

Information & eGovernment Authority

Resolution No. 8 of 2017

Regarding Regulation of Type Approval for Short Range Devices

After reviewing the Telecommunications Law issued by Decree-law No. 48 of 2002; upon Decree No. 69 of 2015 to establish the Information & eGovernment Authority; regulation regarding the fees imposed by the Telecommunication Regulatory Authority on licenses and other services issued by Decree No. 3 of 2010; upon the relevant reports and recommendation issue by the International Telecommunication Union; upon Decree No. 50 of 2015 to establish and form the Spectrum Strategy and Coordination Committee; upon the approval of the Spectrum Strategy and Coordination Committee members and based on the presentation by the General Director of Information Security and Radiocommunication.

Chief Executive of the Information & eGovernment Authority decided the following:

Article (1)

Definitions

The words and phrases included in this regulation shall have the same meanings noted to each of them, unless the context stated otherwise:

Type Approval:

Including the procedures for verifying the conformity of the radiocommunication equipment and standards with the standards and standards adopted in the Kingdom of Bahrain prior to their import, for the purpose of issuing a certificate of accreditation and allowing entry and use in the Kingdom.

Short Range Radiocommunication Devices:

Radiocommunication devices used on a secondary basis as fixed, mobile or portable stations equipped with a link for radio frequency output and dedicated or built-in antennas, which provide unidirectional or bi-directional communications and the probability of causing a harmful interference to other radio equipment is very low.

Internationally accredited laboratories for telecommunications:

Laboratories having a certification of the radio spectrum within the geographical region of which the Kingdom of Bahrain is located, as the division adopted by the Radiocommunication Conference.

Declaration of conformity of the manufacturer

The acknowledgment by the manufacturer of short-range radiocommunication equipment that these devices correspond to the frequency division of the geographical radio band in which the Kingdom of Bahrain is located.

Directorate: Wireless Licensing, Frequency & Monitoring Directorate at the Information & eGovernment Authority.

Licensee: A regular or legal person who is get the type approval certificate for the Directorate.

Applications Devices:

Radio communication devices used for the operation of devices or facilities designed for the generation and local use of radio energy for industrial, scientific, medical, domestic or similar purposes set out in the Annex to this Resolution, except for radio-related devices (applications) used in The field of communication

Harmful interference: means interference which endangers the functioning of a radio-navigation service or other safety services or seriously degrades, obstructs or repeatedly interrupts a Radiocommunications Service operating in accordance with the radio regulations

Secondary Basis: The service that operates on domains does not cause harmful interference to another wireless station and does not require protection from it.

Article (2)

General Provisions

Short-range radiocommunication devices or application devices may not be used or imported except after obtaining a specific certification from the Department, except for devices imported for personal use if they conform to the technical specifications approved in the Kingdom unless five devices.

Article (3)

Scope of application

All devices that meet the specifications and broadcast power conditions mentioned in the Annex are not considered to be effectively occupied by the spectrum and are not protected from harmful interference.

Article (4)

Procedures for applying for a Type Approval Certificate

The application for a type approval certification for the radio-communication equipment subject to the provisions of this resolution shall be submitted to the form prepared by the Department for this purpose:

- 1- Device name, manufacturer and model.
- 2- Detailed technical description of the devices and associated units, including frequencies that can be tuned or used.
- 3- Electromagnetic compatibility (EMC) and safety and radio safety test reports from internationally accredited telecommunications laboratories.
- 4- Declaration of conformity from the manufacturer.
- 5- Type Approval certificates issued by other countries, if any.

If the applicant for a type approval certification is a foreign company, the application must be submitted on its behalf by a Bahraini company.

Article (5)

Decide on the application for the type approval certificate

The Directorate shall decide on the application for a specific approval certificate within five working days from the date of submitting the application in compliance with the required requirements, after coordination with the competent authorities, as the case may be, and in case of rejection the decision must be reasoned.

In case of approval of the application, the applicant or his legal representative shall receive the specific type approval certificate after payment of the fee issued by the Telecommunication Regulatory Authority.

Article (6)

The validity of a Type Approval Certificate

The certificate of Type Approval shall be issued for a period of three years. The applicant for a Type Approval certificate or its legal representative shall be required to renew the Type Approval Certificate at least one month before the expiry of the period, subject to the approval of the Directorate, following the procedures stipulated in Articles 4 and 5 of this Resolution.

And does not renew the Type Approval certificate in case of changing the specifications and requirements adopted in the Kingdom of Bahrain.

Article (7)

Technical requirements

Short-range radiocommunication devices shall comply with the maximum field strength or emission capacity described in the Annex to this Resolution for frequency bands or frequencies assigned to them, and shall meet the requirements relevant to these specifications at all permitted frequencies.

Article (8)

Harmful Interference

Short-range radiocommunication devices operate on a secondary service basis, which are shared used for various applications, such as industrial, scientific, medical and other applications. These devices are not allowed to cause harmful interference to other licensed radio stations and in cases

where the devices may cause harmful interference, The Authority shall comply with all technical standards or have a type approval certificate in accordance with the provisions of this Resolution.

The Directorate shall suspend its operation and remove it from service.

The owners or users of such devices shall not have the right to claim protection from interference caused by licensed radio stations.

Article (9)

The Director-General of **Information Security and Radiocommunication** shall implement the provisions of this Resolution and the Annex thereto, and shall enter into force on the day following the date of their publication in the Official Gazette.

Chief Executive of Information & eGovernment Authority

Mohammed Ali AlQaed

Issued: 5th Rajab, 1438 AH

Corresponding: 3rd April, 2017

Annex 1 to the Regulations for the Specific Accreditation of Short-Range Radio Devices

Frequency bands or assigned frequencies and related requirements

1. Radio spectrum, associated standards and technical conditions

| 1.1. Non-Specific Short Range Devices | | | | |
|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 6765 – 6795 kHz | 42 dB μ A/m @ 10m | No requirement | EN 300 330 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT/ERC/REC 70-03 |
| 13.553 – 13.567 MHz | 42 dB μ A/m @ 10m | No requirement | EN 300 330 EN 301 489 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 26.957 – 27.283 MHz | 42 dB μ A/m @ 10m or 10mW e.r.p. | No requirement | EN 300 220, EN 300 330 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 26.990-27.000 MHz 27.040-27.050 MHz 27.090-27.100 MHz 27.140-27.150 MHz 27.190-27.200 MHz | 100 mW e.r.p | Duty cycle \leq 0.1 % (Note 1), Channel Spacing Up to 10 kHz | | Other references: CEPT ERC/REC 70-03 |
| 40.660 – 40.700 MHz | 10 mW e.r.p. | No requirement | EN 300 220 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 138.20 – 138.45 MHz | \leq 10 mW e.r.p. | Duty cycle \leq 1.0% (Note 1) | EN 300 220 | Other references: CEPT ECC/DEC/(05)02 CEPT ERC/REC 70-03 |
| 169.4000-169.4750 MHz | 200 mW e.r.p. | Duty cycle \leq 1.0 % (Note 1) , Channel Spacing \leq 50 KHz | EN 300.220 | Other references: CEPT ECC/DEC/(05)02 CEPT ERC/REC 70-03 Other Notes: The permitted output power may increase after conducting the necessary study. |
| 169.4000-169.4875 MHz | 10 mW e.r.p. | Duty cycle \leq 0.1 % (Note 1) | EN 300.220 | Other references: CEPT ECC/DEC/(05)02 CEPT ERC/REC 70-03 |
| 169.4875-169.5875 MHz | 10 mW e.r.p. | Duty cycle \leq 0.001 % (Note 1) | EN 300.220 | Other references: CEPT ECC/DEC/(05)02 CEPT ERC/REC 70-03 |
| 169.5875-169.8125 MHz | 10 mW e.r.p. | Duty cycle \leq 0.1 % (Note 1) | EN 300.220 | Other references: CEPT ECC/DEC/(05)02 CEPT ERC/REC 70-03 |
| 315 MHz | \leq 10 mW e.r.p. | The bandwidth of the emission shall be no wider than 0.25% of the center frequency | | |
| 433.050 – 434.790 MHz | 10 mW e.r.p. | Duty Cycle \leq 10 % (Note 1) | EN 300 220 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

1.1. Non-Specific Short Range Devices

| Mandatory Requirements | | | Information | |
|-----------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 433.050 – 434.790 MHz | 1 mW e.r.p. -13 dBm/10 kHz | No requirement except for (Note 9) | EN 300 220 | Power density limited to -13 dBm/10 kHz for wideband modulation with a bandwidth greater than 250 kHz European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 434.040 – 434.790 MHz | 10 mW e.r.p. | No requirement except for (Note 9) Channel Spacing: ≤ 25 kHz | EN 300 220 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 863 – 870 MHz (Notes 3 and 4) | 25 mW e.r.p | Duty Cycle ≤ 0.1 % or LBT (Note 1 and 5), Channel Spacing: ≤ 100 kHz for 47 or more channels (Note 2) | EN 300 220 | (Note 4) FHSS Modulation European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |
| | 25 mW e.r.p Power density : -4.5 dBm/100 kHz (Note 7) | Duty Cycle ≤ 0.1 % or LBT+AFA (Note 1, 5 and 6) | EN 300 220 | (Note 4) DSSS and other wideband modulations other than FHSS European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |
| | 25 mW e.r.p | Duty Cycle ≤ 0.1 % or LBT+AFA (Note 1 and 5), Channel Spacing: ≤ 100 kHz, for 1 or more channels modulation bandwidth ≤ 300 KHz (Note 2) | EN 300 220 | (Note 4) Narrow/wide-band Modulation European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |
| 868.000 – 868.600 MHz (Note 4) | 25 mW e.r.p | Duty Cycle ≤ 1 % or LBT+AFA (Note 1), Channel Spacing; No spacing for 1 or more channels (Note 2) | EN 300 220 | Narrow/wide-band Modulation No channel spacing. However the whole stated frequency band may be used (Note 3). European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 868.700 – 869.200 MHz (Note 4) | 25 mW e.r.p | Duty Cycle ≤ 0.1 % or LBT+AFA (Note 1) , Channel Spacing: No spacing for 1 or more channels (Note 2) | EN 300 220 | Narrow/wide-band Modulation No channel spacing. However the whole stated frequency band may be used (Note 3). European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

1.1. Non-Specific Short Range Devices

| Mandatory Requirements | | | Information | |
|--------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 869.400 – 869.650 MHz | 500 mW e.r.p | Duty Cycle $\leq 10\%$ or LBT+AFA (Note 1) Channel spacing: No spacing, for 1 or more channels The whole stated band may also be used as one single channel for high speed data transmission. | EN 300 220 | Narrow/wide-band Modulation European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 869.700 – 870.000 MHz (Note 9) | 5 mW ERP | No requirement | EN 300 220 | Narrow/wide-band Modulation No channel spacing, however the whole stated frequency band may be used. European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| | 25 mW ERP | Duty Cycle: $\leq 1\%$ or LBT+AFA (Note 1) | | |
| 870-876 MHz | 25 mW e.r.p. | $\leq 0.1\%$ duty cycle. For GSM-R protection (873-876 MHz, where applicable), the duty cycle is limited to $\leq 0.01\%$ and limited to a maximum transmit ontime of 5ms/1s; Channel spacing ≤ 200 kHz | | |
| 870-875.8 MHz | 25 mW e.r.p. | $\leq 1\%$ duty cycle. For GSM-R- protection (873.0-875.8 MHz, where applicable), the duty cycle is limited to $\leq 0.01\%$ and limited to a maximum transmit on time of 5ms/1s; Channel spacing ≤ 600 kHz | | |
| 2400 – 2483.5 MHz | 10 mW e.i.r.p. | No requirement | EN 300 440 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 5725 – 5875 MHz | 25 mW e.i.r.p. | No requirement | EN 300 440 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 24.00 – 24.25 GHz | 100 mW e.i.r.p. | No requirement | EN 300 440 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

| 1.1. Non-Specific Short Range Devices | | | | |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 57 – 64 GHz | 100 mW e.i.r.p., A max. transmitter output power of 10 mW, and a power density limited to 13dBm/MHz e.i.r.p. applies | No requirement | EN 305 550 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 61.0 – 61.5 GHz | 100 mW e.i.r.p. | No requirement | EN 305 550 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 122 – 122.25 GHz | 10 dBm e.i.r.p./250 MHz & -48 dBm/MHz at 30° elevation | (Note 8) | EN 305 550 | Other references: CEPT ERC/REC 70-03 |
| 122.25 – 123 GHz | 100 mW e.i.r.p. | No requirement | EN 305 550 | Other references: CEPT ERC/REC 70-03 |
| 244 – 246 GHz | 100 mW e.i.r.p. | No requirement | EN 305 550 | Other references: CEPT ERC/REC 70-03 |

Note 1: When either duty cycle, Listen Before Talk (LBT) or equivalent efficient mitigation technique applies then it shall not be user dependent/adjustable and shall be guaranteed by appropriate technical means.

For LBT devices without Adaptive Frequency Agility (AFA), or equivalent techniques, the duty cycle limit applies.

For any type of frequency agile device the duty cycle limit applies to the total transmission unless LBT or equivalent technique is used.

Note 2: The preferred channel spacing is 100 kHz allowing for a subdivision into 50 kHz or 25 kHz.

Note 3: Sub-bands for alarms are excluded (see Table 5)

Note 4: Audio and video applications are allowed provided that a digital modulation method is used with a max. bandwidth of 300 kHz. Analogue and digital voice applications are allowed with a max. bandwidth \leq 25 kHz.

In sub-band 863-865 MHz voice and audio conditions of Table 11.

Note 5: Duty cycle may be increased to 1% if the band is limited to 865 – 868 MHz.

Note 6: For wide-band techniques, other than FHSS, operating with a bandwidth of 200 kHz to 3 MHz, the duty cycle can be increased to 1% if the band is limited to 865-868 MHz and power to \leq 10 mW e.r.p.

Note 7: The power density can be increased to +6.2 dBm/100 kHz and -0.8 dBm/100 kHz, if the band of operation is limited to 865 –868 MHz and 865-870 MHz respectively.

Note 8: These limits should be measured with an rms detector and an average time of 1 ms or less.

Note 9: Audio and video applications are excluded. Voice applications (analogue or digital) are allowed with a maximum bandwidth of \leq 25 kHz, and with spectrum access technique such as LBT or equivalent and shall include a power output sensor controlling the transmitter to a maximum transmit period of 1 minute for each transmission.

| 1.2. Wideband Data Transmission Systems | | | | |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 2400 – 2483.5 MHz | 100 mW EIRP | Adequate spectrum sharing mechanism (e.g. Listen-before-Talk, Detect-And-Avoid) shall be implemented by the equipment | EN 300 328 IEEE 802.11a,b,g,ac | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT CEPT ERC/REC 70-03 |
| 5150 – 5250 MHz | 200 mW EIRP (Max mean) Power Density (Max mean EIRP): 10 mW/MHz in any 1 MHz band or equivalently 0.25 mW/25 kHz in any 25 kHz band | Indoor use only. | EN 301 893 IEEE 802.11h IEEE 802.16-2009 | European Legislation: Decisions 2007/90/EC, 2005/513/EC. Other references: CEPT ECC/DEC/(04)08 |
| 5250 – 5350 MHz | 200 mW EIRP (Max mean) Power Density (Max mean EIRP): 10 mW/MHz in any 1 MHz band | Indoor use only. See Note 10 | EN 301 893 IEEE 802.11h IEEE 802.16-2009 | European Legislation: Decisions 2007/90/EC, 2005/513/EC Other references: CEPT ECC/DEC/(04)08 |

| 1.2. Wideband Data Transmission Systems | | | | |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 5725 – 5875 MHz | 2 W EIRP (Max mean) Power Density (Max mean EIRP): 100mW/MHz | - | EN 301 489-4 EN 301 489-17 EN 302 326 EN 302 502 IEEE 802.11h IEEE 802.16-2009 | Individual license may be required Other references: CEPT ECC/REC (06)04 |
| 57 -66 GHz * | 40 dBm mean e.i.r.p. This refers to the highest power level of the transmitter power control range during the transmission burst if transmitter power control is implemented | Fixed outdoor installations are not allowed. Adequate spectrum sharing mechanism (e.g. Listen-before-Talk, Detect-And-Avoid) shall be implemented by the equipment | EN 302 567 | ما زال تحت الدراسة * European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: ERC/REC 70-03 |

Note 10: Transmitter Power Control (TPC) and Dynamic Frequency Selection (DFS) have been included in the reference standard EN 301 893.

| 1.3. Transport and Traffic Telematics (TTT) | | | | |
|----------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 5795 – 5805 MHz | 2 W e.i.r.p. | No requirement | EN 300 674 ES 200 674 | Other references: CEPT ERC/REC 70-03 |
| 5805 – 5815 MHz | 2 W e.i.r.p. | No requirement | EN 300 674 ES 200 674 | Individual license may be required Other references: CEPT ERC/REC 70-03 |
| 24.05 – 24.25 GHz | Maximum peak power of 20 dBm e.i.r.p. | Duty cycle limited to 10% for peak emissions higher than -10 dBm e.i.r.p. | | For Automotive Short Range Radars (SRR) narrow-band emission mode/component. Other references: ECC/DEC/(04)10 |
| 24.25 -26.65 GHz | Maximum mean e.i.r.p. density of -41.3 dBm/MHz and a peak e.i.r.p. density of 0 dBm/50MHz | | | For Automotive Ultra Wideband Short Range Radars (SRR). SRR equipment may only be placed onto the market until 1 January 2018. This date is extended by 4 years for SRR equipment mounted on motor vehicles for which vehicle conformity compliance has been granted before 1 January 2018. Other references: ECC/DEC/(04)10 |
| 24.050-24.075 GHz | 100 mW e.i.r.p. | No requirement | | For vehicle radars |
| 24.075-24.150 GHz | 0.1 mW e.i.r.p. | No requirement | | For vehicle radars |
| | 100 mW e.i.r.p. | ≤ 4μs/40 kHz dwell time every 3ms | | For automotive radars. The spectrum access and mitigation requirement is given for devices mounted behind a bumper. If mounted without a bumper, the requirement should be 3μs/40kHz maximum dwell time every 3ms. A requirement for minimum frequency modulation range (applicable to FMCW or step frequency signals) or minimum instantaneous bandwidth (applicable to pulsed signal) of 250 kHz applies in addition to the requirement on maximum dwell time |

| 1.3. Transport and Traffic Telematics (TTT) | | | | |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| | | ≤ 1ms/40 kHz dwell time every 40ms | | For automotive radars. The spectrum access and mitigation requirement is given for devices mounted either behind a bumper or mounted without a bumper. A requirement for minimum frequency modulation range (applicable to FMCW or step frequency signals) or minimum instantaneous bandwidth (applicable to pulsed signal) of 250 kHz applies in addition to the requirement on maximum dwell time |
| 24.150-24.250 GHz | 100 mW e.i.r.p. | No requirement | | For vehicle radars |
| 24.250-24.495 GHz | -11 dBm e.i.r.p. | Duty cycle: ≤ 0.25%/s/25 MHz | | For automotive radars The activity of the Wideband Low Activity Mode (WLAM) is limited to avoid the risk of interference and this mode is only activated in specific configurations as a complementary to designation 24.050 GHz to 24.250 GHz as described in ECC Report 164 |
| 24.495-24.500 GHz | -8 dBm e.i.r.p. | Duty cycle: ≤ 1.5%/s/5 MHz | | |
| 24.250-24.500 GHz | +20 dBm e.i.r.p. | Duty cycle: ≤ 5.6%/s/25 MHz | | |
| | +16 dBm e.i.r.p. | Duty cycle: ≤ 2.3%/s/25 MHz | | |
| 76 – 77 GHz | 55 dBm peak e.i.r.p. | No requirement | EN 301 091 | 50 dBm average power or 23.5 dBm average power for pulse radar only. For ground based vehicle and infrastructure radar systems Other references: CEPT ERC/REC 70-03 |
| 77-81 GHz | <ul style="list-style-type: none"> Maximum mean power density of -3 dBm/MHz e.i.r.p. associated with an peak limit of 55 dBm e.i.r.p. Maximum mean power density outside a vehicle resulting from the operation of one SRR equipment shall not exceed -9 dBm/MHz e.i.r.p. | | | For automotive Short Range Radars (SRR). Other references: ECC/DEC/(04)03 |

| 1.4. Radiodetermination Applications | | | | |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 30 MHz-12.4 GHz | Apply the technical requirements mentioned in the ECC/DEC/(06)08 | Apply the technical requirements mentioned in the ECC/DEC/(06)08 | | For Ground and Wall Probing Radar (GPR/WPR) imaging systems. subject to an appropriate licensing regime Other references: ECC/DEC/(06)08 |
| 2200-8000 MHz* | See the Technical requirements for Material Sensing & Building Material Analysis (BMA) devices using UWB technology part below 1.15 | | | For Material Sensing Devices. subject to an appropriate licensing regime Other references: ECC/DEC/(07)01 |

| 1.4. Radiodetermination Applications | | | | |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 2400 – 2483.5 MHz | 25 mW e.i.r.p. | No requirements | EN 300 440 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/DEC/(01)08 CEPT ERC/REC 70-03 |
| 3100-4800 MHz | See the table (1.17 A) Location Tracking Application for Emergency Services (LAES) part below. | | | For UWB Location tracking application for emergency and disaster situations (LAES). subject to an appropriate licensing regime Other references: ECC/REC/(11)10 |
| 3100-4800 MHz | See the Location Tracking Systems Type 2 (LT2) part below table (1.17 B) | | | For UWB Location Tracking Systems Type 2 (LT2). subject to an appropriate licensing regime. Other references: ECC/REC/(11)09 |
| 4.5 – 7.0 GHz | -41.3 dBm/MHz e.i.r.p. outside the enclosed test tank structure | No requirement | - | Tank Level Probing Radar (Note 11) (TLPR) only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 8.5 – 10.6 GHz | -41.3 dBm/MHz e.i.r.p. outside the enclosed test tank structure | No requirement | - | Tank Level Probing Radar (Note 11) (TLPR) only The radiated unwanted emissions within the frequency band 10.6-10.7 GHz outside the test tank enclosure shall be less than -60 dBm/MHz e.i.r.p. European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 24.05 – 27.0 GHz | -41.3 dBm/MHz e.i.r.p. outside the enclosed test tank structure | No requirement | - | Tank Level Probing Radar (Note 11) (TLPR) only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 57 – 64 GHz | -41.3 dBm/MHz e.i.r.p. outside the enclosed test tank structure | No requirement | - | Tank Level Probing Radar (Note 11) (TLPR) only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 75 – 85 GHz | -41.3 dBm/MHz e.i.r.p. outside the enclosed test tank structure | No requirement | - | Tank Level Probing Radar (Note 11) (TLPR) only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

| 1.4. Radiodetermination Applications | | | | |
|---------------------------------------------|--------------------------------------------------------|----------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 9200 – 9500 MHz | 25 mW e.i.r.p. | No requirement | EN 300 440 | Other references: CEPT ERC/REC 70-03 |
| 9500 – 9975 MHz | 25 mW e.i.r.p. | No requirement | EN 300 440 | Other references: CEPT ERC/REC 70-03 |
| 10.5 – 10.6 GHz | 500 mW EIRP | No requirement | EN 300 440 | Other references: CEPT ERC/REC 70-03 |
| 13.4 – 14 GHz | 25 mW e.i.r.p. | No requirement | EN 300 440 | Other references: CEPT ERC/REC 70-03 |
| 17.1 – 17.3 GHz | 26 dBm e.i.r.p. | DAA | | Ground Based Synthetic Aperture Radar (GBSAR) Specific requirements for the radar antenna pattern and for the implementation of Detect And Avoid (DAA) technique apply as described in EN 300 440 European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 24.05 – 24.25 GHz | 100 mW e.i.r.p. | No requirement | EN 300 440 | Other references: CEPT ERC/REC 70-03 |

Note 11: “Tank Level Probing Radar” (TLPR) is a specific type of radiodetermination application, which is used for tank level measurements and is installed in metallic or reinforced concrete tanks, or similar structures made of material with comparable attenuation characteristics. The purpose of the tank is to contain a substance.

| 1.5. Model Control | | | | |
|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 26.990-27.000 MHz 27.040-27.050 MHz 27.090-27.100 MHz 27.140-27.150 MHz 27.190-27.200 MHz | 100 mW e.r.p. | Channel Spacing: 10 kHz | EN 300 220 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/DEC/(01)10 CEPT ERC/REC 70-03 |
| 34.995 – 35.225 MHz | 100 mW e.r.p. | Channel Spacing: 10 kHz | EN 300 220 | Flying Models only Other references (Note 12) CEPT ERC/DEC/(01)11 CEPT ERC/REC 70-03 |
| 40.660, 40. 700 MHz | 100 mW e.r.p. | Channel Spacing: 10 kHz | EN 300 220 | Other references: CEPT ERC/DEC/(01)12 CEPT ERC/REC 70-03 |

Note 12: Model airborne vehicles are NOT normally permitted in the Kingdom except under special circumstances and exceptionally an individual authorization would therefore be required. Model aircraft and other model airborne vehicles are therefore NOT covered or permitted by this Regulation.

1.6 Inductive Applications (See Note 12)

| Mandatory Requirements | | Information | | |
|------------------------|-------------------------------------------------|---------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 9 – 90 kHz | 72 dB μ A/m @ 10 m | No requirement | EN 300 330 | In case of external antennas only loop coil antennas may be employed. Field strength level descending 3dB/octave at 30kHz European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 90 – 119 kHz | 42 dB μ A/m @ 10 m | No requirement | EN 300 330 | In case of external antennas only loop coil antennas may be employed. European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 119 – 135 kHz | 66 dB μ A/m @ 10 m | No requirement | EN 300 330 | In case of external antennas only loop coil antennas may be employed. Field strength level descending 3dB/octave at 119kHz European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 135 – 140 kHz | 42 dB μ A/m @ 10 m | No requirement | EN 300 330 | In case of external antennas only loop coil antennas may be employed. European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 140 – 148.5 kHz | 37.7 dB μ A/m @ 10 m | No requirement | EN 300 330 | In case of external antennas only loop coil antennas may be employed. European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

1.6 Inductive Applications (See Note 12)

| Mandatory Requirements | | Information | | |
|------------------------|-------------------------------------------------|---------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 400 – 600 kHz | -8 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only. In the case of external antennas only loop coil antennas may be employed. The maximum field strength is specified in a bandwidth of 10 kHz. The maximum allowed total field strength is -5dB μ A/m at 10 m for systems operating at bandwidths larger than 10 kHz measured at the center frequency whilst keeping the density limit (-8dB μ A/m in a bandwidth of 10 kHz.) These systems should operate with a minimum operating bandwidth of 30 kHz European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 3155 – 3400 kHz | 13.5 dB μ A/m @ 10 m | No requirement | EN 300 330 | In case of external antennas only loop coil antennas may be employed. European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 6765 – 6795 kHz | 42 dB μ A/m @ 10 m | No requirement | EN 300 330 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 7400 – 8800 kHz | 9 dB μ A/m @ 10 m | No requirement | EN 300 330 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 10.200 – 11.000 MHz | 9 dB μ A/m @ 10 m | No requirement | EN 300 330 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 26.957 – 27.283 MHz | 42 dB μ A/m @ 10 m | No requirement | E N 300 330 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 11.810-12.660 MHz | -16 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

1.6 Inductive Applications (See Note 12)

| Mandatory Requirements | | Information | | |
|------------------------|-------------------------------------------------|---------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 12.660-13.110 MHz | -10 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.110-13.410 MHz | -3.5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.410-13.553 MHz | 9 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.567-13.710 MHz | 9 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.710-14.010 MHz | -3.5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 14.010-14.460 MHz | -10 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 14.460-15.310 MHz | -16 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.553 – 13.567 MHz | 60 dB μ A/m @ 10 m | No requirement | EN 300 330 | For RFID and EAS only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 12.660-13.110 MHz | -5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

1.6 Inductive Applications (See Note 12)

| Mandatory Requirements | | Information | | |
|------------------------|-------------------------------------------------------|---------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 13.110-13.360 MHz | -3.5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.360-13.460 MHz | Linear transition from 27 to -3.5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.460-13.553 MHz | 27 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.567-13.660 MHz | 27 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.660-13.760 MHz | Linear transition from 27 to -3.5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 13.760-14.010 MHz | -3.5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 14.010-14.460 MHz | -5 dB μ A/m at 10m | No requirement | EN 300 330 | For RFID only European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

| 1.6 Inductive Applications (See Note 12) | | | | |
|-------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 148.5 kHz – 5 MHz | -15 dB μ A/m at 10m | No requirement | EN 300 330 | In the case of external antennas only loop coil antennas may be employed. The maximum field strength is specified in a bandwidth of 10 kHz. The maximum allowed total field strength is -5 dBA/m at 10m for systems operating at bandwidths larger than 10 kHz whilst keeping the density limit (-15 dBA/m in a bandwidth of 10 KHz) European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 5 - 30 MHz | -20 dB μ A/m at 10m | No requirement | EN 300 330 | In the case of external antennas only loop coil antennas may be employed. The maximum field strength is specified in a bandwidth of 10 kHz. The maximum allowed total field strength is -5 dBA/m at 10m for systems operating at bandwidths larger than 10 kHz whilst keeping the density limit (-20 dBA/m in a bandwidth of 10 KHz) European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |

Note 13: This category covers, for example, devices for car immobilizers, animal identification, alarm systems, cable detection, waste management, personal identification, wireless voice links, access control, proximity sensors, anti-theft systems including RF anti-theft induction systems, EAS (Electronic Article Surveillance), data transfer to handheld devices, automatic article identification, wireless control systems and automatic road tolling.

| 1.7. Alarms | | | | |
|-------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 868.6 – 868.7 MHz | 10 mW e.r.p. | Duty Cycle \leq 1 % Channel Spacing: 25 kHz The whole frequency band may also be used as one single channel for high-speed data transmission. (Note 7) | EN 300 220 | European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |
| 869.200 – 869.250 MHz | 10 mW e.r.p. | Duty Cycle \leq 0.1 % Channel Spacing: 25 kHz (Note 7) | EN 300 220 | Social Alarms (Note 14) European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |

| 1.7. Alarms | | | | |
|-------------------------------|--------------------------------------------------------|----------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 869.250 – 869.300 MHz | 10 mW e.r.p. | Duty Cycle \leq 0.1 % Channel Spacing: 25 kHz (Note 7) | EN 300 220 | European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |
| 869.3 – 869.4 MHz | 10 mW e.r.p. | Duty Cycle \leq 1 % Channel Spacing: 25 kHz (Note 7) | EN 300 220 | European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |
| 869.650 – 869.700 MHz | 25 mW e.r.p. | Duty Cycle \leq 10 % Channel Spacing: 25 kHz (Note 7) | EN 300 220 | European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references : CEPT ERC/REC 70-03 |

Note 14: Social alarm devices are used to assist elderly people and people with disabilities living at home when then they are in distress.

| 1.8. Radio Microphone Applications Including Aids for the Hearing Impaired | | | | |
|-----------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 29.7 – 47.0 MHz | 10 mW ERP. | Channel Spacing: \leq 50 kHz | EN 300 422 | On a tuning range basis. Other references: CEPT ERC/REC 70-03 |
| 169.4 – 174.0 MHz | 10 mW ERP | Channel Spacing: \leq 50 kHz | EN 300 422 | Aids for the hearing impaired. On a tuning range basis. European Legislation: Decision 2005/928/EC Decision 2008/673/EC Other references: CEPT ECC/DEC(05)02 CEPT ERC/REC 70-03 (Note 19) |
| 169.400 - 169.475 MHz | 10 mW ERP | Channel Spacing: \leq 50 kHz | EN 300 422 | Assistive Listening Device (ALD). (Personal Hearing Aid System) |
| 169.400 - 169.475 MHz | 500 mW ERP | Channel Spacing: \leq 50 kHz | EN 300 422 | Assistive Listening Device (ALD). (Public Hearing Aid System) Individual licence may be required. |
| 169.4875 - 169.5875 MHz | 10 mW ERP | Channel Spacing: \leq 50 kHz | EN 300 422 | Assistive Listening Device (ALD). (Personal Hearing Aid System) |
| 169.4875 - 169.5875 MHz | 500 mW ERP | Channel Spacing: \leq 50 kHz | EN 300 422 | Assistive Listening Device (ALD). (Public Hearing Aid System). Individual licence may be required |
| 173.965 – 216MHz | 10 mW ERP | Channel Spacing: \leq 50 kHz | EN 300 422 | For Assistive Listening Device (ALD) systems. On a tuning range basis. Individual licence may be required |
| 174-216 MHz | 50 mW e.r.p. | No requirement | | On a tuning range basis. Individual license may be required |
| 470 – 694 MHz | 50 mW e.r.p. | No requirement | | On a tuning range basis. Individual license may be required |

| 1.8. Radio Microphone Applications Including Aids for the Hearing Impaired | | | | |
|-----------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|----------------------------|--------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 1492-1518 MHz | 50 mW e.i.r.p | No requirement | Not specified | On a tuning range basis. Individual license required. Restricted to indoor use |
| 1785-1795 MHz | 20 mW e.i.r.p. / 50 mW e.i.r.p. | No requirement | Not specified | Individual license may be required. 50 mW restricted to body worn equipment |
| 1795-1800 MHz | 20 mW e.i.r.p. / 50 mW e.i.r.p. | No requirement | Not specified | Individual license may be required. 50 mW restricted to body worn equipment |
| 1800-1804.8 MHz | 20 mW e.i.r.p. / 50 mW e.i.r.p. | No requirement | Not specified | Individual license may be required. 50 mW restricted to body worn equipment |

| 1.9. Radio Frequency Identification Applications (RFID) | | | | |
|----------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 13.553 – 13.567 MHz | 42 dB μ A/m @ 10m or 10mW Effective Radiated Power (ERP) | | EN 300 330 EN 301 489 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 865 – 865.6 MHz | 100 mW ERP | LBT or equally efficient mitigation technique which gives adequate protection to other users of the radio spectrum. Channel Spacing: 200 kHz | EN 302 208 | Other references : CEPT ERC/REC 70-03 |
| 865.6 – 867.6 MHz | 2 W ERP | LBT or equally efficient mitigation technique which gives adequate protection to other users of the radio spectrum. Channel Spacing: 200 kHz | EN 302 208 | Other references : CEPT ERC/REC 70-03 |
| 867.6 – 868 MHz | 500 mW ERP | LBT or an equally efficient mitigation technique which gives adequate protection to other users of the radio spectrum. Channel Spacing: 200 kHz | EN 302 208 | Other references : CEPT ERC/REC 70-03 |
| 2446 – 2454 MHz | \leq 500 mW EIRP | No requirement | Not specified | |
| 2446 – 2454 MHz | > 500 mW to 4 W e.i.r.p | \leq 15% duty cycle FHSS techniques should be used. | Not specified | Power levels above 500 mW are restricted to be used inside the boundaries of a building and the duty cycle of all transmissions shall in this case be \leq 15 % in any 200 ms period (30 ms on /170 ms off) |

1.10. Active Medical Implants and their Associated Peripherals

| Mandatory Requirements | | | Information | |
|------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 9 – 315 kHz | 30 dBμA/m @ 10 m | Duty Cycle ≤ 10 % | EN 300 330 | The application is for Ultra Low Power Active Medical Implant systems using inductive loop techniques for telemetry purposes European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 315 – 600 kHz | -5 dBμA/m @ 10 m | Duty Cycle ≤ 10 % | EN 300 330 | The application is for Animal implantable devices Other references: CEPT ERC/REC 70-03 |
| 12500-20000 kHz | -7 dBμA/m at 10m | ≤ 10% duty cycle | Not specified | The application is for ULP active animal implantable devices (ULP-AID), limited to indoor only applications. The maximum field strength is specified in a bandwidth of 10 kHz. The transmission mask of ULP-AID is defined as follows: 3dB bandwidth 300 kHz 10dB bandwidth 800 kHz 20dB bandwidth 2 MHz |
| 30 – 37.5 MHz | 1 mW ERP | Duty Cycle ≤ 10 % | EN 300 220 | The application is for Ultra Low Power medical membrane implants for blood pressure measurements Other references: CEPT ERC/REC 70-03 |
| 2483.5-2500 MHz | 10 dBm e.i.r.p. | LBT+AFA and ≤ 10% duty cycle. The equipment shall implement a spectrum access mechanism as described in the applicable harmonized standard or an equivalent spectrum access mechanism | | For Low Power Active Medical Implants and associated peripherals, covered by the applicable harmonized standard. Individual transmitters may combine adjacent channels on a dynamic basis for increased bandwidth higher than 1 MHz. Peripheral units are for indoor use only. The frequency band is also identified in Table 1.12 |

1.11. Wireless Audio Applications (See Note 15)

| Mandatory Requirements | | | Information | |
|------------------------|-------------------------------------------------|---------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| 87.5 – 108 MHz | 50 nW ERP | Channel Spacing: 200 kHz | EN 301 357 | European Legislation: Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: |

| 1.11. Wireless Audio Applications (See Note 15) | | | | |
|--------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant Documents/Other Notes |
| | | | | CEPT ERC/REC 70-03 |
| 863 – 865 MHz | 10 mW ERP | No requirements | EN 301 357 | Wireless Audio and Multimedia Streaming Devices. European Legislation : Decision 2006/771/EC Decision 2009/381/EC Decision 2011/829/EU Other references: CEPT ERC/REC 70-03 |
| 864.8 – 865 MHz | 10 mW ERP | Channel Spacing: 50 kHz | EN 300 220 | Narrow band analogue voice devices Other references : CEPT ERC/REC 70-03 |
| 1795-1800 MHz | 20 mW e.i.r.p. | No requirement | Not specified | |

Note 15: Applications for wireless audio systems include cordless loudspeakers, cordless headphones for portable use e.g. portable CD, cassette or radio devices carried on a person, cordless headphones for use in a vehicle, e.g. for use with a radio or mobile telephone, in-ear monitoring, for use with concerts or other stage productions.

| 1.12. Tracking, Tracing and Data Acquisition | | | | |
|-----------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandatory Requirements | | | Information | |
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant documents/ Other notes |
| 456.9 – 457.1 KHz | 7 dB μ A/m @ 10 m | Continuous Wave operation No modulation | EN 300 718 | Emergency detection of buried victims and valuable items. Note: Centre frequency is 457 kHz European Legislation: 2001/148/EC Other references: CEPT ECC/DEC/(04)01 CEPT ERC/REC 70-03 |
| 169.4 - 169.475 MHz | 500 mW e.r.p. | Duty cycle \leq 10%, channel spacing: \leq 50 kHz | EN 300 220 | Meter Reading European Legislation: Decision 2005/928/EC Decision 2008/673/EC Other references: CEPT ECC/DEC(05)02 CEPT ERC/REC 70-03 |
| 2483.5-2500 MHz | 1 mW e.i.r.p. | Adequate spectrum sharing mechanisms (e.g. Listen-Before-Talk and Adaptive Frequency Agility) shall be implemented by the equipment and \leq 10% duty cycle | | The frequency band is also identified in Table 1.10. The application is for MBANS, indoor only within healthcare facilities |
| 2483.5-2500 MHz | 10 mW e.i.r.p. | Adequate spectrum sharing mechanisms (e.g. Listen-Before-Talk and Adaptive Frequency Agility) shall be implemented by the equipment and \leq 2% duty cycle | | The frequency band is also identified in Table 1.10. The application is for MBANS, indoor only within the patient's home |

1.12. Tracking, Tracing and Data Acquisition

| Mandatory Requirements | | Information | | |
|------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band | Maximum Permitted Radiated Power/Field Strength | Spectrum access and mitigation requirements | Reference Standards | Relevant documents/ Other notes |
| 5725-5875 MHz | ≤ 400 mW e.i.r.p. | APC required Adequate spectrum sharing mechanisms (e.g. DFS and DAA) shall be implemented (note 3) | | Wireless Industrial Applications (WIA). Registration and/or notification may be required. The Adaptive Power Control is able to reduce the e.i.r.p. to ≤ 25 mW. The frequency band is also identified in Table 1.1 |

1.13. Requirements for Generic Ultra-Wideband Applications

| Frequency range | Fixed installations | | Non fixed installations Maximum mean e.i.r.p. spectral density |
|-------------------|----------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| | Maximum mean e.i.r.p. spectral density | Maximum mean e.i.r.p. spectral density in the horizontal plane (-20 to 30° elevation) | |
| Below 1.73 GHz | -85 dBm/MHz | | -85 dBm/MHz |
| 1.73 to 2.2 GHz | -65 dBm/MHz | -70 dBm /MHz | -70 dBm/MHz |
| 2.2 to 2.5 GHz | -50 dBm/MHz | | -50 dBm/MHz |
| 2.5 to 2.69 GHz | -65 dBm/MHz Note 1 | -70dBm/MHz | -65 dBm/MHz Note 1 & Note 2 |
| 2.69 to 2.7 GHz | -55 dBm/MHz | -75 dBm/MHz | -70 dBm/MHz Note 3 |
| 2.7 to 2.9 GHz | -50 dBm/MHz | -70 dBm/MHz | -70 dBm/MHz |
| 2.9 to 3.4 GHz | -50 dBm/MHz | -70 dBm/MHz | -70 dBm/MHz Note 1 |
| 3.4 to 3.8 GHz | -50 dBm/MHz | -70 dBm/MHz | -50 dBm/MHz Note 2 & Note 3 |
| 3.8 to 4.8 GHz | -50 dBm/MHz | | -50 dBm/MHz |
| 4.8 to 5 GHz | -55 dBm/MHz | - 75 dBm/MHz | -55 dBm/MHz Note 2 & Note 3 |
| 5 to 5.25 GHz | -50 dBm/MHz | | -50 dBm/MHz |
| 5.25 to 5.35 GHz | -50 dBm/MHz | - 60 dBm/MHz | -60 dBm/MHz |
| 5.35 to 5.6 GHz | -50 dBm/MHz | | -50 dBm/MHz |
| 5.6 to 5.65 GHz | -50 dBm/MHz | -65 dBm/MHz | -65 dBm/MHz |
| 5.65 to 5.725 GHz | -50 dBm/MHz | -60 dBm/MHz | -60 dBm/MHz |
| 5.725 to 8.0 GHz | -50 dBm/MHz | | -50 dBm/MHz |

Emissions radiating from Material Sensing devices shall be kept to a minimum and in any case not exceed the e.i.r.p. spectral density limits within the above table.

Note 1: devices using a Listen Before Talk (LBT) mechanism, as described in the harmonised standard EN 302 498-2, which meet the technical requirements defined within the following table, are permitted to operate in frequency ranges 2.5 to 2.69 and 2.9 to 3.4 GHz with a maximum mean e.i.r.p. spectral density of -50 dBm/MHz.

Note 2: to protect the radio services, non fixed installations must fulfil the following requirement for Total Radiated Power:

- a) In the frequency ranges 2.5 to 2.69 GHz and 4.8 to 5 GHz, the Total Radiated Power spectral density has to be 10dB below the max e.i.r.p. spectral density.
- b) In the frequency ranges 3.4 to 3.8 GHz, the Total Radiated Power spectral density has to be 5dB below the max e.i.r.p. spectral density

Note 3: Limitation of the Duty Cycle to 10% per second.

1.14. المتطلبات التقنية لآلية "استمع قبل التحدث" لأجهزة الاستشعار عن المواد

1. Peak power threshold value for the "Listen Before Talk" (LBT) mechanism to ensure the protection of the listed services are defined within the table below.

| Frequency range | Radio service to be detected | Peak power threshold value |
|-----------------|------------------------------|----------------------------|
| 2.5 - 2.69 GHz | Land Mobile service | -50 dBm/MHz |
| 2.9 - 3.4 GHz | Radiodetermination Service | -7 dBm/MHz |

2. Additional requirements for Radar detection: Continuously listening and automatic switch-off within 10ms for the related frequency range if the threshold value is exceeded the table in bullet 1 above. A silent time of at least 12s while listening continuously is necessary before the transmitter can be switched on again. This silent time during which only the LBT receiver is active has to be ensured even after the device is switched off by the functions described in Technical requirements for Material Sensing devices using UWB technology, the proximity sensor and manual operation.

Relevant documents/other notes:

European Legislation:
Commission Decision 2007/131/EC
2009/343/EC

CEPT references:
ECC/DEC(07)01

1.15. Requirements for Building Material Analysis (BMA)

1. BMA Devices permitted under this resolution shall fulfil the following requirements:
- Transmitter-On only if manually operated with a non-locking switch (e.g. it may be a sensor for the presence of the operators hand) plus being in contact or close proximity to the investigated material and the emissions being directed into the direction of the object (e.g. measured by a proximity sensor or imposed by the mechanical design);
 - The BMA transmitter has to switch-off after max 10s without movement;
 - The Total Radiated Power spectral density (Definition at the Technical requirements for Material Sensing devices) has to be 5 dB below the maximum mean e.i.r.p. spectral density limits in Table below;
2. missions radiating from BMA devices permitted under this decision shall be kept to a minimum and in any case not exceed the e.i.r.p. spectral density limits within the following Table below. The compliance with the limits of Table below has to be ensured with the BMA device on a representative wall (see definition below).

| Frequency range | Maximum mean e.i.r.p. spectral density |
|--------------------------|----------------------------------------|
| Below 1.73 GHz (Note 1) | -85 dBm/MHz |
| 1.73 to 2.2 GHz | -65 dBm/MHz |
| 2.2 to 2.5 GHz | -50 dBm/MHz |
| 2.5 to 2.69 GHz (Note 1) | -65 dBm/MHz |
| 2.69 to 2.7 GHz (Note 2) | -55 dBm/MHz |
| 2.7 to 3.4 GHz (Note 1) | -70 dBm/MHz |
| 3.4 to 4.8 GHz | -50 dBm/MHz |
| 4.8 to 5 GHz (Note 2) | -55 dBm/MHz |
| 5 to 8.5 GHz | -50 dBm/MHz |

Note 1: devices using a Listen Before Talk (LBT) mechanism, as described in the harmonised standard EN 302 435, which meets the technical requirements defined within Technical requirements of the "Listen Before Talk" mechanism for BMA devices, are permitted to operate in frequency range 1.215 to 1.73 GHz with a maximum mean e.i.r.p. spectral density of -70 dBm/MHz and in the frequency ranges 2.5 to 2.69 and 2.7 to 3.4 GHz with a maximum mean e.i.r.p. spectral density of -50 dBm/MHz

Note 2: to protect the RAS bands 2.69 to 2.7 GHz and 4.8 to 5 GHz, the Total Radiated Power spectral density has to be below -65 dBm/MHz.

1.16. المتطلبات التقنية لآلية "الاستماع قبل التحدث" لأجهزة تحليل مواد البناء.

1. Peak power threshold value for the "Listen Before Talk" mechanism to ensure the protection of the listed services are defined within Table 4 below.

| Frequency range | Radio service to be detected | Peak power threshold value |
|-----------------|------------------------------|----------------------------|
| 1.215 - 1.4 GHz | Radiodetermination Service | +8 dBm/MHz |
| 1.61 - 1.66 GHz | Mobile Satellite service | -43 dBm/MHz |
| 2.5-2.69 GHz | Land Mobile service | -50 dBm/MHz |
| 2.7 - 3.4 GHz | Radiodetermination Service | -7 dBm/MHz |

2. Additional requirements for Radar detection: Continuously listening and automatic switch-off within 10ms for the related frequency range if a threshold value is exceeded the table in bullet 1 above. A silent time of at least 12s while listening continuously is necessary before the transmitter can be switched on again. This silent time during which only the LBT receiver is active has to be ensured even after the device is switched off by the functions described in Technical requirements for Building Material Analysis (BMA) devices using UWB technology, the proximity sensor and manual operation.

Other requirements:

The pulse repetition frequency (PRF) for pulsed UWB devices shall not be less than 5MHz. This restriction does not apply to burst repetition frequency.

The peak e.i.r.p. (in dBm) measured in a bandwidth of 50MHz shall be less than a limit that is obtained by adding a conversion factor (in dB) to the 'maximum mean e.i.r.p. spectral density' (in dBm/MHz) limit. By default, the conversion factor for material sensing devices using UWB technology is 25 dB. In case of BMA devices, this con-version factor is 40 dB.

Definitions for the above table

Maximum mean e.i.r.p. spectral density

The highest signal strength measured in any direction at any frequency within the defined range. The mean e.i.r.p. spectral density is measured with a 1MHz resolution bandwidth, an RMS detector and an averaging time of 1ms or less.

Maximum peak e.i.r.p.

The highest signal strength measured in any direction at any frequency within the defined range. The peak e.i.r.p. is measured within a 50MHz bandwidth centered on the frequency at which the highest mean radiated power occurs.

CEPT References:

ECC/DEC/(07)01

1.17. Regulatory Requirements for Location Tracking Application for Emergency Services (LAES) in Disaster Situations

LAES systems are limited to services or agencies, recognized and defined as such by the national law, responsible for public safety, the LAES systems aim to provide accurate indoor location and tracking Information of personnel involved in search or rescue operations in buildings and should mainly be used indoor.

أ. المتطلبات التقنية لتطبيقات أنظمة تتبع الموقع لخدمات الطوارئ (LAES) :

Maximum e.i.r.p. for LAES systems

| 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 GHz to 2.7 GHz | -85 dBm/MHz | -45 dBm |
| 2.7 GHz to 3.1 GHz | -70 dBm/MHz | -36 dBm |
| 3.1 GHz to 3.4 GHz (see note 1) | -70 dBm/MHz | -36 dBm |
| 3.4 GHz to 4.2 GHz (see note 2) | -21.3 dBm/MHz | 20 dBm |
| 4.2 GHz to 4.8 GHz (see note 2) | -41.3 dBm/MHz | 0 dBm |

Note 1: within the band 3.1 – 3.4 GHz, systems implementing Detect And Avoid (DAA) mitigation technique (see technical parameters for DAA in band 3.1 – 3.4 GHz as defined in ECC/DEC/(06)04) may be 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. A maximum duty cycle of 5% per transmitter per second also applies.

Note 2: a maximum duty cycle of 5% per transmitter per second applies.

ب. المتطلبات التقنية لتطبيقات أنظمة تتبع الموقع لخدمات الطوارئ للنطاق العريض جدا النوع 2 لأجهزة LT2

Maximum e.i.r.p. for fixed outdoor terminals

| 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 | -70 dBm/MHz (Note 1) | -36 dBm |
| 3.4 to 4.8 GHz | -41.3 dBm/MHz (Note 2 and 3) | 0 dBm |

Note 1: within the band 3.1-3.4 GHz, terminals implementing Detect-And-Avoid (DAA) mitigation technique (see technical parameters for DAA in the band 3.1-3.4 GHz as defined in ECC/DEC/(06)04) may be 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. A maximum duty cycle of 5% per transmitter per second and a maximum Ton = 25 ms also apply.

Note 2: a maximum duty cycle of 5% per transmitter per second and a maximum Ton = 25 ms apply.

Note 3: the maximum mean e.i.r.p. spectral density in the band 4.2-4.4 GHz for emissions that appear 30° or greater above the horizontal plane should be less than -47.3 dBm/MHz.

Maximum e.i.r.p. for mobile terminals and fixed indoor terminals

| 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 | -70 dBm/MHz (Note 1) | -36 dBm |
| 3.4 to 4.8 GHz | -41.3 dBm/MHz (Note 2) | 0 dBm |

Note 1: within the band 3.1-3.4 GHz, terminals implementing Detect-And-Avoid (DAA) mitigation technique (see technical parameters for DAA in the band 3.1-3.4 GHz as defined in ECC/DEC/(06)04) may be 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. A maximum duty cycle of 5% per transmitter per second and a maximum Ton = 25 ms also apply.

Note 2: a maximum duty cycle of 5% per transmitter per second and a maximum Ton = 25 ms apply. The duty cycle should also be limited to 1.5% per minute or equipment should implement an alternative mitigation technique that provides at least equivalent protection.

2. List of Abbreviations

| | | |
|------|---------------------------------------------------------------|-------------------------------------------------------|
| AVI | Automatic Vehicle Identification | التعرف الارتوماتيكي لنظام المركبات |
| BMA | Building Material Analysis | تحليل مواد البناء |
| NFP | National Frequency Plan | الخطة الوطنية للترددات |
| LLOC | Legislation and Legal Opinion Commission | هيئة الإفتاء والتشريع القانوني |
| ITU | International Telecommunication Union | الاتحاد الدولي للاتصالات |
| BW | Bandwidth (in MHz or part thereof) | عرض النطاق الترددي |
| RF | Radio Frequency | الترددات الراديوية |
| ERM | Electromagnetic compatibility and Radio spectrum Matters | التوافق الكهرومغناطيسي ومسائل طيف الراديو |
| ISM | Industrial, Scientific & Medical applications | الأجهزة الصناعية والعلمية والطبية |
| RTTT | Road Transport and Traffic Telematics | التليماتية في النقل والحركة على الطرق |
| BRAN | Broadband Radio Access Networks | شبكات الاتصال اللاسلكية ذات النطاق العريض |
| EMC | ElectroMagnetic Compatibility | للملاءمة الكهرومغناطيسية |
| DSRC | Dedicated Short Range Communication | محطات متنقلة برية لأنظمة الاتصال قصيرة المدى المكروسة |
| MAC | Medium Access Control | التحكم في الدخول للوسط |
| PHY | Physical Layer | الطبقة المادية |
| LDC | Low Duty Cycle | دورة العمل المنخفضة |
| IDEN | Integrated Digital Enhanced Network | الشبكة الرقمية المتكاملة المحسنة |
| WAS | Wireless Access Systems | أنظمة النفاذ اللاسلكي |
| RLAN | Radio Local Area Networks | شبكة محلية راديوية |
| DoC | Declaration of Conformity | بيان المطابقة |
| ERP | Equivalent Radiated Power | القدرة المشعة المكافئة |
| LTE | Long Term Evolution | تطور طويل الأمد |
| ERIP | Equivalent Radiated Isotropic Power | القدرة المشعة المكافئة المتناحية |
| FDAA | Field Disturbance and Doppler Apparatus | اضطراب المجال وجهاز دوبلر |
| LBT | Listen Before Talk | الاستماع قبل التحدث |
| AFA | Adaptive Frequency Agility | القدرة على تكيف التردد |
| RFID | Radio-frequency Identification | تطبيقات التعرف بواسطة الترددات الراديوية |
| DFS | Dynamic Frequency Selection | الانتقاء الديناميكي للترددات |
| SRD | Short Range Device | أجهزة الاتصال الراديوي قصيرة المدى |
| DAA | Detect-And-Avoid | كشف وتجنب |
| iGA | Informatics & eGovernment Authority of the Kingdom of Bahrain | هيئة المعلومات والحكومة الإلكترونية في البحرين |
| UHF | Ultra High Frequency | الترددات فوق العالي |
| TPC | Transmitter Power Control | التحكم في قدرة المرسل |

| | | |
|------|--------------------------|-----------------------|
| UWB | Ultra-Wideband | النطاق العريض جدا |
| TLPR | Tank Level Probing Radar | رادار جس مستوى الخزان |
| VHF | Very High Frequency | الترددات العالية جدا |
| SRR | Short Range Radars | الرادارات قصيرة المدى |

التعاريف

Necessary Bandwidth: For a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

Power: Whenever the power of a radio transmitter, etc. is referred to it shall be expressed in one of the following forms, according to the class of emission, using the arbitrary symbols indicated:

- peak envelope power (PX or pX);
- mean power (PY or pY);
- carrier power (PZ or pZ).

For different classes of emission, the relationships between peak envelope power, mean power and carrier power, under the conditions of normal operation and of no modulation, are contained in ITU-R Recommendations which may be used as a guide.

For use in formulae, the symbol p denotes power expressed in watts and the symbol P denotes power expressed in decibels relative to a reference level.

Gain of an Antenna: The ratio, usually expressed in decibels, of the power required at the input of a loss-free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power flux-density at the same distance. When not specified otherwise, the gain refers to the direction of maximum radiation.

The gain may be considered for a specified polarization.

Depending on the choice of the reference antenna a distinction is made between:

- a) absolute or isotropic gain (G_i), when the reference antenna is an isotropic antenna isolated in space;
- b) gain relative to a half-wave dipole (G_d), when the reference antenna is a half-wave dipole isolated in space whose equatorial plane contains the given direction;
- c) gain relative to a short vertical antenna (G_v), when the reference antenna is a linear conductor, much shorter than one quarter of the wavelength, normal to the surface of a perfectly conducting plane which contains the given direction.

Equivalent Isotropically Radiated Power (e.i.r.p.): The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

Effective Radiated Power (e.r.p.) (in a given direction): The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction.

What is the relation between $\mu\text{V/m}$ & W ?

The Watt (W) Is the unit used to measure the power generated by a sender. As the Microvolts/Metre ($\mu\text{V/m}$), It is the unit used to measure the electric field strength caused by the operation of a transmitter.

A transmitter, generating a (W) power at a constant level, can produce varying electric fields ($\mu\text{V/m}$) depending on, in particular, the transmitted line and antenna pattern. Since electric field that interferes with the licensed radio communication devices, and the electric field strength does not correspond directly to the transmitter's power level.