

3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Physical layer procedures (TDD) (Release 6)



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 Organisational Partners and shall not be implemented.

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.

© 2004, 3GPP Organizational Partners (ARIB, CCSA, ETSI, T1, TTA, TTC).
All rights reserved.

Contents

Foreword.....	6
1 Scope	7
2 References	7
3 Abbreviations	8
4 Physical layer procedures for the 3,84 Mcps option	9
4.1 General	9
4.2 Transmitter Power Control	9
4.2.1 General Parameters	9
4.2.2 Uplink Control	9
4.2.2.1 General Limits	9
4.2.2.2 PRACH	9
4.2.2.3 DPCCH, PUSCH and HS-SICH.....	9
4.2.2.3.1 Gain Factors	10
4.2.2.3.2 Out of synchronisation handling	11
4.2.3 Downlink Control	11
4.2.3.1 P-CCPCH.....	11
4.2.3.2 S-CCPCH, PICH.....	11
4.2.3.3 SCH 11	
4.2.3.3A PNBSCH	11
4.2.3.4 DPCCH, PDSCH.....	11
4.2.3.4.1 Out of synchronisation handling	12
4.2.3.5 HS-PDSCH	12
4.2.3.6 HS-SCCH	12
4.3 Timing Advance	13
4.4 Synchronisation procedures.....	13
4.4.1 Cell Search.....	13
4.4.2 Dedicated channel synchronisation.....	13
4.4.2.1 Synchronisation primitives	13
4.4.2.1.1 General	13
4.4.2.1.2 Downlink synchronisation primitives.....	13
4.4.2.1.3 Uplink synchronisation primitives	14
4.4.2.2 Radio link monitoring	14
4.4.2.2.1 Downlink radio link failure	14
4.4.2.2.2 Uplink radio link failure/restore	14
4.5 Discontinuous transmission (DTX) procedure	15
4.5.0 Description of Special Bursts.....	15
4.5.1 Use of Special Bursts during DTX	15
4.5.2 Use of Special Bursts for Initial Establishment / Reconfiguration	16
4.5.3 Use of Special Bursts for DTX on Beacon Channels	16
4.6 Downlink Transmit Diversity	16
4.6.1 Transmit Diversity for PDSCH, DPCH, HS-SCCH and HS-PDSCH	16
4.6.2 Transmit Diversity for SCH.....	17
4.6.2.1 SCH Transmission Scheme	17
4.6.3 Transmit Diversity for Beacon Channels.....	17
4.6.3.1 SCTD Transmission Scheme	18
4.7 Random access procedure	18
4.7.1 Physical random access procedure.....	18
4.8 DSCH procedure	19
4.8.1 DSCH procedure with TFCI indication	19
4.8.2 DSCH procedure with midamble indication	19
4.9 Node B Synchronisation Procedure over the Air.....	20
4.9.1 Frequency Acquisition Phase.....	20
4.9.2 Initial Synchronisation	20
4.9.3 Steady-State Phase	20
4.9.4 Late entrant cells.....	20

4.10	Idle periods for IPDL location method	21
4.10.1	General.....	21
4.10.2	Parameters of IPDL	21
4.10.3	Calculation of idle period position.....	21
4.11	HS-DSCH Procedure	22
4.11.1	Link Adaptation Procedure	22
4.11.2	HS-DSCH Channel Quality Indication Procedure.....	23
5	Physical layer procedures for the 1.28 Mcps option	24
5.1	Transmitter Power Control	24
5.1.1	Uplink Control	24
5.1.1.1	General limits.....	24
5.1.1.2	UpPCH.....	25
5.1.1.3	PRACH	25
5.1.1.4	DPCH and PUSCH	25
5.1.1.4.1	Gain Factors	25
5.1.1.4.2	Out of synchronization handling	25
5.1.1.5	HS-SICH.....	25
5.1.2	Downlink Control	25
5.1.2.1	P-CCPCH.....	26
5.1.2.2	The power of the FPACH	26
5.1.2.3	S-CCPCH, PICH.....	26
5.1.2.4	DPCH, PDSCH.....	26
5.1.2.4.1	Out of synchronisation handling	26
5.1.2.5	HS-PDSCH	26
5.1.2.6	HS-SCCH	26
5.2	UL Synchronisation.....	26
5.2.1	General Description	26
5.2.1.1	Preparation of uplink synchronization (downlink synchronization)	27
5.2.1.2	Establishment of uplink synchronization	27
5.2.1.3	Maintenance of uplink synchronisation	27
5.2.2	UpPCH.....	27
5.2.3	PRACH	27
5.2.4	DPCH and PUSCH	28
5.2.4.1	Out of synchronization handling.....	28
5.2.5	HS-SICH.....	28
5.3	Synchronisation procedures.....	28
5.3.1	Cell search	28
5.3.2	DCH synchronization	29
5.4	Discontinuous transmission (DTX) procedure	29
5.5	Downlink Transmit Diversity	29
5.5.1	Transmit Diversity for PDSCH, DPCH, HS-SCCH, and HS-PDSCH	29
5.5.1.1	TSTD for PDSCH and DPCH.....	29
5.5.1.2	Closed Loop Tx Diversity for PDSCH, DPCH, HS-SCCH, and HS-PDSCH	30
5.5.2	Transmit Diversity for DwPCH	30
5.5.3	Transmit Diversity for P-CCPCH	31
5.5.3.1	TSTD Transmission Scheme for P-CCPCH	31
5.5.4	SCTD Transmission Scheme for Beacon Channels.....	31
5.6	Random Access Procedure	32
5.6.1	Definitions	32
5.6.2	Preparation of random access	32
5.6.3	Random access procedure.....	33
5.6.3.1	The use and generation of the information fields transmitted in the FPACH	34
5.6.3.1.1	Signature Reference Number	34
5.6.3.1.2	Relative Sub-Frame Number.....	34
5.6.3.1.3	Received starting position of the UpPCH (UpPCH _{POS})	35
5.6.3.1.4	Transmit Power Level Command for the RACH message.....	35
5.6.4	Random access collision	35
5.7	Node B Synchronisation Procedure over the Air.....	35
5.7.1	Initial Synchronisation	35
5.7.2	Steady-State Phase.....	35
5.7.3	Late entrant cells.....	36

5.8	Idle periods for IPDL location method.....	36
5.8.1	General.....	36
5.8.2	Parameters of IPDL	36
5.8.3	Calculation of idle period position.....	36
5.9	HS-DSCH Procedure.....	37
Annex A (informative): Power Control.....		38
A.1	Example Implementation of Downlink Power Control in the UE	38
A.2	Example Implementation of Closed Loop Uplink Power Control in Node B for 1.28 Mcps TDD	38
A.3	Example Implementation of Downlink Power Control in UE for 1.28 Mcps TDD when TSTD is used	38
A.4	Example Implementation of open Loop Power Control for access procedure for 1.28 Mcps TDD	39
Annex B (informative): Determination of Weight Information.....		40
B.1	STD Weights	40
B.2	TxAA Weights	40
Annex C (informative): Cell search procedure for 3.84 Mcps TDD		41
Annex CA (informative): Cell search procedure for 1.28 Mcps TDD		42
Annex CB (informative): Examples random access procedure for 1.28 Mcps TDD		43
Annex D (informative): Change history		45

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.