

## Mike Kuo

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**From:** Claire Hoque  
**Sent:** Wednesday, June 21, 2006 4:55 PM  
**To:** Mike Kuo  
**Cc:** Christine Vu; Chi Tsou; Michael Heckrotte  
**Subject:** answer: ATHEROS COMMUNICATIONS, INC., FCC ID: PPD-AR5BXB72, Assessment NO.: AN06T5878, Notice#1 ( updated )

**Attachments:** 06U10365-1B FCC DTS REPORT.pdf; Operational Description(revised).pdf



06U10365-1B FCC Operational  
DTS REPORT.pdf... Description(revise...)

Hi Mike,

Pls see answer below.

Question #1: Operation description indicates the chipset that are implemented in this device is AR541X/21XX which does not agree with the chipset number indicated in the photos and test report. Please explain and make necessary correction.  
<answer> pls see revised Operation description.

Question #2: FCC is no longer required 5.15-5.25 GHz band to use integral antenna. You may consider to remove integral antenna requirement in page 28 item 5 of user manual. Please note : No instruction to be provided to the end user in removing / installing the device still applicable.

<answer> Point is noted. No action is taken from client.

Question #3: 6 dB Bandwidth measurement for 802.11b(L/M/H) and 802.11g-low channel / chain 0 does not comply with DTS measurement procedure. FCC requires the RBW=100 kHz but 180 kHz was used. Please redo the measurement and submit the plots.

<answer> pls see revised report.

Question #4: Section 7.1.3 of test report, since option 2 of alternate DTS output power measurement procedure is used, please change your power table header from " Peak " to " RMS Averaging".

<answer> pls see revised report.

Question #5 : Please describe the mode of transmission during radiated emission tests. Were both transmitting antenna activated during the investigation ?  
<answer> pls see revised report.

Thanks,

Claire

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

From: Mike Kuo  
Sent: Wednesday, June 21, 2006 2:24 PM  
To: Claire Hoque; Michael Heckrotte  
Cc: Christine Vu; Chi Tsou  
Subject: FW: ATHEROS COMMUNICATIONS, INC., FCC ID: PPD-AR5BXB72, Assessment NO.: AN06T5878, Notice#1

DTS portion:

Question #1: Operation description indicates the chipset that are implemented in this device is AR541X/21XX which does not agree with the chipset number indicated in the photos and test report. Please explain and make necessary correction.

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Question #5 : Please describe the mode of transmission during radiated emission tests. Were both transmitting antenna activated during the investigation ?

FYI : Based upon FCC MIMO review guideline, the following guideline in determining the antenna gain should be used when MIMO device is in legacy mode :

"when operating in legacy mode, the gain to use was the sum of the gains of the individual antennas (gain dBi +  $10\log(N)$ , where N was the number of transmit chains). In 802.11n mode, the individual transmit chains send different data and so there is no coherency between the streams, hence the use of the single antenna gain without the need to sum the gains of the individual antennas. In legacy mode, an 802.11n device uses a cyclic diversity to attempt to ensure that there is no coherency between the data streams each transmit chain, however the training provided stated that the total gain has to be calculated as the sum of all the individual (numeric) antenna gains "

The antenna gain as disclosed in the test reports are :

PIFA antennas (maximum gain is 3.62 dBi in the 2.4 GHz band and 4.76 dBi in the 5.8 GHz band) or a set of three identical Monopole antennas (maximum gain is 1.5 dBi in the 2.4 GHz band and 4.4 dBi in the 5.8 GHz band).

The max. combined gain @2.4GHz band is : $3.62+(10\log2)=6.62$  dBi. The output power limit should be 29.38 dBm ( Legacy mode ) The max. combined gain @5.8GHz band is : $4.76+(10\log2)=7.76$  dBi. The output power limit should be 28.24 dBm ( legacy mode )

As indicated in test report, the highest combined output power are 23.74 dBm @2.4 GHz band and 20.22 dBm @ 5.8 GHz band. This device complied with output power limits.

Best Regards

Mike Kuo

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.