



September 2005

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](#).

FCC Approvals for a Device Incorporating an 802.11 Module

QUESTION: Our firm intends to use an FCC approved 802.11 module including a GPS receiver, CPUs and a switching power supply on a printed circuit board. The printed circuit board has two I/O connectors and RS232 connectors. The printed circuit board is designed to be installed inside a die cast aluminum box with two antennas connected on the side of the box for diversity. The printed circuit board can also be configured with a total of three RF modules, the other 2 modules are GSM modules, but are NOT included in this installation and therefore not included in this certification. Please let us know what tests we need to perform to comply with FCC rules.

ANSWER: The answer depends on how you want to proceed. The following are two possible options:

- If you want to continue to use the FCC ID of the module as is, without any changes in accordance with the grant, then the only requirement needed is to put the phrase "Contains FCC ID: XXX-XXXX on the host". As long as the antennas used in the host are of the same type and of equal or lesser gain, there are no issues regarding use. However, if there are antennas of greater gain or of different types than the original, a Class II Permissive Change would have to be done on the module's grant in order to allow use of the new antennas. If the module is in a portable device, a new application, including Specific Absorption Rate (SAR) measurements, would be required.
- If you would like your own FCC identifier on the end product, then a new application for certification would have to be completed. The device would be tested in the host under the Commission's Limited Modular Approval (LMA) policy. From a testing standpoint, you could probably use the antenna terminal conducted measurements from the modular grant. You would have to show compliance of the device in the host for radiated emissions. Each type antenna and the highest gain of that type would need to be tested. The application package would include all of the normal exhibits such as user's manual, operational description, external and internal photos, label info, schematics (of the transmitter), test setup photos, block diagram (of the transmitter), and Maximum Permissible Exposure (MPE) or SAR if in a portable application.

SAR Laboratory Accreditation

QUESTION: We have a telecom product requiring SAR measurements prior to FCC application review. How do we know if a SAR laboratory is approved nationally? Does the FCC have a requirement for SAR test laboratories to be accredited?

ANSWER: Currently, there is no FCC requirement for a SAR lab be accredited. However, many SAR facilities are including the various SAR standards on their existing scopes of accreditation under ISO/IEC Guide 17025 standard. In the US, Telecommunications Certification Bodies (TCBs) operating under ISO/IEC Guide 65 stipulate that while a TCB has the responsibility to accept data from an accredited lab, if data comes from a lab that is not accredited, the TCB can accept data from the lab if it has confidence in that data. At the moment, how confidence is established is not clear. The FCC and ANSI have not fully established a set of criterion which a TCB can use in establishing confidence of the non-accredited SAR laboratory. The gamut runs from wanting the TCB to do a full ISO/IEC Guide 17025 type audit to ensure confidence, to those that only want a 'warm fuzzy' technical checklist created by the TCB. Until both the FCC and ANSI decide on exactly what and how much of ISO/IEC Guide 17025 a non-accredited lab is to be assessed by the TCB, this issue will remain unclear. The easiest and best approach is to use a SAR laboratory that has their SAR testing capabilities included in their scope of accreditation. If one cannot be found, discuss this issue with the TCB of your choice and see what must be done for the TCB to establish confidence.

FCC Rules for Frequency Translating Repeater Systems

QUESTION: We are a new manufacturer of frequency translating repeater systems. What are the FCC's rules for testing such systems operating under Part 24, Subpart E?

ANSWER: The procedures for filing applications for certification of Part 24 radio equipment are contained in 47 CFR 2.1033(c). The technical requirements for a frequency translating repeater system under Part 24, Subpart E are contained in Sections 24.232, 24.235 and 24.238. Additionally, equipment such as amplifiers, repeaters and boosters, require a comparison of the input modulated spectrum and the output modulated spectrum. This corresponds to the occupied bandwidth test required under Section 2.1049. For equipment handling multiple signals, an inter-modulation (IM) test is required as follows: the FCC considers inter-modulation (IM) products to be spurious emissions and is covered by the general emissions limitations (mask) in each radio service. The IM products are produced by the transmitter / amplifier carrying two or more signals at the same time. Section 2.1051 of the FCC's rules and regulations requires that measurements be made for spurious emissions at the antenna terminals while the transmitter is modulated. The FCC considers an amplifier to be a transmitter because it is transmitting and is licensed. The word amplifier does not exist in Part 2 and in many of the licensed radio services. The FCC normally requires that the IM test(s) be done with three signals of equal magnitude at their highest rated output level for each type of modulation. The signals are spaced so that two are near to each other at one edge of the pass band and the other signal is alone at the other edge of the pass band. This placement will potentially produce both in-band and out-of-band IM products. A two-signal test is acceptable only as a default when the three signal test could not be performed because of equipment shortages or other limitations. The two-signal test is the second best choice, not an option of the two or three signal test. When a two-signal test is used, both the upper and lower side of the band edge must be tested; that is, two tests are made in place of one three signal test. The three signal test is still considered to be the preferred/primary procedure. In both cases, all different emission modes should be tested.

FCC and EU Microphone Requirements

QUESTION: We would like to know if professional grade wired condenser microphones are required to comply with FCC and EU rules and regulations. Please note that the microphone in question does not contain any digital circuitry or oscillators. Furthermore, we have been experiencing interference on this microphone when performing CE radiated immunity tests and we are soliciting advice on how to solve this problem.

ANSWER: In the US, wired microphones are exempt from FCC rules because of the definition of digital device under FCC Part 15.3(k) "An unintentional radiator (device or system) that generates and uses timing signals or pulses at a rate in excess of 9,000 pulses (cycles) per second and uses digital techniques; inclusive of telephone equipment that uses digital techniques or any device or system that generates and uses radio frequency energy for the purpose of performing data processing functions, such as electronic computations, operations, transformations, recording, filing, sorting, storage, retrieval, or transfer. A radio frequency device that is specifically subject to an emanation requirement in any other FCC Rule part or an intentional radiator subject to subpart C of this part that contains a digital device is not subject to the standards for digital devices, provided the digital device is used only to enable operation of the radio frequency device and the digital device does not control additional functions or capabilities". In Europe, wired microphones are required to comply with EN55103-1. You are entitled to claim an exemption to testing because the wired microphone is all analog. The EMC Directive does not mandate testing; its only requirement is that the emissions and immunity of the product are such that the "essential requirements" are met. There is no need for emissions testing in this case, but immunity testing would be required.

With respect to interference from CE radiated immunity testing, please try the following:

1. Change to Electret microphone capsule with internal bypassed capacitor.
2. If you use your own microphone, decouple and filter the microphone. If you can keep small loop areas on the printed circuit board, it will likely reduce the interference. Typically, the automatic gain control circuit when a microchip or transistor is used in the microphone can be very susceptible; they can change gain as a result of the 1 kHz AM modulated sine wave on the carrier from the generated radiated immunity field.
3. Wind several turns (between 7 and 10) of the microphone cable on to a large ferrite ring of about 75-100mm diameter. Keep the ferrite close to the microphone housing and do not overlap the turns. If the interference is at a higher frequency then use clamp on ferrites with high impedance at high frequency.

INTERNATIONAL UPDATE

US: FCC PROVIDES TEMPORARY RELIEF FROM HEARING AID COMPATABILITY REQUIREMENTS FOR WIRELESS CARRIERS OFFERING DUAL-BAND GSM HANDSETS

On September 9, 2005, the FCC released a Report and Order, WT Docket No. 01-309, which allows temporary, conditional relief from certain hearing aid compatibility requirements for carriers and manufacturers that offer dual-band digital wireless handsets that use the GSM air interface in both the 850 MHz cellular and 1900 MHz broadband PCS bands. The FCC's hearing aid compatibility rules require that, by September 16, 2005, wireless handset manufacturers must offer to carriers and that wireless carriers and service providers must offer to their customers at least two hearing aid-compatible handsets per air interface. In addition, nationwide (Tier I) wireless carriers must offer, per air interface, four hearing aid-compatible digital wireless handset models, or 25% of the total number of digital wireless handset models offered by the carrier nationwide must be hearing aid compatible, by September 16, 2005. Several manufacturers and organizations petitioned the FCC to delay this requirement due to technical problems. Hence, the FCC ruled that, until August 1, 2006, it will base the hearing aid compatibility compliance rating of dual-mode GSM handsets on their operation in the 1900 MHz band only. This action applies to all handset manufacturers, wireless carriers and service providers that offer dual-band GSM handsets that operate in both the 850 MHz and 1900 MHz bands.

In order for manufacturers to take advantage of the relief provided, the following actions must be taken:

1. Notify the FCC of their decision to avail themselves of the relief provided in the Report and Order in their hearing aid compatibility compliance reports due November 17, 2005.
2. Provide detailed information on the status of their efforts to provide dual-band handsets that will be hearing aid-compatible in the 850 MHz band as well as the 1900 MHz band in both their November 17, 2005, and May 17, 2006, hearing aid compatibility compliance reports.
3. Ensure a 30-day trial period or otherwise adopt an acceptable, flexible return policy for consumers seeking to obtain hearing aid-compatible GSM handsets
4. Take reasonable steps to make current technical and anecdotal information available to the public regarding the hearing aid compatibility of specific GSM handsets. [FCC Link](#)

EU: NEW STANDARDS RELEASED THIS MONTH

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

- EN 61280-2-10:2005 Fibre optic communication subsystem test procedures -- Part 2-10: Digital systems - Time-resolved chirp and alpha-factor measurement of laser transmitters CLC/SR 86C 2005- 09-08
- EN 61169-29:2005 Radio-frequency connectors -- Part 29: Sectional specification - Miniature radio frequency coaxial connectors model screw, snap-on, push-pull or quick-lock, slide-in (rack and panel applications) - Characteristic impedance 50 ohms (type 1,0/2,3) - 50 ohms and 75 ohms applications CLC/SR 46F 2005-09-08
- EN 61605:2005 Fixed inductors for use in electronic and telecommunication equipment - Marking codes CLC/SR 51 2005-09-07
- EN 61754-23:2005 Fibre optic connector interfaces -- Part 23: Type LX.5 connector family CLC/TC 86BXA 2005-09-01
- EN 61000-6-2:2005 Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards - Immunity for industrial environments CLC/TC 210 2005-08-26
- EN 60384-14-1:2005 Fixed capacitors for use in electronic equipment -- Part 14-1: Blank detail specification - Fixed capacitors for electromagnetic interference suppression and connection to the supply mains - Assessment level D CLC/TC 40XA 2005-08-26
- EN 60704-2-3:2002/A1:2005 Household and similar electrical appliances - Test code of the determination of airborne acoustical noise -- Part 2- 3: Particular requirements for dishwashers CLC/TC 59X 2005-08-23
- EN 50395:2005 Electrical test methods for low voltage energy cables CLC/TC 20 2005-08-19
- EN 50396:2005 Non electrical test methods for low voltage energy cables CLC/TC 20 2005-08-19 [Cenelec Link](#)

AUSTRALIA:ACMA VARIES LICENSE TO ALLOW SHORT-RANGE BROADBAND COMMUNICATIONS

On August 25, 2005 the ACMA (Australian Communications and Media Authority) modified the Radiocommunications (Low Interference Potential Devices) Class License 2000 (the LIPD class license) to allow equipment to operate in the 60 GHz spectrum band. This move brings Australian radio law into line with those in the United States, Canada and Japan, which allow unlicensed operation of transceiver devices in bands around 60 GHz.

Additionally, medical implant communications systems (MICS) and medical implant telemetry systems (MITS) are now also authorized under the LIPD class license. The use, marketing and supply of these devices require approval by the Therapeutic Goods Administration. Changes have also been made to remove uncertainty and duplication between the Radiocommunications (Spread Spectrum Devices) Class License 2002 (the spread spectrum class license) and the LIPD class license by revoking the spread spectrum class license. Other changes made to the LIPD class license include an expanded frequency range for low power transmitters in the 2.5 GHz band, and updated provisions for radio local area networks (RLANs) operating in the 5250-5350 MHz band. [ACMA Link](#)

INTERNATIONAL: CB SCHEME CERTIFICATES TO BECOME PUBLIC INFORMATION

The IECEE recently decided to make parts of IECEE CB Scheme test certificates publicly available. Currently, CB test certificate information is held in a central database. The IECEE is about to make some of this information available to the public via the web for a trial period of two years. This service will allow consumers to verify products carry valid CB Scheme certifications. The parts of the certificate available will include: reference number, name of issuer, date of issue, model and type of product and the IEC standard(s) referenced. The information will not apply retroactively but only to certificates issued after the online facility is created. [IECEE Link](#)

JAPAN: VCCI INTRODUCES "KIT MODULE" PROGRAM

Japan's VCCI (Voluntary Control Council for Interference from Information Technology Equipment) has changed some of operating rules and is now introducing a "kit module" program. The new program is designed to allow a level of confidence of emissions performance on a component basis rather than at the more usual level of a complete piece of equipment. For example, a kit module assessment might address the relative interference contribution of a memory module or an internal disk subsystem. The program is new and it remains to be seen how widely accepted and useful it becomes. [VCCI Link](#)

CANADA: MODIFICATIONS TO RSS-210 AND THE ADDITION OF TWO NEW STANDARDS

In September, Industry Canada released a new version of RSS-210 which sets out minimum requirements for the certification of low-power radio transmitters and receivers which are exempt from licensing. The document has changed from Issue 5 to Issue 6 and many important technical changes have been made (see link below for detail). Additionally, Industry Canada has introduced two new Radio Standards Specifications: RSS-310, Issue 1 which sets out requirements for license-exempt Category II radiocommunication equipment (i.e. equipment not requiring certification) and RSS-Gen, Issue 1 which comprises all testing, administrative, certification and general technical requirements common to all or most Radio Standards Specifications. Under RSS-Gen, Issue I, Canada has now implemented a limited modular approval. Previously, Canada only allowed the equivalent to the FCC's full modular approval. [Industry Canada 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.

A special thank you to those who have recommended and contributed articles for our newsletter. Please continue to forward new and interesting material to our attention: multipoint@rheintech.com. We respect the privacy of our customers and colleagues. If you would like to cancel your MultiPoint updates, please follow the instructions at the end of this email. The information in the MultiPoint update is subject to change without notice.

[Learn More](#)

email: multipoint@rheintech.com
phone: 703-689-0368
web: <http://www.rheintech.com>

Last revised: September 14, 2005