



FCC 47 CFR PART 15 SUBPART C
MANUFACTURER'S TEST REPORT
FOR

WIRELESS SIREN

MODEL NUMBER: RF6 Siren (LRS500)

FCC ID: CF8DL-LRS500

REPORT NUMBER: R10736708-E1A

ISSUE DATE: 2015-07-14

Prepared for
HONEYWELL SECURITY
2 CORPORATE CENTER DR.
SUITE 100 PO BOX 91040
MELVILLE
NY, 11747, USA

Prepared by
UL LLC
12 LABORATORY DR.
RESEARCH TRIANGLE PARK, NC 27709 USA
TEL: (919) 549-1400



NVLAP Lab code: 200246-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	2015-07-14	Initial Issue	B. Kiewra

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. MEASURING INSTRUMENT CALIBRATION	5
4.2. SAMPLE CALCULATION	5
4.3. MEASUREMENT UNCERTAINTY.....	6
5. EQUIPMENT UNDER TEST	7
5.1. DESCRIPTION OF EUT	7
5.2. DESCRIPTION OF AVAILABLE ANTENNAS	7
5.3. SOFTWARE AND FIRMWARE.....	7
5.4. WORST-CASE CONFIGURATION AND MODE.....	7
5.5. DESCRIPTION OF TEST SETUP.....	8
6. TEST AND MEASUREMENT EQUIPMENT	10
7. ON TIME AND DUTY CYCLE RESULTS	11
8. RADIATED TEST RESULTS.....	12
8.1. LIMITS AND PROCEDURE	12
8.2. TRANSMITTER ABOVE 1 GHz	13
8.2.1. TX ABOVE 1 GHz FOR 802.15.4 MODE IN THE 2.4 GHz BAND	13
8.3. WORST-CASE BELOW 1 GHz.....	33
9. SETUP PHOTOS.....	35

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: HONEYWELL SECURITY
2 CORPORATE CENTER DR
SUITE 100 PO BOX 9040
MELVILLE, NY, 11747, USA

EUT DESCRIPTION: Wireless Siren

MODEL: RF6 Siren

SERIAL NUMBER: Non-Serialized (Identified as FCC#1)

DATE TESTED: June 19 & 22, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C (Radiated emissions only)	PASS

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released
For UL LLC By:

Reviewed By:

Prepared By:



Mike Ferrer
EMC Program Manager



Jeff Moser
EMC Program Manager
UL – Consumer Technology Division



Brian Kiewra
EMC Engineer

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2 and FCC CFR 47 Part 15. This report is a manufacturer's specification report that includes radiated emissions, only.

Note – Radiated testing above 1GHz was performed on a 1.5m table height, per ANSI C63.10: 2013. All other testing was performed per ANSI C63.10: 2009.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA.

12 Laboratory Dr., RTP, NC 27709	
☐	Chamber A
☒	Chamber C

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <http://www.nist.gov/nvlap/>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test	Uncertainty
Radiated Disturbance (30 to 1000 MHz)	+/- 6.04 dB (3m)
Radiated Disturbance (1 to 6 GHz)	+/- 5.96 dB
Radiated Disturbance (6 to 18 GHz)	+/- 6.10 dB
Radiated Disturbance (18 to 26 GHz)	+/- 6.81 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a wireless siren for security purposes. The device contains an 802.15.4 Zigbee transceiver. The device operates from 2405-2475 MHz. The EUT is battery powered.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two PIFA antennas, with a maximum gain of 4 dBi.

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was revision 0.6.3.

The test utility software used during testing was V0.02.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, for each antenna. It was determined that the Y orientation was the worst-case orientation for ANT1 and the X orientation the worst-case for ANT2. Therefore, all final radiated testing was performed with the EUT in the Y orientation for ANT1 and the X orientation for ANT2.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

None.

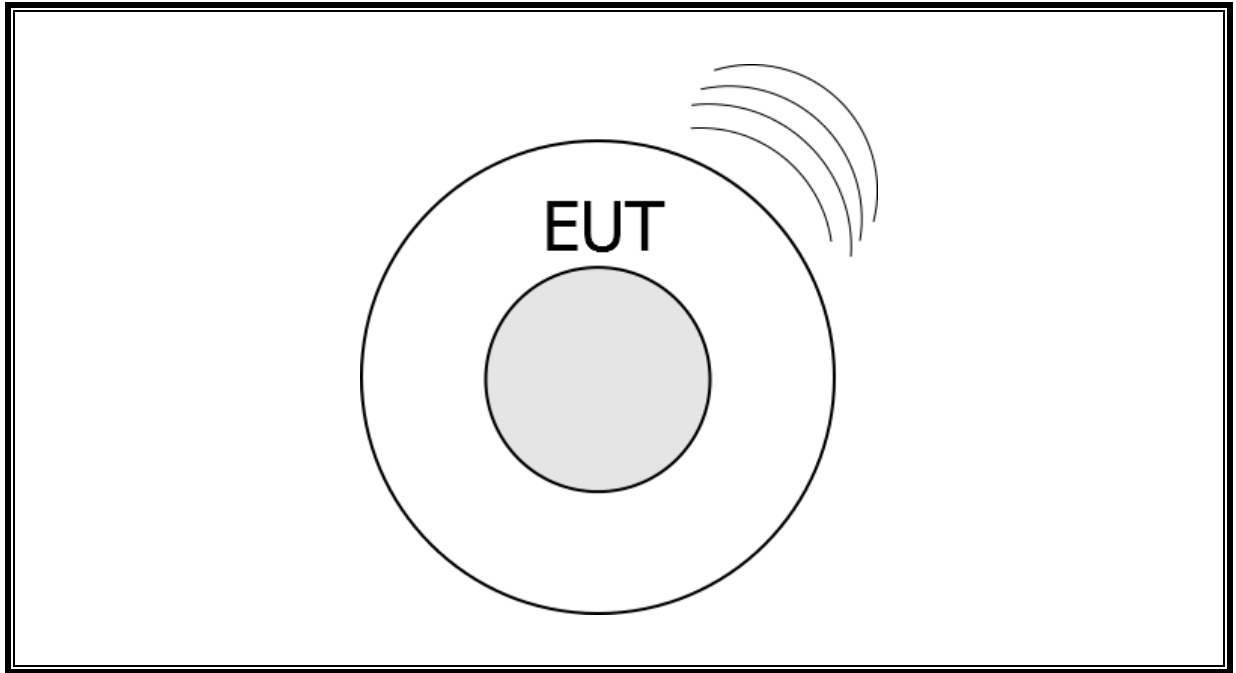
I/O CABLES

None.

TEST SETUP

The EUT is installed as a table top device. Test software exercised the radio part of the device.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Radiated Emission Measurement Equipment

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0066	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB1	2014-07-10	2015-07-31
AT0062	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2014-07-22	2015-07-31
AT0063	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2014-07-23	2015-07-31
SAC_G (Hybrid)	Gain-Loss string for Hybrid antenna at 3m	Various	Various	2015-02-01	2016-02-29
SAC_G (3117)	Gain-Loss string for 3117 antenna at 3m	Various	Various	2015-02-01	2016-02-29
AMP012	18-40GHz preamp	Miteq	JS44-18004000-33-8P	2014-07-18	2015-07-31
CBL252980-001	SF104A/11PC35/PC35/6706mm (22-ft.) DC-26.5GHz	Huber & Suhner	SUCOFLEX 104PEA	2014-07-21	2015-07-31
CBL252981-001	SF104A/11PC35/11PC35/1219mm (4-ft.) DC-26.5GHz	Huber & Suhner	SUCOFLEX 104PEA	2014-07-21	2015-07-31
SA0018	Spectrum Analyzer	Agilent	N9030A	2014-06-26	2015-06-30
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
HI0069	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2014-06-27	2015-06-30

7. ON TIME AND DUTY CYCLE RESULTS

LIMITS

None; for reporting purposes only.

ON TIME AND DUTY CYCLE

The manufacturer stated that the device will be limited to a worst-case duty cycle (DC) of 6.976%. Hence a duty-cycle correction factor as described in FCC Part 15, Section 15.35(c) (RSS-Gen 6.10) was used to calculate an average value as follow:

Average Value [dBuV/m] = Peak Value [dBuV/m] + $20 \cdot \log(\text{DC}/100)$

Average Value [dBuV/m] = Peak Value [dBuV/m] + $20 \cdot \log(6.976/100)$

Average Value [dBuV/m] = Peak Value [dBuV/m] - 23.1dB

Justification for use of 15.35(c) and measurements of worst-case duty cycle to be supplied, in a separate document, by Honeywell.

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz measurements and 1.5 m above the ground plane for above 1GHz measurements. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

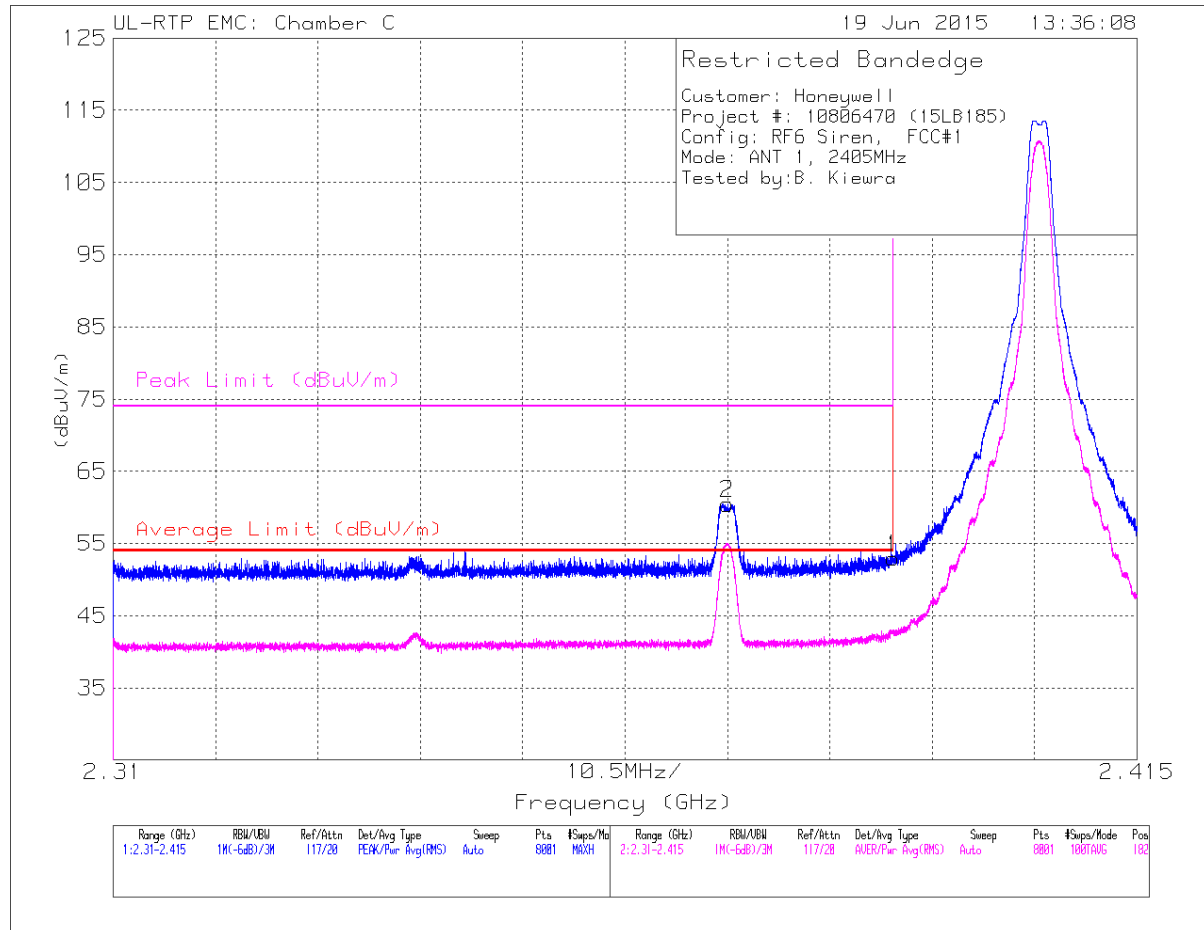
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. TX ABOVE 1 GHz FOR 802.15.4 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL) ANT1



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

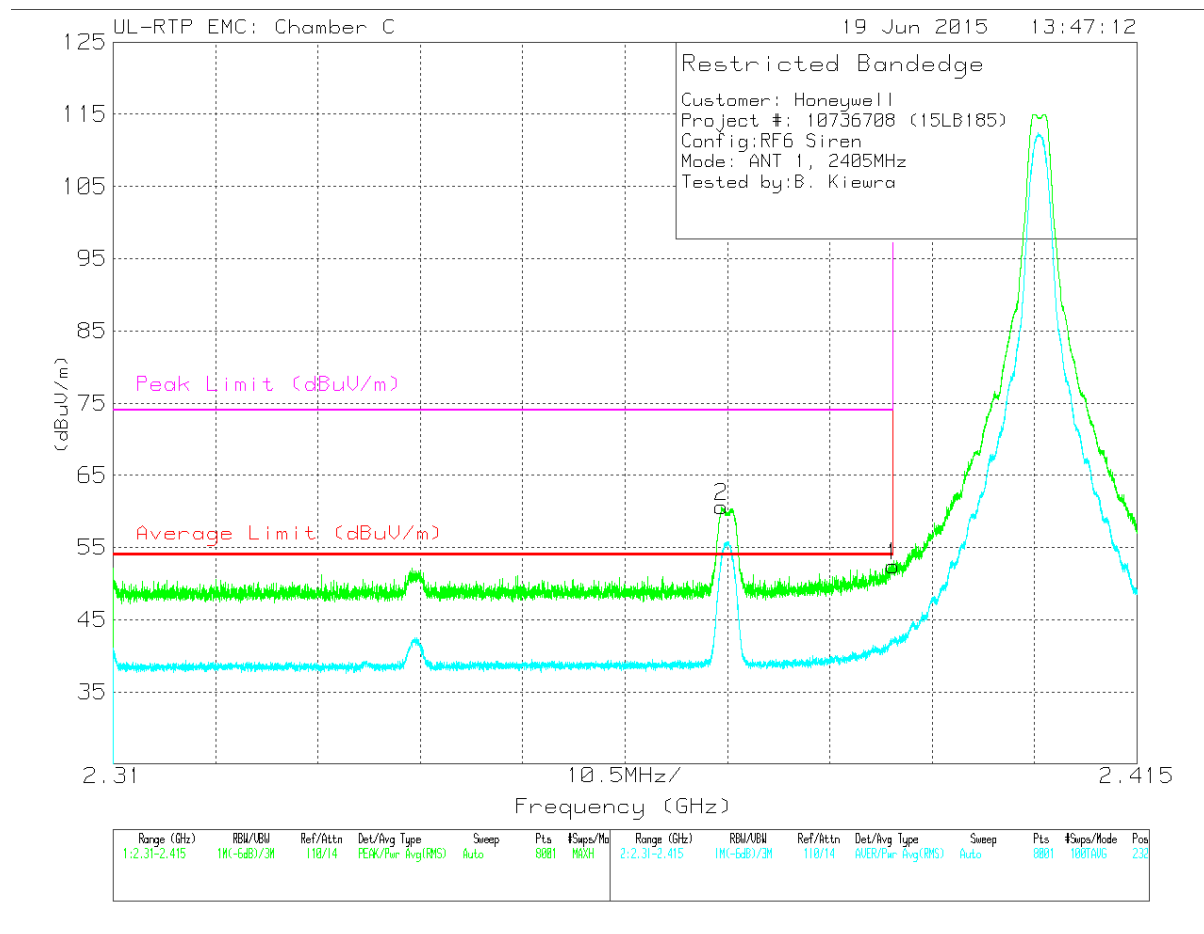
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	47.59	Pk	32.1	-26.7	0	52.99	-	-	74	-21.01	182	271	H
	* 2.39	47.59	AV	32.1	-26.7	-23.1	29.89	54	-24.11	-	-	182	271	H
2	* 2.373	55.2	Pk	32	-26.7	0	60.5	-	-	74	-13.5	182	271	H
	* 2.373	55.2	AV	32	-26.7	-23.1	37.4	54	-16.6	-	-	182	271	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL) ANT1



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

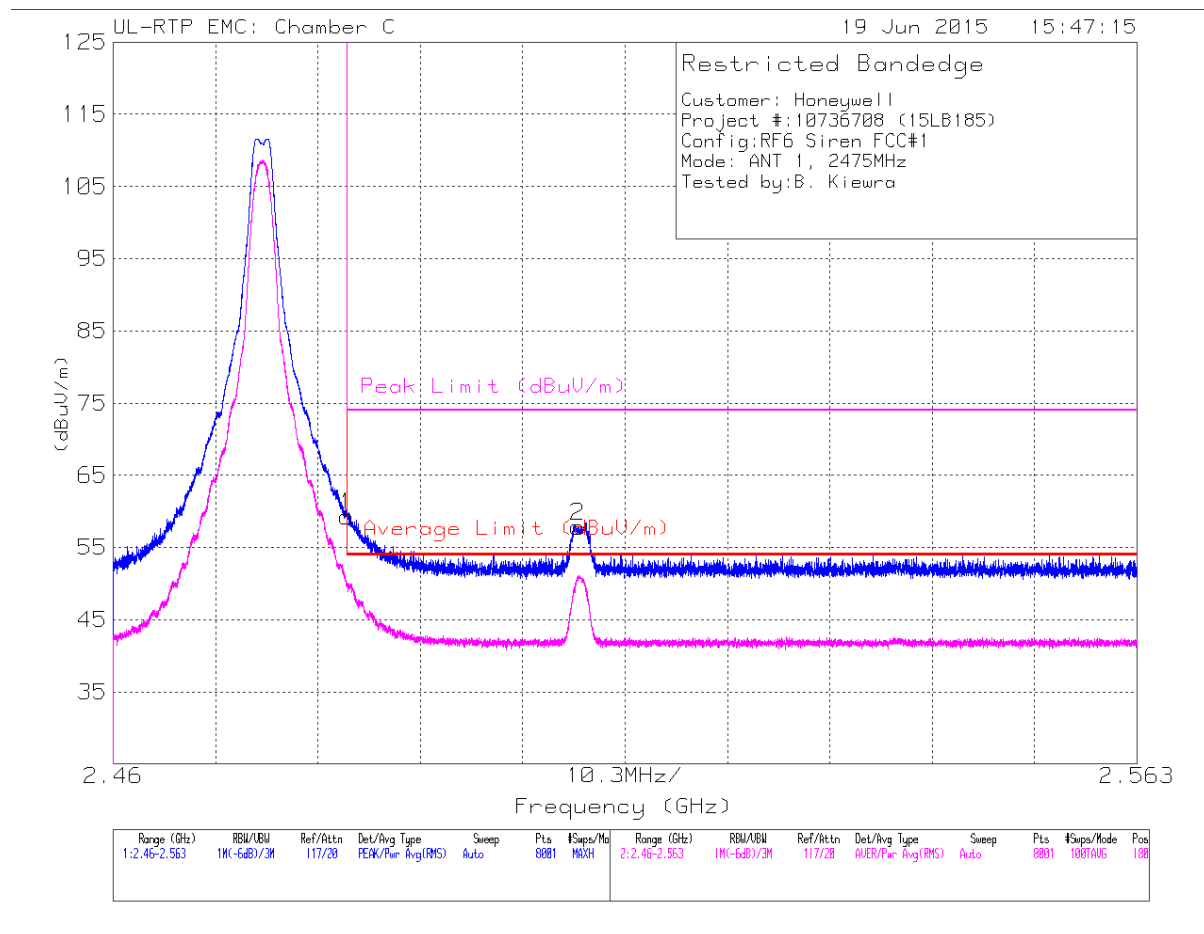
Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBUV/m)	Average Limit (dBUV/m)	Margin (dB)	Peak Limit (dBUV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	47.05	Pk	32.1	-26.7	0	52.45	-	-	74	-21.55	232	114	V
	* 2.39	47.05	AV	32.1	-26.7	-23.1	29.35	54	-24.65	-	-	232	114	V
2	* 2.372	55.35	Pk	32	-26.7	0	60.65	-	-	74	-13.35	232	114	V
	* 2.372	55.35	AV	32	-26.7	-23.1	37.55	54	-16.45	-	-	232	114	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL) ANT1



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

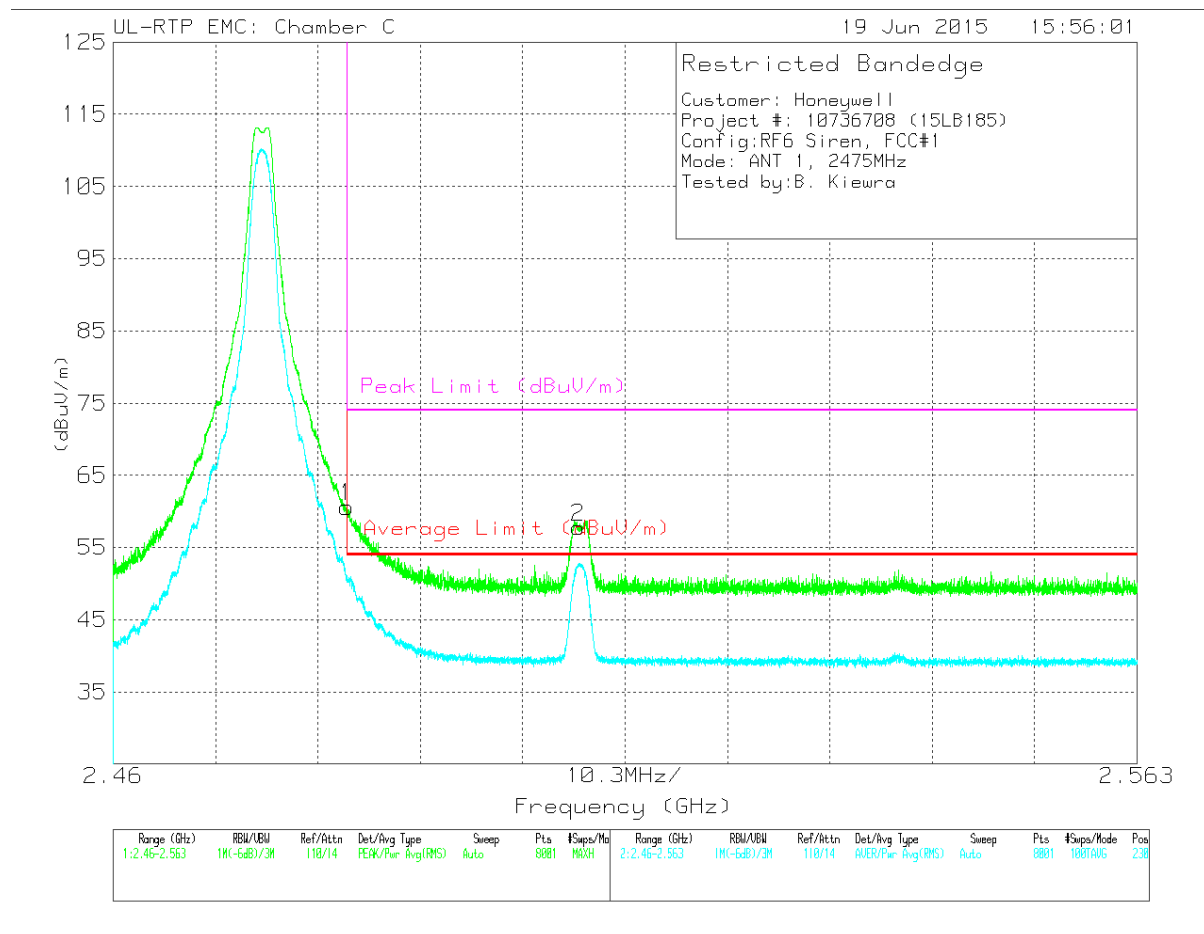
Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBUV/m)	Average Limit (dBUV/m)	Margin (dB)	Peak Limit (dBUV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	53.53	Pk	32.3	-26.5	0	59.33	-	-	74	-14.67	180	222	H
	* 2.484	53.53	AV	32.3	-26.5	-23.1	36.23	54	-17.77	-	-	180	222	H
2	2.507	51.89	Pk	32.4	-26.4	0	57.89	-	-	74	-16.11	180	222	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL) ANT1



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

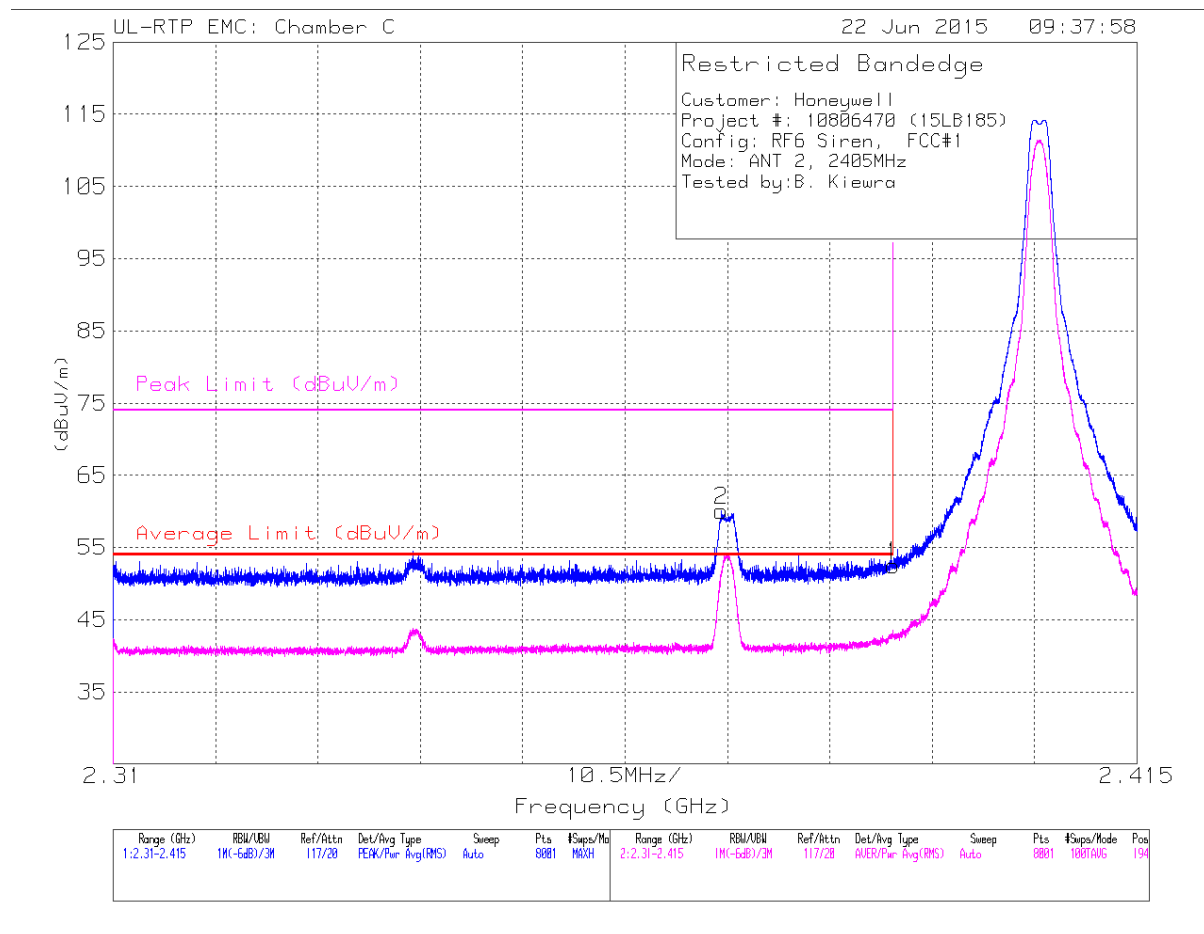
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.83	Pk	32.3	-26.5	0	60.63	-	-	74	-13.37	230	158	V
	* 2.484	54.83	AV	32.3	-26.5	-23.1	37.53	54	-16.47	-	-	230	158	V
2	2.507	51.81	Pk	32.4	-26.4	0	57.81	-	-	74	-16.19	230	158	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL) ANT2



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

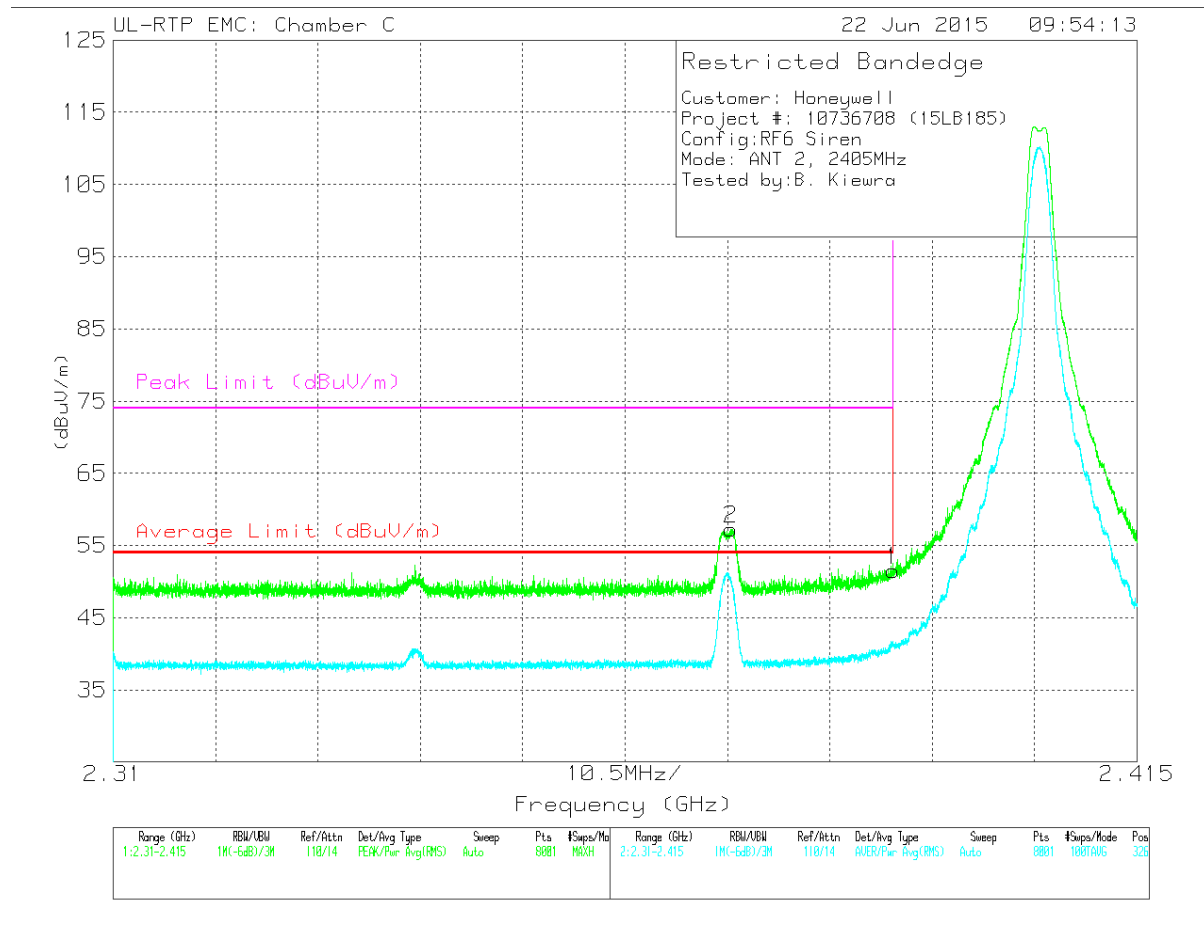
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	47.1	Pk	32.1	-26.7	0	52.5	-	-	74	-21.5	194	124	H
	* 2.39	47.1	AV	32.1	-26.7	-23.1	29.4	54	-24.6	-	-	194	124	H
2	* 2.372	54.79	Pk	32	-26.7	0	60.09	-	-	74	-13.91	194	124	H
	* 2.372	54.79	AV	32	-26.7	-23.1	36.99	54	-17.01	-	-	194	124	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL) ANT2



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

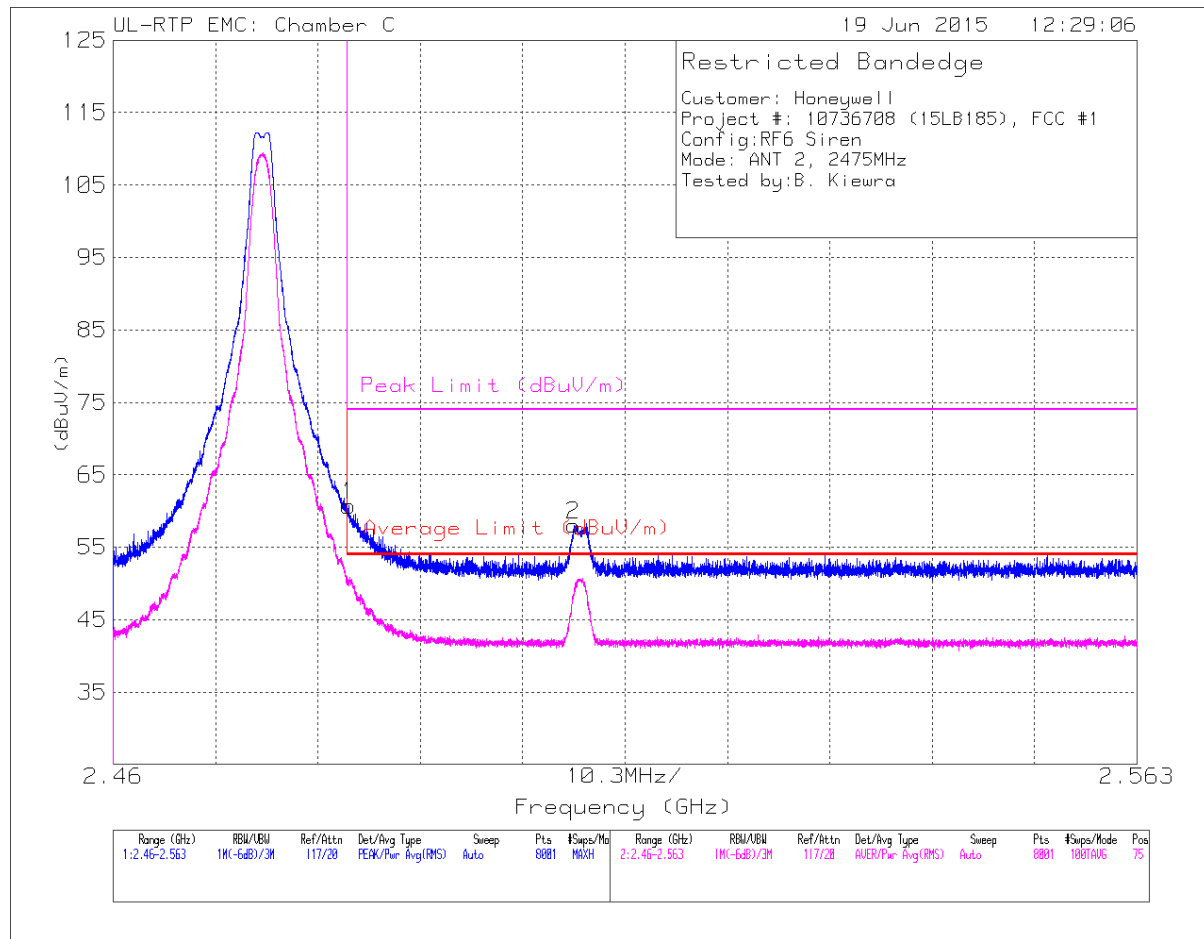
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46.15	Pk	32.1	-26.7	0	51.55	-	-	74	-22.45	326	378	V
	* 2.39	46.15	AV	32.1	-26.7	-23.1	28.45	54	-25.55	-	-	326	378	V
2	* 2.373	51.98	Pk	32	-26.7	0	57.28	-	-	74	-16.72	326	378	V
	* 2.373	51.98	AV	32	-26.7	-23.1	34.18	54	-19.82	-	-	326	378	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL) ANT2



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

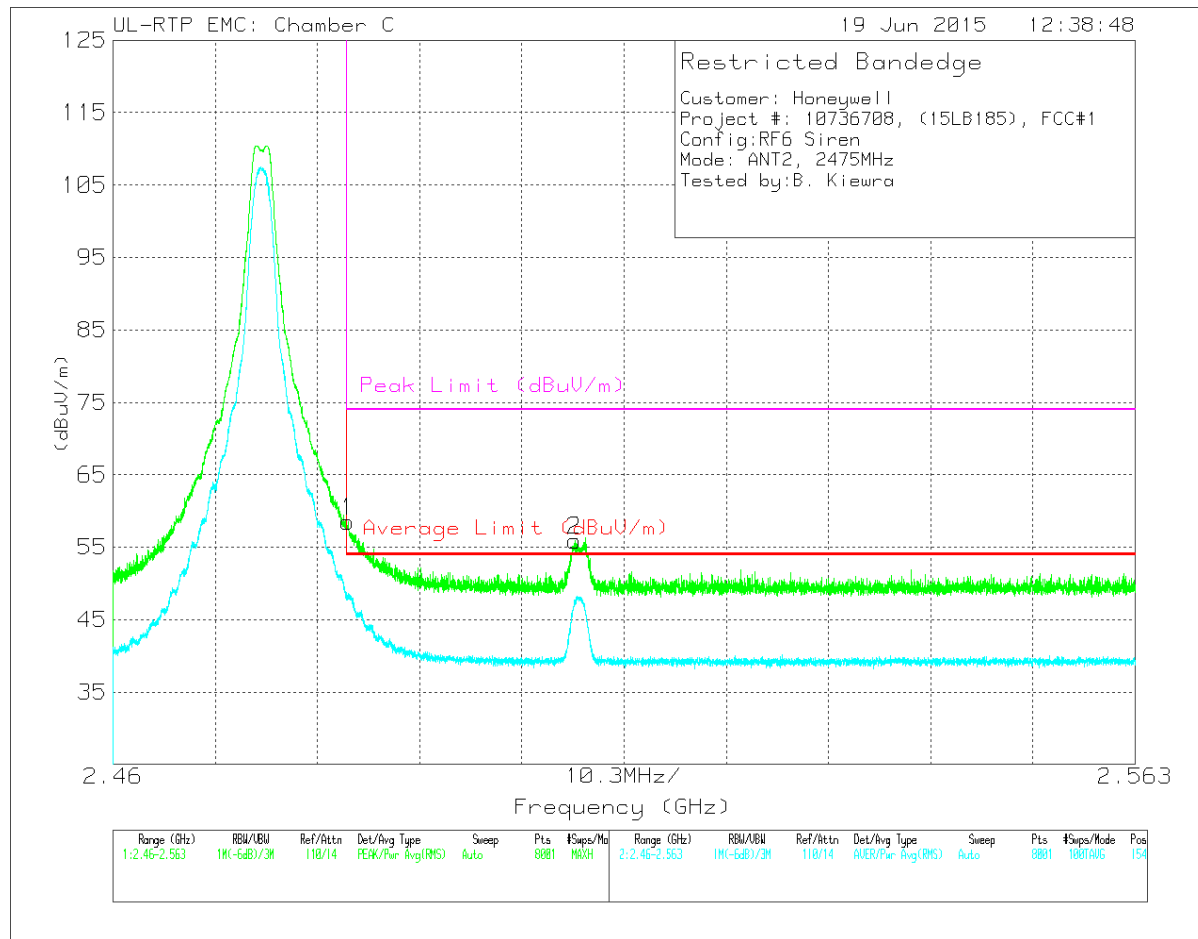
Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBUV/m)	Average Limit (dBUV/m)	Margin (dB)	Peak Limit (dBUV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.94	Pk	32.3	-26.5	0	60.74	-	-	74	-13.26	75	105	H
	* 2.484	54.94	AV	32.3	-26.5	-23.1	37.64	54	-16.36	-	-	75	105	H
2	2.506	52.08	Pk	32.4	-26.4	0	58.08	-	-	74	-15.92	75	105	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL) ANT2



Note: An r.m.s. average trace was generated to show that there were no other emissions hidden within the peak noise floor.

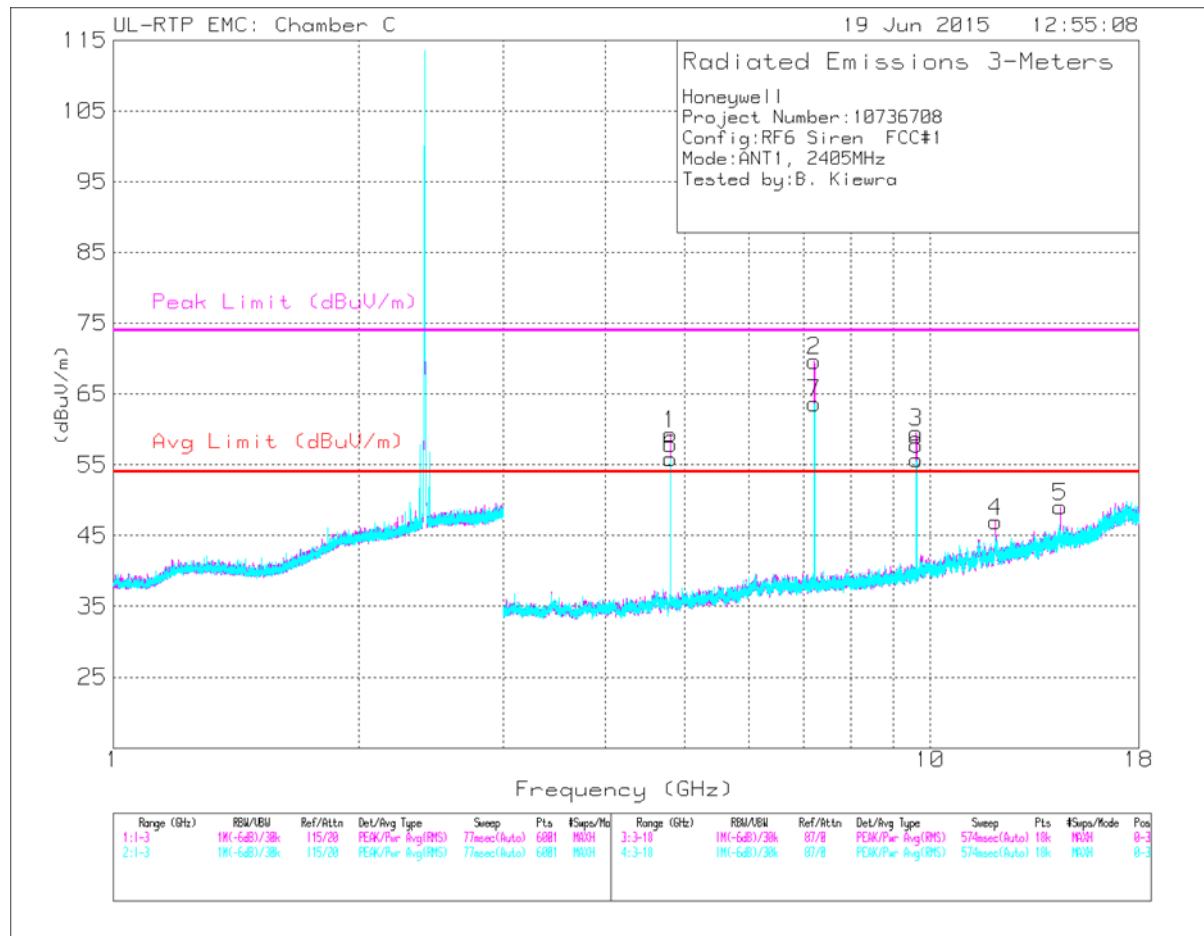
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	52.75	Pk	32.3	-26.5	0	58.55	-	-	74	-15.45	154	392	V
	* 2.484	52.75	AV	32.3	-26.5	-23.1	35.45	54	-18.55	-	-	154	392	V
2	2.507	49.94	Pk	32.4	-26.4	0	55.94	-	-	74	-18.06	154	392	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV - Average calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

HARMONICS AND SPURIOUS EMISSIONS – LOW CHANNEL ANT1

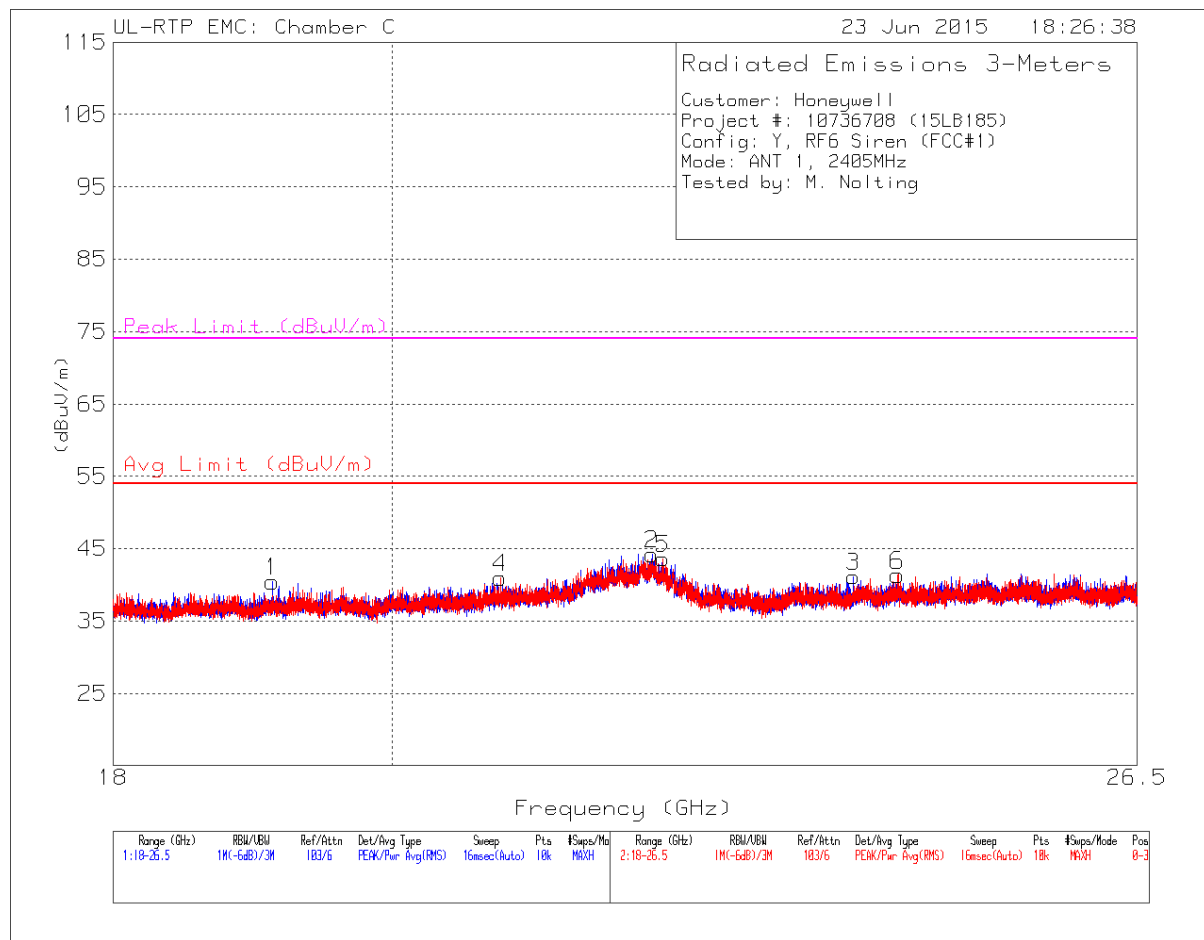


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.811	61.54	Pk	34.1	-32.8	0	62.84	-	-	74	-11.16	175	227	H
	* 4.811	61.54	AV	34.1	-32.8	-23.1	39.74	54	-14.26	-	-	175	227	H
4	* 12.023	41.68	Pk	38.7	-25	0	55.38	-	-	74	-18.62	320	200	H
	* 12.023	41.68	AV	38.7	-25	-23.1	32.38	54	-21.72	-	-	320	200	H
6	* 4.811	57.92	Pk	34.1	-32.8	0	59.22	-	-	74	-14.78	163	294	V
	* 4.811	57.92	AV	34.1	-32.8	-23.1	36.12	54	-17.88	-	-	163	294	V
2	7.213	62.87	Pk	35.6	-28.8	0	69.67	-	-	74	-4.33	0-360	250	H
7	7.216	56.91	Pk	35.6	-28.8	0	63.71	-	-	74	-10.29	0-360	250	V
3	9.618	50.57	Pk	36.8	-27.8	0	59.57	-	-	74	-14.43	0-360	151	H
8	9.621	46.74	Pk	36.8	-27.8	0	55.74	-	-	74	-18.26	0-360	250	V
5	14.433	32.97	Pk	39.3	-23.2	0	49.07	-	-	74	-24.93	0-360	151	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average measurement calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

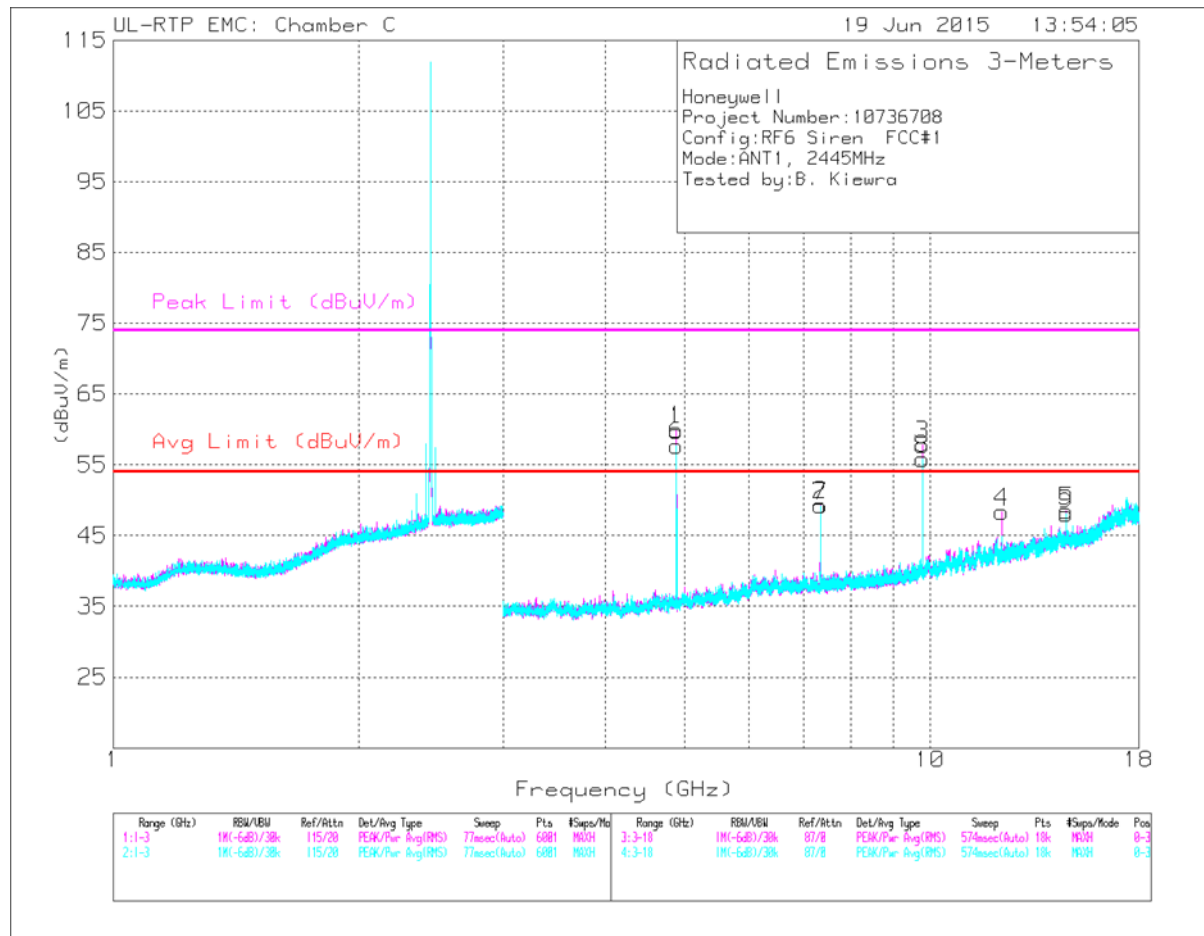


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn AT0063 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 19.116	54.17	Pk	32.5	-46.2	40.47	54	-13.53	74	-33.53	0-360	175	H
2	* 22.063	53.23	Pk	36.9	-45.9	44.23	54	-9.77	74	-29.77	0-360	175	H
3	* 23.809	53.25	Pk	33.6	-45.7	41.15	54	-12.85	74	-32.85	0-360	150	H
4	* 20.834	53.57	Pk	33.3	-45.9	40.97	54	-13.03	74	-33.03	0-360	151	V
5	* 22.155	53.05	Pk	36.5	-45.9	43.65	54	-10.35	74	-30.35	0-360	200	V
6	24.208	53.14	Pk	33.5	-45.3	41.34	-	-	74	-32.66	0-360	151	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS – MID CHANNEL ANT1

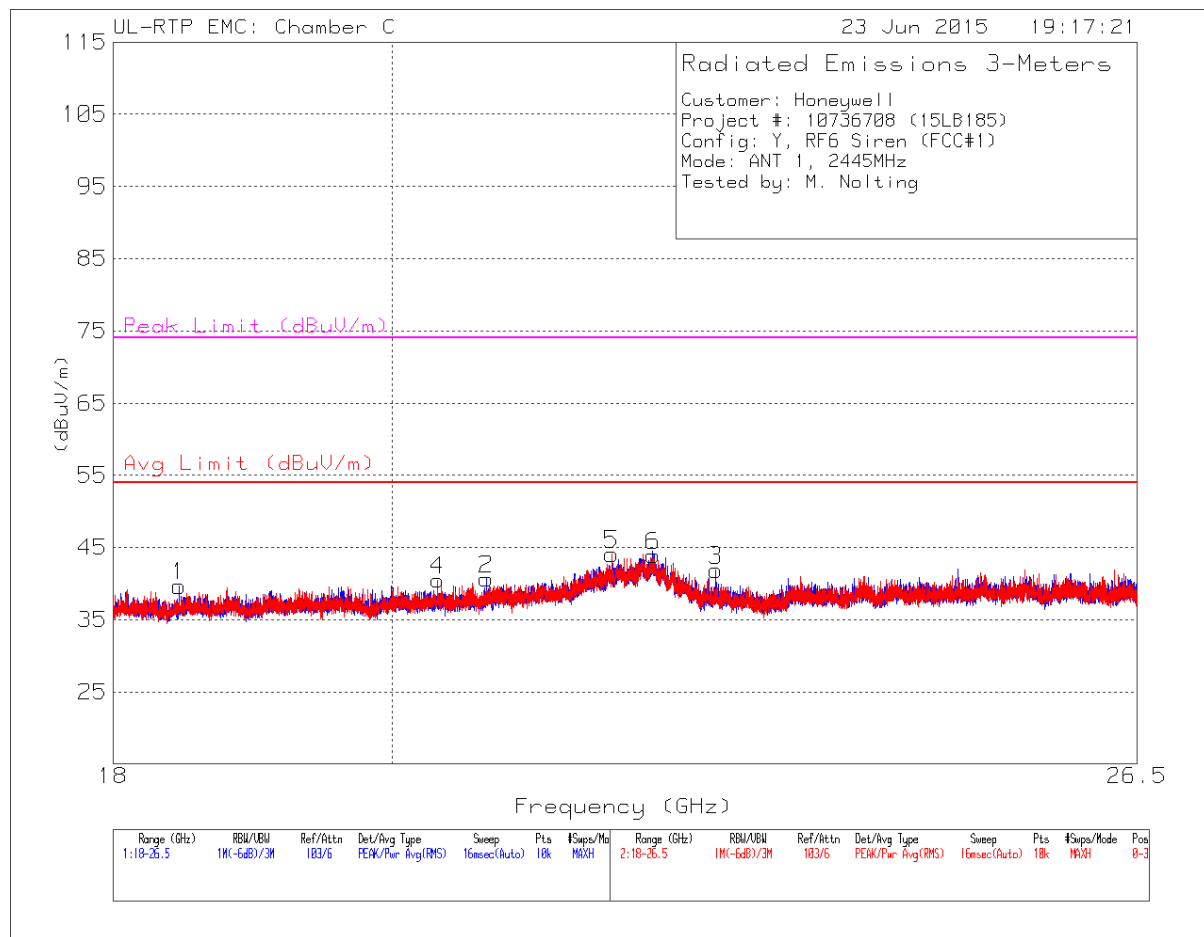


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (Db)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.891	62.28	Pk	34	-33	0	63.28	-	-	74	-10.72	181	204	H
	* 4.891	62.28	AV	34	-33	-23.1	40.18	54	-13.82	-	-	181	204	H
2	* 7.336	48.17	Pk	35.7	-28.9	0	54.97	-	-	74	-19.03	131	238	H
	* 7.336	48.17	AV	35.7	-28.9	-23.1	31.87	54	-22.13	-	-	131	238	H
4	* 12.222	43.29	Pk	38.9	-26.7	0	55.49	-	-	74	-18.51	327	143	H
	* 12.222	43.29	AV	38.9	-26.7	-23.1	32.39	54	-21.61	-	-	327	143	H
6	* 4.889	60.4	Pk	34	-33	0	61.4	-	-	74	-12.6	159	263	V
	* 4.889	60.4	AV	34	-33	-23.1	38.30	54	-15.70	-	-	159	263	V
7	* 7.336	48.57	Pk	35.7	-28.9	0	55.37	-	-	74	-18.63	201	233	V
	* 7.336	48.57	AV	35.7	-28.9	-23.1	32.27	54	-21.73	-	-	201	233	V
8	9.781	45.73	Pk	37	-26.9	0	55.83	-	-	74	-18.17	0-360	151	V
3	9.781	47.73	Pk	37	-26.9	0	57.83	-	-	74	-16.17	0-360	151	H
9	14.673	31.36	Pk	39.5	-22.8	0	48.06	-	-	74	-25.94	0-360	250	V
5	14.674	31.76	Pk	39.5	-22.8	0	48.46	-	-	74	-25.54	0-360	250	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average measurement calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

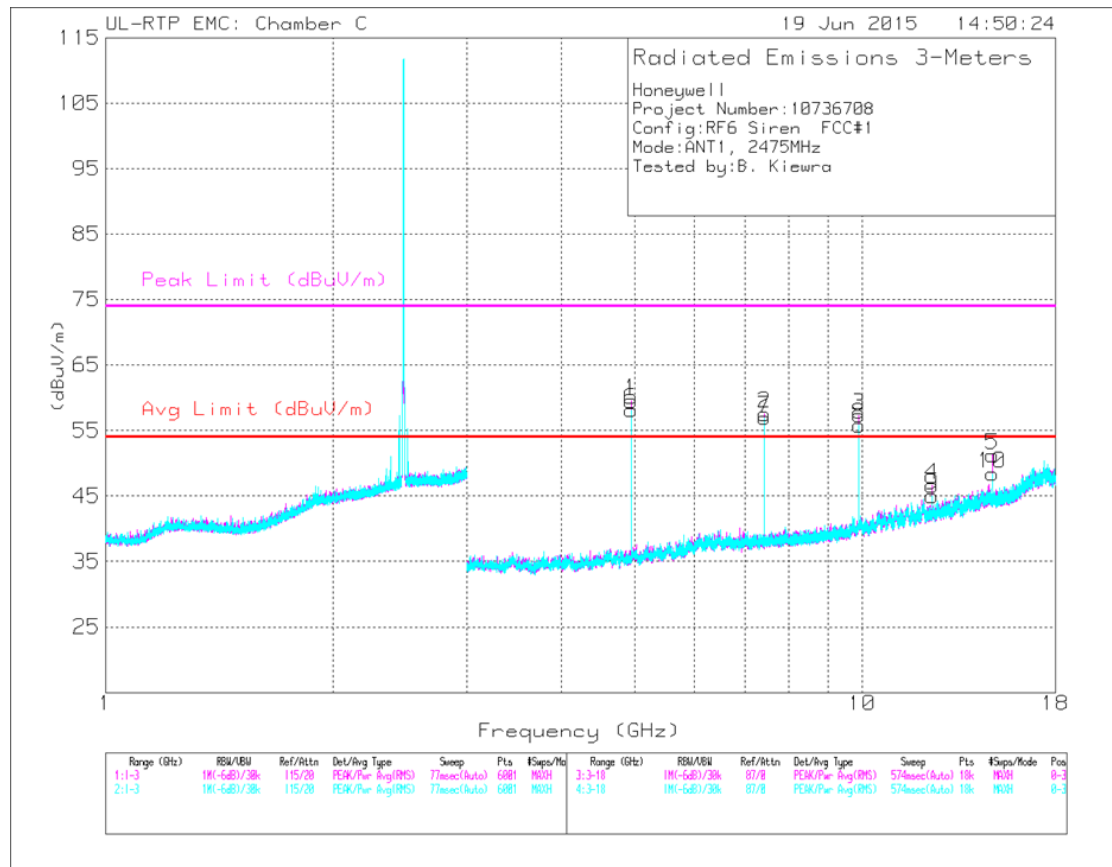


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn AT0063 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 18.456	53.6	Pk	32.4	-46.3	39.7	54	-14.3	74	-34.3	0-360	175	H
2	* 20.725	53.56	Pk	33.1	-46	40.66	54	-13.34	74	-33.34	0-360	225	H
3	* 22.602	53.67	Pk	34.1	-45.9	41.87	54	-12.13	74	-32.13	0-360	225	H
4	* 20.349	53.6	Pk	33	-46.1	40.5	54	-13.5	74	-33.5	0-360	151	V
6	* 22.073	52.82	Pk	36.9	-45.8	43.92	54	-10.08	74	-30.08	0-360	200	V
5	21.731	53.68	Pk	36.2	-45.8	44.08	-	-	74	-29.92	0-360	225	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS – HIGH CHANNEL ANT1

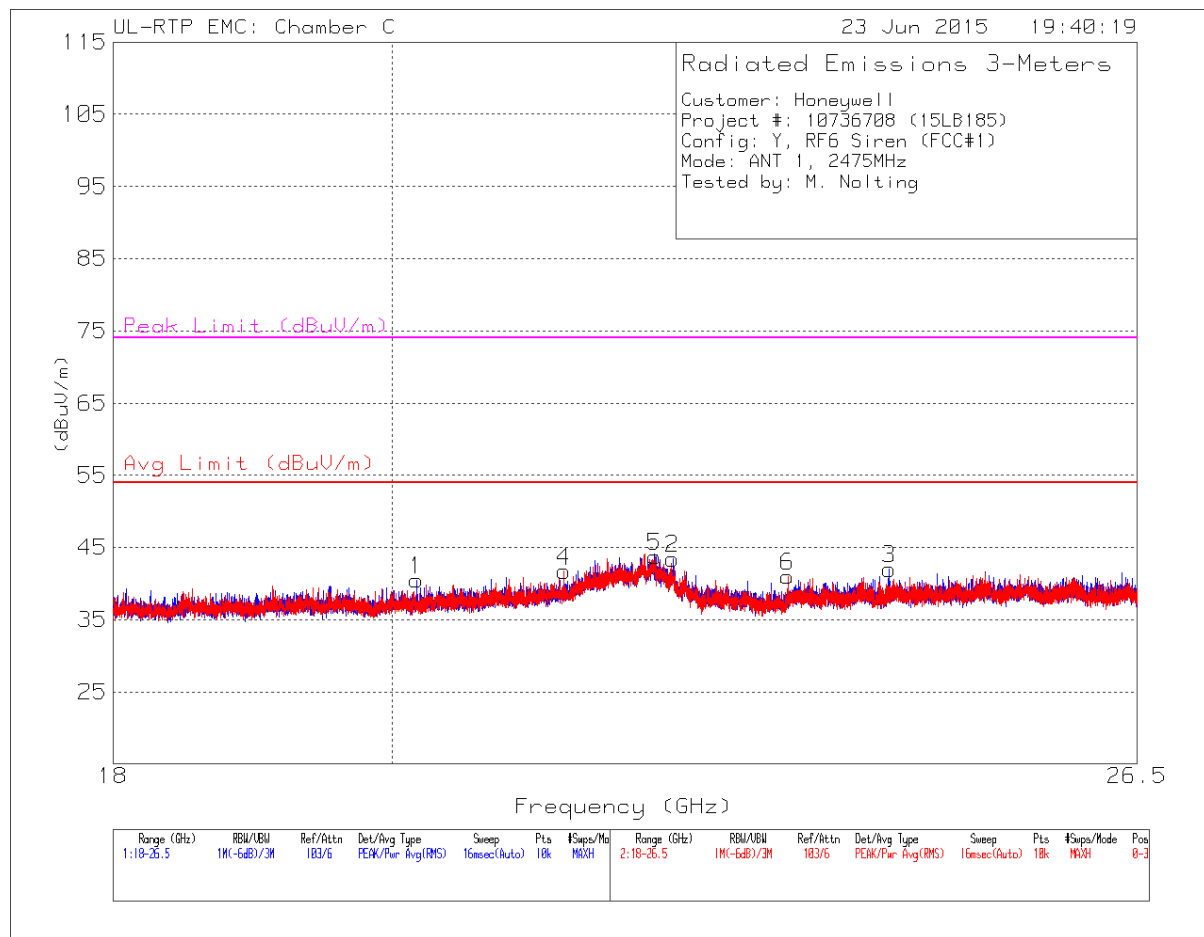


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.951	62.21	Pk	34.1	-32.8	0	63.51	-	-	74	-10.49	71	177	H
	* 4.951	62.21	AV	34.1	-32.8	-23.1	40.41	54	-13.59	-	-	71	177	H
2	* 7.427	56.13	Pk	35.7	-28.6	0	63.23	-	-	74	-10.77	136	206	H
	* 7.427	56.13	AV	35.7	-28.6	-23.1	40.13	54	-13.87	-	-	136	206	H
4	* 12.372	42.65	Pk	38.9	-26.5	0	55.05	-	-	74	-18.95	328	170	H
	* 12.372	42.65	AV	38.9	-26.5	-23.1	31.95	54	-22.05	-	-	328	170	H
6	* 4.949	61.18	Pk	34.1	-32.8	0	62.48	-	-	74	-11.52	166	278	V
	* 4.949	61.18	AV	34.1	-32.8	-23.1	39.38	54	-14.62	-	-	166	278	V
7	* 7.427	54.8	Pk	35.7	-28.6	0	61.9	-	-	74	-12.1	198	239	V
	* 7.427	54.8	AV	35.7	-28.6	-23.1	38.80	54	-15.20	-	-	198	239	V
9	* 12.378	41.02	Pk	38.9	-26.3	0	53.62	-	-	74	-20.38	61	305	V
	* 12.378	41.02	AV	38.9	-26.3	-23.1	30.52	54	-23.48	-	-	61	305	V
3	9.901	46.55	Pk	37.1	-26.3	0	57.35	-	-	74	-16.65	0-360	151	H
8	9.901	45.02	Pk	37.1	-26.3	0	55.82	-	-	74	-18.18	0-360	151	V
5	14.853	35.54	Pk	39.6	-23.9	0	51.24	-	-	74	-22.76	0-360	250	H
10	14.853	32.73	Pk	39.6	-23.9	0	48.43	-	-	74	-25.57	0-360	250	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average measurement calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

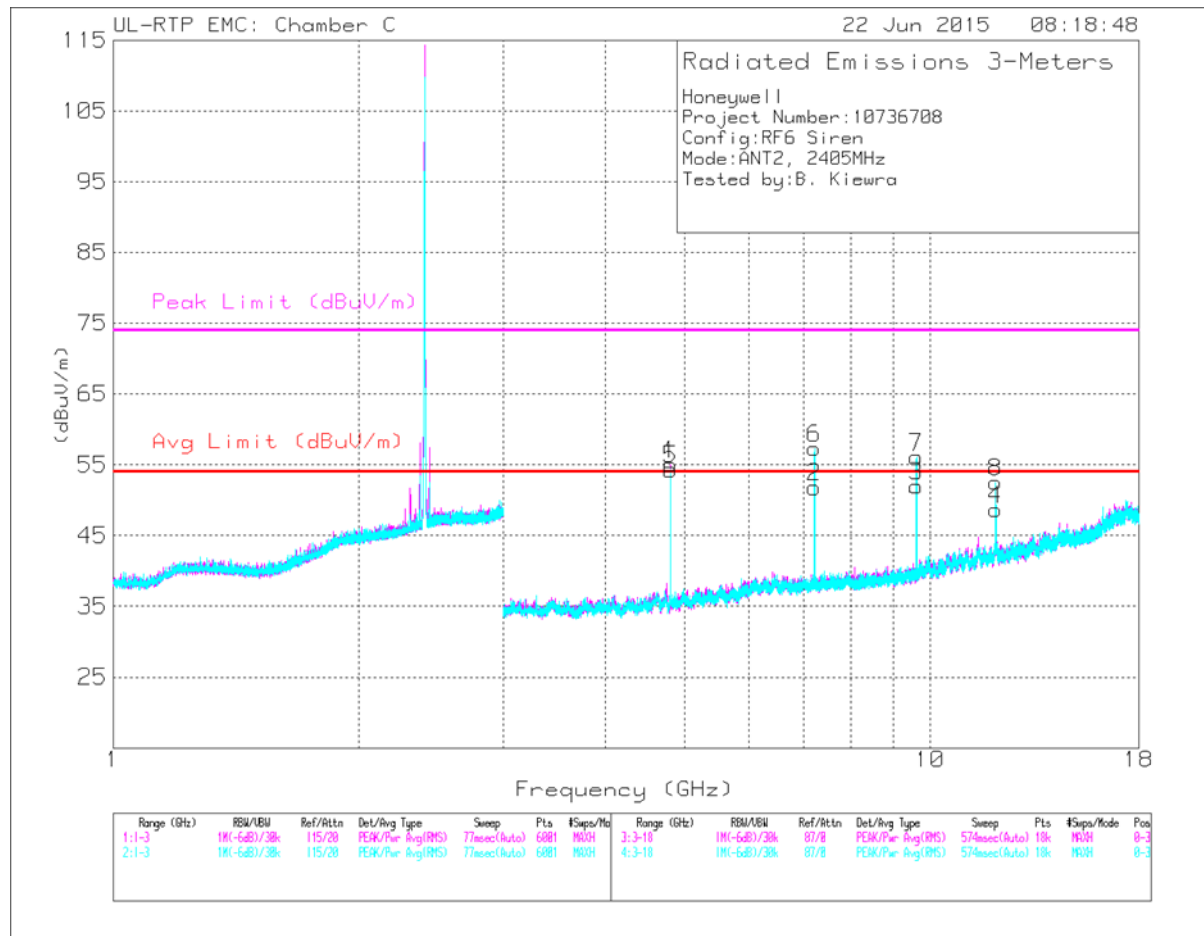


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn AT0063 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 20.187	54.01	Pk	32.7	-46.2	40.51	54	-13.49	74	-33.49	0-360	225	H
2	* 22.237	53.27	Pk	36	-45.8	43.47	54	-10.53	74	-30.53	0-360	151	H
4	* 21.344	53.41	Pk	34.1	-45.8	41.71	54	-12.29	74	-32.29	0-360	151	V
5	* 22.088	52.74	Pk	36.8	-45.8	43.74	54	-10.26	74	-30.26	0-360	225	V
6	23.224	53.41	Pk	33.5	-45.9	41.01	-	-	74	-32.99	0-360	225	V
3	24.133	53.81	Pk	33.5	-45.3	42.01	-	-	74	-31.99	0-360	200	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS – LOW CHANNEL ANT2

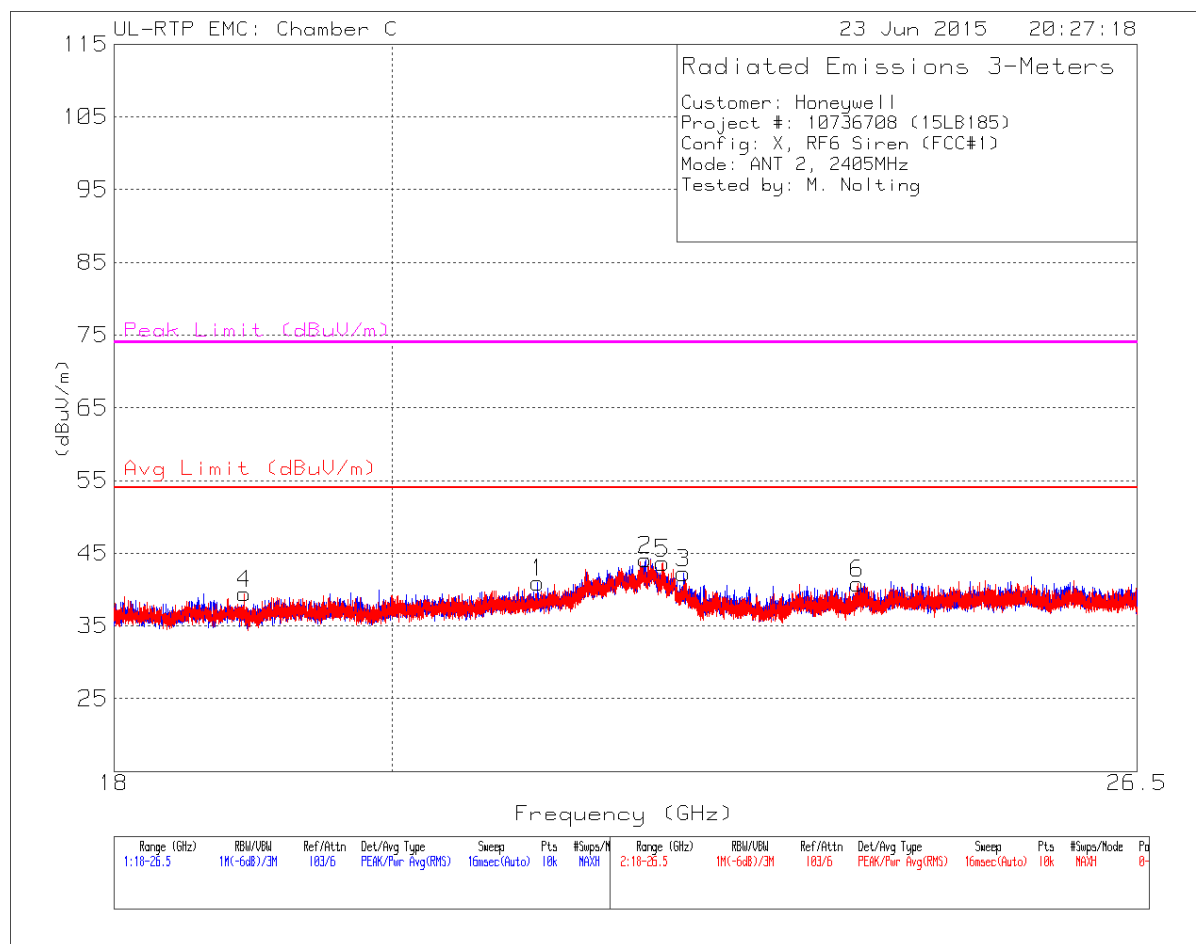


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.811	58.98	Pk	34.1	-32.8	0	60.28	-	-	74	-13.72	160	101	H
	* 4.811	58.98	AV	34.1	-32.8	-23.1	37.18	54	-16.82	-	-	160	101	H
4	* 12.027	42.01	Pk	38.7	-25	0	55.71	-	-	74	-18.29	129	385	H
	* 12.027	42.01	AV	38.7	-25	-23.1	32.61	54	-21.39	-	-	129	385	H
5	* 4.811	56.66	Pk	34.1	-32.8	0	57.96	-	-	74	-16.04	335	297	V
	* 4.811	56.66	AV	34.1	-32.8	-23.1	34.86	54	-19.14	-	-	335	297	V
8	* 12.023	44.66	Pk	38.7	-25	0	58.36	-	-	74	-15.64	301	233	V
	* 12.023	44.66	AV	38.7	-25	-23.1	35.26	54	-18.74	-	-	301	233	V
2	7.216	45.04	Pk	35.6	-28.8	0	51.84	-	-	74	-22.16	0-360	151	H
6	7.216	50.55	Pk	35.6	-28.8	0	57.35	-	-	74	-16.65	0-360	250	V
3	9.621	43	Pk	36.8	-27.8	0	52	-	-	74	-22	0-360	151	H
7	9.621	47.06	Pk	36.8	-27.8	0	56.06	-	-	74	-17.94	0-360	250	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average measurement calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

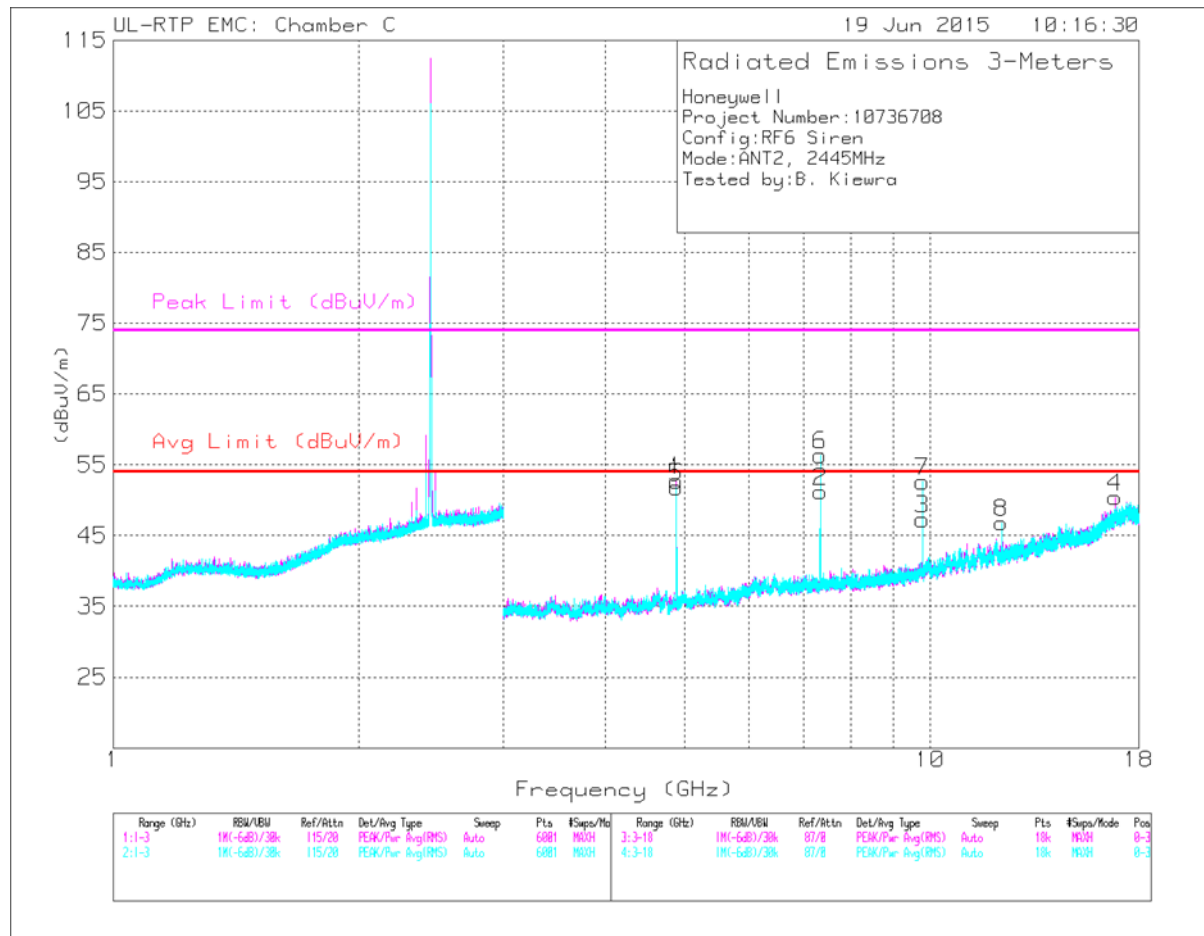


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn AT0063 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 21.129	53.27	Pk	33.5	-45.8	40.97	54	-13.03	74	-33.03	0-360	175	H
3	* 22.326	52.54	Pk	35.6	-45.9	42.24	54	-11.76	74	-31.76	0-360	151	H
4	* 18.911	53.14	Pk	32.5	-46.2	39.44	54	-14.56	74	-34.56	0-360	200	V
5	* 22.151	53.03	Pk	36.5	-45.9	43.63	54	-10.37	74	-30.37	0-360	200	V
6	* 23.843	52.82	Pk	33.6	-45.6	40.82	54	-13.18	74	-33.18	0-360	200	V
2	22.006	53.02	Pk	36.9	-45.8	44.12	-	-	74	-29.88	0-360	175	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS – MID CHANNEL ANT2

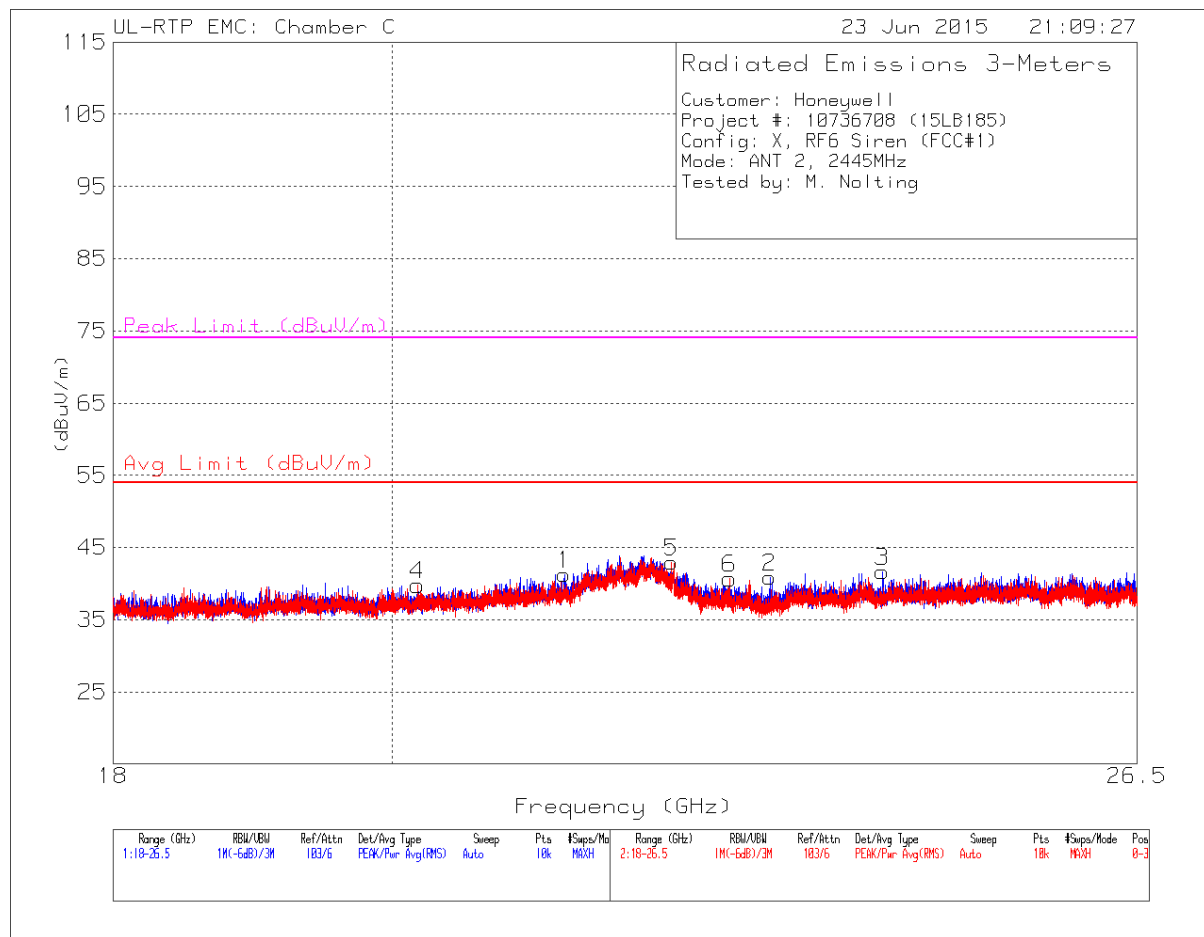


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.891	55.52	Pk	34	-33	0	56.52	-	-	74	-17.48	31	131	H
	* 4.891	55.52	AV	34	-33	-23.1	33.42	54	-20.58	-	-	31	131	H
2	* 7.333	50.88	Pk	35.7	-29	0	57.58	-	-	74	-16.42	216	136	H
	* 7.333	50.88	AV	35.7	-29	-23.1	34.48	54	-19.52	-	-	216	136	H
5	* 4.891	55.61	Pk	34	-33	0	56.61	-	-	74	-17.39	157	299	V
	* 4.891	55.61	AV	34	-33	-23.1	33.51	54	-20.49	-	-	157	299	V
6	* 7.333	53.58	Pk	35.7	-29	0	60.28	-	-	74	-13.72	257	237	V
	* 7.333	53.58	AV	35.7	-29	-23.1	37.18	54	-16.82	-	-	257	237	V
8	* 12.222	42.91	Pk	38.9	-26.7	0	55.11	-	-	74	-18.89	243	228	V
	* 12.222	42.91	AV	38.9	-26.7	-23.1	32.01	54	-21.99	-	-	243	228	V
7	9.778	42.54	Pk	37	-26.9	0	52.64	-	-	74	-21.36	0-360	250	V
3	9.781	37.2	Pk	37	-26.9	0	47.3	-	-	74	-26.7	0-360	151	H
4	16.832	29.64	Pk	41.6	-20.8	0	50.44	-	-	74	-23.56	0-360	250	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average measurement calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.

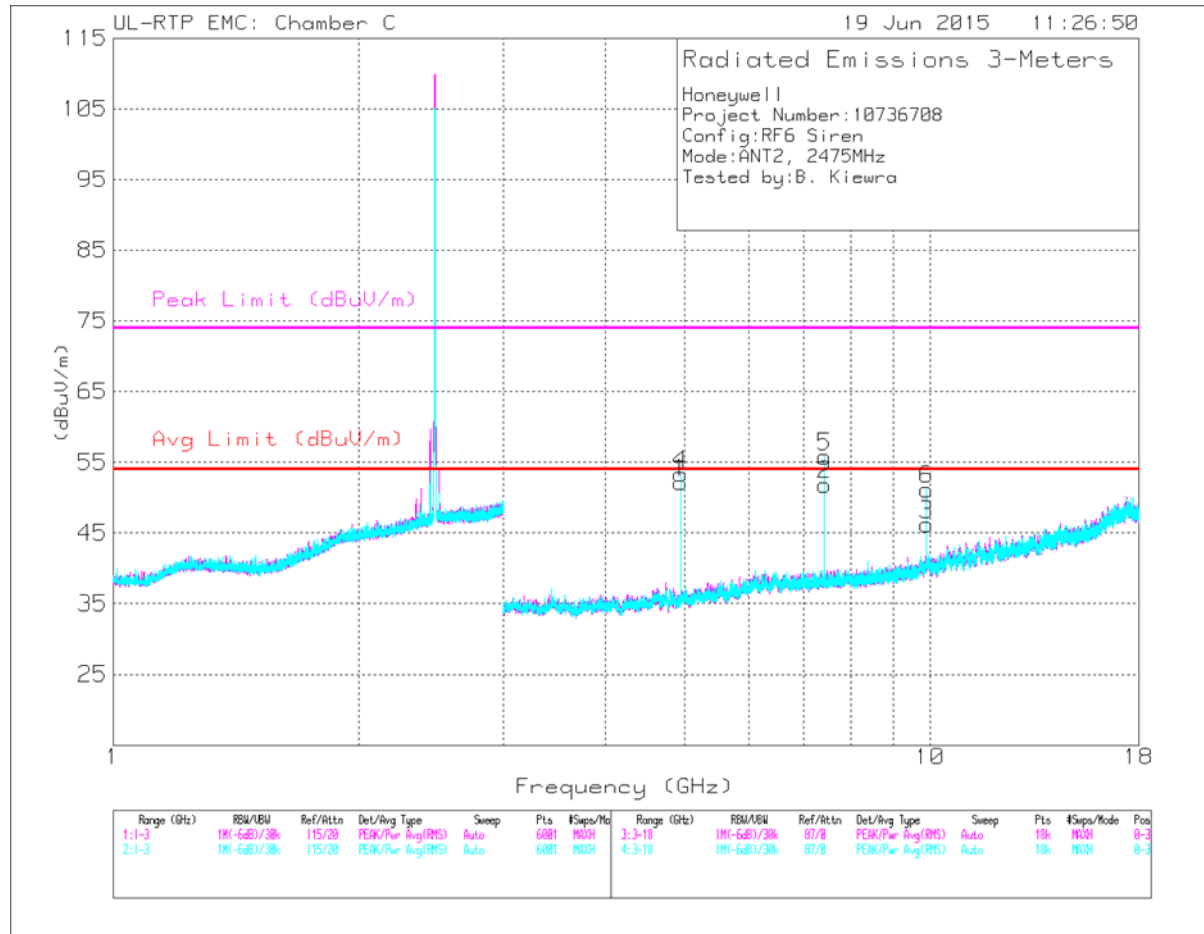


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn AT0063 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 21.344	52.9	Pk	34.2	-45.8	41.3	54	-12.7	74	-32.7	0-360	200	H
2	* 23.068	53.31	Pk	33.5	-45.9	40.91	54	-13.09	74	-33.09	0-360	151	H
4	* 20.193	53.31	Pk	32.7	-46.2	39.81	54	-14.19	74	-34.19	0-360	151	V
5	* 22.227	52.68	Pk	36.1	-45.8	42.98	54	-11.02	74	-31.02	0-360	225	V
6	* 22.72	52.62	Pk	34	-45.9	40.72	54	-13.28	74	-33.28	0-360	200	V
3	24.072	53.57	Pk	33.5	-45.4	41.67	-	-	74	-32.33	0-360	200	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS – HIGH CHANNEL ANT2

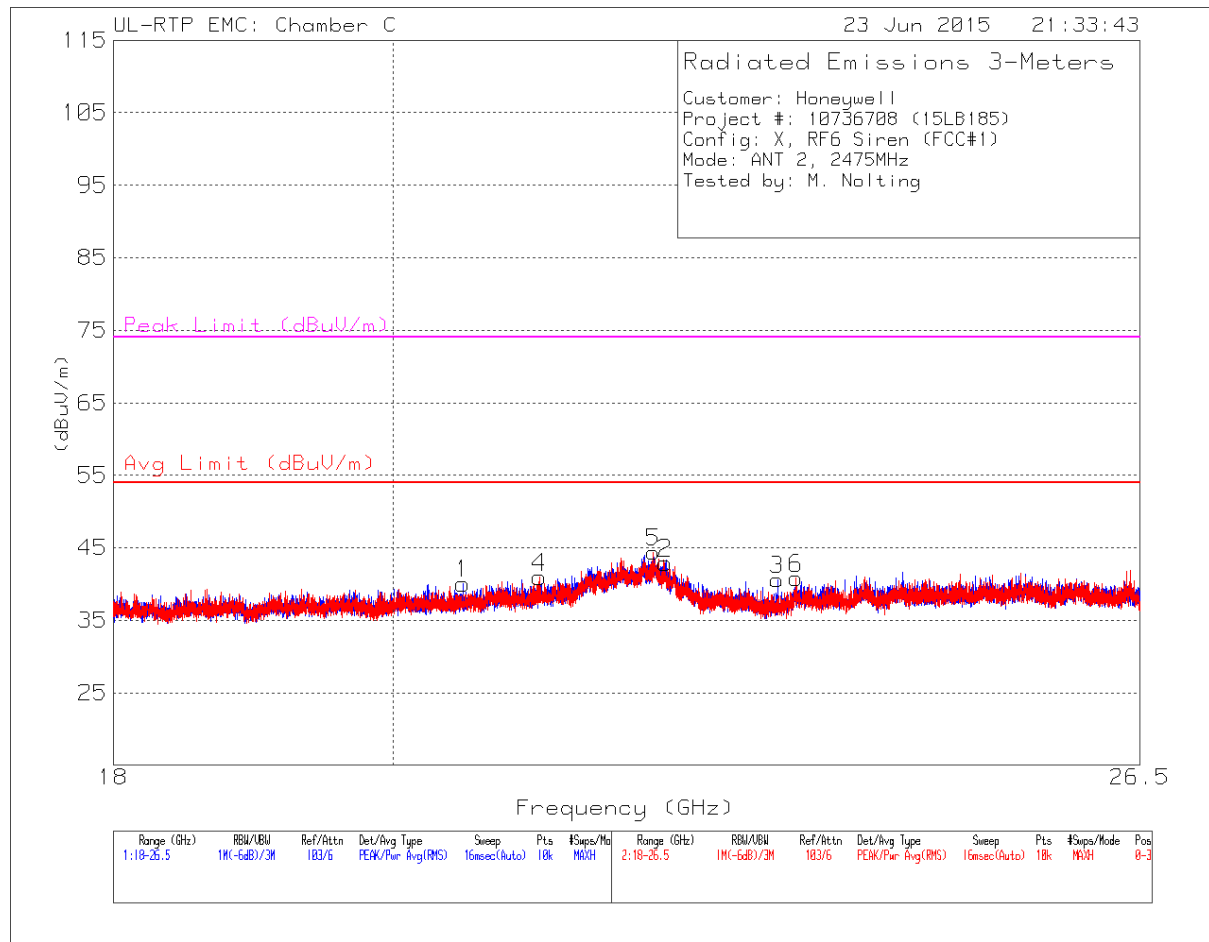


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/F ltr/Pad	DCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.951	55.17	Pk	34.1	-32.8	0	56.47	-	-	74	-17.53	12	278	H
	* 4.951	55.17	AV	34.1	-32.8	-23.1	33.37	54	-20.63	-	-	12	278	H
2	* 7.426	49.95	Pk	35.7	-28.6	0	57.05	-	-	74	-16.95	305	142	H
	* 7.426	49.95	AV	35.7	-28.6	-23.1	33.95	54	-20.05	-	-	305	142	H
4	* 4.951	56.54	Pk	34.1	-32.8	0	57.84	-	-	74	-16.16	273	345	V
	* 4.951	56.54	AV	34.1	-32.8	-23.1	34.74	54	-19.26	-	-	273	345	V
5	* 7.426	53.31	Pk	35.7	-28.6	0	60.41	-	-	74	-13.59	165	287	V
	* 7.426	53.31	AV	35.7	-28.6	-23.1	37.31	54	-16.69	-	-	165	287	V
6	9.898	40.39	Pk	37.1	-26.3	0	51.19	-	-	74	-22.81	0-360	250	V
3	9.901	35.41	Pk	37.1	-26.3	0	46.21	-	-	74	-27.79	0-360	151	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

AV – Average measurement calculated using $AV = PK + 20\log(DC)$. Where $DC = 0.06976$.



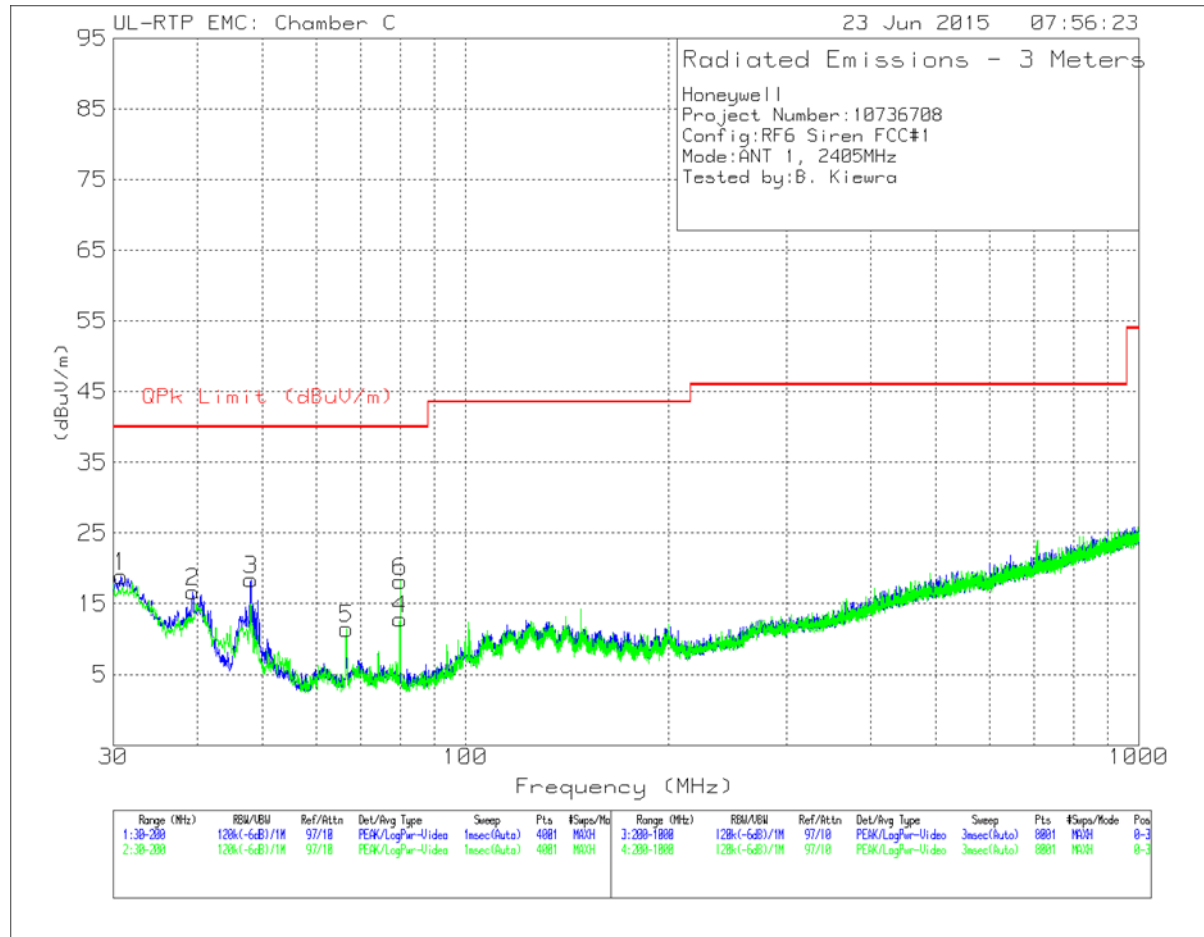
Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	Horn AT0063 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBUV/m)	Avg Limit (dBUV/m)	Margin (dB)	Peak Limit (dBUV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 20.534	53.06	Pk	33.1	-46.1	40.06	54	-13.94	74	-33.94	0-360	175	H
2	* 22.162	52.4	Pk	36.4	-45.9	42.9	54	-11.1	74	-31.1	0-360	151	H
3	* 23.117	53.02	Pk	33.5	-45.9	40.62	54	-13.38	74	-33.38	0-360	151	H
4	* 21.135	53.24	Pk	33.5	-45.8	40.94	54	-13.06	74	-33.06	0-360	225	V
5	* 22.062	53.41	Pk	36.9	-45.9	44.41	54	-9.59	74	-29.59	0-360	225	V
6	23.281	53.23	Pk	33.5	-45.9	40.83	-	-	74	-33.17	0-360	225	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

8.3. WORST-CASE BELOW 1 GHz

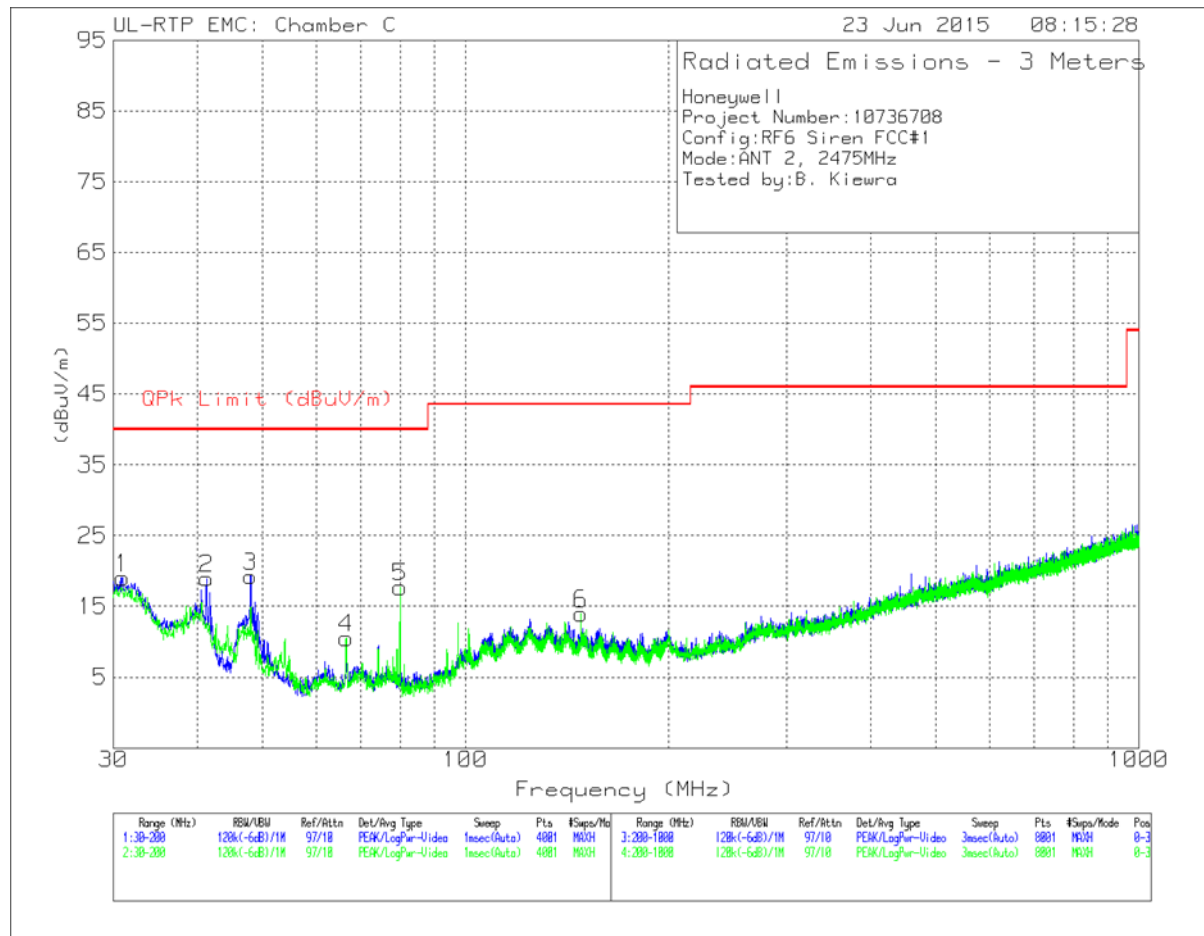
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE) ANT1



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.8075	29.29	Pk	21.2	-31.6	18.89	40	-21.11	0-360	101	H
2	39.3925	33.29	Pk	14.9	-31.5	16.69	40	-23.31	0-360	400	H
3	48.02	41.12	Pk	8.7	-31.4	18.42	40	-21.58	0-360	300	H
4	80.0225	36.52	Pk	7.4	-31.1	12.82	40	-27.18	0-360	101	H
5	66.635	34.38	Pk	8.3	-31.2	11.48	40	-28.52	0-360	101	V
6	79.98	41.89	Pk	7.4	-31.1	18.19	40	-21.81	0-360	101	V

Pk - Peak detector

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE) ANT2

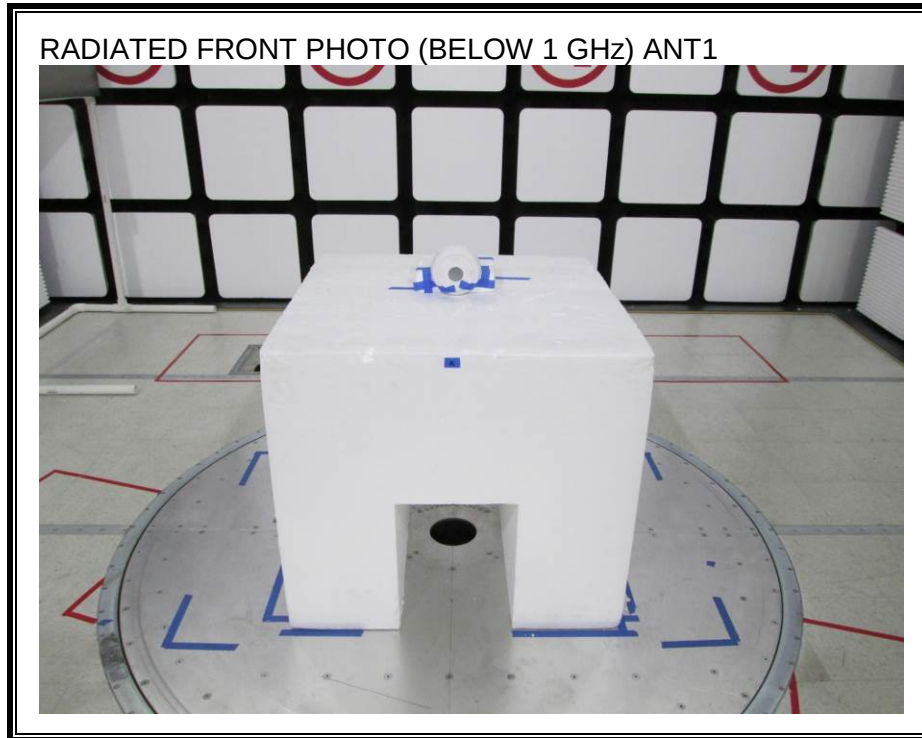


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.9775	29.52	Pk	21.1	-31.6	19.02	40	-20.98	0-360	300	H
2	41.2625	36.85	Pk	13.5	-31.4	18.95	40	-21.05	0-360	200	H
3	47.9775	41.93	Pk	8.7	-31.4	19.23	40	-20.77	0-360	300	H
4	66.5925	33.42	Pk	8.3	-31.2	10.52	40	-29.48	0-360	101	V
5	79.98	41.41	Pk	7.4	-31.1	17.71	40	-22.29	0-360	101	V
6	148.49	31.67	Pk	12.8	-30.5	13.97	43.52	-29.55	0-360	101	V

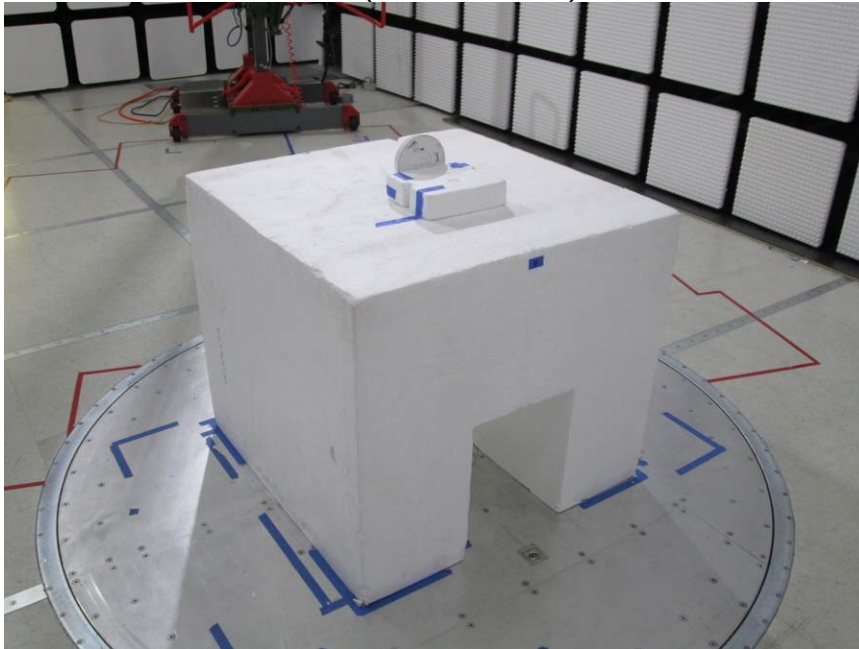
Pk - Peak detector

9. SETUP PHOTOS

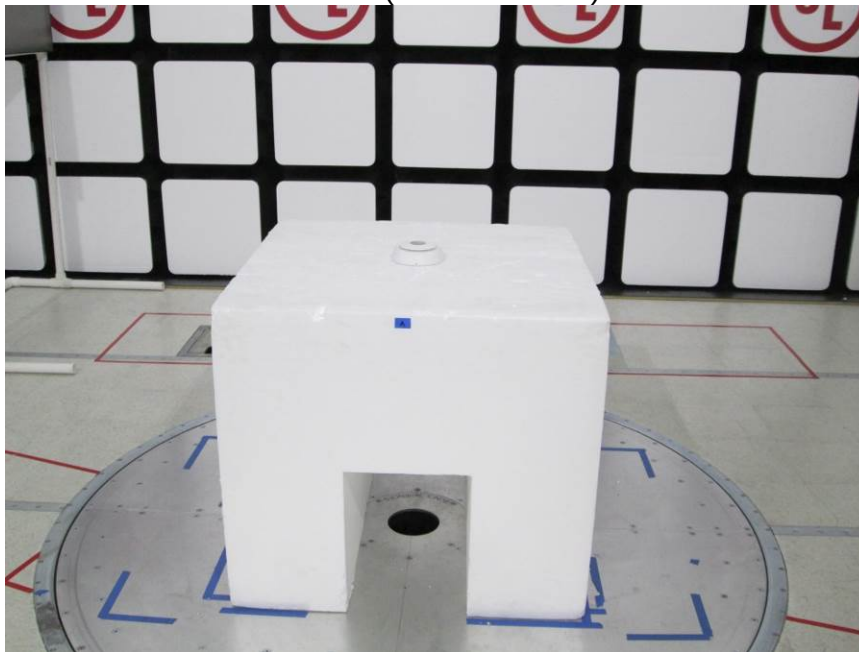
RADIATED RF MEASUREMENT SETUP (BELOW 1 GHz)

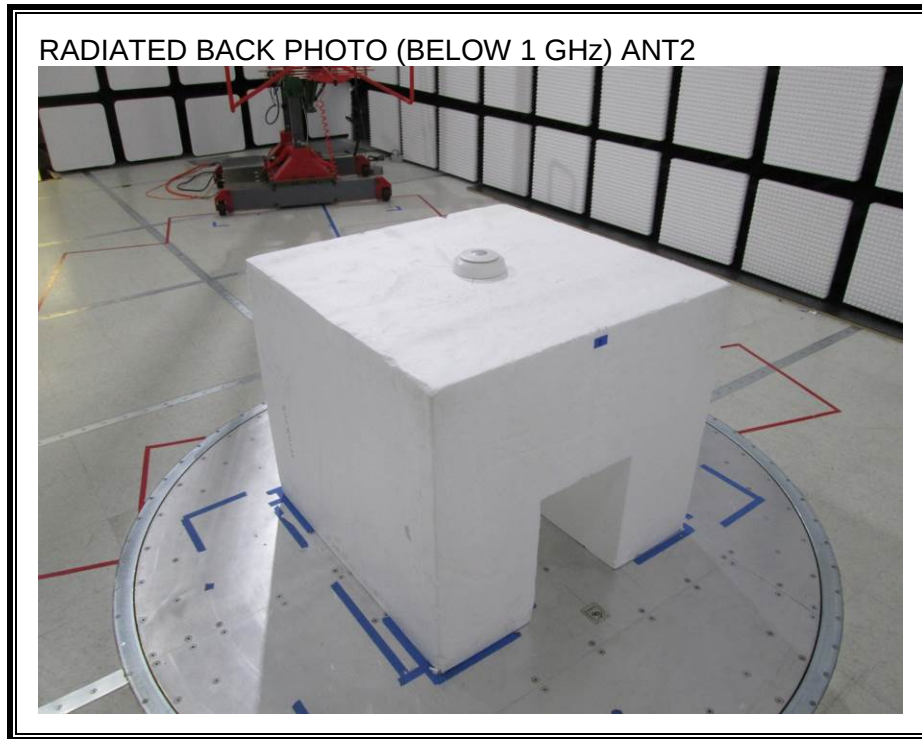


RADIATED BACK PHOTO (BELOW 1 GHz) ANT1



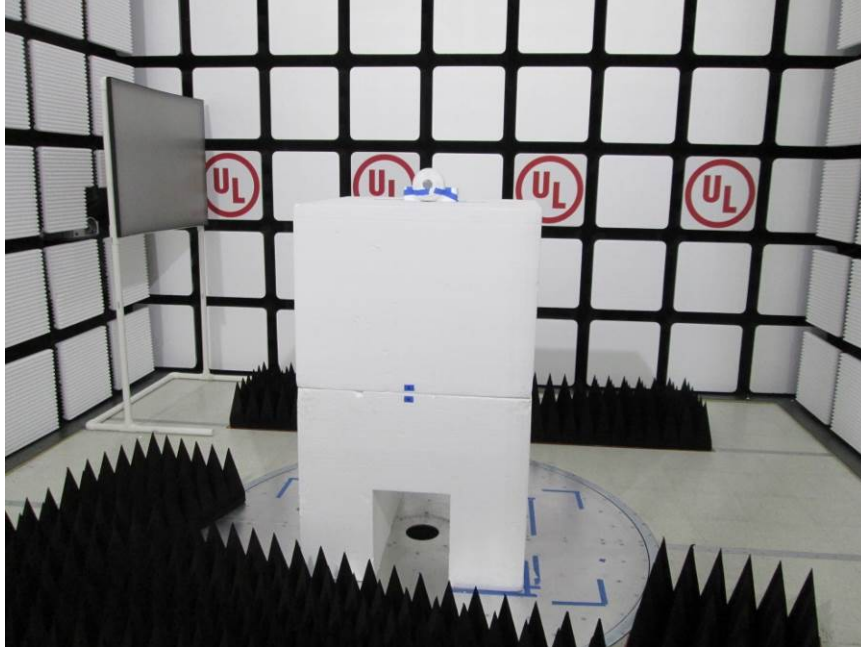
RADIATED FRONT PHOTO (BELOW 1 GHz) ANT2



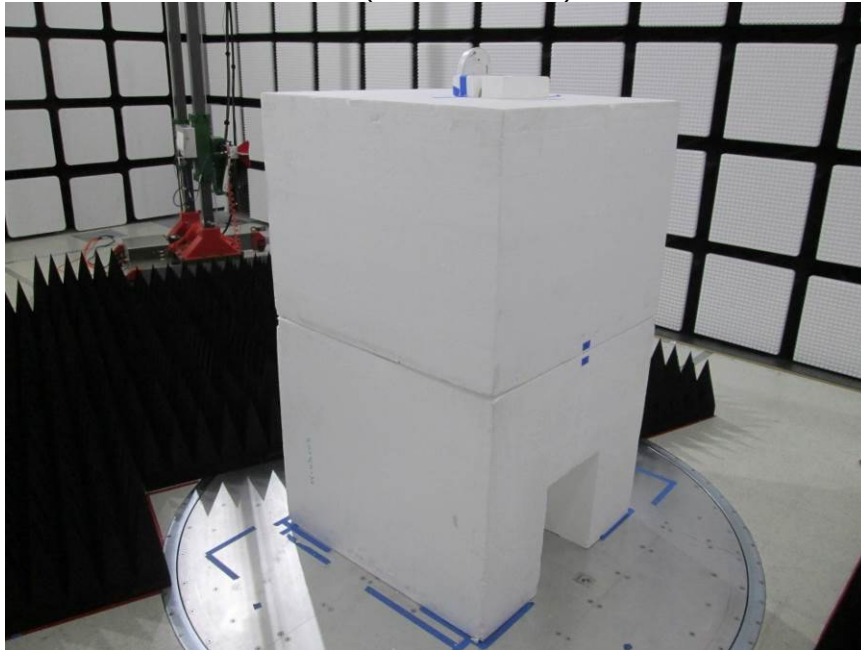


RADIATED RF MEASUREMENT SETUP (ABOVE 1 GHz)

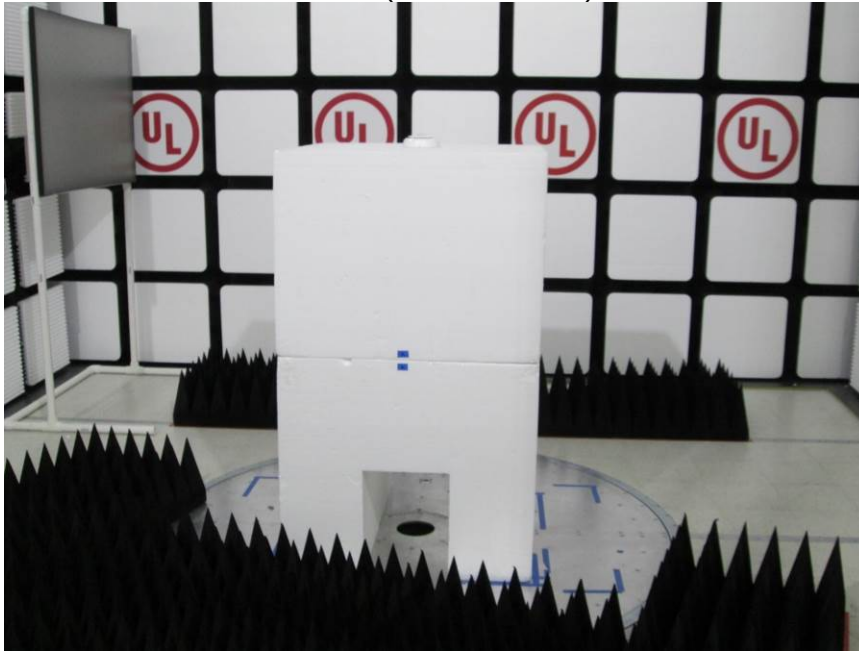
RADIATED FRONT PHOTO (ABOVE 1 GHz) ANT1



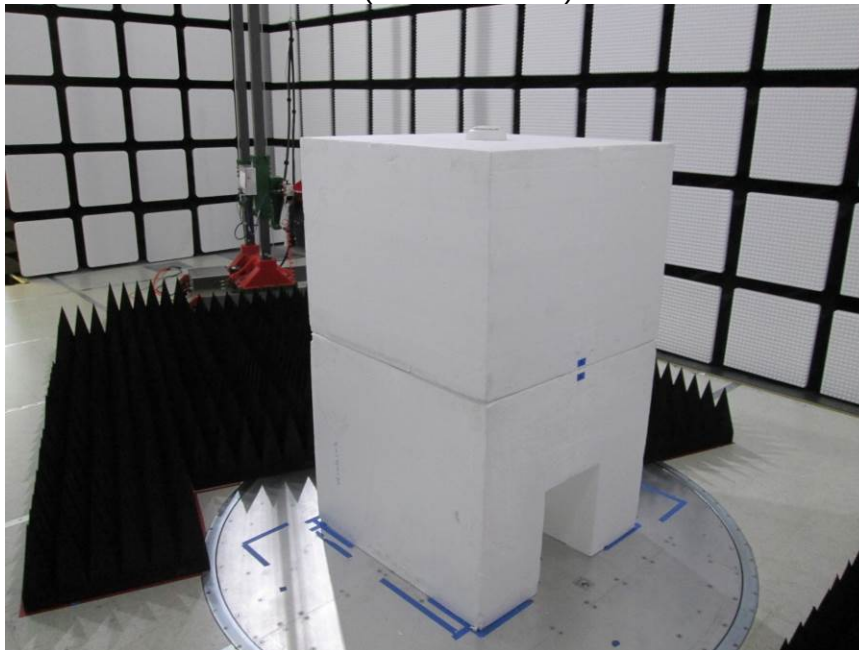
RADIATED BACK PHOTO (ABOVE 1 GHz) ANT1



RADIATED FRONT PHOTO (ABOVE 1 GHz) ANT2

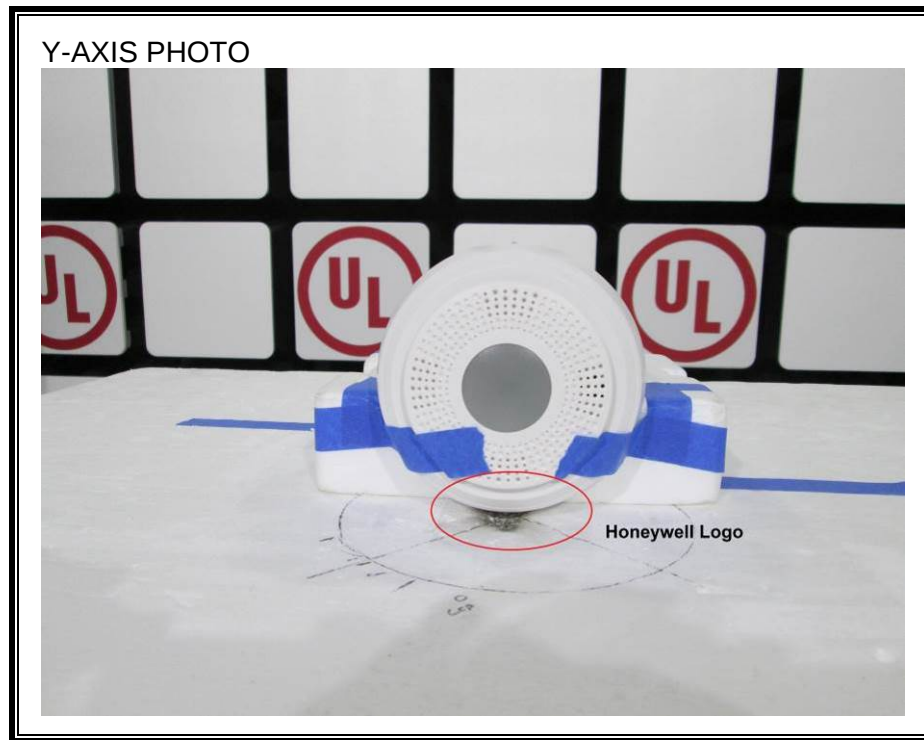


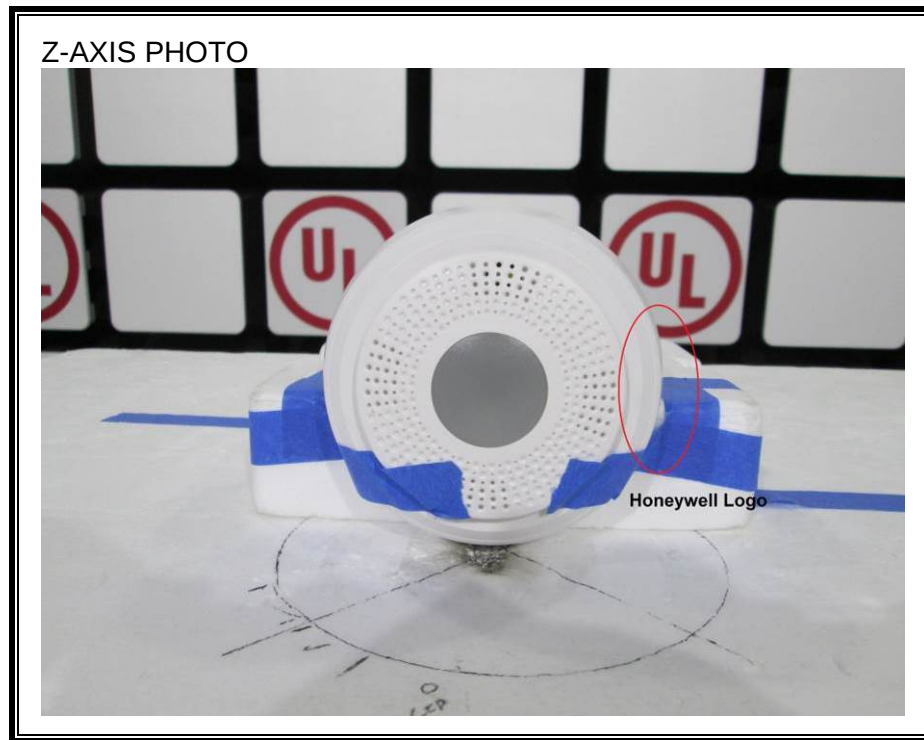
RADIATED BACK PHOTO (ABOVE 1 GHz) ANT2



X,Y,Z ORIENTATION SETUP







END OF REPORT