
Regulations

Ultra-Wide Band and Short Range Devices

Version 5.0

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Telecommunications and Digital Government Regulatory Authority (TDRA)
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TDRA Regulations for Ultra-Wide Band and Short Range Devices, Version 5.0

Article (1)

Legal Reference

- 1.1 These Regulations are issued in accordance with the provisions of the UAE Federal Law by Decree No 3 of 2003 on Regulation of the Telecommunications Sector, (Telecom Law) as amended and its Executive Order.
- 1.2 These Regulations describe the regulatory provisions and technical conditions for the authorization and use of Ultra-Wide Band and Short Range Devices under Class Authorization for various applications.
- 1.3 These Regulations shall be read in conjunction with the following documents available from the TDRA website at www.tdra.gov.ae:
 - 1.3.1 Spectrum Allocation and Assignment Regulations
 - 1.3.2 Spectrum Fees Regulations
 - 1.3.3 Spectrum Monitoring, Interference Management and Enforcement Regulations
 - 1.3.4 National Frequency Plan including National Table of Frequency Allocation
 - 1.3.5 Services Ancillary to Broadcast Production, Program Making & Special Events (PMSE) Regulations
 - 1.3.6 Unmanned Aircraft Radio Systems (UAS) Regulations

Article (2)

Definitions

- 2.1 The terms, words and phrases used in these Regulations shall have the same meaning as is ascribed to them in the UAE Federal Law by Decree No 3 of 2003 on Regulation of the Telecommunications Sector, as amended and its Executive Order; unless these Regulations expressly provide otherwise for, or the context in which those terms, words and phrases are used in these Regulations indicates otherwise.
- 2.2 The following terms and words shall be interpreted, as follows:
 - 2.2.1 "**3GPP**" means the 3rd Generation Partnership Project (3GPP) which consists of telecommunications standard development organizations worldwide to develop Specifications of relevant 3GPP cellular telecommunications technologies including radio access, core network, service capabilities and interworking with non-3GPP networks.
 - 2.2.2 "**Active Medical Implant**" means diagnostic or therapeutic device designed to be implanted in a human body containing a power source and capable of generating radio frequency energy for the purpose of providing a digital communications link.

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- 2.2.3 "**AFA**" means Adaptive Frequency Agility.
- 2.2.4 "**APC**" means Automatic or Adaptive Power Control.
- 2.2.5 "**Authority**" or "**TDRA**" means the General Authority for Regulating the Digital Government and Telecommunication Sector known as Telecommunications and Digital Government Regulatory Authority (TDRA) established pursuant to the provisions of the Federal Law by Decree on Regulation of the Telecommunications Sector No. 3 of 2003 (as amended).
- 2.2.6 "**Authorization**" means a valid frequency spectrum authorization issued by the Authority and permits the use of radio frequency subject to terms and conditions as stipulated by the Authority.
- 2.2.7 "**Class Authorization**" means the Authorization which permits the operation of wireless equipment by any Person within designated frequency bands subject to the terms and conditions stipulated by the Authority.
- 2.2.8 "**Cordless Telephony**" includes cordless telephones; cordless telecommunication systems and the cordless systems providing communications within the Curtilage of any premises.
- 2.2.9 "**Curtilage**" means a partially or entirely enclosed area such as a courtyard, atrium, close, compound, court, enclosure, quadrangle, square, patio or yard.
- 2.2.10 "**DAA**" means Detect And Avoid.
- 2.2.11 "**DFS**" means Dynamic Frequency Selection.
- 2.2.12 "**DECT**" means Digital Enhanced Cordless Telecommunications in accordance with applicable European Telecommunications Standards Institute (ETSI) standards.
- 2.2.13 "**ETSI**" means the European Telecommunications Standards Institute that produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and Internet technologies.
- 2.2.14 "**FHSS**" means Frequency Hopping Spread Spectrum which is a spread spectrum technique in which the transmitter signal occupies a number of frequencies in time, each for some period of time.
- 2.2.15 "**IEEE**" means the Institute of Electrical and Electronics Engineers.
- 2.2.16 "**Inductive Applications**" means inductive loop systems are communication systems based on magnetic fields generally at low radio frequencies.
- 2.2.17 "**ITS**" or "**Intelligent Transport Systems**" means the integration of information and communication technologies (ICTs) and applications that aim to provide services relating to different modes of transport and traffic management, enable users to be better informed and make safer, more coordinated and 'smarter' use of transport networks. They include advanced

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telematics and hybrid communications including IP based communications as well as Ad-Hoc direct communication between vehicles and between vehicles and infrastructure.

- 2.2.18 "**ITU**" means the International Telecommunication Union, which is the United Nations agency for information and communication technologies (ICTs).
- 2.2.19 "**LBT**" means Listen Before Talk which is a mechanism by which an equipment applies clear channel assessment before using the channel.
- 2.2.20 "**Person**" will include 'juridical entities' as well as 'natural persons'.
- 2.2.21 "**PMR 446**" means Private Mobile Radio 446 which is a land mobile radio (i.e. walkie talkie) that operate in the 446 MHz frequency range with technical characteristics as specified in the regulation on Ultra-Wide Band and Short Range Devices for this frequency range.
- 2.2.22 "**PMR over WAS**" means Private Mobile Radio over Wireless Access Systems which is a land mobile radio (i.e. walkie talkie) and base stations (access points) operating in the 2.4 GHz and 5 GHz frequency range based on IEEE 802.11 family of standards.
- 2.2.23 "**PMSE**" means Programme Making and Special Events, i.e. those uses of the radio spectrum which support the production of content and for certain special events.
- 2.2.24 "**Regulation**" means any instrument issued by the Authority under its powers, and includes without limitation regulations, violation decisions, directives, instructions, guidance and recommendations and regulatory policies.
- 2.2.25 "**RFID**" means Radio Frequency Identification which is a system that enables data to be transmitted by a transponder (tag) via radio signals which are received by an RFID interrogator and processed according to the needs of a particular application.
- 2.2.26 "**Short Range Device**" or "**SRD**" means fixed, mobile or portable devices for various radio applications operating with technical conditions as defined in Article 4.
- 2.2.27 "**Telecom Law**" means the Federal Law by Decree No 3 of 2003 on Regulation of the Telecommunications Sector, as amended.
- 2.2.28 "**TPC**" means Transmit Power Control which is a technique in which the transmitter output power is controlled resulting in reduced interference to other systems.
- 2.2.29 "**UAE**" means the United Arab Emirates including its territorial waters and the airspace above.
- 2.2.30 "**UAE Spectrum Regulations**" means the technical regulations and specifications with details on objective procedures and criteria for regulating the use of frequency spectrum in the UAE.

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- 2.2.31 **“Ultra-Wide Band” or “UWB”** means devices that employ spreading of the radio energy over a very wide frequency band, with a very low power spectral density operating with technical conditions as defined in Article 4.
- 2.2.32 **“Wideband Data Transmission System” or “WDTS”** means devices that use wideband modulation techniques to access the spectrum.
- 2.2.33 **"Wireless Access Systems" or "WAS"** means connected wireless equipment complying with technical specifications as set out in ITU-R Recommendations, ETSI standards, IEEE 802.11 family of standards, or related 3GPP standards. This includes networks such as (Radio Local Area Network (RLAN), Wireless Local Area Network (WLAN), Wideband Data Transmission, Multiple Gigabit Wireless Systems (MGWS), Broadband Radio Access Networks (BRAN) etc) in different frequency ranges.
- 2.2.34 **“Wireless Equipment”** means a category of Telecommunication Apparatus used for Radiocommunication Service (including a Station).

Article (3)

Uses related to UWB and SRD

- 3.1 The following Wireless Equipment are covered by this regulation:
- 3.1.1 Ultra-Wide Band (UWB)
- 3.1.2 Short Range Devices (SRD)
- 3.2 For the usage of Ultra-Wide Band and Short Range Devices the following conditions apply
- 3.2.1 The usage is allowed under Class Authorization.
- 3.2.2 The usage is allowed on a non-interference and non-protection basis.
- 3.3 If the usage of wireless networks exceeds the permitted technical conditions (i.e. transmit power/magnetic field) in (Article 4), the application can be submitted as part of other related UAE Spectrum Regulations (e.g. Fixed Radio Systems, Private Mobile Radio (PMR) Service, and Unmanned Aircraft Radio Systems (UAS etc.) as appropriate.

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Article (4)

Technical Conditions

4.1. The technical conditions as given in these regulations shall apply on the use of SRD. The table below gives guidance on available frequency ranges and major usage conditions:

Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
Inductive applications					
9 kHz - 90 kHz	Generic Use	72 dB μ A/m at 10m ²			EN 300 330
	Robotics mowers	42 dB μ A/m at 10m			EN 303 447
	Metal and object detection sensors	72 descending 10 dB/dec above 0,03 MHz			EN 303 454
90 kHz - 119 kHz	Generic Use	42 dB μ A/m at 10m			EN 300 330
	Robotics mowers	42 dB μ A/m at 10m			EN 303 447
	Metal and object detection sensors	42 dB μ A/m at 10m			EN 303 454
119 kHz - 135 kHz	Generic Use	66 dB μ A/m at 10m			EN 300 330
	Robotics mowers	42 dB μ A/m at 10m			EN 303 447
	Metal and object detection sensors	66 descending 10 dB/dec above 0,119 MHz			EN 303 454
135-140 kHz	Generic Use	42 dB μ A/m at 10m			EN 300 330
	Robotics mowers	42 dB μ A/m at 10m			EN 303 447
	Metal and object detection sensors	42 dB μ A/m at 10m			EN 303 454
140 kHz - 148.5 kHz	Inductive applications	37.7 dB μ A/m at 10m			EN 300 330
148.5 kHz - 5000 kHz	Inductive applications	-5 dB μ A/m at 10 m			EN 300 330
3155 kHz - 3400 kHz	Inductive applications	13.5 dB μ A/m at 10m			EN 300 330
5000 kHz - 30000 kHz	Inductive applications	-20 dB μ A/m at 10 m -5 dB μ A/m at 10m in total			EN 300 330
984 kHz - 7484 kHz	Inductive applications	-5 dB μ A/m at 10m			EN 300 330
4232 kHz	Inductive applications	9 dB μ A/m at 10m			EN 300 330
4516 kHz	Inductive applications	7 dB μ A/m at 10m			EN 300 330
6765 kHz - 6795 kHz ³	Inductive applications	42 dB μ A/m at 10m			EN 300 330
7400 kHz - 8800 kHz	Inductive applications	9 dB μ A/m at 10m			EN 300 330
10200 kHz - 11000 kHz	Inductive applications	9 dB μ A/m at 10m			EN 300 330

¹ (e.g. Duty cycle or LBT + AFA), related technical details should be taken from the mentioned reference documents in the table.

² Limit is 42 dB μ A/m for the following spot frequencies: 60 kHz \pm 250 Hz, 66.6 kHz \pm 750 Hz, 75 kHz \pm 250 Hz, and 77.5 kHz \pm 250 Hz.

³ The frequency range 6.765 MHz – 6.795 MHz is not a harmonised ISM frequency band according article 5.138 of the ITU Radio Regulations

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
11810 kHz - 12660 kHz	Inductive applications	-16 dBμA/m at 10m			EN 300 330
12500 kHz - 20000 kHz	Inductive applications	-7 dBμA/m at 10m			EN 300 330
13553 kHz - 13567 kHz	Inductive applications	42 dBμA/m at 10m			EN 300 330
26957 kHz - 27283 kHz	Inductive applications	42 dBμA/m at 10m			EN 300 330
27090 kHz - 27100 kHz	Inductive applications	42 dBμA/m at 10m			EN 300 330
Non-specific short range devices					
13.553 MHz – 13.567 MHz	Non-specific short range devices	42 dBμA/m at 10m or 10 mW e.r.p			EN 300 330
26.957 MHz – 27.283 MHz	Non-specific short range devices	42 dBμA/m at 10m or 10 mW e.r.p			EN 300 220-2 EN 300 330
26.990-27.0 MHz 27.040-27.050 MHz 27.090-27.100 MHz 27.140-27.150 MHz 27.190-27.200 MHz	Non-specific short range devices	100 mW e.r.p	≤ 0.1 %	≤ 10 kHz	EN 300 220-2
40.66 MHz - 40.7 MHz	Non-specific short range devices	10 mW e.r.p			EN 300 220-2
138.2 MHz - 138.45 MHz	Non-specific short range devices	10 mW e.r.p	≤ 0.1 %		EN 300 220-2
169.4 MHz - 169.475 MHz	Non-specific short range devices	500 mW e.r.p	1,0 % duty cycle For metering devices duty cycle limit is 10 %	50 kHz	EN 300 220-2
169.4 MHz - 169.4875 MHz	Non-specific short range devices	10 mW e.r.p	≤ 0.1 %		EN 300 220-2
169.4875 MHz - 169.5875 MHz	Non-specific short range devices	10 mW e.r.p	≤ 0.001% (06h00 - 24h00) ≤ 0.1% (00h00 - 06h00)		EN 300 220-2
169.5875 MHz - 169.8125 MHz	Non-specific short range devices	10 mW e.r.p	≤ 0.1 %		EN 300 220-2
433.05 MHz - 434.79 MHz	Non-specific short range devices	10 mW e.r.p	≤ 10 %		EN 300 220-2

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
433.05 MHz - 434.79 MHz	Non-specific short range devices	1 mW e.r.p -13 dBm/10 kHz power spectral density for bandwidth modulation larger than 250 kHz			EN 300 220-2
863 MHz - 870 MHz	Non-specific short range devices	25 mW e.r.p	≤ 0.1 % or LBT + AFA		EN 300 220-2
865 MHz - 868 MHz	Non-specific short range devices	25 mW e.r.p	≤ 1 % or LBT +AFA	≤ 300 kHz	EN 300 220-2
868 MHz-868.6 MHz	Non-specific short range devices	25 mW e.r.p	≤ 1% or LBT +AFA		EN 300 220-2
868.7-869.2 MHz.	Non-specific short range devices	25 mW e.r.p	≤ 0.1% or LBT+AF A		EN 300 220-2
869.4 MHz - 869.65 MHz	Non-specific short range devices	500 mW e.r.p	≤ 10% or LBT +AFA		EN 300 220-2
869.7-870 MHz	Non-specific short range devices	25 mW e.r.p.	≤ 1% duty cycle or LBT +AFA		EN 300 220-2
870 MHz - 875.8 MHz	Non-specific short range devices	25 mW e.r.p	≤ 1 %	≤ 600 kHz	EN 300 220-2
875.8 MHz - 876 MHz	Non-specific short range devices	25 mW e.r.p	≤ 0.1 %	≤ 200 kHz	EN 300 220-2
915 MHz - 915.2 MHz	Non-specific short range devices	25 mW e.r.p	≤ 0.1 %	≤ 200 kHz	EN 300 220-2
915.2 MHz– 920.8 MHz	Non-specific short range devices	25 mW e.r.p. except for the 4 channels identified in note where 100 mW e.r.p. applies ⁴	≤ 1%	≤ 600 kHz except for the 4 channels identified in note where # 400 kHz applies	EN 300 220-2
920.8 MHz – 921 MHz	Non-specific short range devices	25 mW e.r.p	≤ 0.1 %	≤ 200 kHz	EN 300 220-2
2400 MHz – 2483.5 MHz	Non-specific short range devices	10 mW e.i.r.p			EN 300 440

⁴ The available channel centre frequencies are 916.3 MHz, 917.5 MHz, 918.7 MHz and 919.9 MHz, the channel bandwidth is 400 kHz

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
5725 MHz - 5875 MHz	Non-specific short range devices	25 mW e.i.r.p			EN 300 440
24 GHz - 24.25 GHz	Non-specific short range devices	100 mW e.i.r.p			EN 300 440
57 GHz - 64 GHz	Non-specific short range devices	100 mW e.i.r.p			EN 305 550
122 GHz - 123 GHz	Non-specific short range devices	100 mW e.i.r.p			EN 305 550
244 GHz - 246 GHz	Non-specific short range devices	100 mW e.i.r.p			EN 305 550
Model control					
26.990-27.0 MHz, 27.040-27.050 MHz, 27.090-27.100 MHz, 27.140-27.150 MHz, 27.190-27.200 MHz	Model Control	100 mW e.r.p		≤ 10 kHz	EN 300 220-2
34.995 MHz - 35.225 MHz	Model control	100 mW e.r.p (only for flying models)		≤ 10 kHz	EN 300 220-2
40.66-40.67 MHz, 40.67-40.68MHz, 40.68-40.69 MHz, 40.69-40.7 MHz	Model control	100 mW e.r.p		≤ 10 kHz	EN 300 220-2
72 MHz - 72.25 MHz ⁵	Model control	10 mW e.r.p		≤ 10 kHz	
Tracking, tracing and data acquisition					
456.9 kHz - 457.1 kHz	Tracking, tracing and data acquisition	7 dBμA/m at 10 m		≥ 150 Hz No modulation allowed	EN 300 718

⁵ New approvals for model control applications using 72 MHz – 72.25 MHz will not be granted from 1 January 2021, existing class authorizations for model control applications using 72 MHz – 72.25 MHz can be renewed.

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
169.4 MHz - 169.475 MHz	Tracking, tracing and data acquisition	500 mW e.r.p	$\leq 1 \%$ or $\leq 10 \%$ for metering devices	≤ 50 kHz	EN 300 220-2
865 MHz – 868 MHz	Tracking, tracing & data acquisition	500 mW e.r.p. Transmissions only permitted within the bands: 865,6- 865,8 MHz, 866,2-866,4 MHz, 866,8-867,0 MHz and 867,4- 867,6 MHz. and APC	$\leq 10 \%$ for network access points $\leq 2,5 \%$ otherwise	≤ 200 kHz	EN 303 659
870 MHz - 875.6 MHz	Tracking, tracing and data acquisition	500 mW e.r.p APC is required.	$\leq 10 \%$ for network relay points $\leq 2.5 \%$ otherwise	≤ 200 kHz	EN 303 204
5725 MHz - 5875 MHz	Tracking, tracing and data acquisition	400 mW e.i.r.p APC is required. DFS or DAA shall be implemented as adequate sharing mechanism		≥ 1 MHz and ≤ 20 MHz	EN 303 258

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
Radio Frequency Identification (RFID)					
400 kHz – 600 kHz	RFID	-5 dB μ A/m at 10m with transmitter modulation.			EN 300 330
11.810 MHz – 12.660 MHz	RFID	-16 dB μ A/m at 10m			EN 300 330
13.553 MHz – 13.567 MHz	RFID (including NFC) and EAS	60 dB μ A/m at 10m			EN 300 330 EN 302 291
865 MHz - 868 MHz	RFID	2 W e.r.p. ⁶		≤ 200 kHz	EN 302 208
915 MHz - 921 MHz ⁷	RFID	4 W e.r.p. ⁸		≤ 400 kHz	EN 302 208
2446 MHz - 2454 MHz	RFID	500 mW e.i.r.p FHSS or unmodulated carrier (CW) only			EN 300 440
	RFID (in-Building only)	4 W e.i.r.p. ⁹ FHSS only	≤ 15% +		EN 300 440
Active Medical Implants					
9 kHz - 315 kHz	Active Medical Implants and their associated peripherals	30 dB μ A/m at 10m	≤ 10 %		EN 302 195
315 kHz - 600 kHz	Active Medical Implants and their associated peripherals	-5 dB μ A/m at 10m	≤ 10 %		EN 302 536
12500 kHz - 20000 kHz	Active Medical Implants and their associated peripherals	-7 dB μ A/m at 10m	≤ 10 %		EN 300 330
30 MHz - 37.5 MHz	Active Medical Implants and their associated peripherals	1 mW e.r.p	≤ 10 %		EN 302 510
49 MHz	Active Medical Implants and their associated peripherals	-31.9dBm			IEC 60601-1-11 ERC REC 74-01

⁶ Interrogator transmissions in sub-band a) at 2 W e.r.p. are only permitted within the four channels centred at 865.7 MHz, 866.3 MHz, 866.9 MHz and 867.5 MHz; each with a maximum bandwidth of 200 kHz. RFID tags respond at a very low power level (-20 dBm e.r.p.) in a frequency range around the RFID interrogator channels.

⁷ Passive RFID tags responding to RFID interrogators may operate in the band 915.3-920.9 MHz. Detect And Avoid (DAA) mechanism is required for these passive tags.

⁸ Interrogator transmissions at 4 W e.r.p. only permitted at the centre frequencies: 916.3 MHz; 917.5 MHz; and 918.7 MHz.

⁹ Any emission shall not exceed 500 mW when measured 10 metres from either the installed building or boundary of the user's premises.

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
401 MHz - 402 MHz	Active Medical Implants and their associated peripherals	25 μ W e.r.p Using LBT + AFA for spectrum access		≤ 25 kHz. Individual transmitters may combine adjacent channels for increased bandwidth up to 100 kHz.	EN 302 537
402 MHz – 405 MHz	Active Medical Implants and their associated peripherals	25 μ W e.r.p		≤ 300 kHz	EN 301 839
405 MHz - 406 MHz	Active Medical Implants and their associated peripherals	25 μ W e.r.p Using LBT + AFA for spectrum access		≤ 25 kHz. Individual transmitters may combine adjacent channels for increased bandwidth up to 100 kHz.	EN 302 537
2483.5 MHz – 2500 MHz	Active Medical Implants	10 dBm.			EN 301 559
Aids for the hearing impaired					
169.4 MHz - 174 MHz	Aids for the hearing impaired	10 mW e.r.p		≤ 50 kHz	EN 300 422-4
169.4 MHz - 169.475 MHz	Aids for the hearing impaired	500 mW e.r.p		≤ 50 kHz	EN 300 422-4
169.4875 MHz - 169.5875 MHz	Aids for the hearing impaired	500 mW e.r.p		≤ 50 kHz	EN 300 422-4
Radiodetermination applications					
2400 MHz – 2483.5 MHz	Radiodetermination applications	25 mW e.i.r.p			EN 300 440
9200 MHz - 9975 MHz	Radiodetermination applications	25 mW e.i.r.p			EN 300 440
10.5 GHz - 10.6 GHz	Radiodetermination applications	500 mW e.i.r.p			EN 300 440
13.4 GHz - 14 GHz	Radiodetermination applications	25 mW e.i.r.p			EN 300 440
17.1 GHz - 17.3 GHz	Radiodetermination applications	400 mW (26 dBm) e.i.r.p DAA or equivalent techniques			EN 300 440

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24.05-24.25 GHz	Radiodetermination applications	100 mW e.i.r.p			EN 300 440
Level Probing Radar (LPR) / Tank Level Probing Radar (TLPR)					
6 GHz – 8.5 GHz	Level probing radar	5mW (7 dBm/50 MHz peak e.i.r.p.) (- 33 dBm/MHz mean e.i.r.p. within the LPR operating Bandwidths - within main beam)			EN 302 729 ECC Decision (11)02
24.05 GHz - 26.5 GHz	Level probing radar	400mW (26 dBm/50 MHz peak e.i.r.p.) (- 14 dBm/MHz mean e.i.r.p. within the LPR operating Bandwidths - within main beam)			EN 302 729 ECC Decision (11)02
57 GHz - 64 GHz	Level probing radar	3200 mW (35 dBm/50 MHz peak e.i.r.p.) (- 2 dBm/MHz mean e.i.r.p. within the LPR operating Bandwidths - within main beam)			EN 302 729 ECC Decision (11)02
75 GHz - 85 GHz	Level probing radar	42500 mW (34 dBm/50 MHz peak e.i.r.p.) (-3 dBm/MHz mean e.i.r.p. within the LPR operating Bandwidths - within main beam)			EN 302 729 ECC Decision (11)02
4.5 GHz– 7 GHz	Tank level probing radar ¹⁰	250 mW (24 dBm) maximum peak power, measured in 50 MHz, (within main beam).			EN 302 372
8.5 GHz - 10.6 GHz	Tank level probing radar	1W (30 dBm) maximum peak power, measured in 50 MHz, (within main beam)			EN 302 372
24.05 GHz - 27 GHz	Tank level probing radar	20W (43 dBm) maximum peak power, measured in 50 MHz, (within main beam)			EN 302 372

¹⁰ Equipment must be within a closed tank, which is intended to contain substances

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
57 GHz - 64 GHz	Tank level probing radar	20W (43 dBm) maximum peak power, measured in 50 MHz, (within main beam)			EN 302 372
75 GHz - 85 GHz	Tank level probing radar	20W (43 dBm) maximum peak power, measured in 50 MHz, (within main beam)			EN 302 372
Wireless Access Systems					
2400 MHz – 2483.5 MHz	WAS	100 mW e.i.r.p.			EN 300 328
5150 – 5250 MHz	WAS	200 mW e.i.r.p.			EN 301 893
5250 MHz - 5350 MHz	WAS	100 mW e.i.r.p without TPC 200 mW e.i.r.p with TPC			EN 301 893
5470 MHz - 5725 MHz	WAS	500 mW e.i.r.p without TPC 1 W e.i.r.p with TPC and DFS ¹¹			EN 301 893
5725 MHz – 5875 MHz	WAS	2W e.i.r.p (10 MHz channel) 4W e.i.r.p (20 MHz channel)			EN 302 502
5945 MHz – 6425 MHz	WAS (in-Building only)	200 mW e.i.r.p ¹²			EN 303 687
57 GHz - 66 GHz	WAS	10 W (40 dBm) e.i.r.p Spectrum sharing mechanism (e.g. Listen Before Talk (LBT), DAA)			EN 302 567

¹¹ Slave devices without a Radar Interference Detection, shall comply with the limits for the band 5250 MHz-5350 MHz

¹² Any emission shall not exceed 200 mW e.i.r.p when measured 10 metres from either the installed building or boundary of the user's premises.

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
ITS, TTT and Railway applications and equipment					
984 kHz - 7484 kHz ¹³	Railway applications	9 dBμA/m at 10m	≤ 1.0 %		EN 300 330 EN 302 608
7300 kHz - 23000 kHz ¹⁴	Railway applications	-7 dBμA/m at 10m			EN 302 609
870 MHz - 873 MHz	Transport and traffic telematics	500 mW e.r.p (vehicle to vehicle) 100 mW e.r.p. (in vehicle application) Adaptive Power Control (APC) is required.	≤ 0.1 %	≤ 500 kHz	EN 300 220
873 MHz - 875.8 MHz	Transport and traffic telematics	500 mW e.r.p (vehicle to vehicle) 100 mW e.r.p. (in vehicle application) Adaptive Power Control (APC) is required.	≤ 0.01 %	≤ 500 kHz	EN 300 220
5795 MHz - 5805 MHz	Transport and traffic telematics	2W e.i.r.p			EN 300 674 ES 200 674
5805 MHz - 5815 MHz	Transport and traffic telematics	2W e.i.r.p			EN 300 674 EN 300 440 ES 200 674
5855 MHz - 5925 MHz	Intelligent Transport Systems (ITS)	33 dBm (2W e.i.r.p.)			ITU-R M.2121 EN 302 571 EN 302 663
24 GHz - 24.25 GHz	Automotive radars. ¹⁵	100 mW e.i.r.p			EN 302 858
76 GHz - 77 GHz	Short-range radar for ground-based applications, including automotive radars	55 dBm e.i.r.p peak			EN 301 091 ITU-R M.2057
77 GHz – 81 GHz	Short-range radar for ground-based applications, including automotive radars.	55 dBm e.i.r.p peak			EN 302 264

¹³ Center frequency is 4 234 kHz

¹⁴ Center frequency is 13547 kHz

¹⁵ New approvals for automotive radars using 24 GHz – 24.25 GHz will not be granted from 1 January 2021, existing class authorizations for automotive radars using 24 GHz – 24.25 GHz can be renewed.

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
Alarms					
868.6-868.7 MHz	Alarms	10 mW e.r.p.	≤ 1.0 % duty cycle	≤ 25 kHz	EN 300 220 3-2
869.2-869.25 MHz	Social Alarms	10 mW e.r.p.	≤ 0.1 % duty cycle	≤ 25 kHz	EN 300 220 3-1
869.25-869.3 MHz	Alarms	10 mW e.r.p.	≤ 0.1 % duty cycle	≤ 25 kHz	EN 300 220 3-2
869.3-869.4 MHz	Alarms	10 mW e.r.p.	≤ 1.0 % duty cycle	≤ 25 kHz	EN 300 220 3-2
869.65-869.7 MHz	Alarms	25 mW e.r.p.	≤ 10 % duty cycle	≤ 25 kHz	EN 300 220 3-2
Other SRD uses					
29.7 MHz - 47.0 MHz	Wireless audio applications	10 mW e.r.p		≤ 50 kHz	EN 300 422-2
87.5 MHz - 108 MHz	Wireless audio applications	50 nW e.r.p		≤ 200 kHz	EN 301 357
312 MHz - 315 MHz	Keyless car entry	50 mW e.r.p			EN 300 220
433.05 MHz - 434.79 MHz	LPD 433	10 mW e.r.p		25 kHz	EN 300 220
446 MHz - 446.2 MHz ¹⁶	PMR 446	500 mW			EN 303 405
863 MHz – 865 MHz	Wireless audio applications	10 mW e.r.p.			EN 300 422 EN 301 357
869.7 MHz - 870 MHz	SRD860	5 mW e.r.p		25 kHz	EC/DEC/(11)8 29
1880 MHz - 1900 MHz	DECT applications including Cordless Telephony	nominal transmit power of up to 250 mW			EN 300 175
		400 mW e.i.r.p for omni-directional antennas			ERC/DEC/(98) 22
		1 W e.i.r.p for directional antennas			ERC/DEC/(98) 22
57-71 GHz	Wideband Data Transmission Systems (WDTS) WDTS	40 dBm e.i.r.p., 23 dBm/MHz e.i.r.p. density and maximum transmit power of 27 dBm at the antenna port or ports	Adequate spectrum sharing mechanism shall		EN 303 722 EN 303 753

¹⁶ digital PMR 446 with a channel plan based on 6.25 kHz and 12.5 kHz spacing where the lowest carrier frequencies are 446.003125 MHz and 446.00625 MHz.

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Frequency range	Usage	Maximum effective radiated power, e.r.p. Magnetic field	Channel access and occupation rules ¹	Channel spacing/ Maximum Occupied Bandwidth	Reference
		55 dBm e.i.r.p., 38 dBm/MHz e.i.r.p. density and transmit antenna gain ≥ 30 dBi (Applies only to fixed outdoor installations)	be implemented		

4.2 Generic UWB devices shall comply with the most recent version of EN 302 065

4.2.1 The maximum value of mean power spectral density shall not exceed the values as given in the following table:

Frequency range (GHz)	Without mitigation techniques EIRP (dBm/MHz)	With mitigation techniques EIRP (dBm/MHz)
$f \leq 1.6$	-90	-90
$1.6 < f \leq 2.7$	-85	-85
$2.7 < f \leq 3.1$	-70	-70
$3.1 < f \leq 3.4$	-70	-41.3 (notes 1+2)
$3.4 < f \leq 3.8$	-80	-41.3 (notes 1+2)
$3.8 < f \leq 4.2$	-70	-41.3 (notes 1+2)
$4.2 < f \leq 4.8$	-70	-41.3 (notes 1+2)
$4.8 < f \leq 6.0$	-70	-70
$6.0 < f \leq 8.5$	-41.3	-41.3
$8.5 < f \leq 9.0$	-65	-41.3 (note 2)
$9.0 < f \leq 10.6$	-65	-65
$f > 10.6$	-85	-85

Note 1: Within the band 3.1 GHz to 4.8 GHz, devices implementing Low Duty Cycle (LDC) mitigation technique Annex 2 (LDC) and Annex 3 (DAA) of ECC Decision (06)04 are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz.

Note 2: Within the bands 3.1 GHz to 4.8 GHz and 8.5 GHz to 9.0 GHz, devices implementing Detect And Avoid (DAA) mitigation technique Annex 2 (LDC) and Annex 3 (DAA) of ECC Decision (06)04 are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz.

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4.2.2 Generic UWB devices shall not exceed the maximum peak power limits as given in the table below:

Frequency Range (GHz)	Without mitigation techniques defined in 50 MHz EIRP (dBm)	With mitigation techniques defined in 50 MHz EIRP (dBm)
$f \leq 1.6$	-50	-50
$1.6 < f \leq 2.7$	-45	-45
$2.7 < f \leq 3.1$	-36	-36
$3.1 < f \leq 3.4$	-36	0 (notes 1+2)
$3.4 < f \leq 3.8$	-40	0 (notes 1+2)
$3.8 < f \leq 4.2$	-30	0 (notes 1+2)
$4.2 < f \leq 4.8$	-30	0 (notes 1+2)
$4.8 < f \leq 6.0$	-30	-30
$6.0 < f \leq 8.5$	0	0
$8.5 < f \leq 9.0$	-25	0 (notes 2)
$9.0 < f \leq 10.6$	-25	-25
$f > 10.6$	-45	-45

Note 1: Within the band 3.1 GHz to 4.8 GHz, devices implementing Low Duty Cycle (LDC) mitigation technique Annex 2 (LDC) and Annex 3 (DAA) of ECC Decision (06)04 are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz.

Note 2: Within the bands 3.1 GHz to 4.8 GHz and 8.5 GHz to 9.0 GHz, devices implementing Detect And Avoid (DAA) mitigation technique Annex 2 (LDC) and Annex 3 (DAA) of ECC Decision (06)04 are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz

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4.3 UWB devices for location tracking shall comply with the most recent version of EN 302 065.

4.3.1 The maximum mean EIRP spectral density shall not exceed the values as given in the following table:

Frequency range (GHz)	Maximum mean EIRP spectral density (dBm/MHz)	
	Without DAA	With DAA
$f \leq 1.6$	-90	
$1.6 < f \leq 2.7$	-85	
$2.7 < f \leq 3.1$	-70	
$3.1 < f \leq 3.4$	-70	
$3.4 < f \leq 3.8$	-80	
$3.8 < f \leq 4.8$	-70	
$4.8 < f \leq 6.0$	-70	
$6.0 < f \leq 8.5$	-41.3	
$8.5 < f \leq 9.0$	-65	-41.3
$9.0 < f \leq 10.6$	-65	
$f > 10.6$	-85	

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4.3.2 The maximum peak EIRP shall not exceed the values as given in the following table:

Frequency Range (GHz)	Maximum peak EIRP (dBm, measured in 50 MHz bandwidth)	
	Without DAA	With DAA
$f \leq 1.6$	-50	
$1.6 < f \leq 2.7$	-45	
$2.7 < f \leq 3.1$	-36	
$3.1 < f \leq 3.4$	-36	
$3.4 < f \leq 3.8$	-40	
$3.8 < f \leq 4.8$	-30	
$4.8 < f \leq 6.0$	-30	
$6.0 < f \leq 8.5$	0	
$8.5 < f \leq 9.0$	-25	0
$9.0 < f \leq 10.6$	-25	
$f > 10.6$	-45	

4.3.3 In order to protect Radio Astronomy Services; in the frequency range 2.69 GHz to 2.70 GHz and in the frequency range 4.8 to 5 GHz; the total radiated power density has to be below -65 dBm/MHz.

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4.4 UWB devices for Building Material Analysis shall comply with the most recent version of EN 302 065.

4.4.1 The values of undesired emissions shall not exceed the values as given in the following table:

Frequency range (GHz)	Maximum mean e.i.r.p. spectral density (dBm/MHz)	Maximum peak e.i.r.p. (dBm defined in 50 MHz)	Remarks
Below 1,73	-85	-45	
1,73 to 2.2	-65	-25	
2,2 to 2,5	-50	-10	
2,5 to 2,69	-65	-25	note 1
2,69 to 2,7	-55	-15	Note 1, note 2, note 3
2,7 to 2,9	-70	-30	
2,9 to 3,4	-70	-30	
3,4 to 3,8	- 50	-10	note 2, note 3
3,8 to 4,8	- 50	-10	
4,8 to 5,0	-55	-15	note 1, note 2, note 3
5,0 to 5,25	-50	-10	
5,25 to 5,35	-50	-10	
5,35 to 5,6	-50	-10	
5,6 to 5,65	-50	-10	
5,65 to 5,725	-50	-10	
5,725 to 6,0	-50	-10	
6,0 to 8,5	-41,3	-0	
8,5 to 9,0	-65	-25	
9,0 to 10,6	-65	-25	
Above 10,6	-85	-45	

Note 1: An additional requirement on TRP applies, see clause 4.3.6. of EN 302 065-4-1

Note 2: An additional requirement on DC applies, see clause 4.3.8. of EN 302 065-4-1

Note 3: Reduced limits for mean e.i.r.p. spectral density do apply in case of trading DC and power according to clause 4.3.8.3, table 14 of EN 302 065-4-1

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Frequency range (GHz)	Maximum mean e.i.r.p. spectral density (dBm/MHz)	Maximum peak e.i.r.p. (dBm defined in 50 MHz)	Remarks
Below 1,215	-85	-45	
1,215 to 1,73	-70	-30	note 3
1,73 to 2,2	-65	-25	
2,2 to 2,5	-50	-10	
2,5 to 2,69	-50	-10	note 1, note 4
2,69 to 2,7	-55	-15	note 1, note 2, note 3
2,7 to 2,9	-50	-10	note 4
2,9 to 3,4	-50	-10	note 4
3,4 to 3,8	- 50	-10	note 2, note 3
3,8 to 4,8	- 50	-10	
4,8 to 5,0	-55	-15	note 1, note 2, note 3
5,0 to 5,25	-50	-10	
5,25 to 5,35	-50	-10	
5,35 to 5,6	-50	-10	
5,6 to 5,65	-50	-10	
5,65 to 5,725	-50	-10	
5,725 to 6,0	-50	-10	
6,0 to 8,5	-41,3	0	
8,5 to 9,0	-65	-25	
9,0 to 10,6	-65	-25	
Above 10,6	-85	-45	

Note 1: An additional requirement on TRP applies, see clause 4.3.6 of EN 302 065-4-1

Note 2: An additional requirement on DC applies, see clause 4.3.8 of EN 302 065-4-1

Note 3: Reduced limits for mean e.i.r.p. spectral density do apply in case of trading DC and power according to clause 4.3.8.3, table 14 of EN 302 065-4-1

Note 4: An additional requirement on LBT applies, see clause 4.3.7 of EN 302 065-4-1

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4.5 UWB devices for Ground Penetration Radars (GPR) / Wall Penetration Radars (WPR) imaging systems shall comply with the most recent version of EN 302 066.

4.5.1 The values of mean power density of undesired emissions shall not exceed the values as given in the following table:

Frequency range (MHz)	Maximum mean e.i.r.p. density (dBm/MHz)
<230	-65
230-1000	-60
1000-1600	-65 (note 1)
1600-3400	-51.3
3400-5000	-41.3
5000-6000	-51.3
>6000	-65

Note 1: In addition to the maximum mean e.i.r.p. density given in the table above, a maximum mean e.i.r.p. density of -75 dBm/kHz applies in the RNSS bands 1164-1215 MHz and 1559-1610 MHz in case of spectral lines in these bands

4.5.2 The values of measure peak power density of undesired emissions shall not exceed the values as given in the following table:

Frequency range(MHz)	Maximum peak power
30 to 230	-44.5dBm/120kHz (e.r.p.)
> 230 to 1000	-37.5dBm/120kHz (e.r.p.)
> 1000 to 18000	-30dBm/MHz (e.i.r.p.)

*The method of measurements is given by EN 302 066.

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4.6 UWB Devices in Motor and Railway Vehicles shall comply with the most recent version of EN 302 065.

Frequency range	Maximum mean e.i.r.p. spectral density	Maximum peak e.i.r.p. (defined in 50 MHz)
Below 1.6 GHz	-90 dBm/MHz	-50 dBm
1.6 to 2.7 GHz	-85 dBm/MHz	-45 dBm
2.7 to 3.4 GHz (Notes 1 and 2)	-70 dBm/MHz	-36 dBm
3.4 to 3.8 GHz (Notes 1 and 2)	-80 dBm/MHz	-40 dBm
3.8 to 4.2 GHz (Notes 1 and 2)	-70 dBm/MHz	-30 dBm
4.2 to 4.8 GHz (Notes 1 and 2)	-70 dBm/MHz	-30 dBm
4.8 to 6.0 GHz	-70 dBm/MHz	-30 dBm
6.0 to 8.5 GHz (Notes 1 and 3)	-53.3 dBm/MHz	-13.3 dBm
8.5 to 10.6 GHz (Note 2)	-65 dBm/MHz	-25 dBm
Above 10.6 GHz	-85 dBm/MHz	-45 dBm

Note 1: within the band 3.1-4.8 GHz and 6.0-8.5 GHz, devices implementing Low Duty Cycle (LDC) mitigation technique (see ECC/DEC/(06)04, Annex 2) are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50MHz. Operation is in addition subject to the implementation of an exterior limit (see Annex 5) of -53.3 dBm/MHz. Note 2: within the bands 3.1-4.8 GHz and 8.5-9.0 GHz, devices implementing Detect And Avoid (DAA) mitigation technique (see ECC/DEC/(06)04, Annex 3) are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50MHz. Operation is in addition subject to the implementation of Transmit Power Control (TPC) mitigation technique (see ECC/DEC/(06)04, Annex 4) and an exterior limit (see ECC/DEC/(06)04, Annex 5) of -53.3 dBm/MHz.

Note 2: within the band 6.0-8.5 GHz devices implementing Transmit Power Control (TPC) mitigation technique (see ECC/DEC/(06)04, Annex 4) and an exterior limit (see ECC/DEC/(06)04, Annex 5) of -53.3 dBm/MHz are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz.

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4.7 Trigger-before-transmit mitigation technique for vehicular access systems shall comply with the most recent version of EN 302 065.

Frequency range	Maximum mean e.i.r.p. spectral density	Maximum peak e.i.r.p (defined in 50 MHz)
$3.8 < f \leq 4.2 \text{ GHz}$	<i>-41.3 dBm/MHz with trigger-before-transmit operation and LDC $\leq 0.5\%$ (in 1h)</i>	<i>0 dBm</i>
$6.0 < f \leq 8.5 \text{ GHz}$	<i>-41.3 dBm/MHz with trigger-before-transmit operation and LDC $\leq 0.5\%$ (in 1h) or TPC</i>	<i>0 dBm</i>

Article (5)

Validation and Publication

5.1 These regulations should be published in the official gazette and shall be effective as of the date of their issuance.