

**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**

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Foreword

This Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the Vote phase of the ETSI standards Two-step Approval Procedure.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [i.2] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [i.3] of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive").

The present document is intended to cover the provisions of article 3.2 of Directive 1999/5/EC (R&TTE Directive) [i.3].

The present document does not apply to radio equipment for which a specific Harmonized EN applies as such. Harmonized EN may specify additional EN requirements relevant to the presumption of conformity under article 3.2 of the R&TTE Directive.

Technical specifications relevant to Directive 1999/5/EC [i.3] are summarised in annex A.

Proposed national transposition dates

Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive. The modular structure is shown in EG 201 399 [i.1].

UWB Technologies

The present document provides a generic set of technical requirements covering many different types of UWB technologies used for short range communications. These technologies can be broken down into two groups:

- 1) Impulse based technologies; and
- 2) RF carrier based technologies.

The following clauses give a brief overview of these UWB technologies and their associated modulation techniques.

Impulse technology

Impulse derived UWB technology consists of a series of impulses created from a dc voltage step whose rise time can be modified to provide the maximum useful number of spectral emission frequencies. This derived impulse can then be suitably modified by the use of filters to locate the resulting waveform within a specific frequency spectrum range. This filter can be a standalone filter or incorporated into an antenna design to reduce emissions outside the designated frequency spectrum.

Modulation techniques include pulse positioning in time, pulse suppression and other techniques to convey information. The transmitted energy is summed at the receiver to reproduce the transmitted pulse.

This technology is suitable for direct and non-direct line of sight communications, any reflected or time delayed emissions being suppressed by the receiver input circuits.

RF carrier based technology

RF carrier based UWB technology is based upon classical radio carrier technology suitably modulated by a baseband modulating process. The modulating process must produce a bandwidth in excess of 50 MHz to be defined as UWB.

Different modulating processes are used to transmit the data information to the receiver and can consist of a series of single hopping frequencies or multi-tone carriers.

This technology can be used for both direct and non-direct line of sight communications, any reflected or time delayed emissions being suppressed by the receiver input circuits.

Test and measurement limitations

The ERA report 2006-0713 [i.9] has shown that there are practical limitations on measurements of RF radiated emissions. The minimum radiated levels that can be practically measured in the lower GHz frequency range by using a radiated measurement setup with a horn antenna and pre-amplifier are typically in the range of about -70 dBm/MHz to -75 dBm/MHz (e.i.r.p) to have sufficient confidence in the measured result (i.e. UWB signal should be at least 6 dB above the noise floor of the spectrum analyser and the measurement is performed under far-field conditions at a one meter distance).

For equipment that have dedicated detachable antennas and provide a 50 ohm antenna port for testing, conducted measurements can be made provided that suitable antenna calibrations can be provided. In the present document, test suites for conducted measurements are only provided for DAA conformance measurements. All transmitter emissions of the radio device are expected to be measured using the radiated measurement setup.

For integrated antenna equipment, previous ETSI testing standards have allowed equipment modification to provide a 50 ohm test adaptor to be added to provide the necessary test port. However, UWB integral equipment and particularly impulse based technology does not use classical radio techniques and as such is unlikely to have matched 50 ohm antenna port impedances.