

Chris Harvey

From: SunHee Kim (HCT) [alondra@hct.co.kr]
Sent: Tuesday, August 26, 2008 4:12 AM
To: charvey-tcb@ccsemc.com; Chris Harvey
Cc: Nam-Wook Kang (HCT); Sang-Jun Lee (HCT); '□□□ □□(HCT)'; lucy.tsai@ccsemc.com; charvey-tcb@ccsemc.com
Subject: Re: AXESSTEL INC., FCC ID: PH7MV420A, Assessment NO.: AN08T8291 & AN08T8292, Notice#1
Attachments: WLAN Test Report_MV420A_Rev.1.pdf

Hello Chris,

Thank you for your comment.
I was informed by our RF Engineer like below for this project.

We used spectrum analyzer to measure output power with RBW=VBW=3MHz, Detector Mode=Peak and Trace=Maxhold.

We actually followed Method #1, but didn't use 1 MHz of RBW, because we thought 1 MHz of RBW is too small to measure WLAN device.

So, according your comment, we re-measured the output power. I'm sorry to make confuse you.

If you have more comments, please let me know asap.

Best Regards,
SunHee Kim

----- Original Message -----

From: Chris Harvey
To: '□□□'; charvey-tcb@ccsemc.com
Cc: charvey-tcb@ccsemc.com; lucy.tsai@ccsemc.com; '□□□ (HCT)'; '□□□ □□(HCT)'; '□□□ □□(HCT)'
Sent: Friday, August 22, 2008 8:28 PM
Subject: RE: AXESSTEL INC., FCC ID: PH7MV420A, Assessment NO.: AN08T8291 & AN08T8292, Notice#1

Dear i-Young Lim, thank you for your reply. The test report is confusing and does not contain much detailed description of the Power Measurement procedure. I am sorry that I indicated 2MHz RBW in the last e-mail, and I now see that the plot has 3MHz RBW and 2MHz VBW. However, the diagram still shows a power meter. I am attaching the link for the FCC's DTS Measurement procedure. Please provide a more detailed description of the RF Power measurements, indicating which method of the FCC Guidance you have used:

<http://fjallfoss.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=21124&switch=P>

Section 15.247(b) – Power output.

This is an RF conducted test. Use a direct connection between the antenna port of the transmitter and the spectrum analyzer, through suitable attenuation. Power Output Option 1 is a peak measurement. Power Output Option 2 is the same procedure used for UNII output power measurements. Either option can be used for DTS devices.

Power Output Option 1

Set the RBW greater than 6 dB bandwidth of the emission or use a peak power meter.

Power Output Option 2

Power output measurement allowed per Section 15.247(b)(3).

In the following, "T" is the transmission pulse duration over which the transmitter is on and transmitting at its maximum power control level. Measurements are performed with a spectrum analyzer. Three methods are provided to accommodate measurement limitations of the spectrum analyzer depending on signal parameters. Set resolution

bandwidth (RBW) = 1 MHz. Set span to encompass the entire emission bandwidth (EBW) of the signal. Use automatic setting for analyzer sweep time (except in Method #2). Check the sweep time to determine which procedure to use.

- If sweep time $\leq T$, use Method #1 -- spectral trace averaging -- and sum the power across the band. Note that the hardware operation may be modified to extend the transmission time to achieve this condition for test purposes. (Method #1 may be used only if it results in averaging over intervals during which the transmitter is operating at its maximum power control level; intervals during which the transmitter is off or is transmitting at a reduced power level must not be included in the average.)
- If sweep time $> T$, then the choice of measurement procedure will depend on the EBW of the signal.

- If $EBW \leq$ largest available RBW on the analyzer, use Method #2 -- zero-span mode with trace averaging -- and find the temporal peak.

(Method #2 may be used only if it results in averaging over intervals during which the transmitter is operating at its maximum power control level; intervals during which the transmitter is off or is transmitting at a reduced power level must not be included in the average.)

- If $EBW >$ largest available RBW, use Method #3--video averaging with max hold and sum power across the band.

Method #1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz.
3. Set VBW \geq 3 MHz.
4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display) $<$ 0.5 RBW. Otherwise use peak detector mode.
5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to "free run".
6. Trace average 100 traces in power averaging mode.
7. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

Method #2

1. Set zero span mode. Set center frequency to the midpoint between the -26 dB points of the signal.
2. Set RBW \geq EBW.
3. Set VBW \geq 3 RBW. [If VBW \geq 3 RBW is not available, use highest available VBW, but VBW must be \geq RBW]
4. Set sweep time = T
5. Use sample detector mode.
6. Use a video trigger with the trigger level set to enable triggering only on full power pulses.
7. Trace average 100 traces in power averaging mode.
8. Find the peak of the resulting average trace.

Method #3

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set sweep trigger to "free run".
3. Set RBW = 1 MHz. Set VBW \geq 1/T

4. Use linear display mode.
5. Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode.
6. Set max hold.
7. Allow max hold to run for 60 seconds.
8. Compute power by integrating the spectrum across the 26 dB EBW or apply a bandwidth correction factor of 10 log (EBW/1 MHz) to the spectral peak of the emission. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

Best regards,

Chris Harvey

From: □□□ [mailto:lgy0213@hct.co.kr]
Sent: Friday, August 22, 2008 1:47 AM
To: charvey-tcb@ccsemc.com
Cc: charvey-tcb@ccsemc.com; lucy.tsai@ccsemc.com; '□□□ (HCT)'; □□□ □□(HCT); □□□ □□(HCT)
Subject: FW: AXESSTEL INC., FCC ID: PH7MV420A, Assessment NO.: AN08T8291 & AN08T8292, Notice#1

Dear Sir,

We attached the revised documents and replies are embedded below your questions.

If you have any further questions, please let me know.

HCT CO.,LTD

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----- Original Message -----

From: <charvey-tcb@ccsemc.com>

To: <alondra@hct.co.kr>

Cc: <charvey-tcb@ccsemc.com>; <lucy.tsai@ccsemc.com>

Sent: Friday, August 22, 2008 4:45 AM

Subject: AXESSTEL INC., FCC ID: PH7MV420A, Assessment NO.: AN08T8291 & AN08T8292, Notice#1

➤ Dear SunHee Kim,

>

> You are listed as the Technical Contact for the above referenced TCB application. The following item(s) need (s) to be resolved before the review can be continued:

>

> AN08T8291

> The Users Manual contains a Body-Worn paragraph, which explains the use of this device when worn on the body, and used with clips and similar accessories. This explanation does not apply to this device which is used on a table top, and has been SAR tested for Near Body (2cm) operation. Please revise this Body-Worn paragraph, to be for Near Body operation, and removes statements about clips and accessories, but instead informs the user to keep the transmitting antennas at least 2cm from the body.

➔ Please find the revised User Manual.

>

> AN08T8292

> The WLAN test report documents RF Power Measurements with a diagram of test setup that includes a power meter, but also includes Spectrum Analyzer plots. The signals are 11 and 16 MB wide, but are measured using RBW of 2MHz, which is too small to measure power of such wide signals. Please either explain how this meets the measurement procedures, or re-measure the RF power of these signals.

➔ We measured using RBW of 3 MHz.

The testing was performed based on "Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005"

As far as we know, many other testing labs are measuring like us.

If it is not acceptable please let us know, we are willing to re-measure it.

>

> The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 30 days of the original e-mail date may result in application dismissal and forfeiture of the filing fee. Also, please note that partial responses increase processing time and should not be submitted. Any questions about the content of this correspondence should be directed to the e-mail address listed below the name of the sender.

>

> Best regards,

>

> Chris Harvey

> Charvey-tcb@ccsemc.com

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