



Antenna Gain Test Report

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1. Customer Information

Applicant: Acuity Brands Lighting, Inc
Address: 1 Acuity Way
Decatur, GA 30035
Tel: 770-922-9000

2. Location of Testing

Test Laboratory

Testing was performed at Acuity Brands Lighting, Inc. permanent laboratory located at Conyers, GA

List of Test Equipment

Test Equipment						
Type	Device	Manufacturer	Model	SN#	Current Cal	Cal Due
Antenna	Dual polarized horn antenna	Howland Company	QR-4	1069	12/13/25	12/13/26
Chamber	<u>Anechoic</u> Chamber	Howland Company	3500D	N/A	12/13/25	12/13/26
Power Meter	dual channel power meter	Rohde & Schwarz	NRX	101261-JA	12/13/25	12/13/26
Power Meter Sensor	2x <u>Power Sensor</u>	Rohde & Schwarz	NRP8S	105196-AU 108195-JG	12/13/25	12/13/26

Dates of Testing: 8/18

Signature: Albert. Lu

Name & Title: Yenpao Albert Lu , Distinguished Engineer

Date of Signature 7/20/2026

3. Test Sample(s) (EUT/DUT)

The test sample was received: 4/18/2026

Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

2.4 GHz Sample

Identification	
FCC ID:	2ADCB-AMODIT
Brief Description	2.4 GHz RADIO MODULE
Type of Modular	FULL MODULAR
Model(s) #	
Firmware version	N/A
Software version	N/A
Serial Number	

4. Test methods & Applicable Regulatory Limits

Test methods/Standards/Guidance:

Test procedures and guidance for measuring transmitters are provided in ANSI C63.10-2013.

- 1) ANSI C63.10-2013
- 2) 353028 D01 Antennas Part 15 Transmitters v01r01

5. Applied Limits and Regulatory Limits:

- 3) FCC CFR 47 Part 15.203

6. FCC Notice:

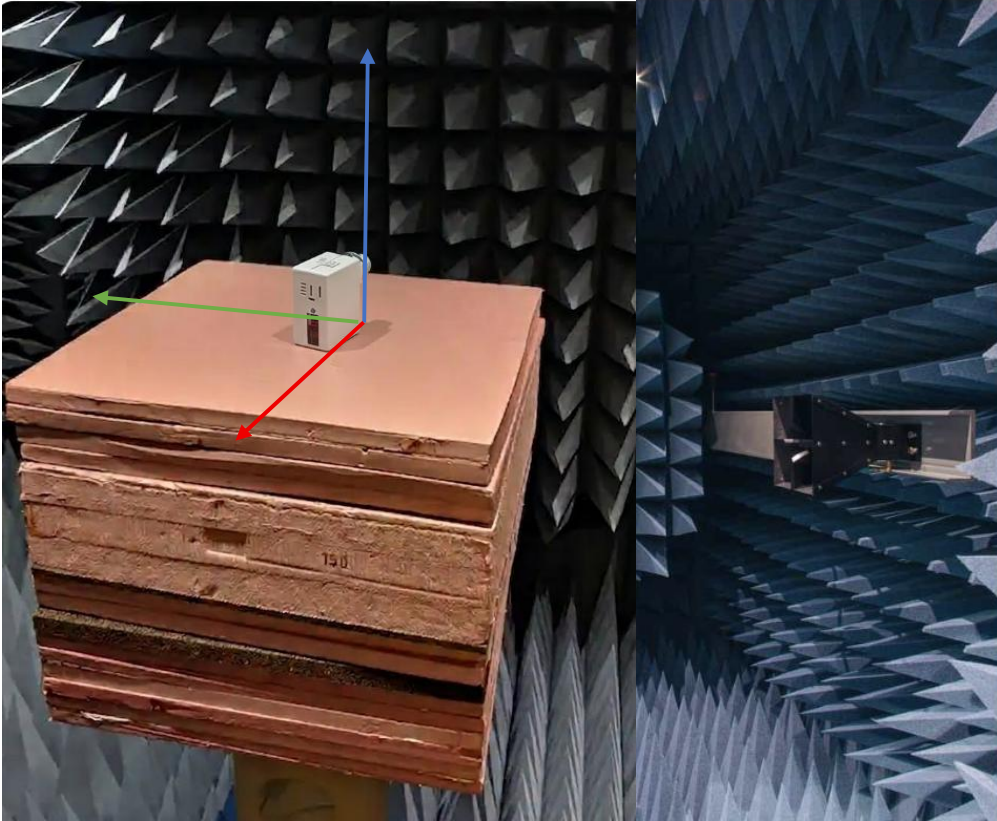
All part 15 applications will need to show how the antenna gain was derived either from a manufacturer data sheet or a measurement. Where the gain of the antenna is inherently accounted for as a result of the measurement, such as field strength measurements on a part 15.249 or 15.231 device, so the gain does not necessarily need to be verified. However, enough information regarding the construction of the antenna shall be provided. Such information may be photographs, length of wire antenna etc.

1. Part 15 applications with equipment classes **DSC, DXX, DCD, 8CC**, etc. which do not have an EIRP limit.
We need at least the following antenna info: **Antenna photos/or drawings, including antenna dimensions.**
 - This info cannot be held short term confidential. If necessary, we will have to request the customer to provide a separate exhibit for that antenna photo/or drawing, if the internal photos are being held short term confidential. Alternatively, antenna info can be placed in the test report. That would make things easier to review and process.
(We plan on providing guidance to customers in our newsletter to identify the antenna info vs. internal photo.)
 - Any antenna technical specifications, which are deemed confidential by customer/applicant should be removed from the antenna exhibit or test report.
 - However, antenna specifications such antenna gain, antenna patterns, etc. are not considered confidential information.
 - Antenna gain reports are **NOT** required for these equipment classes because the antenna gain is already accounted for in the field strength measurement of the fundamental emission. (see attached FCC minutes)
2. Part 15 applications with equipment classes **DTS, DSS, NII, 6ID**, etc. which use the antenna gain for compliance with EIRP limits:
We need the manufacturer antenna data sheet or an antenna gain measurement report
 - The report must be a complete report, with a measurement procedure, test equipment, test setup, signatures, facility/test site descriptions, etc.
 - There is not requirement for the RF lab to be accredited.
 - The FCC has not specified or endorsed any measurement procedures. However, the FCC indicated at the TCBC conf call on June 14...
 - o test labs should use good judgement when reviewing antenna datasheets with gain measured in free space because that the gain might change significantly when attached to the device... FCC wants test labs and manufacturers to be aware of it and take this into account. FCC does not necessarily need to see what was done, but needs to know whether gain has changed.

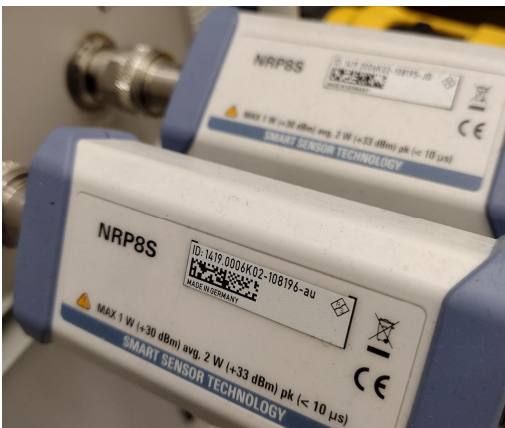
- Confidential information about the antenna can be made confidential but photos/drawings, gain, antenna patterns, test setups are not considered confidential.

7. Measurement/Calculation Procedure

The DUT was set to transmit continuous sine wave at 2440 MHz. The output power is set to 0 dBm. The DUT is placed at the center of the anechoic chamber.



A dual channel power analyzer is used. The first channel of the power sensor measures the vertical polarization of the dual polarized ridge horn, while the second channel measures the horizontal polarization.



The raw data from the power meter received from Dual ridge horn contains both vertical and horizontal polarized power. Below is the sample data at 2.44 GHz

+++++++ Test Data Summary +++++++				90.00	0.24	-53.614	-57.036
Path Loss HPOL Cal Factor = 47.70 dB				90.00	15.16	-53.171	-56.224
Path Loss VPOL Cal Factor = 46.94 dB				90.00	30.23	-54.099	-49.855
Calculated TRP = -3.54 dBm				90.00	45.08	-61.440	-51.318
***** Test Data Results *****				90.00	60.22	-53.325	-47.921
THETA	PHI	H-Pol	V-Pol	90.00	75.35	-53.087	-45.920
(deg)	(deg)	(dbm)	(dBm)	90.00	90.04	-66.281	-45.437
0.00	0.07	-54.344	-57.107	90.00	105.14	-54.915	-45.701
0.00	15.10	-55.844	-54.667	90.00	120.18	-54.354	-48.357
0.00	30.07	-57.851	-53.032	90.00	135.21	-51.861	-52.902
0.00	45.04	-61.372	-52.093	90.00	150.38	-51.337	-54.043
0.00	60.16	-64.062	-51.941	90.00	165.07	-51.258	-54.376
0.00	75.16	-60.655	-52.306	90.00	180.07	-53.228	-57.970
0.00	90.27	-57.103	-53.174	90.00	195.27	-56.034	-67.559
0.00	105.23	-54.551	-54.601	90.00	210.26	-70.198	-72.806
0.00	120.22	-53.056	-57.006	90.00	225.23	-68.268	-62.704
0.00	135.24	-52.433	-61.002	90.00	240.15	-60.789	-69.796
0.00	150.11	-52.399	-63.535	90.00	255.17	-57.924	-58.359
0.00	165.26	-52.892	-61.399	90.00	270.30	-60.040	-55.264
0.00	180.16	-53.857	-56.769	90.00	285.16	-63.239	-56.340
0.00	195.31	-55.243	-54.232	90.00	300.19	-56.607	-62.778
0.00	210.18	-57.512	-52.859	90.00	315.26	-54.156	-65.951
0.00	225.25	-61.325	-51.968	90.00	330.13	-55.763	-59.589
0.00	240.04	-64.322	-51.828	90.00	345.23	-53.783	-57.693
0.00	255.32	-61.338	-52.189	75.00	0.20	-54.026	-62.208
0.00	270.29	-57.268	-52.830	75.00	15.15	-52.069	-54.912
0.00	285.28	-54.720	-54.346	75.00	30.14	-54.955	-53.470
0.00	300.15	-53.585	-56.608	75.00	45.16	-56.241	-52.527
0.00	315.25	-52.844	-60.519	75.00	60.29	-57.887	-51.108
0.00	330.15	-52.888	-64.145	75.00	75.13	-54.652	-46.204
0.00	345.22	-53.327	-61.141	75.00	90.20	-64.362	-44.659
				75.00	105.25	-60.922	-45.956
				75.00	120.17	-53.593	-49.600

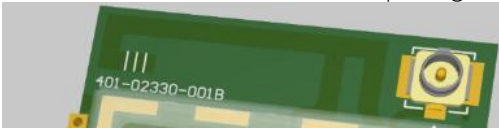
8. Equations

The following equation is used to determine the realized gain.

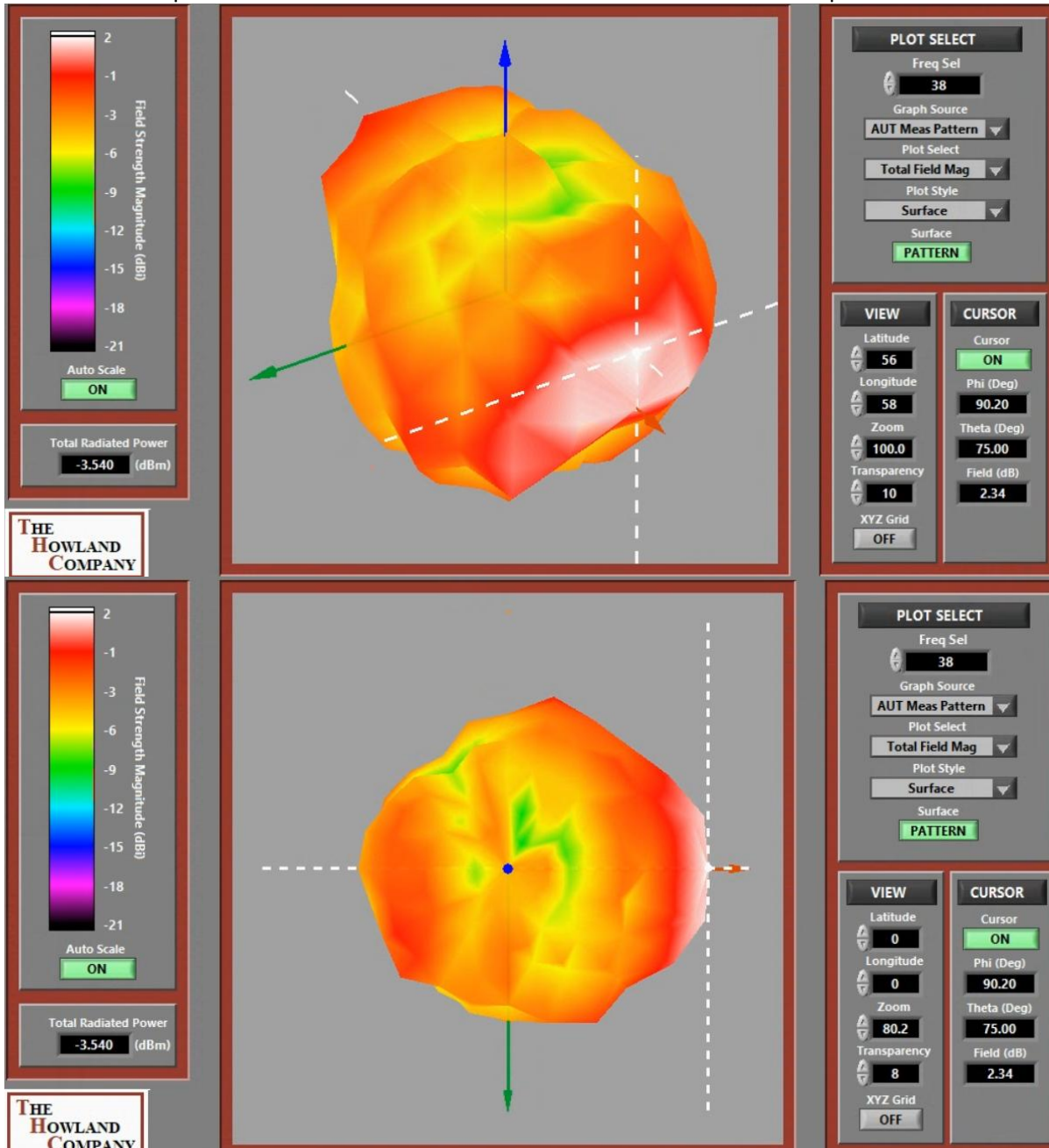
Realized gain = Raw measured value + Path loss Cal Factor - conducted output power

9. RF Exposure Results

The onboard IFA antenna has a peak gain of ~3 dBi



The 3D radiated pattern for the radio module that uses the PCB IFA antenna is depicted below.



For the exsternal u.FL monopole antenna, the a peak gain of 4 dBi according to our own in house measurement.



Manufacturer: Pulse Larsen Antenna
Address: 15255 Innovation Drive #100 San Diego, CA 92128
Part number: W9032



TECHNICAL DATA SHEET



Series: Wire Antenna
PART NUMBER: W9032

ELECTRICAL SPECIFICATIONS	
Antenna Type	Monopole
Frequency	2402-2480MHz
Nominal Impedance	50 Ω
Return Loss	-15dB
Radiation Pattern	Omni
Gain	4 dBi
Efficiency	65%
Polarization	Vertical

MECHANICAL SPECIFICATIONS	
Overall Length	289 mm
Weight	29.5 g
Antenna Color / Material	Black
Connector type	Compatible with U.FL
Cable type	Ø1.13mm Coaxial, Black
Cable length	200mm

ENVIRONMENTAL SPECIFICATIONS	
Operating Temperature	-40 ~ +85 ° C
Storage Temperature	-40 ~ +85 ° C
Ingress Protection	IP67 after installed
RoHS Compliant	Yes

Below is the 3D radiation pattern for the u.FL monopole.

