



Regulations

Ultra Wide Band and Short Range Devices

Version 2.0

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www.tra.gov.ae



TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

Article (1)

Scope of Document

- 1.1 These regulations are issued in accordance with the provisions of the UAE Federal Law by Decree No 3 of 2003 (Telecom Law) as amended and its Executive Order.
- 1.2 This document comprises technical regulations for the authorization of Ultra Wide Band and Short Range Devices under Class Authorization for various applications. It shall be read in conjunction with the following documents available from the TRA website at www.tra.gov.ae:
 - 1.1.1 Spectrum Allocation and Assignment Regulations
 - 1.1.2 Spectrum Fees Regulations
 - 1.1.3 Interference Management Regulations
 - 1.1.4 National Frequency Plan and National Table of Frequency Allocation

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 Telecom Law and its Executive Order as amended (Federal Law by Decree No. 3 of 2003 as amended 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. The following terms and words shall have the meanings ascribed to them below:
 - 2.1.1 **“AFA”** means Adaptive Frequency Agility.
 - 2.1.2 **“APC”** means Automatic / Adaptive Power Control.
 - 2.1.3 **“Application”** means the request for issuance of a License or an Authorization, received at the Authority on prescribed forms as per the procedure in vogue.



TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

- 2.1.4 “**Authority (TRA)**” means the General Authority for Regulating the Telecommunication Sector known as Telecommunications Regulatory Authority (TRA) established pursuant to the provisions of Article 6 of Federal Law by Decree No. 3 of 2003.
- 2.1.5 “**Broadband Radio Access Networks (BRAN)**” means networks using equipment complying with technical specifications as set out in ETIS EN 301 893 and ETSI EN302 567. This includes equipment based on IEEE 802.11 family of standards.
- 2.1.6 “**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 TRA.
- 2.1.7 “**Cordless Telephony**” includes cordless telephones; cordless telecommunication systems and the cordless systems providing communications within the curtilage of any premises.
- 2.1.8 “**Curtilage**” means a partially or entirely enclosed area such as a courtyard, atrium, close, compound, court, enclosure, quadrangle, square, patio or yard.
- 2.1.9 “**DAA**” means Detect And Avoid.
- 2.1.10 “**DFS**” means Dynamic Frequency Selection.
- 2.1.11 “**DECT**” means Digital Enhanced Cordless Telecommunications in accordance with applicable European Telecommunications Standards Institute (ETSI) standards.
- 2.1.12 “**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.
- 2.1.13 “**Frequency Hopping Spread Spectrum (FHSS)**” means a spread spectrum technique in which the transmitter signal occupies a number of frequencies in time, each for some period of time.
- 2.1.14 “**IEEE**” means the Institute of Electrical and Electronics Engineers.
- 2.1.15 “**ITU**” means the International Telecommunication Union, a leading United Nations agency for information and communication technologies.
- 2.1.16 “**Listen Before Talk (LBT)**” means mechanism by which an equipment applies clear channel assessment before using the channel.



TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

- 2.1.17 **“National Spectrum Plan”** means Radio Frequency Allocation plan for the UAE approved by the Board and any modifications thereof.
- 2.1.18 **“Person”** will include ‘juridical entities’ as well as ‘natural persons’.
- 2.1.19 **“PMR446”** means land mobile radio (i.e. walkie talkie) that operate in the 466 MHz frequency range with technical characteristics as specified in the regulation on Ultra-wide band and Short Range Devices for this frequency range.
- 2.1.20 **“PMR over WLAN”** means 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 radio standard IEEE 802.11 a/b/g/n.
- 2.1.21 **“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.
- 2.1.22 **“Radio Frequency Identification (RFID)”** means system that enable 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. UAE means the United Arab Emirates including its territorial waters and the airspace above.
- 2.1.23 **“Radio Local Area Network (RLAN)”** equipment means equipment complying with technical specifications as set out in ETIS EN 301 893 and ETSI EN302 567. This includes equipment based on IEEE 802.11 family of standards.
- 2.1.24 **“Short Range Device (SRD)”** means fixed, mobile or portable devices for various radio applications operating with technical conditions as defined in Article 4.
- 2.1.25 **“Transmit Power Control (TPC)”** means a technique in which the transmitter output power is controlled resulting in reduced interference to other systems.
- 2.1.26 **“Ultra Wide Band (UWB)”** Devices mean 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.
- 2.1.27 **“Wideband data transmission”** equipment means equipment complying with technical specifications as set out in ETIS EN 300 328. This includes equipment based on IEEE 802.11 family of standards.



TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

2.1.28 **“Wireless Local Area Networks (WLAN)”** means network of connected equipment connected without the use of wires using IEEE 802.11 family of standards.

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.

Article (4)

Technical Conditions

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

Frequency range	Usage	Transmit power / Magnetic field	Duty cycle	Channel Spacing	Reference
9 kHz – 59.75 kHz	Inductive applications	72 dBµA/m at 10m			EN 300 330
59.75 kHz – 60.25 kHz	Inductive applications	42 dBµA/m at 10m			EN 300 330
60.25 kHz - 90 kHz	Inductive applications	72 dBµA/m at 10m			EN 300 330
9 kHz - 315 kHz	Active Medical Implants and their associated peripherals	30 dBµA/m at 10m	≤ 10 %		EN 302 195
90 kHz - 140 kHz	Inductive applications	42 dBµA/m at 10m			EN 300 330

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

Frequency range	Usage	Transmit power / Magnetic field	Duty cycle	Channel Spacing	Reference
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	-15 dB μ A/m at 10 m			EN 300 330
315 kHz- 600 kHz	Active Medical Implants and their associated peripherals	-5 dB μ A/m at 10m	$\leq 10 \%$		EN 302 536
400 kHz - 600 kHz	Inductive applications	-8 dB μ A/m at 10 m			EN 300 330
456.9 kHz - 457.1 kHz	Tracking, tracing and data acquisition	7 dB μ A/m at 10 m		No modulation allowed	EN 300 718
984 kHz - 7484 kHz	Railway applications	9 dB μ A/m at 10m	$\leq 1.0 \%$		EN 302 608
3155 kHz - 3400 kHz	Inductive applications	13.5 dB μ A/m at 10m			EN 300 330
5000 kHz - 30 MHz	Inductive applications	-20 dB μ A/m at 10 m			EN 300 330
6765 kHz - 6795 kHz	Non-specific	42 dB μ A/m at 10m			EN 300 330
7300 kHz - 23000 kHz	Railway applications	-7 dB μ A/m at 10m			EN 302 609
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
11810 kHz - 12660 kHz	Inductive applications	-16 dB μ A/m at 10m			EN 300 330
12500 kHz - 20000 kHz	Active Medical Implants and their associated peripherals	-7 dB μ A/m at 10m	$\leq 10 \%$		EN 300 330
13553 kHz - 13567 kHz	Non-specific	42 dB μ A/m at 10m			EN 300 330
	RFID and EAS	60 dB μ A/m at 10m			EN 300 330
13567 kHz - 13660 kHz	Inductive applications	27 dB μ A/m at 10m			EN 300 330
13660 kHz - 13710 kHz	Inductive applications	9 dB μ A/m at 10m			EN 300 330
13710 kHz - 14010 kHz	Inductive applications	-3.5 dB μ A/m at 10m			EN 300 330
14010 kHz - 14460 kHz	Inductive applications	-10 dB μ A/m at 10m			EN 300 330
14460 kHz - 15310 kHz	Inductive applications	-16 dB μ A/m at 10m			EN 300 330
26957 kHz - 27283 kHz	Non-specific	42 dB μ A/m at 10m 10 mW e.r.p			EN 300 330
26995, 27045, 27095, 27145, 27195 kHz	Non-specific	100 mW e.r.p	$\leq 0.1 \%$	≤ 10 kHz	EN 300 220
29.7 MHz - 47.0 MHz	Radio microphone applications	10 mW e.r.p		≤ 50 kHz	EN 300 422

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

Frequency range	Usage	Transmit power / Magnetic field	Duty cycle	Channel Spacing	Reference
30 MHz - 37.5 MHz	Active Medical Implants and their associated peripherals	1 mW e.r.p	≤ 10 %		EN 302 510
34.995 MHz - 35.225 MHz	Model control	100 mW e.r.p		10 kHz	EN 300 220
40.66 MHz - 40.7 MHz	Non-specific	10 mW e.r.p			EN 300 220
40.665, 40.675, 40.685, 40.695 MHz	Model control	100 mW e.r.p		≤ 10 kHz	EN 300 220
72 MHz - 72.25 MHz	Model control	10 mW e.r.p		≤ 10 kHz	EN 300 220
87.5 MHz - 108 MHz	Wireless audio applications	50 nW e.r.p		≤ 200 kHz	EN 301 357
138.2 MHz - 138.45 MHz	Non-specific	≤ 10 mW e.r.p			EN 300 220
169.4 MHz - 169.475 MHz	Non-specific	10 mW e.r.p	≤ 0.1 %		EN 300 220
	Tracking, tracing and data acquisition	500 mW e.r.p	≤ 10 %	≤ 50 kHz	EN 300 220
	Aids for the hearing impaired	500 mW e.r.p	≤ 10 %	≤ 50 kHz	EN 300 422
169.475 MHz - 169.4875 MHz	Non-specific	10 mW e.r.p	≤ 0.1 %		EN 300 220
	Aids for the hearing impaired	10 mW e.r.p		≤ 50 kHz	EN 300 422
169.4875 MHz - 169.5875 MHz	Non specific	10 mW e.r.p	≤ 0.001% (06h00 - 24h00) ≤ 0.1% (00h00 - 06h00)	Non-specific	EN 300 220
	Aids for the hearing impaired	500 mW e.r.p		≤ 50 kHz	EN 300 422
169.5875 MHz - 169.8125 MHz	Non-specific	10 mW e.r.p	≤ 0.1 %		EN 300 220
	Aids for the hearing impaired	10 mW e.r.p		≤ 50 kHz	EN 300 422
169.4 MHz - 174 MHz	Aids for the hearing impaired	10 mW e.r.p		≤ 50 kHz	EN 300 422
312 MHz - 315 MHz	Keyless car entry	50 mW e.r.p			EN 300 220
401 MHz - 402 MHz	Active Medical Implants and their associated peripherals	25 uW e.r.p		≤ 100 kHz	EN 302 537
402 MHz – 405 MHz	Active Medical Implants and their associated peripherals	25 uW e.r.p		≤ 300 kHz	EN 301 839
405 MHz - 406 MHz	Active Medical Implants and their associated peripherals	25 uW e.r.p		≤ 100 kHz	EN 302 537
433.05 MHz -	Non-specific	1 mW e.r.p			EN 300 220

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

Frequency range	Usage	Transmit power / Magnetic field	Duty cycle	Channel Spacing	Reference
434.79 MHz	Non-specific	10 mW e.r.p	≤ 10 %		EN 300 220
	LPD 433	10 mW e.r.p		25 kHz	EN 300 220
446 MHz - 446.2 MHz	PMR 446	500 mW			TS 102 490
863 MHz - 870 MHz	Non-specific	25 mW e.r.p	≤ 0.1 % or LBT		EN 300 220
	SRD860	10 mW e.r.p		25 kHz	
868.7 MHz – 869.2 MHz	Automatic Meter Reading	25 mW e.r.p			EN 300 220
869.4 MHz - 869.65 MHz	Non-specific	500 mW e.r.p	≤ 10% or LBT +AFA	≤ 25 kHz. ¹	EN 300 220
865 MHz - 865.6 MHz	RFID	100 mW e.r.p		≤ 200 kHz	EN 302 208
865.6 MHz - 867.6 MHz	RFID	2 W e.r.p		≤ 200 kHz	EN 302 208
867.6 MHz - 868 MHz	RFID	500 mW e.r.p		≤ 200 kHz	EN 302 208
870 MHz - 875.4 MHz	Non-specific	10 mW e.r.p			EN 300 220
870 MHz - 875.8 MHz	Non-specific	25 mW e.r.p	≤ 1 %	≤ 600 kHz	EN 300 220
870 MHz - 876 MHz	Non-specific	25 mW e.r.p	≤ 0.1 %	≤ 200 kHz	EN 300 220
870 MHz - 875.6 MHz	Tracking, tracing and data acquisition	500 mW e.r.p	≤ 2.5% and APC ²	≤ 200 kHz	EN 303 204
870 MHz - 875.8 MHz	Transport and traffic telematics	500 mW e.r.p (vehicle to vehicle) 100 mW e.r.p. (in vehicle application)	≤ 0.1 % ³	≤ 500 kHz	EN 300 200
915 MHz - 918 MHz	Non-specific	25 mW e.r.p	≤ 0.1 %	≤ 200 kHz	EN 300 220
918 MHz - 921 MHz	Non-specific	25 mW e.r.p	≤ 0.01%	≤ 200 kHz	EN 300 220
916.1 - 920.1 MHz	Radio microphone applications including aids for the hearing impaired	10 mW e.r.p	≤ 25 %	≤ 400 kHz	EN 300 422
915 - 921 MHz	RFID	4 W e.r.p ⁴		≤ 400 kHz	EN 302 208
1785 - 1804.8 MHz	Radio microphone applications	50 mW e.i.r.p			EN 300 422

¹ The whole stated frequency band may be used as 1 wideband channel for high speed data transmission.

² For ER-GSM protection (873 – 875.6MHz, where applicable), the duty cycle is limited to ≤ 0.01%.

³ For ER-GSM protection (873 – 875.6MHz, where applicable), the duty cycle is limited to ≤ 0.01%.

⁴ Interrogator transmissions at 4 W e.r.p, are only permitted within the four channels centred at 916.3 MHz, 917.5 MHz, 918.7 MHz and 919.9 MHz; each with a maximum bandwidth of 400kHz. For ER-GSM protection (918-921 MHz, where applicable) DAA is required.

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

Frequency range	Usage	Transmit power / Magnetic field	Duty cycle	Channel Spacing	Reference
1795 - 1800 MHz	Wireless audio applications	20 mW e.i.r.p			EN 301 357
1880 MHz - 1900 MHz	DECT applications including Cordless Telephony	250 mW e.i.r.p			ITU-R M.1033-1 EN 300 175
2400 MHz – 2483.5 MHz	Wideband data transmission (e.g. WLAN, PMR over WLAN)	100 mW e.i.r.p.			EN 300 328
	Non specific	10 mW e.i.r.p			EN 300 440
	Radiodetermination applications	25 mW e.i.r.p			EN 300 440
2446 MHz - 2454 MHz	RFID	500 mW			EN 300 761 EN 300 440
	RFID	4 W	≤ 15% + FHSS		EN 300 440
2483.5 MHz – 2500 MHz	Active Medical Implants	10 dBm e.i.r.p			EN 301 559
4500 MHz - 7000 MHz	Tank level probing radar	-41.3 dBm/MHz e.i.r.p. outside the enclosed test tank structure			EN 302 372
5150 MHz - 5875 MHz	Indoor conference systems. Indoor only	160 mW			
5150 MHz - 5250 MHz	Broadband Radio Access Networks (e.g. RLAN). Indoor only	200 mW e.i.r.p. (with and without) TPC			EN 301 893 TPC/DFS: EN 301 893 (Table D.1)
5250 MHz - 5350 MHz	Broadband Radio Access Networks (e.g. RLAN). Indoor only	100 mW e.i.r.p without TPC / 200 mW e.i.r.p with TPC			EN 301 893 TPC/DFS: EN 301 893 (Table D.1)
5470 MHz - 5725 MHz	Broadband Radio Access Networks (e.g. RLAN)	500 mW e.i.r.p without TPC/ 1W e.i.r.p with TPC and DFS ⁵			EN 301 893 TPC/DFS: EN 301 893 (Table D.1)
5725 MHz – 5925 MHz	Broadband Radio Access Networks (e.g. RLAN)	500 mW without TPC / 1W e.i.r.p with TPC and DFS			EN 301 893 TPC/DFS: EN 301 893 (Table D.1)
5725 MHz - 5875 MHz	Non-specific	50 mW e.i.r.p			EN 300 440
	Tracking, tracing and data acquisition	400 mW e.i.r.p		≥ 1 MHz and ≤ 20 MHz	EN 303 258
5795 MHz - 5815 MHz	Transport and traffic telematics	2W e.i.r.p			EN 300 674

⁵ Slave devices without a Radar Interference Detection shall comply with the limits for the Band 5150MHz-5250

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

Frequency range	Usage	Transmit power / Magnetic field	Duty cycle	Channel Spacing	Reference
8500 MHz - 10.6 GHz	Tank level probing radar	-41.3 dBm/MHz e.i.r.p. outside the enclosed test tank structure			EN 302 372
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	Non-specific	25 mW e.i.r.p			EN 300 440
17.1 GHz - 17.3 GHz	Non-specific	100 mW e.i.r.p.			EN 300 440
	Radiodetermination applications	400 mW (26 dBm) e.i.r.p			EN 300 440
24 GHz - 24.25 GHz	Non-specific	100 mW e.i.r.p			EN 300 440
24.05 GHz - 27 GHz	Tank level probing radar	20W (43 dBm) e.i.r.p.			EN 302 858
57 GHz - 64 GHz	Non-specific	100 mW e.i.r.p; 13 dBm/MHz e.i.r.p.			EN 305 550
	Tank level probing radar	400 mW (26 dBm) e.i.r.p			EN 302 372
57 GHz - 66 GHz	Broadband Radio Access Networks (e.g. RLAN)	10 W (40 dBm) e.i.r.p	Spectrum sharing mechanism (e.g. LBT, DAA)		EN 302 567
75 GHz - 85 GHz	Tank level probing radar	-41.3 dBm/MHz e.i.r.p.			EN 302 372
	Radiodetermination applications	400 mW (26 dBm) e.i.r.p			EN 302 729
76 GHz - 77 GHz	Railway applications and Transport and traffic telematics	55 dBm e.i.r.p peak			EN 301 091
77.5 – 78 GHz	Ground based short range radar including automotive radars	45 dBm e.i.r.p peak			ITU-R M.2057
122 GHz - 123 GHz	Non-specific	100 mW e.i.r.p			EN 305 550
244 GHz - 246 GHz	Non-specific	100 mW e.i.r.p			EN 305 550

3.2 Generic UWB devices shall comply with EN 302 065 -1.

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

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

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
$8.5 < f \leq 10$	-65	-41.3 (note 2)
$0 < f \leq 10.6$	-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 TS 102 754 and CEPT report 45 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 GHz, devices implementing Detect And Avoid (DAA) mitigation technique TS 102 754 and CEPT report 45 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.

3.2.2 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
$2.7 < f \leq 3.1$	-45	-45
$3.1 < f \leq 3.4$	-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
$8.5 < f \leq 9$	-25	0 (notes 2)
$9 < f \leq 10.6$	-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 TS 102 754 and CEPT report 45 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.

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

NOTE 2: Within the bands 3.1 GHz to 4.8 GHz and 8,5 GHz to 9 GHz, devices implementing Detect And Avoid (DAA) mitigation technique TS 102 754 and CEPT report 45 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

3.3 UWB devices for location tracking shall comply with EN 302 500-1.

3.3.1 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]
$f \leq 1.6$	-90
$1.6 < f \leq 2.7$	-85
$2.7 < f \leq 3.4$	-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
$8.5 < f \leq 9$	-41.3 (see note)
$9 < f \leq 10.6$	-65
$f > 10.6$	-85

NOTE: Operation is subject to the implementation of DAA. If DAA is not implemented, the following applies: 8.5 GHz to 9 GHz \leq -65 dBm/MHz.

3.3.2 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]
$f \leq 1.6$	-50
$1.6 < f \leq 2.7$	-45
$2.7 < f \leq 3.4$	-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 (see note)
$9 < f \leq 10.6$	-25
$f > 10.6$	-45

NOTE: Operation is subject to the implementation of DAA. If DAA is not implemented, the following applies: 8.5 GHz to 9 GHz \leq -25 dBm (measured in 50 MHz bandwidth).

3.3.3 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.

3.4 UWB devices for Building Material Analysis shall comply with EN 302 435-1.

TRA Regulations for Ultra Wide Band and Short Range Devices, Version 2.0, Issued 18 May 2016

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

Frequency range (GHz)	Limit values of undesired emissions (dBm/MHz)	
	without LBT	with LBT
$f \leq 1.215$ (notes 1 and 2)	-85	-85
$1.215 f \leq f < 1.73$ (notes 1 and 2)	-85	-70
$1.73 f \leq f < 2.2$ (note1)	-65	-65
$2.2 f \leq f < 2.5$	-50	-50
$2.5 f \leq f < 2.69$	-65	-50
$2.69 f \leq f < 2.7$	-55	-55
$2.7 f \leq f < 3.4$	-70	-50
$3.4 f \leq f < 4.8$	-50	-50
$4.8 f \leq f < 5.0$	-55	-55
$5.0 f \leq f < 8.5$	-50	-50
$f \geq 8.5$	-85	-85

NOTE 1: In some frequency ranges the UWB emissions limits are very low power radio signals, comparable with the power limits of emissions from digital and analogue circuitry (other emissions, see clause 8.3.2.3 of EN 302 435-1.). If it can be clearly demonstrated that an emission from the ultra-wideband device is not the ultra-wideband emission identified in this table (e.g. by disabling the device's UWB transmitter) or it can clearly be demonstrated that it is impossible to differentiate between other emissions (OE) and the UWB transmitter emissions (UE) within the measurement uncertainty, then emission shall be considered as other emissions (OE) (see clause 8.3.2 of EN 302 435-1.).

NOTE 2: If, after optimization of the measurement set-up as described in clauses 6.1,7.1 and 8.2.2 of EN 302 435-1, it is still not possible to identify any OE or UE emission above the noise floor, than it is considered that the UE limit is fulfilled.