



August 2007

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 at 703-689-0368 or view archived issues of MultiPoint at our [web site](#).

Allowable Tolerance for Mobile Radios

QUESTION: The firm I work for manufactures mobile radios and I would like to know the allowed tolerance between actual conducted power measured and rated wanted conducted power for mobile radios in the LMR UHF band that is allowable by the FCC.

ANSWER: The FCC allows the actual output power measured to be de-rated by 20% to rated wanted power for Part 90 devices. For example, if the actual measured power is 104 Watts, the rated wanted power can be listed as 100 Watts rated on the grant. The wanted rated power is referred to as P_{nominal} by the FCC. Furthermore, all other documents pertaining to the application filing such as the EMC report, User's manual, Operational Description, Exhibits, and FCC Form 731 should contain P_{nominal} value. If RF exposure evaluation is applicable, it should contain P_{nominal} +20% value unless the application filing contains a manufacturer's attestation that the radio would not produce the P_{nominal} +20% value. However, the maximum actual output power measured should be used for the RF exposure evaluation measurement.

Measurements Taken in a Fully Anechoic Room

QUESTION: Our company manufactures wireless devices and we would like to use our Fully Anechoic Room (FAR) to perform FCC radiated emissions testing above 1 GHz. Is this acceptable by the FCC?

ANSWER: The frequency range for testing is established per FCC Part 15.33 and frequencies below 1 GHz testing must be measured in accordance with the FCC rule requirements (ANSI C63.4-2001). For Part 15 device certification, FCC Part 2.948 (a)(2) specifies testing at a listed lab, where such listing shall include information showing site compliance to C63.4-2001 subclauses 5.4.6 to 5.5, the aforementioned subclauses are the same as in **the new version of ANSI C63.4**, the 2003 version.

There are currently no test-site validation requirements above 1 GHz. However, facilities suitable for measurements in the frequency range 30 MHz to 1000 MHz are considered suitable for the frequency range 1 GHz to 40 GHz, including the presence of the reference ground plane (see ANSI C63.7- 1992).

Note: Additional site validation requirements above 1 GHz are currently under study by the FCC's staff members whom are continuing participation in ANSI C63.4 committee discussions on this topic. Our newsletter will provide further updates when available, but for now the use of a FAR is not allowed.

Module Shielding Requirements

QUESTION: FCC DA001407 states that modules must have their own shielding and for a full modular approval, the module must be tested in a standalone configuration. The concept of shielding seems to be varied and complex. As an example, shielding of the top of the RF section alone may be sufficient in some cases but in other cases, full shielding on all sides of the RF section may be required for emissions to comply. Hence, I have the following questions:

- Does the shielding requirement mean 1) all sides of the module must be shielded, or 2) only sufficient shielding to cover the top of the RF section, or 3) sufficient shielding must exist to make the module comply? The later would seem to be the intent of the requirement.
- The requirement for standalone testing is to ensure that the shielding on the module is sufficient so that any shielding from the host is not of benefit or detriment to the module shielding. Assume a module that does not have shielding (i.e. no ground plane) on the bottom part of the module and is tested on a fixture that does provide a ground plane under the RF section of the module. While the device may not be inside the host, it may benefit from the added ground plane of the test fixture and test results may not be representative of a true stand-alone configuration where only the module shielding is considered. This would not be much of an issue if the module did in fact pass where there were no additional ground plane provided by the fixture, but this could be an issue if the additional ground plane was required for the module to comply. In the later case, with the additional ground plane, would this not show that the module did not have sufficient shielding to meet the requirements of DA001407 and would it not be improper to use such a fixture even though technically the module was not tested inside a host?

ANSWER: It depends on the shielding requirement for the specific needs of the "stand alone" product and the requirements that meet the level of "shielding effectiveness"(SE) of the module. According to the FCC Requirement, Full Modular Approval is for compliance with ALL 8 of the requirements and Limited Modular Approval is available as a sub-set compliance with the Grantee retaining control over the final installation of the device (this includes liability). The FCC is concerned with transmitters, not receivers (with the exception of scanning receivers). The FCC released a Public Notice, [Part 15 Unlicensed Modular Transmitter Approval](#) (DA 00-1407), that sets forth the requirements for approval of modular transmitter equipment designs. The FCC noted that these requirements are in addition to those normally required for an application for an intentional radiator. The Public Notice lists the following specific requirements which must be addressed for modular transmitter approval:

- Must have its own RF shielding
- Must have buffered modulation/data inputs (concern is over-modulation and excessive data rates)
- Must have its own regulator to control output power and sideband splatter
- Must comply with antenna requirements Section 15.203, 15.204
- Either be permanently attached or have a unique connector
- Antennas need to approved with the module
- Additional antennas can be added with a Class II permissive change

"The modular transmitter must have its own RF shielding. This is intended to ensure that the module does not have to rely upon the shielding provided by the device into which it is installed in order for all modular transmitter emissions to comply with Part 15 limits. It is also intended to prevent coupling between the RF circuitry of the module and any wires or circuits in the device into which the module is installed. Such coupling may result in non-compliant operation.

"The modular transmitter must comply with any applicable RF exposure requirements. For example, FCC Rules in Sections 2.1091, 2.1093 and specific Sections of Part 15, including 15.319(i), 15.407(f), 15.253(f) and 15.255(g), require that Unlicensed PCS, UNII and millimeter wave devices perform routine environmental evaluation for RF Exposure to demonstrate compliance. In addition, spread spectrum transmitters operating under Section 15.247 are required to address RF Exposure compliance in accordance with Section 15.247(b)(4). Modular transmitters approved under other Sections of Part 15, when necessary, may also need to address certain RF Exposure concerns, typically by providing specific installation and operating instructions for users, installers and other interested parties to ensure compliance."

In cases where compliance with one or more of these numbered requirements cannot be demonstrated, the FCC may grant a "Limited Modular Approval" (LMA) in "those instances where the Grantee can demonstrate that it will retain control over the final installation of the device, such that compliance of the end product is assured."

FCC Label Placement

QUESTION: We are testing a Part 15 device and our client advised us that the certification label will be placed on the battery compartment cover of the device. The cover has already been machined with a recess to accommodate the label. We notified them that this was not allowed per FCC policy. The client then proposed two labels, one on the battery compartment cover as they had planned and an additional label inside the battery compartment. Thus, if the battery cover were lost, there would still be a label appearing on the equipment on what would then be the external surface of the device. Will the FCC allow the approval of such labeling?

ANSWER: FCC ID labels must not go on the battery cover. It is best that your client choose another location for the placement of the ID label. In addition, pursuant to Section 2.925(d) (2), the FCC ID must be readily visible from the outside of the equipment enclosure at the time of purchase. It is also preferable that it is visible at all times during normal installation or use, but this is not a prerequisite for grant of equipment authorization.

Please note further that Section 2.925(f) of the FCC rules state states, "Where a permanently attached label is not desirable or feasible, an alternate method may be used if approved by the FCC. The proposed alternative method of identification and the justification for its use must be included with the application for equipment authorization when filed to the TCB or FCC. Guidelines for labeling and user information for Part 15 and Part 18 devices are posted at this [link](#) .

SAR Testing

QUESTION: We have an Ultra Mobile Personal Computer (UMPC) for FCC approval. The device is a miniature computer approximately 5 x 8 in size. It has no voice functions; therefore, face or ear held SAR testing is not required. The device does have the capability of body worn positioning. We would like to perform SAR testing at 0 cm spacing on both the front and backsides and SAR testing with a 1.5 cm air gap on all edges. Is this acceptable by the FCC?

ANSWER: RF exposure compliance and evaluation of UMPC devices is determined by the operating configurations and exposure conditions of individual products as they are introduced into the market. It is too early to draw specific conclusions on generic RF exposure test requirements until UMPC products have matured several years from now. RF exposure compliance is evaluated in accordance with the design and the intended and normal use configurations of individual devices, including installation and operating requirements. As for any new products and technologies, information on device operating configurations and exposure conditions must be supported by fully documented, compliant test results.

The scope of UMPC devices appears to include a substantially large group of rather generic operating configurations, which leads to various exposure conditions. Therefore, such information may not be appropriate for defining the test and evaluation requirements of an individual product. This specific product should be tested according to its operating configurations, exposure conditions, installation, and operating requirements etc.

INTERNATIONAL UPDATE

EU: NEW CENELEC STANDARDS RELEASED THIS MONTH

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

- **EN 60745-2-19:2005/A11:2007** (7/27/2007) Hand-held motor- operated electric tools - Safety -- Part 2-19: Particular requirements for jointers
- **EN 60601-1-2:2007** (7/31/2007) Medical electrical equipment -- Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests
- **EN 60601-1-8:2007** (7/31/2007) Medical electrical equipment -- Part 1-8: General requirements for basic safety and essential performance - Collateral Standard: General

requirements, tests and guidance for alarm systems in medical electrical equipment and medical electrical systems

- **EN 60335-2-106:2007** (7/31/2007) Household and similar electrical appliances - Safety -- Part 2- 106: Particular requirements for heated carpets and for heating units for room heating installed under removable floor coverings
- **EN 60601-1-6:2007** (7/31/2007) Medical electrical equipment -- Part 1-6: General requirements for basic safety and essential performance - Collateral Standard: Usability
- **EN 60335-2-79:2004/A2:2007** (8/8/2007) Household and similar electrical appliances - Safety -- Part 2- 79: Particular requirements for high pressure cleaners and steam cleaners
- **EN 61008-1:2004/A11:2007** (8/8/2007) Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's) -- Part 1: General rules
- **EN 55024:1998/IS1:2007** (8/10/2007) Information technology equipment - Immunity characteristics - Limits and methods of measurement
- **EN 60898-1:2003/IS4:2007** (8/10/2007) Electrical accessories - Circuit breakers for overcurrent protection for household and similar installations -- Part 1: Circuit-breakers for a.c. operation

See www.cenelec.org 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 60598-2-8** (July 25, 2007) Luminaires - Part 2-8: Particular requirements - Handlamps
- **IEC 61131-2** (July 25, 2007) Programmable controllers - Part 2: Equipment requirements and tests
- **IEC 62137-1-2** (July 25, 2007) Surface mounting technology - Environmental and endurance test methods for surface mount solder joint - Part 1-2: Shear strength test
- **IEC 61157** (August 9, 2007) Standard means for the reporting of the acoustic output of medical diagnostic ultrasonic equipment
- **IEC 61340-5-1** (August 9, 2007) Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements
- **IEC 61689** (August 9, 2007) Ultrasonics - Physiotherapy systems - Field specifications and methods of measurement in the frequency range 0,5 MHz to 5 MHz
- **IEC 61557-12** (August 15, 2007) Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 12: Performance measuring and monitoring devices (PMD)
- **IEC 60364-4-44** (August 14, 2007) Low-voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances
- **IEC 62311** (August 14, 2007) Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
- **IEC 61850-SER** (August 10, 2007) Communication networks and systems in substations - ALL PARTS

See [IEC](http://www.iec.ch) for additional information.

EU: NEW ETSI STANDARDS RELEASED THIS MONTH

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

- [ETSI EN 301 839-1 V1.2.1](#) (July 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Active Medical Implants (ULP-AMI) and Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Part 1: Technical characteristics and test methods
- [ETSI EN 301 839-2 V1.2.1](#) (July 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Active Medical Implants (ULP-AMI) and Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
- [ETSI EN 301 893 V1.4.1](#) (July 2007) Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

- [ETSI EN 302 454-1 V1.1.1](#) (July 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Meteorological Aids (Met Aids); Radiosondes to be used in the 1 668,4 MHz to 1 690 MHz frequency range; Part 1: Technical characteristics and test methods
- [ETSI EN 302 454-2 V1.1.1](#) (July 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Meteorological Aids (Met Aids); Radiosondes to be used in the 1 668,4 MHz to 1 690 MHz frequency range; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
- [ETSI EN 302 510-1 V1.1.1](#) (July 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 30 MHz to 37,5 MHz for Ultra Low Power Active Medical Membrane Implants and Accessories; Part 1: Technical characteristics and test methods
- [ETSI EN 302 510-2 V1.1.1](#) (July 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 30 MHz to 37,5 MHz for Ultra Low Power Active Medical Membrane Implants and Accessories; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
- [ETSI TR 102 552 V1.1.1](#) (July 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Broadband Electronic Communications through Powerlines: A code of Practice relating to the Standardization of the Measurement of Emission, Data Collection and Reporting of Results
- [ETSI TR 102 579 V1.1.1](#) (August 2007) Electromagnetic compatibility and Radio spectrum Matters (ERM); Report providing guidance for the production of Community Specifications for application under the Single European Sky Interoperability Regulation EC 552/2004
See [ETSI](#) for additional information

FCC: 700 MHz RULES REVISED

On July 31, 2007, the FCC adopted a Second Report & Order addressing the 698- 806 MHz portion of the spectrum that will be vacated by television broadcasters as part of the DTV transition. The Order established a "framework for a 700 MHz Public Safety/Private Partnership between the licensee for one of the commercial spectrum blocks and the licensee of the public safety broadband spectrum." Additionally, the Order noted that the commercial licensee would be creating a "nationwide, interoperable broadband network for the use of public safety." Such an infrastructure would facilitate communications across jurisdictions for emergency works and first responders of different disciplines.

The FCC also adopted several changes to the 700 MHz band plan as follows:

- Under the new band plan, 62 megahertz of spectrum, divided into five spectrum blocks, will be auctioned for commercial uses.
- The commercial spectrum will be made available at auction in a mix of geographic area sizes, including Cellular Market Areas (CMAs), Economic Areas (EAs), and Regional Economic Area Groupings (REAGs).
- The 10-megahertz Upper D Block will be licensed on a nationwide basis and will become part of a 700 MHz Public Safety/Private Partnership.
- Within the 24 megahertz of public safety spectrum, the public safety wideband spectrum is being redesignated for broadband use to allow for nationwide interoperable broadband communications by public safety users.
- The public safety broadband spectrum is placed in a 10-megahertz block at the bottom of this band and the existing public safety narrowband spectrum is consolidated in a 12-megahertz block at the top of the band. Internal guard bands are placed in between the broadband and narrowband segments
- There will be a single, nationwide license for the public safety broadband spectrum, assigned to a Public Safety Broadband Licensee, which will work with the adjacent commercial D Block licensee as part of the 700 MHz Public Safety/Private Partnership.
- The Public Safety Band is shifted by downward by one megahertz from 764-776/794-806 MHz to 763-775/793-805 MHz in order to protect public safety narrowband operations in the Canadian border areas.
- To accommodate the shift in the Public Safety Band, the Guard Band A Block is being relocated to a new location between the Upper C and D Blocks, and, to further protect the public safety narrowband operations from potential interference, the Guard Band B Block is being placed above the narrowband block at the top of the 700 MHz Band. [Link](#)

CANADA: REPEAL OF TELECOMMUNICATIONS ORDER

On August 15, 2007, Industry Canada released order SOR/200-192 repealing the existing Telecommunications Apparatus Assessment and Testing Fees Order (ATF). SOR/200-192 comes into effect on September 10, 2007. The new fee structure is aimed to reduce regulatory costs and paper burden to the industry. [Link](#)

EU: COMMISSION PROPOSAL FOR GSM BAND

On July 25, 2007, the EU Commission proposed measures to make it easier and more lucrative for mobile operators in Europe to offer and develop innovative wireless technologies. The proposal is aimed at opening radio spectrum for advanced mobile data and multimedia services. The proposal allows for new technologies to coexist with GSM in the frequencies of 900 MHz and 1800 MHz while preserving the continued operation of GSM in the EU. If the proposal becomes law, it should allow for an increase in the number and choice of wireless services available and expand geographic coverage of such services. [Link](#)

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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