Telecommunications Standards Advisory Committee (TSAC)

Technical Specification

Short Range Devices

IMDA TS SRD
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Telecommunications Standards Advisory Committee (TSAC)

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Content

1 Scope

1.1 This Specification defines the minimum technical requirements for Short Range Devices (SRD) to operate in one of the authorised frequency bands or frequencies, and transmit within the corresponding output power levels given in Table 1 and 2.

1.2 This Specification allows SRDs to share the use of spectrum on a non-exclusive manner, based on technical usage conditions and where necessary, requiring spectrum access mechanisms such as duty cycle, frequency hopping, detect and avoid, adaptive power control and listen before talk. It provides flexibility for deployment of a variety of SRD applications, catering to specific (common) usage scenarios as well as non-specific usage scenarios.

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

2 References

For the technical requirements captured in this Specification, reference has been made to the following standards. Where versions are not indicated, implementation of this Specification shall be based on current and valid versions of these standards published by the respective Standards Development Organisations.

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 under article 3.2 of Directive 2014/53/EU
ETSI EN 302 291-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13.56 MHz; Part 1: Technical characteristics and test methods
ETSI EN 300 220-1	Short Range Devices (SRD) operating in the frequency range 25 MHz to 1000 MHz; Part 1: Technical characteristics and test methods
Draft ETSI EN 300 220-2	Short Range Devices (SRD) operating in the frequency range 25 MHz to 1000 MHz; Part 2: Harmonised Standard for access to radio spectrum for nonspecific radio equipment
ETSI EN 300 220-4	Short Range Devices (SRD) operating in the frequency range 25 MHz to 1000 MHz; Part 4: Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU; Metering devices operating in designated band 169.400 MHz to 169.475 MHz
ETSI EN 300 422-1	Wireless microphones; Audio PMSE up to 3 GHz; Part 1: Class A Receivers; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU
ETSI EN 300 422-4	Wireless microphones; Audio PMSE up to 3 GHz; Part 4: Assistive Listening Devices including personal sound amplifiers and inductive systems up to 3 GHz; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU
ETSI EN 300 433	Citizens' Band (CB) radio equipment; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU

ETSI EN 300 224	Land Mobile Service; Radio Equipment for use in Paging Service operating within the frequency range 25 MHz – 470 MHz; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU;
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 under article 3.2 of Directive 2014/53/EU
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
Draft 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 301 839	Ultra Low Power Active Medical Implants (ULP-AMI) and associated Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU
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 under article 3.2 of Directive 2014/53/EU
ETSI EN 300 390	Land Mobile Service; Radio equipment intended for the transmission of data (and speech) and using an integral antenna; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU
ETSI EN 300 113	Land Mobile Service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an integral antenna connector; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU
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 under article 3.2 of Directive 2014/53/EU; Part 1: Ground based vehicular radar
ETSI EN 302 208	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 4W; Harmonised Standard covering the essential requirements under 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 under article 3.2 of Directive 2014/53/EU
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
Draft ETSI EN 300 328	Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using wide band modulation techniques; Harmonised Standard for access to radio spectrum

ETSI EN 301 893	5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.1(b) of the Directive 2014/53/EU
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
Draft ETSI EN 305 550	Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Harmonised Standard for access to radio spectrum
ETSI EN 302 567	Multiple-Gigabit/s radio equipment operating in the 60 GHz band; Harmonised Standard covering the essential requirements under article 3.2 of Directive 2014/53/EU
ETSI EN 301 489-1	Electromagnetic Compatibility (EMC) standard for radio equipment and services; Harmonised Standard covering the essential requirements of article 3.1(b) of the Directive 2014/53/EU and the essential requirements of article 6 of the Directive 2014/30/EU; Part 1: Common technical requirements
ETSI EN 301 489-3	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz
ETSI EN 301 489-17	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of the Directive 2014/53/EU
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
FCC Part 15	Radio Frequency Devices
Subpart A –	General
§15.31	Measurement Standards
§15.33	Frequency Range of Radiated Measurements
§15.35	Measurement Detector Functions and Bandwidths
FCC Part 15	Radio Frequency Devices
Subpart C –	Intentional Radiators
§15.209	Radiated emission limits, general requirements
§15.225 (a)	Operation within the band 13.553 – 13.567 MHz
§15.227	Operation within the band 26.96 – 27.28 MHz
§15.229	Operation within the band 40.66 – 40.70 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
§15.240	Operation in the band 433.5 – 434.5 MHz
§15.241	Operation in the band 174 – 216 MHz
§15.242	Operation in the bands 174 – 216 MHz and 470 – 668 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
FCC Part 15	Radio Frequency Devices
Subpart E –	Unlicenced National Information Infrastructure Devices
§15.407	General technical requirements
FCC Part 95	The 76-81 GHz Band for Radar Service
Subpart M –	Operating Rules
	Technical Rules

FCC Part 15	Radio Frequency Devices
Subpart B –	Unintentional Radiators
§15.107	Conducted limits
§15.109	Radiated emission limits

IEC CISPR 32	Electromagnetic compatibility of multimedia equipment – Emission requirements
IEC CISPR 24	Information technology equipment – Immunity characteristics – Limits and methods of measurement
ISO 7637-2	Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only
ITU-T K.116	EMC requirements and test methods for radio telecommunication terminal equipment
ITU-R Rec. SM.329-12	Unwanted emissions in the spurious domain

3 Abbreviations & Definitions

AC	Alternating Current
ALD	Assistive Listening Devices
ANSI	American National Standards Institute
CB	Citizens' Band
CISPR	International Special Committee on Radio Interference of the IEC
DC	Direct Current
DC	Duty Cycle
DFS	Dynamic Frequency Selection
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMS	Electromagnetic Sustainability
EN	European Standard
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
IEC	International Electrotechnical Commission
ISM	Industrial, Scientific and Medical
ISO	International Organization for Standardization
ITU-R	ITU Radiocommunication Sector
ITU-T	ITU Telecommunication Standardization Sector
MEDS	Medical Data Service
PMSE	ITU-R F.[PMSE] – use of terrestrial audio and video Programme Making and Special Events applications
RF	Radio Frequency
RFID	Radio Frequency Identification
SRD	Short Range Devices
TPC	Transmit Power Control
TS	IMDA Technical Specification
TTT	Transport and Traffic Telematics
ULP-AMI	Ultra Low Power Active Medical Implants
ULP-AMI-P	ULP-AMI and associated Peripherals
WLAN	Wireless Local Area Network

Effective Radiated Power (e.r.p.) refers to radiation of a half wave tuned dipole, which is used for frequencies below 1 GHz.

Equivalent Isotropic Radiated Power (e.i.r.p.) 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 e.i.r.p. and e.r.p. [e.i.r.p. (dBm) = e.r.p. (dBm) + 2.15]

4 General Requirements

4.1 Design of Short Range Device

Short range devices (SRDs) shall be designed to meet the following basic objectives:

(a) 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.

(b) 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.

4.2 Electromagnetic Compatibility (EMC) Requirements

For EMC assessment, the SRD and/or ancillary equipment shall be classified as equipment for fixed use; vehicular use (i.e. mobile terminal connected with vehicular charger or DC supply); or portable/mobile use (i.e. powered by its integral battery). This equipment classification is used to determine the applicability of the EMC (emission and immunity) testing requirements based on §5.5 and §7 of ETSI EN 301 489-1; or §7.5 and §9 of ITU-T K.116. The ETSI EN 301 489-1 standard shall be used in conjunction with the ETSI EN 301 489-3 standard for SRD operating on frequencies between 9 kHz and 246 GHz; or ETSI EN 301 489-17 standard for broadband data transmission systems, where applicable (e.g. Wireless Local Area Network).

4.2.1 EMI or emission measurements

(a) Radiated emissions from associated ancillary equipment not incorporated in the SRD shall be measured to Class B requirements defined in §4 and Tables A.4 and A.5 of IEC CISPR 32.

(b) Conducted emission at the DC power port of the SRD intended for vehicular use, shall be measured to Class B requirements defined in §4 and Table A10 of IEC CISPR 32.

(c) Conducted emission at the AC mains port shall be measured for SRD with dedicated power adapter/charger to Class B requirements defined in §4 and Table A.10 of IEC CISPR 32. Equipment with DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment (§3.1.1 of CISPR 32).

(d) Conducted emission at the wired network port[1] of the SRD shall be measured to Class B requirements defined in Table A.12 of IEC CISPR 32; or §8.7 of ETSI EN 301 489-1.

Note 1: If SRD is a module intended to be marketed and sold separately from a host, it shall be assessed with at least one representative host system. Modules may be internal, mounted, plug-in or external (§6.2 of IEC CISPR 32).

Note 2: Emission measurements performed to FCC Part 15 Subpart B for unintentional radiators (§15.105 and §15.109) may be acceptable as an alternative to IEC CISPR 32.

4.2.2 EMS or immunity testing

The following immunity tests may be performed on the SRD to requirements defined in IEC CISPR 24, §11 of ITU-T K.116 or §9 of ETSI EN 301 489-1, where applicable:

(a) RF electromagnetic field (80 MHz to 1 GHz and 1.4 GHz to 6 GHz) at the enclosure of the

[1] Wired network port is used for voice, data and signaling transfers intended for connection to a communication network, e.g. CATV, PSTN, ISDN, ADSL and LAN (§3.1.32 of IEC CISPR 32).

equipment

(b) Electrostatic discharge at the enclosure of the equipment

(c) Fast transients (common mode) at DC power and AC main power ports that have cables longer than 3 m

(d) RF common mode 0.15 MHz to 80 MHz at DC power and AC mains power ports that have cables longer than 3 m

(e) Transients and surges (vehicular environment) on nominal 12V and 24V DC supply voltage input ports of mobile terminal and ancillary equipment intended also for mobile use in vehicles [ISO 7637-2]

(f) Voltage dips and interruptions at AC mains power port of mobile or portable terminal with dedicated power adapter/charger

(g) Surges, common and differential mode at AC mains power port of mobile or portable terminal with dedicated power adapter/charger

5 Technical Requirements

5.1 The SRD shall comply with the maximum field strength or radio frequency (RF) output power and spurious emissions given in Table 1 and 2 of this Specification, operating in its intended frequency band or frequencies. It shall fulfil the relevant requirements of this Specification on all the permitted frequencies which it is intended to operate.

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

Table 1: Technical Requirements for Short Range Devices (SRD)						
Authorised Frequency Bands / Frequencies		**Maximum Field Strength / RF Output power**	**Transmitter Spurious Emissions**	**Standards for Measurement Methods**	**Application Types**	**Remarks**
1a	16 – 150 kHz	≤ 66 dBµA/m @ 10m	Refer to limits given in Table1-a of this TS	EN 300 330	Induction loop system / RFID	
1b	150 – 5000 kHz	≤ 13.5 dBµA/m @ 10m		FCC Part 15 §15.221 (a) and ANSI C63.10-2013; or EN 300 330		
1c	6765 – 6795 kHz	≤ 42 dBµA/m @ 10m		EN 300 330		
1d	7400 – 8800 kHz	≤ 9 dBµA/m @ 10m		EN 300 330		
2	0.016 – 0.150 MHz	≤ 100 dBµV/m @ 3m	Refer to limits given in Table1-a of this TS	EN 300 330	Radio detection, alarm system	
3	13.553 – 13.567 MHz	≤ 94 dBµV/m @ 10m		FCC Part 15 §15.225 (a) and ANSI C63.10-2013; or EN 302 291-1	Close range inductive data communication	
				EN 300 330	Non-specific SRD	
4a	146.35 – 146.50 MHz	≤ 100 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 220-1	Radio detection, alarm system	
4b	240.15 – 240.30 MHz					
4c	300.00 – 300.30 MHz					
4d	312.00 – 316.00 MHz					
4e	444.40 – 444.80 MHz					
5	0.51 – 1.60 MHz	≤ 57 dBµV/m @ 3m	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.221 (b) and ANSI C63.10-2013; or EN 300 330	Wireless microphone	
6	40.66 – 40.70 MHz	≤ 65 dBµV/m @ 10m	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.229 and ANSI C63.10-2013; or EN 300 220-1, EN 300 220-2	Wireless microphone Non-specific SRD	

Table 1: Technical Requirements for Short Range Devices (SRD)						
Authorised Frequency Bands / Frequencies		**Maximum Field Strength / RF Output power**	**Transmitter Spurious Emissions**	**Standards for Measurement Methods**	**Application Types**	**Remarks**
7	88.00 – 108.00 MHz	≤ 60 dBµV/m @ 10m	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.239 and ANSI C63.10-2013; or EN 300 220-1	Wireless microphone	
8	470.00 – 806.00 MHz	≤ 10 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 220-1	Wireless microphone	
9a	169.40 – 175.00 MHz	≤ 500 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 422-1 or EN 300 422-1	Wireless microphone, Hearing/Audio assistance aids ALD operating in 169.4-169.475 MHz, channel spacing 50 kHz ALD operating on a tuning range basis	
				EN 300 220-1 EN 300 220-2; or EN 300 220-4	Non-specific SRD, channel spacing 50 kHz, DC 1.0%	
9b	180.00 – 200.00 MHz	≤ 112 dBµV/m @ 10m		EN 300 422-1 or EN 300 422-4	Wireless microphone, Hearing/Audio assistance aids ALD operating on a tuning range basis	
9c	487.00 – 507.00 MHz					
10a	26.96 – 27.28 MHz	≤ 100 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.227 and ANSI C63.10-2013; or EN 300 220-1, EN 300 220-2	Remote controls of garage door, cameras, toys and miscellaneous devices Bandwidth 10 kHz	
10b	34.995 – 35.225 MHz	≤ 100 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 220-1, EN 300 220-2; or FCC Part 15		

Table 1: Technical Requirements for Short Range Devices (SRD)						
Authorised Frequency Bands / Frequencies		**Maximum Field Strength / RF Output power**	**Transmitter Spurious Emissions**	**Standards for Measurement Methods**	**Application Types**	**Remarks**
10c	40.665 – 40.695 MHz	≤ 500 mW (e.r.p.)		§15.231 (Periodic operation in 40.66-40.7 MHz) and ANSI C63.10-2013	Non-specific SRD	
10d	40.77 – 40.83 MHz					
10e	72.13 – 72.21 MHz					
11a	26.96 – 27.28 MHz	≤ 500 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 220-1	Remote controls of aircraft and glider models, telemetry, detection and alarm systems	
11b	29.70 – 30.00 MHz	≤ 500 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 220-1		
12a	26.96 – 27.28 MHz	≤ 500 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 433 or EN 300 224	On-site radio paging system	
12b	40.66 – 40.70 MHz			EN 300 224		
13	151.125 MHz 151.150 MHz	≤ 1000 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 224	On-site radio paging system	
14a	9 – 315 kHz	30 dBµA/m at 10 m		EN 302 195	Medical and Biological telemetry	
14b	40.50 – 41.00 MHz	≤ 0.01 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 220-1		
14c	216.00 – 217.00 MHz	> 25 µW to ≤ 100 mW (e.r.p.)		EN 300 220-1		
15	1427.00 – 1432.00 MHz	> 25 µW to ≤ 100 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 440-1	Medical and Biological telemetry	
16	All frequencies	≤ 25 µW (e.r.p.)	Refer to limits given in Table1-a of this TS	ANSI C63.10-2013 or FCC Part 15 §15.241 & §15.242 EN 300 220-1 EN 300 330-1 EN 300 440-1 EN 301 839 EN 302 537	Medical and Biological telemetry	

Table 1: Technical Requirements for Short Range Devices (SRD)						
Authorised Frequency Bands / Frequencies		**Maximum Field Strength / RF Output power**	**Transmitter Spurious Emissions**	**Standards for Measurement Methods**	**Application Types**	**Remarks**
17	72.080 MHz 72.200 MHz 72.400 MHz 72.600 MHz 158.275/162.875 MHz 158.325/162.925 MHz	≤ 1000 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 390 EN 300 113	Wireless modem, data communication system	
18	76 – 77 GHz	≤ 37 dBm peak (e.i.r.p.) when vehicle is in motion ≤ 23.5 dBm (e.i.r.p.) when stationary	Refer to limits given in Table1-a of this TS	FCC Part 95 Subpart M; or EN 301 091-1	Short range radar systems such as automatic cruise control and collision warning systems for vehicle	
19	433.05 – 434.79 MHz	≤ 10 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.240 (433.5 – 434.5 MHz) and ANSI C63.10-2013 or EN 300 220-1, EN 300 220-2	Radio telemetry, telecommand system Non-specific SRD DC ≤ 10%	
20a	866 – 869 MHz	≤ 500 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 302 208	Radio Telemetry, Telecommand, RFID system	
20b	920 – 925 MHz	≤ 500 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.249 and ANSI C63.10-2013	Radio Telemetry, Telecommand, RFID system	
21	2.4000 – 2.4835 GHz	≤ 100 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.249 and ANSI C63.10-2013 ; or EN 300 440	Wireless video transmitter and other SRD applications (e.g. radio determination devices)	
22	10.50 – 10.55 GHz	≤ 117 dBµV/m @ 10m	Refer to limits given in Table1-a of this TS	EN 300 440		
23	24.00 – 24.25 GHz	≤ 100 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	EN 302 858 EN 300 440		Radar gun devices are not allowed to operate under this provision.

Table 1: Technical Requirements for Short Range Devices (SRD)						
Authorised Frequency Bands / Frequencies		**Maximum Field Strength / RF Output power**	**Transmitter Spurious Emissions**	**Standards for Measurement Methods**	**Application Types**	**Remarks**
24	2.4000 – 2.4835 GHz	≤ 100 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 440	Bluetooth Non-specific SRD ≤ 10 mW e.i.r.p.	
25	2.4000 – 2.4835 GHz	≤ 200 mW (e.i.r.p)	Refer to limits given in Table1-a of this TS	ANSI C63.10-2013 and FCC Part 15 § 15.247 or EN 300 328	Wireless LAN only	
26	5.725 – 5.850 GHz	≤ 100 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 440	SRD application	
27	5.725 – 5.850 GHz	≤ 1000 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.247 FCC Part15 §15.407 (3) 5.725-5.85 GHz	Wireless LAN and broadband access only	
28	5.150 – 5.350 GHz	> 100 mW (e.i.r.p.) ≤ 200 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part15 §15.407 (1) 5.15-5.25 GHz (2) 5.25-5.35 GHz EN 301 893	Wireless LAN	WLAN operating in 5.250 – 5.350 GHz under this provision shall employ Dynamic Frequency Selection (DFS) mechanism and implement Transmit Power Control (TPC).
29	5.150 – 5.350 GHz	≤ 100 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part15 §15.407 (1) 5.15-5.25 GHz (2) 5.25-5.35 GHz EN 301 893	Wireless LAN	WLAN operating under this provision shall implement DFS function in the frequency range 5.250 – 5.350 GHz.
30	5.470 – 5.725 GHz	≤ 1000 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part15 §15.407 (2) 5.47-5.725 GHz EN 301 893	Wireless LAN and broadband access	WLAN operating under this provision shall employ Dynamic Frequency Selection (DFS)

Table 1: Technical Requirements for Short Range Devices (SRD)						
Authorised Frequency Bands / Frequencies		**Maximum Field Strength / RF Output power**	**Transmitter Spurious Emissions**	**Standards for Measurement Methods**	**Application Types**	**Remarks**
						mechanism and implement Transmit Power Control (TPC).
31	57 – 66 GHz	≤10W (e.i.r.p)	Refer to limits given in Table1-a of this TS	EN 302 567 EN 305 550	Wireless LAN and broadband access	Indoor use is restricted to maximum mean EIRP density of 13 dBm/MHz Outdoor use is restricted to max e.i.r.p. of 25 dBm and max e.i.r.p. power spectral density of -2 dBm/MHz

Table 1-a: Category B of Spurious Domain Emission Limits (ITU-R Rec. SM.329-12 §4.3, Table 3)	
Type of SRD	**Limits**
SRD operating below 30 MHz	29 – 10 log(*f* (kHz)/9) dB(μA/m) at 10 m for 9 kHz < *f* < 10 MHz –1 dBμA/m at 10 m for 10 MHz < *f* < 30 MHz –36 dBm for 30 MHz ≤ except frequencies below < 1 GHz –54 dBm for f within the bands 47-74 MHz, 87.5-118 MHz, 174-230 MHz, 470-862 MHz –30 dBm for 1 GHz ≤ *f* < (see ITU-R Rec. SM.329-12 §2.5)
SRD operating above 30 MHz	–36 dBm for 9 kHz ≤ except frequencies below< 1 GHz –54 dBm for *f* within the bands 47-74 MHz, 87.5-118 MHz, 174-230 MHz, 470-862 MHz –30 dBm for 1 GHz ≤ *f* < (see ITU-R Rec. SM.329-12 §2.5)

Table 2: Technical Requirements for Short Range Devices (SRD) – Operation Requires Approval						
Authorised Frequency Bands / Frequencies		**Maximum Field Strength / RF Output power**	**Transmitter Spurious Emissions**	**Standards for Measurement Methods**	**Application Types**	**Remarks**
1	170.275 MHz 170.375 MHz 173.575 MHz 173.675 MHz	≤ 1000 mW (e.r.p.)	Refer to limits given in Table1-a of this TS		Remote control of cranes and loading arms	Operating under these provisions shall be approved on an exceptional basis.
2	26.96 – 27.28 MHz 40.66 – 40.70 MHz	> 500 mW (e.r.p.) ≤ 3000 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 433-1 EN 300 224-1	On-site radio paging system	Operating under these provisions shall be approved on an exceptional basis.
3	151.125 MHz 151.150 MHz	>1000 mW (e.r.p.) ≤ 3000 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	EN 300 224-1		
4	920 – 925 MHz	> 500 mW (e.r.p.) ≤ 2000 mW (e.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.249 and ANSI C63.10-2013, EN 300 220-1 or EN 302 208	Radio Frequency Identification (RFID) systems	Only RFID systems operating in the 920 -925 MHz frequency band shall be allowed to transmit between 500 mW and 2000 mW (e.r.p.) and approved on an exceptional basis.
5	5.725 – 5.850 GHz	> 1000 mW (e.i.r.p.) ≤ 4000 mW (e.i.r.p.)	Refer to limits given in Table1-a of this TS	FCC Part 15 §15.247 or §15.407 (3)	Wireless LAN and broadband access only	Operating under this provision shall be approved on an exceptional basis.

Annex

Addendum/Corrigendum

Revised TS		Items Changed	Effective Date
Page	**Section**		
Changes to IMDA TS SRD, Issue 1, October 2016			
2	§1 & §2	The IMDA TS SRD Issue 1 Revision 1 (April 2018) has replaced the IMDA TS SRD Issue 1 (October 2016). Changes are intended to provide updates to the reference standards and clarity in generic as well as specific conformity assessment requirements for use of SRD applications, in line with standards development taken place in the related Standards Development Organisations.	1 Apr 18
2	§1.1	Responding to technological and market developments in SRDs, deleted the text "*Short range devices are intended for communications in confined areas of buildings as well as for localised on-site operations*."	1 Apr 18
8 – 15	There are no changes to the technical requirements captured in §5 of this Specification, except for the following:		1 Apr 18
13	§5 Table 1	Corresponding to the editorial change in §1.1, under provisions of items 25, 27 to 30, also removed the need for non-localised operations to be approved on exceptional basis.	
11 & 12	§5 Table 1	Removed provisions for SRD usage of the 450-470 MHz frequency band under items 14 and 17, as service relocation is taking effect from 1 April 2018.	
14	§5 Table 1-a	Streamlined spurious emission requirements for SRDs to align with category B limits defined in §4.3 Table 3 of the ITU-R Rec. SM.329-12.	
15	§5 Table 2	Removed provisions for SRD usage of the 450-470 MHz frequency band under item 1, as service relocation is taking effect from 1 April 2018.	

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Addendum/Corrigendum

Revised TS		Items Changed	Date of Issue
Page	Section		
Changes to IDA TS SRD, Issue 1 Rev 7, April 2013			
6	§3.2	The IMDA TS SRD Issue 1 (October 2016) has replaced the IDA TS SRD Issue 1 Rev 7 (April 2013). Changes are largely editorial to provide updates and clarity in the application of EMC requirements, in line with standards development that has taken place in the Standards Development Organisations concerned.	1 Oct 16

Page	TS Ref.	Items Changed	Effective Date
		Changes to IDA TS SRD, Issue 1 Rev 6, May 11	
3	Table 1 (1)	The max field strength for 16 – 150 kHz has been revised from 66 dBµA/m @ 3m to 66 dBµA/m @ 10m	25 Apr 13
3	Table 1 (3)	Listing of additional ETSI standard - EN 302 291-1	25 Apr 13
3	Table 1 (9)	Listing of additional ETSI standard - EN 300 422-1	25 Apr 13
5	Table 1 (14)	Allow max field strength of Medical Telemetry applications operating in the range 9 – 315 kHz up to 30 dBµA/m @10m.	25 Apr 13
5	Table 1 (16)	Listing of additional ETSI standard - EN 301 839-1 and EN 302 537-1	25 Apr 13
6	Table 1 (23)	Listing of additional ETSI standard - EN 302 288-1	25 Apr 13
9	Table 1 (31)	Listing of additional ETSI standard - EN 305 550-1	25 Apr 13
Changes to IDA TS SRD, Issue 1 Rev 5, Apr 11			
		Change of IDA's address at cover page to Mapletree Business City.	1 May 11
Changes to IDA TS SRD, Issue 1 Rev 4, Jul 09			
4	Table 1 (1)	Inclusion of reference to EN 300 330-1 – Technical Characteristics and Test Methods for Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz	1 Apr 11
10	Table 1 (30)	The band 5.470 – 5.725 GHz at ≤ 1000 mW (e.i.r.p.) is an additional frequency allocation for Wireless LAN / broadband access applications.	1 Apr 11
10	Table 1 (31)	The band 57 – 66 GHz at ≤ 10W (e.i.r.p) is an additional frequency allocation for Wireless LAN / broadband access applications.	1 Apr 11

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Addendum/Corrigendum

Page	TS Ref.	Items Changed	Effective Date
Changes to IDA TS SRD, Issue 1 Rev 3, Jan 08			
-	-	Changes are purely editorial in nature. The Short Range Devices (SRD) requiring IDA's approval for operation are listed separately in Table 2 for better clarity.	July 09
4	Table 1	Short Range Devices (SRD) which does not require IDA's approval for operation remain in Table 1. Those that require IDA's approval are extracted and listed in Table 2	July 09
10	Table 2	The following are Short Range Devices (SRD) which require IDA's approval for operation: 170.275 MHz 170.375 MHz 173.575 MHz 173.675 MHz ≤ 1000 mW (e.r.p.) 451.750 MHz 452.000 MHz 452.050 MHz 452.325 MHz	July 09
		26.96 – 27.28 MHz > 500 mW (e.r.p.) 40.66 – 40.70 MHz ≤ 3000 mW (e.r.p.)	
		151.125 MHz >1000 mW (e.r.p.) 151.150 MHz ≤ 3000 mW (e.r.p.)	
		920 – 925 MHz > 500 mW (e.r.p.) ≤ 2000 mW (e.r.p.)	
		5.725 – 5.850 GHz > 1000 mW (e.i.r.p.) ≤ 4000 mW (e.i.r.p.)	
Changes to IDA TS SRD, Issue 1 Rev 2, Aug 06			
4	Table 1	Provisions have been revised in line with the Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) (Amendment) Notification 2008.	2 Jan 08
4	Table 1 (1)	The following are additional frequency allocations that may be used for induction loop and RFID systems: (a) 0.150 – 5.00 MHz, ≤ 13.5 dBµA/m @ 10m (b) 6.765 – 6.795 MHz, ≤ 42 dBµA/m @ 10m (c) 7.400 – 8.800 MHz, ≤ 9 dBµA/m @ 10m Please note that the unit for field strength has been standardised to magnetic field strength: the former 0.016 – 0.15 MHz, ≤ 100 dBµV/m @ 3m has been replaced by 0.016 – 0.15 MHz, ≤ 66 dBµA/m @ 3m.	
4	Table 1 (4)	Frequency band 312.00 - 315.00 MHz has been changed to 312.00 - 316.00 MHz.	
4	Table 1 (8)	The band 470.00 – 806.00 MHz at ≤ 10 mW (e.r.p.) is an additional frequency allocation for wireless microphones applications.	
4	Table 1 (9)	The band 169.40 – 175.00 MHz at ≤ 500 mW (e.r.p.) is an additional frequency allocation for hearing/audio assistance aids applications.	

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Addendum/Corrigendum

Page	TS Ref.	Items Changed	Effective Date
5	Table 1 (10)	RF output power for the 26.96 – 27.28 MHz band for remote control devices applications has been increased to ≤ 100 mW (e.r.p.). The following are additional frequency allocations that may be used for remote control devices applications: (a) 34.995 – 35.225 MHz, ≤ 100 mW (e.r.p.) (b) 40.665 – 40.695 MHz, ≤ 500 mW (e.r.p.) (c) 40.770 – 40.830 MHz, ≤ 500 mW (e.r.p.) (d) 72.130 – 72.210 MHz, ≤ 500 mW (e.r.p.)	
6	Table 1 (15)	The following are additional frequency allocations that may be used for medical telemetry applications: (a) 216.00 – 217.00 MHz, ≤ 100 mW (e.r.p.) (b) 1427.00 – 1432.00 MHz, ≤ 100 mW (e.r.p.) (c) All frequencies at ≤ 25 µW	
7	Table 1 (20)	Frequency band 433.79 - 434.79 MHz has been changed to 433.05 – 434.79 MHz	
Changes to IDA TS SRD, Issue 1 Rev 1, Jul 05			
4 and 7	Table 1 (4), 1(20) And 1(21)	Provisions have been revised in line with the Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) (Amendment) Notification 2006: a. 314.7 – 315 MHz frequency band revised to 312 – 315 MHz b. 923 – 925 MHz frequency band revised to 920 – 925 MHz	Jun 06
5	Table 1 (10)	Amended remark: "Use of remote controls of aircraft and glider models is subject to IDA's licensing."	Jun 06
7	Table 1 (25)	Provision to operate in the 630 – 710 MHz band is deleted from the Specification.	Jun 06
Changes to IDA TS SRD, Issue 1, Dec 04			
—	—	Specification has been reissued as IDA TS SRD Issue 1 Rev 1.	21 Jul 05
8	Table 1(30), And 1(31)	Changes are mainly editorial in nature. The essential technical requirements for conformity assessment remain unchanged.	21 Jul 05

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Addendum/Corrigendum

Page	TS Ref.	Items Changed	Effective Date
Changes to IDA TS 5 to TS 14, TS SRRS and TS WLAN			
–	–	This Specification supersedes the following IDA Type Approval Specifications: a. IDA TS 5 Issue 1 Rev 5 b. IDA TS 6 Issue 1 Rev 3 c. IDA TS 7 Issue 1 Rev 3 d. IDA TS 8 Issue 1 Rev 3 e. IDA TS 9 Issue 1 Rev 3 f. IDA TS 10 Issue 1 Rev 8 g. IDA TS 11 Issue 1 Rev 4 h. IDA TS 12 Issue 1 Rev 3 i. IDA TS 13 Issue 1 Rev 6 j. IDA TS 14 Issue 1 Rev 5 k. IDA TS SRRS Issue 1 l. IDA TS WLAN Issue 1 Rev 11	1 Dec 04
–	–	Title of Specification has been renamed as “Technical Specification for Short Range Devices” (IDA TS SRD Issue 1). Changes are mainly editorial in nature and carried out to streamline the essential technical requirements for compliance. The few changes in technical requirements are summarised below.	1 Dec 04
6	TS SRD Table 1(1)	Maximum output power for induction loop systems has been revised from “100 dBµV/m at 30 m” to “100 dBµV/m at 3 m” in line with the Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) Notification.	1 Dec 04
6	TS SRD Table 1(6)	Maximum output power has been revised from “57 dBµV/m at 3 m” to “65 dBµV/m at 10 m” in line with the Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) Notification.	1 Dec 04
6	TS SRD Table 1(8)	Maximum output power has been revised from “60 dBµV/m at 10 m” to “112 dBµV/m at 10 m” in line with the Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) Notification.	1 Dec 04
8	TS SRD Table 1(14) And 1(15)	Maximum output power has been revised from “20 dBµV/m at 15 m” to “0.01 mW ERP” and from “54 dBµV/m at 30 m” to “2 mW ERP” in line with the Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) Notification.	1 Dec 04

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Addendum/Corrigendum

Page	TS Ref.	Items Changed	Effective Date
		Changes to IDA TS 5 to TS 14, TS SRRS and TS WLAN	
9	TS SRD Table 1(19) 1(20) And 1(21)	Provisions have been revised for RFID applications as follows [The Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) (Amendment) Notification 2004]: a. 866.1 – 869 MHz frequency band revised to 866 – 869 MHz b. 924 – 925 MHz frequency band revised to 923 – 925 MHz c. Output power limit for both bands increased from 10 mW ERP to 500 mW ERP For RFID applications in the 923 – 925 MHz frequency band, output power up to 2 W ERP is allowed, subject to IDA's licensing.	2 Nov 04
		Changes to IDA TS 5 to TS 14, TS SRRS and TS WLAN	
10	TS SRD Table 1(27), 1(28) and 1(29)	Provisions for WLAN operating in 2.4 GHz and 5.8 GHz frequency bands have been revised as follows [The Schedule to the Telecommunications (Exemption from sections 33, 34(1)(b) and 35) (Amendment) Notification 2004]: a. Output power limit for 2.4000 – 2.4835 GHz band increased from 100 mW EIRP to 200 mW EIRP b. Output power limit for 5.725 – 5.850 GHz band increased from 100 mW EIRP to 1 W EIRP c. Output power limit of 4 W EIRP is allowed for operations in the 5.725 – 5.850 GHz band, subject to IDA's licensing.	1 Dec 04
–	–	Provisions given in IDA TS 10 for mobile phone sensors to operate in the 824 – 915 MHz and 1710 – 1910 MHz bands are deleted from this Specification.	1 Dec 04