

TECHNICAL CODE

COMMUNICATIONS EQUIPMENT - BASELINE REQUIREMENTS

Developed by



Registered by



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MCMC MTSFB TC T022:2026

Development of technical codes

The Communications and Multimedia Act 1998 (Laws of Malaysia Act 588) ('the Act') provides for a 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 requirements 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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Committee representation

This technical code was developed by Communications Terminal Working Group of the Malaysian Technical Standards Forum Bhd (MTSFB), which consists of representatives from the following organisations:

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SIRIM Berhad

Smart Tech Asia Pacific Sdn Bhd

Terengganu Telecommunications Sdn Bhd

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Foreword

This technical code for Communications Equipment - Baseline Requirements ('Technical Code') was developed pursuant to Section 185 of the Communications and Multimedia Act 1998 (Laws of Malaysia Act 588) by the Communications Terminal Working Group of the Malaysian Technical Standards Forum Bhd (MTSFB).

This Technical Code was developed for the purpose of communications equipment's compliance with the Communications and Multimedia (Technical Standards) Regulations 2000.

This Technical Code shall be read together with other applicable Technical Codes on communications equipment. In the event of any conflict, this Technical Code shall prevail and supersede the conflicting specific requirements in those other Technical Codes to the extent of such inconsistency.

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

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COMMUNICATIONS EQUIPMENT - BASELINE REQUIREMENTS

Introduction

With the communications market experiencing robust growth and rapid technological advancements in communications equipment, there is a clear need to establish a standard guideline for baseline requirements. This Technical Code will not only streamline the compliance process but also enhance the interoperability and electrical safety of communications equipment. This Technical Code is applicable to all communications equipment in Malaysia.

It is intended to complement the applicable Technical Codes in ensuring that the equipment complies with both this Technical Code and the relevant Technical Code. For communications equipment that is not covered in any Technical Code, this Technical Code shall be served as a baseline requirement.

1. Scope

This Technical Code defines the minimum requirements for all communications equipment, including (but not limited to) user equipment, network facilities, and radiocommunications equipment (“the Equipment”), to ensure compliance with operational, general, and technical requirements for use in communications services.

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. Abbreviations

For the purposes of this Technical Code, the following abbreviations apply.

AC	Alternating Current
EMC	Electromagnetic Compatibility
IP	Internet Protocol
IPv6	Internet Protocol version 6
PVC	Polyvinyl Chloride
PD	Power Density
RF	Radio Frequency
SAR	Specific Absorption Rate

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4. Terms and definitions

In this Technical Code, the following terms and definitions apply unless the context requires otherwise:

4.1 Communications equipment

Any network facilities, customer equipment or radiocommunications equipment.

4.2 Connected equipment

4.2.1 Directly connected equipment

The Equipment that establish a direct connection to the Network Service Provider (NSP) without requiring an intermediary device as illustrated in Figure 1 of Clause 5.

4.2.2 Non-directly connected equipment

The Equipment that establishes a connection to the NSP that require an intermediary device as illustrated in Figure 1 of Clause 5.

4.3 Electromagnetic Compatibility (EMC)

The ability of the Equipment to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to other equipment in that environment.

This means that the Equipment shall operate correctly when exposed to electromagnetic disturbances and should not emit levels of electromagnetic interference that would prevent other equipment from functioning as intended.

4.4 Specific Absorption Rate (SAR)

The rate at which the human body absorbs RF energy from an electromagnetic field. It is typically measured in watts per kilogram (W/kg) and is used to ensure that exposure to electromagnetic radiation remains within safe limits.

4.5 Power Density (PD)

The radiant power incident perpendicular to a surface, divided by the area of that surface (W/m^2). It is the principal quantity used for assessing human exposure to electromagnetic fields in the far-field region, particularly for frequencies above 6 GHz.

5. Requirements

5.1 Operational requirements

The operation of the Equipment shall be designed to meet the following basic requirements:

- a) Shall not cause interference with other authorised radiocommunication services and be able to tolerate any interference caused by other radiocommunication services, electrical or electronic equipment.
- b) 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 use of the frequency bands for IMT systems in Malaysia is subject to the relevant instruments issued under the Act and the subsidiary legislations made under the Act, including the Communications and Multimedia (Spectrum) Regulations 2000, such as Spectrum Plan, other instruments/documents such as Standard Radio System Plan (SRSP), guidelines and regulatory policies, including any revision(s) made to the same thereafter.
- d) For directly connected equipment it shall comply with the requirements of Internet Protocol version 6 (IPv6), Safety, EMC and SAR (if applicable). Figure 1 differentiates between directly connected and non-directly connected equipment.

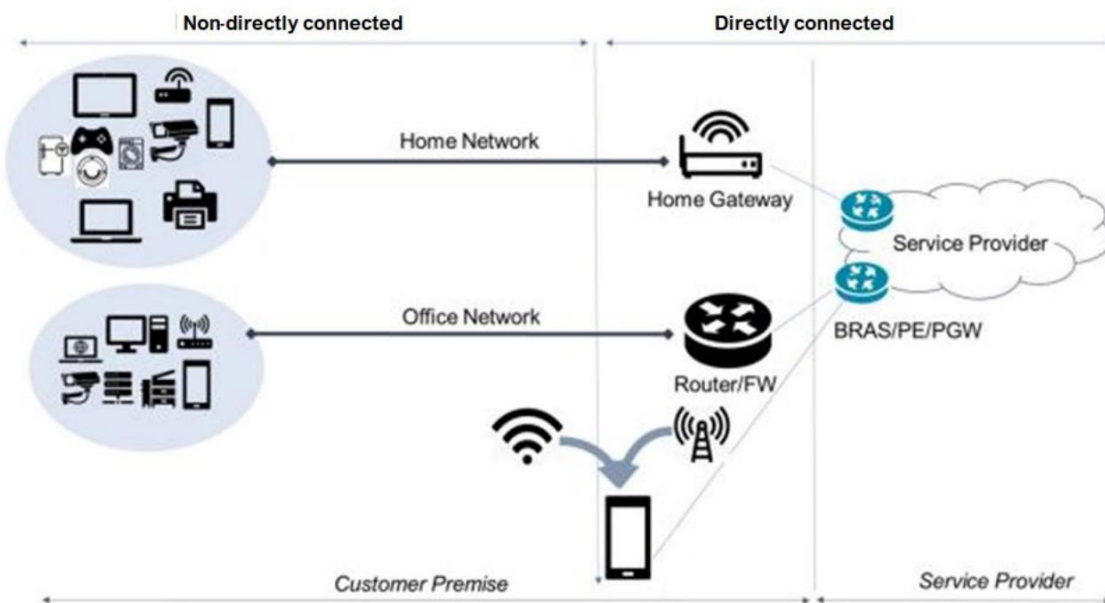


Figure 1. Directly and non-directly connected device

If the equipment has hybrid functionality and can operate as both directly and indirectly connected equipment, it shall comply with the requirements for directly connected equipment.

5.2 General requirements

5.2.1 Marking

The Equipment shall be marked with the following information:

- a) supplier or manufacturer's name or identification mark;
- b) equipment's brand name or trademark;
- c) equipment's model; and
- d) 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.

In cases where it is not feasible to mark the information directly on the Equipment due to design, material, or space limitations, the required information shall instead be clearly marked on the primary package.

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5.2.2 Interoperability

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

5.2.3 Keypad

Telephones or any Equipment incorporating a keypad shall be equipped with an alphanumeric keypad for accessing the telephone network. The allocation of letters to digits and the keypad layout shall conform to the requirements specified in ITU-T Recommendation E.161 (02/2001).

5.3 Technical requirements

5.3.1 Radio Frequency (RF)

The Equipment shall operate and conform to the RF requirements as specified in the relevant registered Technical Codes.

5.3.2 Internet Protocol version 6 (IPv6)

The Equipment that supports Internet Protocol (IP) and IP-based functionalities shall comply with the IPv6 requirements specified in MCMC MTSFB TC T013.

5.3.3 Electromagnetic Compatibility (EMC)

The Equipment shall comply with the EMC requirements as specified in ETSI EN 301 489-1 or equivalent standards, except for the communication equipment listed in Table 1 which shall comply with relevant EMC standards specified therein. The requirements shall cover emissions and immunity.

Table 1. List of communications equipment with reference document for Electromagnetic Compatibility (EMC) requirements

Communications equipment	Test references
Maritime	ETSI EN 301 843-1 or IEC 60945
Aeronautical	ETSI EN 301 489-22
Base station	ETSI TS 138 113
DTTV broadcasting	ETSI EN 301 489-53 or CISPR 32 and CISPR 35
Notes:	
1. All equipment is required to comply with the aforementioned standards or any relevant standards. For equipment that requires certification, the certifying agency will assess the relevance of such standards as part of the certification process, including conducting a comprehensive suitability assessment and gap analysis, subject to the approval of the regulator.	
2. New test references may be introduced for future equipment.	

This clause shall not apply to non-directly connected equipment to the NSP or otherwise required.

5.3.4 Electrical safety

5.3.4.1 Equipment

The Equipment shall comply with the electrical safety requirements as specified in IEC 62368-1 or equivalent standards, except for the communication equipment listed in Table 2 which shall comply with relevant safety standards specified therein.

Table 2. List of communications equipment with reference document for electrical safety requirements

Communications equipment	Test references
Maritime	IEC 60945
<p>Notes:</p> <ol style="list-style-type: none"> 1. All equipment is required to comply with the aforementioned standards or any relevant standards. For equipment that requires certification, the certifying agency will assess the relevance of such standards as part of the certification process, including conducting a comprehensive suitability assessment and gap analysis, subject to the approval of the regulator. 2. New test references may be introduced for future Equipment. 	

This clause shall not apply to non-directly connected equipment to the NSP or otherwise required.

5.3.4.2 Power supply

For Alternating Current (AC) powered equipment, the operating voltage shall be 230 V (+10 %, -6%) and frequency 50 Hz ± 1 % in accordance with MS IEC 60038.

In the case of external power supply (e.g. AC adaptor) is used, it shall not affect the capability of the equipment to meet this Technical Code and shall be pre-approved by the relevant regulatory body before being used with the equipment.

5.3.4.3 Power supply cord and mains plug

The Equipment shall be fitted with a suitable and certified power supply cord and mains plug. The power supply cord and mains plug are regulated products and shall be pre-approved by the relevant regulatory body, with the following requirements, before they can be 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 mains plug shall be certified according to:
 - i) MS 589-1 or BS 1363-1 (for 13 A, fused plugs);
 - 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).

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5.3.5 Specific Absorption Rate (SAR)

The Equipment that operates using cellular and mobile radio that is intended to be used at a position near the human body, in the manner described by the manufacturer, with the radiating part(s) of the device at distances up to and including 200 mm from a human body shall comply with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for Specific Absorption Rate (SAR) and one or more of the following standards:

- a) EN 50360;
- b) EN 50566;
- c) IEC 62209-1;
- d) IEC 62209-2; and/or
- e) any equivalent standards.

This clause shall not apply to non-directly connected equipment to the NSP or otherwise required.

5.3.6 Power Density (PD)

The Equipment that operates with exposure determination for frequencies above 6 GHz shall comply with IEC/IEEE 63195-1 or any equivalent standard.

Annex A
(normative)

Normative references

MCMC MTSFB TC T013, *Internet Protocol version 6 (IPv6) - Equipment Compliance*

MS 589-1, *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 15 A 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*

CISPR 32, *Electromagnetic compatibility of multimedia equipment - Emission requirements*

CISPR 35, *Electromagnetic compatibility of multimedia equipment - Immunity requirements*

ICNIRP guideline

IEC/IEEE 63195-1, *Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz) - Part 1: Measurement procedure*

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 60945, *Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results*

IEC 62209-1, *Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz)*

IEC 62209-2, *Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)*

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

EN 50360, *Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz - 3 GHz)*

EN 50566, *Product standard to demonstrate the compliance of wireless communication devices with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 30 MHz to 6 GHz: hand-held and body mounted devices in close proximity to the human body*

ETSI EN 301 489-1, *Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility*

ETSI EN 301 489-22, *ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 22: Specific conditions for ground based aeronautical mobile and fixed radio equipment; Harmonised Standard for ElectroMagnetic Compatibility*

ETSI EN 301 489-53, *ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 53: Specific conditions for terrestrial sound broadcasting and digital TV broadcasting service transmitters and associated ancillary equipment Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU*

ETSI EN 301 843 -1, *ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Harmonised Standard for electromagnetic compatibility; Part 1: Common technical requirements*

ETSI TS 138 113, *5G; NR; Base Station (BS) ElectroMagnetic Compatibility (EMC) (3GPP TS 38.113 version 16.3.0 Release 16)*

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

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*

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