TECHNICAL SPECIFICATION
FOR
BROADBAND WIRELESS ACCESS (BWA) EQUIPMENT

Suruhanjaya Komunikasi dan Multimedia Malaysia
Off Pesiaran Multimedia, 63000 Cyberjaya, Selangor Darul Ehsan, Malaysia

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FOREWORD

This Technical Specification was developed under the authority of the Malaysian Communications and Multimedia Commission (SKMM) under the Communications and Multimedia Act 1998 (CMA 98) and the relevant provisions on technical regulation of Part VII of the CMA 98. It is based on recognised International Standards documents.

This Technical Specification specifies the specifications to conform for approval of telecommunications devices.

NOTICE

This Specification is subject to review and revision
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Introduction

Broadband Wireless Access (BWA) is a technology aimed at providing high-speed wireless access over a wide area for data, voice and video services to business and residential subscribers.

The term BWA 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 connectivity.

Applications may include point to multipoint backhaul (e.g. E1/T1 services for business), point to point backhaul (e.g. connecting to Internet back bone), and consumer last mile and portable wireless broadband internet connection.

According to the IEEE 802.16, broadband means having instantaneous bandwidth greater than around 1 MHz and supporting data rates greater than about 1.5 Mbit/s.

1. Scope

1.1 This specification provides the minimum technical requirements for Broadband Wireless Access (BWA) base (central) station and subscriber (terminal) stations as according to the Standard Radio System Plan (SRSP) published by Malaysian Communication and Multimedia Commission (SKMM) for the equipment operating in the following frequency band:

a) 821 MHz to 824 MHz and 866 MHz to 869 MHz;
b) 1 790 MHz to 1 800 MHz;
c) 2 300 MHz to 2 400 MHz;
d) 2 504 MHz to 2 688 MHz;
e) 3 400 MHz to 3 700 MHz; and
f) 10 150 MHz to 10 300 MHz and 10 500 MHz to 10 650 MHz.

1.2 The specification does not restrict the type of BWA technology to be employed. It mainly defines the operating frequency bands, spurious emission and output power limits, electromagnetic compatibility and electrical safety and health requirements.

2. Normative references

The following normative references are indispensable for the application of this Technical Specification. For dated references, only the edition cited applies. For undated references, the latest edition of the normative references (including any amendments) applies.

See Annex A.
3. Abbreviations

For the purposes of this standard, the following abbreviations apply:

- AC: Alternating Current
- BWA: Broadband Wireless Access
- DC: Direct Current
- ETSI: European Telecommunications Standards Institute
- EIRP: Effective Isotropic Radiated Power
- EMC: Electromagnetic Compatibility
- FCC: Federal Communications Commission
- FWA: Fixed Wireless Access
- HIPERMAN: High Performance Radio Metropolitan Area Network
- IEC: International Electrotechnical Commission
- IEEE: Institute of Electrical and Electronic Engineers
- ITU-R: International Telecommunication Union - Radio
- LMR: Land Mobile Radio
- MMDS: Multipoint Microwave Distribution System
- RF: Radio Frequency
- RPS: Radio Performance Specification
- Rx: Receive
- SKMM: Malaysian Communications and Multimedia Commission
- SRSP: Standard Radio System Plan
- Tx: Transmit
- WiMAX: Worldwide Interoperability for Microwave Access
4. Requirements

4.1 General requirements

BWA equipment shall be designed to meet the following basic requirements:

a) The Radio Frequency (RF) carrier of the BWA equipment shall be tuned to operate within the frequency spectrum assigned by SKMM.

b) The BWA 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 the specification.

4.1.1 Power supply requirements

The BWA equipment may be AC or DC powered. For AC powered equipment, the operating voltage shall be 240 V +5 %, -10 % and frequency 50 Hz ± 1 % as according to MS 406 or 230 V ± 10 % and frequency 50 Hz ± 1 % as according to MS IEC 60038 whichever is current.

Where external power supply is used, e.g AC adaptor, it shall not affect the capability of the equipment to meet this specification. Adaptor must be pre-approved by the relevant regulatory body before it can be used with the equipment.

4.1.2 Power supply cord and mains plug requirements

The equipment shall be fitted with a suitable and appropriate approved power supply cord and mains plug. Both are regulated products and must be pre-approved by the relevant regulatory body before it can be used with the equipment.

The power supply cord shall be certified as according to:

a) MS 140; or
b) BS 6500; or
c) IEC 60227-5; or
d) IEC 60245-4.

The main plug shall be certified as according to:

a) 13 A fused plugs: MS 589: Part 1 or BS 1363: Part 1; or
b) 15 A plugs: MS 1577 or BS 546; or
c) 2.5 A, 250 V, flat non-rewirable two-pole plugs: MS 1578 or BS EN 50075.

4.1.3 Interoperability and Connectivity

The BWA equipment shall comply with the minimum requirement that is specified by the regulatory body.
4.1.3.1 Interoperability

The BWA equipment shall have an ability to exchange information and to use the information that has been exchanged between two or more systems or components.

4.1.3.2 Connectivity

The BWA equipment shall have the ability to link with other programs and devices to allow interoperability.

4.1.4 Marking Requirements

The equipment shall be marked with the following information:

a) supplier/manufacturer’s name or identification mark;

b) supplier/manufacturer’s model or type reference; and

c) other markings as required by the relevant standards.

The markings shall be legible, indelible and readily visible. All information on the marking shall be either in Bahasa Melayu or English Language.

4.2 Technical requirements

The equipment shall comply with the following requirements:

a) Radio Frequency (RF).

b) Electromagnetic Compatibility (EMC).

c) Electrical Safety and Health.

4.2.1 Radio Frequency Requirements

The equipment shall comply with the output power and spurious emissions limits as given in Table 1 and Table 2. It shall fulfill the requirements of this requirement on all the permitted frequencies which it is intended to operate.
Table 1. Technical Specification for RF Output Power

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency Band (MHz)</th>
<th>RF Power (EIRP)</th>
<th>Reference Standard / Document</th>
</tr>
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</table>
| 1.  | Base Station (Rx): 821 – 824  
Base Station (Tx): 866 – 869  
Subscriber Station (Tx): 821 – 824  
Subscriber Station (Rx): 866 – 869 | Base station: ≤ + 47 dBm  
Subscriber station:  
Mobile station: ≤ + 44 dBm  
Hand-portable station: ≤ + 37 dBm | RPS 001  
RPS 003-01  
SKMM WTS LMR  
MCMC SRSP-531 BWA |
| 2.  | 1 790 to 1 800 | Base station – as per Exhibit 3 of MCMC SRSP-544 BWA  
Subscriber station – as per Exhibit 4 of MCMC SRSP-544 BWA | MCMC SRSP-544 BWA |
| 3.  | 2 300 to 2 400 | Base station: ≤ + 40 dBm  
Subscriber station: ≤ + 40 dBm | MCMC SRSP-532 BWA |
| 4.  | 2 504 to 2 688 | Base station: ≤ + 44 dBm  
Subscriber station: ≤ + 37 dBm | MCMC SRSP-523 MMDS |
| 5.  | 3 400 to 3 700 | The EIRP limit for base station and subscriber station are specified in Recommendation ITU-R SF.406-8  
MCMC SRSP-507a FWA | ITU-R SF.406-8  
MCMC SRSP-507a FWA |
| 6.  | 10 150 to 10 300 | The EIRP limit for base station and subscriber station are specified in Recommendation ITU-R SF.406-8 | Rec. ITU-R SF.406-8  
MCMC SRSP-507b FWA |
| 7.  | 10 500 to 10 650 | The EIRP limit for base station and subscriber station are specified in Recommendation ITU-R SF.406-8  
Note:  
The EIRP for frequency within the band 10.616 GHz – 10.644 GHz are as follows:  
Base Station: ≤ + 70 dBm  
Subscriber station: ≤ + 70 dBm | ITU-R SF.406-8  
MCMC SRSP-507b FWA |
| 8.  | 24 250 to 27 000  
27 000 to 29 000  
31 000 to 31 300 | The EIRP limit for base station will be based on apparatus assignment  
Subscriber station: ≤ + 37 dBm | MCMC SRSP-509 LMCS  
Notification of Issuance of Class Assignment |
Table 2. Technical Specification for Spurious Emission

|-----|----------------------|-------------------|-----------------------------|
| 1.  | Base Station (Rx) : 821 – 824  
Base Station (Tx) : 866 – 869  
Subscriber Station (Tx) : 821 – 824  
Subscriber Station (Rx) : 866 – 869 | ≤ - 50 dBm for 9 kHz to 21.2 GHz | ETSI EN 301 390 |
| 2.  | 1 790 to 1 800 | | |
| 3.  | 2 300 to 2 400 | | |
| 4.  | 2 504 to 2 688 | | |
| 5.  | 3 400 to 3 700 | | |
| 6.  | 10 150 to 10 300 | | |
| 7.  | 10 500 to 10 650 | | |
| 7.  | 10 500 to 10 650 | | |
| 8.  | 24 250 to 27 000  
27 000 to 29 500  
31 000 to 31 300 | | |

4.3 Electromagnetic compatibility requirements

The equipment shall comply with the EMC emissions requirements as defined in the ETSI EN 301 489-1. The requirements shall cover radiated and conducted emission.

4.4 Electrical Safety and Health requirements

The equipment shall comply with the safety requirements defined in MS IEC 60950-1. The supplier shall submit full type test report of MS IEC 60950 -1 or equivalent standards.
Annex A  
(normative)

Normative references

BS 1363: Part 1  
13 A plugs, socket-outlets, adaptors and connection units  
– Part 1: Specification for rewirable and non-rewirable 13 A  
fused plugs

BS 6500  
Electric cables Flexible cords rated up to 300/500 V, for  
use with appliances and equipment intended for domestic,  
office and similar environments

BS EN 50075  
Specification for flat non-wirable two-pole plugs 2.5 A 250  
V, with cord, for the connection of class II-equipment for  
household and similar purposes

B. U. (B 416)  
Notification of Issuance of Class Assignment B. U. (B 416)

ETSI EN 301 126-1  
Fixed Radio Systems, Conformance testing: Part 1: Point-  
to-point equipment – Definitions, general requirements and  
test procedures

ETSI EN 301 126-2-1  
Fixed Radio Systems, Conformance testing: Part 2-1:  
Point-to-Multipoint equipment – Definitions, and general  
requirements

ETSI EN 301 126-2-2  
Fixed Radio Systems, Conformance testing: Part 2-2:  
Point-to-Multipoint equipment – Test procedures for FDMA  
systems

ETSI EN 301 126-2-3  
Fixed Radio Systems, Conformance testing: Part 2-3:  
Point-to-Multipoint equipment – Test procedures for TDMA  
systems

ETSI EN 301 126-2-4  
Fixed Radio Systems, Conformance testing: Part 2-4:  
Point-to-Multipoint equipment – Test procedures for FH-  
CDMA systems

ETSI EN 301 126-2-5  
Fixed Radio Systems, Conformance testing: Part 2-5:  
Point-to-Multipoint equipment – Test procedures for DS-  
CDMA systems

ETSI EN 301 126-2-6  
Fixed Radio Systems, Conformance testing: Part 2-6:  
Point-to-Multipoint equipment – Test procedures for Multi  
Carrier Time Division Multiple Access (MC-TDMA)  
systems
<table>
<thead>
<tr>
<th>Standard/Specification</th>
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<tr>
<td>ETSI EN 301 390</td>
<td>Fixed Radio Systems, Point-to-point and Multipoint Systems; – Spurious emissions and receiver immunity limits at equipment/antenna port of Digital Fixed Radio Systems</td>
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<tr>
<td>ETSI EN 301 489-1</td>
<td>Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services – Part 1: Common technical requirements</td>
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<td>ETSI TS 102 177</td>
<td>Broadband Radio Access Networks (BRAN); HIPERMAN; Physical (PHY) Layer</td>
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<td>ETSI TS 102 178</td>
<td>Broadband Radio Access Networks (BRAN); HIPERMAN; data Link Control (DLC) Layer</td>
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<td>ETSI TS 102 210</td>
<td>Broadband Radio Access Networks (BRAN); HIPERMAN; System profiles</td>
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<td>ETSI EN 300 440-1</td>
<td>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</td>
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<td>FCC Part 27</td>
<td>Miscellaneous Wireless Communication Services</td>
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<td>IEC 60245-4</td>
<td>Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables</td>
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<td>IEC 60227-5</td>
<td>Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 5: Flexible cables (cords)</td>
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<td>IEEE 802.16</td>
<td>Standard for Telecommunications and Information Exchange between Systems – LAN/MAN Specific Requirements – Air Interface for Fixed Broadband Wireless Access Systems</td>
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<tr>
<td>MCMC SRSP-507a FWA</td>
<td>Requirements for Fixed Wireless Access (FWA) Systems Operating in the Frequency Band from 3400 MHz to 3700 MHz</td>
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<td>MCMC SRSP-507b FWA</td>
<td>Requirements for Fixed Wireless Access (FWA) Systems Operating in the Frequency Band from 10000 MHz to 10700 MHz</td>
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<td>MCMC SRSP-523 MMDS</td>
<td>Requirements for Broadband Wireless Access (BWA) Systems Operating in the Frequency band from 2504 MHz to 2688 MHz.</td>
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<td>Requirements for Broadband Wireless Access (BWA) Systems Operating in the Frequency band from 1790 MHz to 1800 MHz</td>
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<td>MCMC SRSP-544 BWA</td>
<td>Requirements for Broadband Wireless Access (BWA) Systems Operating in the Frequency band 2300 MHz to 2400 MHz</td>
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<td>MCMC SRSP-509 LMCS</td>
<td>Requirements for Broadband Wireless Access (BWA) Systems Operating in the Frequency band 2300 MHz to 2400 MHz</td>
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<tr>
<td>MS 140</td>
<td>Specification for insulated flexible cords and cables</td>
</tr>
<tr>
<td>MS 406</td>
<td>Specification for voltages and frequency for alternating current transmission and distribution systems</td>
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<td>MS 1578</td>
<td>Specification for flat non-rewirable two-pole plugs, 2.5 A, 250 V, with cord, for the connection of class II-Equipment for household and similar purposes</td>
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<td>MS IEC 60038</td>
<td>IEC Standard voltages</td>
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<td>Information Technology equipment – Safety</td>
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<td>MS IEC CISPR 22</td>
<td>Information Technology Equipment – Radio disturbance characteristics – Limits and methods of measurement</td>
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<td>Rec. ITU-R SF. 406-8</td>
<td>Maximum equivalent isotropically radiated power of radio-relay systems transmitters operating shared with the fixed-satellite service</td>
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<td>RPS 001</td>
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<td>RPS 003-01</td>
<td>Radio Performance Specifications RPS 003-01</td>
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<td>SKMM WTS LMR</td>
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