

From: Terry Mahn <TGM@fr.com>  
To: Steve Anderson <Steve.Anderson@cobham.com>  
Subject: FW: Test Procedure Question

Steve,

I think this resolves the issue. Please let me know if you or Tim have any additional questions...Terry

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**From:** Steve Jones [mailto:Steve.Jones@fcc.gov]  
**Sent:** Wednesday, August 17, 2011 5:50 PM  
**To:** Terry Mahn  
**Cc:** Rashmi Doshi; Andrew Leimer  
**Subject:** RE: Test Procedure Question

Hi Terry,

We now have internal clarification on this subject and I can confirm the measurement guidance previously issued. As stated previously, we prefer average power measurement techniques be used for devices operating under both 90.205(o) and (p).

90.205(o) specifies the limit in terms of maximum transmitter output power which we have previously interpreted to mean the maximum average power measured over the fundamental emission bandwidth.

90.205(p) refers to 90.1215 regarding output power limits for operations in 4940-4990 MHz. 90.1215 specifies the limit in terms of "the maximum conducted output power" which again we have previously interpreted to mean the maximum average power measured over the fundamental emission bandwidth.

90.1215 also specifies a PSD limit for "high power" devices ( $\geq 20$  dBm total output power) which is stated as "a peak power spectral density limit of 21 dBm/MHz". I suspect that this requirement is what has led to the confusion. We have previously interpreted that compliance to this requirement be demonstrated with an average power measurement. In this case the word "peak" refers to the particular 1 MHz segment where the maximum average PSD occurs rather than the true peak power per MHz. This interpretation is consistent with how we have handled other rule parts where similar language is used (e.g., UNII).

Best Regards,  
Steve

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**From:** Terry Mahn [mailto:TGM@fr.com]  
**Sent:** Tuesday, August 09, 2011 3:56 PM  
**To:** Steve Jones  
**Cc:** Rashmi Doshi; Andrew Leimer; Terry Mahn  
**Subject:** RE: Test Procedure Question

Hi Steve,

Sorry to bother you further on this matter but our client's TCB asked me to confirm specifically, that an RMS detector can be used for the power measurement requirements of 90.205 (o) and (p) for the types of devices described in my earlier email – i.e. 2.4 GHz and 4.9 GHz digital mobile video transmitters using OFDM modulation in user-selectable bandwidths between 1.25 MHz and 8 MHz. Thanks again for your assistance on this. Best regards.

Terry

**From:** Steve Jones [mailto:Steve.Jones@fcc.gov]  
**Sent:** Friday, August 05, 2011 11:04 AM  
**To:** Terry Mahn  
**Cc:** Rashmi Doshi; Andrew Leimer  
**Subject:** RE: Test Procedure Question

Hi Terry,

Sorry about the delay in responding. We agree that average power is the correct parameter to be measured for comparison to the limit in the case of the device that you describe and that the power averaging (RMS) detector is the appropriate detector to use. Please see KDB 971168 for measurement guidance.

Best Regards,  
Steve

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**From:** Terry Mahn [mailto:TGM@fr.com]  
**Sent:** Thursday, August 04, 2011 2:29 PM  
**To:** Steve Jones  
**Cc:** Terry Mahn; Rashmi Doshi  
**Subject:** Test Procedure Question

Hi Steve,

This is to follow up a voice mail message that I left for you earlier today. I am trying to determine the appropriate detector to be used for measuring emissions from a digital mobile video transmitter to be authorized under the Part 90 rules. The device will operate in the 2.4GHz band (a similar device will operate in the 4.9GHz band) at approximately 1 watt of output power, in user-selectable bandwidths between 1.25 MHz and 8 MHz, using OFDM technology.

As I read the Part 90 rules, it appears that an RMS detector is permitted to be used for measuring emissions from transmitters of this type. For example, Rule 90.210 allows emissions to be "expressed in average values" unless otherwise restricted to peak.

Inasmuch as the 2.5GHz band in the Industrial Radio Pool (see Rule 90.35) is not expressly restricted to peak limits it would appear that an RMS detector can be used for transmitters operating in this band. Similarly, Rule 90.1215 governs the output power of 4.9GHz band transmitters and allows measurements using "instrumentation calibrated in terms of an RMS-equivalent voltage" (see Rule 15.1215(c)). Finally, I note that KNB 971168 sets forth the recommended test procedures for digital wideband (over 1MHz) transmitters and specifically provides for "average power" measurements to be made unless an applicable rule part requires peak.

We are planning to discuss this issue with one of the TCBs in the next few days so it

would be helpful if you could confirm that our client's device, as described above, can be measured using an RMS detector. Please let me know if you need any additional information regarding this matter. Best regards.

Terry  
Terry Mahn  
Managing Principal, D.C. Office

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