



December 2009

RF/EMC Regulatory Update

Dear Colleague,

We have provided typical questions and answers that represent in most cases technical opinions with justification in FCC and CE requirements. The particulars of the product for certification must be considered with respect to the applicability of these questions and answers. We hope you find our update valuable and welcome your feedback if you have any special needs or questions. Call us at 703-689-0368 for your testing requirements. You can view archived issues of MultiPoint at our [web site](#).

NOTE: In December, MultiPoint will begin publishing a second monthly newsletter featuring Q/A on international regulatory requirements and developments.

New Service:

Rhein Tech Laboratories, RTL, is now providing a new market differentiating consulting service that will focus on assisting our clients in optimizing their internal design and manufacturing processes which are critical to consistent product performance.

Have you ever been faced with situations like this? A product submitted for compliance testing failed regulatory limits with no identifiable reason for it. A regulatory or customer inquiry has been made yet test records indicate no problem. The first 1000 units built worked fine but suddenly performance issues became apparent - yet no product changes have been made. Getting units ready for product testing can be challenging, and you wish you had a process that defined when, in what instances, along with an overall testing strategy to optimize your total costs. Keeping material costs down is important, but you have always been concerned about how to ensure that all the suppliers used are adequately tested to minimize the risks that multiple suppliers may have on product performance.

RTL has partnered with a leading telecommunications compliance process specialist whose focus is to offer our clients solutions to these questions and related client issues. Our expert will partner with you to analyze product performance issues discovered during your testing program at RTL, help determine the process gap in the design, manufacturing and/or supply chain that led to it, and recommend solutions. This service offers a holistic compliance program tailored to your specific need that clearly delineates the instances when testing should be done as well as identifying when testing is needed due to manufacturing changes.

Our expert comes from a major telecommunications manufacturer where he developed processes and procedures to address the above questions, inclusive of software and hardware, spanning many technologies and platforms. With over 100,000+ ship approvals globally, our expert has experienced the challenges in varying product performance and the impact that inadequate or non robust process controls can have. With his management of global compliance organizations he brings the right insight of how to partner with quality, technical operations, and engineering teams to provide the optimum balance of effort while minimizing costs. Call us at 703-689-0368 for more detailed information.

CE Mark and CCC Mark

QUESTION: We have tested our all our products for the CE mark and would now like the Chinese CCC mark. Is there any relation between having met the CE standards and the CCC mark? I am aware that many of the CCC tests are based on IEC standards.

ANSWER: The China Compulsory Certificate mark (CCC) is administered by the CNCA (Certification and Accreditation Administration). The China Quality Certification Centre (CQC) is designated by the CNCA to process CCC mark applications and define the products that need CCC. It has been in existence since May 1st, 2002.

CE reports or FCC reports cannot transfer into a CCC mark. In China, there are four major approvals now; the CCC mark is for EMC and safety. EMC testing must occur in China, typically referred to as "in-country" testing. Through the CB scheme, CB safety reports are acceptable. The main difference in the CB scheme safety report is that major components in a system, such as a power supply or monitor, must also be CCC Certified or must have the component evaluated separately by a CNCA-designated test laboratory in China. This can be done by submitting an IEC CB Test Report with China deviations on the component or have the product tested in China.

You are correct that for many product categories, the Chinese (Guo Biao) GB standards are equivalent to their IEC equivalent standards. Unlike the CE mark, which is a self-declaration by the manufacturer, obtaining a CCC mark also involves an initial inspection at the factory and annual follow-up inspections. For RF devices, China requires radio type approval with "in-country testing." Overseas reports are unacceptable and testing and approvals are completed by SRMTC in Beijing.

Network access approval for PSTN-terminal or public communication devices such as cell phones is required. China ROHS is also required for most electronic products.

ODM and FCC Compliance Responsibility

QUESTION: We are an Original Design Manufacturer (ODM) and plan to produce an international 802.11a/b/g DFS- capable DTS + UNII mini-PCI card.

1. Could we require that other companies, such as integrators, be responsible for insuring this device meets with the FCC's DTS channel 12-13 prohibition?
2. Could we require that other companies, such as integrators, be responsible for insuring that, when the module is used in a DFS-required UNII band, a separate DFS equipment authorization is obtained?

We would like to put the burden of compliance on the integrators. In both examples, drivers are available freely to OEM integrators and can be easily downloaded into the device.

ANSWER: If your are wondering whether OEM integrators and companies that would integrate the device as a module into a host and can an applicant apply for a modular grant under multiple rule parts 15 B (15.247) and 15 E (15.407) with the following conditions:

- The module is capable of operating world wide- on both US and non-US frequencies.
- The module only has partial capabilities for compliance with 15 E Dynamic Frequency Selection (DFS) and Transmitter Power Control (TPC) requirements.
- The third party host system (OEM integrators and other companies) would need to provide the missing controls for compliance.
- The third party would download US drivers commonly available on the internet and the third party would be responsible for operating only on US frequencies without further testing.

Then the answers are as follows:

For DFS and TPC capability, the third party, i.e. integrators and other companies, would have to obtain a new certification. Obtaining a separate DFS equipment authorization for DFS is not relevant to the grant for the module since third party and other companies would have to obtain a new FCC authorization. The module, in

this case would be an uncertified sub-assembly and the OEM would need a new certification for the ensemble (host and sub-assembly).

On the other hand, if the device is client or a master, the answers may be different. A client module (as defined in FCC 15.202 rule part and definitions for a DFS client device) may be possible. The device cannot initiate any non-compliant transmissions or 802.11 probes. All transmissions must be under the control of a certified master.

As a master device, a standalone module approval is not possible since compliance is dependant on the host.

There may be possibilities to certify the product as a limited host specific module using BIOS protection and/or as a software defined radio with the grantee controlling the software and the security. However, such a grant would be tightly coupled with specific hosts and the grantee would be responsible and must state how control of the end product into which the module will be installed will be maintained such that full compliance of the integrators and other companies' end products are always ensured.

The aforementioned conditions may not be in line with your original question, but to answer your question, you cannot put the burden of compliance on integrators and other companies. Furthermore, specific host environments would require more elaborate details including software controls and grantee responsibility.

FCC Rules for UWB

QUESTION: Our company manufactures Ultra Wide Band (UWB) devices and we have the following questions:

1. What constitutes the bandwidth of a UWB emission?
2. How is the UWB emission bandwidth determined?
3. What portion of the UWB emission spectrum is required to be within the authorized frequency bands? Is it adequate for just the center frequency to be within the authorized band?
4. Can a device be certified under the UWB rules if its emission bandwidth resides outside of the authorized frequency bands when all of its emissions are below the specified limits?
5. What other subtleties should be considered when determining the bandwidth of a UWB device emission spectrum?
6. How are the emissions limits applied in determining compliance of a UWB device?
7. Is any specialized test equipment necessary for performing UWB compliance measurements?
8. What compliance information should be included with the application for certification?
9. What type of measurement antenna should be used for performing radiated emissions measurements on UWB devices when assessing compliance to the UWB rules?

ANSWER: Please see the following answers to your questions:

1. The points on the emission spectrum define the bandwidth of a UWB emission where the amplitude is 10 dB below the maximum emission amplitude (i.e., the -10 dBc points). In cases where the measured emission spectrum contains multiple (more than two) -10 dB points, the outermost points define the bandwidth (i.e., the widest bandwidth is assumed).
2. The bandwidth of a UWB emission must be determined from a radiated measurement with the device using the antenna with which it is designed to operate (i.e., the antenna frequency characteristics may define the radiated bandwidth of a UWB device and is thus considered an integral part of the system). It is recommended that this measurement be performed using the spectrum analyzer peak detector with a resolution bandwidth of 1 MHz or greater and the maximum-hold function. The device under test should be measured for maximum bandwidth by varying the antenna height between 1 to 4 meters, varying antenna polarization between horizontal and vertical and rotating the device 360 degrees several times.
3. For a UWB emission spectrum, the entire fundamental bandwidth (that portion of the spectrum between the outermost -10 dB points) must be contained within the authorized frequency band. For example, the emissions spectrum from a ground penetrating radar (GPR) applying for authorization under Section 15.509 must have its fundamental bandwidth located below 960 MHz.
4. It is presumed that this question refers to a scenario whereby the frequencies associated with the maximum emission and the -10 dB points are located within a frequency band that is outside of those bands authorized for UWB operation (e.g., 960- 3100 MHz), but are less than the applicable emissions limit. Under these conditions, the requirement that the -10 dB bandwidth be

fully contained within the authorized frequency bands is not realized and thus the device cannot be authorized.

5. When measuring the bandwidth of a UWB device using a radiated test set-up, it is imperative that appropriate adjustments be made to the measured amplitude levels to account for the frequency- dependent components of the measurement system (e.g., antenna gain or factor, pre-amplifier gain, cable loss, etc). Since UWB emissions can have bandwidths several GHz wide, these frequency- dependent characteristics can vary dramatically over the fundamental emission.
6. In each rule section pertaining to specific UWB applications, a table is included listing the emission limit applicable in each frequency band. The device under test must comply with all applicable limits accounting for all specified frequency bands. For example, an application for authorization of a device under Section 15.509 (low frequency imaging device) must demonstrate compliance not only to the emission limits provided for the 960-1610 MHz band, but also to those limits specified for both the 1610- 1990 MHz and the above 1990 MHz band.
7. A spectrum analyzer with a quasi-peak detector is required for measuring UWB emissions below 960 MHz to verify compliance with the emissions limits in that portion of the spectrum. An analyzer with a true RMS detector is recommended, but not required, for measuring UWB emissions above 960 MHz. An alternative is provided in procedure (3) contained in Appendix F of the UWB First Report and Order (ET Docket No.98-153) for performing the emissions measurements with an analyzer that does not include an RMS detector. Also, a low-noise preamplifier is required to measure emissions to the levels necessary to determine compliance with the limits specified in the frequency band 960 to 1610 MHz for some UWB applications (e.g., indoor UWB devices authorized under Section 15.517). If the radiated measurements are not conducted in an anechoic chamber, then the use of this pre-amplifier may also require that a pre-select filter be inserted ahead of the pre-amplifier to prevent saturation from strong ambient RF signals.
8. At a minimum, the following information is required for processing a UWB application for certification: The UWB application category (e.g., imaging device, indoor system, handheld device, etc.) and the applicable rule section -The lower and upper - 10 dB frequencies (fL and fH, respectively) and the frequency of the maximum observed emission level (fM) - A description of the procedure used to determine the UWB bandwidth -The maximum radiated emissions (including narrowband emissions) and the associated frequencies observed in each frequency band identified in the applicable emission limits tables -In the event that no emissions are observed in the above frequency bands, report the measurement systems minimum sensitivity (noise floor) in these bands (i.e., show that the measurement system was capable of detecting emissions down to the level dictated by the applicable emissions limit). - A complete description of the measurement system, including antenna, pre-amplifier, etc. This should include information such as antenna gain/factor, preamplifier noise figure and gain, particularly at each frequency for which a data point is provided (peak emission frequency, -10 dB points, etc.) - Calibration information for the measurement system at each frequency for which a data point is reported. - If applicable, report all digital circuitry emissions exceeding the applicable UWB limits and provide a complete description of the process used to justify invoking the exception stated in Section 15.521(c) - A description of the technique used to determine RMS average emission levels - A description of the test site used, specifying whether the measurements were performed in a test chamber, outdoor test site, with or without a ground screen, and any other pertinent information. - Where applicable, indicate the presence of required labels and/or a manual disable switch - Describe the pulse characteristics (PRF, pulse width, etc.). Is the pulse pseudo random (dithered) or periodic? An oscilloscope plot would be helpful. - Supporting photographs depicting the measurement system set-up and the device under test.
9. Two measurement antennas will likely be necessary for performing these tests. A log-periodic antenna is recommended for performing the necessary radiated measurements below 960 MHz, although other types of measurement antennas (e.g., Biconical) can be used. For the radiated measurements above 960 MHz, a broadband horn antenna or a broadband log periodic antenna may be used. When using a horn antenna to measure emissions from a device that is not placed on a turntable (e.g., a ground penetrating radar placed near the ground to replicate actual operating conditions), the antenna should be pointed in the direction of the radiating head. This is consistent with ANSI C63.4 Section 8.3.1.2, which states that the antenna must be kept within the cone of radiation and pointed at the area of the device under test.

FCC Requirements for Wireless Devices

QUESTION: We are a wireless manufacturer and have the following two questions regarding the new products we are designing:

1. What are the FCC requirements for using the CDMA 1.25 MHz bandwidth signal over the air and using an up-converter to up-convert this signal to 2.4 GHz? After utilizing the up-converter, the device would then transmit this signal to another unit within a building and using a down-converter, down-convert this 2.4 GHz signal to 800 MHz or 1900 MHz.
2. Is operation in an airplane of UNII devices, under 47 CFR Part 15 Subpart E operating in the 5.15-5.25 GHz band, considered indoor operation?

ANSWER:

1. This device requires authorization as a composite device under Section 15.247 or 15.249 and under Part 22 and Part 24. Under Section 15.247 or 15.249, the device must comply with all technical requirements, regardless of the multiple input signals in the 800/1900 MHz band. The down converter must comply with Part 22 and/or 24 licensed service rules regardless of the signal states and configuration of the Section 15.247 or 15.249 input signals.
2. Yes, under the current rules, operation in an airplane is considered indoor operation. However, please note that operation in a train or in an automobile is not considered indoor operation.

FCC Approval for HF SSB Combo

QUESTION: We have a High Frequency (HF) Single Side Band (SSB) transmitter that we have combined with a Part 80 radio. We plan to present the Part 80 application to our TCB or the FCC for approval. It may not be obvious that our transmitter/radio can be also be marketed for amateur work. Does the FCC allow such combos?

ANSWER: Part 80/97 combo devices are prohibited by the FCC. Please see the list below and note the only exceptions.

Any device that applies for an equipment authorization to operate under multiple radio services is referred to as a combo; the Wireless Telecommunications Bureau (WTB) approves combinations. The list below released by the FCC is a guide for combinations that have been either approved or rejected as of 11/09/2007.

All Part 15 devices are generally not included in this definition and are prohibited unless allowed by the FCC, for example, specific combinations such as Part 15 and Part 101 devices at 92-95 GHz.

Combination Radio Guide list approved by the FCC as of 11/09/2007:

- FRS/GMRS combo - approved
- Part 95G/Part 22/24/90 combos - approved
- Part 80 VHF (156-163 MHz)/FRS combo - approve
- Part 80 UHF (456-468 MHz)/ FRS, GMRS, or FRS/GMRS combos - prohibited
- MURS (Part 95J) combos - prohibited
- Amateur (Part 97) combos - prohibited
- Part 15 /Part 101 at 92-95 GHz - prohibited

Amateur (Part 97) combo transceivers are not permitted. The one exception is that Part 97 (Amateur)/Part 87 (Aviation VHF 118- 136.975 MHz) combo transceivers are permitted provided that marketing conditions are met. The FCC may issue Grant condition that states the following: *"This device is for a combination amateur (Part 97) and Aviation (Part 87) device."* The holder of this certificate will market this radio only to the aviation community including licensed pilots, aircraft owners, other Aeronautical Radio licensees, and other legitimate members of the aviation industry, and to vendors for such customers, through aeronautical marketing and distribution outlets such as websites, magazines and catalogues intended primarily for such audience.

Part 97/87 Combo transceivers must be approved by the FAA Spectrum Engineering Division as specified in 47 CFR Section 87.147(d). Furthermore, the FAA approval letter must be included in the application as a letter exhibit. All combo devices must meet RF exposure requirements and all other FCC Rules. In addition there may be additional requirements or restrictions enforced by WTB.

Questions about specific combinations may be submitted to the FCC at <http://www.fcc.gov/labhelp> - use the link "[Submit an Inquiry](#)" to access the form to submit a question.

FCC Part 27 Measurement Procedure

QUESTION: Can you clarify the procedures for measuring the emissions limit in FCC 47 CFR 27.53 of the FCC rules for devices operating under Part 27 in the frequency bands 746-764 MHz and 776-794 MHz? Specifically, can you clarify the following?

a) 47 CFR 27.53(b)(3) states that emissions on all frequencies between 764 to 776 MHz and 794 to 806 MHz shall be attenuated below the transmitter power by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz segment.

Does this mean that all emissions shall be measured in 6.25 kHz segment and compared to the total transmitted power in a licensee's frequency band? If this is true, if a licensee occupies a 5 MHz band and transmits a wide-band signal with equal power across the band, then relative to a 6.25 kHz segment in-band (on a per Hz basis), the emissions must be attenuated by $76 + 10 \log(P) - 10 \log(5 \text{ MHz}/6.25 \text{ kHz}) = 47 + 10 \log(P)$ dB.

b) 47 CFR 27.53(b)(5) states that measurement instrumentation for measuring emissions outside the licensee's band should employ resolution of 100 kHz or greater, except 30 kHz should be employed within the nearest 100 kHz. Suppose that emissions are being measured in 100 kHz or 30 kHz segments and are being compared to the total power inside the licensee's band. Is it correct that for the above example of a 5 MHz wide signal on a per Hz basis the required attenuation is $43 + 10 \log(P) - 10 \log(5 \text{ MHz}/100 \text{ kHz}) = 26 + 10 \log(P)$ dB?

ANSWER: a) Yes, the term P as used in the attenuation formula $76 + 10 \log(P)$ is the total power of the transmitter. The net effect of the above-cited formula is that the levels (in dB) of the undesired emissions relative to the level of the desired emissions are less than the dB figure given in the above-cited formula. On a spectrum analyzer, the levels of the desired emissions for a modulated signal with uniform spectral distribution appear in proportion to the ratio of the occupied bandwidth of the modulated spectrum to the spectrum analyzer resolution bandwidth (RBW) used. Several factors will affect the reading - including the measurement RBW used, the actual shape of the modulated signal and the modulation method used. The actual specification remains as written: $76 + 10 \log(P)$ for emissions in a 6.25 kHz band segment.

b) The response in question a also applies to question b. Compliance with the emissions limit at the frequency block edges are a function of the placement of the desired emission with respect to the frequency block edge. The FCC Grant of Certification lists the highest and lowest operating (center) frequency that will enable compliance with the emissions limit at the frequency block edges. All readings of emissions are to be adjusted by the ratio of the specified measurement band (width) or segment to the actual RBW used.

STANDARDS UPDATE

EU: NEW CENELEC STANDARDS RECENTLY RELEASED

This is a shortened list of the CENELEC standards published during the past month:

- **EN 60644:2009** (12/02/2009) Specification for high-voltage fuse-links for motor circuit application
- **EN 60384-1:2009** (12/02/2009) Fixed capacitors for use in electronic equipment -- Part 1: Generic specification
- **EN 61280-4-1:2009** (12/02/2009) Fibre optic communication subsystem test procedures -- Part 4-1: Installed cable plant - Multimode attenuation measurement
- **EN 62080:2009** (12/04/2009) Sound signalling devices for household and similar purposes
- **EN 61558-2-16:2009** (12/04/2009) Safety of transformers, reactors, power supply units and similar

products for supply voltages up to 1 100 V -- Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units

- **EN 60079-18:2009** (12/04/2009) Explosive atmospheres -- Part 18: Equipment protection by encapsulation "m"
- **EN 60079-31:2009** (12/04/2009) Explosive atmospheres -- Part 31: Equipment dust ignition protection by enclosure "t"
- **EN 62267:2009** (12/04/2009) Railway applications - Automated urban guided transport (AUGT) - Safety requirements
- **EN 61968-9:2009** (12/08/2009) Application integration at electric utilities - System interfaces for distribution management -- Part 9: Interface for meter reading and control
- **EN 60626-2:2009** (12/09/2009) Combined flexible materials for electrical insulation -- Part 2: Methods of test
- **EN 60851-2:2009** (12/10/2009) Winding wires - Test methods -- Part 2: Determination of dimensions
- **EN 60728-7-3:2009** (12/10/2009) Cable networks for television signals, sound signals and interactive services -- Part 7-3: Hybrid fibre coax outside plant status monitoring - Power supply to transponder interface bus (PSTIB)
- **EN 60320-2-4:2006/A1:2009** (12/10/2009) Appliance couplers for household and similar general purposes -- Part 2-4: Appliance couplers dependent on appliance weight for engagement
- **EN 80601-2-35:2009** (12/11/2009) Medical electrical equipment -- Part 2-35: Particular requirements for the basic safety and essential performance of heating devices using blankets, pads and mattresses and intended for heating in medical use
- **EN 62083:2009** (12/11/2009) Medical electrical equipment - Requirements for the safety of radiotherapy treatment planning systems
- **EN 60335-2-59:2003/A2:2009** (12/16/2009) Household and similar electrical appliances - Safety - Part 2-59: Particular requirements for insect killers
- **EN 60335-2-74:2003/A2:2009** (12/16/2009) Household and similar electrical appliances - Safety - Part 2-74: Particular requirements for portable immersion heaters
- **CLC/TR 50506-2:2009** (12/16/2009) Railway applications - Communication, signalling and processing systems - Application Guide for EN 50129 -- Part 2: Safety **assurance**
- **EN 60335-2-73:2003/A2:2009** (12/17/2009) Household and similar electrical appliances - Safety - Part 2-73: Particular requirements for fixed immersion heaters

See [CENELEC](#) for additional information.

EU: NEW IEC STANDARDS RECENTLY RELEASED

This is a shortened list of the new IEC standards published during the past month:

- **IEC 60335-2-73** (11/25/2009) Household and similar electrical appliances - Safety - Part 2-73: Particular requirements for fixed immersion heaters
- **IEC 62540** (11/25/2009) Radio frequency identification (RFID) for stationary lead acid cells and monoblocs - Tentative requirements
- **IEC 60695-1-10** (11/25/2009) Fire hazard testing - Part 1-10: Guidance for assessing the fire hazard of electrotechnical products - General guidelines
- **IEC 60436** (11/25/2009) Electric dishwashers for household use - Methods for measuring the performance
- **IEC 60335-2-74** (11/25/2009) Household and similar electrical appliances - Safety - Part 2-74: Particular requirements for portable immersion heaters
- **IEC 61000-4-34** (11/26/2009) Electromagnetic compatibility (EMC) - Part 4-34: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16 A per phase
- **IEC 61916** (11/26/2009) Electrical accessories - Harmonization of general rules
- **IEC 60335-2-30** (11/26/2009) Household and similar electrical appliances - Safety - Part 2-30: Particular requirements for room heaters
- **ISO 80601-2-56** (12/8/2009) Medical electrical equipment - Part 2-56: Particular requirements for basic safety and essential performance of clinical thermometers for body temperature measurement
- **IEC 62493** (12/10/2009) Assessment of lighting equipment related to human exposure to electromagnetic fields
- **IEC 60335-2-35-am2** (12/10/2009) Amendment 2 - Household and similar electrical appliances - Safety - Part 2-35: Particular requirements for instantaneous water heaters
- **IEC 60335-2-41-am2** (12/10/2009) Amendment 2 - Household and similar electrical appliances - Safety - Part 2-41: Particular requirements for pumps
- **IEC 60335-2-29-am2** (12/10/2009) Amendment 2 - Household and similar electrical appliances - Safety - Part 2-29: Particular requirements for battery chargers

- **IEC 60204-33** (12/10/2009) Safety of machinery - Electrical equipment of machines - Part 33: Requirements for semiconductor fabrication equipment
- **IEC 60601-2-52** (12/10/2009) Medical electrical equipment - Part 2-52: Particular requirements for the basic safety and essential performance of medical beds
- **IEC 60335-2-2** (12/14/2009) Household and similar electrical appliances - Safety - Part 2-2: Particular requirements for vacuum cleaners and water-suction cleaning appliances
- **IEC 60335-2-13** (12/14/2009) Household and similar electrical appliances - Safety - Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances
- **IEC 60335-2-27** (12/14/2009) Household and similar electrical appliances - Safety - Part 2-27: Particular requirements for appliances for skin exposure to ultraviolet and infrared radiation

See [IEC](#) for additional information.

EU: NEW ETSI STANDARDS RECENTLY RELEASED

This is a shortened list of the new ETSI standards published during the past month:

- ETSI EN 300 113-1 V1.6.2 (November 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: Technical characteristics and methods of measurement
- ETSI EN 300 113-2 V1.4.2 (November 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
- ETSI EN 300 698-3 V1.2.1 (December 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio telephone transmitters and receivers for the maritime mobile service operating in the VHF bands used on inland waterways; Part 3: Harmonized EN covering essential requirements of article 3.3 (e) of the R&TTE Directive
- ETSI EN 302 561 V1.2.1 (December 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using constant or non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
- ETSI EN 300 373-2 V1.2.1 (December 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Maritime mobile transmitters and receivers for use in the MF and HF bands; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
- ETSI EN 300 373-3 V1.2.1 (December 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Maritime mobile transmitters and receivers for use in the MF and HF bands; Part 3: Harmonized EN covering essential requirements under article 3.3(e) of the R&TTE Directive; Equipment with integrated or associated equipment for Class E Digital Selective Calling (DSC)
- ETSI EN 302 435-1 V1.3.1 (December 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Technical characteristics for SRD equipment using Ultra WideBand technology (UWB); Building Material Analysis and Classification equipment applications operating in the frequency band from 2,2 GHz to 8,5 GHz; Part 1: Technical characteristics and test methods
- ETSI EN 302 435-2 V1.3.1 (December 2009) Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Technical characteristics for SRD equipment using Ultra WideBand technology (UWB); Building Material Analysis and Classification equipment applications operating in the frequency band from 2,2 GHz to 8,5 GHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

See new [ETSI website](#) for additional information.



CONTACT RHEIN TECH FOR YOUR INTERNATIONAL REGULATORY APPROVALS

Rhein Tech Laboratories' worldwide homologation services offer the best strategy for gaining product approval in a large number of target countries. In addition, we reduce the number of emissions, immunity, and product safety tests required by defining the minimum subset of regulatory standards at the onset, thus reducing the time and cost to enter multiple target countries. We offer research and approvals in over 50 countries.

ABOUT US

RTL has provided EMC compliance engineering & testing services since 1988 and has a superior reputation with both the Federal Communications Commission and others in the industry. RTL provides testing services to meet the emissions, immunity, and safety requirements of the European EMC Directive and the EU R&TTE Directive, all FCC rules and regulations, VCCI (Japan), ACMA (Australia), and other international standards.

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