Telecommunications Standards Advisory Committee (TSAC)

Technical Specification

Wireless Broadband Access Equipment

IDA TS WBA
Issue 1 Rev 2, November 2012

Infocomm Development Authority of Singapore
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Telecommunications Standards Advisory Committee (TSAC)

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Content

1 General Requirements

1.1 Scope of Specification

1.1.1 This Specification defines the minimum technical requirements for wireless broadband access (WBA) equipment operating in the 2.3 and 2.5 GHz licensed frequency bands where line-of-sight is not essential. The term WBA equipment refers to the base stations or subscriber stations which provide the broadband wireless connectivity, as well as the fixed or mobile devices which require the connectivity.

1.1.2 The Specification does not restrict the type of WBA technology to be employed. It mainly defines the operating frequency bands, emission and output power limits, and electromagnetic compatibility and electrical safety requirements where relevant. Applications may include: point to multipoint backhaul (e.g. E1/T1 services for business), point to point backhaul (e.g. connecting to Internet backbone), and consumer last mile and portable wireless broadband Internet connection.

1.1.3 The Specification includes, as examples, references to the interoperable standards that have been created by the WiMAX Forum, based on the IEEE 802.16, IEEE 802.16m, the ETSI HIPERMAN standards, IMT-2000 OFDMA TDD WMAN and IMT-Advanced WirelessMAN-Advanced.

1.1.4 The Specification does not define a standard for WBA network compatibility and equipment interoperability. As such, suppliers of WBA fixed or mobile devices are required to ascertain to which WBA network equipment and operator their WBA devices are intended for interoperating.

1.2 Design of Wireless Broadband Access Equipment

WBA equipment shall be designed to meet the following basic objectives:

(a) The Radio Frequency (RF) carrier of the WBA equipment shall be tuned to operate within the frequency spectrum assigned to its WBA operator.

(b) The WBA equipment shall not be constructed with any external or readily accessible control which permits the adjustment of its operation in a manner that is inconsistent with this Specification.

(c) The WBA equipment (e.g. base stations) may be ac powered or dc powered. For ac powered equipment, this Specification shall be complied with when operating from an AC mains supply of voltage 230V ± 10% and frequency 50 Hz ± 2%. Where external power supply is used, e.g. ac adaptor, it shall not affect the capability of the equipment to meet this Specification.

(d) The WBA equipment shall be marked with the supplier/manufacturer's name or identification mark, and the supplier/manufacturer's model or type reference. The markings shall be legible, indelible and readily visible.

2 Technical Requirements

The WBA equipment shall comply with the maximum output power and emissions limits, operating in its intended frequency bands. It shall fulfil the requirements of this Specification on all the permitted frequencies which it is intended to operate.

2.1 Frequency Assignments

The WBA equipment shall be tuned or programmed to operate within the frequency spectrum assigned to its WBA operator, located in the 2300 to 2350 MHz and/or 2516 to 2678 MHz frequency bands.

2.2 Power and Emission Limits

2.2.1 Transmitter output power of base stations shall be limited to 100W EIRP while mobile stations shall be limited to 2 W EIRP.

2.2.2 The spurious emissions shall not exceed – 57 dBm in the frequency range 30 MHz to 1 GHz (measurement bandwidth: 100 kHz) and – 50 dBm in the frequency range 1 GHz to 26.5 GHz (measurement bandwidth: 1 MHz).

2.2.3 The base stations shall be set to work in a manner which is safe and does not impair or interfere with the working of any other station or network authorised by IDA.

2.3 Electromagnetic Compatibility and Electrical Safety Requirements

If the WBA equipment is a base station or a subscriber station, it shall comply with the EMC emissions from the DC power or AC mains power input/output ports defined in the ETSI EN 301 489-1 or IEC CISPR 22. It shall also comply with the safety requirements defined in IEC 60950-1 safety standard.

2.4 System Profiles

In implementing HIPERMAN compliant systems, the WBA equipment may use a common HIPERMAN system profile to achieve multi-vendor equipment interoperability.

3 Compliance with Technical Requirements

3.1 Suppliers shall demonstrate that the WBA equipment has been tested[1] to comply with the power and emission limits, and the permitted range of operating frequencies stipulated in § 2.1 and § 2.2 of this Specification. Measurement methods of the testing shall be as defined in FCC Part 27 or ETSI EN 300 440-1, or equivalent methods as specified by the manufacturer.

3.2 If the WBA equipment is a base station or a subscriber station, which is directly or indirectly powered by the AC mains, suppliers shall also demonstrate that it has been tested according to measurement methods and limits for:

(a) EMC emissions from the DC power or AC mains power input/output ports defined in ETSI EN 301 489-1 or IEC CISPR 22; and

(b) Electrical safety defined in the IEC 60950-1.

[1] IDA accepts test reports from (a) labs recognised by IDA under Mutual Recognition Arrangement (MRA); (b) labs accredited by accreditation bodies recognised by IDA; or (c) equipment manufacturers. The list of testing labs recognised by IDA under MRA is available from IDA's website www.ida.gov.sg, under Policies & Regulations / International Relations For Telecom..

4 References

For the technical requirements captured in this Specification, reference has been made to the following documents:

ETSI TS 102 177	Broadband Radio Access Networks (BRAN); HIPERMAN; Physical (PHY) Layer
ETSI TS 102 178	Broadband Radio Access Networks (BRAN); HIPERMAN; Data Link Control (DLC) Layer
ETSI TS 102 210	Broadband Radio Access Networks (BRAN); HIPERMAN; System profiles
IEEE P802.16™ (2009)	Standard for Local and metropolitan area networks – Part 16 – Air Interface for Broadband Wireless Access Systems
IEEE P802.16m	Standard for Local and metropolitan area networks – Part 16 – Advanced Air Interface for Broadband Wireless Access Systems
ETSI TS 102 210	Broadband Radio Access Networks (BRAN); HIPERMAN; System profiles
ETSI EN 300 440-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 1: Technical characteristics and test methods
ETSI EN 301 908-19	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 19: OFDMA TDD WMAN (Mobile WiMAX) TDD User Equipment (UE)
ETSI EN 301 908-20	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 20: OFDMA TDD WMAN (Mobile WiMAX) TDD Base Stations (BS)
FCC Part 27 § 27.50 § 27.53	Miscellaneous Wireless Communications Services Power limits Emission limits
ETSI EN 301 489-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
ITU-R M.1457-10	Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)
ITU-R M.2012	Detailed specifications of the terrestrial radio interfaces

	of International Mobile Telecommunications Advanced (IMT-Advanced)
IEC CISPR 22:	Information Technology Equipment – Radio disturbance characteristics – Limits and methods of measurement
IEC 60950-1:	Information Technology Equipment – Safety

Note:

ETSI HIPERMAN	European Telecommunications Standards Institute High Performance Radio Metropolitan Area Network
FCC	Federal Communications Commission
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
WiMAX	Worldwide Interoperability for Microwave Access
OFDMA	Orthogonal Frequency Division Multiple Access
TDD	Time Division Duplexing
WMAN	Wireless Metropolitan Area Network

Annex A: Corrigendum / Addendum

Page	TS Ref.	Items Changed	Effective Date
Changes to IDA TS WBA Issue 1 Rev 1, May 2011			
3	**2.2.1**	Maximum transmitter output power is reduced from 2000W to 100W.	Nov 12
5	**4**	Technical References to include IEEE P802.16m, ETSI EN 301 908-19, ETSI EN 301 908-20 to include IMT-Advanced Requirements	Nov 12
Changes to IDA TS WBA Issue 1, Jun 05			
		Change of IDA's address at cover page to Mapletree Business City.	1 May 11