

Dward ATCB

From: Kwok Chan [Kwok.Chan@fcc.gov]
Sent: 11/16/2006 6:12 AM
To: Dward ATCB; David Case (davecase); Rashmi Doshi; Joe Dichoso
Cc: Kwok Chan
Subject: RE: Question (802.11 0.5 dB clarifications)

Dennis & Dave:

As indicated in my earlier replies, if the device test configurations/conditions and requirements are different for SAR, EMC or HAC, the output power measurements under such circumstances would be different. If the same configurations are used, the numbers are expected to agree within good tolerances. Therefore, certain additional considerations are necessary (if feasible) in order for numbers measured under different circumstances to be comparable.

Also note that the 5% in your item 2C is for a different purpose, to ensure test device is within 5% of maximum output among production line units. It is not related to power measurements using the same setup by the same laboratory for the current situation to check *variations in output power of different device operating modes for SAR testing*, which is the intent and goal of the 0.5 dB for both the 3G and 802.11 SAR procedures. This was also explained in the October 2006 TCB training/presentation/workshop – not to chase after numbers within measurement tolerance range.

Joe Dichoso will be the point of contact on providing further clarification and guidance on the 3 items you have identified below.

Kwok Chan

From: Dward ATCB [mailto:dward@atcb.com]
Sent: Wednesday, November 15, 2006 3:23 PM
To: Kwok Chan; 'David Case (davecase)'; Rashmi Doshi; Joe Dichoso
Subject: RE: Question

Hi All

Please note the slides from TCB training.

- 1 Slide 29 from presentation "4 - 0512054 MP - HAC Review" May -2005. This slide says the power levels from HAC?SAR and EMC are to 'agree'. The only guidance on what "agree" means is from the FCC statement dealing with power that 0.5dB conducted and 3dB erp/eirp is expected.
- 2 From the OET SAR checklist
"Output power"
 - a. Powers in SAR report must agree with EMC report and tune-up procedure
 - b. **Conducted power in SAR report should be greater than or equal to what's in EMC report,** but not exceeding tune-up/tolerance
 - c. **Scaling up or down 5% is allowed...**
- 3 Other emails and communications during training etc indicates that TCB approval of SAR needs to have powers reported in SAR/EMC within 0.5dB conducted and 3dB erp/eirp.

Clear guidance would be appreciated
Thanks

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From: Kwok Chan [mailto:Kwok.Chan@fcc.gov]
Sent: 11/14/2006 9:11 AM
To: dward@atcb.com; David Case (davecase); Rashmi Doshi; Joe Dichoso
Subject: RE: Question

Dennis & Dave:

Can you identify the source of the following 0.5 dB "[SAR measurement & RF exposure requirements](#)" so that we can address the issues appropriately (TCB training, other documented procedures etc)?

(Dave)

TCB restriction that they cannot evaluate a SAR report if the power measured between the SAR power test and EMC power test is greater the 0.5dB.

(Dennis)

Will the FCC allow a TCB to certify a device where the power measurements between the EMC and SAR report exceed 0.5dB especially if the SAR is lesser in power measured?

If this is so, isn't this a different stand than in the past where the 0.5dB or less was expected to exist.

The question then also becomes – how relevant then is the FCC requirement of conducted power measurements on PC2s being within 0.5dB of the original as it would seem the same logic should apply.

Please also note that there was a subsequent reply I sent that may address some of the concerns regarding differences in SAR and EMC requirements (attached).

Kwok Chan

From: dward ATCB [mailto:dward@atcb.com]
Sent: Monday, November 13, 2006 11:02 PM
To: Kwok Chan; 'David Case (davecase)'; Rashmi Doshi; Joe Dichoso
Subject: RE: Question

Hi Kwok

The issue then only becomes, will the FCC allow a TCB to certify a device where the power measurements between the EMC and SAR report exceed 0.5dB especially if the SAR is lesser in power measured? If this is so, isn't this a different stand than in the past where the 0.5dB or less was expected to exist. The question then also becomes – how relevant then is the FCC requirement of conducted power measurements on PC2s being within 0.5dB of the original as it would seem the same logic should apply.

Please give clear guidance on this issue as it has come up a number of times and the FCC has consistently want the 0.5dB or less. Can a TCB certify a device where more than 0.5dB exists between the SAR and EMC and where the SAR is the lesser power.

Thanks

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From: Kwok Chan [mailto:Kwok.Chan@fcc.gov]
Sent: Monday, November 13, 2006 9:27 AM
To: David Case (davecase); Rashmi Doshi; Joe Dichoso
Cc: Dennis Ward
Subject: RE: Question

The document is for SAR only; it contains no EMC procedures. Therefore, it would be incorrect to assume any sort of comparison between EMC and SAR power measurements. In certain situations, depending on the test mode signal used and other test parameters, the power measurement required for EMC purposes may not necessarily be the same as that required for SAR. It happens to be the same, then it would be the same measurement and there is nothing to compare. For SAR purposes, continuous time-averaged power is the parameter of interest, which can be easily and accurately measured with an appropriate power meter or a suitable spectrum analyzer. The 0.5 dB mainly accounts for how good a specific laboratory can measure the time-averaged output power at the antenna port of a device using appropriate equipment so that we don't have to chase after numbers within the measurement tolerance range; that is, measurement repeatability. How numbers compare across labs using similar or different equipment is reproducibility (or inter-laboratory comparison) which is not addressed by this document. During the development of IEEE 1528 about 5 years ago, it was acknowledged that output power at the antenna port can be accurately measured to about 0.3 dB. To give some consideration for cables and connectors etc., 0.5 dB was selected.

From: David Case (davecase) [mailto:davecase@cisco.com]
Sent: Monday, November 13, 2006 11:56 AM
To: Kwok Chan; Rashmi Doshi; Joe Dichoso
Cc: Dennis Ward
Subject: Question

All

Looking at the 802.11 SAR procedures for TCB's the allowed power measurement difference between EMC test and SAR test is +0.5dB. This test measurement difference is more likely to occur if two different labs were to do the measurements.

For 802.11 radios the actual specifications of operation over temperature, the power variation can be as high as +2dB though +- 1dB is more nominal..

We have a case where the measured power difference between our internal test lab and the external lab is 0.87dB difference. This raises a problem for the TCB since it is greater than 0.5dB but it is within the tolerance difference of the radio operation specification as well as within the measurement uncertainty of most test equipment.

Therefore Cisco believes a more realistic power measurement tolerance of +-1dB should be allowed for 802.11 radios between the measured SAR and EMC portion.

Regards

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