
Foreword

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Introduction

The definition of the Conformance Tests for UE in 3G will be a complex task as the complete test suite covers RF, EMC and Protocol aspects of the UE.

Each test requires a Test Environment to be defined in which the UE has to operate to defined standards, constraints and performance. The overall task can be simplified if there are a number of well defined and agreed Common Test Environments where every one can be used for a number of tests. Hence the present document defines testing conditions that are common to several tests avoiding the need to duplicate the same information for every single test.

The present document defines default values for a variety of common areas. Where values are not specified in test cases, the defaults in the present document will apply. If specified, the test case values will take precedence.

The present document addresses the FDD mode as well as the TDD mode.

1 Scope

The present document contains definitions of reference conditions and test signals, default parameters, reference radio bearer configurations used in radio bearer interoperability testing, common radio bearer configurations for other test purposes, common requirements for test equipment and generic set-up procedures for use in UE conformance tests.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 34.123-1: "User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".
- [2] 3GPP TS 34.121-1: " User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 1: Conformance specification ".
- [2a] 3GPP TS 34.121-2: "User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 2: Implementation Conformance Statement (ICS)".
- [3] 3GPP TS 34.123-2: "User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) proforma specification".
- [4] 3GPP TS 34.124: " Electromagnetic Compatibility (EMC) requirements for Mobile terminals and ancillary equipment".
- [5] 3GPP TS 34.122: "Terminal Conformance Specification; Radio Transmission and Reception (TDD)".
- [6] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".
- [7] 3GPP TS 25.301 "Radio interface protocol architecture".
- [8] 3GPP TS 25.214: "Physical layer procedures (FDD)".
- [9] 3GPP TR 21.905: " Vocabulary for 3GPP Specifications".
- [10] 3GPP TR 25.990: " Vocabulary".
- [11] 3GPP TS 25.101: "User Equipment (UE) radio transmission and reception (FDD)".
- [12] 3GPP TS 25.102: "User Equipment (UE) radio transmission and reception (TDD)".
- [13] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".
- [14] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".
- [15] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [16] 3GPP TS 26.110: "Codec for circuit switched multimedia telephony service; General description".
- [17] 3GPP TS 29.007: " General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

- [18] 3GPP TR 23.910: "Circuit switched data bearer service".
- [19] Void.
- [20] 3GPP TS 25.104: "Base Station (BS) radio Transmission and Reception (FDD)".
- [21] 3GPP TS 25.105: "Base Station (BS) radio Transmission and Reception (TDD)".
- [22] 3GPP TS 31.101: "UICC-terminal interface; Physical and logical characteristics".
- [23] 3GPP TS 31.102: "Characteristics of the USIM application".
- [24] 3GPP TS 33.102: "3G security; Security architecture".
- [25] 3GPP TS 33.103: "3G security; Integration guidelines".
- [26] 3GPP TS 33.105: "Cryptographic algorithm requirements".
- [27] 3GPP TS 25.224: "Physical layer procedures (TDD)".
- [28] 3GPP TS 25.221: "Physical channels and mapping of transport channels onto physical channels (TDD)".
- [29] 3GPP TS 25.222: "Multiplexing and channel coding (TDD)".
- [30] 3GPP TS 25.133: "Requirements for support of radio resource management (FDD)".
- [31] 3GPP TS 51.010-1: "Mobile Station (MS) conformance specification; Part 1: Conformance specification".
- [32] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [33] 3GPP TS 25.171: "Requirements for support of Assisted Global Positioning System (A-GPS); Frequency Division Duplex (FDD)".
- [34] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".
- [35] 3GPP TS 25.223: "Spreading and modulation (TDD)".
- [36] 3GPP TS 25.304: "User Equipment (UE) procedures in idle mode and procedures for cell reselection in connected mode".
- [37] 3GPP TS 25.123: "Requirements for support of radio resource management (TDD)".
- [38] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".
- [39] 3GPP TS 31.120: "UICC-terminal interface; Physical, electrical and logical test specification".
- [40] 3GPP TS 31.121: "Base Station System (BSS) equipment specification; Radio aspects".
- [41] 3GPP TS 34.171: "Terminal conformance specification; Assisted Global Positioning System (A-GPS); Frequency Division Duplex (FDD)".
- [42] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [43] NATO Standard Agreement STANAG 4294 Issue 1
- [44] 3GPP TS 43.020: "Security related network functions".
- [45] 3GPP TS 36.508: "Common test environments for User Equipment (UE) conformance testing".
- [46] 3GPP TS 34.229-1: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".
- [47] 3GPP TS 37.571-1: "Universal Terrestrial Radio Access (UTRA) and Evolved UTRA (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 1: Conformance test specification".

- [48] 3GPP TS 37.571-5: "Universal Terrestrial Radio Access (UTRA) and Evolved UTRA (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data".

3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [9], 3GPP TR 25.990 [10] and the following apply:

maximum average power: average transmitter output power obtained over any specified time interval, including periods with no transmission, when the transmit time slots are at the maximum power setting

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [9], 3GPP TR 25.990 [10] and the following apply:

4C-HSDPA	Four-Carrier HSDPA. HSDPA operation configured on 3 or 4 DL carriers
AFC	Automatic Frequency Control
A-GPS	Assisted - Global Positioning System
AM	Acknowledgement Mode
ATT	ATTenuator
BCCH	Broadcast Control Channel
CBS	Cell Broadcast Service
CC	Convolutional Coding
CCCH	Common Control Channel
CCTrCH	Coded Composite Transport Channel
CS	Circuit Switching
DB-DC-HSDPA	Dual Band Dual Cell HSDPA
DC-HSDPA	Dual Cell HSDPA
DCCH	Dedicated Control Channel
DL	Down Link
DPCH	Dedicated Physical Channel
DT	Direct transfer
DTCH	Dedicated Traffic Channel
FTM	File Tunnelling Mode
GPS	Global Positioning System
GSS	GPS System Simulator
HYB	HYBrid
IMB	Integrated Mobile Broadcast
NAS	Non-Access Stratum
OBW	Occupied BandWidth
OCNS	Orthogonal Channel Noise Simulator

NOTE: A mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink.

PRA CH	Physical Random Access Channel
PS	Packet Switching
RAB	Radio Access Bearer
RB	Radio Bearer
RRC	Radio Resource Control

NOTE: (for sub-Layer of layer 3) but also Root-Raised Cosine (for Filter shape).

SCCPCH	Secondary Common Control Physical Channel
SMS	Short Message Service
SRB	Signalling Radio Bearer
SS	System Simulator

SSD	Source Statistics Descriptor
TC	Turbo Coding
TLM	TeLeMetry word

NOTE: It contains an 8-bits preamble (10001011).

TM	Transparent Mode
TOW	Time Of Week
TFFF	Time To First Fix
UL	UpLink
UM	Unacknowledgement Mode

3.3 Symbols

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

I_{oc}	The power spectral density of a band limited white noise source (simulating interference from other cells) as measured at the UE antenna connector.
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4 Common requirements of test equipment

Mobile conformance testing can be categorized into 3 distinct areas:

- RF Conformance Testing.
- EMC Conformance Testing.
- Signalling Conformance Testing.

The test equipment required for each category of testing may or not be different, depending on the supplier of the test equipment. However, there will be some generic requirements of the test equipment that are essential for all three categories of test, and these are specified in this clause.

In addition, there will be requirements to test operation in multi-system configurations (e.g. UTRA plus GSM/DCS1800). However, these would not form a common test equipment requirement for the three test areas and are not considered in the present document.

4.1 General Functional Requirements

NOTE: This clause has been written such that it does not constrain the implementation of different architectures and designs of test equipment.

All test equipment used to perform conformance testing on a UE shall provide a platform suitable for testing UE's that are either:

- a) FDD Mode; or
- b) TDD Mode; or
- c) both FDD/TDD Modes.

All test equipment shall provide (for the mode(s) supported) the following minimum functionality.

- The capability of emulating a single UTRA cell with the appropriate channels to allow the UE to register on the cell.
- The capability to allow the UE to set up an RRC connection with the System Simulator, and to maintain the connection for the duration of the test.
- The capability (for the specific test):
 - to select and support an appropriate Radio Bearer for the downlink;
 - to set the appropriate downlink power levels;

- to set up and support the appropriate Radio Bearer for the uplink;
- to set and control the uplink power levels.

4.2 Minimum performance levels

4.2.1 Supported Cell Configuration

The System Simulator shall provide the capability to simulate a minimum number of cells (of the appropriate UTRA Mode) whose number and capabilities are governed by the test cases that need to be performed (test cases are defined in 3GPP TS 34.123-1 [1] (Signalling), 3GPP TS 34.121 [2] (RF-FDD) and 3GPP TS 34.122 [5] (RF-TDD)). For this purpose test cases can be split into two different categories: Tests that require only one cell and Tests that require several cells.

To perform test cases requiring one cell, the system simulator must provide a Cell offering the capabilities to perform all the test cases in this category.

To perform test cases requiring several cells, additional cells must be provided by the system simulator. The additional cells, however, need only provide a minimum set of capabilities so as to support the first cell in carrying out the multi-cell test cases.

To perform test cases for MBMS in MBSFN mode the SS must provide simultaneous support for both the MBSFN cell(s) (TDD or FDD) directly applicable to the test cases and must also provide support for cells(s) on a unicast carrier providing other necessary services to the UE such as PLMN registration. The choice of supporting unicast carrier cell(s) may be TDD or FDD decided by the capabilities of the UE under test, and the choice may be independent of the mode (TDD or FDD) of the MBSFN cell(s).

The type and number of channels (especially physical channels) constitute an important set of capabilities for a cell. The following clauses list possible channels that may be supported by the SS. Each channel type, however, and the minimum number of channels needed are only mandatory if specific test cases require them.

The mapping between Logical and Transport channels is as described in 3GPP TS 25.301 [7]. Similarly the mapping between Transport channels and Physical channels is as described in 3GPP TS 25.211 [13] for the FDD mode, and 3GPP TS 25.221 [28] for the TDD mode. The reference measurement channels (mapping between Transport channels and Physical channels for DTCH/DCCH to be tested) are defined in 3GPP TS 34.121 [2] annex C for FDD and 3GPP TS 34.122 [5] annex C for TDD.

4.2.1.1 Supported Channels for FDD Mode

4.2.1.1.1 Logical channels

Logical channel	Minimum number	Comments
BCCH	1	
CCCH	1	
DCCH	4	2 for RRC testing, 2 for NAS testing
PCCH	1	
DTCH	n <FFS>	Depending on SS's support for RB service testing (See clause 14 of 3GPP TS 34.123-1 [1])

4.2.1.1.2 Transport channels

Transport channel	Minimum number	Comments
BCH	1	
FACH	1	
PCH	1	
DCH	n <FFS>	
DSCH	1	Release 99 and Release 4 only.
RACH	2	
CPCH	1	Release 99 and Release 4 only.
FAUSCH	N/A	Not in Release 1999

4.2.1.1.3 Physical channels

Physical channel	Minimum number	Comments
P-CCPCH	1	Primary Common Control Physical channel. This is used by the Cell to Broadcast System Information messages; it is transmitted using the Primary Scrambling Code for the Cell.
P-CPICH	1	Primary Common Pilot Channel using the Primary Scrambling Code for the Cell.
S-CPICH	1 (For RF Tests)	Secondary Common Pilot Channel. This signal is used as the phase reference for some RF tests.
SCH	1	Synchronization Channel (includes P-SCH and S-SCH)
S-CCPCH	2	Secondary Common Control Physical channel.
PICH	1	To identify when the UE should access the PCCH for Paging Messages.
AICH	1	General Acquisition Indicator Channel that can be used for: <ul style="list-style-type: none"> - Acquisition Indicator Channel, for PRACH - Access Preamble Acquisition Indicator Channel (AP-ICH), for PCPCH. (For release 99 and release 4 only) - Collision-Detection/Channel-Assignment Indicator Channel (CD/CA-ICH), for PCPCH. (For release 99 and release 4 only)
DPDCH	3	Downlink Physical Data Channel. There will be a single DPCCH associated with all the DPDCHs used for Layer 1 signalling. This number is for the First Cell. Additional Cells may define a lower number which should be at least 1.
PDSCH	1	Physical Downlink Shared Channel. Release 99 and Release 4 only.
DPCH	1	Uplink Dedicated Physical channel
PRACH	2	Physical Random Access Channel.
PCPCH	1	Physical Common Packet Channel. (For release 99 and release 4 only)
CSICH	1	CPCH Status Indicator Channel. (For release 99 and release 4 only)

4.2.1.2 Supported Channels for TDD Mode

4.2.1.2.1 Logical channels

Logical channel	Minimum number	Comments
Control channels		
BCCH	1	Broadcast Control Channel: DL channel for broadcasting system control information.
CCCH	1	Common Control Channel: Bi-directional channel for transmitting control information between network and UEs. This channel is commonly used by the UEs having no RRC connection with the network and by the UEs using common transport channels when accessing a new cell after cell reselection.
DCCH	4	Dedicated Control Channel: A point-to-point bi-directional channel that transmits dedicated control information between a UE and the network. This channel is established through RRC connection setup procedure. 2 channels for RRC testing and 2 channels for NAS testing estimated.
PCCH	1	Paging Control Channel: DL channel that transfers paging information. This channel is used when the network does not know the location cell of the UE, or, the UE is in the cell connected state
SHCCH	1	Shared Channel Control Channel: Bi-directional channel that transmits control information for uplink and downlink shared channels between network and UEs. This channel is for TDD only.
Traffic channels		
DTCH	1	Dedicated Traffic Channel is a point-to-point channel, dedicated to one UE, for the transfer of user information. A DTCH can exist in both UL and DL.
CTCH	1	Common Traffic Channel is a point-to-multipoint unidirectional channel for transfer of dedicated user information for all or a group of specified UEs.

4.2.1.2.2 Transport channels

Transport channel	Minimum number	Comments
BCH	1	Broadcast Channel: DL channel used to broadcast system and cell-specific information.

FACH	1	Forward Access Channel: DL channel used to carry control information to a mobile station when the system knows the location cell of the mobile station (may also carry short user packets).
PCH	1	Paging Channel: DL channel used to carry control information to a mobile station when the system does not know the location cell of the mobile station.
DCH	2	Dedicated Channel: UL or DL channel used to carry user or control information between the UTRAN and a UE
DSCH	1	DL shared channel: DL channel shared by several UEs carrying dedicated control or traffic data.
USCH	1	UL shared channel: UL channel shared by several UEs carrying dedicated control or traffic data.
RACH	1	Random Access Channel: UL channel used to carry control information from mobile station. The RACH may also carry short user packets.

4.2.1.2.3 Physical channels (3.84 Mcps option)

Physical channel	Minimum number	Comments
P-CCPCH	1	Primary Common Control Physical channel. The BCH as described in clause 4.2.1 is mapped onto the P-CCPCH. The position (time slot / code) of the P-CCPCH is known from PSCH.
SCH	1	Synchronization Channel. Code group of a cell can be derived from the synchronization channel. In order not to limit the uplink/downlink asymmetry the SCH is mapped on one or two downlink slots per frame only.
S-CCPCH	2	Secondary Common Control Physical channel. PCH and FACH as described in clause 4.2.1 are mapped onto one or more S-CCPCH.
PICH		Paging Indicator Channel is a physical channel used to carry the paging indicators.
DPCH (DL)	3	Downlink Dedicated Physical channel. DCH channels are mapped onto DPCH
PDSCH	1	Physical Downlink Shared Channel. DSCH as described in clause 4.2.1 is mapped onto one or more PDSCH.
DPCH (UL)	1	Uplink Dedicated Physical channel. DCH channels are mapped onto DPCH.
PUSCH	1	Physical Uplink Shared Channel. The USCH as described in clause 4.2.1 is mapped onto one or more PUSCH. Timing advance, as described in 3GPP TS 25.224 [27], clause 4.3, is applied to the PUSCH.
PRACH	2	Physical Random Access Channel. The RACH as described in clause 4.2.1 is mapped onto PRACH
PNBSCH	1	Physical node B synchronization channel: In case cell sync bursts are used for Node B synchronization the PNBSCH shall be used for the transmission of the cell sync burst 3GPP TS 25.223 [35]. The PNBSCH shall be mapped on the same timeslot as the PRACH.

4.2.1.2.4 Physical channels (1.28 Mcps option)

Physical channel	Minimum number	Comments
P-CCPCH	2	Primary Common Control Physical channel. The BCH as described in clause 4.2.1 is mapped onto the P-CCPCH1 and P-CCPCH2. The position (time slot / code) of the P-CCPCHs is fixed in the 1.28 Mcps TDD. The P-CCPCHs are mapped onto the first two code channels of timeslot#0 with spreading factor of 16.
DwPCH	1	Synchronization Channel for DL. Present in each 5 ms subframe.
UpPCH	1	Synchronization Channel for UL. Present in each 5 ms subframe.
S-CCPCH	2	Secondary Common Control Physical channel. PCH and FACH as described in clause 4.2.1 are mapped onto one or more S-CCPCH.
PICH		Paging Indicator Channel is a physical channel used to carry the paging indicators.
DPCH (DL)	3	Downlink Dedicated Physical channel. DCH channels are mapped onto DPCH
PDSCH	1	Physical Downlink Shared Channel. PDSCH provides the possibility for transmission of TFCI, SS, and TPC in downlink.
DPCH (UL)	1	Uplink Dedicated Physical channel. DCH channels are mapped onto DPCH.
PUSCH	1	Physical Uplink Shared Channel. PUSCH provides the possibility for transmission of TFCI, SS, and TPC in uplink.

FPACH	1	Fast Physical Access Channel. FPACH is used by the Node B to carry, in a single burst, the acknowledgement of a detected signature with timing and power level adjustment indication to a user equipment.
PRACH	2	Physical Random Access Channel. The RACH as described in clause 4.2.1 is mapped onto one or more uplink Physical Random Access Channels (PRACH).

4.2.1.2A Supported Channels for MBSFN (FDD and TDD Mode)

4.2.1.2A.1 Logical channels

Logical channel	Minimum number	Comments
Control channels		
BCCH	1	Broadcast Control Channel: DL channel for broadcasting system control information.
MCCH	1	MBMS point-to-multipoint Control Channel: A point-to-multipoint downlink channel used for transmitting control information from the network to the UE. This channel is only used by UEs that receive MBMS.
MSCH	1	MBMS point-to-multipoint Scheduling Channel: A point-to-multipoint downlink channel used for transmitting scheduling control information, from the network to the UE, for one or several MTCHs carried on a CCTrCH. This channel is only used by UEs that receive MBMS.
Traffic channels		
MTCH	1	MBMS point-to-multipoint Traffic Channel: A point-to-multipoint downlink channel used for transmitting traffic data from the network to the UE. This channel is only used for MBMS.

4.2.1.2A.2 Transport channels

Transport channel	Minimum number	Comments
BCH	1	Broadcast Channel: DL channel used to broadcast system and cell-specific information.
FACH	2	Forward Access Channel: Common downlink channel without closed-loop power control used for transmission of relatively small amounts of data. In addition FACH is used to carry broadcast and multicast data.

4.2.1.2A.3 Physical channels (3.84/7.68 Mcps options)

Physical channel	Minimum number	Comments
P-CCPCH	1	Primary Common Control Physical channel: The BCH as described in clause 4.2.1 is mapped onto the P-CCPCH. The position (time slot / code) of the P-CCPCH is known from PSCH.
SCH	1	Synchronization Channel: Code group of a cell can be derived from the synchronization channel. In order not to limit the uplink/downlink asymmetry the SCH is mapped on one or two downlink slots per frame only.
S-CCPCH	2	Secondary Common Control Physical channel: FACH as described in clause 4.2.1 is mapped onto one or more S-CCPCH.
MICH	1	MBMS Indicator Channel: Used to carry the MBMS notification indicators

4.2.1.2A.3A Physical channels (3.84 Mcps TDD IMB option)

Physical channel	Minimum number	Comments
P-CPICH	1	Primary Common Pilot Channel using the Primary Scrambling Code for the Cell.
T-CPICH	1	Time multiplexed Common Pilot Channel using the same Scrambling Code as P-CPICH for the Cell.
P-CCPCH	1	Primary Common Control Physical channel: The BCH as described in clause 4.2.1.2A.2 is mapped onto the P-CCPCH.
SCH	1	Synchronization Channel (includes P-SCH and S-SCH)
S-CCPCH	1	Secondary Common Control Physical channel: FACH carrying MCCH logical channel is mapped onto one S-CCPCH.

S-CCPCH Type 2	1	Secondary Common Control Physical Channel Type 2: one or more FACH carrying MTCH logical channels is/are mapped onto one S-CCPCH Type 2
MICH	1	MBMS Indicator Channel: Used to carry the MBMS notification indicators

4.2.1.3 Support of T_{cell} timing offset

In test case parameter declarations, the parameter T_{cell} may be specified between 0 to 38 399, to allow for extensibility. However, the system simulator is required only to support a maximum T_{cell} value of 2 304, with a step resolution of 256. The SS may limit a T_{cell} value of greater than 2 304, and may round T_{cell} to the nearest multiple of 256.

4.2.2 RF Performance

4.2.2.1 Frequency of Operation

The System Simulator shall be capable of adjusting the Carrier Frequency of the DL channels to any frequency allowed in the DL frequency band. The DL frequency shall be accurate to the level of accuracy set by the core specifications 3GPP TS 25.104 [20] for FDD and 3GPP TS 25.105 [21] for TDD.

For RF tests, the requirement of Test Equipment is described in 3GPP TS 34.121 [2] annex F for FDD and 3GPP TS 34.122 [5] annex F for TDD respectively.

4.2.2.2 Power Level Setting Accuracy

The system simulator shall be able to adjust the average power output of the DL Channels to meet the absolute accuracy of the system simulator DL power levels covered in clause 5.4.1 Downlink Signal Levels.

For RF tests, the requirement of Test Equipment is described in 3GPP TS 34.121 [2] annex F for FDD and 3GPP TS 34.122 [5] annex F for TDD respectively.

The system simulator shall be capable of altering the power of the DL Dedicated channels under control of the UE Layer 1 Signalling information.

4.2.2.3 Uplink Power Control

The system simulator shall be able to command the UE to transmit at the maximum level for its power class or a lower level required for specific tests. The system simulator shall also provide the capability of generating the Layer 1 Signalling information to set the power levels of the Uplink Dedicated Channels from the UE to lower levels if required.

4.2.2.4 Uplink Signal Handling

For FDD mode, the System Simulator shall not be damaged by a Power Class 1 UE transmitting at the maximum power level permitted in 3GPP TS 25.101 [11] and for TDD mode by a Power Class 2 UE transmitting at the maximum power level permitted in 3GPP TS 25.102 [12].

4.2.2.5 Uplink Sensitivity

The simulator shall be able to receive uplink transmissions from the UE when it is transmitting at the minimum power level defined in 3GPP TS 25.101 [11] for FDD mode, and 3GPP TS 25.102 [12] for TDD mode.

Editor's note: this is obviously a useful feature for the system simulator; however it is <ffs> if it should be an essential common requirement for a protocol test system.

4.2.3 Timers Tolerances

All the timers used during testing are within a tolerance margin given by the equation below. If for a specific test a different tolerance value is required then this should be specified in the relevant test document (i.e. the document where the test is described).

Timer tolerance = 10%, or $2 \times TTI + t_{\text{delta}}$, whichever value is the greater.

Where t_{delta} is 55 ms.

5 Reference test conditions

5.1 Test frequencies

The test frequencies are based the UMTS frequency bands defined in the core specifications.

To avoid interference with adjacent frequency bands the lowest test frequency (downlink and uplink) needs to be offset upwardly by at least 2.6 MHz since the channel's width is 5 MHz for FDD and 3.84 Mcps TDD option, and 0.8 MHz for 1.28 Mcps TDD option since the channel's width is 1.6 MHz. The raster spacing is 200KHz. Similarly the highest test frequency (downlink and uplink) needs to be offset downwardly by at least 2.6 MHz for FDD and 3.84 Mcps TDD option, and 0.8 MHz for 1.28 Mcps TDD option.

NOTE1: Additional regulations concerning interferences to frequency bands used by different systems may also exist. Those regulations are specific to the country where the test equipment is used and need to be taken into account if they require a higher offset than 2.6 MHz from the edge frequencies for FDD and 3.84 Mcps TDD option, and 0.8 MHz for 1.28 Mcps TDD option.

NOTE2: In Band VI, to avoid interference with adjacent frequency bands the lowest test frequency (downlink and uplink) needs to be offset upwardly by at least 2.5 MHz, highest test frequency (downlink and uplink) needs to be offset downwardly by at least 2.5 MHz from the edge frequencies since additional centre frequencies are specified according to 3GPP TS 25.101 [11].

5.1.1 FDD Mode Test frequencies

UTRA/FDD is designed to operate in one or more paired bands specified in 3GPP TS 25.101 [11]. The reference test frequencies for the common test environment for each operating bands are defined in the following tables.

In DC-HSDPA mode UE receives two cells simultaneously, the serving HS-DSCH cell and the secondary serving HS-DSCH cell. The spacing of carrier frequencies of the two cells is 5 MHz.

In DC-HSUPA mode UE transmits two cells simultaneously, the Primary uplink frequency and the Secondary uplink frequency. The spacing of carrier frequencies of the two cells is 5 MHz.

In DB-DC-HSDPA mode UE receives two cells simultaneously, the serving HS-DSCH cell and the secondary serving HS-DSCH cell. The serving and secondary serving cell are on different operating bands and therefore utilize the same reference test frequencies per operating band as in single cell operation. The same test frequency ID (Low, Mid or High) is configured on both bands. The serving cell is placed on the lowest band number and the secondary serving cell is placed on the highest band number in the band combination defined in table 5.0aA of 3GPP TS 25.101 [11].

In 4C-HSDPA mode UE receives up to four cells simultaneously, the serving HS-DSCH cell and the secondary serving HS-DSCH cells. The serving cell and the secondary serving cells configuration for single band and dual band are defined in tables 5.0aB and 5.0aC of 3GPP TS 25.101 [11] respectively. The spacing of the adjacent carrier frequencies in downlink and uplink shall be 5 MHz and Mid frequency shall be used on both the bands wherever applicable. The downlink test frequencies for the different 4C-HSDPA band combinations are specified under each associated band (A and B).

NOTE: Example 4C-HSDPA band combination II-2-IV-2: The test frequencies for the Serving Cell and one of the Secondary Serving Cells are specified in subclause 5.1.1.2 for band II (Band A); and the other two Secondary Serving Cells are specified in subclause 5.1.1.4 for band IV (Band B).

5.1.1.1 FDD reference test frequencies for Operating Band I

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	9613	1922.6 MHz	10563	2112.6 MHz
Mid Range	9750	1950.0 MHz	10700	2140.0 MHz
High Range	9887	1977.4 MHz	10837	2167.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink

Low Range	Serving Cell	9613	1922.6 MHz	10563	2112.6 MHz
	Secondary Serving Cell	-	-	10588	2117.6 MHz
Mid Range	Serving Cell	9750	1950.0 MHz	10700	2140.0 MHz
	Secondary Serving Cell	-	-	10725	2145.0 MHz
High Range	Serving Cell	9887	1977.4 MHz	10837	2167.4 MHz
	Secondary Serving Cell	-	-	10812	2162.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	9613	1922.6 MHz	10563	2112.6 MHz
	Secondary Serving Cell	9638	1927.6 MHz	10588	2117.6 MHz
Mid Range	Serving Cell	9750	1950.0 MHz	10700	2140.0 MHz
	Secondary Serving Cell	9775	1955.0 MHz	10725	2145.0 MHz
High Range	Serving Cell	9887	1977.4 MHz	10837	2167.4 MHz
	Secondary Serving Cell	9862	1972.4 MHz	10812	2162.4 MHz

For 3C/4C DC-HSDPA mode:

Applicable 3C/4C configurations: I-1-V-2, I-2-VIII-1.I-2-V-1, I-2-V-2, I-3 and I-3-VIII-1 with up to 2 uplink carriers.

NOTE See subclauses 5.1.1.5 and 5.1.1.8 for test frequencies for the associated carriers on bands V and VIII.

Test Frequency ID	HS-DSCH Cell	Applicable I-x configuration	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	I-1, I-2, I-3	9613	1922.6 MHz	10563	2112.6 MHz
	Secondary Serving Cell	I-2, I-3	9638	1927.6 MHz	10588	2117.6 MHz
	Secondary Serving Cell	I-3	-	-	10613	2122.6 MHz
Mid Range	Serving Cell	I-1, I-2, I-3	9750	1950.0 MHz	10700	2140.0 MHz
	Secondary Serving Cell	I-2, I-3	9775	1955.0 MHz	10725	2145.0 MHz
	Secondary Serving Cell	I-3	-	-	10750	2150.0 MHz
High Range	Serving Cell	I-1, I-2, I-3	9887	1977.4 MHz	10837	2167.4 MHz
	Secondary Serving Cell	I-2, I-3	9862	1972.4 MHz	10812	2162.4 MHz
	Secondary Serving Cell	I-3	-	-	10787	2157.4 MHz

5.1.1.2 FDD reference test frequencies for Operating Band II

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	9263	1852.6 MHz	9663	1932.6 MHz
Mid Range	9400	1880.0 MHz	9800	1960.0 MHz
High Range	9537	1907.4 MHz	9937	1987.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	9263	1852.6 MHz	9663	1932.6 MHz
	Secondary Serving Cell	-	-	9688	1937.6 MHz
Mid Range	Serving Cell	9400	1880.0 MHz	9800	1960.0 MHz
	Secondary Serving Cell	-	-	9825	1965.0 MHz
High Range	Serving Cell	9537	1907.4 MHz	9937	1987.4 MHz
	Secondary Serving Cell	-	-	9912	1982.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	9263	1852.6 MHz	9663	1932.6 MHz
	Secondary Serving Cell	9288	1857.6 Mhz	9688	1937.6 MHz
Mid Range	Serving Cell	9400	1880.0 MHz	9800	1960.0 MHz
	Secondary Serving Cell	9425	1885.0 Mhz	9825	1965.0 MHz
High Range	Serving Cell	9537	1907.4 MHz	9937	1987.4 MHz
	Secondary Serving Cell	9512	1902.4 Mhz	9912	1982.4 MHz

For 3C/4C DC-HSDPA mode:

Applicable 3C/4C configurations: II-1-IV-2, II-2-IV-1 and II-2-IV-2 with up to 2 uplink carriers.

NOTE See subclause 5.1.1.4 for test frequencies for the associated carriers on band IV.

Test Frequency ID	HS-DSCH Cell	Applicable II-x configuration	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	II-1, II-2	9263	1852.6 MHz	9663	1932.6 MHz
	Secondary Serving Cell	II-2	9288	1857.6 Mhz	9688	1937.6 MHz
Mid Range	Serving Cell	II-1, II-2	9400	1880.0 MHz	9800	1960.0 MHz
	Secondary Serving Cell	II-2	9425	1885.0 Mhz	9825	1965.0 MHz
High Range	Serving Cell	II-1, II-2	9537	1907.4 MHz	9937	1987.4 MHz
	Secondary Serving Cell	II-2	9512	1902.4 Mhz	9912	1982.4 MHz

5.1.1.3 FDD reference test frequencies for Operating Band III

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	938	1712.6 MHz	1163	1807.6 MHz
Mid Range	1112	1747.4 MHz	1337	1842.4 MHz
High Range	1287	1782.4 MHz	1512	1877.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	938	1712.6 MHz	1163	1807.6 MHz
	Secondary Serving Cell	-	-	1188	1812.6 MHz
Mid Range	Serving Cell	1112	1747.4 MHz	1337	1842.4 MHz
	Secondary Serving Cell	-	-	1362	1847.4 MHz
High Range	Serving Cell	1287	1782.4 MHz	1512	1877.4 MHz
	Secondary Serving Cell	-	-	1487	1872.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	938	1712.6 MHz	1163	1807.6 MHz
	Secondary Serving Cell	963	1717.6 MHz	1188	1812.6 MHz
Mid Range	Serving Cell	1112	1747.4 MHz	1337	1842.4 MHz
	Secondary Serving Cell	1137	1752.4 MHz	1362	1847.4 MHz
High Range	Serving Cell	1287	1782.4 MHz	1512	1877.4 MHz
	Secondary Serving Cell	1262	1777.4 MHz	1487	1872.4 MHz

5.1.1.4 FDD reference test frequencies for Operating Band IV

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
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Low Range	1313	1712.6 MHz	1538	2112.6 MHz
Mid Range	1450	1740.0 MHz	1675	2140.0 MHz
High Range	1512	1752.4 MHz	1737	2152.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	1313	1712.6 MHz	1538	2112.6 MHz
	Secondary Serving Cell	-	-	1563	2117.6 MHz
Mid Range	Serving Cell	1450	1740.0 MHz	1675	2140.0 MHz
	Secondary Serving Cell	-	-	1700	2145.0 MHz
High Range	Serving Cell	1512	1752.4 MHz	1737	2152.4 MHz
	Secondary Serving Cell	-	-	1712	2147.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	1313	1712.6 MHz	1538	2112.6 MHz
	Secondary Serving Cell	1338	1717.6 MHz	1563	2117.6 MHz
Mid Range	Serving Cell	1450	1740.0 MHz	1675	2140.0 MHz
	Secondary Serving Cell	1475	1745.0 MHz	1700	2145.0 MHz
High Range	Serving Cell	1512	1752.4 MHz	1737	2152.4 MHz
	Secondary Serving Cell	1487	1747.4 MHz	1712	2147.4 MHz

For 3C/4C DC-HSDPA mode:

Applicable 3C/4C configurations: II-1-IV-2, II-2-IV-1 and II-2-IV-2 with up to 2 uplink carriers.

NOTE See subclause 5.1.1.2 for test frequencies for the associated carriers on band II.

Test Frequency ID	HS-DSCH Cell	Applicable IV-x configuration	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Secondary Serving Cell	IV-1, IV-2	-	-	1538	2112.6 MHz
	Secondary Serving Cell	IV-2	-	-	1563	2117.6 MHz
Mid Range	Secondary Serving Cell	IV-1, IV-2	-	-	1675	2140.0 MHz
	Secondary Serving Cell	IV-2	-	-	1700	2145.0 MHz
High Range	Secondary Serving Cell	IV-1, IV-2	-	-	1737	2152.4 MHz
	Secondary Serving Cell	IV-2	-	-	1712	2147.4 MHz

5.1.1.5 FDD reference test frequencies for Operating Band V

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	4133	826.6 MHz	4358	871.6 MHz
Mid Range	4175	835.0 MHz	4400	880.0 MHz
High Range	4232	846.4 MHz	4457	891.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4133	826.6 MHz	4358	871.6 MHz
	Secondary Serving Cell	-	-	4383	876.6 MHz
Mid Range	Serving Cell	4175	835.0 MHz	4400	880.0 MHz
	Secondary Serving Cell	-	-	4425	885.0 MHz
High Range	Serving Cell	4232	846.4 MHz	4457	891.4 MHz

	Secondary Serving Cell	-	-	4432	886.4 MHz
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For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4133	826.6 MHz	4358	871.6 MHz
	Secondary Serving Cell	4158	831.6 MHz	4383	876.6 MHz
Mid Range	Serving Cell	4175	835.0 MHz	4400	880.0 MHz
	Secondary Serving Cell	4200	840.0 MHz	4425	885.0 MHz
High Range	Serving Cell	4232	846.4 MHz	4457	891.4 MHz
	Secondary Serving Cell	4207	841.4 MHz	4432	886.4 MHz

For 3C/4C DC-HSDPA mode:

Applicable 3C/4C configurations: I-1-V-2, I-2-V-1 and I-2-V-2 with up to 2 uplink carriers.

NOTE See subclause 5.1.1.1 for test frequencies for the associated carriers on band I.

Test Frequency ID	HS-DSCH Cell	Applicable V-x configuration	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Secondary Serving Cell	V-1, V-2	-	-	4358	871.6 MHz
	Secondary Serving Cell	V-2	-	-	4383	876.6 MHz
Mid Range	Secondary Serving Cell	V-1, V-2	-	-	4400	880.0 MHz
	Secondary Serving Cell	V-2	-	-	4425	885.0 MHz
High Range	Secondary Serving Cell	V-1, V-2	-	-	4457	891.4 MHz
	Secondary Serving Cell	V-2	-	-	4432	886.4 MHz

5.1.1.6 FDD reference test frequencies for Operating Band VI

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	812	832.5 MHz	1037	877.5 MHz
Mid Range	4175	835.0 MHz	4400	880.0 MHz
High Range	837	837.5 MHz	1062	882.5 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-
Mid Range	Serving Cell	812	832.5 MHz	1037	877.5 MHz
	Secondary Serving Cell	-	-	1062	882.5 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-
Mid Range	Serving Cell	812	832.5 MHz	1037	877.5 MHz
	Secondary Serving Cell	837	837.5 MHz	1062	882.5 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

NOTE 1: For Band VI testing, the Mobile Country Code shall be set to (MCC = '442/443').

NOTE 2: In DC-HSDPA mode and in DC-HSDPA mode only Mid Range frequencies are specified since the available downlink bandwidth is only 10 MHz at Band VI and hence the specified Mid Range frequencies already cover the whole available downlink bandwidth.

5.1.1.7 FDD reference test frequencies for Operating Band VII

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	2013	2502.6 MHz	2238	2622.6 MHz
Mid Range	2175	2535.0 MHz	2400	2655.0 MHz
High Range	2337	2567.4 MHz	2562	2687.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	2013	2502.6 MHz	2238	2622.6 MHz
	Secondary Serving Cell	-	-	2263	2627.6 MHz
Mid Range	Serving Cell	2175	2535.0 MHz	2400	2655.0 MHz
	Secondary Serving Cell	-	-	2425	2660.0 MHz
High Range	Serving Cell	2337	2567.4 MHz	2562	2687.4 MHz
	Secondary Serving Cell	-	-	2537	2682.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	2013	2502.6 MHz	2238	2622.6 MHz
	Secondary Serving Cell	2038	2507.6 MHz	2263	2627.6 MHz
Mid Range	Serving Cell	2175	2535.0 MHz	2400	2655.0 MHz
	Secondary Serving Cell	2200	2540.0 MHz	2425	2660.0 MHz
High Range	Serving Cell	2337	2567.4 MHz	2562	2687.4 MHz
	Secondary Serving Cell	2312	2562.4 MHz	2537	2682.4 MHz

5.1.1.8 FDD reference test frequencies for Operating Band VIII

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	2713	882.6 MHz	2938	927.6 MHz
Mid Range	2788	897.6 MHz	3013	942.6 MHz
High Range	2862	912.4 MHz	3087	957.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	2713	882.6 MHz	2938	927.6 MHz
	Secondary Serving Cell	-	-	2963	932.6 MHz
Mid Range	Serving Cell	2788	897.6 MHz	3013	942.6 MHz
	Secondary Serving Cell	-	-	3038	947.6 MHz
High Range	Serving Cell	2862	912.4 MHz	3087	957.4 MHz
	Secondary Serving Cell	-	-	3062	952.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
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Low Range	Serving Cell	2713	882.6 MHz	2938	927.6 MHz
	Secondary Serving Cell	2738	887.6 MHz	2963	932.6 MHz
Mid Range	Serving Cell	2788	897.6 MHz	3013	942.6 MHz
	Secondary Serving Cell	2813	902.6 MHz	3038	947.6 MHz
High Range	Serving Cell	2862	912.4 MHz	3087	957.4 MHz
	Secondary Serving Cell	2837	907.4 MHz	3062	952.4 MHz

For 3C/4C DC-HSDPA mode:

Applicable 3C/4C configurations: I-2-VIII-1 and I-3-VIII-1 with up to 1 uplink carrier.

NOTE See subclause 5.1.1.1 for test frequencies for the associated carriers on band I.

Test Frequency ID	HS-DSCH Cell	Applicable VIII-x configuration	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Secondary Serving Cell	VIII-1	-	-	2938	927.6 MHz
Mid Range	Secondary Serving Cell	VIII-1	-	-	3013	942.6 MHz
High Range	Secondary Serving Cell	VIII-1	-	-	3087	957.4 MHz

5.1.1.9 FDD reference test frequencies for Operating Band IX

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	8 762	1752.4 MHz	9 237	1847.4 MHz
Mid Range	8 837	1767.4MHz	9 312	1862.4 MHz
High Range	8 912	1782.4 MHz	9 387	1877.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	8762	1752.4 MHz	9237	1847.4 MHz
	Secondary Serving Cell	-	-	9262	1852.4 MHz
Mid Range	Serving Cell	8837	1767.4MHz	9312	1862.4 MHz
	Secondary Serving Cell	-	-	9337	1867.4 MHz
High Range	Serving Cell	8 912	1782.4 MHz	9387	1877.4 MHz
	Secondary Serving Cell	-	-	9362	1872.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	8762	1752.4 MHz	9237	1847.4 MHz
	Secondary Serving Cell	8787	1757.4 MHz	9262	1852.4 MHz
Mid Range	Serving Cell	8837	1767.4MHz	9312	1862.4 MHz
	Secondary Serving Cell	8862	1772.4MHz	9337	1867.4 MHz
High Range	Serving Cell	8912	1782.4 MHz	9387	1877.4 MHz
	Secondary Serving Cell	8887	1777.4 MHz	9362	1872.4 MHz

NOTE 1: For Band IX testing, the Mobile Country Code shall be set to (MCC = '442/443').

5.1.1.10 FDD reference test frequencies for Operating Band X

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	2888	1712.6 MHz	3113	2112.6 MHz
Mid Range	3025	1740.0 MHz	3250	2140.0 MHz
High Range	3162	1767.4 MHz	3387	2167.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	2888	1712.6 MHz	3113	2112.6 MHz
	Secondary Serving Cell	-	-	3138	2117.6 MHz
Mid Range	Serving Cell	3025	1740.0 MHz	3250	2140.0 MHz
	Secondary Serving Cell	-	-	3275	2145.0 MHz
High Range	Serving Cell	3162	1767.4 MHz	3387	2167.4 MHz
	Secondary Serving Cell	-	-	3362	2162.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	2888	1712.6 MHz	3113	2112.6 MHz
	Secondary Serving Cell	2913	1717.6 MHz	3138	2117.6 MHz
Mid Range	Serving Cell	3025	1740.0 MHz	3250	2140.0 MHz
	Secondary Serving Cell	3050	1745.0 MHz	3275	2145.0 MHz
High Range	Serving Cell	3162	1767.4 MHz	3387	2167.4 MHz
	Secondary Serving Cell	3137	1762.4 MHz	3362	2162.4 MHz

5.1.1.11 FDD reference test frequencies for Operating Band XI

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	3487	1430.4 MHz	3712	1478.4 MHz
Mid Range	3525	1438.0 MHz	3750	1486.0 MHz
High Range	3562	1445.4 MHz	3787	1493.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	3487	1430.4 MHz	3712	1478.4 MHz
	Secondary Serving Cell	-	-	3737	1483.4 MHz
Mid Range	Serving Cell	3525	1438.0 MHz	3750	1486.0 MHz
	Secondary Serving Cell	-	-	3775	1491.0 MHz
High Range	Serving Cell	3562	1445.4 MHz	3787	1493.4 MHz
	Secondary Serving Cell	-	-	3762	1488.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	3487	1430.4 MHz	3712	1478.4 MHz
	Secondary Serving Cell	3512	1435.4 MHz	3737	1483.4 MHz
Mid Range	Serving Cell	3525	1438.0 MHz	3750	1486.0 MHz
	Secondary Serving Cell	3550	1443.0 MHz	3775	1491.0 MHz
High Range	Serving Cell	3562	1445.4 MHz	3787	1493.4 MHz
	Secondary Serving Cell	3537	1440.4 MHz	3762	1488.4 MHz

5.1.1.12 FDD reference test frequencies for Operating Band XII

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	3613	700.6 MHz	3838	730.6 MHz
Mid Range	3645	707.0 MHz	3870	737.0 MHz

High Range	3677	713.4 MHz	3902	743.4 MHz
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For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	3613	700.6 MHz	3838	730.6 MHz
	Secondary Serving Cell	-	-	3863	735.6 MHz
Mid Range	Serving Cell	3652	708.4 MHz	3877	738.4 MHz
	Secondary Serving Cell	-	-	3902	743.4 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	3613	700.6 MHz	3838	730.6 MHz
	Secondary Serving Cell	3638	705.6 MHz	3863	735.6 MHz
Mid Range	Serving Cell	3652	708.4 MHz	3877	738.4 MHz
	Secondary Serving Cell	3677	713.4 MHz	3902	743.4 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

NOTE: In DC-HSDPA mode and in DC-HSUPA mode only Low Range and Mid Range frequencies are specified since the available downlink bandwidth is only 18 MHz at Band XII and hence the specified Low Range and Mid Range frequencies already cover the whole available downlink bandwidth.

5.1.1.13 FDD reference test frequencies for Operating Band XIII

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	3793	779.6 MHz	4018	748.6 MHz
Mid Range	3805	782.0 MHz	4030	751.0 MHz
High Range	3817	784.4 MHz	4042	753.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-
Mid Range	Serving Cell	3842	779.5 MHz	4067	748.5 MHz
	Secondary Serving Cell	-	-	4092	753.5 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-
Mid Range	Serving Cell	3842	779.5 MHz	4067	748.5 MHz
	Secondary Serving Cell	3867	784.5 MHz	4092	753.5 MHz
High Range	Serving Cell	-	-	-	-

	Secondary Serving Cell	-	-	-	-
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NOTE: In DC-HSDPA mode and in DC-HSUPA mode only Mid Range frequencies are specified since the available downlink bandwidth is only 10 MHz at Band XIII and hence the specified Mid Range frequencies already cover the whole available downlink bandwidth.

5.1.1.14 FDD reference test frequencies for Operating Band XIV

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	3893	790.6 MHz	4118	760.6 MHz
Mid Range	3905	793.0 MHz	4130	763.0 MHz
High Range	3917	795.4 MHz	4142	765.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-
Mid Range	Serving Cell	3942	790.5 MHz	4167	760.5 MHz
	Secondary Serving Cell	-	-	4192	765.5 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-
Mid Range	Serving Cell	3942	790.5 MHz	4167	760.5 MHz
	Secondary Serving Cell	3967	795.5 MHz	4192	765.5 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

NOTE: In DC-HSDPA mode and in DC-HSUPA mode only Mid Range frequencies are specified since the available downlink bandwidth is only 10 MHz at Band XIV and hence the specified Mid Range frequencies already cover the whole available downlink bandwidth.

5.1.1.15 FDD reference test frequencies for Operating Band XV

FFS

5.1.1.16 FDD reference test frequencies for Operating Band XVI

FFS

5.1.1.17 FDD reference test frequencies for Operating Band XVII

FFS

5.1.1.18 FDD reference test frequencies for Operating Band XVIII

FFS

5.1.1.19 FDD reference test frequencies for Operating Band XIX

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	387	832.5 MHz	787	877.5 MHz

Mid Range	412	837.5 MHz	812	882.5 MHz
High Range	437	842.5 MHz	837	887.5 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	387	832.5 MHz	787	877.5 MHz
	Secondary Serving Cell	-	-	812	882.5 MHz
Mid Range	Serving Cell	412	837.5 MHz	812	882.5 MHz
	Secondary Serving Cell	-	-	837	887.5 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	387	832.5 MHz	787	877.5 MHz
	Secondary Serving Cell	412	837.5 MHz	812	882.5 MHz
Mid Range	Serving Cell	412	837.5 MHz	812	882.5 MHz
	Secondary Serving Cell	437	842.5 MHz	837	887.5 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

NOTE: In DC-HSDPA mode and in DC-HSUPA mode only Low Range and Mid Range frequencies are specified since the available downlink bandwidth is only 15 MHz at Band XIX and hence the specified Low Range and Mid Range frequencies already cover the whole available downlink bandwidth.

5.1.1.20 FDD reference test frequencies for Operating Band XX

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	4288	834.6 MHz	4513	793.6 MHz
Mid Range	4350	847.0 MHz	4575	806.0 MHz
High Range	4412	859.4 MHz	4637	818.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4288	834.6 MHz	4513	793.6 MHz
	Secondary Serving Cell	-	-	4538	798.6 MHz
Mid Range	Serving Cell	4338	844.6 MHz	4563	803.6 MHz
	Secondary Serving Cell	-	-	4588	808.6 MHz
High Range	Serving Cell	4412	859.4 MHz	4637	818.4 MHz
	Secondary Serving Cell	-	-	4612	813.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4288	834.6 MHz	4513	793.6 MHz
	Secondary Serving Cell	4313	839.6 MHz	4538	798.6 MHz
Mid Range	Serving Cell	4338	844.6 MHz	4563	803.6 MHz
	Secondary Serving Cell	4363	849.6 MHz	4588	808.6 MHz
High Range	Serving Cell	4412	859.4 MHz	4637	818.4 MHz

	Secondary Serving Cell	4387	854.4 MHz	4612	813.4 MHz
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5.1.1.21 FDD reference test frequencies for Operating Band XXI

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	462	1450.4 MHz	862	1498.4 MHz
Mid Range	487	1455.4 MHz	887	1503.4 MHz
High Range	512	1460.4 MHz	912	1508.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	462	1450.4 MHz	862	1498.4 MHz
	Secondary Serving Cell	-	-	887	1503.4 MHz
Mid Range	Serving Cell	487	1455.4 MHz	887	1503.4 MHz
	Secondary Serving Cell	-	-	912	1508.4 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	462	1450.4 MHz	862	1498.4 MHz
	Secondary Serving Cell	487	1455.4 MHz	887	1503.4 MHz
Mid Range	Serving Cell	487	1455.4 MHz	887	1503.4 MHz
	Secondary Serving Cell	512	1460.4 MHz	912	1508.4 MHz
High Range	Serving Cell	-	-	-	-
	Secondary Serving Cell	-	-	-	-

NOTE: In DC-HSDPA mode and in DC-HSUPA mode only Low Range and Mid Range frequencies are specified since the available downlink bandwidth is only 15 MHz at Band XXI and hence the specified Low Range and Mid Range frequencies already cover the whole available downlink bandwidth.

5.1.1.22 FDD reference test frequencies for Operating Band XXII

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	4438	3412.6 MHz	4663	3512.6 MHz
Mid Range	4625	3450.0 MHz	4850	3550.0 MHz
High Range	4812	3487.4 MHz	5037	3587.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4438	3412.6 MHz	4663	3512.6 MHz
	Secondary Serving Cell	-	-	4688	3517.6 MHz
Mid Range	Serving Cell	4625	3450.0 MHz	4850	3550.0 MHz
	Secondary Serving Cell	-	-	4875	3555.0 MHz
High Range	Serving Cell	4812	3487.4 MHz	5037	3587.4 MHz
	Secondary Serving Cell	-	-	5012	3582.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4438	3412.6 MHz	4663	3512.6 MHz
	Secondary Serving Cell	4463	3417.6 MHz	4688	3517.6 MHz
Mid Range	Serving Cell	4625	3450.0 MHz	4850	3550.0 MHz
	Secondary Serving Cell	4650	3455.0 MHz	4875	3555.0 MHz
High Range	Serving Cell	4812	3487.4 MHz	5037	3587.4 MHz
	Secondary Serving Cell	4787	3482.4 MHz	5012	3582.4 MHz

5.1.1.23 FDD reference test frequencies for Operating Band XXIII

FFS

5.1.1.24 FDD reference test frequencies for Operating Band XXIV

FFS

5.1.1.25 FDD reference test frequencies for Operating Band XXV

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	4888	1852.6 MHz	5113	1932.6 MHz
Mid Range	5037	1882.4 MHz	4962	1962.4 MHz
High Range	5187	1912.4 MHz	5412	1992.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4888	1852.6 MHz	5113	1932.6 MHz
	Secondary Serving Cell	-	-	5138	1937.6 MHz
Mid Range	Serving Cell	5037	1882.4 MHz	4962	1962.4 MHz
	Secondary Serving Cell	-	-	4987	1967.4 MHz
High Range	Serving Cell	5187	1912.4 MHz	5412	1992.4 MHz
	Secondary Serving Cell	-	-	5387	1987.4 MHz

For DC-HSUPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4888	1852.6	5113	1932.6
	Secondary Serving Cell	4913	1857,6	5138	1937.6
Mid Range	Serving Cell	5037	1882.4	4962	1962.4
	Secondary Serving Cell	5062	1887,4	4987	1967.4
High Range	Serving Cell	5187	1912.4	5412	1992.4
	Secondary Serving Cell	5162	1907,4	5387	1987.4

5.1.1.26 FDD reference test frequencies for Operating Band XXVI

Test Frequency ID	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	4083	816.6 MHz	4308	861.6 MHz
Mid Range	4157	831.4 MHz	4382	876.4 MHz
High Range	4232	846.4 MHz	4457	891.4 MHz

For DC-HSDPA mode:

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4083	816.6 MHz	4308	861.6 MHz
	Secondary Serving Cell	-	-	4333	866.6 MHz
Mid Range	Serving Cell	4157	831.4 MHz	4382	876.4 MHz
	Secondary Serving Cell	-	-	4407	881.4 MHz
High Range	Serving Cell	4232	846.4 MHz	4457	891.4 MHz
	Secondary Serving Cell	-	-	4432	886.4 MHz

For DC-HSUPA mode

Test Frequency ID	HS-DSCH Cell	UARFCN	Frequency of Uplink	UARFCN	Frequency of Downlink
Low Range	Serving Cell	4083	816.6 MHz	4308	861.6 MHz
	Secondary Serving Cell	4108	821.6 MHz	4333	866.6 MHz
Mid Range	Serving Cell	4157	831.4 MHz	4382	876.4 MHz
	Secondary Serving Cell	4182	836.4 MHz	4407	881.4 MHz
High Range	Serving Cell	4232	846.4 MHz	4457	891.4 MHz
	Secondary Serving Cell	4207	841.4 MHz	4432	886.4 MHz

5.1.2 TDD Mode Test frequencies

UTRA/TDD is designed to operate in one of three unpaired bands (3GPP TS 25.102 [12]). The reference test frequencies for the common test environment for each of the 3 operating bands are defined in the following tables:

5.1.2.1 Standard TDD reference test frequencies (3.84 Mcps option)

Test Frequency ID	Band a		Band b		Band c	
	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)
Low Range	9 513	1 902.6 MHz	9 263	1 852.6 MHz	9 563	1 912.6 MHz
Mid Range	9 550	1 910 MHz	9 400	1 880 MHz	9 600	1 920 MHz
High Range	9 587	1 917.4 MHz	9 537	1 907.4 MHz	9 637	1 927.4 MHz
Low Range	10 063	2 012.6 MHz	9 663	1 932.6 MHz		
Mid Range	10 087	2 017.4 MHz	9 800	1 960 MHz		
High Range	10 112	2 022.4 MHz	9 937	1 987.4 MHz		

5.1.2.2 Standard TDD reference test frequencies (1.28 Mcps option)

Test Frequency ID	Band a		Band b		Band c	
	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)
Low Range	9504	1900.8 MHz	9254	1850.8 MHz	9554	1910.8 MHz
Mid Range	9550	1910 MHz	9400	1880 MHz	9600	1920 MHz
High Range	9596	1919.2 MHz	9546	1909.2 MHz	9646	1929.2 MHz
Low Range	10054	2010.8 MHz	9654	1930.8 MHz		
Mid Range	10087	2017.4 MHz	9800	1960 MHz		
High Range	10121	2024.2 MHz	9946	1989.2 MHz		

Test Frequency ID	Band d		Band e		Band f	
	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)
Low Range	12854	2570.8 MHz	11504	2300.8 MHz	9404	1880.8 MHz
Mid Range	12950	2595 MHz	11750	2350 MHz	9500	1900 MHz
High Range	13096	2619.2 MHz	11996	2399.2 MHz	9596	1919.2 MHz

Low Range						
Mid Range						
High Range						

NOTE: In China, Band a only includes 2010 - 2025 MHz for 1.28 Mcps TDD option.

5.1.2.3 Standard TDD reference test frequencies (7.68 Mcps option)

Test Frequency ID	Band a		Band b		Band c	
	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)	UARFCN	Frequency (UL and DL)
Low Range	9 513	1 905 MHz	9 275	1 855 MHz	9 575	1 915 MHz
Mid Range	9 550	1 910 MHz	9 400	1 880 MHz	9 600	1 920 MHz
High Range	9 575	1 915 MHz	9 525	1 905 MHz	9 625	1 925 MHz
Low Range	10 075	2 015 MHz	9 675	1 935 MHz		
Mid Range	10 087	2 017.4 MHz	9 800	1 960 MHz		
High Range	10 100	2 020 MHz	9 925	1 985 MHz		

5.2 Radio conditions

There are a number of radio propagation conditions defined in 3GPP TS 34.121 [2] for FDD mode and 3GPP TS 34.122 [5] for TDD mode, which may be required for a number of tests and hence can be considered as Common Conditions for FDD mode and TDD mode respectively.

NOTE: The System Simulator is required to support at least the normal Propagation Condition; support of the other propagation conditions is optional, depending on the specific test supported by the simulator.

5.2.1 Normal propagation condition

This condition provides a connection between the System Simulator that is effectively free from Additive White Gaussian Noise, and where there are no fading or multipath effects. This condition will be used for Signalling tests.

5.2.2 Static propagation condition

See 3GPP TS 34.121 [2], annex D for FDD.

For TDD mode, the propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading and multi-paths exist for this propagation model.

5.2.3 Multi-path fading propagation conditions

See 3GPP TS 34.121 [2], annex D for FDD and 3GPP TS 34.122 [5], annex D for TDD.

5.2.4 Moving propagation conditions

See 3GPP TS 34.121 [2], annex D for FDD. There are no currently defined Moving propagation conditions for TDD.

5.2.5 Birth-Death propagation conditions

See 3GPP TS 34.121 [2], annex D for FDD. There are no currently defined Birth-Death propagation conditions for TDD.

5.2.6 High speed train conditions

See 3GPP TS 34.121 [2], annex D for FDD. There are no currently defined High speed train conditions for TDD.

5.3 Standard test signals

Reference 3GPP TS 25.101 [11] and 3GPP TS 25102 [12] for definitions of standard test signals.

5.4 Signal levels

The power levels given in clauses 5.4.1 and 5.4.2 apply for Signalling tests only. For RF tests power levels are given in 3GPP TS 34.121 [2], annex E for FDD and 3GPP TS 34.122 [5], annex E for TDD.

5.4.1 Downlink signal levels

The default signal levels are defined in clauses 6.1.5, 6.1.6, and 6.1.7 of this document. The SS shall be capable of setting these downlink signal levels, and any levels specifically defined in a test case within a maximum tolerance of +/- 3dB. If a test case fails due to inaccurate setting of the downlink signal levels by the SS, then the SS is adjusted in order that it provides the correct level, measured at the UE antenna, for the specific test case.

5.4.2 Uplink signal levels

The SS shall be capable of transmitting uplink TPC commands in order to meet the requirements specified in 3GPP TS 34.123-3 clause 7.3.2.2.14a.

5.5 Downlink Physical Channels Code Allocation

5.5.1 Downlink physical channels code allocation for Signalling (FDD)

5.5.1.1 Downlink physical channels code allocation for non-HSDPA test cases

Table 5.5.1.1.1 shows details of the downlink code tree for the Primary Scrambling Code, SF=16 & Code=0 used in the non-HSDPA test cases. The numbers in the Code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

Table 5.5.1.1.1: Non-HSDPA Downlink Physical Channels Code Allocation for SF=16 Code=0

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213
1: P-CCPCH			TS 25.213
2: PICH	1: -		Section 6.1.0b (SIB5)
3: AICH			Section 6.1.0b (SIB5)
4: -	2: -	1: S-CCPCH	Sections 6.1.0b, 6.1.1 & 6.1.3 (SIB5)
5: -			
6: -	3: -		
7: -			
8: -	4: S-CCPCH	2: S-CCPCH	Code 2: Section 6.1.3 (SIB5) Code 4: Sections 6.1.1 & 6.1.2 (SIB5) Code 5: Section 6.1.2 (SIB5) See Note.
9: -			
10: -	5: S-CCPCH	3: -	Section 6.1.3 (SIB5)
11: -			
12: -	6: S-CCPCH		
13: -			
14: -	7: -	-	
15: -		-	
Note: The default code allocation is extracted from section 6.1.0b. The S-CCPCH channels on codes 2, 4 & 5 are defined in specific cell configurations, as per sections 6.1.1, 6.1.2 & 6.1.3. For each configuration described above, the orthogonality is respected.			

5.5.1.2 Downlink physical channels code allocation for HSDPA test cases

Table 5.5.1.2.1 shows details of the downlink code tree for the Primary Scrambling Code, SF=16 & Code=0 used in the HSDPA test cases. Table 5.5.1.2.2 shows the downlink code tree used for 64QAM HSDPA test cases. The numbers in the Code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

The HS-PDSCH channels are allocated dynamically by the SS during execution of the HSDPA test case, under the same Scrambling Code as the HS-SCCH channel, on SF=16, in the range Code=1 to Code=15.

Table 5.5.1.2.1: HSDPA Downlink Physical Channels Code Allocation for SF=16 Code=0

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213
1: P-CCPCH			TS 25.213
2: PICH	1: -		Section 6.1.0b (SIB5)
3: AICH			Section 6.1.0b (SIB5)
4: -	2: -	1: S-CCPCH	Section 6.1.0b (SIB5)
5: -			
6: -			
7: -	3: -	2: -	-
8: -			
9: -	4: -	3: -	-
10: -			
11: -	5: -	3: -	-
12: -			
13: -	6: -	3: -	-
14: -			
15: -	7: HS-SCCH		Section 9.1.1 RB Setup message

Table 5.5.1.2.2: HSDPA [64QAM] Downlink Physical Channels Code Allocation for SF=16 Code=0

Code with SF=256	Code with SF=128	Code with SF=64	Note
0: P-CPICH	0: -	0: -	TS 25.213
1: P-CCPCH			TS 25.213
2: PICH	1: -		Section 6.1.0b (SIB5)
3: AICH			Section 6.1.0b (SIB5)
4: -	2: -	1: S-CCPCH	Section 6.1.0b (SIB5)
5: -			
6: -			
7: -	3: -	2: -	Section 9.1.1 RB Setup message, condition A17a
8: -			
9: -	4: HS-SCCH1	2: -	Section 9.1.1 RB Setup message, condition A17a
10: -			
11: -	5: HS-SCCH2	3: -	-
12: - S-CPICH			
13: DPCH-	6: -	3: -	- Section 9.1.1 RB Setup message, condition A28 (when mimo is configured)
14: -			Section 9.1.1 RB Setup message, condition A17a
15: -	7: -		

5.5.1.3 Downlink physical channels code allocation for E-DCH test cases

Table 5.5.1.3.1 shows details of the downlink code tree for the Primary Scrambling Code, SF=16 & Code=0 used in the E-DCH test cases. The numbers in the Code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

The HS-PDSCH channels are allocated dynamically by the SS during execution of the HSDPA test case, under the same Scrambling Code as the HS-SCCH channel, on SF=16, in the range Code=1 to Code=15.

Table 5.5.1.3.1: E-DCH Downlink Physical Channels Code Allocation for SF=16 Code=0

Code with SF=256	Code with SF=128	Code with SF=64	Note	
0: P-CPICH	0: -	0: -	TS 25.213	
1: P-CCPCH			TS 25.213	
2: PICH	1: -		Section 6.1.0b (SIB5)	
3: AICH			Section 6.1.0b (SIB5)	
4: -	2: -	1: S-CCPCH	Section 6.1.0b (SIB5)	
5: -				
6: -				
7: -	3: -	2: -	Section 9.1.1 RB Setup message	
8: -				
9: -	4: E-HICH/E-RGCH			
10: E-AGCH	5: -			Section 9.1.1 RB Setup message
11: -				
12: F-DPCH	6: -	3: -	Section 9.1.1 RB Setup message, condition A14	
13: -S-CPICH			- Section 9.1.1 RB Setup message, condition A28 (when mimo is configured.)	
14: -			7: HS-SCCH	Section 9.1.1 RB Setup message
15: -				

Table 5.5.1.3.2: E-DCH Downlink Physical Channels Code Allocation for SF=16 Code=0 with HSDPA [64QAM]

Code with SF=256	Code with SF=128	Code with SF=64	Note	
0: P-CPICH	0: -	0: -	TS 25.213	
1: P-CCPCH			TS 25.213	
2: PICH	1: -		Section 6.1.0b (SIB5)	
3: AICH			Section 6.1.0b (SIB5)	
4: -	2: -	1: S-CCPCH	Section 6.1.0b (SIB5)	
5: -				
6: -				
7: -	3: -	2: -	Section 9.1.1 RB Setup message	
8: -				
9: -	4: E-HICH/E-RGCH			
10: E-AGCH	5: -			Section 9.1.1 RB Setup message
11: F-DPCH				
12: -	6: HS-SCCH1	3: -	Section 9.1.1 RB Setup message, condition A17c	
13: -				
14: -				7: HS-SCCH2
15: -				

5.5.1.4 Downlink physical channels code allocation for MBMS/MBSFN test cases

Table 5.5.1.4 shows details of the downlink code tree for the Primary Scrambling Code used in the MBMS/MBSFN test cases. The numbers in the Code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

Table 5.5.1.4: MBMS/MBSFN Downlink Physical Channels Code Allocation

Code with SF=256	Code with SF=128	Code with SF=64	Code with SF=32	Code with SF=16	Code with SF=8	Note
0: P-CPICH	0: -	0: -	0: -	0: -	0: -	TS 25.213
1: P-CCPCH						TS 25.213
2: PICH	1: -	0: -	0: -	0: -	0: -	Clause 6.1.0b (SIB5)
3: AICH						Clause 6.1.0b (SIB5)
4: -	2: -	1: S-CCPCH1	0: -	0: -	0: -	Clause 6.1.0b (SIB5)
5: -						
6: -	3: -	1: S-CCPCH1	0: -	0: -	0: -	Clause 6.1.0b (SIB5)
7: -						
8: MICH	4: -	2	1: -	0: -	0: -	Clause 6.1.0b (SIB5)
9: S-CCPCH2						
10: -	5: -	2	1: -	0: -	0: -	Clause 6.1.0b (SIB5)
11: -						
12: -	6: -	3	1: -	0: -	0: -	Clause 6.1.0b (SIB5)
13: -						
14: -	7: -	3	1: -	0: -	0: -	Clause 6.1.0b (SIB5)
15: -						
16: -	8: -	4	2: S-CCPCH3	1: S-CCPCH3	0: -	Code 1: 129.6 kbps RB for MTCH
17: -						Code 2: 64.8 kbps RB for MTCH
18: -	9: -	4	2: S-CCPCH3	1: S-CCPCH3	0: -	Code 1: 129.6 kbps RB for MTCH
19: -						Code 2: 64.8 kbps RB for MTCH
20: -	10: -	5: -	2: S-CCPCH3	1: S-CCPCH3	0: -	Code 1: 129.6 kbps RB for MTCH
21: -						Code 2: 64.8 kbps RB for MTCH
22: -	11: -	5: -	2: S-CCPCH3	1: S-CCPCH3	0: -	Code 1: 129.6 kbps RB for MTCH
23: -						Code 2: 64.8 kbps RB for MTCH
24: -	12: -	6: -	3: S-CCPCH4	1: S-CCPCH3	0: -	64.8 kbps RB for MTCH
25: -						64.8 kbps RB for MTCH
26: -	13: -	6: -	3: S-CCPCH4	1: S-CCPCH3	0: -	64.8 kbps RB for MTCH
27: -						64.8 kbps RB for MTCH
28: -	14: -	7: -	3: S-CCPCH4	1: S-CCPCH3	0: -	64.8 kbps RB for MTCH
29: -						64.8 kbps RB for MTCH
30: -	15: -	7: -	3: S-CCPCH4	1: S-CCPCH3	0: -	64.8 kbps RB for MTCH
31: -						64.8 kbps RB for MTCH
32: -	16: -	8: -	4: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
33: -						Code 2: 129.6 kbps RB for MTCH
34: -	17: -	8: -	4: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
35: -						Code 2: 129.6 kbps RB for MTCH
36: -	18: -	9: -	4: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
37: -						Code 2: 129.6 kbps RB for MTCH
38: -	19: -	9: -	4: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
39: -						Code 2: 129.6 kbps RB for MTCH
40: -	20: -	10: -	5: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
41: -						Code 2: 129.6 kbps RB for MTCH
42: -	21: -	10: -	5: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
43: -						Code 2: 129.6 kbps RB for MTCH
44: -	22: -	11: -	5: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
45: -						Code 2: 129.6 kbps RB for MTCH
46: -	23: -	11: -	5: -	2: S-CCPCH4	1: S-CCPCH3	Code 1: 259.2 kbps RB for MTCH
47: -						Code 2: 129.6 kbps RB for MTCH
48: -	24: -	12: -	6: -	3: -	0: -	Code 1: 259.2 kbps RB for MTCH
49: -						Code 2: 129.6 kbps RB for MTCH
50: -	25: -	12: -	6: -	3: -	0: -	Code 1: 259.2 kbps RB for MTCH
51: -						Code 2: 129.6 kbps RB for MTCH
52: -	26: -	13: -	6: -	3: -	0: -	Code 1: 259.2 kbps RB for MTCH
53: -						Code 2: 129.6 kbps RB for MTCH
54: -	27: -	13: -	6: -	3: -	0: -	Code 1: 259.2 kbps RB for MTCH

55:-						
56:-	28:-	14:-	7:-			
57:-						
58:-	29:-					
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60:-	30:-	15:-				
61:-						
62:-	31:-					
63:-						
64:-	32:-	16:-	8:-	4:-	2: S-CCPCH4	259.2 kbps RB for MTCH
65:-						
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5.5.2 Downlink physical channels code allocation for Signalling (TDD)

<FFS>

5.5.2.1 Downlink physical channels code allocation for Signalling (3.84 Mcps TDD IMB)

Table 5.5.2.1 shows details of the downlink code tree for the Primary Scrambling Code used in the MBSFN test cases. The numbers in the Code columns indicate the code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

Table 5.5.2.1: MBSFN Downlink Physical Channels Code Allocation (3.84 Mcps TDD IMB)

Physical Channels	Spreading Factor	Code index	Note
P-CCPCH	256	1	TS 25.223
P-CPICH	256	0	TS 25.223
T-CPICH	16	1 to 15	TS 25.223
S-CCPCH	256	2 to 15	TS 25.223
S-CCPCH Type 2	16	1 to 15	TS 25.223
MICH	256	2 to 15	TS 25.223

5.5.2.2 Physical channels code allocation for Signalling (1.28 Mcps TDD)

Table 5.5.2.2 shows details of the physical channel code used in the test cases. The numbers in the Code columns indicate the timeslot and code number with the respective spreading factor (SF). The Note column refers to specifications where the code allocation is defined.

Table 5.5.2.2: Physical Channels Code Allocation (1.28 Mcps TDD IMB)

Physical Channels	Time slot	Spreading Factor	Code index	Note
P-CCPCH	0	16	0, 1	TS 25.223
P-RACH	1	8	7, 8	TS 25.223
FPACH	0	16	15	TS 25.223
PICH	0	16	5, 6	TS 25.223
S-CCPCH	0	16	7, 8	TS 25.223
HS-SCCH	6	16	11, 12	TS 25.223
HS-SICH	1	16	13	TS 25.223
ERUCCH	1	8	8	TS 25.223
E-AGCH	6	16	13, 14	TS 25.223
E-HICH	6	16	15	TS 25.223

5.5.3 Downlink physical channels code allocation for RF

The downlink physical channels code allocation for RF tests is defined in 3GPP TS 34.121 [2] Annex E.6.