



Engineering and Testing for EMC and Safety Compliance

December 2, 2002

To: Mr. Joe Dichoso
Federal Communications Commission

From: Rachid Sehb
Rhein Tech Laboratories, Inc.

RE: FCC ID: QLN-DP2310P0001
731 Confirmation number: EA298184
Correspondence Reference number: 24319 and 24320

Dear Mr. Dichoso,

Please refer to the information below in response to the correspondence noted above.

1) The output power in the manual indicates possible settings -6 to +6 dBm at each port. The output power description indicates only 0 dBm at each port. You will need to correct the manual if 0 dBm is applicable maximum. Please explain how you derive the corrected output power of 12.4 dBm given the 0 dBm output to each 16 inputs of the combiner.

FYI, $0 \text{ dBm} + 10\log 16 = 12.04 \text{ dBm}$. This doesn't even take into account the 2.4 combiner loss that was stated. Please correct/retest as necessary. This exhibit must agree with the manual settings.

What is the maximum manual setting?

What is the output power into each of the 16 inputs of the combiner?

What is the combiner loss?

What is the total output at the end of the combiner?

Response:

The maximum output power measured at any of the 16 ports was 0.3dBm. At the output of the combiner the maximum power output was measured at 12.4dBm. The power at the input of the combiner was not the same for all the ports, as you will find in the document named "Power Output Measurement Addendum", uploaded with this response. Rather than using $10 \log 16$, which I believe to be more appropriate for a splitter configuration, instead one would have to sum the power output of all the ports to compare it with the total power measurement obtained with the combiner.

2) When justifying professional installation, the marketing, use and installation must be addressed. Verify that the device will not be marketed to the general public and its use is intended for business installation environments. What is it about the installation that is difficult and requires professional installation (the average technically inclined person could not install)?

Response:

Please refer to the cover letter exhibit named "FCC Professional Installation Justification" from Vivato's CTO, Skip Crilly, uploaded with this response.

3) RF safety review be completed once the output power is clarified. The 2 meter separation looks acceptable but we will need to clarify some RF exhibits, statements, comments or declarations just so there aren't any misunderstandings as to what is acceptable/correct.

a) The usual far field MPE estimation formula is probably not appropriate here.

A better formula may be given in Reference Data for Engineers: Radio, Electronics, and Communications, 7th ed., SAMS/Macmillan: Indianapolis, IN, pg. 32 6, 1985. However, I need to look up original derivation of this in '63 IEEE Trans. AP. or aperture antenna equations may apply, OET 65 equations 11 and 17.

Response:

The antenna gain in the original uploaded application was determined using OET OET 65 equation 11, and 17. Please refer to the Confidential Technical Operational Description exhibit named "Correspondence Response to Q3a and 3b.pdf", uploaded with this response.

3b) In Section 1.3.3 of the manual, note 2, What does "The values in the above table were computed using numerical analysis" mean?

Response:

The values in the table represent the antenna gain at different distances from the antenna. The antenna gain was determined by summing the electric field strength from each active antenna element. This sum represents the Surface Power Density. Please refer to the confidential Technical Operational Description exhibit named "Correspondence Response to Q3a and 3b.pdf", uploaded with this response, for the calculations.

3c) With regard to Section 3.3.4, Per 2.1091(d)(2) time averaging provisions may not be used in determining typical exposure levels for devices intended for use by consumers in general population/uncontrolled environments as defined in 1.1310. Please remove the reference to 30 minutes in users manual.

Response:

The reference to 30 minutes was removed from the user manual; please refer to the User Manual exhibit "Revised Vivato DP2310 WiFi Installation Guide" uploaded with this response.

We hope that these responses address your questions satisfactorily.

Sincerely,

Rachid Sehb,

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