

MCMC MTSFB TC T007:2020

TECHNICAL CODE

SHORT RANGE DEVICES - SPECIFICATIONS (SECOND REVISION)

Developed by



Registered by



Registered date:

6 May 2020

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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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Committee representation

This Technical Code was developed by Fixed and Wireless Terminal Working Group under the Malaysian Technical Standards Forum Bhd (MTSFB) which consists of representatives from the following organisations:

Celcom Axiata Berhad

Digi Telecommunications Sdn Bhd

Fraunhofer IIS

Maxis Communications Berhad

Measat Broadcast Network Systems Sdn Bhd

Redsun Engineering Sdn Bhd

SIRIM QAS International Sdn Bhd

Telekom Malaysia Berhad

TM Research and Development Sdn Bhd

YTL Communications Sdn Bhd

Foreword

This technical code for the Specification for Short Range Devices - Specifications ('this Technical Code') was developed pursuant to section 185 of the Act 588 by the Malaysian Technical Standards Forum Bhd via 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.

Major modifications in this revision are as follows:

- a) Update the frequency bands and maximum transmit power limits for generic and specific SRD applications to be aligned with the latest Class Assignment No. 2 of 2019;
- b) Inclusion of technical requirements for new SRD applications such as Ultra-Wideband (UWB), inductive device and automotive radar based on the latest Class Assignment No. 2 of 2019; and
- c) Inclusion of new technical requirements for electrical safety and EMC for devices that can be directly connected to the service provider's network.

This Technical Code cancels and replaces the MCMC MTSFB TC T007:2014, *Specification for Short Range Devices (SRD) (First Revision)*.

This Technical Code shall continue to be valid and effective until reviewed or cancelled.

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SHORT RANGE DEVICES - SPECIFICATIONS

1. Scope

This Technical Code defines the technical requirements for Short Range Devices (SRDs) operating in the frequencies as defined in the relevant Standard Radio System Plans (SRSPs) and the Class Assignments issued by MCMC.

The SRDs may be fixed, mobile or portable stations that are fitted with an antenna connector or an integral antenna. The applications include various generic short range and inductive applications, Industrial Scientific and Medical (ISM), Radio Frequency Identification (RFID), wireless microphone, security, automotive radar, active medical implant and Ultra-Wideband (UWB). The SRDs may employ different types of modulation and power requirement which may include data, video, voice and inductive applications.

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.

Refer to Annex A.

3. Abbreviation

For the purposes of this Technical Code, the following abbreviation applies.

AC	Alternating Current
AFA	Adaptive Frequency Agility
CCTV	Closed-Circuit Television
DC	Direct Current
DECT	Digital Enhanced Cordless Telecommunication
DFS	Dynamic Frequency Selection
EIRP	Effective Isotropic Radiated Power
EMC	Electromagnetic Compatibility
ERP	Effective Radiated Power
ISM	Industrial, Scientific and Medical
LBT	Listen Before Talk
LPLDC	Low Power Low Duty Cycle
PVC	Polyvinyl Chloride
RF	Radio Frequency
RFID	Radio Frequency Identification Device
RLAN	Radio Local Area Network
SRSP	Standard Radio System Plan
SRD	Short Range Devices

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SRC	Short Range Communication
TPC	Transmit Power Control
UWB	Ultra-wideband

4. Requirements

4.1 General requirements

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

- a) The SRDs 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 SRDs 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 SRDs default setting shall be within the frequency range stipulated in SRSPs and Class Assignment.

4.1.1 Power supply

The SRDs may be Alternating Current (AC) or Direct Current (DC) powered. For AC powered equipment, the operating voltage shall be 240 V, + 5 %, - 10 % and frequency 50 Hz \pm 1 % in according to MS 406 or 230 V \pm 10 % and frequency 50 Hz \pm 1 % in 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 Technical Code. Adaptor shall 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

The SRDs 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 according to:

- a) MS 2112-5 or BS EN 50525-2-11 or IEC 60227-5 (Polyvinyl Chloride (PVC) insulated - flexible cables/cords); or
- b) MS 2127-4 or IEC 60245-1 and IEC 60245-4 (rubber insulated - flexible cables/cords)

The main plug shall be certified according to:

- a) 13 A fused plug complying to MS 589-1 or BS 1363-1;
- b) 15 A fused plugs complying to MS 1577;
- c) 2.5 A, 250 V, flat non-rewireable two-pole plugs with cord for the connection of class II equipment complying to MS 1578 or BS EN 50075.

4.1.3 Marking

The SRDs 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

4.2.1 Safety

The SRDs that are directly connected to the service providers' networks shall comply with the safety requirements defined in MS IEC 60950-1, IEC 62368-1 or any equivalent standards. Please refer to Figure 1 for the illustrations on directly and non-directly connected equipment.

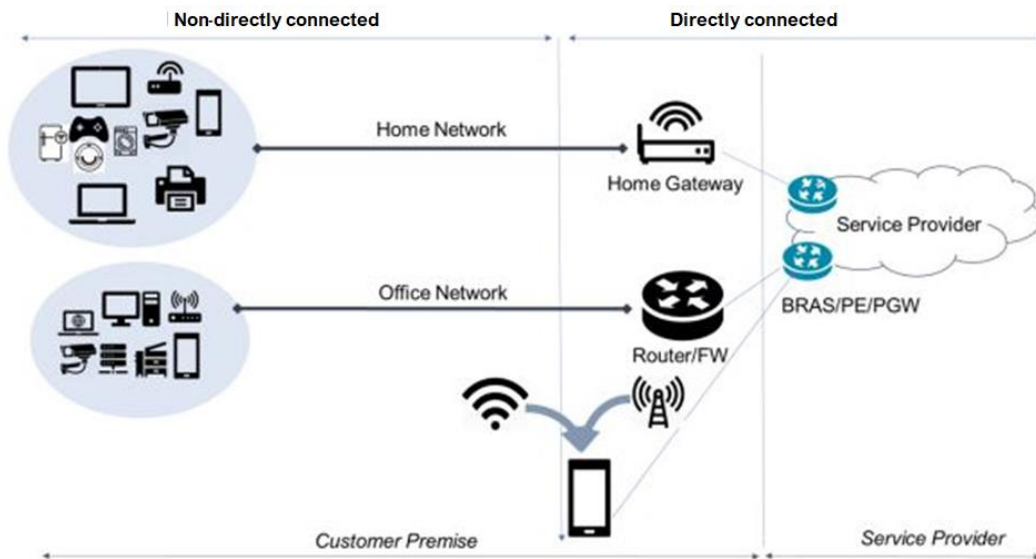


Figure 1. Directly connected equipment

4.2.2 Electromagnetic Compatibility (EMC)

The SRDs that connects (directly or indirectly) to AC mains network and connects directly to the service providers' networks shall comply with the conducted emission requirements as defined in the ETSI EN 301 489-1 or CISPR 32 or any equivalent standards.

4.2.3 Radio Frequency (RF)

The SRDs shall be designed to operate within the specified frequency bands and comply with the maximum field strength or Radio Frequency (RF) output power and transmitter and receiver spurious emissions given in Table 1. It shall fulfill the relevant requirements of this Technical Code on all the permitted frequencies which it is intended to operate.

Table 1. Technical requirements for short range devices

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
1.	3 kHz - 195 kHz	50 mW (EIRP)	EN 300 330	EN 300 330	Security device	
2.	9 kHz - 90 kHz	≤ 72 dBμA/m at 10 m	EN 300 330/ EN 303 417	EN 300 330/ EN 303 417	Inductive device	
3.	9 kHz - 315 kHz	≤ 30 dBμA/m at 10 m	EN 302 195	EN 302 195	Active medical implant device	
4.	90 kHz - 119 kHz	≤ 42 dBμA/m at 10 m	EN 300 330/ EN 303 417	EN 300 330/ EN 303 417	Inductive device	
5.	119 kHz - 135 kHz	≤ 66 dBμA/m at 10 m	EN 300 330/ EN 303 417	EN 300 330/ EN 303 417	Inductive device	
6.	135 kHz - 140 kHz	≤ 42 dBμA/m at 10 m	EN 300 330/ EN 303 417	EN 300 330/ EN 303 417	Inductive device	
7.	140 kHz - 148.5 kHz	≤ 37.7 dBμA/m at 10 m	EN 300 330/ EN 303 417	EN 300 330/ EN 303 417	Inductive device	
8.	148.5 kHz - 30 MHz	≤ - 5 dBμA/m at 10 m	EN 300 330/ EN 303 417	EN 300 330/ EN 303 417	Inductive device	
9.	315 kHz - 400 kHz	≤ - 5 dBμA/m at 10 m	EN 300 330	EN 300 330	Inductive device	
10.	400 kHz - 600 kHz	≤ - 8 dBμA/m at 10 m	EN 300 330	EN 300 330	Inductive device	
11.	984 kHz - 7 484 kHz	≤ 9 dBμA/m at 10 m	EN 300 330	EN 300 330	Inductive device	

Notes:

1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.
2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
12.	3 155 kHz - 3 400 kHz	≤ 13.5 dBμA/m at 10 m	EN 300 330	EN 300 330	Short Range Communication (SRC) device	
					Inductive device	
13.	6 765 kHz - 6 795 kHz	≤ 100 mW (EIRP)	EN 300 330	EN 300 330	SRC device	
		≤ 500 mW (EIRP)	EN 300 330	EN 300 330	Industrial, Scientific and Medical (ISM) device	
		≤ 42 dBμA/m at 10 m	EN 300 330/ EN 303 417	EN 300 330/ EN 303 417	Inductive device	
14.	7 400 kHz - 8 800 kHz	≤ 9 dBμA/m at 10 m	EN 300 330	EN 300 330	Inductive device	
15.	10 200 kHz - 11 000 kHz	≤ 10 mW (EIRP)	EN 300 330	EN 300 330	SRC device	
		≤ 9 dBμA/m at 10 m	EN 300 330	EN 300 330	Inductive device	
<p>Notes:</p> <ol style="list-style-type: none"> 1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz. 2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15]. 						

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
16.	13 553 kHz - 13 567 kHz	≤ 100 mW (EIRP)	EN 300 330/ EN 302 291-1	EN 300 330/ EN 302 291-1	SRC device	
					Radio Frequency Identification (RFID)	
		≤ 500 mW (EIRP)	EN 300 330	EN 300 330	ISM device	
		≤ 42 dBµA/m at 10 m	EN 300 330	EN 300 330	Inductive device	
17.	26.957 MHz - 27.283 MHz	≤ 100 mW (EIRP)	EN 300 220-1	EN 300 220-1	SRC device	
		≤ 500 mW (EIRP)	EN 300 220-1	EN 300 220-1	ISM device	
		≤ 42 dBµA/m at 10 m	EN 300 330	EN 300 330	Inductive device	
18.	26.957 28 MHz - 27.282 72 MHz	≤ 50 mW (EIRP)	EN 300 220-1	EN 300 220-1	Wireless microphone device	
<p>Notes:</p> <p>1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.</p> <p>2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].</p>						

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
19.	26.9650 MHz - 27.2750 MHz	≤ 50 mW (EIRP)	EN 300 220-1	EN 300 220-1	Remote controlled device	
20.	40 MHz					
21.	40.435 MHz - 40.925 MHz				Wireless microphone device	
22.	40.660 MHz - 40.700 MHz	≤ 500 mW (EIRP)	EN 300 220-1/ FCC Part 15	EN 300 220-1/ FCC Part 15	ISM device	
		≤ 1 W (EIRP)			SRC device	
23.	47 MHz	≤ 50 mW (EIRP)	EN 300 220-1/ EN 301 357	EN 300 220-1/ EN 301 357	Remote controlled device	
24.	49 MHz					
25.	87.5 MHz - 108 MHz	≤ 50 nW (ERP)	EN 300 220-1/ EN 301 357	EN 300 220-1/ EN 301 357	SRC device	
		≤ 50 nW (EIRP)			Wireless microphone device	
<p>Notes:</p> <p>1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.</p> <p>2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].</p>						

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
26.	174 MHz - 230 MHz	≤ 50 mW (EIRP)	EN 300 220-1/ EN 300 422-1/ FCC Part 15	EN 300 220-1/ EN 300 422-1/ FCC Part 15	Wireless microphone device	
27.	228.006 3 MHz - 228.993 7 MHz	≤ 50 mW (EIRP)	EN 300 220-1	EN 300 220-1	Security device	
28.	303 MHz - 320 MHz				Security device	
					Remote controlled device	
29.	400 MHz - 402 MHz				Security device	
30.	401 MHz - 402 MHz	≤ 25 µW (ERP)	EN 302 537	EN 302 537	Active medical implant device	≤ 25 µW (ERP) for devices with Adaptive Frequency Agility (AFA) and Listen Before Talk (LBT)
		≤ 250 nW (ERP)	EN 302 537	EN 302 537	Active medical implant device	≤ 250 nW (ERP) for devices using Low Power Low Duty Cycle (LPLDC)

Notes:

1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.
2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
31.	402 MHz - 405 MHz	≤ 25 μW (ERP)	EN 301 839-1	EN 301 839-1	Active medical implant device	≤ 25 μW (ERP) for devices with AFA and LBT
32.	405 MHz - 406 MHz	≤ 25 μW (ERP)	EN 302 537	EN 302 537	Active medical implant device	≤ 25 μW (ERP) for devices with AFA and LBT
		≤ 250 nW (ERP)	EN 302 537	EN 302 537	Active medical implant device	≤ 250 nW (ERP) for devices using LPLDC
33.	433 MHz - 435 MHz	≤ 50 mW (EIRP)	EN 300 220-1	EN 300 220-1	Security device	
					Remote controlled device	
		≤ 100 mW (EIRP)	EN 300 220-1	EN 300 220-1	SRC device	
					RFID	

Notes:

1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.
2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
34.	470 MHz - 694 MHz	≤ 50 mW (EIRP)	EN 300 220-1/ EN 300 422-1	EN 300 220-1/ EN 300 422-1	Wireless microphone device	
35.	916 MHz – 919 MHz	≤ 25 mW (EIRP)	EN 300 220-1/ FCC Part 15	EN 300 220-1/ FCC Part 15	SRC device	Duty cycle < 1% or Frequency Hopping or Listen Before Talk (LBT)
36.	919 MHz - 923 MHz	≤ 500 mW (EIRP)	EN 300 220-1/ FCC Part 15	EN 300 220-1/ FCC Part 15	SRC device	RFID interrogator below 2 W (ERP) is subject to Class Assignment and up to 4 W (ERP) is subject to an Apparatus Assignment as per MCMC SRSP-530 RFID.
		≤ 2 W (ERP)	EN 300 220-1/ EN 302 208-1/ FCC Part 15	EN 300 220-1/ EN 302 208-1/ FCC Part 15	RFID	
		≤ 4 W (ERP)	EN 300 220-1/ EN 302 208-1/ FCC Part 15	EN 300 220-1/ EN 302 208-1/ FCC Part 15		
37.	923 MHz - 924 MHz	≤ 500 mW EIRP	EN 300 220-1/ FCC Part 15	EN 300 220-1/ FCC Part 15	SRC device	≤ 500 mW (EIRP) with duty cycle < 1% or Frequency Hopping or LBT

Notes:

1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.
2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks		
38.	1 880 MHz - 1 900 MHz	≤ 250 mW (EIRP)	EN 300 440	EN 300 440	SRC device			
			EN 300 176/ EN 301 406	EN 300 176/ EN 301 406	Cordless Telephone			
39.	2 400 MHz - 2 500 MHz	≤ 500 mW (EIRP)	EN 300 440	EN 300 440	SRC device			
					RFID			
		≤ 1W (EIRP)			Closed-Circuit Television (CCTV) access device			
		≤ 50 mW (EIRP)			Wireless microphone			
		≤ 500 mW (EIRP)			EN 300 328/ FCC Part 15 §15.247	EN 300 328/ FCC Part 15 §15.247	ISM device	
							SRC device	
Notes:								
<p>1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.</p> <p>2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].</p>								

Table 1. Technical requirements for short range devices (continued)

No.	Authorised frequency bands/frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	applications	Remarks
40.	3 100 MHz - 3 400 MHz	- 36 dBm (EIRP)	EN 302 065	EN 303 883	Ultra-wideband (UWB) communication device	To fulfil the conditions as per Class Assignment for UWB.
41.	3 400 MHz - 3 800 MHz	- 40 dBm (EIRP)	EN 302 065	EN 303 883		
42.	3 800 MHz - 6 000 MHz	- 30 dBm (EIRP)	EN 302 065	EN 303 883		
43.	4 940 MHz - 4 990 MHz	≤ 1 W (EIRP)	EN 300 440	EN 300 440	CCTV access device	For government use only. Subject to an Apparatus Assignment as per Class Assignment for CCTV hub station.
44.	5 150 MHz - 5 350 MHz	≤ 1 W (EIRP)	EN 300 440	EN 300 440	SRC device	SRC device operating under this provision shall implement Dynamic Frequency Selection (DFS) function in the frequency range 5.250 GHz - 5.350 GHz.
					CCTV access device	
			EN 301 893/ FCC Part 15 §15.407	EN 301 893/ FCC Part 15 §15.407	SRC device	
Notes:						
<p>1. Effective Radiated Power (ERP) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.</p> <p>2. Equivalent Isotropic Radiated Power (EIRP) is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].</p>						

Table 1. Technical requirements for short range devices (continued)

No	Authorised frequency bands/ frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
45.	5 470 MHz - 5 650 MHz	≤ 1 W (EIRP)	EN 300 440	EN 300 440	SRC device	SRC Device operating under this provision shall implement DFS and Transmit Power Control (TPC).
			EN 301 893	EN 301 893	SRC device (RLAN)	
46.	5 650 MHz - 5 725 MHz	≤ 1 W (EIRP)	EN 300 440	EN 300 440	CCTV access device	For government use only. Subject to an Apparatus Assignment as per Class Assignment for CCTV hub station.
47.	5 725 MHz - 5 875 MHz	≤ 500 mW (EIRP)	EN 300 44/ FCC Part 15 § 15.247 or §15.407	EN 300 440/ FCC Part 15 §15.247 or § 15.407	ISM device	
		≤ 1 W (EIRP)			SRC device	
					CCTV access device	
48.	6 000 MHz - 8 500 MHz	≤ 0 dBm (EIRP)	EN 302 065	EN 303 883	UWB communication device	To fulfil the conditions as per Class Assignment for UWB.
<p>Notes:</p> <ol style="list-style-type: none"> ERP refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz. EIRP is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15]. 						

Table 1. Technical requirements for short range devices (continued)

No	Authorised frequency bands/ frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
49.	8 500 MHz - 10 600 MHz	≤ -25 dBm (EIRP)	EN 302 065	EN 303 883	UWB communication device	To fulfil the conditions as per Class Assignment for UWB.
50.	21.65 GHz - 22 GHz	≤ 0 dBm (EIRP)	*EN 302 288	*EN 302 288	Automotive radar	To fulfil the conditions as per Class Assignment for Automotive Radar. <i>*Transmitter and receiver Spurious Emissions and Test Reference recommended by ERC Recommendation 70-03.</i>
51.	22 GHz - 29.5 GHz	≤ 0 dBm (EIRP)	*EN 302 288	*EN 302 288	Automotive radar	To fulfil the conditions as per Class Assignment for Automotive Radar. <i>*Transmitter & Receiver Spurious Emissions and Test Reference recommended by ERC Recommendation 70-03.</i>

Notes:

- ERP refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.
- EIRP is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15].

Table 1. Technical requirements for short range devices (continued)

No	Authorised frequency bands/ frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks
52.	24 GHz - 24.25 GHz	≤ 500 mW (EIRP)	EN 300 440/ FCC Part 15	EN 300 440/ FCC Part 15	ISM device	
		≤ 1 W (EIRP)			SRC device	
		≤ 30 dBm (EIRP)	EN 302 288/ EN 302 858	EN 302 288/ EN 302 858	Automotive radar	
53.	57 GHz - 64 GHz	≤ 10 W (EIRP)	EN 302 567	EN 302 567	SRC device	
54.	61 GHz - 61.5 GHz	≤ 500 mW (EIRP)	EN 305 550-1/ FCC Part 15	EN 305 550-1/ FCC Part 15	ISM device	
55.	76 GHz - 77 GHz	≤ 50 mW (EIRP)	EN 305 550-1	EN 305 550-1	Security device	
		≤ 55 dBm (EIRP)	EN 301 091-1	EN 301 091-1	Automotive radar	
56.	77 GHz - 81 GHz	≤ 55 dBm (EIRP)	EN 301 091-1	EN 301 091-1	Automotive radar	
<p>Notes:</p> <ol style="list-style-type: none"> ERP refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz. EIRP is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a constant difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15]. 						

Table 1. Technical requirements for short range devices (concluded)

No	Authorised frequency bands/ frequencies	Field strength/ RF output power	Transmitter and receiver spurious emissions	Test reference	Applications	Remarks		
57.	122 GHz - 123 GHz	≤ 500 mW (EIRP)	EN 305 550-1	EN 305 550-1	ISM device			
		≤ 1 W (EIRP)			SRC device			
58.	244 GHz - 246 GHz	≤ 500 W (EIRP)					ISM device	
		≤ 1 W (EIRP)					SRC device	
<p>Notes:</p> <ol style="list-style-type: none"> ERP refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz. EIRP is a product of the power supplied to the antenna and the maximum antenna gain, relative to an isotropic antenna, and is used for frequencies above 1 GHz. There is a difference of 2.15 dB between EIRP and ERP [EIRP (dBm) = ERP (dBm) + 2.15]. 								

Annex A

Normative references

MCMC Class Assignment No. 1 2019

MCMC SRSP - 530 RFID, *Requirement for Radio Frequency Identification Device operating in the frequency band from 919 MHz to 923 MHz*

MCMC SRSP - 534 WLAN, *Requirements for wireless local area networks (WLAN) systems operating in the frequency band 5150 MHz to 5350 MHz*

MCMC SRSP - 546 CCTV, *Requirements for wireless closed circuit television (CCTV) systems operating in the frequency band 5650 MHz to 5725 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 cable*

MS IEC 60038, *IEC Standard voltages*

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

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

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

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

ETSI EN 300 176 (All parts), *Digital Enhanced Cordless Telecommunications (DECT); Test Specification*

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ETSI EN 300 220-1, *Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 1: Technical characteristics and methods of measurement*

ETSI EN 300 328, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive*

ETSI EN 300 330, *Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

ETSI EN 300 422-1, *Wireless Microphones; Audio PMSE up to 3 GHz; Part 1: Class A Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

ETSI EN 300 440, *Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard for access to radio spectrum*

ETSI EN 301 091-1, *Short Range Devices; Transport and Traffic Telematics (TTT); Radar equipment operating in the 76 GHz to 77 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part 1: Ground based vehicular radar*

ETSI EN 301 357, *Cordless audio devices in the range 25 MHz to 2 000 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

ETSI EN 301 406, *Digital Enhanced Cordless Telecommunications (DECT); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU*

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 301 839-1, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Active Medical Implants (ULP-AMI) and Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Part 1: Technical characteristics and test methods*

ETSI EN 301 893, *5 GHz RLAN; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

ETSI EN 302 065, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB) for communications purposes; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive*

ETSI EN 302 195, *Short Range Devices (SRD); Ultra Low Power Active Medical Implants (ULP-AMI) and accessories (ULP-AMI-P) operating in the frequency range 9 kHz to 315 kHz Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU*

ETSI EN 302 208-2, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W and in the band 915 MHz to 921 MHz with power levels up to 4 W; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive*

ETSI EN 302 288, *Short Range Devices; Transport and Traffic Telematics (TTT); Ultra-wideband radar equipment operating in the 24,25 GHz to 26,65 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

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ETSI EN 302 291-1, *Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Part 1: Technical characteristics and test methods*

ETSI EN 302 537, *Ultra Low Power Medical Data Service (MEDS) Systems operating in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU*

ETSI EN 302 567, *Multiple-Gigabit/s radio equipment operating in the 60 GHz band; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

ETSI EN 302 858, *Short Range Devices; Transport and Traffic Telematics (TTT); Radar equipment operating in the 24,05 GHz to 24,25 GHz or 24,05 GHz to 24,50 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU*

ETSI EN 303 417, *Wireless power transmission systems, using technologies other than radio frequency beam in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz ranges; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

ETSI EN 303 883, *Short Range Devices (SRD) using Ultra Wide Band (UWB); Measurement Techniques*

ETSI EN 305 550-1, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Part 1: Technical characteristics and test methods*

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

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*

FCC Part 15, *Federal Communications Commission Part 15 - Radio Frequency Devices*

Acknowledgements

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