



قيھق برکواس ايندوستري تیکنولوگي اينفو - کومونیکاسي بروني دارالسلام
Authority for Info-communications Technology Industry of Brunei Darussalam

Technical Specification for Short Range Devices

**AITI-TS-SRD
Issue 2**

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1 General Requirements

1.1 Scope of Specification

1.1.1 This Specification defines the minimum technical requirements for short range device transmitters and receivers to operate in the frequency bands as specified in Table 1 below. Short range devices are intended for communications in confined areas of buildings as well as for localised on-site operations.

1.1.2 Short range devices may be fixed, mobile or portable stations that come with a radio frequency (RF) output connector and dedicated antenna or an integral antenna. Applications include alarms, security devices, identification systems, radio-detection, radio frequency identification device (RFID), vehicle radar systems, wireless local area networks (WLAN), wireless microphones, remote controls, telecommand, telemetry and on-site paging systems. These devices may employ different types of modulation and may have speech application.

1.2 Design Requirements

Short range devices shall be designed to meet the following basic requirements:

- i. The device is intended for operating in unprotected and shared frequency bands. Its operation shall not cause interference with other authorised radio-communication services, and be able to tolerate any interference caused by other radio-communication services, electrical or electronic equipment.
- ii. The device 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.

1.3 Marking Requirements

The device shall be marked with the manufacturer's brand or identification mark, and the manufacturer's model or type reference. The markings required shall be legible, indelible and readily visible.

1.4 Language

All markings and related documents has to include Bahasa Melayu or English Language.

2 Technical Requirements

Short range devices (SRD) shall comply with the maximum Effective Isotropic Radiated Power (EIRP) and Transmitter & Receiver Spurious Emissions given in Table 1, operating in its intended frequency band or frequencies. It shall fulfill the relevant requirements of this Technical Specification on all the permitted frequencies which it is intended to operate.

Technical Regulations for Short Range Radiocommunication Devices					
No	Typical Application Types	Authorised Frequency Bands / Frequencies	Maximum Field Strength / RF Output power	Transmitter Spurious Emissions	Applicable Radio Standards
1	CB Walkie Talkie Transceivers	26.96 – 27.28 MHz	≤ 500 mW (e.r.p.)		
2	Multi-channel Walkie Talkie Transceivers	446.00 – 446.10 MHz 477.00 – 477.25 MHz	≤ 500 mW (e.r.p.)		
3	Induction loop system / RFID	16 – 150 kHz	≤ 66 dB μ A/m @ 3m	≥ 32 dB below carrier at 3 m or EN 300 224-1	EN 300 224-1
		150 – 5000 kHz	≤ 13.5 dB μ A/m @ 10m		
		6765 – 6795 kHz	≤ 42 dB μ A/m @ 10m		
		7400 – 8800 kHz	≤ 9 dB μ A/m @ 10m		
		13.553 – 13.567 MHz	≤ 94 dB μ V/m @ 10m		
4	Radio detection, alarm system	0.016 – 0.150 MHz	≤ 100 dB μ V/m @ 3m	≥ 32 dB below carrier at 3 m or EN 300 330-1	FCC Part 15 or EN 300 330-1
5		13.553 – 13.567 MHz	≤ 94 dB μ V/m @ 10m		
6		868.10 – 869.00 MHz	≤ 65 dB μ V/m @ 10m		
7		10.50 – 10.55 GHz	≤ 117 dB μ V/m @ 10m		
8		26.96 – 27.28 MHz 146.35 – 146.50 MHz 240.15 – 240.30 MHz 300.00 – 300.30 MHz 312.00 – 316.00 MHz	≤ 100 mW (e.r.p.)	≥ 32 dB below carrier at 3 m or EN 300 220-1	FCC Part 15 or EN 300 220-1

Technical Regulations for Short Range Radiocommunication Devices					
No	Typical Application Types	Authorised Frequency Bands / Frequencies	Maximum Field Strength / RF Output power	Transmitter Spurious Emissions	Applicable Radio Standards
		444.40 – 444.80 MHz			
9	Wireless microphone	0.51 – 1.60 MHz	≤ 57 dBμV/m @ 3m		
10		40.66 – 40.70 MHz	≤ 500 mW (e.r.p.)		
11		88.00 – 108.00 MHz	≤ 60 dBμV/m @ 10m		
12		180.00 – 200.00 MHz	≤ 122 dBμV/m @ 10m		
13		470.00 – 742.00 MHz	≤ 10 mW (e.r.p.)		
14	Remote controls of garage door, cameras, toys and miscellaneous devices	26.96 – 27.28 MHz 34.995 – 35.225 MHz	≤ 100 mW (e.r.p.)	≥ 32 dB below carrier at 3 m or EN 300 220-1	FCC Part 15 or EN 300 220-1
		40.665 – 40.695 MHz 72.13 – 72.21 MHz	≤ 100 mW (e.r.p.)		
		40.770 – 40.830 MHz	≤ 500 mW (e.r.p.)		
15	Remote controls of aircraft and glider models, telemetry, detection and alarm systems	26.96 – 27.28 MHz 29.70 – 30.00 MHz	≤ 100 mW (e.r.p.)		
16	Medical and Biological telemetry	40.50 – 41.00 MHz	≤ 0.01 mW (e.r.p.)	≥ 32 dB below carrier at 3 m or	FCC Part 15 or EN 300 220-1

Technical Regulations for Short Range Radiocommunication Devices					
No	Typical Application Types	Authorised Frequency Bands / Frequencies	Maximum Field Strength / RF Output power	Transmitter Spurious Emissions	Applicable Radio Standards
		216.00 – 217.00 MHz	> 25 μ W to \leq 100 mW (e.r.p.)	EN 300 220-1	
		454.00 – 454.50 MHz	\leq 2 mW (e.r.p.)		
		1427.00 – 1432.00 MHz	\leq 100 μ V (e.r.p.)		
17	Wireless modem, data communication system	72.080 MHz 72.200 MHz 72.400 MHz 72.600 MHz	\leq 100 mW (e.r.p.)	\geq 43 dB below carrier over 100 kHz to 2000 MHz; EN 300 390-1 or EN 300 113-1	EN 300 390-1 or EN 300 113-1
18	Short range radar systems such as automatic cruise control and collision warning systems for vehicle	76 – 77 GHz	\leq 37 dBm (e.r.p.) when vehicle is in motion \leq 23.5 dBm (e.r.p.) when vehicle is stationary	FCC Part 15 § 15.253 (c) or EN 301 091	FCC Part 15 or EN 301 091
19	Radio telemetry, telecommand system	433.05 – 434.79 MHz	\leq 10 mW (e.r.p.)	\geq 32 dB below carrier at 3 m or EN 300 220-1	FCC Part 15 or EN 300 220-1
20		26.96 – 27.28 MHz 29.70 – 30.00 MHz	\leq 100 mW (e.r.p.)		

Technical Regulations for Short Range Radiocommunication Devices					
No	Typical Application Types	Authorised Frequency Bands / Frequencies	Maximum Field Strength / RF Output power	Transmitter Spurious Emissions	Applicable Radio Standards
21	Radio Telemetry, Telecommand, RFID system	866 – 869 MHz 923 – 925 MHz	≤ 500 mW (e.r.p.)	≥ 32 dB below carrier at 3 m; EN 300 220-1 or EN 302 208	FCC Part 15 ; EN 300 220-1 or EN 302 208
22	Radio Frequency Identification (RFID) systems	923 – 925 MHz	> 500 mW (e.r.p.) ≤ 2000 mW (e.r.p.)	≥ 32 dB below carrier at 3 m; EN 300 220-1 or EN 302 208	FCC Part 15 ; EN 300 220-1 or EN 302 208
23	Wireless video transmitter and other SRD applications	2.4000 – 2.4835 GHz	≤ 100 mW (e.i.r.p.)	FCC Part 15 § 15.209; § 15.249 (d) or EN 300 440-1	FCC Part 15 or EN 300 440-1
24		10.50 – 10.55 GHz	≤ 117 dBμV/m @ 10m		
25		24.00 – 24.25 GHz	≤ 100 mW (e.i.r.p.)		
26	Bluetooth	2.4000 – 2.4835 GHz	≤ 100 mW (e.i.r.p.)	FCC Part 15 § 15.209; or EN 300 328	FCC Part 15 § 15.247 or EN 300 328
27	Wireless LAN only	2.4000 – 2.4835 GHz	≤ 200 mW (e.i.r.p.)		

Technical Regulations for Short Range Radiocommunication Devices					
No	Typical Application Types	Authorised Frequency Bands / Frequencies	Maximum Field Strength / RF Output power	Transmitter Spurious Emissions	Applicable Radio Standards
28	SRD applications	5.725 – 5.850 GHz	≤ 100 mW (e.i.r.p.)		
29	Wireless LAN	5.725 – 5.850 GHz	≤ 1000 mW (e.i.r.p.)	FCC Part 15 § 15.209	FCC Part 15 § 15.247 or 15.407
30		5.725 – 5.850 GHz	> 1000 mW (e.i.r.p.) ≤ 4000 mW (e.i.r.p.)		
31	Wireless LAN	5.150 – 5.350 GHz	> 100 mW (e.i.r.p.) ≤ 200 mW (e.i.r.p.)	FCC Part 15 § 15.407 (b) or EN 301 893	FCC Part 15 § 15.407 or EN 301 893
32	Wireless LAN	5.150 – 5.350 GHz	≤ 100 mW (e.i.r.p.)	FCC Part 15 § 15.407 (b) or EN 301 893	FCC Part 15 § 15.407 or EN 301 893
33	Baby Monitor Devices	1880.00 – 1900.00 MHz	≤ 250 mW (e.i.r.p.)		

Technical Regulations for Short Range Radiocommunication Devices					
No	Typical Application Types	Authorised Frequency Bands / Frequencies	Maximum Field Strength / RF Output power	Transmitter Spurious Emissions	Applicable Radio Standards
35	Cordless Telephone or Wireless PABX	1.605 – 1.800 MHz	≤ 94 dB μ V/m @ 3m		
		40.00 – 40.50 MHz	≤ 57 dB μ V/m @ 3m		
		46.50 – 47.00 MHz	≤ 90 dB μ V/m @ 3m		
		49.50 – 50.00 MHz	≤ 90 dB μ V/m @ 3m		
		1880.00 – 1900.00 MHz	≤ 250 mW (e.i.r.p.)		

~Effective Radiated Power (ERP) refers to radiation of a half wave tuned of a half wave tuned dipole, which is used for frequencies below 1 GHz

~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. EIRP is used for frequencies above 1 GHz.

3 Conformity Assessment Requirements

The short range device shall be tested for compliance with the applicable technical requirements stipulated in §2 and Table 1 of this Specification, following test methods and conditions given in one or more of the following references which may be applicable to the device under test (refer to Table 1 for guidance):

ETSI EN 300 220-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio Equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Technical characteristics and test methods
ETSI EN 300 330-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); 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; Part 1: Technical characteristics and test methods
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 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 spread spectrum modulation techniques; Harmonised EN covering essential requirements under article 3.2 of the R&TTE Directives
ETSI EN 301 893	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
ETSI EN 300 390-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and speech) and using an integral antenna; Part 1: Technical characteristics and methods of measurement
ETSI EN 300 113-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: Technical characteristics and methods of measurement

ETSI EN 301 091	Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Technical characteristics and test methods for radar equipment operating in the 76 GHz to 77 GHz band
ETSI EN 300 135-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Angle-modulated Citizens Band radio equipment (CEPT PR 27 Radio Equipment); Part 1: Technical characteristics and methods of measurement
ETSI EN 300 433-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Double Side Band (DSB) and/or Single Side Band (SSB) amplitude modulated citizen's band radio equipment; Part 1: Technical characteristics and methods of measurement
ETSI EN 300 224-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); On-site paging service; Part 1: Technical and functional characteristics, including test methods
FCC Part 15 Subpart A	<u>Radio Frequency Devices General</u>
§ 15.31	Measurement Standards
§ 15.33	Frequency Range of Radiated Measurements
§ 15.35	Measurement Detector Functions and Bandwidths
FCC Part 15 Subpart C	<u>Radio Frequency Devices Intentional Radiators</u>
§ 15.209	Radiated emission limits, general requirements
§ 15.219	Operation in the band 510 – 1705 kHz
§ 15.225	Operation in the band 13.553 – 13.567 MHz
§ 15.227	Operation in the band 26.96 – 27.28 MHz
§ 15.231	Periodic operation in the band 40.66 – 40.70 MHz and above 70 MHz
§ 15.239	Operation in the band 88 – 108 MHz
§ 15.242	Operation in the bands 174 – 216 MHz and 470 – 668 MHz
§ 15.245	Operation in the bands 902 – 928 MHz, 2435 – 2465 MHz, 5785 – 5815 MHz, 10500 – 10550 MHz and 24075 – 24175 MHz
§ 15.247	Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, and 5725 – 5850 MHz
§ 15.249	Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5725 – 5875 MHz and 24.0 – 24.25 GHz
§ 15.253	Operation within the bands 46.7 – 46.9 GHz and 76.0 – 77.0 GHz

FCC Part 15 Subpart E Radio Frequency Devices Unlicensed National
Information Infrastructure Devices

§ 15.407 General technical requirements

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