MultiPoint
A Rhein Tech EMC Regulatory Update

November 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.

Composite Filing for FHSS/DSSS Device

QUESTION: We have a device that is both FHSS (Bluetooth) and DSSS (802.11b/g). Is it necessary to create a composite filing under FCC Part 15.247 when both devices fall under the same rule part? We have found an example of where it is not necessary to apply a composite filing: Part 22/24 (cell phones) do not require composite filing even though there are two different rule parts (Part 24E and Part 22H), and two possible equipment codes (PCE and TNE). Applying for a composite filing for our FHSS/DSSS device seems to be an unnecessary expense for us and may be an inconsistent policy by the FCC. Please provide clarification

ANSWER: When devices, under Part 15 transmitters, are filed under two different equipment codes, the filing must be a composite filing. If possible, ask your TCB to file the FHSS Bluetooth low power device under the same equipment code as the WLAN device. Both FHSS and DSSS devices may comply with the requirements for a digital transmission system under FCC Part 15.247. If this is the case, your TCB could use the same equipment code (DTS) and apply as a non-composite filing.

FCC Part 90 Requirements for Digital Radios

QUESTION: Our firm manufactures a 64 Kbps digital radio and we intend to have it FCC certified. What are the FCC requirements under FCC Part 90 for such radios?

ANSWER: The FCC allows transmitters operating under FCC Rule Part 90, (Business, Industrial and Public Safety) Section 90.203(j)(3), to meet a minimum spectrum efficiency for voice of one voice channel per 12.5 kHz of channel bandwidth and a minimum data rate of 4,800 bits per 6.25 kHz of channel bandwidth. Other technical requirements under Part 90 are for frequency stability, under Section 90.213; transient frequency behavior, under Section 90.214; and station power limits, under Section 90.205. There are no baseband/format requirements for digital modulation. The certification procedure as outlined in Part 2.1033(c) should be followed.

RMS Measurements of an Ultra Wide Band Device

QUESTION: We would like to know how to make RMS measurements for Ultra Wide Band (UWB) devices with an analyzer that does not have an RMS detector.

ANSWER: The best approach is to use an analyzer that incorporates a true RMS detector. Both Agilent (PSA Series Spectrum Analyzer) and Tektronics make an analyzer with this capability. In order to obtain the maximum 1 millisecond (ms) integration time, the ((sweep time)/number of points), should be less than or equal to 1 ms. The default number of points (also referred to as bins) on some analyzers is 601 points (pts). Some analyzers allow you to choose the number of points. If the analyzer is set at 601 pts, the sweep time should be set to 601 ms or less, so as not to exceed the 1 ms maximum integration time. When making these measurements, trace averaging should not be used since this would further average the data that is obtained from the RMS detector. If an analyzer does not incorporate a true RMS detector, there is a method described in Appendix F, paragraph (3) in the First Report and Order (FCC 02-48) from the FCC for obtaining RMS values using analyzers that do not have RMS detector capabilities. The first step in such a measurement is to perform a peak detection scan of the spectrum with a resolution bandwidth (RBW) of 1 MHz and a video bandwidth (VBW) of at least 1 MHz. From the resulting trace, identify the frequencies and bandwidths associated with the five (5) highest peak levels measured. With the analyzer tuned to each of these five peak frequencies, perform a zero span measurement, using a RBW of 1 MHz and a VBW of at least 1 MHz and employing the analyzer's sample detector. The sweep rate should be set to 1 ms. The trace data produced by this measurement must be retrieved (via a GPIB interface and appropriate software, e.g., Agilent's Bench link or comparable software) and stored. These (time, amplitude) data points must then be post-processed to determine RMS average by the following method:

1. Converting each amplitude point from dBm to uV.
2. Squaring the result of step 1.
3. Summing the converted and squared amplitude points.
4. Dividing by the number of samples (at least 10 samples necessary, note one sweep of the Agilent 864x will produce 601 samples).
5. Taking the square root of the sum.

This will yield RMS average power in uV which then can be converted back to dBm for comparison to the limits. This post processing can be performed manually; however, it is less cumbersome to utilize a spread sheet or customized software routine to perform the calculations. When obtaining RMS values with either method describe and/or provide the formula used to post-process the data with the Certification filing if requested.

Access Point With PCMCIA Slot

QUESTION: We have an access point, falling under FCC Part 15.247, which also contains a PCMCIA slot intended for co-location use with licensed devices. The grant for the PCMCIA card was approved for portable use in laptops only with non- co-location requirements. We would like to know if our configuration could be approved with a Permissive Change to the PCMCIA device only.

ANSWER: This configuration concerns certain desktop, wall-mount, etc. final-products (mobile RF exposure conditions where persons are normally 20 cm or more away from the device), which contain one built-in part 15 transmitter typically operating in 15.247 (2.4-2.482, 5.725-5.85 GHz) and/or 15.407 (5.15-5.35, 5.725-5.825 GHz), such a configuration is typically intended to serve gateway and/or backbone functions between 802.11abg-WLANs and WWANs (Wireless Wide Area Networks). For the WAN part, it is understood that such "gateway" products are intended always to be used with end-user-plug-in integral-antenna radio cards (e.g., PCMCIA, Card bus, Compact Flash, etc.), operating in licensed radio services (e.g., FCC Parts 22 and/or Part 24, Part 27, Part 90; and some Part 21, and Part 74), for which most presently-available certified cards have certification applications in accordance with the FCC's 3-host SAR test procedure to support use in certain portable RF exposure conditions. The Grantee for the Part 15 gateway-device is responsible to ensure compliance with the FCC's rules for intended and expected end-use configurations. The FCC may allow the Certification application if the application document configuration conditions and/or specific radio cards, including measurement data where appropriate, to ensure compliance with applicable FCC Part 15, licensed-service, and RF exposure (mobile condition) rules.

INTERNATIONAL UPDATE

US: FCC MODIFIES DIGITAL TUNER REQUIREMENTS TO ADVANCE DTV TRANSITION

On November 3, 2005, the FCC amended its rules to move the date on which all TV receivers must include the capability to receive digital television signals forward four months to March 1, 2007 and to apply the tuner requirement to all television receivers, regardless of their size. This action is intended to further the FCC's efforts to ensure that consumers are able to receive off-the-air digital broadcast television services as soon as possible. The digital television reception requirement, which is also often termed the DTV tuner requirement, is being implemented on a schedule that applies it first to large screen receivers and then to progressively smaller screen sets and other devices that receive TV signals, such as VCRs and digital video recorders. On July 1, 2004, the tuner requirement was applied to 50% of large sets (screen sizes 36" and larger), and last July (July 1, 2005), the tuner requirement was applied to all large sets and to 50% of mid-size sets (25"-36"). Beginning March 1, 2006, DTV tuners will be required in all mid-size sets as well. This final step of the phase-in plan will now require that all new TV sets in all size ranges and other TV receivers include a DTV tuner beginning March 1, 2007. (Previously, the deadline for small sets (13"- 24") and for other TV receivers was July 1, 2007). The FCC also extended the DTV tuner requirement to new TV receivers screen sizes less than 13" on the same schedule as other TV receivers. (Previously, the tuner requirement did not apply to very small sets, smaller than 13").

- **FCC Link**

EU: NEW STANDARDS RELEASED THIS MONTH

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

- EN 60947-6-1:2005: Low-voltage switchgear and control gear -- Part 6-1: Multiple function equipment - Transfer switching equipment
- EN 60695-9-1:2005: Fire hazard testing -- Part 9- 1: Surface spread of flame - General guidance
- EN 61162-402:2005: Maritime navigation and radiocommunication equipment and systems - Digital interfaces -- Part 402: Multiple talkers and multiple listeners - Ship systems interconnection - Documentation and test requirements
- EN 60079-15:2005: Electrical apparatus for explosive gas atmospheres -- Part 15: Construction, test and marking of type of protection "n" electrical apparatus
- CLC/TR 50456:2005: Guidelines to achieving compliance with EC directives for alarm systems
- EN 60384-6:2005: Fixed capacitors for use in electronic equipment -- Part 6: Sectional specification - Fixed metallized polycarbonate film dielectric d.c. capacitors
- EN 60384-6-1:2005: Fixed capacitors for use in electronic equipment -- Part 6-1: Blank detail specification - Fixed metallized polycarbonate film dielectric d.c. capacitors - Assessment level E
- EN 61967-2:2005: Integrated circuits - Measurement of electromagnetic emissions, 150 kHz to 1 GHz -- Part 2: Measurement of radiated emissions - TEM cell and wideband TEM cell method
- EN 60335-2-8:2003/A1:2005: Household and similar electrical appliances - Safety -- Part 2-8: Particular requirements for shavers, hair clippers and similar appliances
- EN 60335-2-15:2002/A1:2005: Household and similar electrical appliances - Safety -- Part 2-15: Particular requirements for appliances for heating liquids

- **Cenelec Link**

CANADA: NEW REVISION OF RSS-102, RF EXPOSURE COMPLIANCE

On November 12, 2005, Industry Canada released a new version of Radio Standards Specification 102 , Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) which sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radio communication apparatus designed to be used within the vicinity of the human body. The first issue of RSS-102 (1999) outlined Industry Canada's evaluation procedures used by certification applicants to declare compliance of mobile and portable radio transmitters with the radio frequency exposure limits established in Health Canada's Safety Code 6. Since the original publication, technological advancements have resulted in radio communication apparatus that are more versatile, easier to use and provide a range of new services. With the introduction of new technologies comes the need for updated regulatory requirements. RSS-102, Issue 1 has been revised to cover new equipment and also to mandate the use of standard internationally recognized measurement techniques and to modify compliance methods under certain circumstances.

- **Link to new RSS-102**

CANADA: RELEASE OF RSS-243, ACTIVE MEDICAL IMPLANTS

On November 12, 2005, Industry Canada also released Radio Standards Specification 243, Issue 2, Active Medical Implants Operating in the 402-405 MHz Band, which sets out the minimum certification requirements for devices using new and emerging technologies for medical applications including:

- external transceivers (programmers/controls) that incorporate frequency agile interference avoidance systems and transceivers internal to the human body (active medical implants) that radiate radio frequency energy from within the human body; and
- external receivers that rely on single-frequency, low duty cycle, redundant-code repetitive-transmission interference avoidance systems and transmitters internal to the human body (active medical implants) that radiate radio frequency energy from within the human body.

RSS-243, Issue 2, must be used in conjunction with RSS-Gen, General Requirements and Information for the Certification of Radiocommunication Equipment, for general specifications and information relevant to the equipment for which this Standard applies.

- **Link to RSS-243**

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

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