3G TR 25.928 V0.0.3 (2000-03)

Technical Report

3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG); Radio Access Network (RAN); 1.28Mcps functionality for UTRA TDD Physical Layer

Reference
DTS/TSGR-0125223 (25223-300.PDF)

Keywords
<keyword[, keyword]>

3GPP

Postal address

Office address

Internet
secretariat@3gpp.org
Individual copies of this deliverable
can be downloaded from
http://www.3gpp.org

Contents

Foreword

This Technical Report has been produced by the 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 this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 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 specification.

[4] TS 25.223: “Spreading and modulation (TDD)”

[5] TS 25.224: “Physical layer procedures (TDD)”

[6] TS 25.225: "Physical layer – Measurements (TDD)"

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CDMA	Code Division Multiple Access
PN	Pseudo Noise
QPSK	Quadrature Phase Shift Keying
RACH	Random Access Channel

4 Radio Requirements

4.1 Radio environments

4.2 Services

4.3 Operational requirements

4.3.1 Deployment scenarios

4.4 Handover and Cell selection/reselection

4.5 Particular characteristics of the low chip rate TDD

5 High level characteristics

6 Physical layer - General description

6.1 General description of Layer 1

6.2 Document structure of the physical layer specification

7 Physical channels and mapping of transport channels onto physical channels

7.1 Transport channels

7.1.1 Transport channels

7.1.1.1 Dedicated transport channels

7.1.1.2 Common transport channels

7.2 Physical channels

7.2.1 Frame structure

7.2.2 Dedicated physical channel (DPCH)

7.2.2.1 Spreading

7.2.2.1.1 Spreading for Downlink Physical Channels

7.2.2.1.2 Spreading for Uplink Physical Channels

7.2.2.2 Burst Types

7.2.2.2.1 Transmission of TFCI

7.2.2.2.2 Transmission of TPC

7.2.2.2.3 Timeslot formats

7.2.2.2.3.1 Downlink timeslot formats

7.2.2.2.3.2 Uplink timeslot formats

7.2.2.3 Training sequences for spread bursts

7.2.2.3.1 Midamble Transmit Power

7.2.2.4 Beamforming and Transmit Diversity

7.2.3 Primary common control physical channel (P-CCPCH)

7.2.3.1 Primary common control physical channel (P-CCPCH)

7.2.3.1.1 P-CCPCH Spreading

8 Multiplexing and channel coding

8.1 Transport channel coding/multiplexing

8.1.1 Error detection

8.1.1.1 CRC calculation

8.1.1.2 Relation between input and output of the Cyclic Redundancy Check

8.1.2 Transport block concatenation and code block segmentation

8.1.2.1 Concatenation of transport blocks

8.1.2.2 Code block segmentation

8.1.3 Channel coding

8.1.3.1 Convolutional Coding

8.1.3.2 Turbo coding

8.1.3.2.1 Turbo coder

8.1.3.2.2 Trellis termination in turbo code

8.1.3.2.3 Turbo code internal interleaver

8.1.4 Radio frame size equalisation

8.1.5 1st interleaving

8.1.6 Radio frame segmentation

8.1.7 Rate matching

8.1.7.1 Determination of rate matching parameters

8.1.7.2 Bit separation for rate matching

8.1.7.3 Rate matching pattern determination

8.1.8 TrCH multiplexing

8.1.9 Physical channel segmentation

8.1.10 2nd interleaving

8.1.10.1 Frame related 2nd interleaving

8.1.10.2 Timeslot related 2nd interleaving

8.1.11 Physical channel mapping

8.1.11.1 Mapping scheme after frame related 2nd interleaving

8.1.11.2 Mapping scheme after timeslot related 2nd interleaving

8.1.12 Multiplexing of different transport channels onto one CCTrCH, and mapping of one CCTrCH onto physical channels

8.1.12.1 Allowed CCTrCH combinations for one UE

8.1.12.1.1 Allowed CCTrCH combinations on the uplink

8.1.12.1.2 Allowed CCTrCH combinations on the downlink

8.1.13 Transport format detection

8.1.13.1 Blind transport format detection

8.1.13.2 Explicit transport format detection based on TFCI

8.1.13.2.1 Transport Format Combination Indicator (TFCI)

8.2 Coding for layer 1 control

8.2.1 Coding of transport format combination indicator (TFCI)

8.2.1.1 Default TFCI word

8.2.1.2 Coding of short TFCI lengths

8.2.2 Coding of Paging Indicator (PI)

8.2.3 Coding of Transmit Power Control (TPC)

9 Spreading and Modulation

9.1 Data modulation

9.1.1 Symbol rate

9.1.2 Mapping of bits onto signal point constellation

9.2 Spreading modulation

9.2.1 Basic spreading parameters

9.2.2 Spreading codes

9.2.3 Scrambling codes

9.2.4 Spread and scrambled signal of data symbols and data blocks

9.3 Synchronisation codes

9.3.1 Code Generation

9.3.2 Code Allocation

9.3.2.1 Code allocation for Case 1:

9.3.2.2 Code allocation for Case 2:

9.3.2.3 Code allocation for Case 3:

9.3.3 Evaluation of synchronisation codes

10 Physical layer procedures

10.1 Transmitter Power Control

10.1.1 General Parameters

10.1.2 Uplink Control

10.1.2.1 Common Physical Channel

10.1.2.2 Dedicated Physical Channel

10.1.3 Downlink Control

10.1.3.1 Common Physical Channel

10.1.3.2 Dedicated Physical Channel

10.2 Timing Advance

10.2.1 With UL Synchronization

10.3 Synchronisation and Cell Search Procedures

10.3.1 Cell Search

10.4 ODMA Relay Probing

10.4.1 Initial Mode Probing

10.4.2 Idle Mode Probing

10.4.3 Active Mode Probing

10.5 Discontinuous transmission (DTX) of Radio Frames

10.6 Downlink Transmit Diversity

10.6.1 Transmit Diversity for DPCH

10.6.1.1 Determination of Weight Information

10.6.1.1.1 STD Weights

11 Physical layer measurements

11.1 Control of UE/UTRAN measurements

11.1.1 General measurement concept

11.1.2 Measurements for cell selection/reselection

11.1.3 Measurements for Handover

11.1.4 Measurements for DCA

11.1.5 Measurements for timing advance

11.2 Measurement abilities for UTRA TDD

11.2.1 UE measurement abilities

11.2.1.1 PCCPCH RSCP

11.2.1.2 CPICH RSCP

11.2.1.3 RSCP

11.2.1.4 Timeslot ISCP

11.2.1.5 UTRA carrier RSSI

11.2.1.6 GSM carrier RSSI

11.2.1.7 SIR

11.2.1.8 CPICH Ec/No

11.2.1.9 Physical channel BER

11.2.1.10 Transport channel BLER

11.2.1.11 UE transmitted power

11.2.1.12 SFN-SFN observed time difference

11.2.1.13 Observed time difference to GSM cell

11.2.2 UTRAN measurement abilities

11.2.2.1 RSCP

11.2.2.2 Timeslot ISCP

11.2.2.3 RSSI

11.2.2.4 SIR

11.2.2.5 Physical channel BER

11.2.2.6 Transport channel BLER

11.2.2.7 Transmitted carrier power

11.2.2.8 Transmitted code power

11.2.2.9 RX Timing Deviation

Annex A (informative): Monitoring GSM from TDD: Calculation Results

A.1 Low data rate traffic using 1 uplink and 1 downlink slot

A.1.1 Higher data rate traffic using more than 1 uplink and/or 1 downlink TDD timeslot

12 Performance analysis of the low chip rate

13 History

Document history		
V0.0.1	January 2000	Created in WG#10 in Beijing, Table of contents approved, R1-00-149
V0.0.2	March 2000	New structure created according to the comments at the WG1#11

Editor information:

Mirko Aksentijevic
Nokia Networks

Email: mirko.aksentijevic@nokia.com