TECHNICAL CODE

CELLULAR BOOSTER EQUIPMENT - SPECIFICATIONS

Developed by

Malaysian Technical Standards Forum Bhd

Registered by

MCMC

Registered date:

MCMC MTSFB TC TXXX:2020

Development of technical codes

The Communications and Multimedia Act 1998 ('the Act') provides for Technical Standards Forum designated under section 184 of the Act or the Malaysian Communications and Multimedia Commission ('the Commission') to prepare a technical code. The technical code prepared pursuant to section 185 of the Act shall consist of, at least, the requirement for network interoperability and the promotion of safety of network facilities.

Section 96 of the Act also provides for the Commission to determine a technical code in accordance with section 55 of the Act if the technical code is not developed under an applicable provision of the Act and it is unlikely to be developed by the Technical Standards Forum within a reasonable time.

In exercise of the power conferred by section 184 of the Act, the Commission has designated the Malaysian Technical Standards Forum Bhd ('MTSFB') as a Technical Standards Forum which is obligated, among others, to prepare the technical code under section 185 of the Act.

A technical code prepared in accordance with section 185 shall not be effective until it is registered by the Commission pursuant to section 95 of the Act.

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This technical code was developed by Cellular Booster Sub Working Group which is supervised by Fixed and Wireless Terminal Working Group under the Malaysian Technical Standards Forum Bhd (MTSFB) consists of representatives from the following organisations:

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Maxis Broadband Sdn Bhd

Redsun Engineering Sdn Bhd

SIRIM Berhad

Telekom Malaysia Bhd

U Mobile Sdn Bhd

webe digital sdn bhd

Wideminds Pte Ltd

Wilson Electronics Malaysia Sdn Bhd

YTL Communications Sdn Bhd

Foreword

This technical code for the Cellular Booster Equipment - Specifications ('this Technical Code') was developed pursuant to section 185 of the Act 588 by the Malaysian Technical Standards Forum Bhd (MTSFB) via its Fixed and Wireless Terminal Working Group.

This Technical Code was developed for the purpose of certifying communications equipment under the Communications and Multimedia (Technical Standards) Regulations 2000.

This Technical Code shall continue to be valid and effective from the date of its registration until it is replaced or revoked.

CELLULAR BOOSTER - SPECIFICATIONS

1. Scope

This Technical Code defines the technical requirements for Cellular Booster Equipment (CBE) that is designed or intended for use in connection with public mobile telecommunications services in Malaysia. This Technical Code sets forth rules and specifications to ensure this device won't cause interference to wireless networks. They are intended for in-building or localized on-site operations (fixed use).

CBEs provide strong cellular signal by boosting/amplifying the cellular signal from the outside and repeating/rebroadcasting the signal on the inside of a building. Applications are market segment dependent (residential or commercial).

2. Normative references

The following normative references are indispensable for the application of this Technical Code. 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. Abbreviation

AC	Alternating Current
CBE	Cellular Booster Equipment
EDGE	Enhanced Data GSM Environment
EIRP	Effective Isotropic Radiated Power
EMC	Electromagnetic Compatibility
FDD	Frequency Division Duplexing
GSM	Global System for Mobile Communications
IMT	International Mobile Telecommunications
LTE	Long Term Evolution
NFC	Near Field Communication
PVC	Polyvinyl Chloride
RF	Radio Frequency
SRSP	Standard Radio System Plan
TDD	Time Division Duplexing
UMTS	Universal Mobile Telecommunications Service
WLAN	Wireless Local Area Network

4. Requirements

4.1 General requirements

The CBEs shall be designed to meet the following basic requirements:

a) The CBEs shall not cause interference with other authorized radiocommunication services and be able to tolerate any interference caused by other radiocommunication services, electrical or electronic equipment.

b) The CBEs shall not be constructed with any external or readily accessible control which permits the adjustments of its operation in a manner that is inconsistent with this Technical Code.

c) The CBEs default setting shall be such that they only operate within the frequency range stipulated in SRSPs.

d) The CBEs shall fulfill the additional requirements made by the relevant Regulatory Body (if any).

4.1.1 Power supply

Alternating Current (AC) adaptor for CBEs shall not affect the capability of the equipment to meet this specification. The operating voltage shall be 240 V + 5 %, - 10 % and frequency of 50 Hz ± 1 % for single phase equipment as according to MS 406 or MS IEC 60038 whichever is current.

Adaptor shall be pre-approved by the relevant regulatory body before being used with the equipment.

4.1.2 Power supply cord and mains plug

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

a) The power supply cord shall be certified according to:

   i) MS 2112-5 or BS EN 50525-2-11 or IEC 60227-5 (for Polyvinyl Chloride (PVC) insulated - flexible cables/cords); or

   ii) MS 2127-4 or IEC 60245-1 and IEC 60245-4 (for rubber insulated - flexible cables/cords).

b) The main plug shall be certified according to:

   i) MS 589-1 or BS 1363 (for 13 A, fused plug); or

   ii) MS 1577 (for 15 A, fused plugs); or

   iii) MS 1578 or BS EN 50075 (for 2.5 A, 250 V, flat non-rewireable two-pole plugs with cord for the connection of class II equipment).

4.1.3 Marking

The CBEs shall be marked with the following information:

a) supplier/manufacturer's brand 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 CBEs shall comply with the following requirements:

a) Radio Frequency (RF);

b) Electromagnetic Compatibility (EMC); and

c) Safety requirements.

4.2.1 Radio Frequency (RF)

The CBEs shall operate within the following frequency bands as defined in Tables 1, 2 and 3.

The CBEs shall comply with the maximum RF output power, spurious emissions and out of band gain given in 4.2.1.1.

The maximum RF output power shall not exceed 22 dBm (EIRP) per carrier.

It shall fulfill the relevant requirements of this Technical Code on all the permitted frequencies which it is intended to operate.

Table 1. GSM/EDGE Operating band plans

Operating band	Duplex mode	Operating band		Band plan reference
		Uplink (MHz)	Downlink (MHz)	
900	FDD	880 - 915	925 - 960	SKMM SRSP-504
1800	FDD	1,710 - 1,785	1,805 - 1,880	SKMM SRSP-508

Table 2. UMTS Operating band plans

Operating band	Duplex mode	Operating band		Band plan reference
		Uplink (MHz)	Downlink (MHz)	
900	FDD	880 - 915	925 - 960	SKMM SRSP-504
2100	FDD	1,920 - 1,980	2,110 - 2,170	SKMM SRSP-524M

Table 3. LTE Operating band plans

Operating Band	Duplex Mode	Operating band		Band plan reference
		Uplink (MHz)	Downlink (MHz)	
850	FDD	824 - 834	869 - 879	SKMM SRSP-504
900	FDD	880 - 915	925 - 960	SKMM SRSP-504
1800	FDD	1,710 - 1,785	1,805 - 1,880	SKMM SRSP-508
2100	FDD	1 ,920 - 1,980	2,110 - 2,170	SKMM SRSP-524M
2100	TDD	1,915 - 1,920		SKMM SRSP-524M
		2,010 - 2,025		
2300	TDD	2,300 - 2,400		SKMM SRSP-532
2600	FDD	2,500 - 2,570	2,620 - 2,690	SKMM SRSP-523
2600	TDD	2,570 - 2,620		SKMM SRSP-523

The precise operating frequency range of a CBEs shall follow that of the Network Operator from whom the service is obtained.

4.2.1.1 Conformity

The CBEs shall comply with the frequency bands stated in 4.2.1 and the requirements of one or more of the following standards:

a) ETSI EN 303 609;

b) ETSI EN 301 908-11;

c) ETSI EN 301 908-15;

d) ETSI TS 136 143.

In the case of CBEs supports LTE TDD, the test measurement method shall refer to 3GPP TS 25 153 standard and the limit shall follow ETSI TS 136 143 standard.

If the CBEs support technologies other than listed above, for example 5G, Wireless Local Area Network (WLAN), Bluetooth and Near Field Communication (NFC), suppliers shall demonstrate that the CBEs has been tested and certified for conformance to related Technical Codes and Class Assignments.

4.2.2 Electromagnetic Compatibility (EMC)

The CBEs shall comply with the EMC emission requirements as defined in the ETSI EN 301 489-1 or ETSI EN 301 489-23 or ETSI EN 301 489-50 or any equivalent standard.

4.2.3 Safety

The CBEs shall comply with the safety requirements defined in MS IEC 60950-1, IEC 62368-1 or any equivalent standards.

Annex A
(Normative)

Normative references

SKMM SRSP-504, *Requirements for mobile cellular systems and International Mobile Telecommunications (IMT) systems operating in the frequency bands 825 MHz to 835 MHz paired with 870 MHz to 880 MHz and 880 MHz to 915 MHz paired with 925 MHz to 960 MHz*

SKMM SRSP-508*, Requirements for mobile cellular systems and International Mobile Telecommunications (IMT) systems operating in the frequency bands 1710 MHz to 1785 MHz and 1805 MHz to 1880 MHz*

SKMM SRSP-523, *Requirements for Broadband Wireless Access (BWA) systems operating in the frequency band 2504 MHz to 2688 MHz*

SKMM SRSP-524M*, Requirements for International Mobile Telecommunications (IMT) systems operating in the frequency bands 1885 MHz to 2025 MHz and 2110 MHz to 2200 MHz*

SKMM SRSP-532, *Requirements for Broadband Wireless Access (BWA) systems operating in the frequency band 2300 MHz to 2400 MHz*

MS 406, *Specification for voltages and frequency for alternating current transmission and distribution systems*

MS 589: Part 1, *Specification for 13 A plugs, socket outlets, adaptors and connection units - Part 1: Specification for rewirable and non-rewirable 13 A fused plugs*

MS 1577, *Specification for 15A Plugs and Socket Outlets for Domestic and Similar purposes.*

MS 1578, *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*

MS 2112-5, *Electric Cable and Wire: Polyvinyl Chloride(PVC) insulated cables of rated voltages up to and including 450/750 V - Part 5 : Flexible cables.*

MS 2127-4, *Rubber insulated cables of rated voltages up to and including 450/750 V - Part 4: Cords and flexible cables*

MS IEC 60038, *IEC Standard voltages*

MS IEC 60950-1, *Information Technology equipment - Safety*

IEC 60227-5, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 5: Flexible cables (cords)*

IEC 60245-1, *Rubber insulated cables - Rated voltages up to and including 450/750 V - Part 1: General requirements*

IEC 60245-4, *Rubber insulated cables - Rated voltages up to and including 450/750 V - Part 4: Cords and flexible cables*

IEC 62368-1, *Audio/video, information and communication technology equipment - Part 1: Safety requirements*

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*

ETSI EN 301 489-23, *Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 23: Specific conditions for IMT-2000 CDMA, Direct Spread (UTRA and E-UTRA) Base Station (BS) radio, repeater and ancillary equipment*

ETSI EN 301 489-50, *Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 50: Specific conditions for Cellular Communication Base Station (BS), repeater and ancillary equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of the Directive 2014/53/EU*

ETSI EN 301 908-11*, IMT cellular networks; Harmonized EN covering essential requirements of Directive 2014/53/EU; Part 11: CDMA Direct Spread (UTRA FDD) Repeaters*

ETSI EN 301 908-15, *IMT cellular networks; Harmonised EN covering essential requirements of Directive 2014/53/EU; Part 15: Evolved Universal Terrestrial Radio Access (E-UTRA) FDD Repeaters*

ETSI EN 303 609, *Global System for Mobile communications (GSM); GSM Repeaters; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU*

ETSI TS 136 143, *LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); FDD repeater conformance testing (3GPP TS 36.143 version 12.1.0 Release 12)*

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*

BS EN 50525-2-11, *Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation*

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

3GPP TS 25 153, *3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRA repeater conformance testing (LCR TDD) (Release 15)*

Acknowledgements

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