



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1**

C2PC CERTIFICATION TEST REPORT

For

DOLPHIN CT50 HEALTHCARE

**MODEL NUMBER: CT50L0N
FCC ID: HD5-CT50L0N
IC ID: 1693B-CT50L0N**

REPORT NUMBER: 15U21901-E1V2

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	12/21/2015	Initial Issue	C.S.OOI
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: HONEYWELL INTERNATIONAL INC
HONEYWELL SENSING AND PRODUCTIVITY SOLUTIONS

EUT DESCRIPTION: DOLPHIN CT50 HEALTHCARE

MODEL: CT50L0N

SERIAL NUMBER: 152884063F (Radiated)

DATE TESTED: NOVEMBER 17 - DECEMBER 2, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 ISSUE 1	Pass
INDUSTRY CANADA RSS-GEN ISSUE 4	Pass

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, RSS-GEN Issue 4, RSS-247 Issue 1.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☒ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☒ Chamber H(IC: 2324B-8)

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Dolphin CT50 Healthcare with BT, BLE, DTS & UNII a/b/g/n/ac and NFC.

5.2. MAXIMUM OUTPUT POWER

Refer to the original report, 15U20259-E8 for detail.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an embedded antenna, with a maximum gain of 1.7 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the equipment during testing was Android Helsinki-eng 4.4.4 KTU84P 59.02.02.0013E dev-keys.

The test utility software used during testing was FTM Tool, Ver. 1.6.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were 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, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

5.6. REASON FOR C2PC

Enclosure plastic material changed compound. Enclosure is the same shape and size as what was filed but will be produce with no hand strap. All other electronic components are the same as what was filed. Only radiated emissions tests were performed in this filing. Results of other tests performed in the original filing would not be affected by this change

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	PHIHONG	PSA10F-050Q	N/A	N/A
USB CUP Adapter	Honeywell	N/A	N/A	N/A

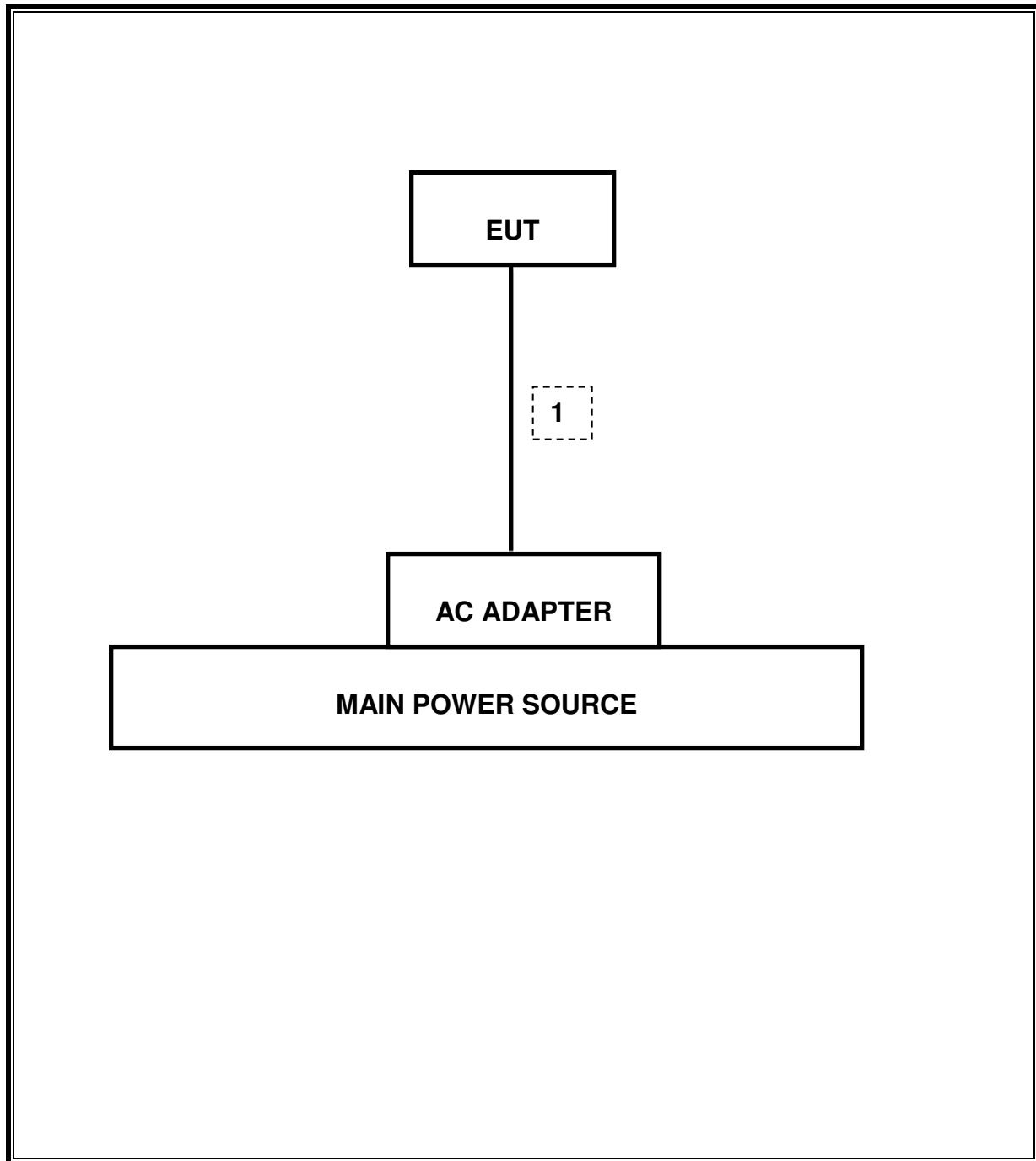
I/O CABLES

N/A

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	Manufacturer	Model	T No.	Cal Date	Cal Due
Bilog Antenna 30-1000MHz	Sunol	JB1	130	09/01/15	09/01/16
Horn Antenna 1-18GHz	ETS	3117	136	03/03/15	03/03/16
Horn Antenna 1-18GHz	ETS	3117	345	03/03/15	03/03/16
Horn Antenna 1-18GHz	ETS	3117	863	04/10/15	10/10/16
Horn Antenna 18-26GHz	ARA	SWH-28	98	12/17/14	12/17/15
Horn Antenna 26.5- 40GHz	ARA	MWH-2640/B	90	07/28/15	07/28/16
Preamp 10kHz-1000MHz	Sonoma	310	300	09/01/15	09/01/16
Preamp 1-8GHz	Miteq	AMF-4D-010008	782	10/22/15	10/22/16
Preamp 1-18GHz	Miteq	AFS42-00101800	493	01/16/15	01/16/16
Preamp 1-26.5GHz	Agilent	8449B	404	04/13/15	04/13/16
Amplifier, 26-40GHz	Miteq	NSP4000-SP2	88	04/07/15	04/07/16
Spectrum Analyzer 3kHz - 44GHz	Agilent	N9030A	908	06/16/15	05/26/16
Spectrum Analyzer 3kHz - 44GHz	Agilent	N9030A	907	05/15/15	05/15/16
Spectrum Analyzer 9kHz - 40GHz	HP	8564E	106	08/14/15	08/14/16
3GHz HPF	Micro-Tronics	HPM17543	487	01/31/15	01/31/16
EMI Test Receiver	Rohde & Schwarz	ECSI 7	212	08/07/15	08/07/16
LISN for Conducted Emission	FCC	50/250-25-2	24	01/16/15	01/16/16

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Version 9.5, 07/24/15
Conducted Software	UL	UL EMC	Version 9.5, 05/26/15
Antenna Port Software	UL	UL RF	Version 3.6, 10/23/15

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	RSS-GEN 6.6	Occupied Band width (99%)	N/A	Conducted	Pass	refer 15U20259-E8
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	refer 15U20259-E8
15.247 (b)(1)	RSS-247 5.4(1)	TX conducted output power	<21dBm		Pass	refer 15U20259-E8
15.247 (a)(1)	RSS-247 5.1 (1)	Hopping frequency separation	> 25KHz		Pass	refer 15U20259-E8
15.247 (a)(1)(iii)	RSS-247 5.1(4)	Number of Hopping channels	More than 15 non-overlapping channels		Pass	refer 15U20259-E8
15.247 (a)(1)(iii)	RSS-247 5.1(4)	Avg Time of Occupancy	< 0.4sec		Pass	refer 15U20259-E8
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	refer 15U20259-E8
15.205, 15.209	RSS-GEN 8.9	Radiated Spurious Emission	< 54dBuV/m		Pass	40.2dBuV/m

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

IC RSS-GEN Clause 7 (Receiver)

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. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 1/T (on time) for average measurement.

GFSK = $1/T = 1 / 0.0028S = 360Hz$.

8PSK = $1/T = 1 / 0.0028S = 360Hz$

The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

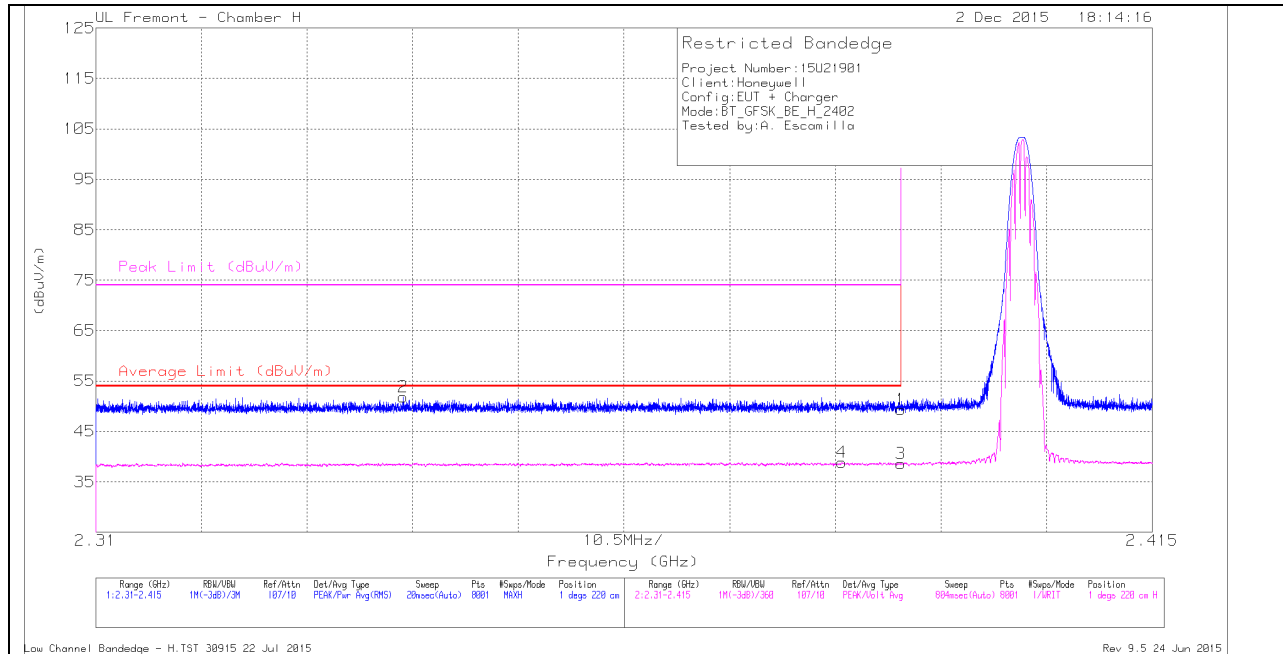
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



Trace Markers

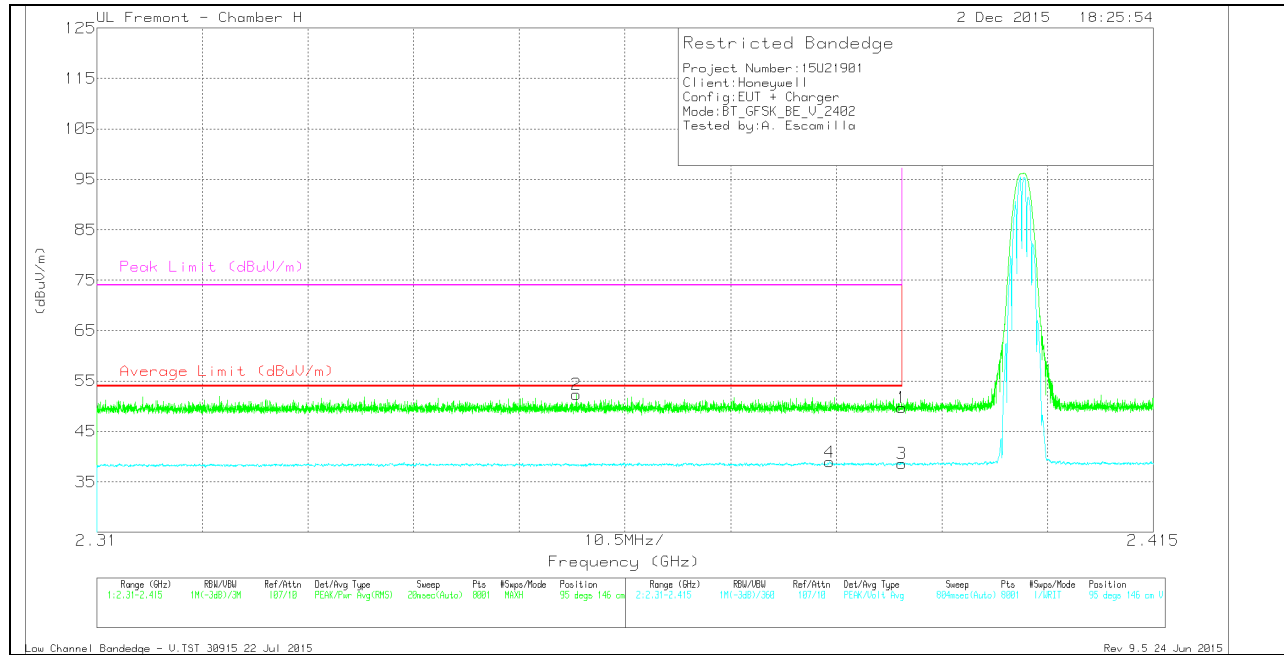
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.89	Pk	32	-23.5	49.39	-	-	74	-24.61	1	220	H
2	* 2.341	43.35	Pk	31.9	-23.4	51.85	-	-	74	-22.15	1	220	H
3	* 2.39	30.14	VA1T	32	-23.5	38.64	54	-15.36	-	-	1	220	H
4	* 2.384	30.31	VA1T	32	-23.4	38.91	54	-15.09	-	-	1	220	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B=1/T_{on}$ where: T_{on} is transmit duration

VERTICAL PEAK AND AVERAGE PLOT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.358	43.87	Pk	31.9	-23.4	52.37	-	-	74	-21.63	95	146	V
4	* 2.383	30.34	VA1T	32	-23.4	38.94	54	-15.06	-	-	95	146	V
1	* 2.39	41.19	Pk	32	-23.5	49.69	-	-	74	-24.31	95	146	V
3	* 2.39	30.16	VA1T	32	-23.5	38.66	54	-15.34	-	-	95	146	V

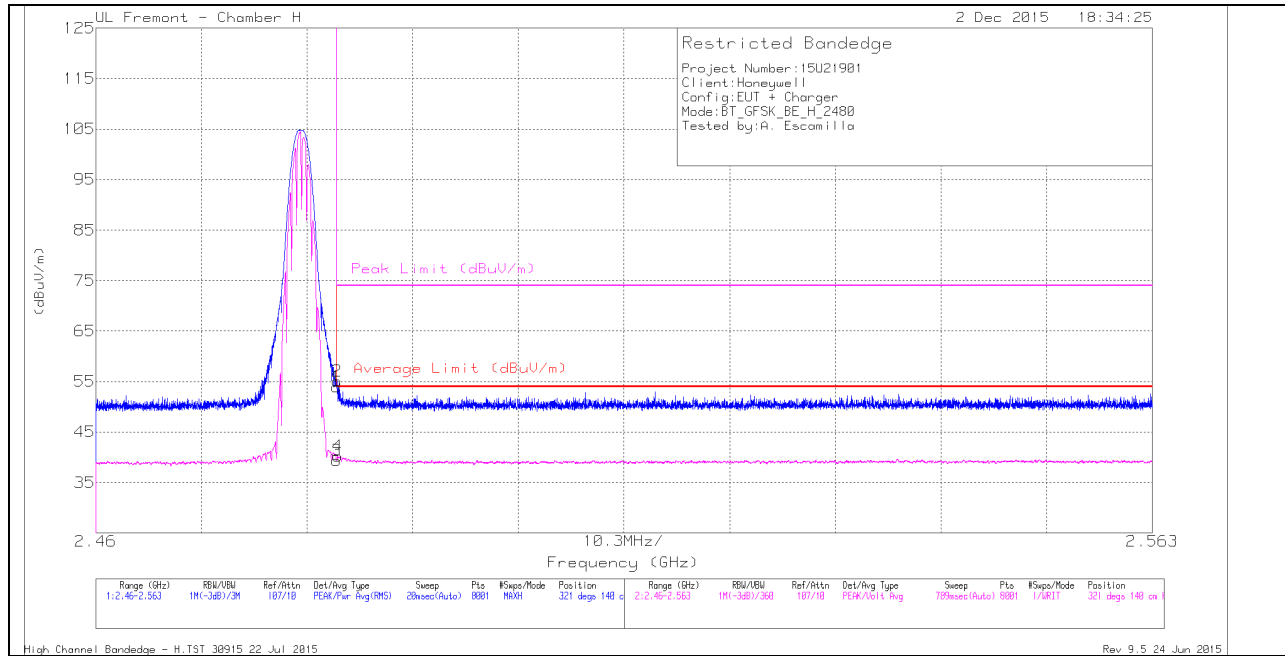
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $VB=1/Ton$ where: Ton is transmit duration

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



Trace Markers

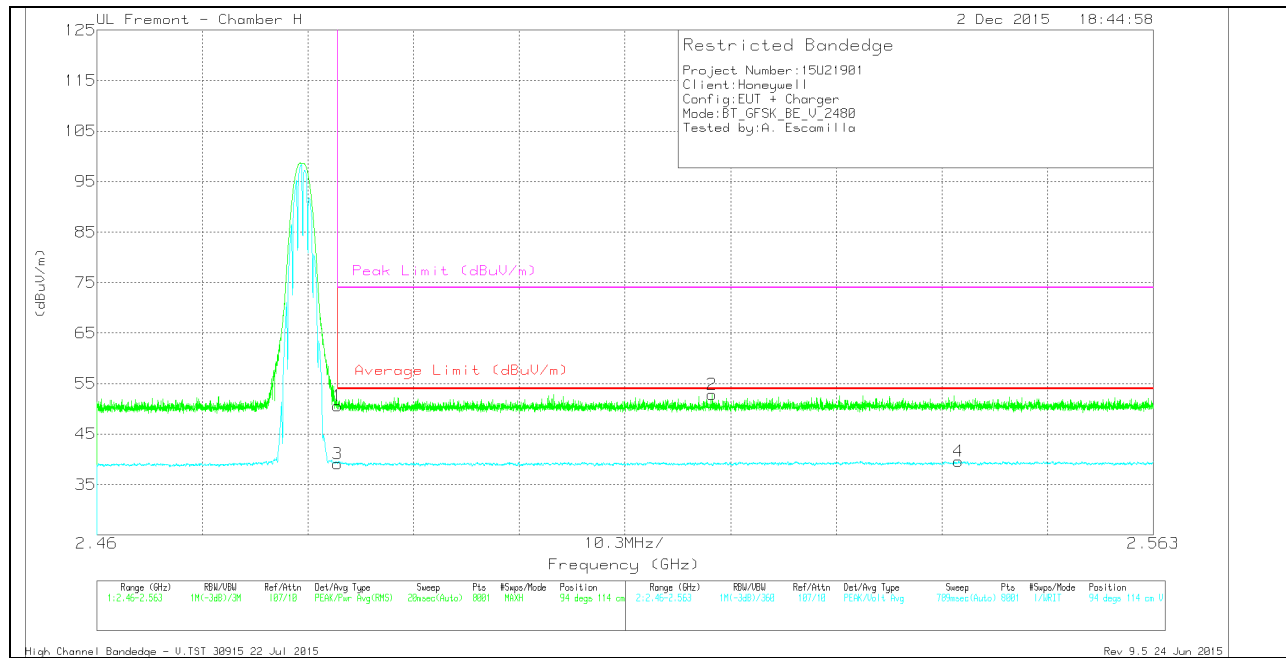
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	44.91	Pk	32.4	-23.4	53.91	-	-	74	-20.09	321	140	H
2	* 2.484	46.11	Pk	32.4	-23.4	55.11	-	-	74	-18.89	321	140	H
3	* 2.484	30.34	VA1T	32.4	-23.4	39.34	54	-14.66	-	-	321	140	H
4	* 2.484	31.2	VA1T	32.4	-23.4	40.2	54	-13.8	-	-	321	140	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL PEAK AND AVERAGE PLOT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fitr/Pad (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	41.63	Pk	32.4	-23.4	50.63	-	-	74	-23.37	94	114	V
3	* 2.484	30.17	VA1T	32.4	-23.4	39.17	54	-14.83	-	-	94	114	V
2	2.52	43.67	Pk	32.5	-23.3	52.87	-	-	74	-21.13	94	114	V
4	2.544	30.33	VA1T	32.5	-23.2	39.63	54	-14.37	-	-	94	114	V

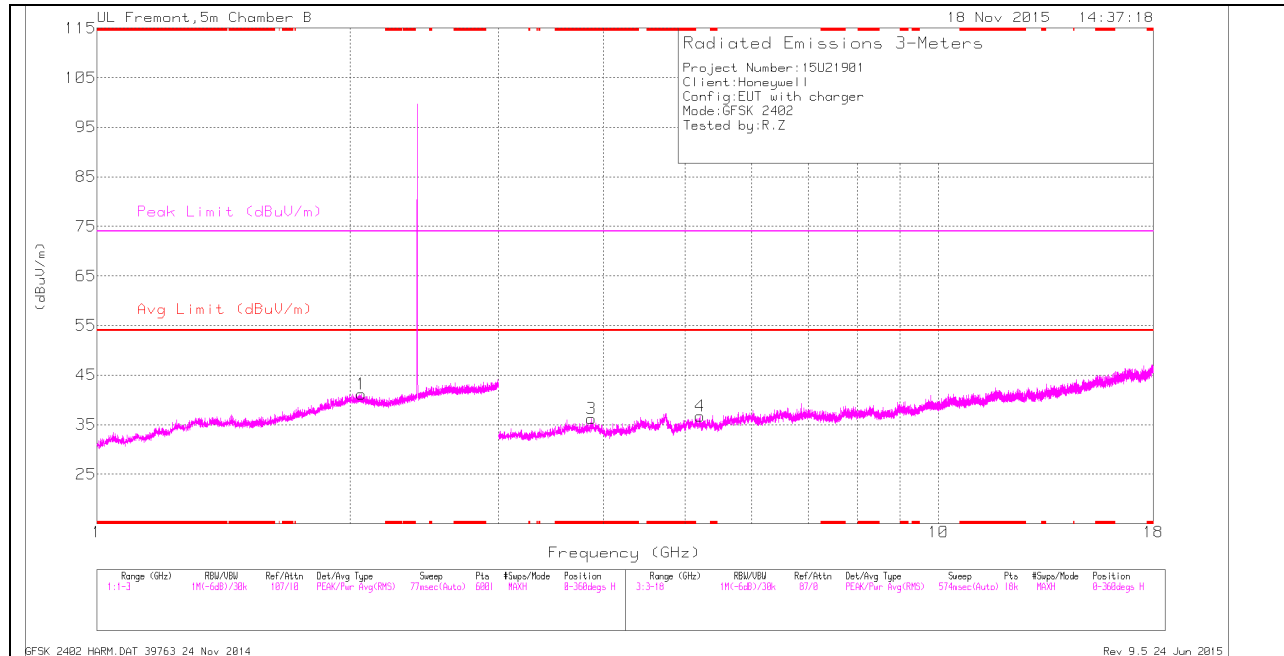
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

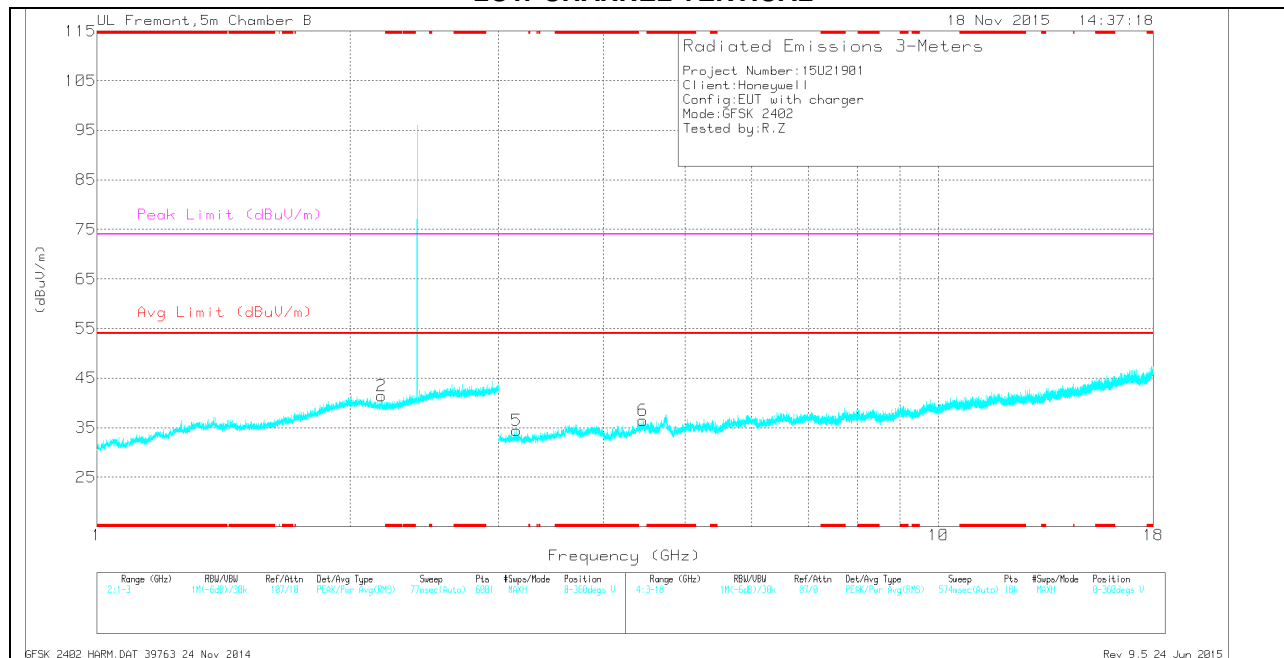
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Low Channel Data

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 3.868	34.47	Pk	33.4	-31.7	36.17	-	-	74	-37.83	0-360	199	H
1	2.064	30.78	Pk	32	-21.6	41.18	-	-	74	-32.82	0-360	101	H
2	2.18	31.98	Pk	31.2	-21.8	41.38	-	-	74	-32.62	0-360	199	V
5	3.152	34.18	Pk	32.5	-32.3	34.38	-	-	74	-39.62	0-360	199	V
6	4.456	33.38	Pk	33.9	-30.8	36.48	-	-	74	-37.52	0-360	102	V
4	5.212	34.68	Pk	34.3	-32.3	36.68	-	-	74	-37.32	0-360	199	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

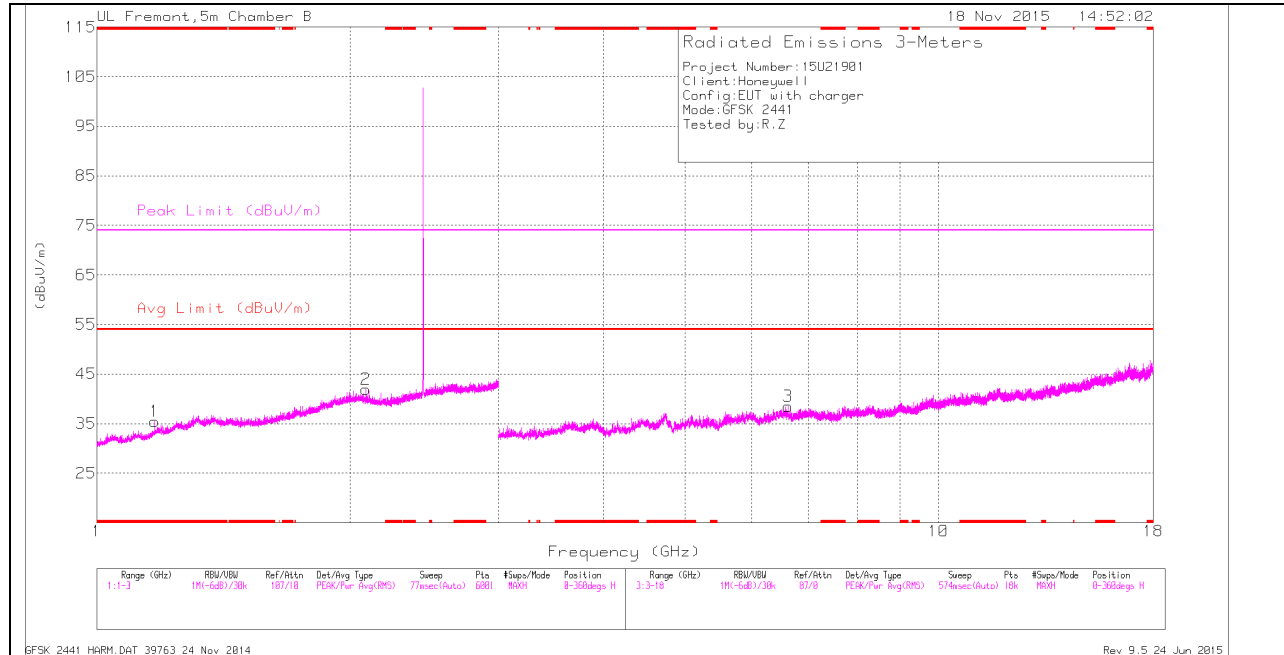
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.869	42.22	PK2	33.4	-31.7	43.92	-	-	74	-30.08	1	199	H
* 3.868	29.47	VA1T	33.4	-31.7	31.17	54	-22.63	-	-	1	199	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

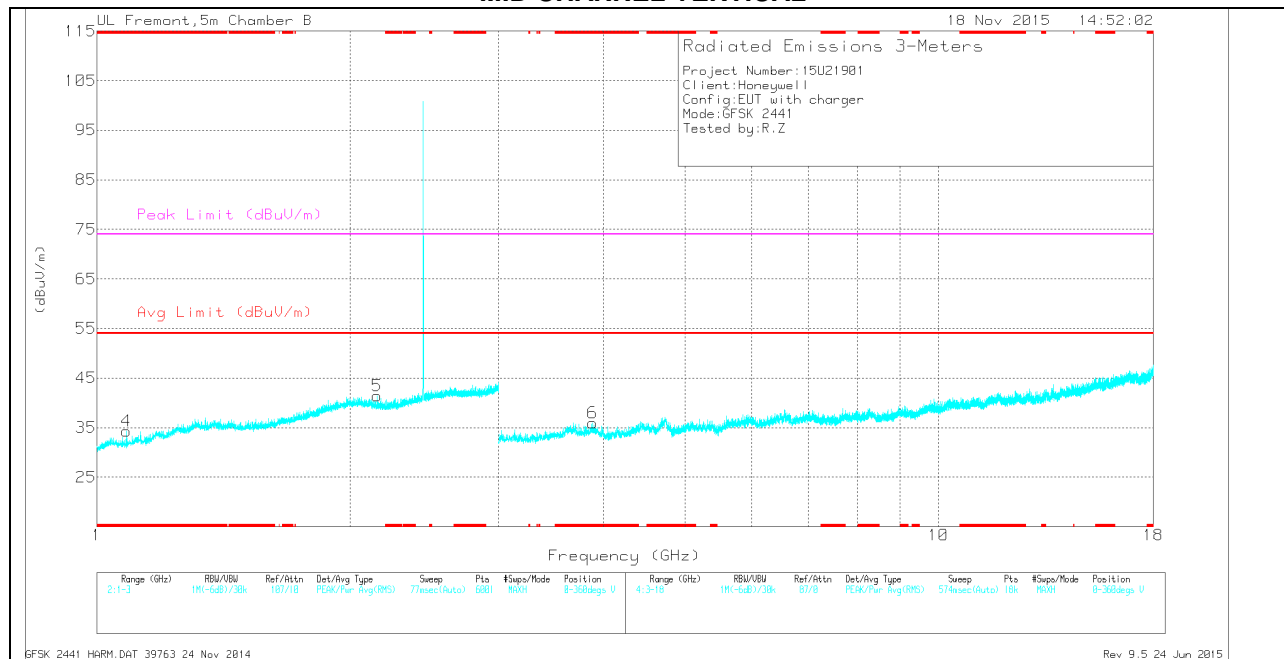
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.171	30.4	Pk	28.2	-23.2	35.4	-	-	74	-38.6	0-360	200	H
4	* 1.083	30.34	Pk	27.6	-23.6	34.34	-	-	74	-39.66	0-360	101	V
6	* 3.882	34.09	Pk	33.5	-31.6	35.99	-	-	74	-38.01	0-360	101	V
2	2.087	31.73	Pk	31.9	-21.7	41.93	-	-	74	-32.07	0-360	101	H
5	2.154	31.78	Pk	31.4	-21.8	41.38	-	-	74	-32.62	0-360	200	V
3	6.631	33.35	Pk	35.9	-30.7	38.55	-	-	74	-35.45	0-360	199	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

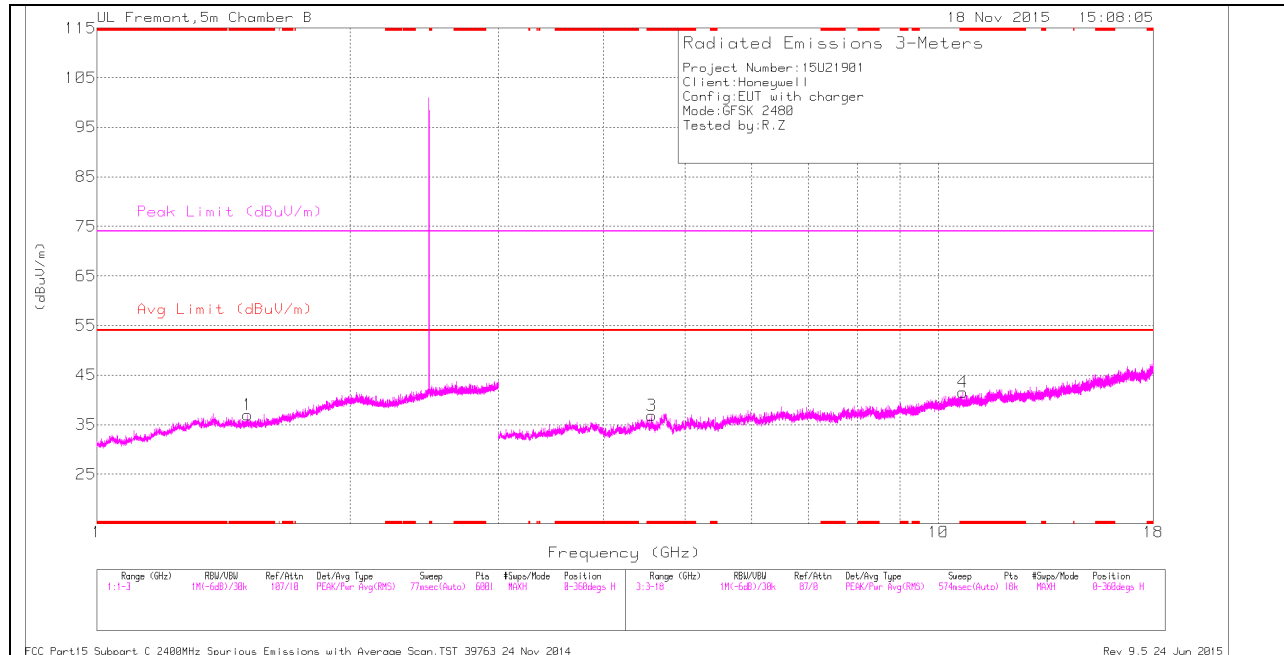
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.17	37.22	PK2	28.2	-23.2	42.22	-	-	74	-31.78	1	199	H
* 1.172	24.26	VA1T	28.2	-23.2	29.26	54	-24.74	-	-	1	199	H
* 1.082	36.66	PK2	27.6	-23.7	40.56	-	-	74	-33.44	1	102	V
* 1.084	23.68	VA1T	27.6	-23.6	27.68	54	-26.32	-	-	1	102	V
* 3.881	42.32	PK2	33.5	-31.6	44.22	-	-	74	-29.78	1	102	V
* 3.881	29.2	VA1T	33.5	-31.6	31.1	54	-22.9	-	-	1	102	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

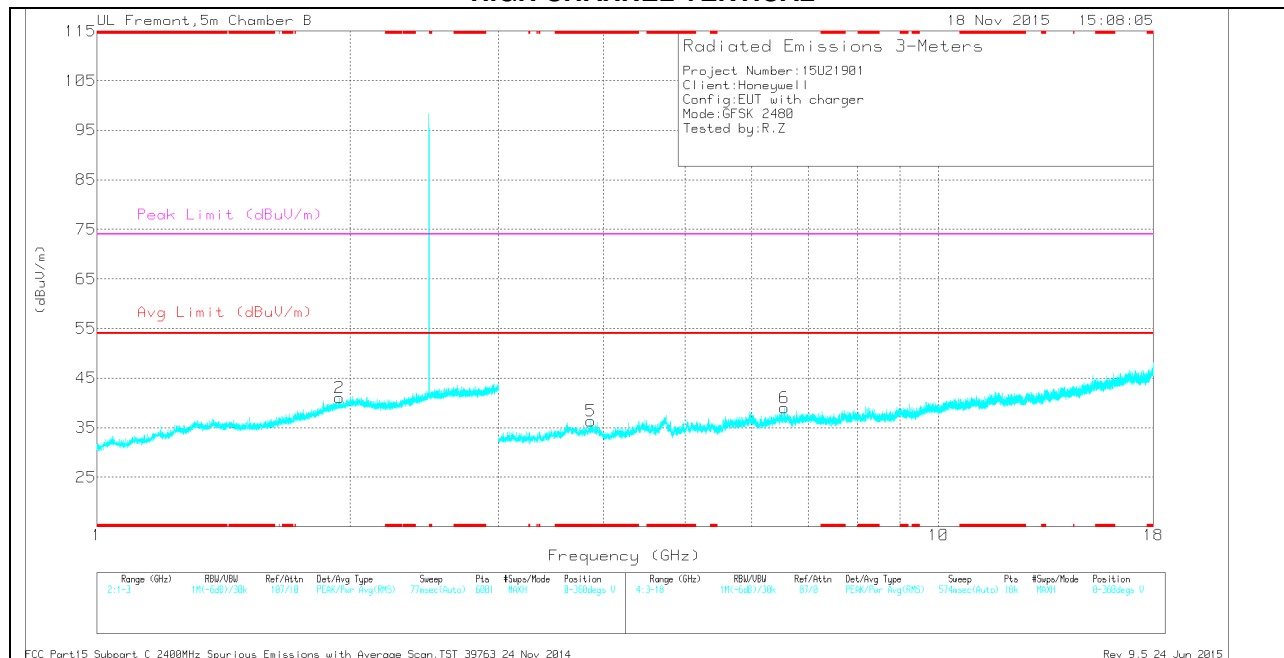
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.51	30.21	Pk	28.7	-21.9	37.01	-	-	74	-36.99	0-360	199	H
3	* 4.565	35.1	Pk	34	-32.3	36.8	-	-	74	-37.2	0-360	101	H
4	* 10.694	29.04	Pk	37.7	-25.2	41.54	-	-	74	-32.46	0-360	200	H
5	* 3.859	34.84	Pk	33.4	-31.9	36.34	-	-	74	-37.66	0-360	101	V
2	1.943	30.71	Pk	32	-21.7	41.01	-	-	74	-32.99	0-360	101	V
6	6.561	33.5	Pk	35.9	-30.4	39	-	-	74	-35	0-360	200	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.509	23.61	VA1T	28.6	-21.9	30.31	54	-23.69	-	-	1	198	H
* 1.508	37.21	PK2	28.6	-22	43.81	-	-	74	-30.19	1	199	H
* 4.563	42.22	PK2	34	-32.2	44.02	-	-	74	-29.98	1	103	H
* 4.567	29.53	VA1T	34	-32.3	31.23	54	-22.77	-	-	1	103	H
* 10.693	35.41	PK2	37.7	-25.2	47.91	-	-	74	-26.09	1	200	H
* 10.695	23.23	VA1T	37.7	-25.2	35.73	54	-18.27	-	-	1	200	H
* 3.858	42.03	PK2	33.4	-31.9	43.53	-	-	74	-30.47	1	102	V
* 3.859	29.68	VA1T	33.4	-31.9	31.18	54	-22.82	-	-	1	102	V

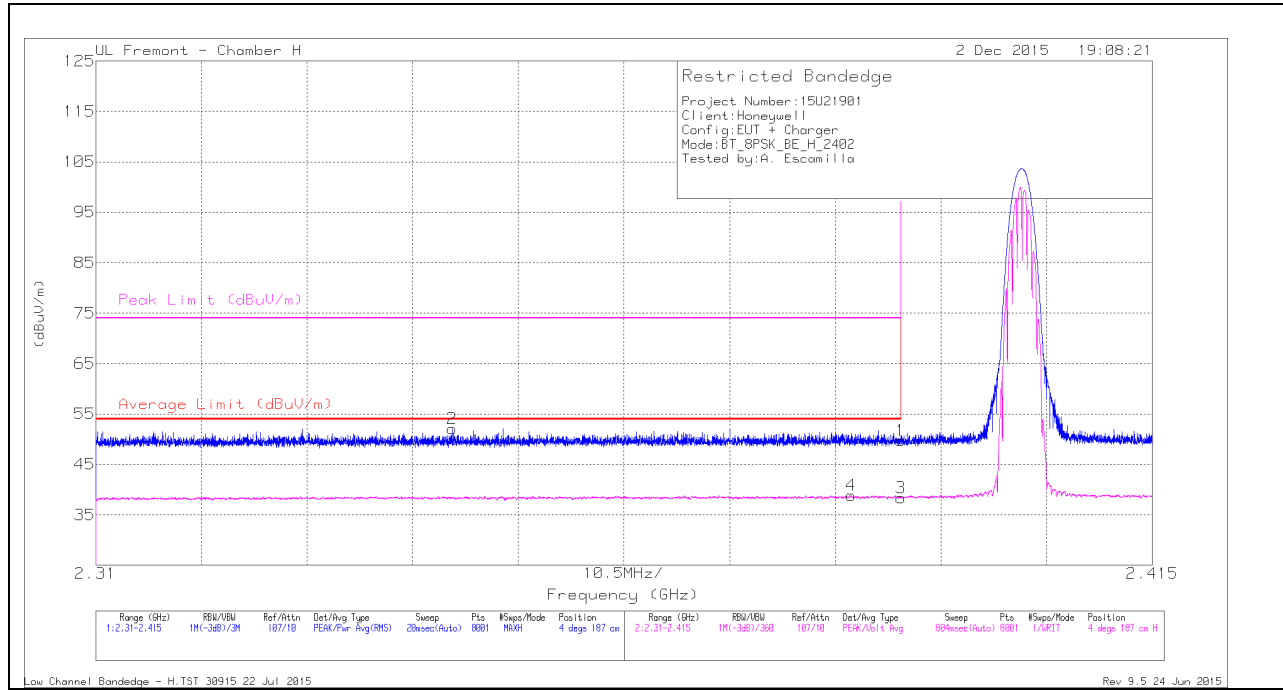
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

8.2.2. ENHANCED DATA RATE 8PSK MODULATION RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



Trace Markers

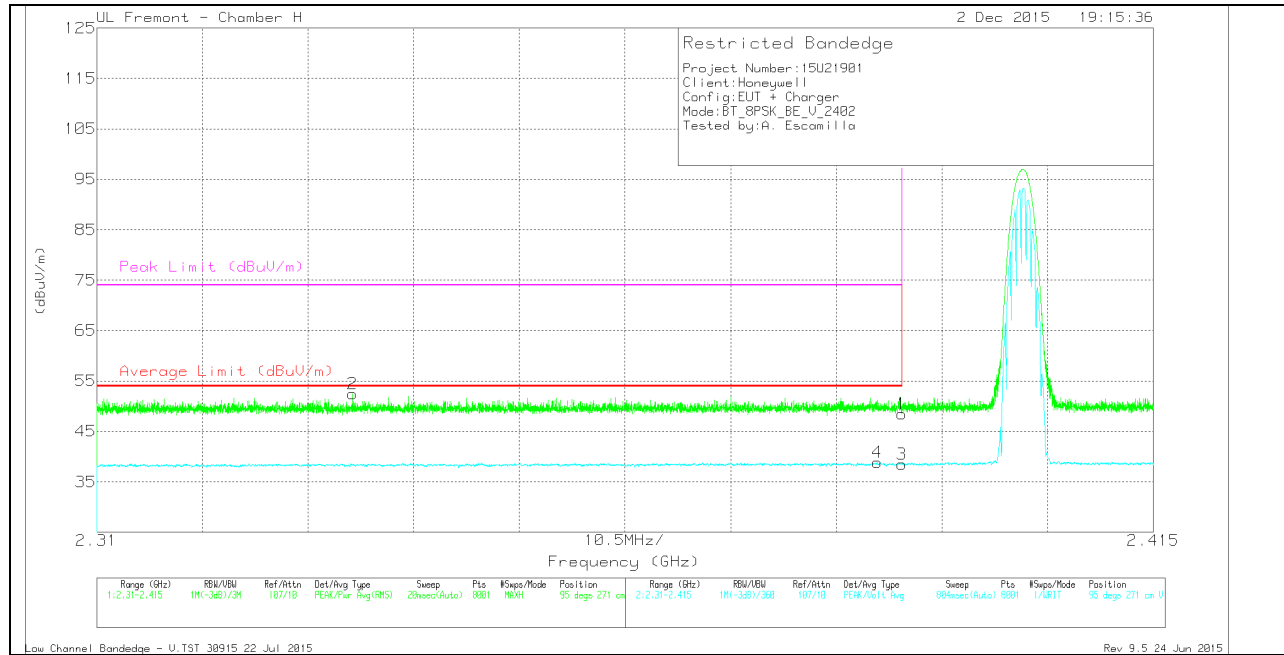
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.345	43.7	Pk	31.9	-23.5	52.1	-	-	74	-21.9	4	187	H
4	* 2.385	30.26	VA1T	32	-23.4	38.86	54	-15.14	-	-	4	187	H
1	* 2.39	41.18	Pk	32	-23.5	49.68	-	-	74	-24.32	4	187	H
3	* 2.39	29.9	VA1T	32	-23.5	38.4	54	-15.6	-	-	4	187	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL PEAK AND AVERAGE PLOT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.335	43.96	Pk	31.9	-23.4	52.46	-	-	74	-21.54	95	271	V
4	* 2.388	30.23	VA1T	32	-23.4	38.83	54	-15.17	-	-	95	271	V
1	* 2.39	39.99	Pk	32	-23.5	48.49	-	-	74	-25.51	95	271	V
3	* 2.39	30.05	VA1T	32	-23.5	38.55	54	-15.45	-	-	95	271	V

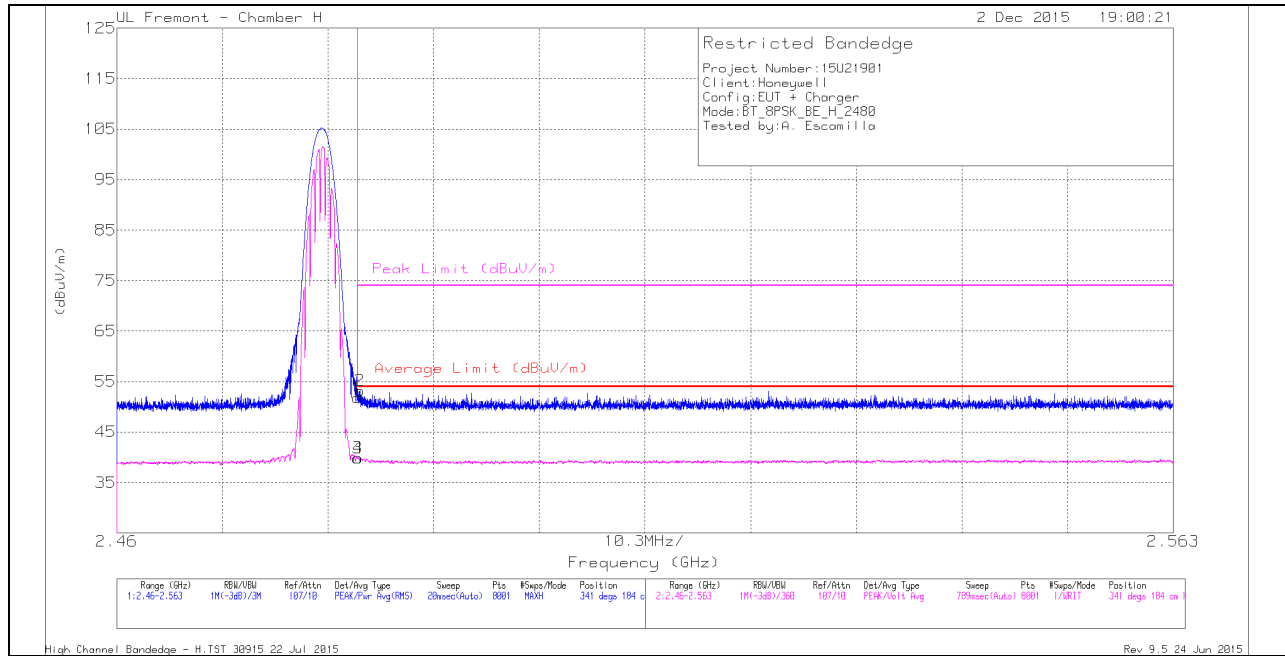
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $VB=1/Ton$ where: Ton is transmit duration

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



Trace Markers

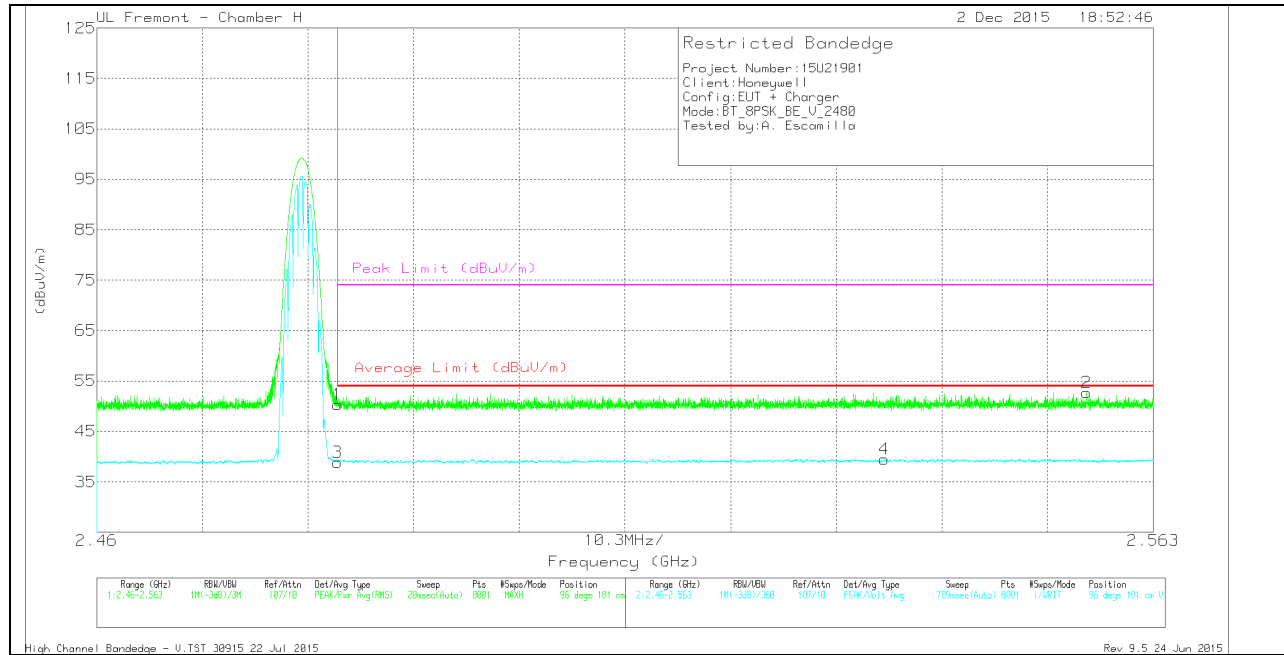
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.83	Pk	32.4	-23.4	51.83	-	-	74	-22.17	341	184	H
2	* 2.484	44.24	Pk	32.4	-23.4	53.24	-	-	74	-20.76	341	184	H
3	* 2.484	30.86	VA1T	32.4	-23.4	39.86	54	-14.14	-	-	341	184	H
4	* 2.484	30.91	VA1T	32.4	-23.4	39.91	54	-14.09	-	-	341	184	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL PEAK AND AVERAGE PLOT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fitr/Pad (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	41.32	Pk	32.4	-23.4	50.32	-	-	74	-23.68	96	181	V
3	* 2.484	29.89	VA1T	32.4	-23.4	38.89	54	-15.11	-	-	96	181	V
4	2.537	30.23	VA1T	32.5	-23.2	39.53	54	-14.47	-	-	96	181	V
2	2.556	43.39	Pk	32.5	-23.2	52.69	-	-	74	-21.31	96	181	V

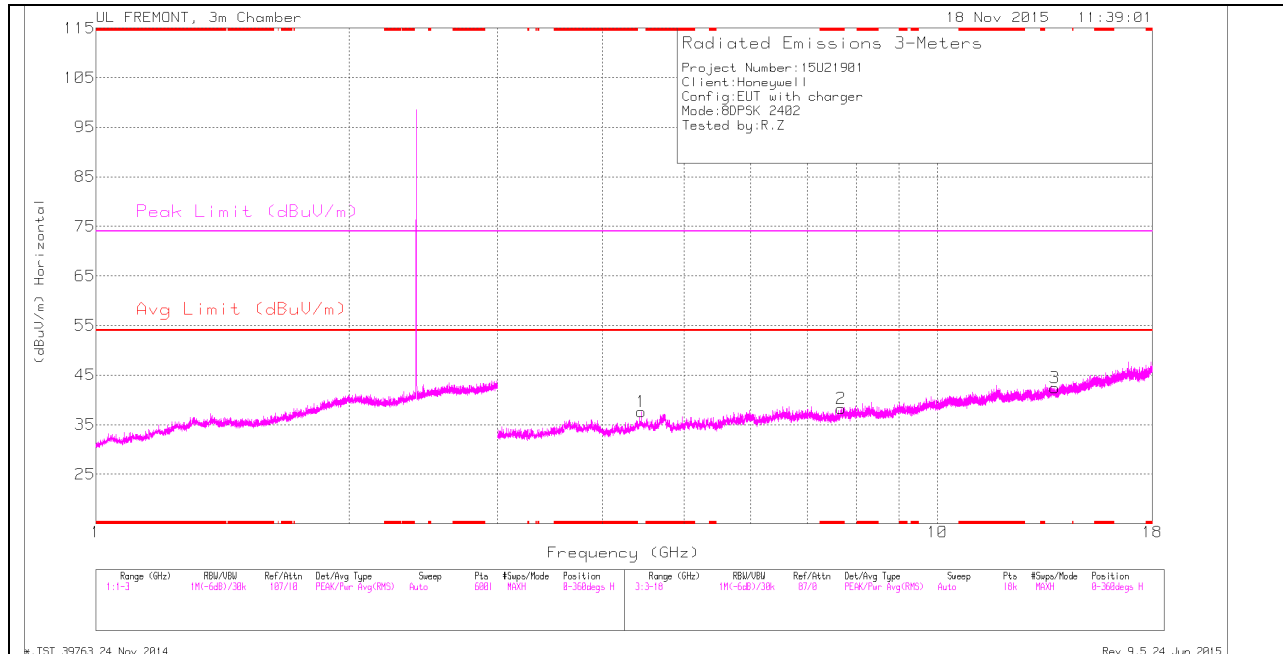
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

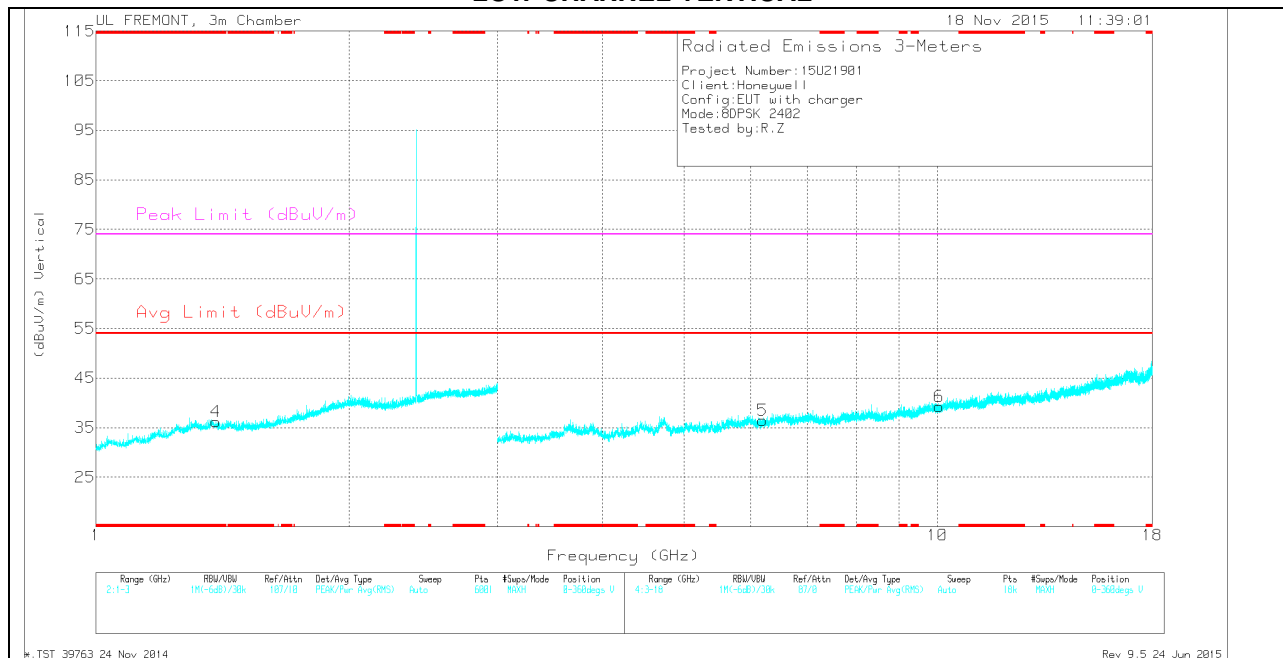
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.388	29.12	Pk	29.4	-22.3	0	36.22	-	-	74	-37.78	0-360	101	V
2	* 7.683	31.23	Pk	35.5	-28.5	0	38.23	-	-	74	-35.77	0-360	101	H
1	4.445	34.37	Pk	33.9	-30.7	0	37.57	-	-	74	-36.43	0-360	199	H
5	6.2	32.27	Pk	35.5	-31.3	0	36.47	-	-	74	-37.53	0-360	199	V
6	10.042	28.11	Pk	37.2	-26	0	39.31	-	-	74	-34.69	0-360	101	V
3	13.789	27.33	Pk	38.9	-23.8	0	42.43	-	-	74	-31.57	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

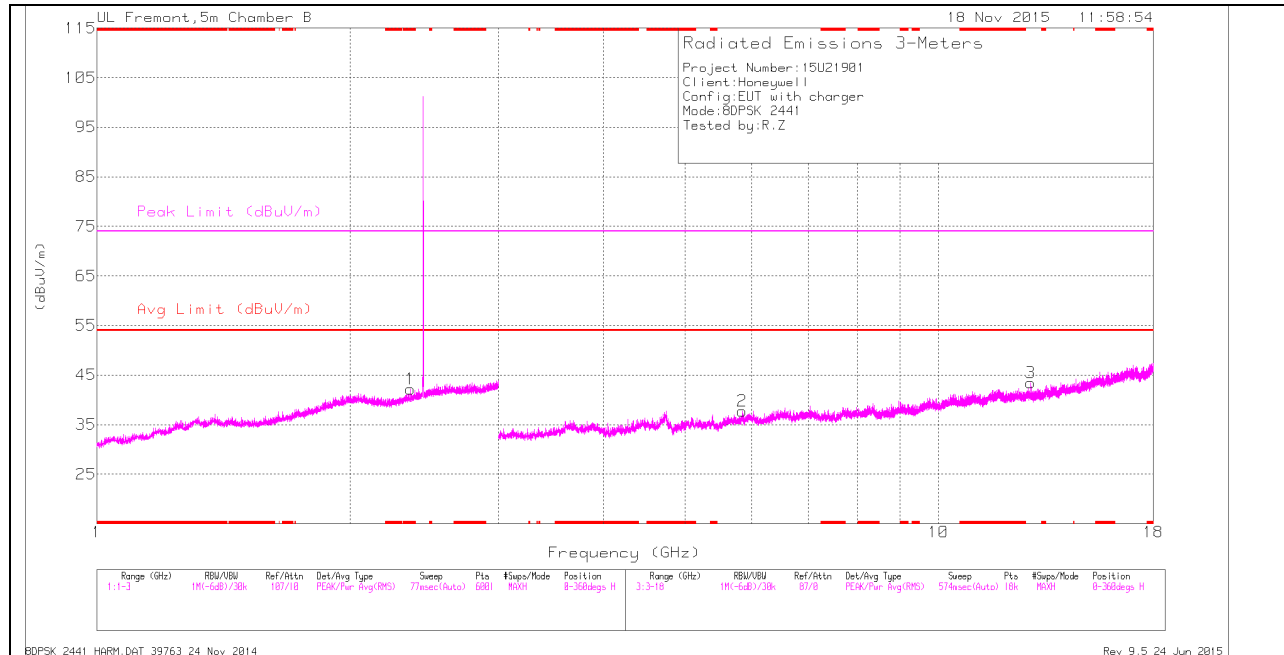
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.388	36.98	PK2	29.4	-22.3	44.08	-	-	74	-29.92	1	102	V
* 1.388	24.08	VA1T	29.4	-22.3	31.18	54	-22.82	-	-	1	102	V
* 7.681	38.98	PK2	35.5	-28.5	45.98	-	-	74	-28.02	1	102	H
* 7.683	26.51	VA1T	35.5	-28.5	33.51	54	-20.49	-	-	1	102	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

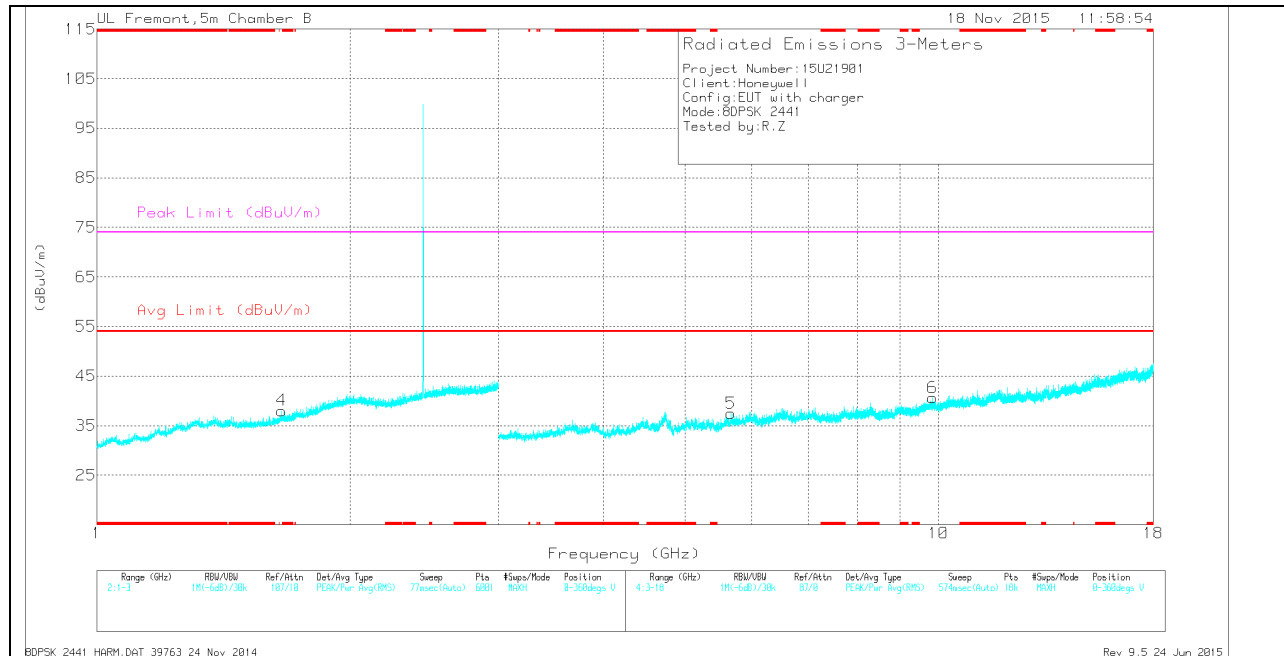
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Mid Channel Data

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.36	32.23	Pk	31.8	-21.9	42.13	-	-	74	-31.87	0-360	199	H
4	1.657	30.65	Pk	29.3	-21.9	38.05	-	-	74	-35.95	0-360	101	V
5	5.667	33.47	Pk	34.9	-30.9	37.47	-	-	74	-36.53	0-360	199	V
2	5.847	33.98	Pk	35.3	-31.5	37.78	-	-	74	-36.22	0-360	101	H
6	9.847	29.43	Pk	37	-25.8	40.63	-	-	74	-33.37	0-360	101	V
3	12.878	29.05	Pk	38.8	-24.4	43.45	-	-	74	-30.55	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

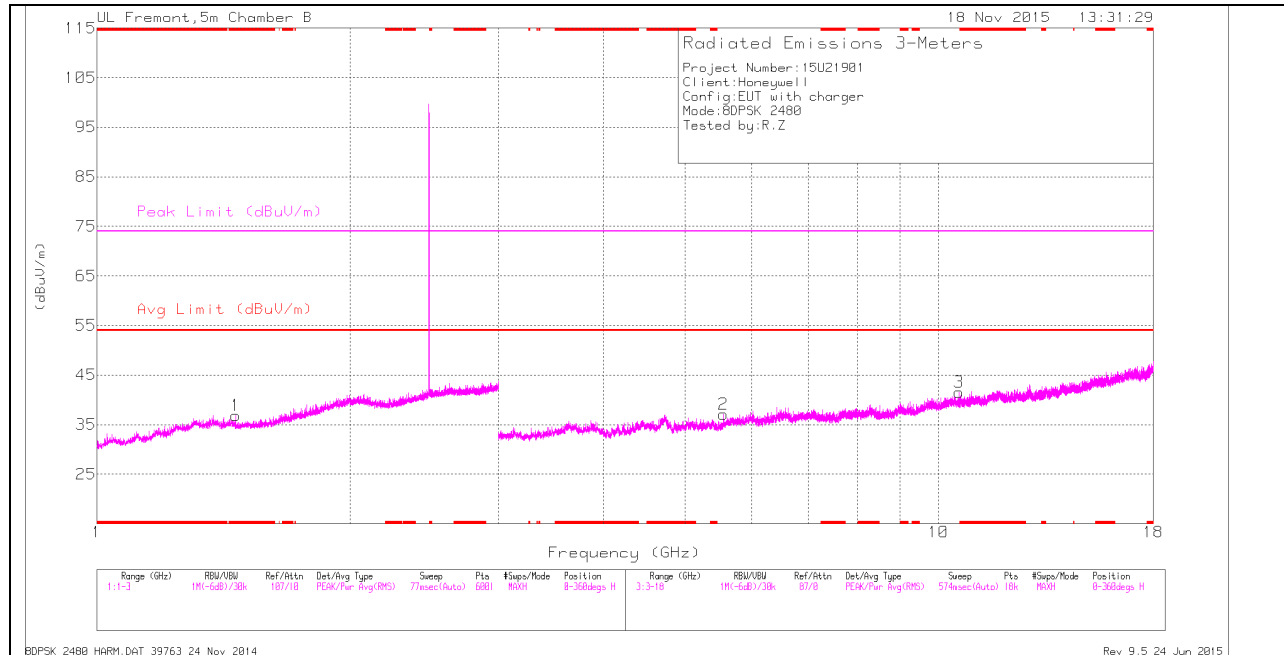
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.358	24.82	VA1T	31.8	-21.9	34.72	54	-19.28	-	-	1	198	H
* 2.36	38.44	PK2	31.9	-21.8	48.54	-	-	74	-25.46	1	198	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

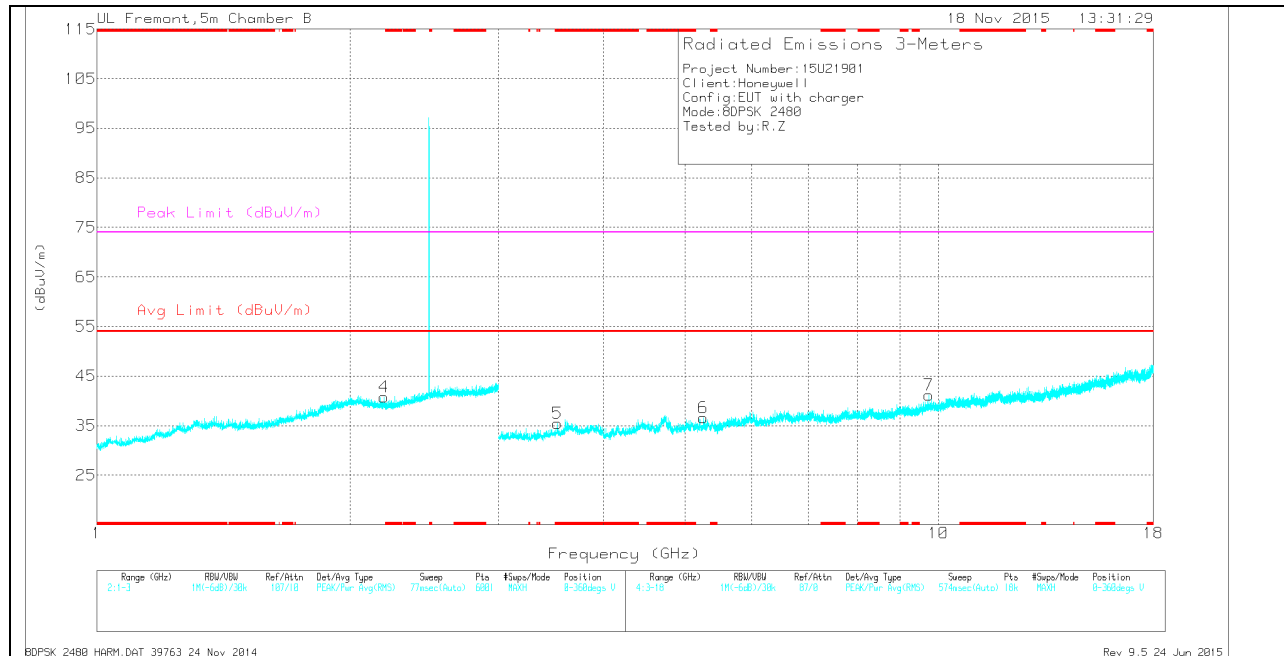
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.461	30.1	Pk	28.9	-22.1	36.9	-	-	74	-37.1	0-360	199	H
5	* 3.523	34.89	Pk	33.6	-33	35.49	-	-	74	-38.51	0-360	101	V
4	2.194	31.57	Pk	31.1	-21.9	40.77	-	-	74	-33.23	0-360	199	V
6	5.258	34.09	Pk	34.3	-31.8	36.59	-	-	74	-37.41	0-360	199	V
2	5.548	34.5	Pk	34.6	-32	37.1	-	-	74	-36.9	0-360	199	H
7	9.736	30.58	Pk	36.9	-26.3	41.18	-	-	74	-32.82	0-360	199	V
3	10.583	29.3	Pk	37.6	-25.4	41.5	-	-	74	-32.5	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.461	36.87	PK2	28.9	-22.1	43.67	-	-	74	-30.33	1	198	H
* 1.459	23.93	VA1T	28.9	-22.2	30.63	54	-23.37	-	-	1	198	H
* 3.525	42.19	PK2	33.6	-32.9	42.89	-	-	74	-31.11	1	102	V
* 3.525	29.44	VA1T	33.6	-32.9	30.14	54	-23.86	-	-	1	102	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

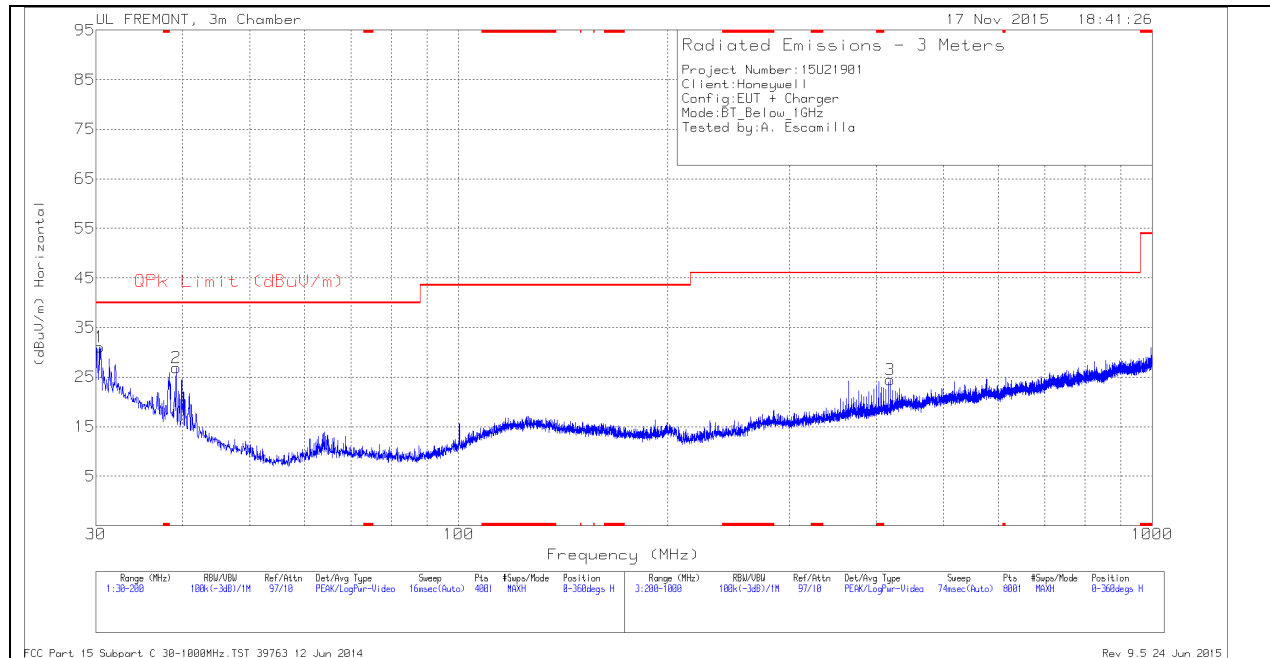
V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

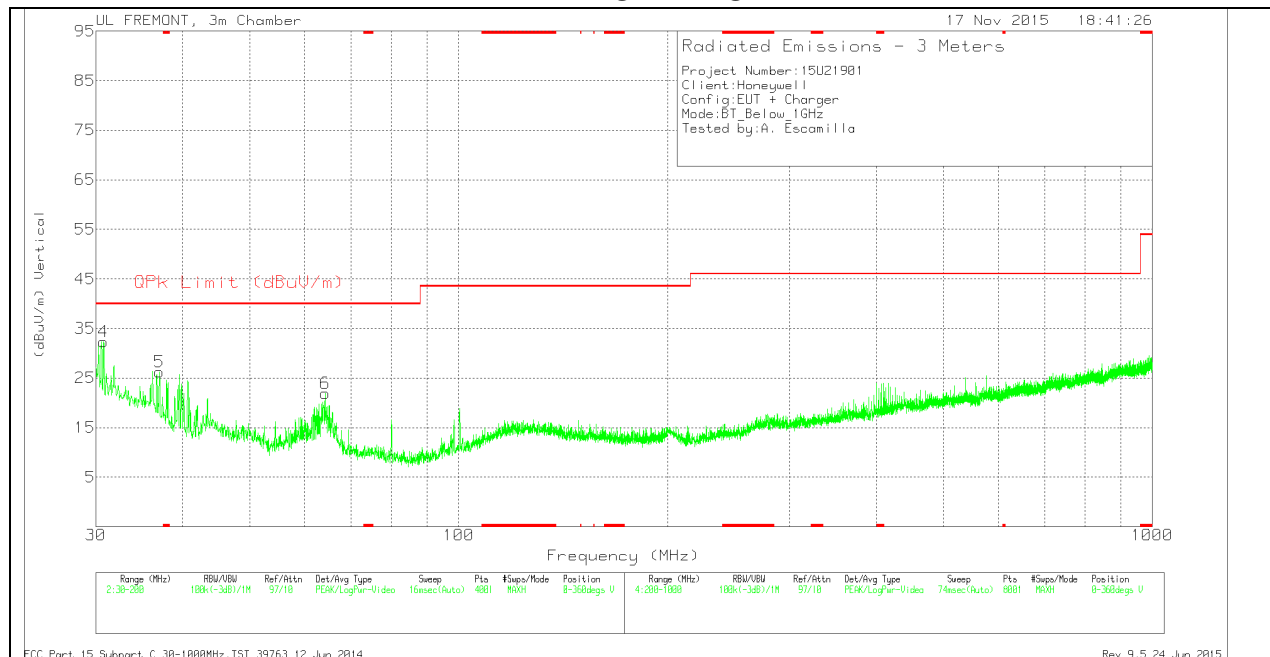
8.3. WORST-CASE BELOW 1 GHz

GFSK SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



VERTICAL PLOT



Below 1GHz Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.34	36.79	Pk	21.5	-27.2	31.09	40	-8.91	0-360	100	H
4	30.765	38.41	Pk	21.1	-27.2	32.31	40	-7.69	0-360	100	V
5	37.0125	36.84	Pk	16.5	-27.1	26.24	40	-13.76	0-360	100	V
2	39.1375	39.04	Pk	14.9	-27.1	26.84	40	-13.16	0-360	100	H
6	64.17	40.87	Pk	7.8	-26.8	21.87	40	-18.13	0-360	100	V
3	419.2	33.51	Pk	15.9	-24.9	24.51	46.02	-21.51	0-360	200	H

Pk - Peak detector