A.6.1.2.1	Default midamble	61
5A.6.1.2.2	Common Midamble	61
5A.6.2	Midamble Allocation for UL Physical Channels	62
5A.7	Midamble Transmit Power	62
5B	Physical channels for the 7.68 Mcps option	62
5B.1	General	62

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.