WiMAX Forum® Air Interface Specifications

WiMAX Forum® Mobile System Profile

WMF-T23-001-R021v02

WMF Approved Specification

(2021-05-20)

WiMAX Forum Proprietary

Copyright Notice, Use Restrictions, Disclaimer, and Limitation of Liability

Table of Contents

List of Tables

Abstract

This document specifies the WiMAX Forum ® mobile air interface system profile Release 3, for the purpose of certification of conformant Subscriber Stations and Base Stations. The profile is based on IEEE Std 802.16m. WiMAX Forum Mobile Air Interface system profile Release 2.1 is backward compatible to Certification Release 1b of WiMAX Forum Mobile System Profile Release 1 or 1.5 or 2.1 or 2.2 as specified in [1] and [2] ,[4],[5],[6], [7] and [8]. This air interface profile document specifies feature level compliance requirements for MAC layer and PHY layer aspects of the system.

1. Scope

This document specifies the WiMAX Forum® mobile air interface system profile of Release 3, for the purpose of certification of conformant Subscriber Stations and Base Stations. The profile is backward compatible to Release 1b of WiMAX Forum Mobile System Profile Release 1 [1],[2], WiMAX Forum Mobile System Profile Release 1.5 [4],[5],[6], WiMAX Forum Mobile System Profile Release 2.1 [7], and WiMAX Forum Mobile System Profile Release 2.2 [8]. Although this document includes features related to the categorization of Release 2 devices, the details of device categorization including relevant parameters are covered in [3].

2. References

[1] WMF-T23-001-R010v09_MSP, WiMAX Forum® Mobile System Profile Release 1, 2010-09-07

[2] WMF-T24-002-R010_TPA, WiMAX Forum® Trait Packages Release 1

[3] WMF-T23-00X-Rnnn MDC, WiMAX Forum® Mobile Device Categories

[4] WMF-T23-001-R015v03_MSP, WiMAX Forum® Mobile System Profile Release 1.5 Common Part, 2012-04-16

[5] WMF-T23-002-R015v01_MSP-TDD, WiMAX Forum® Mobile System Profile Release 1.5 TDD Specific Part, 2009-08-01

[6] WMF-T23-003-R015v01_MSP-FDD, WiMAX Forum® Mobile System Profile Release 1.5 FDD Specific Part, 2009-08-01

[7] WMF-T23-001-R021 - WiMAX Forum® Air Interface Specifications - Mobile System Profile - Release 2.1

[8] WMF-T23-001-R022 - WiMAX Forum® Air Interface Specifications - Mobile System Profile - Release 2.1

[9] TS 38.101-1 NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone: V16.5.0

[10] TS 38.101-2 NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone: V16.5.0

[11] TS 38.101-3 NR; User Equipment (UE) radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios: V16.5.0

[12] TS 38.104 NR; Base Station (BS) radio transmission and reception: V16.5.0

[13] TS 38.133 NR; Requirements for support of radio resource management: V16.5.0

[14] TS 38.201 NR; Physical layer; General description: V16.0.0

[15] TS 38.202 NR; Services provided by the physical layer: V16.2.0

[16] TS 38.211 NR; Physical channels and modulation: V16.3.0

[17] TS 38.212 NR; Multiplexing and channel coding: V16.3.0

[18] TS 38.213 NR; Physical layer procedures for control: V16.3.0

[19] TS 38.214 NR; Physical layer procedures for data: V16.3.0

[20] TS 38.215 NR; Physical layer measurements: V16.3.0

[21] TS 38.300 NR; Overall description; Stage-2: V16.3.0

[22] TS 38.304 NR; User Equipment (UE) procedures in idle mode and in RRC Inactive state: V16.2.0

[23] TS 38.306 NR; User Equipment (UE) radio access capabilities: V16.2.0

[24] TS 38.307 NR; Requirements on User Equipments (UEs) supporting a release-independent frequency band: V16.4.0

[25] TS 38.321 NR; Medium Access Control (MAC) protocol specification: V16.2.1

[26] TS 38.322 NR; Radio Link Control (RLC) protocol specification: V16.1.0

[27] TS 38.323 NR; Packet Data Convergence Protocol (PDCP) specification: V16.2.0

[28] TS 38.331 NR; Radio Resource Control (RRC); Protocol specification: V16.2.0

[29] TS 37.324 Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Service Data Adaptation Protocol (SDAP) specification: V16.2.0

[30] TS 37.340 NR; Multi-connectivity; Overall description; Stage-2: V16.3.0

Note: The version number of WiMAX Forum® Air Interface Specifications - Mobile System Profile - Release 2.1 and Release 2.2 can be read as the latest one in the same release if the document number is updated

Note: The version number of 3GPP specification document can be read as the latest one if the document number is updated.

3. Definitions

For the purposes of the present document, the following terms and definitions apply:

3.1 Abbreviations

3.2 Definitions of system profiles

Definitions of different terms used in the System Profile provided in this subsection.

3.3 Conventions

3.3.1 Item column

The Item column contains a number that identifies each description in the table.

3.3.2 Description column

The description column describes in free text each respective item (e.g., sub-features, parameters, timers, etc.).

3.3.3 Reference column

The reference column indicates the section of standard [1] from which the item is derived.

3.3.4 Status column

The following notations are used in the status column to indicate whether each item is mandatory or optional [1].

Table 1. Status Column Entries

m	Explicitly shown as mandatory in the standard. It is required to implement
pm	Potentially mandatory, required for the system to perform basic operations (Not explicitly shown as mandatory in the standard). It is required to implement.
o	Explicitly mentioned as optional in the standard or is not explicitly mentioned but has capability negotiations. It may or may not be implemented.
oi	Qualified options need a mutually exclusive or selectable option from a set. One or more of the options from the set shall be supported.
po	Potentially optional. Not explicitly mentioned as mandatory, but from the standard we may conclude it is, though not really required for the system to perform basic operations. We have to decide whether it should be defined as optional
n/a	Not applicable – in the given context, it is impossible to use the capability.

3.3.5 BS/MS Required column

The MSR/BSR columns indicate whether the item is required for every BS/MS to implement for WiMAX® certification purposes.

Table 2. Required Column Entries

Y or **y**	Required to implement
N or **n**	Not required to implement.
IOBS-NNNN	Inter-operable Options: Item belongs to NNNN group of features for which it is requested to provide testing procedure and distinct labeling of BS equipment as relevant to BS operation with a certain channel bandwidth. More specifically ▪ The item is not required to get general "WiMAX® certified" label and ▪ Is required to get distinct "WiMAX certified with NNNN capability label
IOMS-NNNN	Inter-operable Options: Item belongs to NNNN group of features for which it is requested to provide testing procedure and distinct labeling of MS equipment as relevant to MS operation with a certain channel bandwidth. More specifically ▪ The item is not required to get general "WiMAX certified" label and ▪ It is required to get distinct "WiMAX certified with NNNN capability" label
n/a	Not applicable

The following Inter-operable Options are defined and used in this document.

IO Option	Description
IOBS/IOMS-T16C	Group of Inter-operable Option features related to 1/16 CP length operation in TDD system.
IOBS/IOMS-T8C	Group of Inter-operable Option features related to 1/8 CP length operation in 8.75MHz or 7MHz TDD system.
IOBS-LS5	Group of Inter-operable Option features related to legacy support operation in 5MHz TDD system.
IOBS/IOMS-LS7	Group of Inter-operable Option features related to legacy support operation in 7MHz TDD system.
IOBS/IOMS-LS87	Group of Inter-operable Option features related to legacy support operation in 8.75MHz TDD system.
IOBS-LS10	Group of Inter-operable Option features related to legacy support operation in 10MHz TDD system.
IOBS/IOMS-LUL	Group of Inter-operable Option features related to longer UL frame operation in TDD system. This feature is applicable to specific applications only such as public safety/smart grid/M2M/etc.
IOBS/IOMS-F16C	Group of Inter-operable Option features related to 1/16 CP length operation in FDD system.
IOBS/IOMS-F8C	Group of Inter-operable Option features related to 1/8 CP length operation in FDD system.
IOBS-SNDC	Group of Inter-operable Option features related to Sounding CDM operation.
IOBS-SNDF	Group of Inter-operable Option features related to Sounding FDM operation.
IOBS-2TXB	Group of Inter-operable Option features related to 2 transmit antenna ABS operation.

IOBS-4TXB	Group of Inter-operable Option features related to 4 transmit antenna ABS operation.
IOMS-1TXM	Group of Inter-operable Option features related to 1 transmit antenna AMS operation.
IOMS-2TXM	Group of Inter-operable Option features related to 2 transmit antenna AMS operation.
IOMS-4TXM	Group of Inter-operable Option features related to 4 transmit antenna AMS operation.
IOMS-EDI0	Group of Inter-operable Option features related to EDI type 0 operation.
IOBS/IOMS-EDI3	Group of Inter-operable Option features related to EDI type 3 operation.
IOBS/IOMS-MC	Group of Inter-operable Option features related to Multi-carrier
IOBS/IOMS-MCTD	Group of Inter-operable Option features related to TDD Intra-Band Non-contiguous Carrier Aggregation
IOBS/IOMS-MCFD	Group of Inter-operable Option features related to FDD Intra-Band Non-contiguous Carrier Aggregation
IOBS/IOMS-MCSA	Group of Inter-operable Option features related to Carrier Aggregation Support with Subcarrier Alignment
IOBS/IOMS-MCSN	Group of Inter-operable Option features related to Carrier Aggregation Support without Subcarrier Alignment
IOBS/IOMS-MCAA	Group of Inter-operable Option features related to asymmetric carrier aggregation
IOBS/IOMS-MCLU	Group of Inter-operable Option features related to Preferred carrier selection by Location Update
IOBS/IOMS-AGPS	Group of Inter-operable Option features related to AGPS operation.
IOBS/IOMS-IPv6	Group of Inter-operable Option features related to IPv6 operation.
IOBS/IOMS-ROHCv4	Group of Inter-operable Option features related to ROHCv4 operation.
IOBS/IOMS-ROHCv6	Group of Inter-operable Option features related to ROHCv6 operation.
IOBS/IOMS-ETH	Group of Inter-operable Option features related to Ethernet CS operation.
IOBS/IOMS-ES1	Group of Inter-operable Option features related to emergency service support for E911 type services.
IOBS/IOMS-ES2	Group of Inter-operable Option features related to emergency service support for NS/EP services.
IOBS/IOMS-ES3	Group of Inter-operable Option features related to support of emergency alert using L2XFER message type 9.

IOBS/IOMS-NDS	Group of Inter-operable Option features related to support for obtaining NSP list using AAI-SII-ADV.
IOBS/IOMS-RNG	Group of Inter-operable Option features related to unsolicited UL BW allocation during network entry.
IOBS/IOMS-SLP	Group of Inter-operable Option features related to support Sleep Mode
IOBS/IOMS-SLP1	Group of Inter-operable Option features related to the use of Bitmap to indicate the listening sub-frames in the Listening Window.
IOBS/IOMS-SLP2	Group of Inter-operable Option features related to operation of keeping the FFBCH during Sleep Mode.
IOBS/IOMS-DCR	Group of Inter-operable Option features related to DCR mode operation.
IOBS/IOMS-CLC	Group of Inter-operable Option features related to Co-located Coexistence operation.
IOBS/IOMS-CLC-1	Group of Inter-operable Option features related to CLC Type I operation.
IOBS/IOMS-CLC-2	Group of Inter-operable Option features related to CLC Type II - Subtype 1 operation.
IOBS/IOMS-CLC-3	Group of Inter-operable Option features related to CLC Type II - Subtype 3 operation.
IOBS/IOMS-CLC-4	Group of Inter-operable Option features related to CLC Type III operation.
IOBS-MC	Group of Inter-operable Option features related to multi-carrier.
IOBS-DRNG	Group of Inter-operable Option features related to Dedicated Ranging operation.
IOBS-ZSLM	Group of Inter-operable Option features related to Zone Switch from LZone to MZone operation.
IOBS-ZSML	Group of Inter-operable Option features related to Zone Switch from MZone to LZone operation.
IOBS/IOMS-ORAT	Group of Inter-operable Option features related to Inter-RAT HO support using L2 transfer message operation.
IOMS/IOMS-MIH	Group of Inter-operable Option features related to Inter-RAT HO support using MIH frame.
IOBS-IDPRIVACY	Group of Inter-operable Option features related to MSID Privacy.
IOBS/IOMS-R1	Group of Inter-operable Option features related to R1 mode.
IOBS/IOMS-R2	Group of Inter-operable Option features related to R2 mode.
IOBS/IOMS-AE	Group of Inter-operable Option features related to additional elements.

IOBS/IOMS-R3	Group of Inter-operable Option features related to R3 mode.

3.3.6 BS/MS Values column

The MSV/BSV columns indicate the specific value or range of values for each BS/MS to implement for WiMAX certification purposes.

Table 3. Value Column Entries

xx	Set to value xx
aa - bb	Set to range aa - bb
n/a	Not applicable

3.3.7 Trait Package

This column specifies the associated trait package ID to each item.

3.3.8 Comment column

The comment column provides additional clarification and reasoning for each item.

3.3.9 Duplexing Mode Column

This column indicates whether the item is applied to TDD or FDD system.

Table 4. Duplexing Mode Column Entries

TDD	Applicable to TDD only
FDD	Applicable to FDD only
Common	Applicable to both TDD and FDD with identical function, procedure, and parameters.
TDD, FDD	Applicable to both TDD and FDD, but the details of the profile item, related to functionality, procedure, and/or parameters may be different depending on the duplex mode.

4. Mode Selection

In this document, the following modes are defined:

Table 5. WiMAX Mode

Term	Meaning
Support of R1 mode	Support of features specified in Release 1.0 or 1.5 MSP
Support of R2 mode	Support of features specified in sections 5-7 of this document
Support of additional elements	Support of features specified in section 8 of this document
Support of R3 mode	Support of features specified in sections 5 and section 6 of this document

4.1 Mode Selection in BS

A Release3 conformant BS can support multiple modes among R1 mode, R2 mode, additional elements, and R3.

Table 6. Mode Selection in BS

Item	Description	Reference	Status	BS Required	Comments
1	Support of R2 mode		o	IOBS-R2	TDD
2	Support of R1 mode and additional elements		o	IOBS-AE	TDD
3	Support of R2 mode and additional elements		o	IOBS-AE	TDD
4	Support of R3 mode		o	IOBS-R3	TDD

4.2 Mode Selection in MS

A Release2.1 conformant MS can support single mode and multiple modes among R1 mode, R2 mode, and additional elements.

Table 7. Mode Selection in MS

Item	Description	Reference	Status	MS Required	Comments
1	Support of R2 mode		o	IOMS-R2	TDD
2	Support of R1 mode and additional elements		o	IOMS-AE	TDD
3	Support of R2 mode and additional elements		o	IOMS-AE	TDD

4	Support of R1 mode		o	IOMS-R1	TDD
5	Support of additional elements		o	IOMS-AE	TDD
6	Support of R3 mode		o	IOMS-R3	TDD

5. PHY Profile

5.1 Profiles of BS and MS

All features listed in this document are optional in Release 3 profile (For this reason, the top item, i.e. 'Release 3 support' is filled with IOBS-R3 and IOMS-R3 for both BS and MS. In the document, 'Y' in 'BS/MS required field' indicates a mandatory feature, and "IO" indicates an optional feature, on condition that the relevant BS/MS supports additional elements function.

Table 8. Multi-system Support

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	R3 support		o	IOBS-AE	IOMS-AE	TDD,

5.2 Frame Configuration for supporting additional elements

5.2.1 System Architecture

Table 9. System Structure

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of System Structure	4 in [21]	o	Y	Y	TDD

5.2.2 Frequency Structure

Table 10. Bandwidth

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of System Bandwidth	5.3 in [9] 5.3 in [10] 5.3 in [11] 5.3 in [12]	o	Y	Y	TDD

5.2.3 Access Mode

Table 11. Access Mode

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Orthogonal Frequency Division	5 in[21], 4.2.1 in	o	Y	Y	TDD

	Multiplexing (OFDM) with a cyclic prefix (CP) in downlink	[14]				
2	Support of Orthogonal Frequency Division Multiplexing (OFDM) with a cyclic prefix (CP) in uplink	5 in[21], 4.2.1 in [14]	o	Y	Y	TDD
3	Support of Discrete Fourier Transform-spread-OFDM (DFT-s-OFDM) with a CP in uplink	5 in [21], 4.2.1 in [14]				

5.2.4 Frame Structure

Table 12. Frame Structure

Item	Description	Reference	Status	BS Required	MS Required	BS Value	MS Value	Comments
1	Support of Numerologies	4.2 in [16]	o	Y	Y			TDD
2	Support of Frame Structure	4.3 in [16]	o	Y	Y	0, 1, 2, 3, 4, 5, 6	The same as BS values	TDD
3	Uplink Downlink Configuration	6.2 and 6.3 in [28]	o	Optional	Optional	0, 1, 2, 3, 4, 5, 6, 7, 8	The same as BS values	TDD

5.2.5 Timing

Table 13. Timing

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Uplink-downlink frame timing	4.3 in [16]	o	Y	Y	TDD

5.2.6 Physical Resource

Table 14. Physical Resource Block

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Physical Resource in downlink	7.2 in [16]	o	Y	Y	TDD
2	Physical Resource in uplink	6.2 in [16]	o	Y	Y	TDD

5.2.7 MAC and Radio Connection

Table 15. Connection

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Layer2	6 in [21]	o	Y	Y	TDD
2	Support of RRC	7 in [21]	o	Y	Y	TDD

5.2.8 Protocol Model

Table 16. Protocol Architecture

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Radio Protocol Architecture	4.4 in [21]	o	Y	Y	TDD

5.2.9 RF characteristics

Table 17. RF Characteristics

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Operating Bands of BS	5 in[12]	o	Y	N/A	TDD
2	Operating Bands of MS	5 in [9],[10],[11]	o	N/A	Y	TDD
3	Transmitter Characteristic of BS	6 in [12]	o	Y	N/A	TDD
4	Transmitter Characteristic of MS	6 in [9],[10],[11]	o	N/A	Y	TDD
5	Receiver	7 in [12]	o	Y	N/A	TDD

	Characteristic of BS					
6	Receiver Characteristic of MS	7 in [9],[10],[11]	o	N/A	Y	TDD
7	Performance Requirement of BS	8 in [12]	o	Y	N/A	TDD
8	User Equipment Radio Access Capabilities	[23]	o	N/A	Y	TDD
9	Release-Independent Frequency Band	[24]	o	N/A	Y	TDD

5.3 Services Provided by the Physical Layer

Table 18. Generic Functions

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Services and functions of the physical layer	4 in [15]	o	Y	Y	TDD
2	Support of Uplink model	5.1 in [15]	o	Y	Y	TDD
3	Support of Downlink model	5.2 in [15]	o	Y	Y	TDD
4	Support of Simultaneous transmission and reception of physical channels and physical signals	6 in [15]	o	Y	Y	TDD
5	Support of Measurements provided by the physical layer	7 in [15]	o	Y	Y	TDD

5.4 Physical Channels and Modulation

5.4.1.1 Generic Functions

Table 19. Generic Functions

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Modulation Mapper	5.1 in [16]	o	Y	Y	TDD
2	Support of Sequence generation	5.2 in [16]	o	Y	Y	TDD
3	Support of OFDM based signal generation	5.3 in [16]	o	Y	Y	TDD
4	Support of Modulation and Upconversion	5.4 in [16]	o	Y	Y	TDD

5.4.1.2 DL OFDM PHY Layer

Table 20. Physical Channel in Downlink

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Physical Downlink Shared Channel	7.3.1 in [16]	o	Y	Y	TDD
2	Support of Scrambling	7.3.1.1 in [16]	o	Y	Y	TDD
3	Support of Modulation	7.3.1.2 in [16]	o	Y	Y	TDD
4	Support of Layer mapping	7.3.1.3 in [16]	o	Y	Y	TDD
5	Support of Antenna port mapping	7.3.1.4 in [16]	o	Y	Y	TDD
6	Support of Mapping to virtual resource blocks	7.3.1.5 in [16]	o	Y	Y	TDD
7	Support of Mapping from virtual to physical resource block	7.3.1.6 in [16]	o	Y	Y	TDD
8	Support of Physical Downlink Control Channel	7.3.2 in [16]	o	Y	Y	TDD
9	Support of Physical Broadcast Channel	7.3.3 in [16]	o	Y	Y	TDD

10	Support of Reference Signal	7.4.1 in [16]	o	Y	Y	TDD
11	Support of Synchronization Signal	7.4.2 in [16]	o	Y	Y	TDD
12	Support of SS/PBCH block	7.4.3 in [16]	o	Y	Y	TDD

5.4.1.3 UL SC PHY Layer

Table 21. Physical Channel in Uplink

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Physical Uplink Shared Channel	6.3.1 in [16]	o	Y	Y	TDD
2	Support of Scrambling	6.3.1.1 in [16]	o	Y	Y	TDD
3	Support of Modulation	6.3.1.2 in [16]	o	Y	Y	TDD
4	Support of Layer mapping	6.3.1.3 in [16]	o	Y	Y	TDD
5	Support of Transform Precoding	6.3.1.4 in [16]	o	Y	Y	TDD
6	Support of Precoding	6.3.1.5 in [16]	o	Y	Y	TDD
7	Support of Mapping to virtual resource blocks	6.3.1.6 in [16]	o	Y	Y	TDD
8	Support of Mapping from virtual to physical resource block	6.3.1.7 in [16]	o	Y	Y	TDD
9	Support of Physical Uplink Control Channel	6.3.2 in [16]	o	Y	Y	TDD
10	Support of Random Access Channel	6.3.3 in [16]	o	Y	Y	TDD
11	Support of Reference Signal	6.4.1 in [16]	o	Y	Y	TDD

5.5 Multiplexing and Channel Coding

Table 22. Multiplexing and channel coding

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Channel coding	5.3 in [17]	o	Y	Y	TDD
2	Support of Rate matching	5.4 in [17]	o	Y	Y	TDD
3	Support of Random access channel	6.1 in [17]	o	Y	Y	TDD
4	Support of Uplink shared channel	6.2 in [17]	o	Y	Y	TDD
5	Support of Uplink control information	6.3 in [17]	o	Y	Y	TDD
6	Support of Broadcast channel	7.1 in [17]	o	Y	Y	TDD
7	Support of Downlink shared channel and paging channel	7.2 in [17]	o	Y	Y	TDD
8	Support of Downlink control information	7.3 in [17]	o	Y	Y	TDD

5.6 Physical Layer Procedures for Control

Table 23. Physical Control Procedures

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Synchronization procedures	4 in [18]	o	Y	Y	TDD
2	Support of Radio link monitoring	5 in [18]	o	Y	Y	TDD
3	Support of Link recovery procedures	6 in [18]	o	Y	Y	TDD
4	Support of Uplink power control	7 in [18]	o	Y	Y	TDD
5	Support of Random access procedure	8 in [18]	o	Y	Y	TDD
6	Support of UE procedure for reporting control information	9 in [18]	o	Y	Y	TDD
7	Support of UE procedure for receiving control	10 in [18]	o	Y	Y	TDD

	information					
8	Support of UE-group common signaling	11 in [18]	o	Y	Y	TDD
9	Support of Bandwidth part operation	12 in [18]	o	Y	Y	TDD
10	Support of UE procedure for monitoring Type0-PDCCH CSS sets	13 in [18]	o	Optional	Optional	TDD

5.7 Physical layer procedures for data

Table 24. Physical Data Procedures

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of power control for downlink	4 in [19]	o	Y	Y	TDD
2	Support of Physical downlink shared channel related procedures	5 in [19]	o	Y	Y	TDD
3	Support of Physical uplink shared channel related procedures	6 in [19]	o	Y	Y	TDD

5.8 Physical layer Measurements

Table 25. Physical layer measurements

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of UE measurement capabilities	5.1 in [20]	o	Y	Y	TDD
2	Support of NG-RAN measurement abilities	5.2 in [20]	o	Optional	Optional	TDD

6. MAC Profile

6.1 Protocol Specification

Table 26. Sublayer

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of MAC sub-layer1	[25]	o	Y	Y	TDD
2	Support of MAC sub-layer2	[26]	o	Y	Y	TDD
3	Support of MAC sub-layer3	[27]	o	Y	Y	TDD

6.2 Common Channel Specification

Table 27. Common Channel

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of BCCH reception	5.6 in [25]	o	Y	Y	TDD
2	Support of PCCH reception	5.5 in [25]	o	Y	Y	TDD
3	Support of Paging	7 in [22]	o	Y	Y	TDD
4	Support of Paging Group Calculation rule	7 in [22]	o	Y	Y	TDD
5	Support of State Transitions	9 in [21]	o	Y	Y	TDD

6.3 Radio Resource Control Protocol Specification

6.3.1 Radio Connection Management Sequence

Table 28. Radio Connection Management

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of System information	5.2 in [28]	o	Y	Y	TDD
2	Support of Connection control	5.3 in [28]	o	Y	Y	TDD

3	Paging	5.3.2 in [28]	o	Y	Y	TDD
4	RRC connection establishment	5.3.3 in [28]	o	Y	Y	TDD
5	RRC reconfiguration	5.3.5 in [28]	o	Y	Y	TDD
6	RRC connection reestablishment	5.3.7 in [28]	o	Y	Y	TDD
7	RRC connection release	5.3.8 in [28]	o	Y	Y	TDD
8	Radio link failure related actions	5.3.10 in [28]	o	Y	Y	TDD

6.3.2 Measurements

Table 29. Measurements

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Measurements	5.5 in [28]	o	Y	Y	TDD

6.3.3 Mobility Management

Table 30. Mobility

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Cell selection	5.2 in [22]	o	Y	Y	TDD
2	Support of Cell reselection	5.2 in [22]	o	Y	Y	TDD
3	Support of Mobility	9 in [21]	o	Y	Y	TDD
4	Support of Inter-RAT mobility	5.4 in [28]	o	Optional	Optional	TDD

6.4 Medium Access Control Protocol Specification

Table 31. MAC protocol

Item	Description	Reference	Status	BS Required	MS Required	Comments

1	Support of MAC procedures	5 in [25]	o	Y	Y	TDD
2	Support of Random access procedure	5.1 in [25]	o	Y	Y	TDD
3	Support of DL-SCH data transfer	5.3 in [25]	o	Y	Y	TDD
4	Support of UL-SCH data transfer	5.4 in [25]	o	Y	Y	TDD

6.5 Radio Link Control Protocol Specification

Table 32. RLC protocol

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of RLC procedures	5 in [26]	o	Y	Y	TDD
2	Support of RLC entity handling	5.1 in [26]	o	Y	Y	TDD
3	Support of Data transfer procedures	5.2 in [26]	o	Y	Y	TDD
4	Support of ARQ procedures	5.3 in [26]	o	Y	Y	TDD

6.6 Packet Data Convergence Protocol Specification

Table 33. PDCP protocol

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of PDCP procedures	5 in [27]	o	Y	Y	TDD
2	Support of PDCP entity handling	5.1 in [27]	o	Y	Y	TDD
3	Support of Data transfer	5.2 in [27]	o	Y	Y	TDD
4	Support of Status reporting	5.4 in [27]	o	Y	Y	TDD
5	Support of Header compression and decompression	5.7 in [27]	o	Y	Y	TDD
6	Support of Ciphering	5.8 in [27]	o	Y	Y	TDD

	and deciphering					

6.7 Service Data Adaptation Protocol Specification

Table 34. SDAP protocol

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of SDAP architecture	4.2 in [29]	o	Y	Y	TDD
2	Support of SDAP entity handling	5.1 in [29]	o	Y	Y	TDD
3	Support of Data transfer	5.2 in [29]	o	Y	Y	TDD
4	Support of Qos flow to DRB mapping	5.3 in [29]	o	Y	Y	TDD
5	Support of RQI handling	5.4 in [29]	o	Y	Y	TDD

6.8 Multi-connectivity

Table 35. Multi-connectivity

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of Multi-Radio dual connectivity	4 in [30]	o	Optional	Optional	TDD

6.9 Radio Resource Management

Table 36. SDAP protocol

Item	Description	Reference	Status	BS Required	MS Required	Comments
1	Support of SA: RRC_IDLE state mobility	4 in [13]	o	Optional	Optional	TDD
2	Support of SA: RRC_INACTIVITY state mobility	5 in [13]	o	Optional	Optional	TDD

3	Support of RRC_CONNECTED state mobility	6 in [13]	o	Optional	Optional	TDD
4	Support of Timing	7 in [13]	o	Y	Y	TDD
5	Support of Signaling characteristics	8 in [13]	o	Y	Y	TDD
6	Support of Measurement procedure	9 in [13]	o	Y	Y	TDD