Louis A. Feudi

From: Al Patrick [apatrick@cirronet.com]
Sent: Monday, August 20, 2007 2:05 PM
To: Lfeudi@ustech-lab.com
Subject: FW: ZMN2430HP Module certification
Importance: High

Lou, below is the conversations with Joe Dichoso at the FCC on the on the shape and length of the micro strip lines.

Now you have the whole picture.

Al Patrick

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From: Mark Tucker
Sent: Monday, August 13, 2007 11:48 AM
To: Al Patrick
Subject: ZMN2430HP Module certification

Al,

Here is the whole stream regarding the multiple Microstrip testing scheme we've used on the ZMN2430HP. Start at the bottom and work up.

Mark

From: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov]
Sent: Thursday, March 09, 2006 10:19 AM
To: Mark Tucker
Cc: Paul Maziarczyk; Tim Cutler; Steven Dayhoff; Joe Dichoso
Subject: RE: Tracking number 539509

Mark,
I took another quick look. The only other issue that needs elaboration is the OEM instructions on the shape and length of the micro strip line and what tests you will perform to ensure that the range of installations would ensure compliance. You can prescan different shapes and sizes to check for compliance.

If the only construction is a straight microstrip line with various lengths the OEM instructions should make it clear and testing easier.

-Joe

*** Non-Public: For Internal Use Only ***

-----Original Message-----
From: Mark Tucker [mailto:mtucker@cirronet.com]
Sent: Thursday, March 09, 2006 10:01 AM
To: Joe Dichoso
Cc: Paul Maziarczyk; Tim Cutler
Subject: RE: Tracking number 539509

Joe,

Thanks for the reply. Yea, I knew this proposal might be a little involved and take a few days to resolve. I just wanted to make sure you had it in hand. Let me know if any of my points aren't clear or need further elaboration.

Regards,

Mark

From: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov]
Sent: Thursday, March 09, 2006 9:45 AM
To: Mark Tucker
Subject: RE: Tracking number 539509

Mark,
Yes, it was received. A quick look at it looks like it needs discussion with several staff so this one may take some time.
Joe

-----Original Message-----
From: Mark Tucker [mailto:mtucker@cirronet.com]
Sent: Wednesday, March 08, 2006 6:07 PM
To: Joe Dichoso
Subject: Tracking number 539509

Joe,

Sorry to bother you about a housekeeping item, but I need to make sure a reply I submitted to your lab-help web site made it into the system and I didn't know who else to contact to find out.

I submitted a question to the lab-help site early last week and received a tracking number of 539509. OET replied within two days asking for more detail on a few of my points. I then replied to those questions using the "reply comments" section of the web site last Friday (3/3).

I haven't heard a reply since then and just wanted to make sure my reply comments were actually received. It's fine if you're still chewing over the answer – I just wanted to make sure my reply made it to OET's office.

Thanks,

Mark

From: Bessie Bordenave [mailto:Bessie.Bordenave@fcc.gov]

Sent: Thursday, February 23, 2006 3:08 PM
To: Mark Tucker
Subject: RE: Modular Approval for a 15.247 device soldered on OEM's support board

You should submit this inquiry through our Knowledge Database System at: www.fcc.gov/labhelp. After submitting the inquiry, you will receive a tracking number for future use concerning this inquiry.

We (Cirronet) would like to obtain module approval for a Zigbee module coming out later this year.

This module will be designed to be compliant as a DTS under 15.247. The module itself is very small – roughly 1 inch by 0.5 inch - and is designed to be soldered directly on to an OEM's support board. Per the modular approval rules, our module is designed to have the following features:

1) RF shield is provided around the module

2) All data/modulation inputs are buffered

3) The module has its own internal power regulation

4) The module employs a "unique" antenna connection – a solder pad on the back side of the board that must be soldered to the OEM's support board

5) The module would be tested in the same configuration as the OEM would use it without added shielding or other emissions-reducing circuitry added

6) The module would have the appropriate FCC ID on the top shield

7) These modules are only sold to OEM industrial monitoring and control customers. A detailed operating manual is included with the sale of each module that outlines correct usage of the module.

8) Standard SAR measurements/calculations will be made as part of the testing. Appropriate MPE warnings/alerts will be in the manual.

Items 4 and 5 require more explanation. Given the module's small size, the OEM customer will have to solder it down directly on the PWB of their product. Connection between the RF connection pin on our module and their external antenna will be made by means of a micro strip line on their PWB leading into a MMXC antenna connector. No additional matching or filtering will be required between the module and the antenna connector – just the micro strip line.

Given the intended use of the module, we propose to test it in exactly the same fashion at the lab. The module will be soldered on to a support PWB with a section of 50 micro strip transmission line between the module and the antenna connector. The various antennas we want to certify with the module will then be attached to the connector through a coaxial cable for spurious emissions testing.

The OEM customer will take the same approach with the module in their product as we did in our testing. They will solder down our module onto their support board and provide a short section of micro strip to connect the RF pin of our module to their external antenna. We will specify the design and construction of the 50 ohm micro strip line on the OEM's support board in the manual for the module. [This is essentially no different from specifying the exact type of RF cable that a customer should use between antenna connector on a module and his antenna.] The customer will also be instructed to use only our approved antennas in their installations.

With these design rules clearly stated in the manual, an OEM's setup will be identical to what was

tested in the lab. Our customers are engineers who design products for a living – not members of the general public. They are more than competent enough to follow simple directions for creating a 1-inch run of 50 ohm micro strip. If the OEM can be trusted to install only the antennas we have specified in our manual and follow the MPE rules in our guide, then they can be trusted enough to create a section of micro strip between our module and their antenna connector.

To sum up, we have been given confusing information from our local lab and TCB as to whether the product described above can obtain modular approval. This is the question I want to put to OET.

Thanks,

Mark Tucker
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