



Tx Power Requirements for Indoor UWB RTLS Applications in the EU

Application Note APR005

Introduction

This document outlines the history and current status of the additional +10 dB transmit (Tx) power allowance for certain indoor Ultra-Wideband (UWB) applications in the EU within the 6 – 8.5 GHz frequency band. It also details the **current** status and Tx power requirements of Draft ETSI EN 302 065-2-5, which specifies requirements for transceivers and transmitters using UWB technology for location tracking in enhanced indoor devices operating between 6.0 GHz and 8.5 GHz.

History

The current UWB regulations were published as [an update to ECC Decision \(06\)04](#) by the ECC (European Communications Committee) on 18 November 2022. Besides fixed outdoor transmissions, the update introduced enhanced indoor operations for specific applications, allowing up to –31.3 dBm/MHz in 6.0 - 8.5 GHz. [CEPT Report 84](#) suggested that the European Commission updated its Decision on UWB accordingly.

In May 2024, Commission Implementing Decision (EU) [2024/1467](#) was adopted, amending Implementing Decision (EU) 2019/785 on the harmonisation of radio spectrum for equipment using UWB technology in the EU. This Decision introduces fixed outdoor transmissions and enhanced indoor operations for specific applications. Unlike the voluntary ECC Decision, European Commission Decisions are mandatory for single-market member states, which were given 6 months to implement the Decision.

Starting December 2024, all EU single-market members must allow an additional 10 dB Tx power indoors for radiodetermination, location tracking, tracing, or data acquisition applications operating in the 6 – 8.5 GHz band.

ETSI is currently drafting Harmonised Standards to support these applications. A first draft, EN 302 065-2-5, (available at [ETSI](#)), is available for location tracking devices. This draft can be used to obtain product certification from a Notified Body. Once published in the OJEU, it will also enable self-certification.

Commission Implementing Decision (EU) 2024/1467

Annex 4.2. of Decision [2024/1467](#) states a major update as it includes an increased maximum Tx Power for “indoor use and supporting radiodetermination, location tracking, tracing or data acquisition applications” operating in the 6 – 8.5 GHz band.

The maximum allowable Tx power for indoor UWB devices is raised by **10 dB**; from –41.3 dBm/Hz to –31.3 dBm/Hz.

The 6 – 8.5 GHz band contains these UWB high-band channels:

Channel	Carrier Frequency [MHz]	Carrier Bandwidth [MHz]	Qorvo Silicon
5	6489.6	499.2	all
6	6988.8	499.2	-
7	6489.6	1081.6	DW1000
8	7488.0	499.2	-
9	7987.2	499.2	all, except DW1000, DWM1001C ⁽¹⁾

Note (1): DWM1001C is a module containing DW1000.



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Draft ETSI EN 302 065-2-5 Status

ETSI EN 302 065-2-5 “Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard for access to radio spectrum; Part 2: Ultra Wide Band location tracking devices; Sub-part 5: Requirements for enhanced indoor devices within 6,0 GHz to 8,5 GHz”.

The status of this standard v0.1.6 is “stable draft”, publication target is end of 2026.

This standard is aligned with Decision (EU) [2024/1467](#).

This draft Harmonised standard can already be used to obtain type approval certificates from Notified Bodies. Once the Standard is listed in the *Official Journal of the European Union (OJEU)*, it will also be possible to self-declare compliance.

This standard covers two **main** equipment categories:

- Portable Devices, and
- Fixed Indoor Devices.

Furthermore, three equipment **sub-categories** are defined:

- Fixed Indoor Infrastructure Device with UWB TX only
- Fixed Indoor Infrastructure Device with UWB RX/TX
- Portable Device.

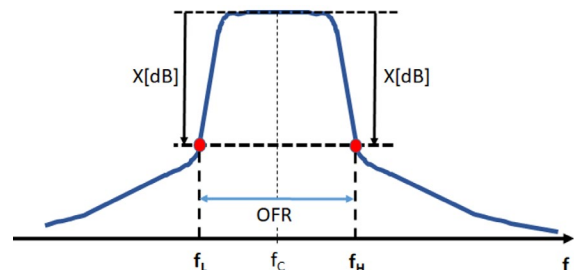
The main Tx requirements are listed in the table below.

Equipment Sub-category	Mean e.i.r.p spectral density limit	Peak e.i.r.p spectral density limit	Duty Cycle	PROF ⁽¹⁾	OFR ⁽²⁾
Fixed Indoor Infrastructure Device with UWB TX only	-31.3 dBm/MHz	10 dBm/50 MHz	$\leq 5\%$ /s	6 – 8.5 GHz	≥ 50 MHz
Fixed Indoor Infrastructure Device with UWB RX/TX	-31.3 dBm/MHz	10 dBm/50 MHz	$\leq 5\%$ /s	6 – 8.5 GHz	≥ 50 MHz
Portable Device - operating within an identifiable network and controlled by an indoor infrastructure	-31.3 dBm/MHz	10 dBm/50 MHz	$\leq 100\%$ /s ⁽³⁾	6 – 8.5 GHz	≥ 50 MHz
Portable Device - not (operating within an identifiable network and controlled by an indoor infrastructure)	-41.3 dBm/MHz	0 dBm/50 MHz	$\leq 100\%$ /s ⁽³⁾	6 – 8.5 GHz	≥ 50 MHz

Note (1): **PROF** (Permitted Range of Operating Frequency) is the frequency range(s) within which the device is authorized to operate.

Note (2): **OFR** (Operating Frequency Range) is the frequency range over which the EUT is intentionally transmitting and is determined by the lowest (f_L) and highest frequency (f_H), see the figure on the right. For UWB, the value of the parameter X is specified to be 10 dB.

Note (3): a Duty Cycle limitation of maximum of 5 % per second shall be applicable if the Mean e.i.r.p spectral density limit is > -41.3 dBm/MHz or the Peak e.i.r.p spectral density limit is > 0 dBm/50 MHz.





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Conclusion

Decision (EU) [2024/1467](#) enables indoor UWB Real-Time Location System (RTLS) applications operating in the 6–8.5 GHz band to benefit from:

- Increased range between tags and anchors
- Operational cost savings due to fewer anchors needed to cover the same area
- Improved link budget and communication reliability
- New use cases in large or high-interference environments.

Draft ETSI EN 302 065-2-5 is currently available for use in obtaining type approval certificates from Notified Bodies.

Important Information

The latest published legislative and/or normative information from the EC, ECC and ETSI is leading in case of any contradiction or misalignment found in this Application Note.

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