

Standards for the New Radio Equipment Directive

Welcome

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Short Range Device Standards

- Which Standards cover most SRD equipment
- How they differ from the final R&TTE versions
- Typical requirements for transmitters and receivers
- WiFi and Wireless LAN test equipment
- Preparing radio equipment for third party testing

Radio Equipment Directive

- RED is the **ONLY** route to compliance for Radio equipment
- R&TTE Directive cannot be used as of 13/6/2017
- Two practical routes for most companies
 - Harmonised Standards
 - Use of a Notified Body to get a Type Examination Certificate
- RED available to use for compliance on 13/6/2016
- By the end of January 2017 only 47 Standards in OJEU

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Standards for Short Range Devices

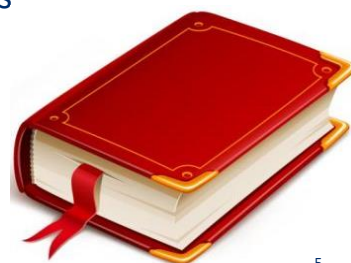
- 9 kHz to 25 MHz – EN 300 330 v 2.1.1
- 25 MHz to 1 GHz – EN 300 220 – various parts
- 1 GHz to 40 GHz – EN 300 440 v 2.1.1
- 2.4 GHz WiFi and Bluetooth – EN 300 328 v 2.1.1
- 5 GHz RLAN – EN 301 893 v 2.1.1
- Not an exhaustive list



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Differences in Scope

- RED Standards reference the directive in the title
- They include requirements for receiver performance
- They give limits and conditions for each harmonised sub-band
- Often have some minor changes in the test methods applied
- Some expand the options for polite spectrum access
- Duty cycle is now tested rather than declared



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EN 300 330 v 2.1.1

- Replaced version 1.8.1
- Published in the Official Journal in March 2017
- Merged parts 1 and 2 into a single part
- Wireless Power Transfer (WPT) removed from scope
- Removed 3 receiver classes – now single limit
- Expanded receiver spurious emission requirement



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EN 300 220-1 v 3.1.1

- Replaced version 2.4.1
- EN300 220 now has a new multi-part structure
- Part 1 not intended to appear in the OJEU
- Remains separate from other parts of EN 300 220
- Used for test methods for all other parts
- Analogue audio equipment removed from scope
- Blocking tests modified – method and limits

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EN 300 220-1 v 3.1.1 (cont.)

- The concept of Operating Channel is introduced
- Modulation Bandwidth replaced by Maximum Occupied Bandwidth and Tx Out of Band requirement
- Maximum power spectral density clause added
- Duty Cycle is now a test instead of a declaration
- Adaptive power control clause added
- Receiver Category 1.5 introduced
- Polite Spectrum Access replaces Listen Before Talk
- New Bi-directional communications test added for certain alarm equipment

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EN 300 220 – Other Parts

- EN 300 220-2 v 3.1.1
 - Harmonised part for compliance of non-specific radio equipment
- EN 300 220-3-1 v 1.1.1
 - Harmonised Product Standard for 868 MHz LDC/HR social alarms
- EN 300 220-3-2 v 1.1.1
 - Harmonised Product Standard for 868 MHz LDC/HR alarms
- EN 300 220-4 v 1.1.1
 - Harmonised Product Standard for 169 MHz metering devices

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EN 300 220-2 v 3.1.1

- Applies to equipment within the scope not covered by a product Standard
- Category 3 blocking limits will be withdrawn on 31/12/2018
- Annex B describes harmonised radio interfaces
- Annex C includes non-harmonised radio interfaces
- Other non-harmonised radio interfaces may be available
- Annex D includes information to be declared by the applicant
- This part does not address Category 1 receivers

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EN 300 220-3-1 v 1.1.1

- Product Standards always take precedence over Generics
- Applies to social alarm equipment operating on designated frequencies (869.20 MHz to 869.25 MHz)
- Categorised as Low duty cycle high reliability (LDC/HR) equipment
- Relies in EN 300 220-1 v 3.1.1 for technical requirements
- 10 mW ERP max. 25 kHz operating channel width
- Duty Cycle less than 0.1% in any 1 hour period
- This part is based on Category 1 and Category 1.5 receivers

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EN 300 220-3-2 v 1.1.1

- Also a Product Standard
- Applies to alarm equipment operating on designated frequencies
 - (868.60 MHz to 868.70 MHz)
 - (869.25 MHz to 869.40 MHz)
 - (869.65 MHz to 869.70 MHz)
- Also Low duty cycle high reliability (LDC/HR) equipment
- Relies in EN 300 220-1 v 3.1.1 for technical requirements
- 10 mW or 25 mW ERP max depending on band used
- 25 kHz operating channel width
- Duty Cycle less than 0.1%, 1% or 10% depending on band used
- This part is based on Category 2 receivers

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EN 300 220-4 v 1.1.1

- Also a Product Standard
- Applies to metering devices operating on frequency band
 - (169.400 MHz to 169.475 MHz)
- Bi-directional transmission required
- Relies in EN 300 220-1 v 3.1.1 for technical requirements
- 500 mW ERP maximum
- 50 kHz maximum occupied bandwidth
- Duty Cycle less than 10%
- This part is based on Category 2 receivers

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EN 300 440 v 2.1.1

- Replaced part 1 v 1.6.1 and part 2 v 1.4.1
- Published in the Official Journal in July 2017
- Not harmonised for receiver categories 2 and 3
- Includes clarifications in measurement procedures
- Includes tables of limits in various sub-bands
- EN 300 440-2 v 1.4.1 was published under the RED but will expire on 31 December 2018

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EN 300 328 v 2.1.1

- Covers 2.4 GHz WiFi and Bluetooth
- Replaced version 1.9.1
- Published in the Official Journal in January 2017
- Includes receiver blocking as a new requirement
- Includes an alternative test method for measuring Power Spectral Density (PSD)
- Reduced the minimum number of hopping frequencies for non-adaptive FHSS



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What's in a Typical Standard? (Transmitters)

- Transmitter Power (Conducted or Radiated)
- Frequency tests (error, drift, temperature stability)
- Occupied Bandwidth (often defined for 99% of power)
- Adjacent Channel Power
- Transient power
- Power Spectral Density
- Duty Cycle
- Out Of Band emissions
- Spurious emissions



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What's in a typical Standard? (Receivers)

- Spurious emissions (Conducted or Radiated)
- Receiver sensitivity
- Adjacent channel selectivity
- Receiver saturation at adjacent channel (category 1)
- Spurious response rejection
- Blocking
- Polite spectrum access



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What's always included?

- Spurious emissions (Transmitter)
- Spurious emissions (Receiver)
- Transmitter Power
- Occupied Bandwidth
- Transmitter operating frequency
- Blocking
- Duty cycle or polite spectrum access

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Wireless LAN and WiFi

- EN 300 328 v 2.1.1
- Wideband equipment in the 2.4 GHz band
- Requires a fast power sensor for RF output power
 - 1 M Sample/sec minimum sample speed
 - Measure RMS power
 - One sensor needed for each transmit chain
 - Capture enough samples to calculate the average power
- Standard covers both DSSS and FHSS equipment
- EN 301 893 (5 GHz RLAN) measured similarly

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Third Party Testing (How to Help Yourself)

- Transmitter effective radiated power (ERP)
- Frequency Stability
- Transmitter Occupied Bandwidth
- Transient Power
 - Test modes – continuous carrier
 - Test modes – continuous modulation
 - Test modes – intermittent transmission
 - (1-5 seconds ON, 1-5 seconds OFF)



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Third Party Testing (How to help yourself)

- Receiver sensitivity and other receiver tests
 - Need a coaxial connector in place of the antenna
 - Needs a valid transmitted message
- Transmitter Occupied Bandwidth
- Transient Power
 - Test modes – continuous carrier
 - Test modes – continuous modulation
 - Test modes – intermittent transmission
- Receiver sensitivity
- Adjacent channel selectivity



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Preparation for Testing

- Download the Standard - Free from the ETSI Website
- Fill in the form in the annex - Important!
- Prepare the required test modes
- Examples
 - Continuous transmit – normal modulation
 - Continuous transmit – no modulation
 - Intermittent transmit for transient tests
 - Transmitter sending valid packets for receiver testing
 - Receiver with software to monitor packet reception

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A Cautionary Note.....

- Standards now contain spectrum rules, unlike their R&TTE equivalents
- When the spectrum rules change, the Standards will have to follow
- Commission Implementing Decision 2017/1483 published 8 August 2017
 - Affects 40.66 MHz
 - Affects assistive listening devices in the DAB band,
 - Extra sub-bands 47a and 47b defined in the 865 MHz range
- Standards do not reflect this yet – but the Spectrum is available from January 2018

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Further Details and Support

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Thanks for coming

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