

Annex 1 Non-specific Short Range Devices

Scope of Annex

This annex covers frequency bands and regulatory as well as informative parameters recommended primarily for Telemetry, Telecommand, Alarms and Data in general and other similar applications. Video applications should be preferably used above 2.4 GHz.

This annex also includes references to the generic UWB regulation which was primarily developed to allow communication applications using UWB technology in bands below 10.6 GHz; but enables also other types of radio applications.

Regulatory parameters related to Annex 1

Frequency Band	Power / Magnetic Field	Spectrum access and mitigation requirement	Channel spacing	ECC/ERC Decision	Notes
a 6765-6795 kHz	42 dBµA/m at 10m	No requirement	No spacing		
b 13.553-13.567 MHz	42 dBµA/m at 10m	No requirement	No spacing		
c 26.957-27.283 MHz	42 dBµA/m at 10m 10 mW e.r.p	No requirement	No spacing	ERC/DEC/(01)02	
d 40.660-40.700 MHz	10 mW e.r.p.	No requirement	No spacing	ERC/DEC/(01)03	
e 138.20-138.45 MHz	10 mW e.r.p.	< 1.0 % (note 1)	No spacing		
f 433.050-434.790 MHz (note 4)	10 mW e.r.p.	< 10 % (note 1)	No spacing		
f1 433.050-434.790 MHz (note 4bis)	1 mW e.r.p. -13 dBm/10 kHz	No requirement	No spacing		Power density limited to -13 dBm/10 kHz for wideband modulation with a bandwidth greater than 250 kHz
f2 434.040-434.790 MHz (note 4bis)	10 mW e.r.p.	No requirement	Up to 25 kHz		
g 863-870 MHz (note 3, 4 and 6)	≤ 25 mW e.r.p.	≤ 0.1% or LBT (note 1 and 5)	≤ 100 kHz for 47 or more channels (note 2)		FHSS modulation
	≤ 25 mW e.r.p. (note 6) Power density : - 4.5 dBm/100 kHz (note 7)	≤ 0.1% or LBT+AFA (note 1, 5 and 6)	No spacing		DSSS and other wideband modulation other than FHSS
	≤ 25 mW e.r.p.	≤ 0.1% or LBT+AFA (note 1 and 5)	≤ 100 kHz, for 1 or more channels modulation bandwidth ≤ 300 kHz (note 2)		Narrow /wide-band modulation
g1 868.000-868.600 MHz (note 4)	≤ 25 mW e.r.p.	≤ 1% or LBT+AFA (note 1)	No spacing, for 1 or more channels (note 2)		Narrow / wide-band modulation. No channel spacing, however the whole stated frequency band may be used
g2 868.700-869.200 MHz (note 4)	≤ 25 mW e.r.p.	≤ 0.1% or LBT+AFA (note 1)	No spacing, for 1 or more channels (note 2)		Narrow / wide-band modulation. No channel spacing, however the whole stated frequency band may be used
g3 869.400-869.650 MHz	≤ 500 mW e.r.p.	≤ 10% or LBT+AFA (note 1)	25 kHz (for 1 or more channels)		Narrow / wide-band modulation The whole stated frequency band may be used as 1 channel for high speed data transmission
g4 869.700-870.000 MHz (note 4bis)	≤ 5 mW e.r.p.	No requirement	No spacing (for 1 or more channels)		Narrow / wide-band modulation. No channel spacing, however the whole stated frequency band may be used
	≤ 25 mW e.r.p.	up to 1% or LBT+AFA (note 1)			
h 2400.0-2483.5 MHz	10 mW e.i.r.p.	No requirement	No spacing		
i 5725-5875 MHz	25 mW e.i.r.p.	No requirement	No spacing		
j 24.00-24.25 GHz	100 mW e.i.r.p.	No requirement	No spacing		
k 61.0-61.5 GHz	100 mW e.i.r.p.	No requirement	No spacing		
l 122-123 GHz	100 mW e.i.r.p.	No requirement	No spacing		
m 244-246 GHz	100 mW e.i.r.p.	No requirement	No spacing		
n 3.1-4.8 GHz 6 – 9 GHz	*	*	*	ECC/DEC/(06)04 ECC/DEC/(06)12	Generic UWB regulation * See detailed requirements in related ECC Decisions

- Note 1: When either a duty cycle, Listen Before Talk (LBT) or equivalent 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 ERC/REC 70-03 Annex 7).
- 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 ≤ 25 kHz.
In sub-band 863-865 MHz voice and audio conditions of Annexes 10 and 13 of ERC/REC 70 – 03 apply respectively.
- Note 4bis: Audio and video applications are excluded. Analogue or digital voice applications are allowed with a max. bandwidth ≤ 25 kHz and with spectrum access technique such as LBT or equivalent. The transmitter shall include a power output sensor controlling the transmitter to a maximum transmit period of 1 minute for each transmission
- Note 5: Duty cycle may be increased to 1% if the band is limited to 865-868 MHz.
- Note 6: For other wide-band modulation than FHSS and DSSS with a bandwidth of 200 kHz to 3 MHz, duty cycle can be increased to 1% if the band is limited to 865-868 MHz and power to ≤ 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.

Additional Information

Harmonised Standards

EN 300 220	sub-bands c) to g4)
EN 300 330	sub-bands a) to c)
EN 300 440	sub-bands h) i) and j)
EN 302 065	subband n)
EN 302 500-2	subband n)

Technical parameters also referred to in the harmonised standard

Listen before talk (LBT) with Adaptive Frequency Agility (AFA) technique feature may be used instead of duty cycle.

LBT is defined in EN 300 220.

Audio and voice are defined in EN 300 220

Frequency issues

The bands in Annex 1 a - b - c - d f - f1 - f2 - h - i - j - k - l and m are also designated for industrial, scientific and medical (ISM) applications as defined in ITU Radio Regulations.

Sub-band g)

Certain channels may be occupied by RFID operating at higher powers (See Annex 11 for further details). To minimise the risk of interference from RFID, SRDs should use LBT with AFA or observe suitable separation distances. (In the high power RFID channels typically these may vary from 918 m (indoor) to 3.6 km (rural outdoor). In the remaining 2.2 MHz, where tags at -20 dBm e.r.p. occupy the spectrum, this may vary from 24 m (indoor) to 58 m (rural outdoor)).

The adjacent frequency bands below 862 MHz and above 870 MHz may be used by high power systems. Manufacturers should take this into account in the design of equipment and choice of power levels.