



TECHNICAL REPORT

**Short Range Devices (SRD)
using Ultra Wide Band (UWB);
Part 3: Worldwide UWB regulations between 3,1 and 10,6 GHz**

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document is part 3 of a multi-part deliverable covering UWB signal characteristics and related mitigation techniques, as identified below:

- Part 1: "UWB signal characteristics and overview CEPT&ECC and EC regulation";
- Part 2: "UWB mitigation techniques";
- Part 3: "Worldwide UWB regulations between 3,1 GHz and 10,6 GHz".**

Modal verbs terminology

In the present document "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document presents a summary of the worldwide regulatory situation relating to UWB.

NOTE: The present document is a snapshot of the known UWB regulation world wide at May 2016. The reader is invited to report any changes and additional information on UWB regulations and standards to ETSI.

2 References

2.1 Normative references

As informative publications shall not contain normative references this clause shall remain empty.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI EN 302 065-1 (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Requirements for Generic UWB applications".
- [i.2] ETSI EN 302 065-2 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 2: Requirements for UWB location tracking".
- [i.3] ETSI EN 302 065-3 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 3: Requirements for UWB devices for road and rail vehicles".
- [i.4] ETSI EN 302 066-1: "ETSI EN 306 066-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ground- and Wall- Probing Radar applications; Part 1: Technical characteristics and test methods".
- [i.5] ETSI EN 302 066-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Ground- and Wall- Probing Radar applications (GPR/WPR) imaging systems; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".
- [i.6] Industry Canada: "Devices Using Ultra-Wideband (UWB) Technology", RSS-220, Issue 1, March 2009.
- [i.7] FCC Code of Federal Regulations 47.
- [i.8] CITC RI085 Issue 1, 10/01/2010.
- [i.9] Radio communications (Low Interference Potential Devices) Class Licence Variation Notice 2010 (No. 1) and subsequent amendments including compilation made 14th July 2014.
- [i.10] MIIT File 354.

- [i.11] ARIB: "UWB (Ultra-Wideband) Radio Systems", STD-T91 Version 2.0.
- [i.12] KCC Radio Equipment Rules: "Revised 3/13/2012" KCC notice No. 2012-12.
- [i.13] Communications and Multimedia Commission SKMM SRSP-549 UWB.
- [i.14] New Zealand Gazette, 31/7/2008, No. 119, p. 3145.
- [i.15] IDA: "Technical Specification for Ultra Wideband (UWB) Devices", Issue 1 Rev1, May 2011.
- [i.16] ETSI TR 103 181-1 (V1.1.1): "Short Range Devices (SRD) using Ultra Wide Band (UWB); Technical Report Part 1: UWB signal characteristics and overview CEPT/ECC and EC regulation".
- [i.17] ETSI TR 103 181-2 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band (UWB); Transmission characteristics Part 2: UWB mitigation techniques".
- [i.18] ETSI EN 302 065 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB) for communications purposes; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.19] Recommendation ITU-R SM 1754: "Measurement techniques of ultra-wideband transmissions".
- [i.20] Recommendation ITU-R SM.1757: "Impact of devices using ultra-wideband technology on systems operating within radiocommunication services".
- [i.21] ETSI TS 103 060: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Method for a harmonized definition of Duty Cycle Template (DCT) transmission as a passive mitigation technique used by short range devices and related conformance test methods".
- [i.22] ECC Recommendation 70-03: "Relating to the use of Short Range Devices (SRD)".
- [i.23] ECC Decision 06(04): "The availability of frequency bands for the introduction of Wide Band Digital Land Mobile PMR/PAMR in the 400 MHz and 800/900 MHz bands".
- [i.24] ETSI EN 302 500-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra WideBand (UWB) technology; Location Tracking equipment operating in the frequency range from 6 GHz to 8,5 GHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".
- [i.25] ETSI EN 301 489-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements".
- [i.26] ETSI EN 301 489-32: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 32: Specific conditions for Ground and Wall Probing Radar applications".
- [i.27] ETSI EN 301 489-33: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 33: Specific conditions for Ultra Wide Band (UWB) communications devices".
- [i.28] Addendum 16 the GRFC decision May 7, 2007, No. 07-20-03-001.
- [i.29] Addendum to the GRFC decision from December 15, 2009, No. 5/9/02-05-02.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply:

activity factor: reflects the effective transmission time ratio

maximum mean e.i.r.p. spectral density: highest signal strength measured in any direction at any frequency within the defined range

NOTE: The mean e.i.r.p. spectral density is measured with a 1 MHz resolution bandwidth, an RMS detector and an averaging time of 1 ms or less.

maximum peak e.i.r.p.: highest signal strength measured in any direction at any frequency within the defined range

NOTE: The peak e.i.r.p. is measured within a 50 MHz bandwidth centred on the frequency at which the highest mean radiated power occurs.

3.2 Symbols

For the purposes of the present document, the symbols given in ETSI TS 103 060 [i.21] and the following apply:

f_c Centre frequency
 f_m frequency at which the highest radiated emission occurs

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Alternating Current
ACMA	Australian Communications and Media Authority
ARIB	Association of Radio Industries and Businesses (Japan)
CEPT	Commission Européenne des Postes et Télécommunications
CFR	Code of Federal Regulations (USA)
CISPR	Comité International Spécial des Perturbations Radioélectriques
CITC	Communications and Information Technology Commission (Saudi Arabia)
DAA	Detect And Avoid
e.i.r.p.	equivalent isotropically radiated power
EC	European Commission
ECC	European Communication Comity
EIRP	Effective Isotropic Radiated Power
EMEA	Europe, Middle East and Africa
FCC	Federal Communications Commission (USA)
GPR	Ground Probing Radar
GRFC	General Radio Frequency Centre
IDA	Info-communication Development Authority of Singapore
ILAC	International Laboratory Accreditation Cooperation
KCC	Korean Communication Commission (Korea)
LAES	Location tracking Application for Emergency and disaster Situations
LDC	Low Duty Cycle
MIIT	Ministry of Industry & Information Technology (China)
RLM	Robotic Lawn Mower
RMS	Root Mean Square
SKMM	Suruhanjaya Komunikasi dan Multimedia Malaysia (Malaysian Communications and Multimedia Commission)
TBC	To Be Confirmed
UAE	United Arab Emirates

USA United States of America
WPR Wall Probing Radar

4 Global Summary

4.1 Introduction

This clause presents a summary of the global regulatory situation relating to UWB in the frequency range from 3,1 GHz to 10,6 GHz. Each jurisdiction in the world is considered and the current situation presented in tabular form. This clause is only concerned with UWB as a communications medium, it does not concern itself with other UWB uses for which there may be additional regulations (e.g. ground penetrating radar, through wall imaging systems or automotive radar applications).

Colours are used to give a visual indication of the status with the following meanings.

Table 1: Colour legend

Table Colour	What does this mean?
	Specific UWB regulations exist in the named jurisdiction
	Specific UWB regulations do not exist in the named jurisdiction. Either: <ul style="list-style-type: none"> the regulatory regime remains to be clarified; or the regulations that most typically apply (usually FCC or ETSI) are listed

The various headings in the tables that follow have the following meanings.

Table 2: Heading legend

Table Heading	What does this mean?	Potential responses
Country	The name of the jurisdiction	
Do Specific UWB regulations exist?	Has the communications regulatory body in this jurisdiction introduced specific regulations governing the use of UWB in this jurisdiction?	Y = Yes N = No
What is the regulatory regime?	What is the source of the regulations governing the use of UWB in this jurisdiction?	Where the jurisdiction has implemented specific regulations the source reference is listed. Where the jurisdiction has not implemented specific regulations, the usual approach to such matters is described
What frequency range is permitted?	What range of frequencies is permitted to be used for UWB transmission at the mean EIRP under the applicable regulatory regime?	Given in GHz range of frequencies e.g. 6,0 - 8,5 GHz
Do these regulations permit outdoor use?	Does the applicable regulatory regime permit use of UWB outdoors?	Y = Yes, regulations permit use outdoors TBC = To be confirmed N = No, regulations do not permit use outdoors
e.i.r.p. (dBm / MHz)	What is the maximum value of mean power spectral density permitted under the applicable regulatory regime?	Where known this is given in dBm / MHz otherwise it is marked as TBC
Emission profile	What is the spectral emissions profile allowed under the applicable regulatory regime?	This column refers to later clause in the present document

4.2 Europe, Middle East and Africa

4.2.1 Europe

A short overview is given in table 3, for more details please check, clause 5 and ETSI TR 103 181-1 [i.16].

Table 3: Overview Europe

	Country	Do specific UWB regs exist?	What is the regulatory regime?	What frequency range is permitted (GHz)?	Do these regs permit outdoor use?	Max mean e.i.r.p. (dBm / MHz)	Emission Profile
1	Albania	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
2	Andorra	N	Generally will approve ETSI compliant equipment	3,1 - 9,0	Y	-41,3	ETSI clause 5
3	Austria	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
4	Belarus	N	Generally will approve ETSI compliant equipment	3,1 - 9,0	Y	-41,3	ETSI clause 5
5	Belgium	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
6	Bosnia & Herzegovina	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
7	Bulgaria	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
8	Canary Islands	Y	Telecoms matters overseen by government of Spain	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
9	Croatia	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
10	Cyprus	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
11	Czech Republic	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5

	Country	Do specific UWB regs exist?	What is the regulatory regime?	What frequency range is permitted (GHz)?	Do these regs permit outdoor use?	Max mean e.i.r.p. (dBm / MHz)	Emission Profile
12	Denmark	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
13	Estonia	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
14	Finland	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note 1) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
15	France	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
16	Germany	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
17	Gibraltar	N	Generally will approve ETSI compliant equipment	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
18	Greece	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
19	Hungary	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
20	Iceland	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
21	Ireland	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
22	Italy	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
23	Latvia	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
24	Lithuania	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5

	Country	Do specific UWB regs exist?	What is the regulatory regime?	What frequency range is permitted (GHz)?	Do these regs permit outdoor use?	Max mean e.i.r.p. (dBm / MHz)	Emission Profile
25	Luxembourg	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
26	Macedonia	N	TBC	TBC			
27	Malta	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
28	Moldova	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
29	Monaco	N	Generally will approve ETSI compliant equipment	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
30	Montenegro	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
31	Netherlands	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
32	Norway	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
33	Poland	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
34	Portugal	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
35	Romania	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5
36	Russia	Y	Has implemented ECC Rec 70-03 [i.22] but with local modifications Addendum No. 16 the GRFC decision May 7, 2007 No. 07-20-03-001 [i.28] Addendum to the GRFC decision from December 15, 2009 # 5/9/02-05-02 [i.29]	6,0 - 8,1 8,625 - 9,15 9,15 - 10,6	Y	-47 -45 (in 9,15 to 10,6 freq range)	Clause 5
37	San Marino	Y	ECC Rec 70-03 [i.22] / ECC Decision 06(04) [i.23] / ETSI EN 302 065 [i.18]	3,1 - 4,8 (see note) 6,0 - 8,5 8,5 - 9,0 (see note)	Y	-41,3	ETSI clause 5