



Engineering and Testing for EMC and Safety Compliance

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Federal Communications Commission  
7435 Oakland Mills Road  
Columbia, MD 21046

Re: FCC: ID E2XSWL-2200U

Justification Of Difference Between Theoretical EIRP And Measured EIRP

The integral antenna was removed in order to verify the device conducted output power (16 dBm) as stated in the manual and manufacturers attestation. This conducted power was verify by Rhein Tech Laboratories on the manufacturer's modified unit.

The theoretical EIRP using the measured 16 dBm output power + the max peak antenna free space gain value (max peak = 0.8dBi, max average = -5.1dBi, low = -10dBi) equates to 16.8 dBm. However, when the EIRP was measured using the substitution method on the device with the integral antenna, the result yielded 7.3 dBm with the unit investigated and tested on 3 orthogonal positions. Great care was taken to find the maximum EIRP by positioning the EUT so that maximum level can be achieved. This discrepancy resulted in the use of the free space antenna gain value (un-loaded antenna) in determining theoretical EIRP.

The large difference between the measured EIRP and the theoretical EIRP results confirm that the integral antenna when loaded, i.e. installed in the EUT's housing, does not perform efficiently as stated in the free space gain value. The result demonstrates that the antenna performed closer to the free space low gain value than the max peak free space gain value. This is consistent with experience in our lab that the gain characteristic specifications provided by wireless LAN manufacturers are typically free space data and that when these antennas are loaded, the free space gain data is no longer valid for the configuration. This result is further collaborated by EIRP measurements contained in the SAR report provided for the aforementioned EUT.

Sincerely,

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