FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1

BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT

FOR

BLUETOOTH, BLE, and 802.11 a/b/g/n Measuring Device

MODEL NUMBER: IKE-IK04-L

FCC ID: 2ACBG4000

IC ID: 11952A-4000

REPORT NUMBER: 16U22614-E2V1

ISSUE DATE: 3/17/2016

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	03/17/16	Initial Issue	C. Vergonio

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: IkeGPS

EUT DESCRIPTION: Bluetooth, BLE, and 802.11 a/b/g/n Measuring Device.

MODEL: IKE-IK04-L

SERIAL NUMBER: DVT2 UNIT37 (Radiated), DVT2 UNIT46 (Conducted)

DATE TESTED: February 22 – March 16, 2016

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 revision 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, and 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	☐ Chamber D
☐ Chamber B	☐ Chamber E
☒ Chamber C	☐ Chamber F
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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, 9KHz to 30 MHz	2.14 dB
Radiated Disturbance, 30 to 1000 MHz	4.98 dB
Radiated Disturbance,1000 to 6000 MHz	3.86 dB
Radiated Disturbance,6000 to 18000 MHz	4.23 dB
Radiated Disturbance,18000 to 26000 MHz	5.30 dB
Radiated Disturbance,26000 to 40000 MHz	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 Bluetooth, BLE, and 802.11a/b/g/n Measuring Device.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402-2480	BLE	-0.50	0.89

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPC antenna, with a maximum gain of .79dBi.

5.4. SOFTWARE and HARDWARE

The test utility software and hardware used during testing was Software Version: 1.0 and Hardware Version: 1.0.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit on the channel with higher 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. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	IkeGPS	ASSA41w2-050250	N/A	N/A

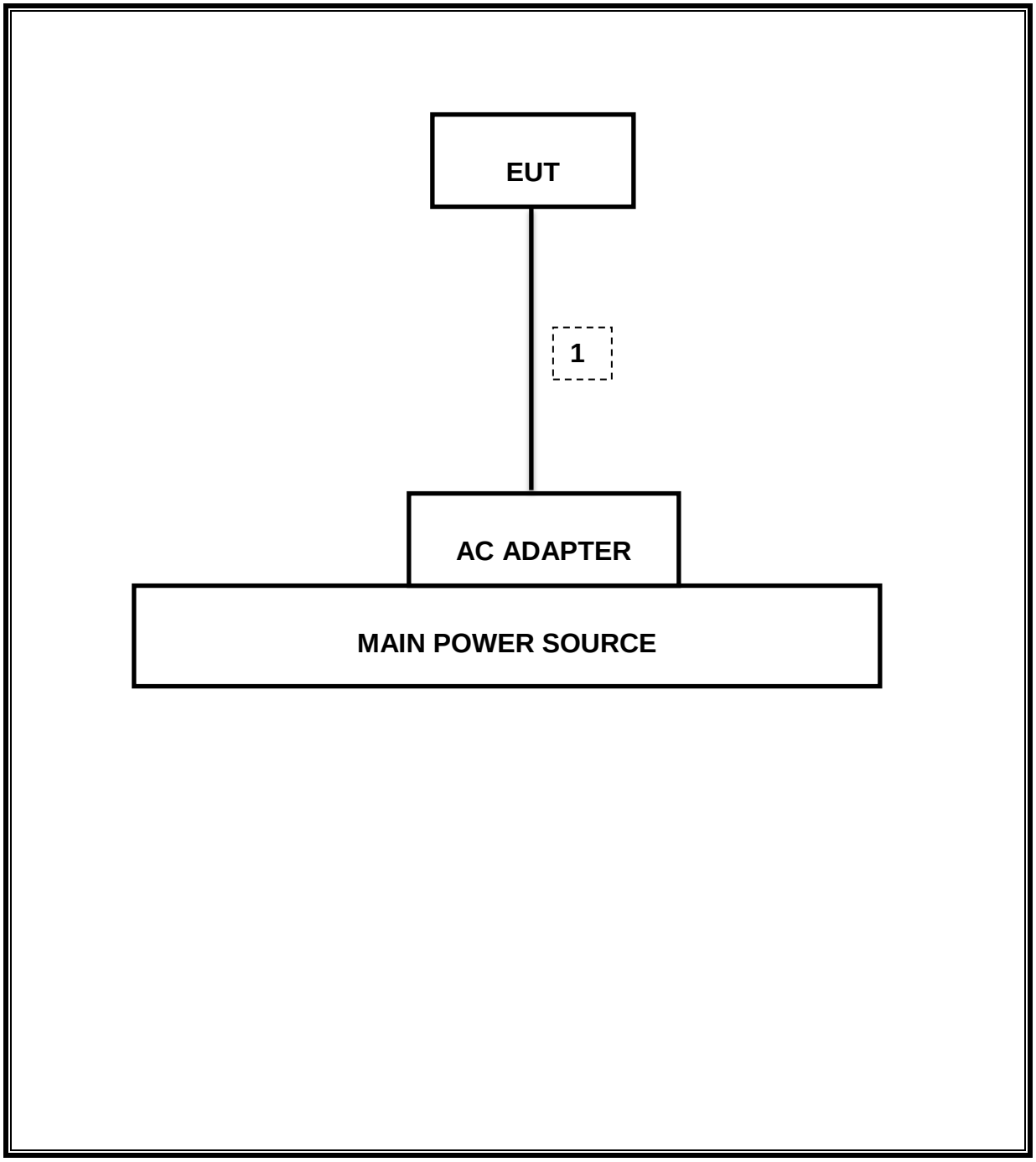
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	USB	Unshielded	1.5	N/A

TEST SETUP

EUT was set in the Engineering Test menu mode to enable BLE communications.

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 Number**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	130	09/01/16
Antenna, Horn, 18GHz	EMCO	3115	59	11/18/16
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	447	05/12/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	88	04/07/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	404	06/29/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	123	10/22/16
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	907	06/11/16
EMI Test Receiver, 9 KHz to 7 GHz	Rohde & Schwarz	ECSI7	284	09/10/16
Peak Power Meter	Agilent / HP	N1914A	254	06/08/16
Peak / Average Power Sensor	Keysight	E9323A	338	04/16/16
LISN, 30 MHz	Solar	8012-50-R-24-BNC	28	7/28/2016
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	160	CNR
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	417	05/04/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	893	04/25/16
High Pass Filter 3GHz	Micro-Tronics	HPS17543	898	04/25/16

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
Antenna Port Software	UL	UL RF	Ver 3.9.1, Dec 28, 2015

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	RSS-247 5.2.1	Occupied Bandwidth (6dB)	>500KHz	Conducted	Pass
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass
15.247	RSS-247 5.4.4	TX conducted output power	<30dBm		Pass
15.247	RSS-247 5.2.2	PSD	<8dBm		Pass
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass
15.205, 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	< 54dBuV/m		Pass

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE

LIMITS

None; for reporting purposes only

PROCEDURE

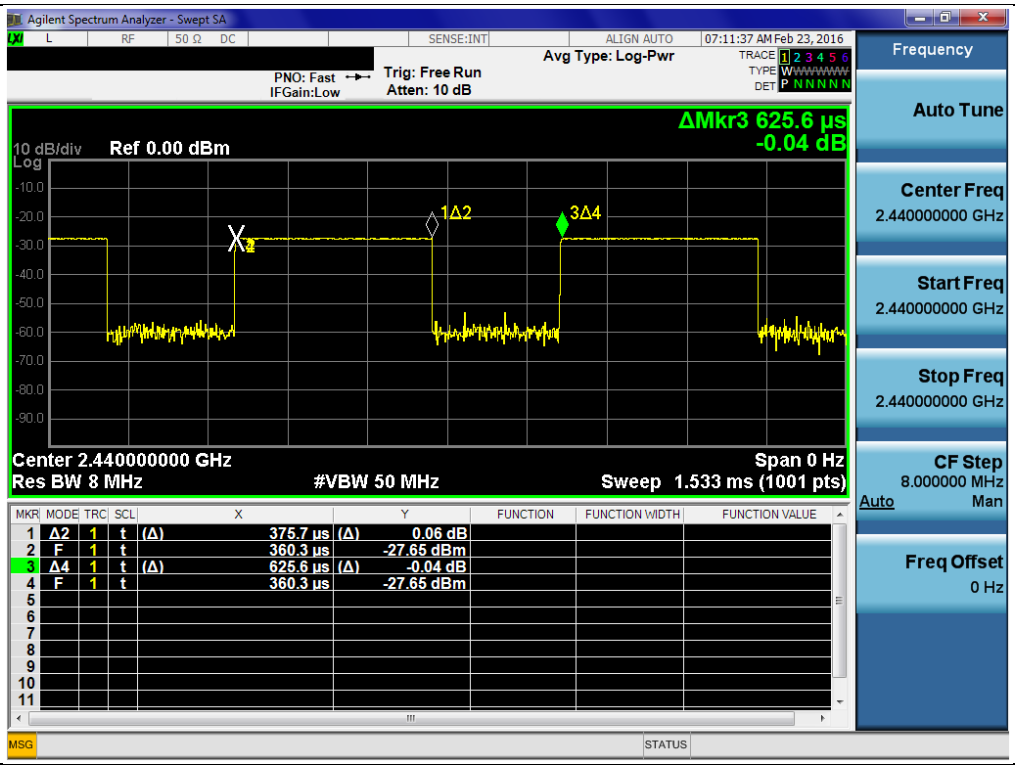
KDB 558074 Zero-Span Spectrum Analyzer Method

RESULTS

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
BLE	0.376	0.626	0.601	60.05%	2.21	2.662

DUTY CYCLE PLOTS



NOTE: --

8.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 5.2.1

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

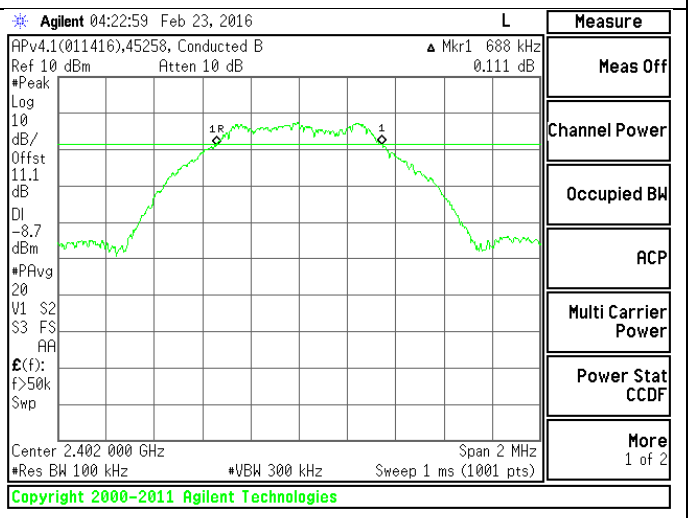
RESULTS

8.2.1. 6 dB BANDWIDTH PLOTS AND TABLE

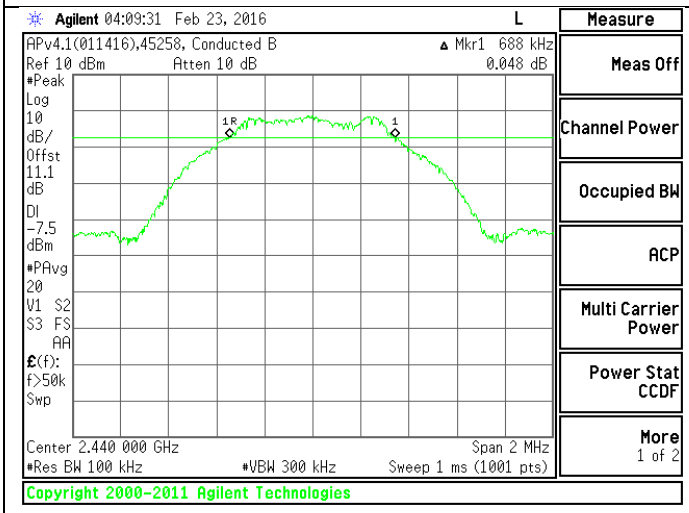
TEST RESULT TABLE

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
Low	2402	0.688
Middle	2440	0.688
High	2480	0.678

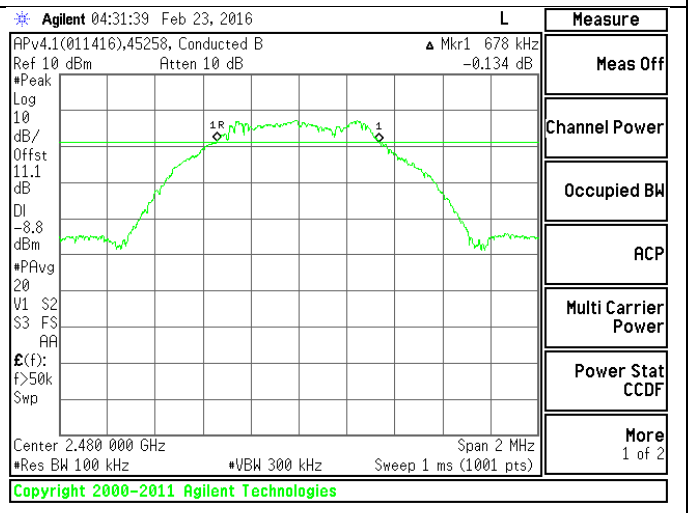
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Refer to KDB558074 D01 DTS Meas Guidance v03r04: The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

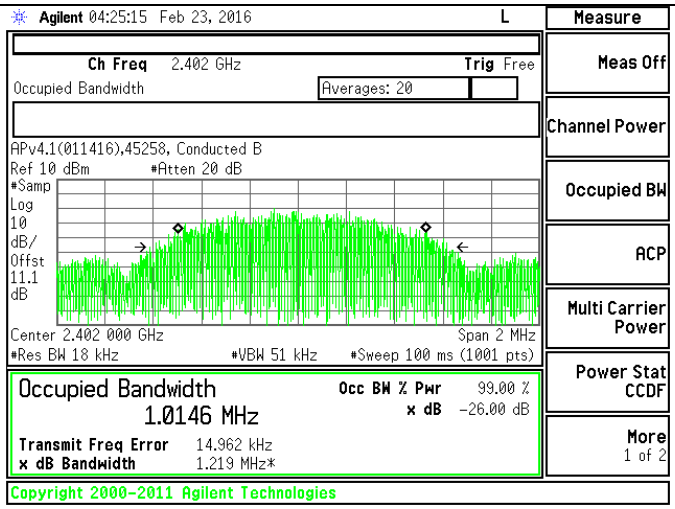
RESULTS

8.3.1. 99% BANDWIDTH PLOTS AND TABLE

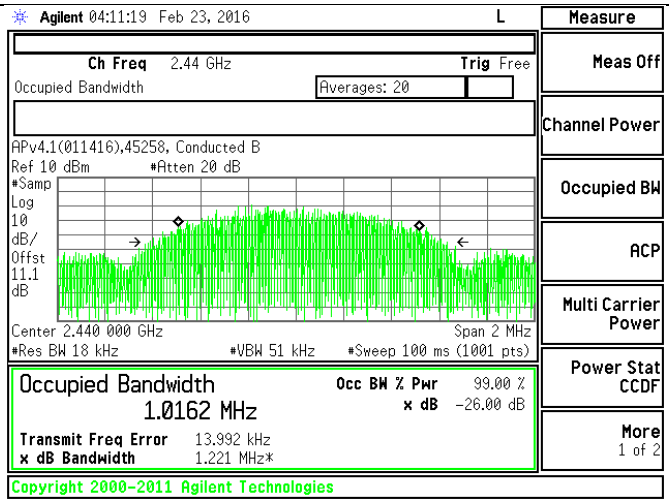
TEST RESULT TABLE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.015
Middle	2440	1.016
High	2480	1.016

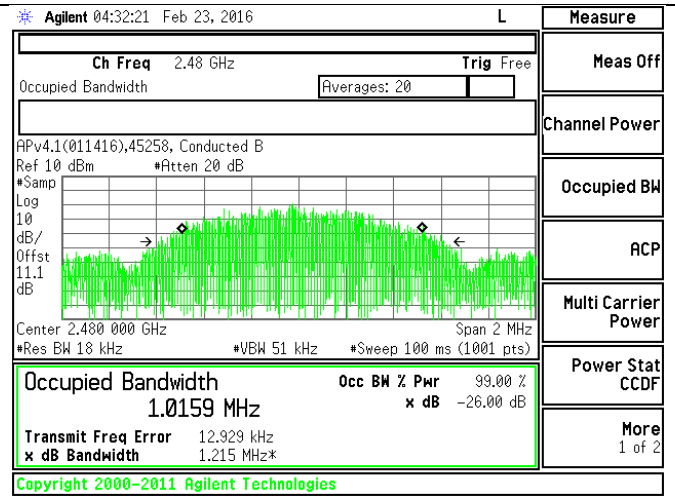
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-247 5.4.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r04 spectrum analyzer.

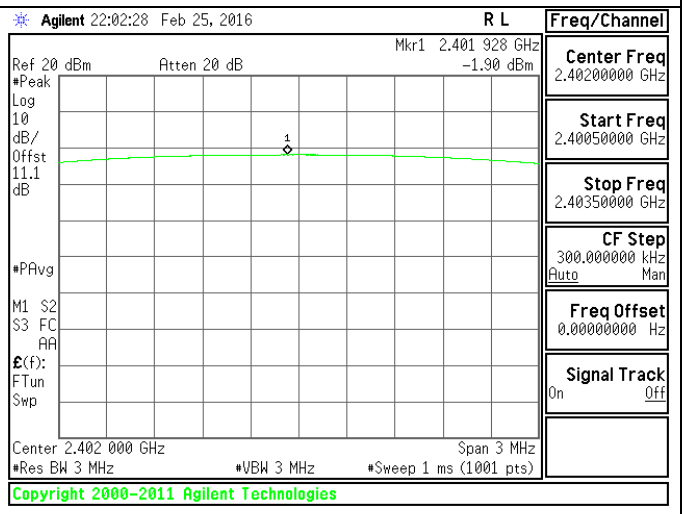
RESULTS

8.4.1. OUTPUT POWER PLOTS

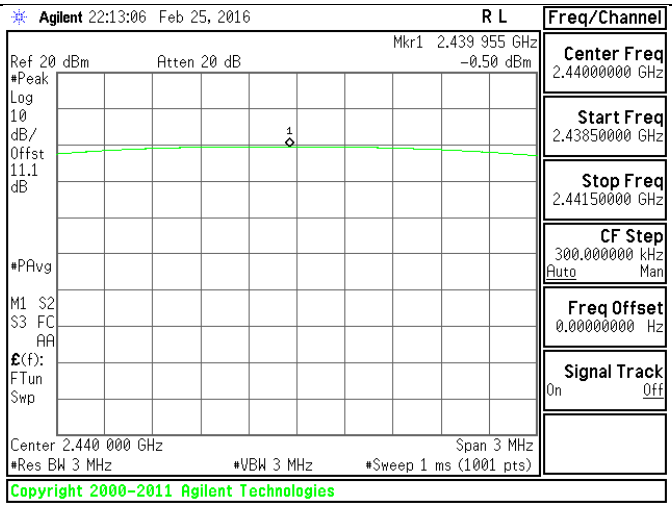
TEST RESULT TABLE

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-1.90	30	-31.90
Middle	2440	-0.50	30	-30.50
High	2480	-1.85	30	-31.85

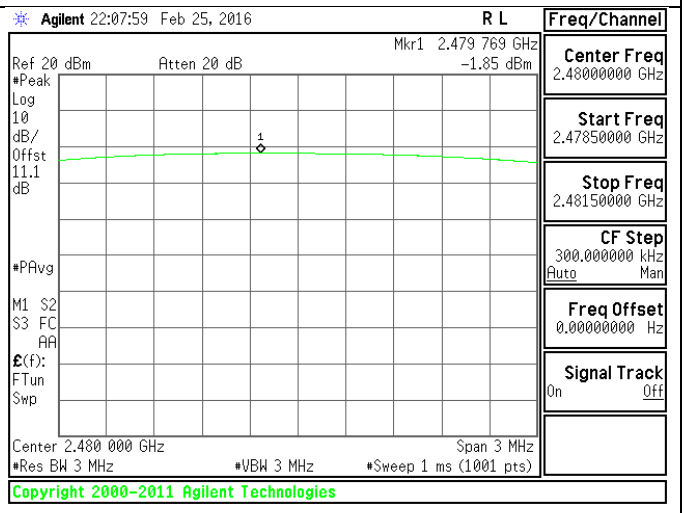
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



NOTE:

8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.6 dB (including 10 dB pad and 0.6 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-2.52
Middle	2440	-1.38
High	2480	-2.56

NOTE: --

8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-247 5.2.2

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v03r04.

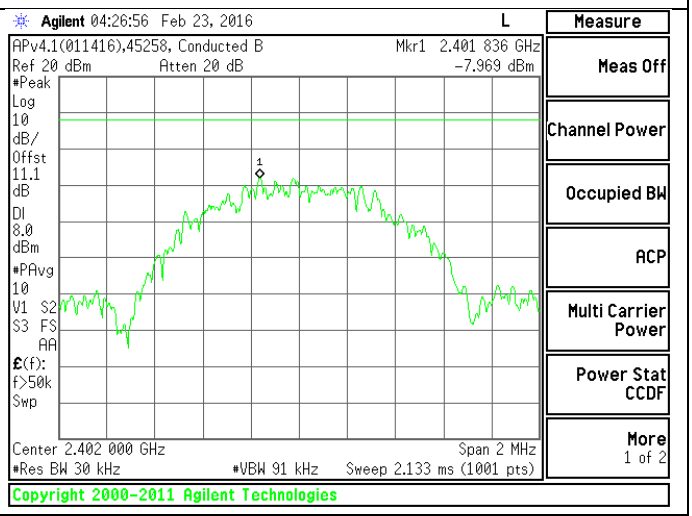
RESULTS

8.6.1. POWER SPECTRAL DENSITY PLOTS AND TABLE

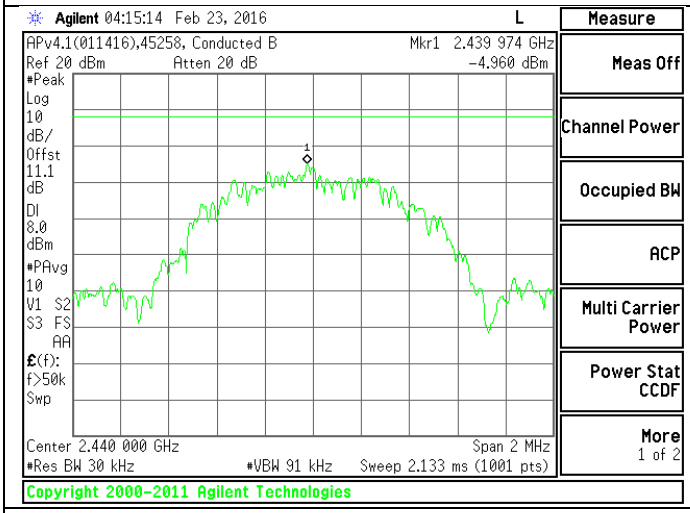
TEST RESULT TABLE

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-7.97	8	-15.969
Middle	2440	-4.96	8	-12.96
High	2480	-7.487	8	-15.487

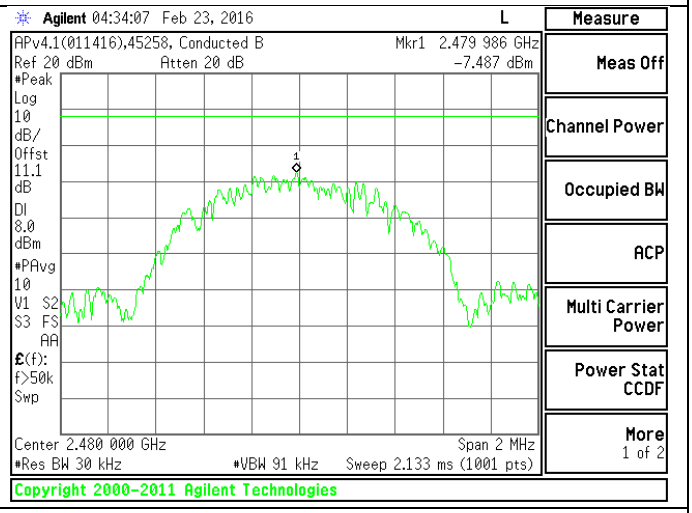
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



NOTE:

8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

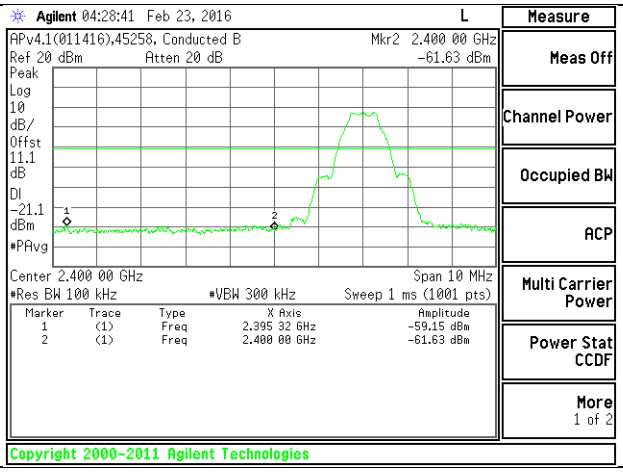
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

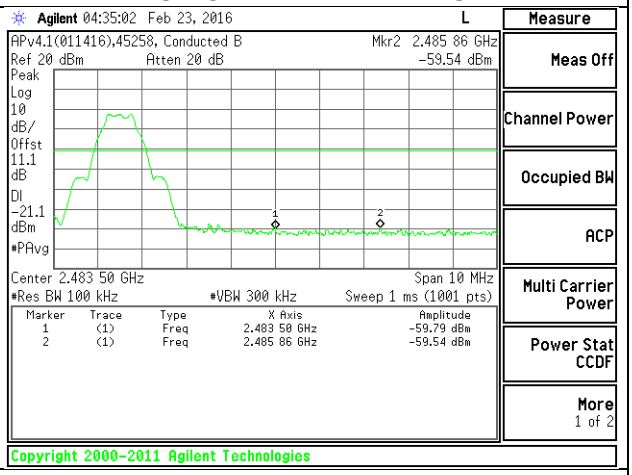
RESULTS

8.7.1. BANDEDGE AND SPURIOUS EMISSIONS PLOTS

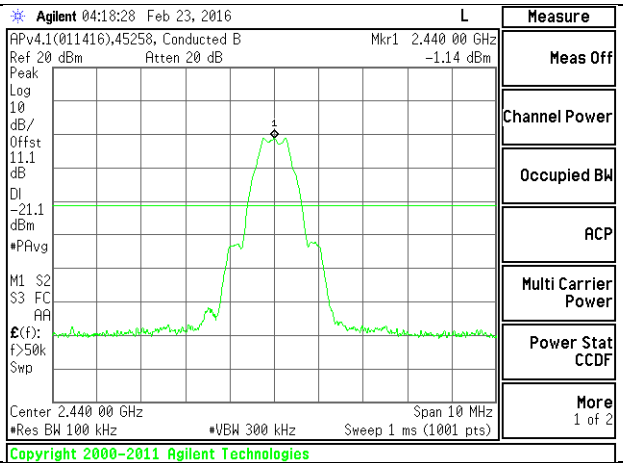
LOW CHANNEL BANDEDGE



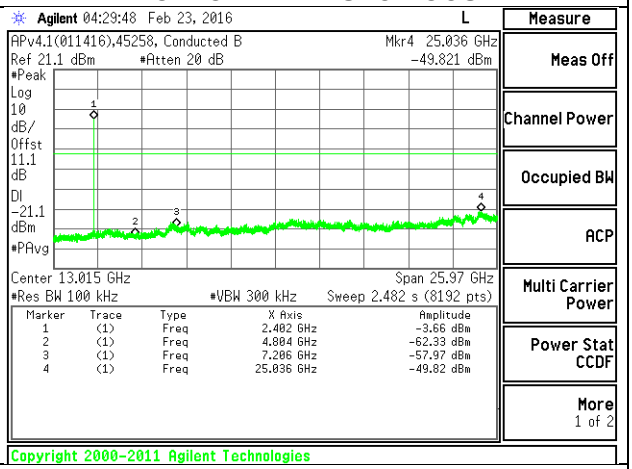
HIGH CHANNEL BANDEDGE



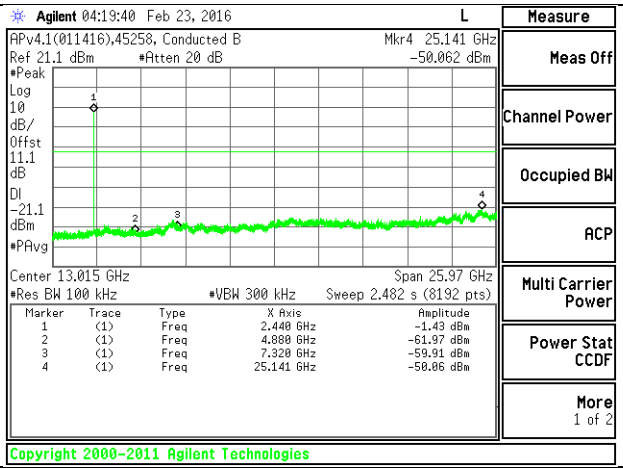
MID CHANNEL REFERENCE



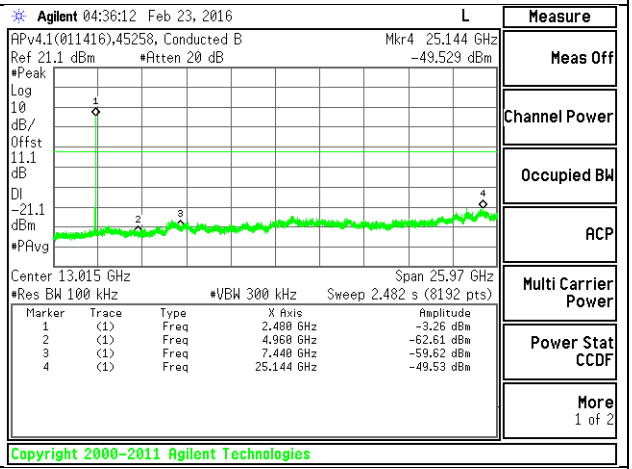
LOW CHANNEL SPURIOUS



MID CHANNEL SPURIOUS



HIGH CHANNEL SPURIOUS



NOTE:--

9. RADIATED TEST RESULTS

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 for below 1GHz and 150cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. 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 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 add duty cycle factor for average measurements. Duty cycle factor = 10 log (1/x). For example: DCCF = 10log (1/0.601)=2.21dB (Spectrum Analyzer round it up to 2 dB)

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

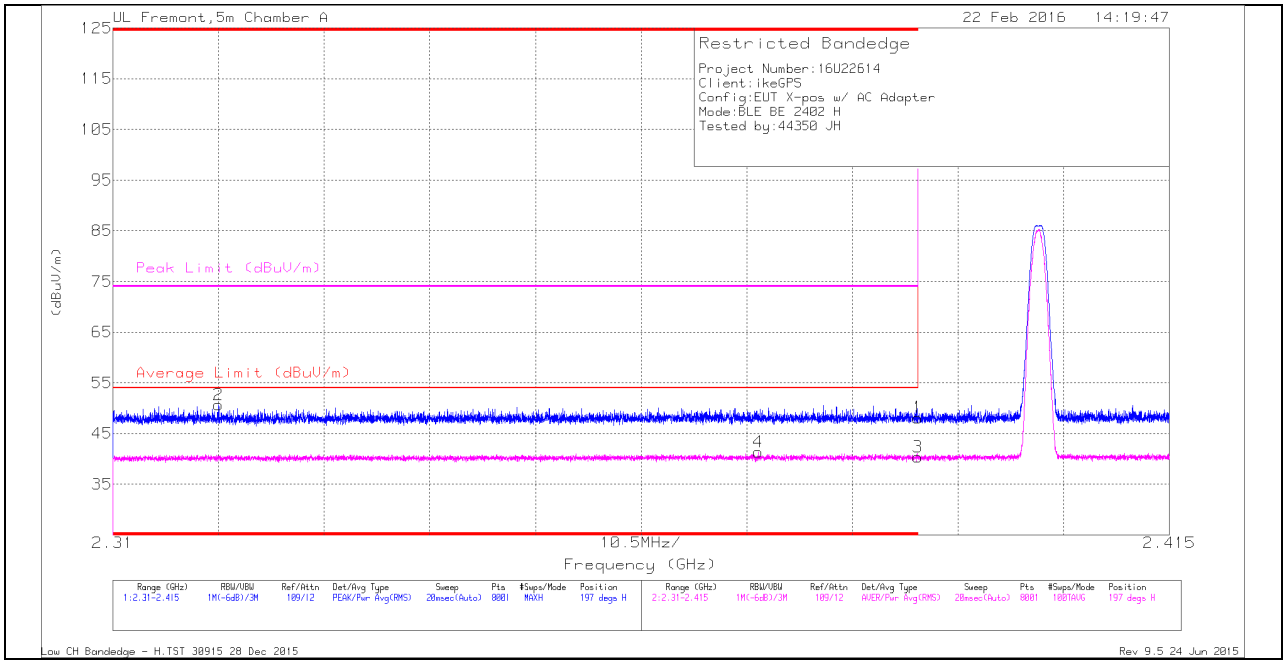
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

RESULTS

9.1. TRANSMITTER ABOVE 1 GHz

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

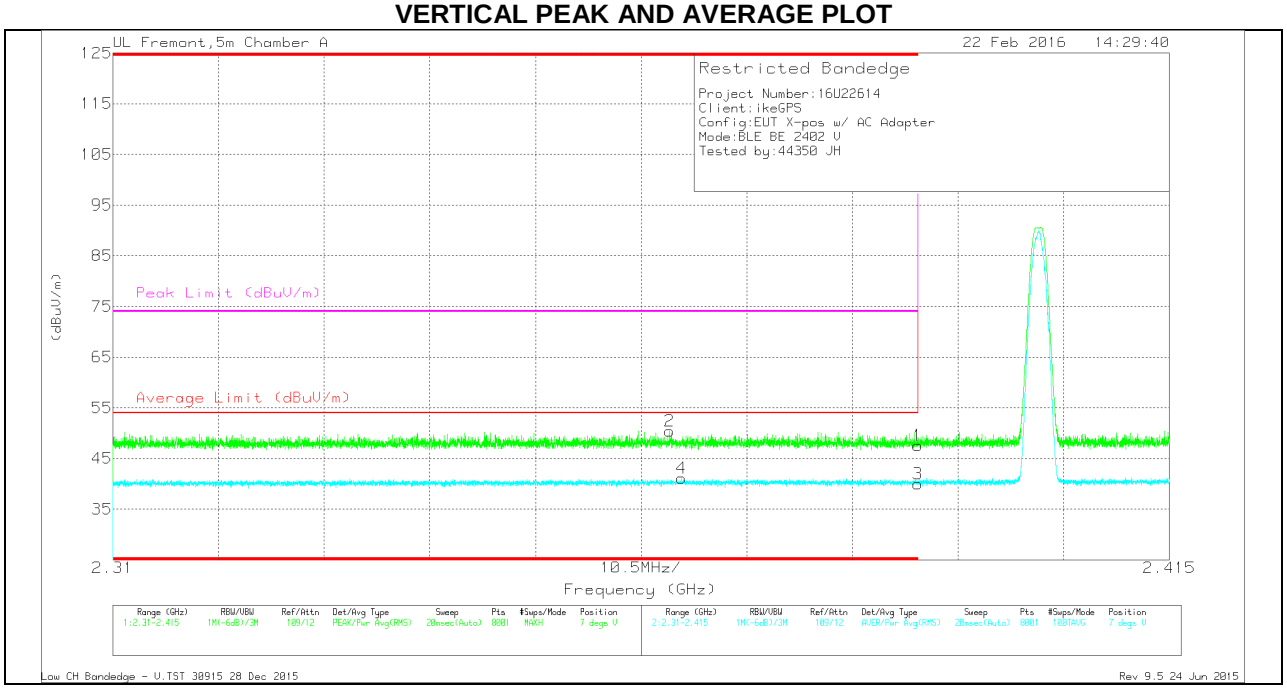
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	36.02	Pk	32	-19.9	0	48.12	-	-	74	-25.88	197	255	H
2	* 2.321	38.42	Pk	31.9	-19.7	0	50.62	-	-	74	-23.38	197	255	H
3	* 2.39	26.04	RMS	32	-19.9	2.21	40.35	54	-13.65	-	-	197	255	H
4	* 2.374	27.02	RMS	31.9	-19.8	2.21	41.33	54	-12.67	-	-	197	255	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (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	35.46	Pk	32	-19.9	0	47.56	-	-	74	-26.44	7	253	V
2	* 2.365	38.34	Pk	31.9	-19.8	0	50.44	-	-	74	-23.56	7	253	V
3	* 2.39	25.67	RMS	32	-19.9	2.21	39.98	54	-14.02	-	-	7	253	V
4	* 2.367	26.74	RMS	31.9	-19.8	2.21	41.05	54	-12.95	-	-	7	253	V

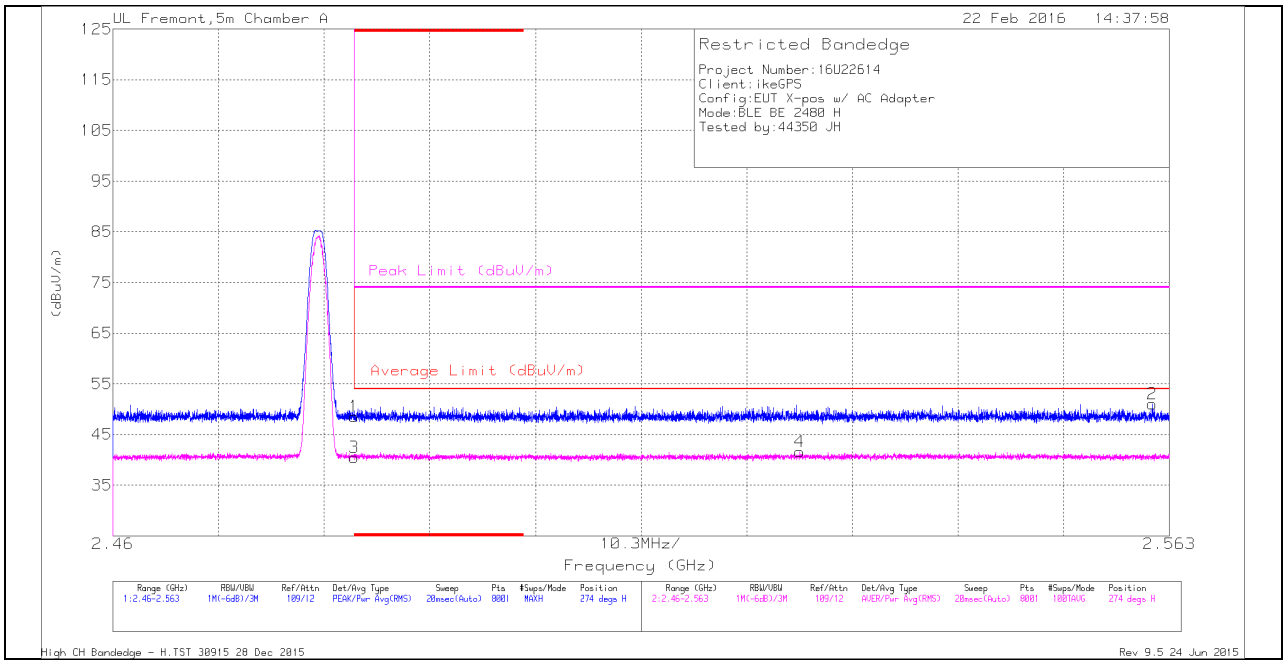
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

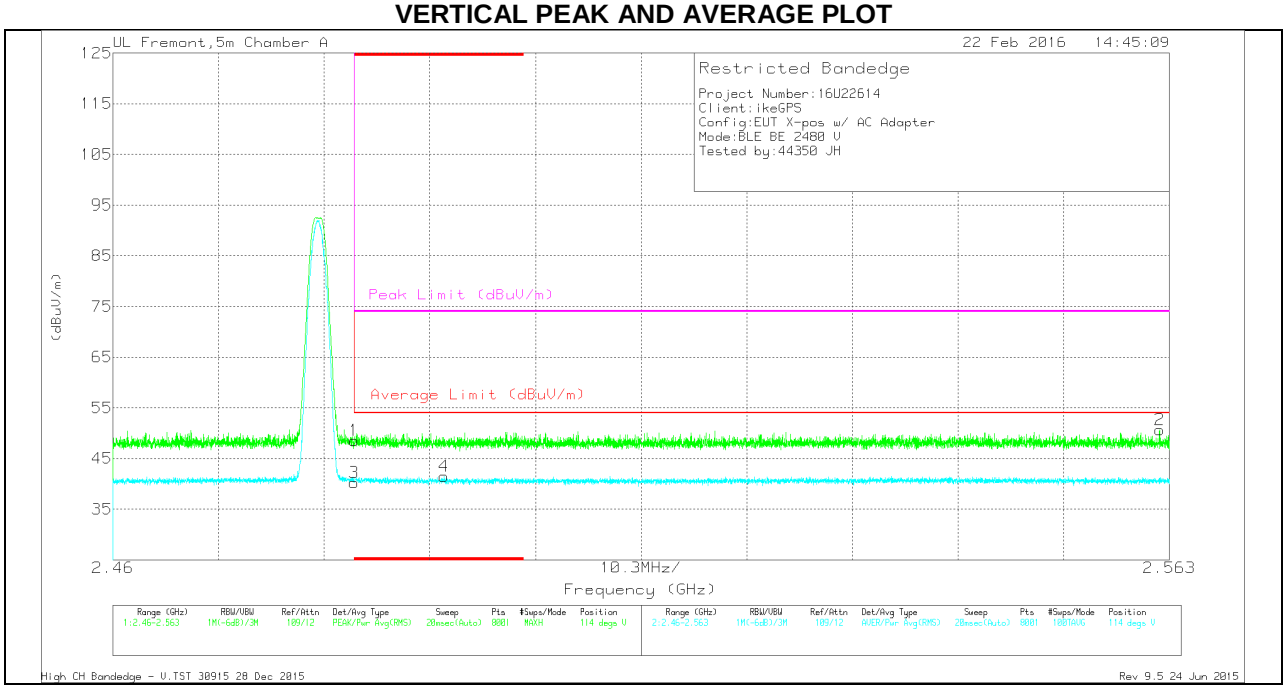
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	36.41	Pk	32.1	-20	0	48.51	-	-	74	-25.49	274	259	H
3	* 2.484	26.21	RMS	32.1	-20	2.21	40.52	54	-13.48	-	-	274	259	H
4	2.527	27.34	RMS	32.1	-20.1	2.21	41.55	54	-12.45	-	-	274	259	H
2	2.561	39.03	Pk	32.2	-20.2	0	51.03	-	-	74	-22.97	274	259	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (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	36.48	Pk	32.1	-20	0	48.58	-	-	74	-25.42	114	176	V
3	* 2.484	25.93	RMS	32.1	-20	2.21	40.24	54	-13.76	-	-	114	176	V
4	* 2.492	27.28	RMS	32.1	-20.1	2.21	41.49	54	-12.51	-	-	114	176	V
2	2.562	38.66	Pk	32.2	-20.2	0	50.66	-	-	74	-23.34	114	176	V

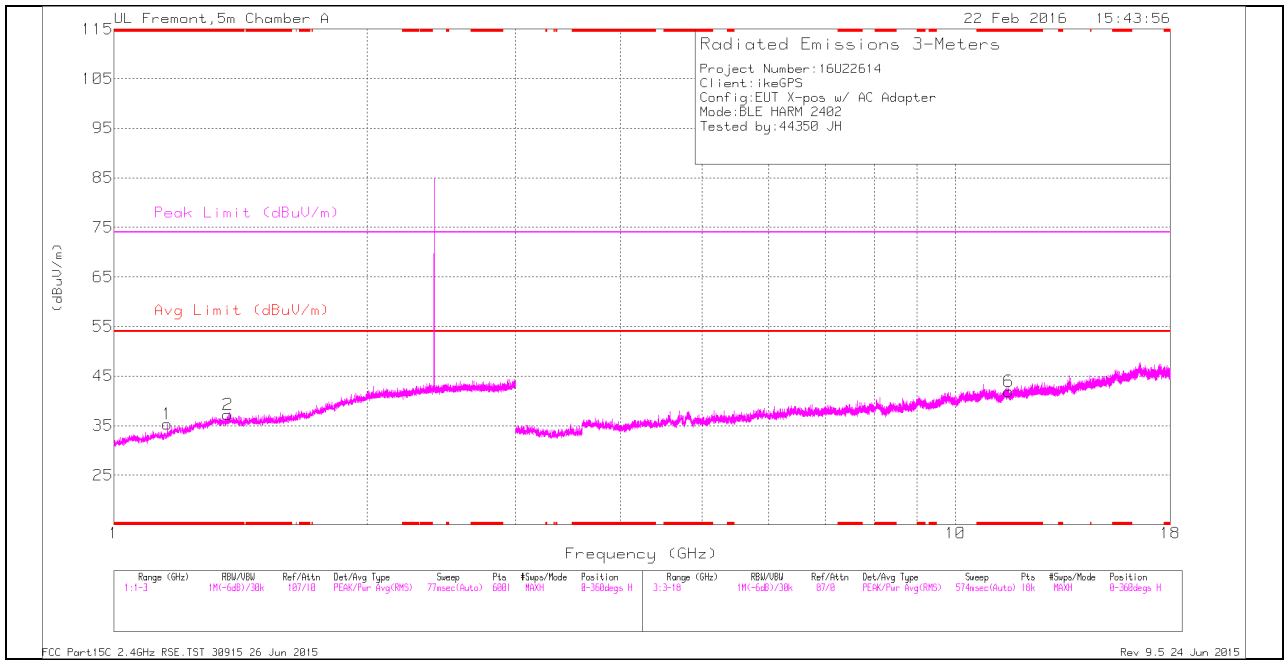
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RMS - RMS detection

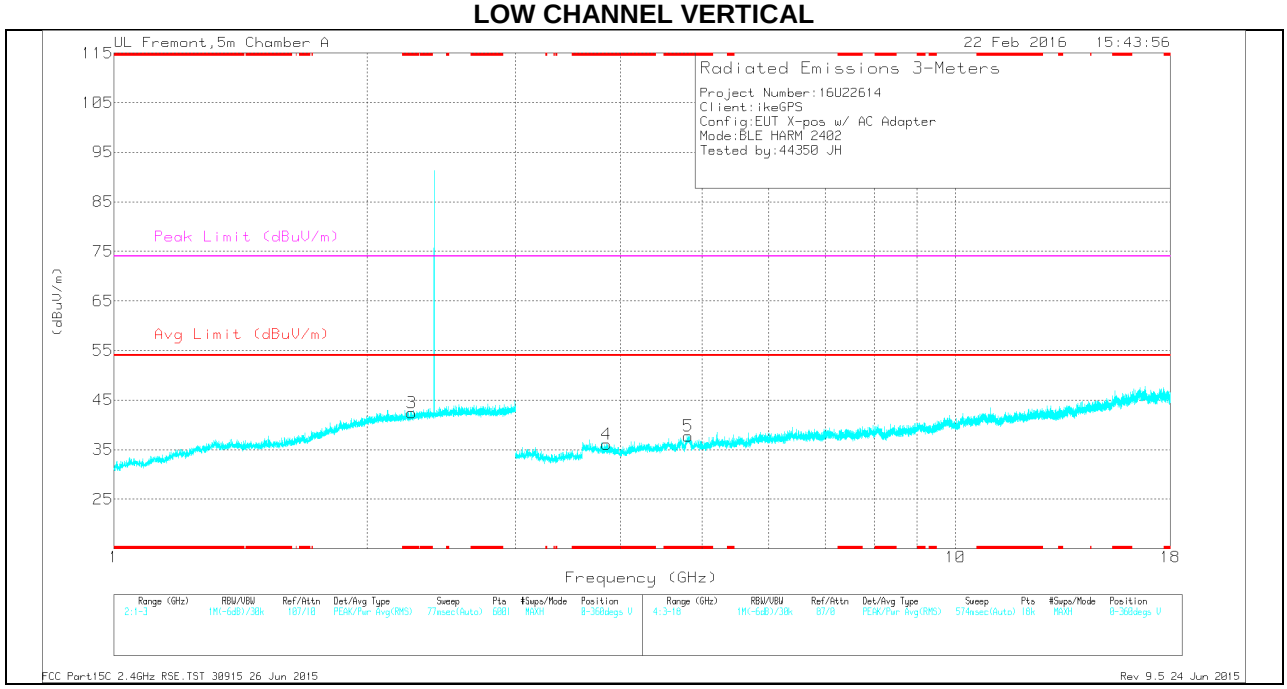
HARMONICS AND SPURIOUS EMISSIONS

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 T136 (dB/m)	Amp/Cbl/Fltr/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
1	* 1.157	29.82	Pk	27.7	-22.2	0	35.32	-	-	74	-38.68	0-360	100	H
2	* 1.366	29.48	Pk	28.6	-20.9	0	37.18	-	-	74	-36.82	0-360	100	H
3	* 2.259	30.4	Pk	31.6	-19.6	0	42.4	-	-	74	-31.6	0-360	100	V
6	* 11.572	26.17	Pk	38.1	-22.3	0	41.97	-	-	74	-32.03	0-360	100	H
4	* 3.846	34.48	Pk	33.4	-31.8	0	36.08	-	-	74	-37.92	0-360	200	V
5	* 4.814	33.6	Pk	33.9	-29.8	0	37.7	-	-	74	-36.3	0-360	100	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Avg - Video bandwidth < Resolution bandwidth

Radiated Emissions

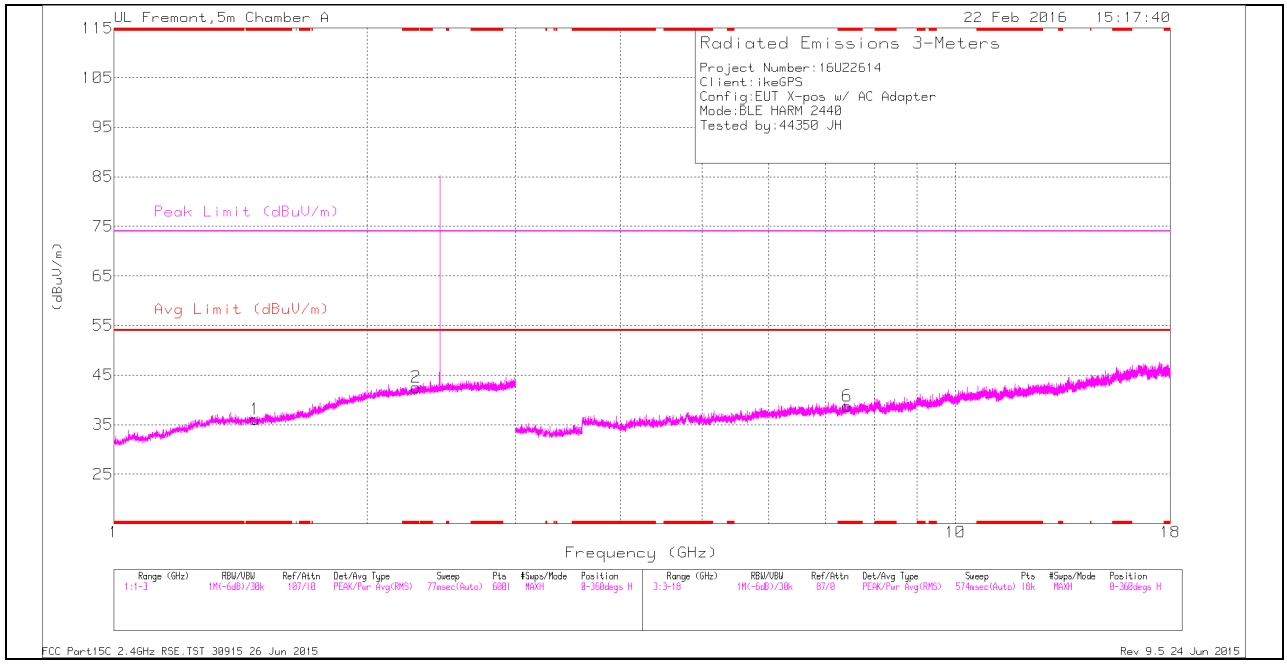
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.156	36.4	PK2	27.7	-22.2	0	41.9	-	-	74	-32.1	30	119	H
* 1.158	24.87	MAv1	27.7	-22.2	2.21	32.58	54	-21.42	-	-	30	119	H
* 1.365	37.3	PK2	28.6	-20.9	0	45	-	-	74	-29	190	256	H
* 1.367	25.02	MAv1	28.6	-20.9	2.21	34.93	54	-19.07	-	-	190	256	H
* 2.26	37.41	PK2	31.6	-19.6	0	49.41	-	-	74	-24.59	215	229	V
* 2.26	25.97	MAv1	31.6	-19.6	2.21	40.18	54	-13.82	-	-	215	229	V
* 11.572	34.09	PK2	38.1	-22.3	0	49.89	-	-	74	-24.11	241	170	H
* 11.57	22.84	MAv1	38.1	-22.3	2.21	40.85	54	-13.15	-	-	241	170	H
* 3.846	42.46	PK2	33.4	-31.8	0	44.06	-	-	74	-29.94	178	204	V
* 3.845	31.31	MAv1	33.4	-31.8	2.21	35.12	54	-18.88	-	-	178	204	V
* 4.815	40.78	PK2	33.9	-29.7	0	44.98	-	-	74	-29.02	309	233	V
* 4.812	29.83	MAv1	33.9	-29.8	2.21	36.14	54	-17.86	-	-	309	233	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

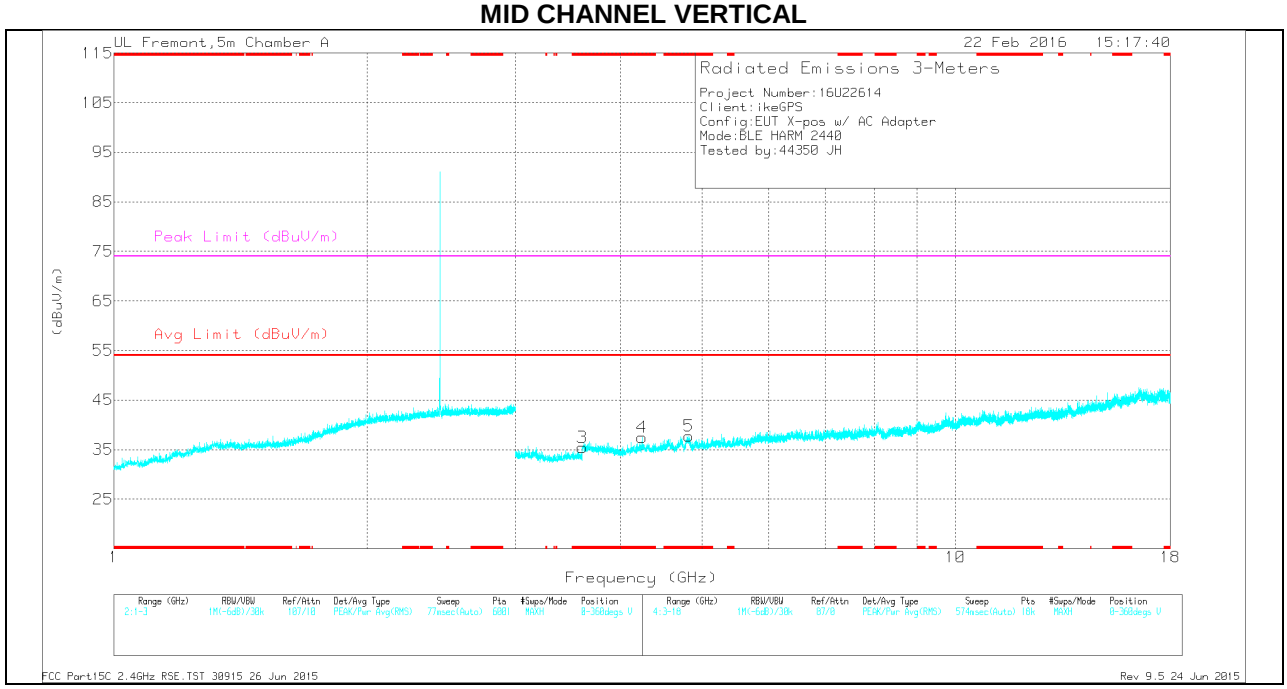
MAv1 - KDB558074 Option 1 Maximum RMS Average

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 T136 (dB/m)	Amp/Cbl/Fltr/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
1	* 1.472	28.26	Pk	28.2	-20.4	0	36.06	-	-	74	-37.94	0-360	201	H
2	* 2.287	30.36	Pk	31.8	-19.6	0	42.56	-	-	74	-31.44	0-360	201	H
6	* 7.439	28.16	Pk	35.5	-24.9	0	38.76	-	-	74	-35.24	0-360	100	H
3	* 3.602	34.7	Pk	33.1	-32.3	0	35.5	-	-	74	-38.5	0-360	100	V
4	* 4.242	34.5	Pk	33.4	-30.4	0	37.5	-	-	74	-36.5	0-360	100	V
5	* 4.822	33.41	Pk	33.9	-29.6	0	37.71	-	-	74	-36.29	0-360	100	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Avg - Video bandwidth < Resolution bandwidth

Radiated Emissions

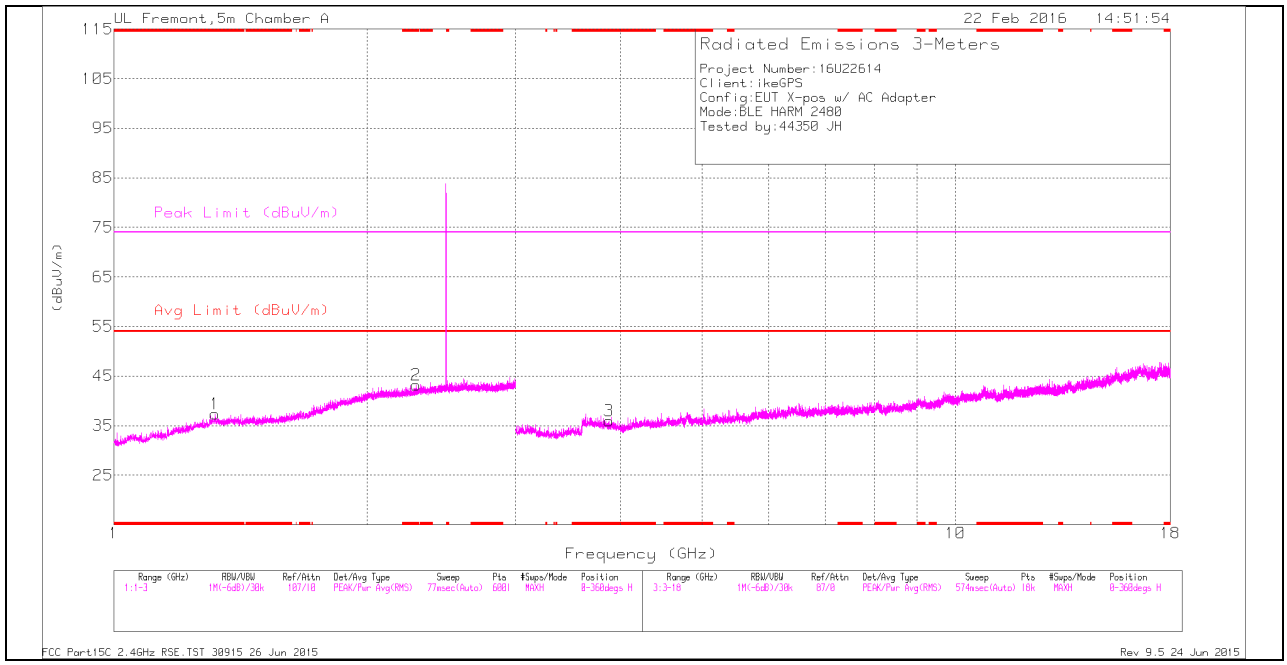
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.473	36.77	PK2	28.2	-20.4	0	44.57	-	-	74	-29.43	324	124	H
* 1.471	24.91	MAv1	28.2	-20.4	2.21	34.92	54	-19.08	-	-	324	124	H
* 2.285	38.55	PK2	31.8	-19.6	0	50.75	-	-	74	-23.25	220	216	H
* 2.289	26.05	MAv1	31.8	-19.6	2.21	40.46	54	-13.54	-	-	220	216	H
* 7.438	35.76	PK2	35.5	-24.9	0	46.36	-	-	74	-27.64	178	240	H
* 7.44	24.98	MAv1	35.5	-24.9	2.21	37.79	54	-16.21	-	-	178	240	H
* 3.604	42.67	PK2	33.1	-32.3	0	43.47	-	-	74	-30.53	204	193	V
* 3.601	31.62	MAv1	33.1	-32.3	2.21	34.63	54	-19.37	-	-	204	193	V
* 4.242	40.92	PK2	33.4	-30.4	0	43.92	-	-	74	-30.08	168	230	V
* 4.243	30.08	MAv1	33.4	-30.4	2.21	35.29	54	-18.71	-	-	168	230	V
* 4.823	40.95	PK2	33.9	-29.6	0	45.25	-	-	74	-28.75	93	138	V
* 4.821	29.9	MAv1	33.9	-29.7	2.21	36.31	54	-17.69	-	-	93	138	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

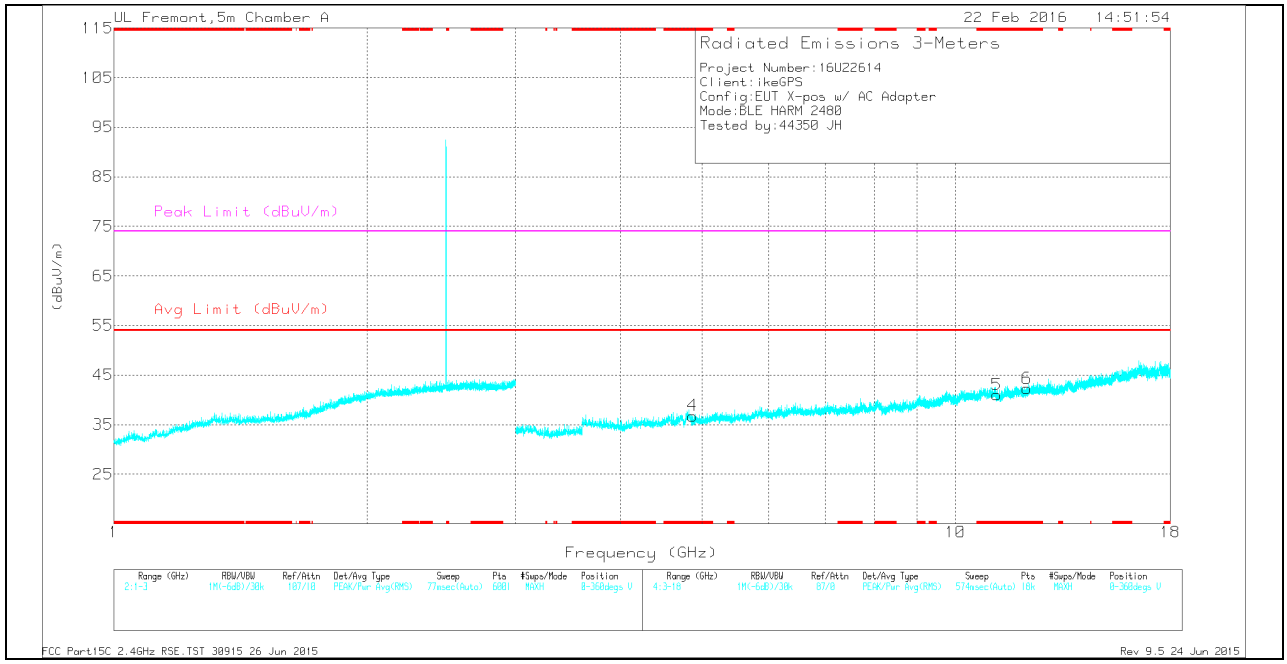
MAv1 - KDB558074 Option 1 Maximum RMS Average

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 T136 (dB/m)	Amp/Cbl/Fltr/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
1	* 1.318	29.56	Pk	28.8	-21	0	37.36	-	-	74	-36.64	0-360	100	H
5	* 11.194	25.77	Pk	37.8	-22.5	0	41.07	-	-	74	-32.93	0-360	100	V
6	* 12.158	25.89	Pk	38.8	-22.4	0	42.29	-	-	74	-31.71	0-360	100	V
2	* 2.287	31.01	Pk	31.8	-19.6	0	43.21	-	-	74	-30.79	0-360	201	H
3	* 3.875	34.18	Pk	33.5	-31.7	0	35.98	-	-	74	-38.02	0-360	100	H
4	* 4.87	32.18	Pk	33.9	-29.3	0	36.78	-	-	74	-37.22	0-360	200	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Avg - Video bandwidth < Resolution bandwidth

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/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
* 1.316	36.57	PK2	28.8	-21.1	0	44.27	-	-	74	-29.73	57	115	H
* 1.32	25.16	MAv1	28.8	-21	2.21	35.17	54	-18.83	-	-	57	115	H
* 2.287	38.03	PK2	31.8	-19.6	0	50.23	-	-	74	-23.77	85	145	H
* 2.286	26.08	MAv1	31.8	-19.6	2.21	40.49	54	-13.51	-	-	85	145	H
* 3.876	42.37	PK2	33.5	-31.7	0	44.17	-	-	74	-29.83	168	200	H
* 3.875	31.21	MAv1	33.5	-31.7	2.21	35.22	54	-18.78	-	-	168	200	H
* 4.87	40.18	PK2	33.9	-29.3	0	44.78	-	-	74	-29.22	209	188	V
* 4.872	28.9	MAv1	33.9	-29.3	2.21	35.71	54	-18.29	-	-	209	188	V
* 11.194	33.72	PK2	37.8	-22.5	0	49.02	-	-	74	-24.98	255	233	V
* 11.192	22.51	MAv1	37.8	-22.5	2.21	40.02	54	-13.98	-	-	255	233	V
* 12.16	33.9	PK2	38.8	-22.4	0	50.3	-	-	74	-23.7	219	269	V
* 12.156	22.39	MAv1	38.8	-22.4	2.21	41	54	-13	-	-	219	269	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

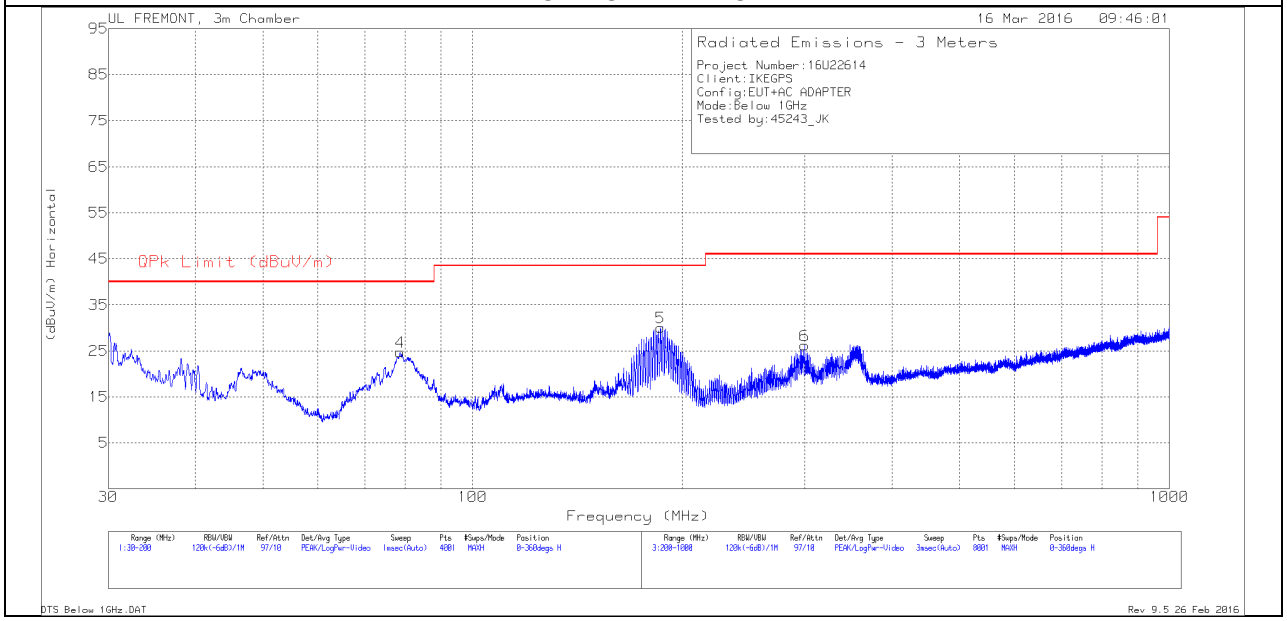
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

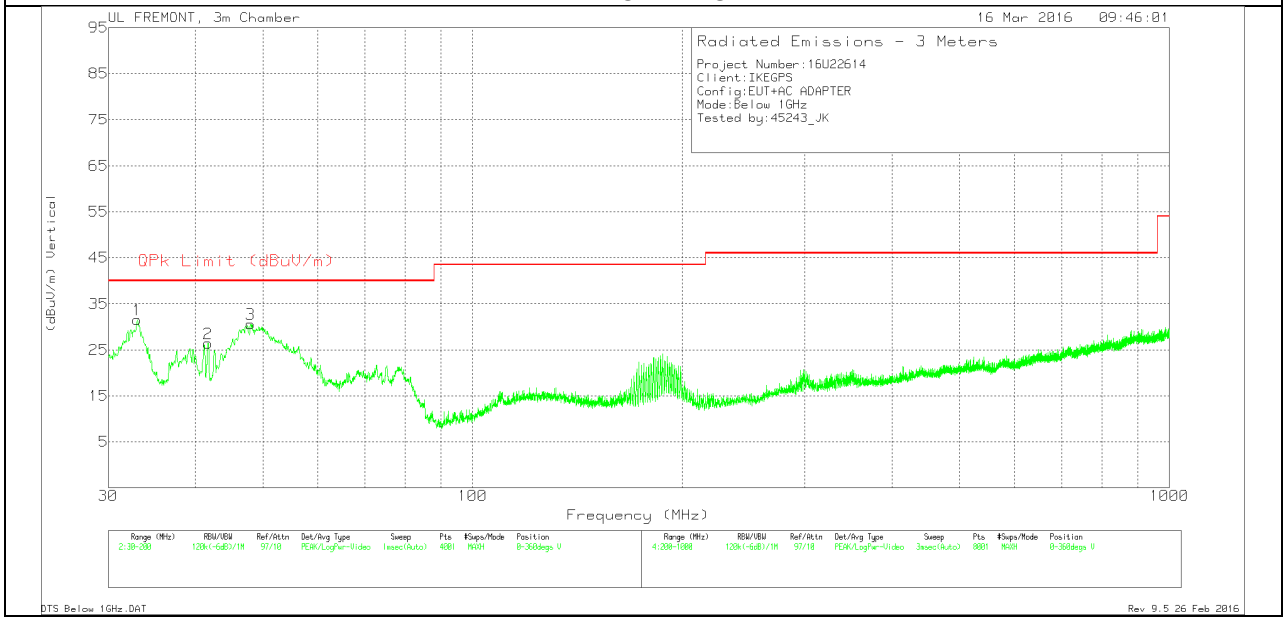
9.2. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

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	33.0175	39.14	Pk	19.5	-27.1	31.54	40	-8.46	0-360	100	V
2	41.73	40.52	Pk	13	-27.1	26.42	40	-13.58	0-360	100	V
3	48.02	48.5	Pk	9	-26.9	30.6	40	-9.4	0-360	100	V
4	78.705	43.23	Pk	8.1	-26.6	24.73	40	-15.27	0-360	400	H
5	186.06	44.33	Pk	11	-25.3	30.03	43.52	-13.49	0-360	100	H
6	299.7	37.5	Pk	13.1	-24.4	26.2	46.02	-19.82	0-360	100	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

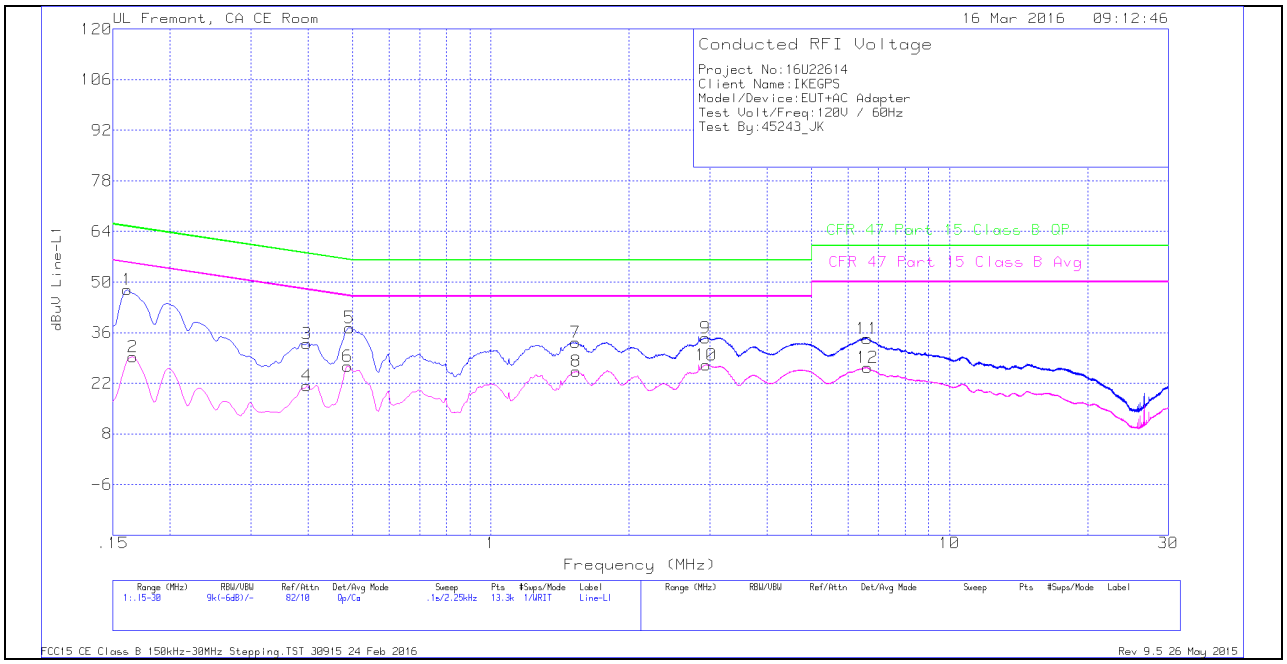
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULT

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.16125	36.54	Qp	1.3	0	10.1	47.94	65.4	-17.46	-	-
2	.16575	17.98	Ca	1.2	0	10.1	29.28	-	-	55.17	-25.89
3	.3975	22.46	Qp	.4	0	10.1	32.96	57.91	-24.95	-	-
4	.3975	10.88	Ca	.4	0	10.1	21.38	-	-	47.91	-26.53
5	.492	26.89	Qp	.4	0	10.1	37.39	56.13	-18.74	-	-
6	.4875	16.28	Ca	.4	0	10.1	26.78	-	-	46.21	-19.43
7	1.5315	22.88	Qp	.2	.1	10.1	33.28	56	-22.72	-	-
8	1.536	14.84	Ca	.2	.1	10.1	25.24	-	-	46	-20.76
9	2.9355	24.18	Qp	.2	.1	10.1	34.58	56	-21.42	-	-
10	2.94563	16.71	Ca	.2	.1	10.1	27.11	-	-	46	-18.89
11	6.61538	23.87	Qp	.2	.1	10.2	34.37	60	-25.63	-	-
12	6.6165	15.82	Ca	.2	.1	10.2	26.32	-	-	50	-23.68

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 PLOT

LINE 2 RESULT

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.15225	35.69	Qp	1.5	0	10.1	47.29	65.88	-18.59	-	-
14	.15675	16.76	Ca	1.4	0	10.1	28.26	-	-	55.63	-27.37
15	.18375	33.63	Qp	1.1	0	10.1	44.83	64.31	-19.48	-	-
16	.186	13.71	Ca	1.1	0	10.1	24.91	-	-	54.21	-29.3
17	.42675	25.59	Qp	.4	0	10.1	36.09	57.32	-21.23	-	-
18	.429	9.35	Ca	.4	0	10.1	19.85	-	-	47.27	-27.42
19	.51675	29.36	Qp	.4	0	10.1	39.86	56	-16.14	-	-
20	.51675	14.48	Ca	.4	0	10.1	24.98	-	-	46	-21.02
21	2.86575	20.12	Qp	.2	.1	10.1	30.52	56	-25.48	-	-
22	2.868	12.92	Ca	.2	.1	10.1	23.32	-	-	46	-22.68
23	17.32875	17.35	Qp	.3	.2	10.3	28.15	60	-31.85	-	-
24	17.331	5.94	Ca	.3	.2	10.3	16.74	-	-	50	-33.26

Qp - Quasi-Peak detector

Ca - CISPR average detection