



**FCC 47 CFR PART 15 SUBPART C  
INDUSTRY CANADA RSS-210 ISSUE 8**

**BLUETOOTH LOW ENERGY  
CERTIFICATION TEST REPORT**

**FOR**

**802.11 a/b/g/n, BLE, and BT module**

**MODEL NUMBER: EDISON**

**FCC ID: 2AB8ZND1  
IC: 1000X-ND1**

**REPORT NUMBER: 14U17976-E8**

**ISSUE DATE: August 19, 2014**

*Prepared for*  
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2200 MISSION COLLEGE BOULEVARD  
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**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/19/14	Initial Issue	C.S.OOI

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** INTEL CORPORATION  
2200 MISSION COLLEGE BOULEVARD  
SANTA CLARA, CA 95052, U.S.A

**EUT DESCRIPTION:** 802.11 a/b/g/n, BLE, and BT module

**MODEL:** EDISON

**SERIAL NUMBER:** SMED425D0039PBAF(SKU10),(Conducted)  
SMED425D004KPBAF(SKU9),(Radiated)

**DATE TESTED:** JULY 30-AUGUST 18, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	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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PROJECT LEAD  
UL Verification Services Inc.

Tested By:



THANH PHAM  
EMC ENGINEER  
UL Verification Services Inc.

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

## 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
<input type="checkbox"/> Chamber A	<input type="checkbox"/> Chamber D
<input type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F
	<input type="checkbox"/> Chamber G
	<input checked="" type="checkbox"/> Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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	$\pm 3.52$ dB
Radiated Disturbance, 30 to 1000 MHz	$\pm 4.94$ dB
Radiated Disturbance, 1 to 6 GHz	$\pm 3.86$ dB
Radiated Disturbance, 6 to 18 GHz	$\pm 4.23$ dB
Radiated Disturbance, 18 to 26 GHz	$\pm 5.30$ dB
Radiated Disturbance, 26 to 40 GHz	$\pm 5.23$ dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a 802.11 a/b/g/n, BLE, and BT module.

The radio module is made by Intel.

### 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	1.42	1.39

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a WiFi antenna, with gain as follows:

Frequency Range (MHz)	Max Gain (dBi)
2400-2483.5	3.2
5150-5850	4.2

### 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 6.10 RC190.40.

The EUT driver software installed during testing was 6.10.190.49

## **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 Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.



## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	T420	4236b92	N/A
AC / DC Adapter	Lenovo	42T4430	11S42T4430Z1ZGWE28	N/A
Laptop	HP Compaq	2510P	CNF7422KL6	N/A
AC / DC Adapter	HP Compaq	384021-001	W97950ELLVC685	N/A

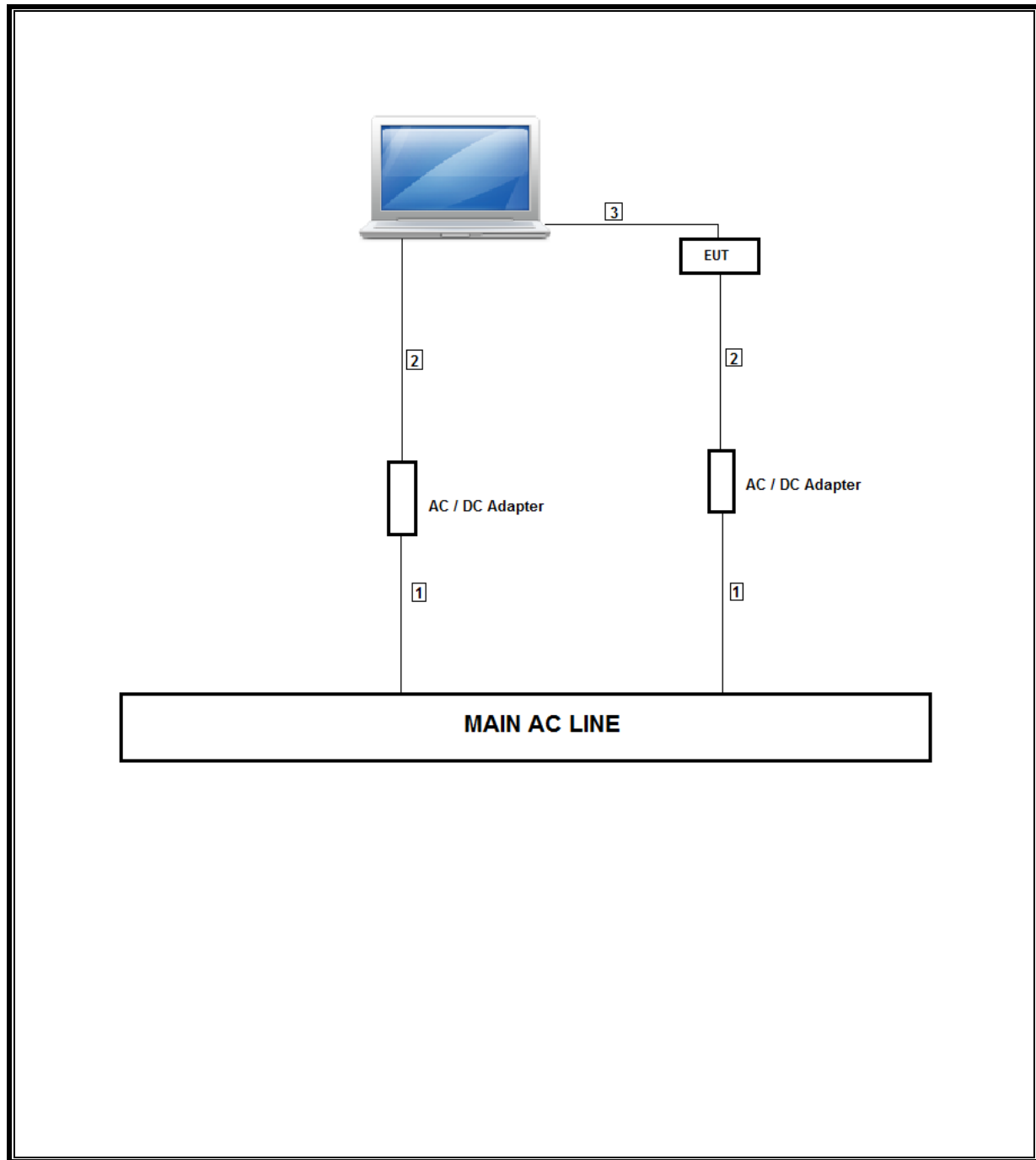
### I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	2	AC	Unshielded	1	AC input
2	DC	2	DC	Unshielded	1	DC output
3	USB	1	USB	Unshielded	0.5	USB-A to OTG

### TEST SETUP

The EUT is connected with a host laptop computer by USB cable 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	Asset	Cal Date	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	T146	06/19/14	06/19/15
PXA Signal Analyzer	Agilent	N9030A	T339	12/10/13	12/10/14
Horn Antenna, 1GHz-18GHz	ETS Lindgren	3117	T119	01/06/14	01/06/15
Antenna, Horn, 18 GHz	EMCO	3115	C01218	01/18/14	01/18/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/13	11/14/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	08/22/13	08/22/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/19/13	10/19/14
Peak Power Meter	Agilent / HP	N1911A	T379	02/07/14	02/07/15
Power Meter Sensor	Agilent / HP	N1921A	T309	12/12/13	12/12/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/14	01/16/15
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	01/09/14	1/9/2015
5GHz Low Pass Filter	Micro-Tronics	LPS17541	F00219	01/11/14	01/11/15
3GHz High Pass Filter	Micro-Tronics	HPS17542	F00222	01/11/14	01/11/15
6GHz High Pass Filter	Micro-Tronics	HPM17543	F00224	01/11/14	01/11/15

## 7. ANTENNA PORT TEST RESULTS

### 7.1. ON TIME, DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

### 7.2. 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/B Minimum VBW (kHz)
BLE	0.3490	0.6250	0.558	55.84%	2.53	2.865

### **7.3. MEASUREMENT METHODS**

6 dB BW: KDB 558074 D01 v03r02, Section 8.1.

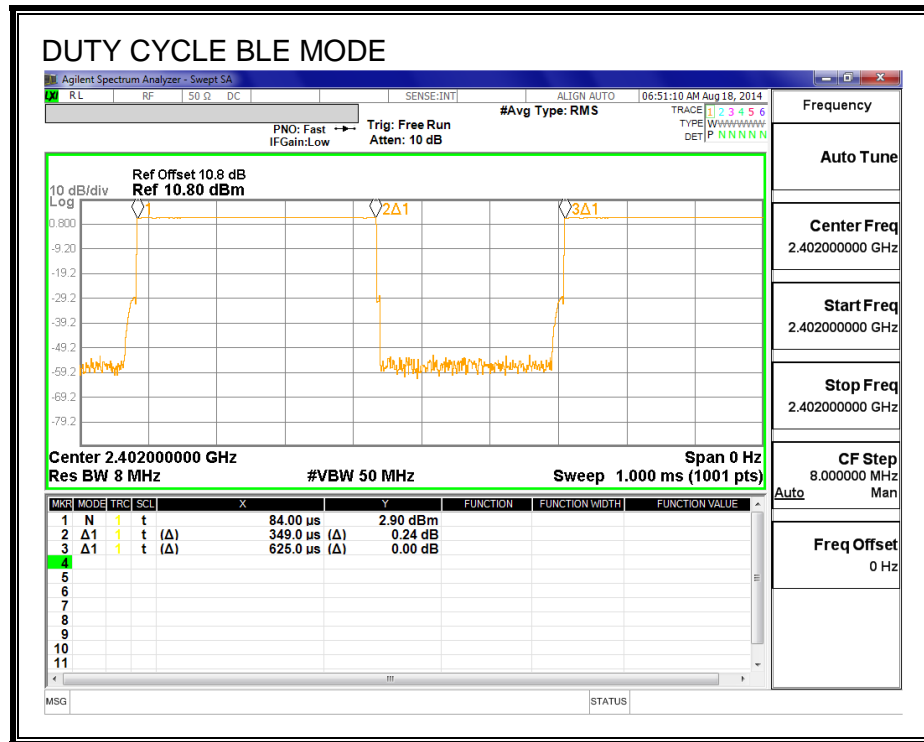
Output Power: KDB 558074 D01 v03r02, Section 9.2.3.2.

Power Spectral Density: KDB 558074 D01 v03r02, Section 10.3 and 10.5

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r02, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r02, Section 12.1.

## 7.4. DUTY CYCLE PLOTS



## 7.5. 6 dB BANDWIDTH

### LIMITS

FCC §15.247 (a) (2)

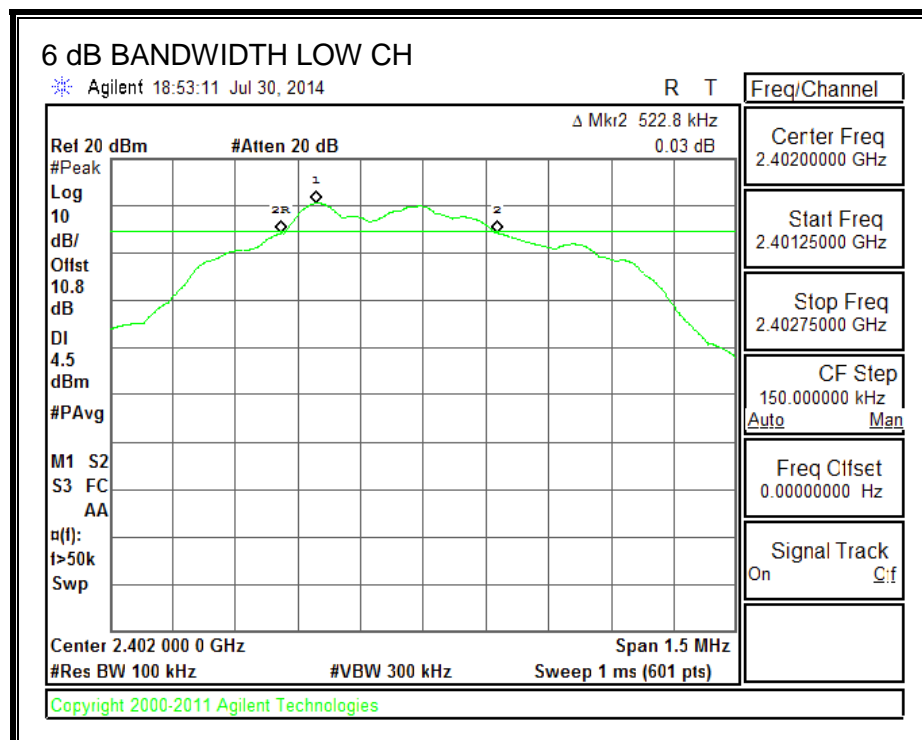
IC RSS-210 A8.2 (a)

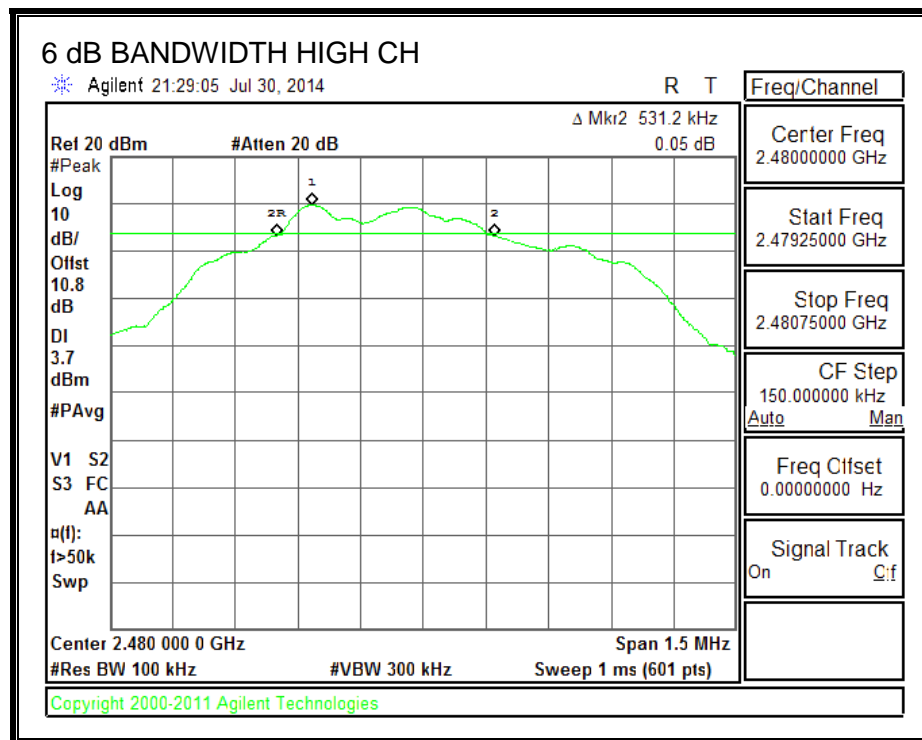
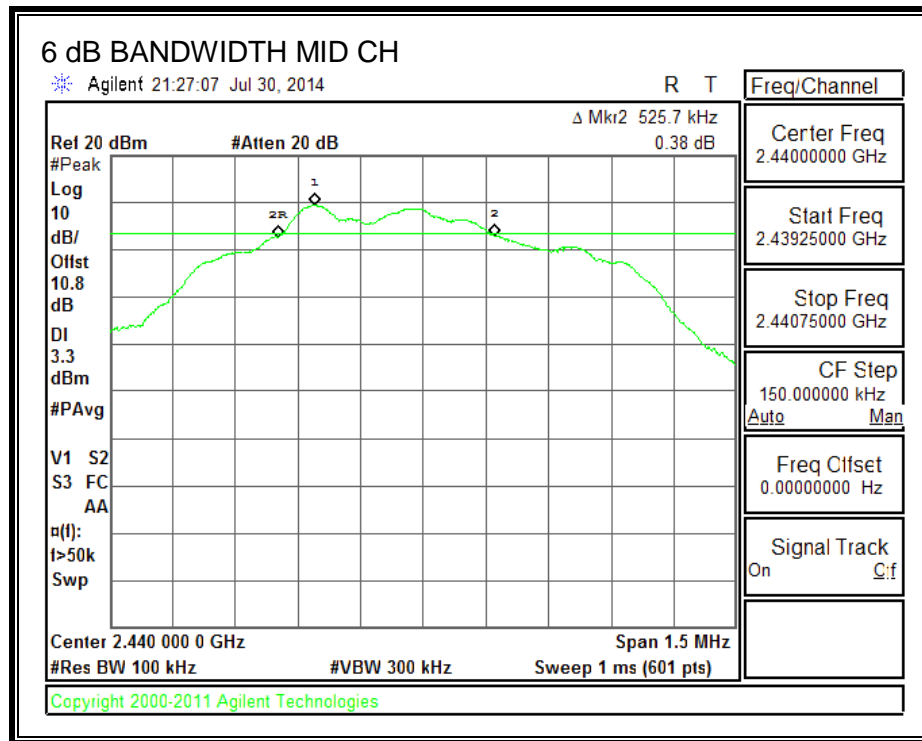
The minimum 6 dB bandwidth shall be at least 500 kHz.

### RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.5228	0.5
Middle	2440	0.5257	0.5
High	2480	0.5312	0.5

### 6 dB BANDWIDTH







## 7.6. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

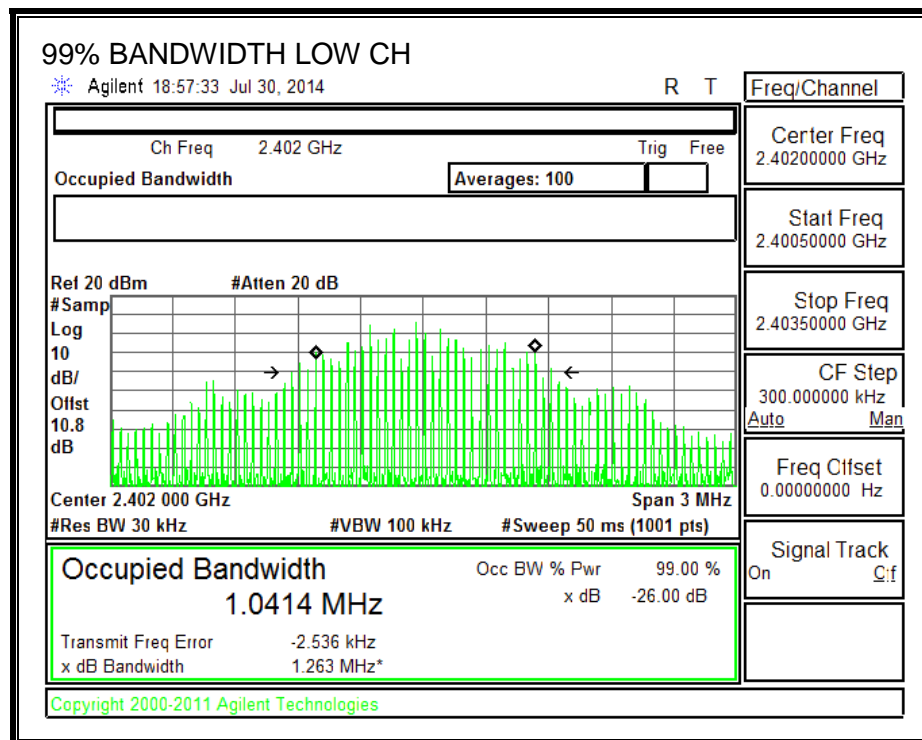
### TEST PROCEDURE

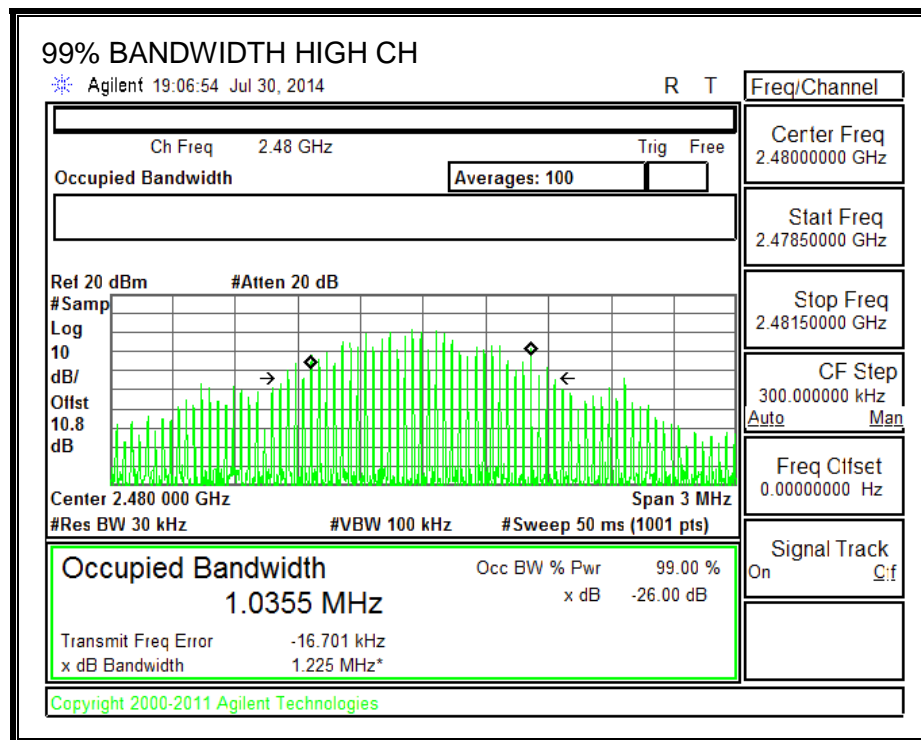
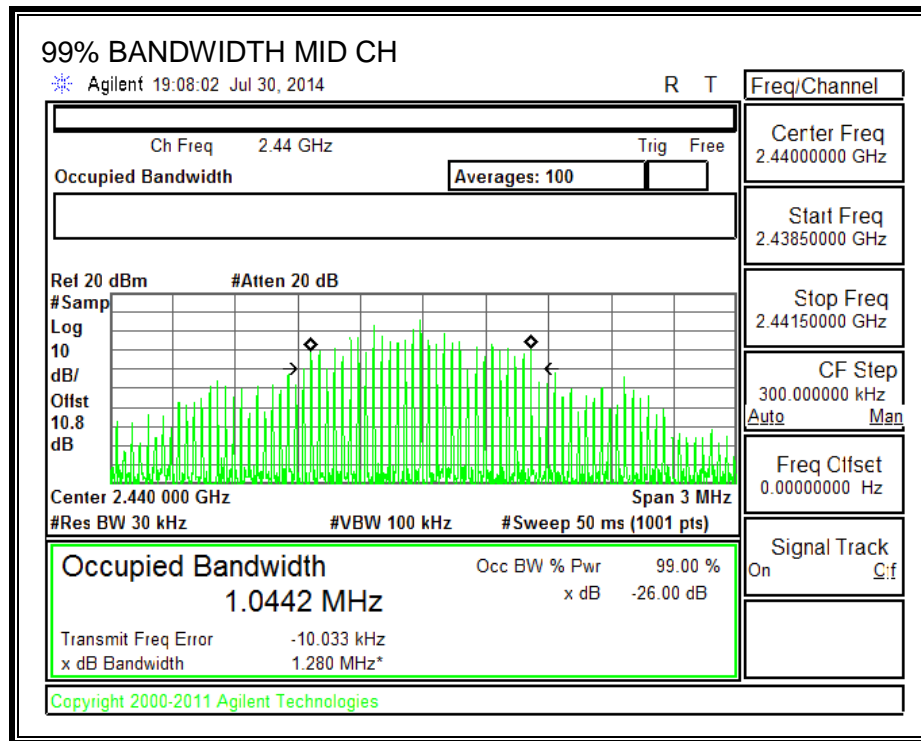
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

### RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0414
Middle	2440	1.0442
High	2480	1.0355

### 99% BANDWIDTH





## 7.7. OUTPUT POWER

### LIMITS

FCC §15.247 (b)

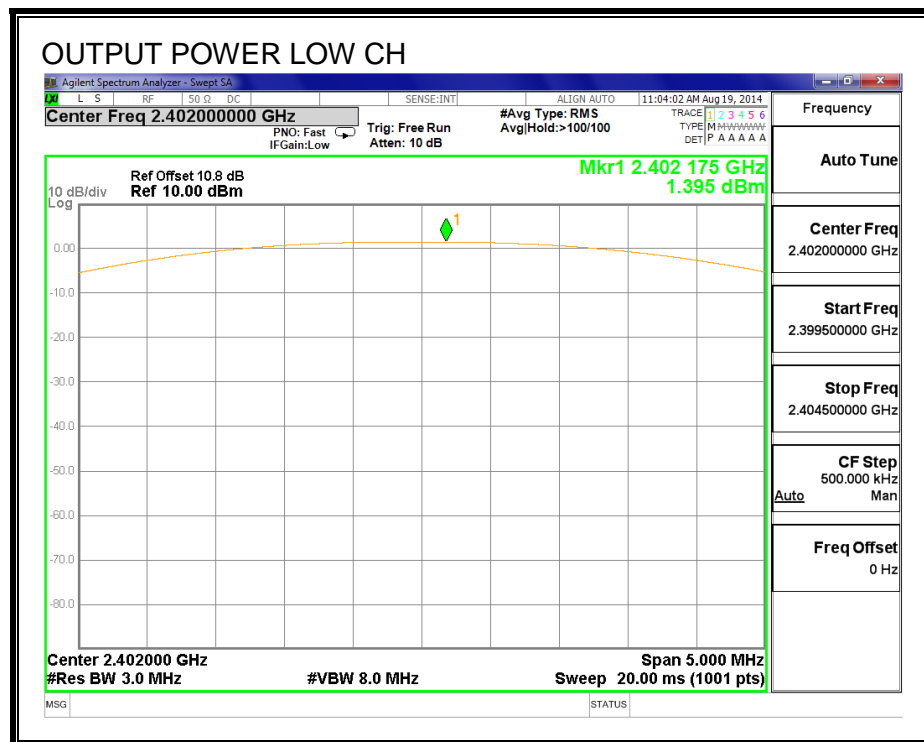
IC RSS-210 A8.4

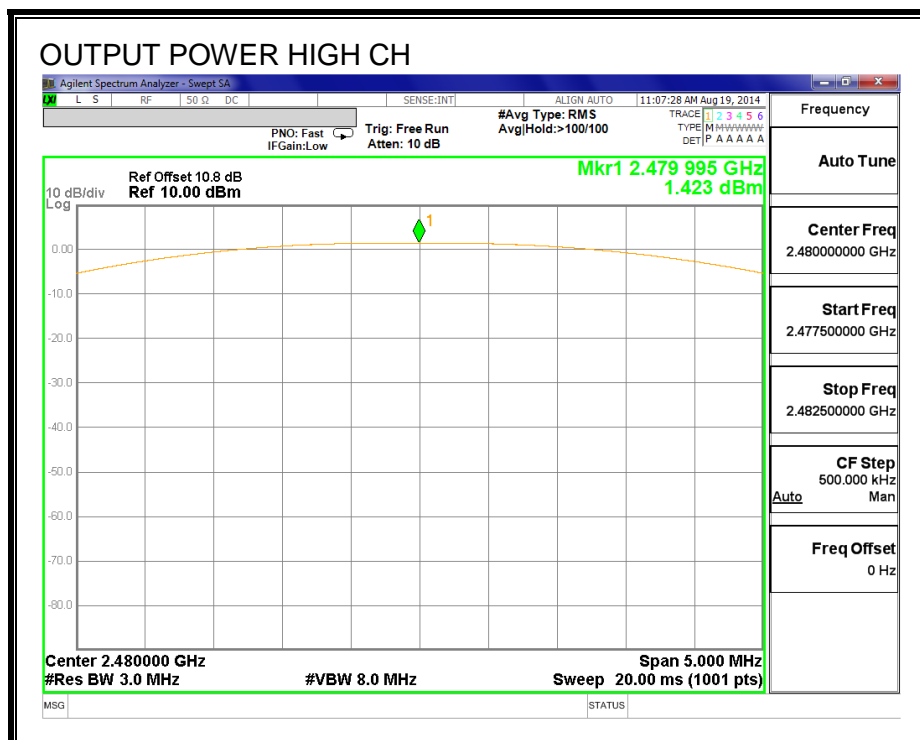
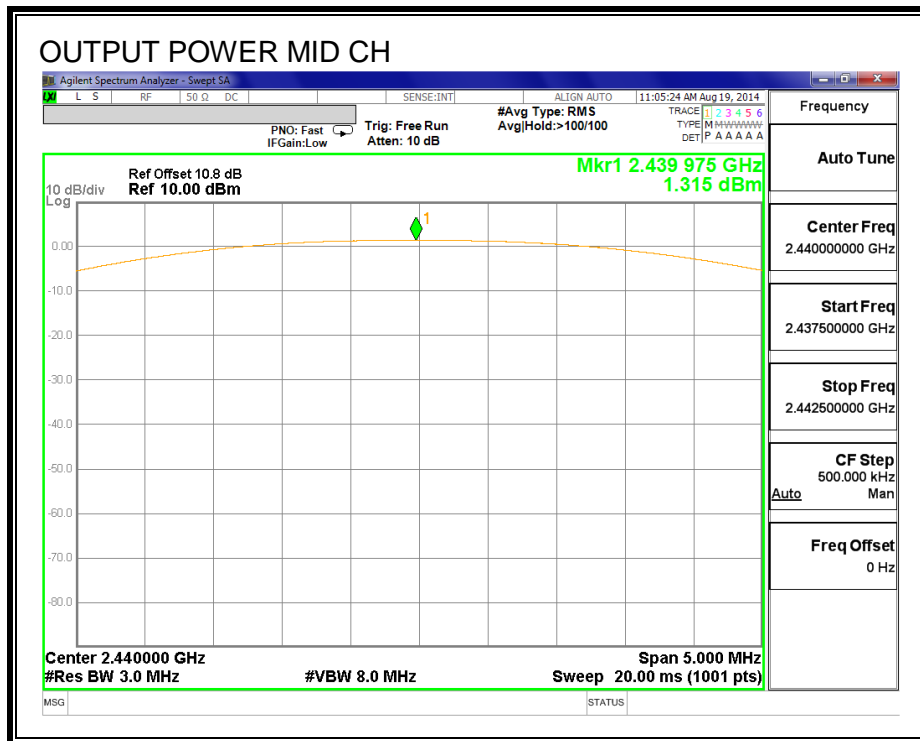
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

### RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.395	30	-28.605
Middle	2440	1.315	30	-28.685
High	2480	1.423	30	-28.577

### OUTPUT POWER





## 7.8. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### RESULTS

The cable assembly insertion loss of 10.8 dB (including 10 dB pad and 0.8 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	-1.54
Middle	2440	-1.46
High	2480	-1.47

**Note:** the power readings above are measured with power meter gated method.

## 7.9. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

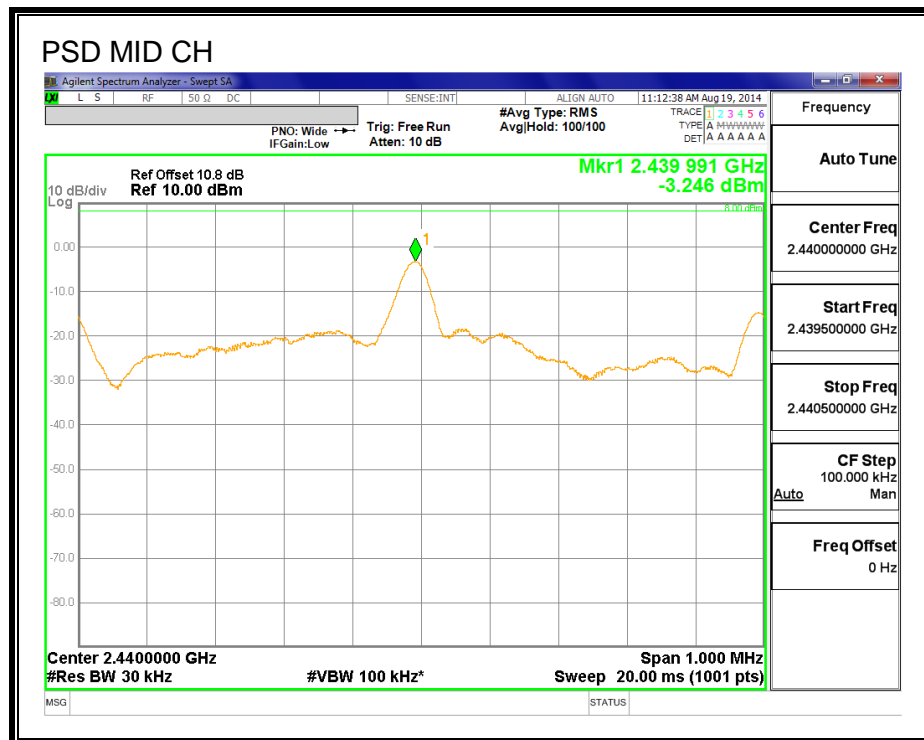
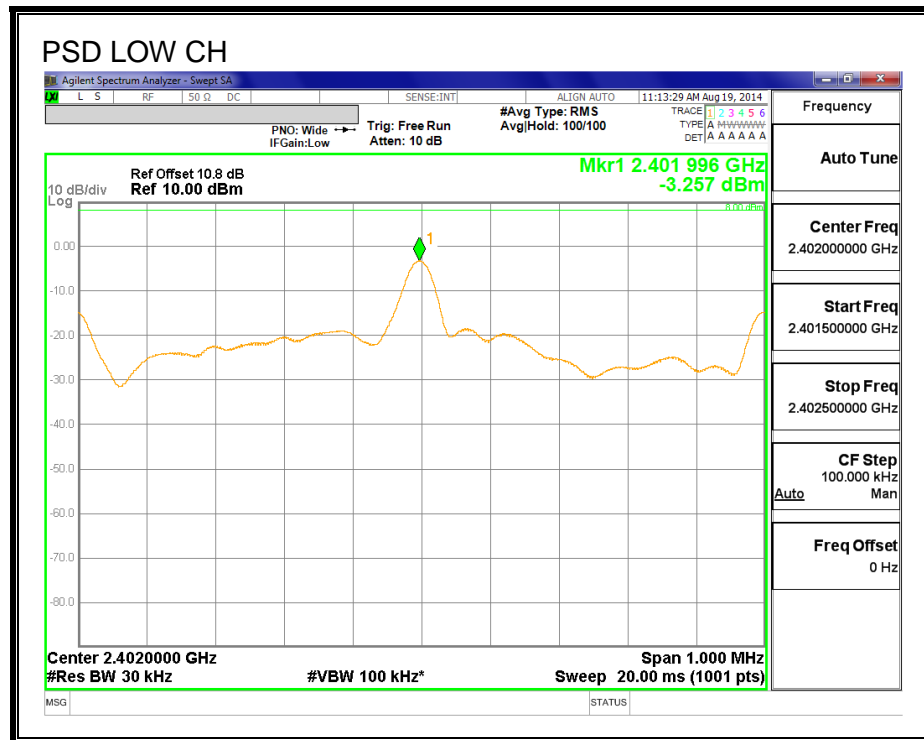
IC RSS-210 A8.2 (b)

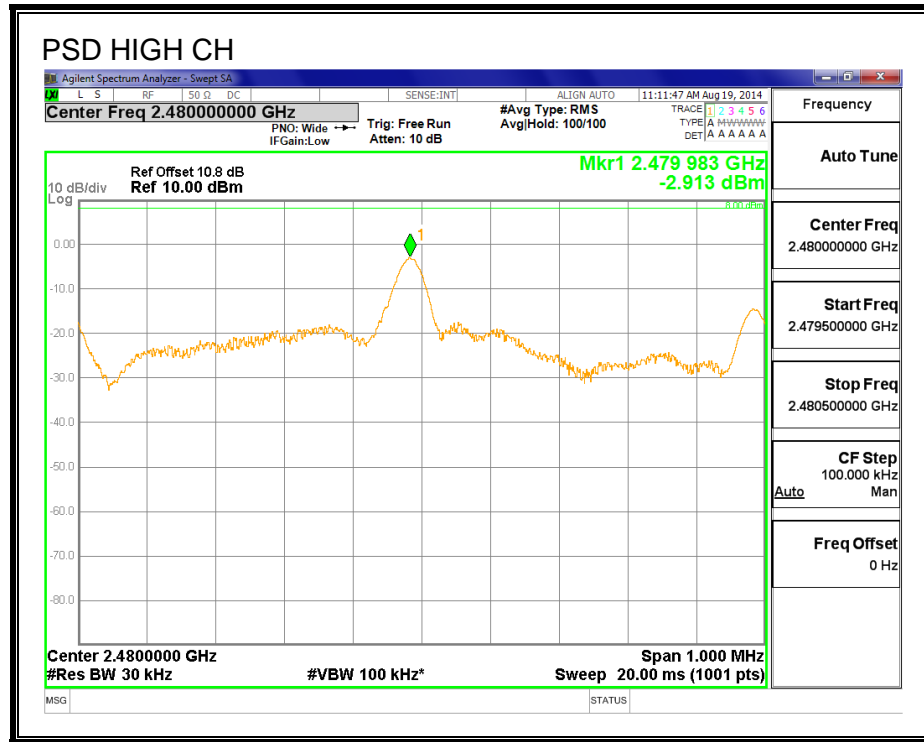
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-3.257	8	-11.26
Middle	2440	-3.246	8	-11.25
High	2480	-2.913	8	-10.91

## POWER SPECTRAL DENSITY







## **7.10. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

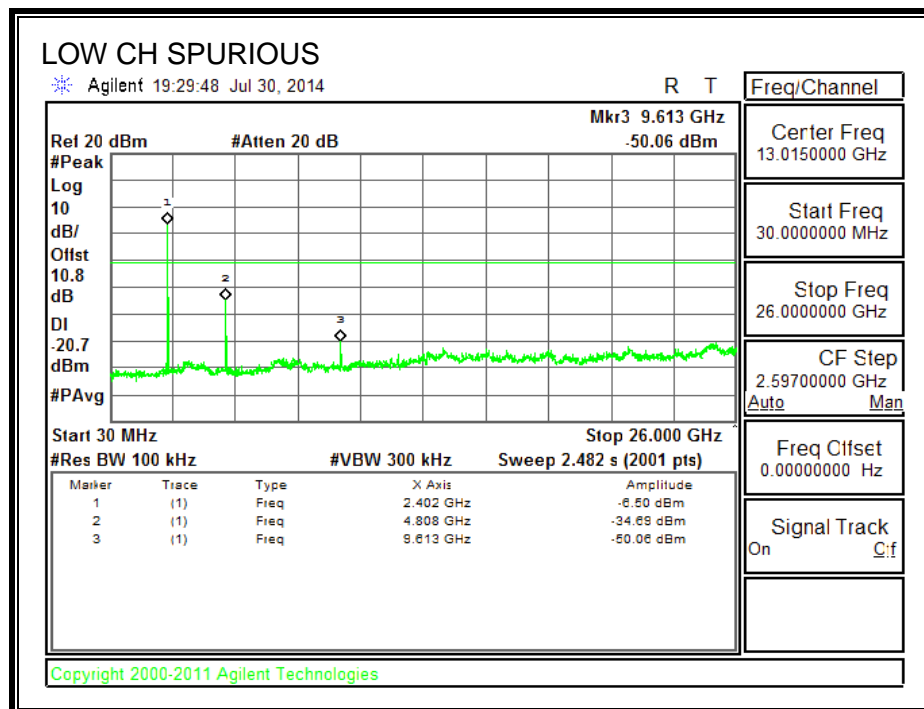
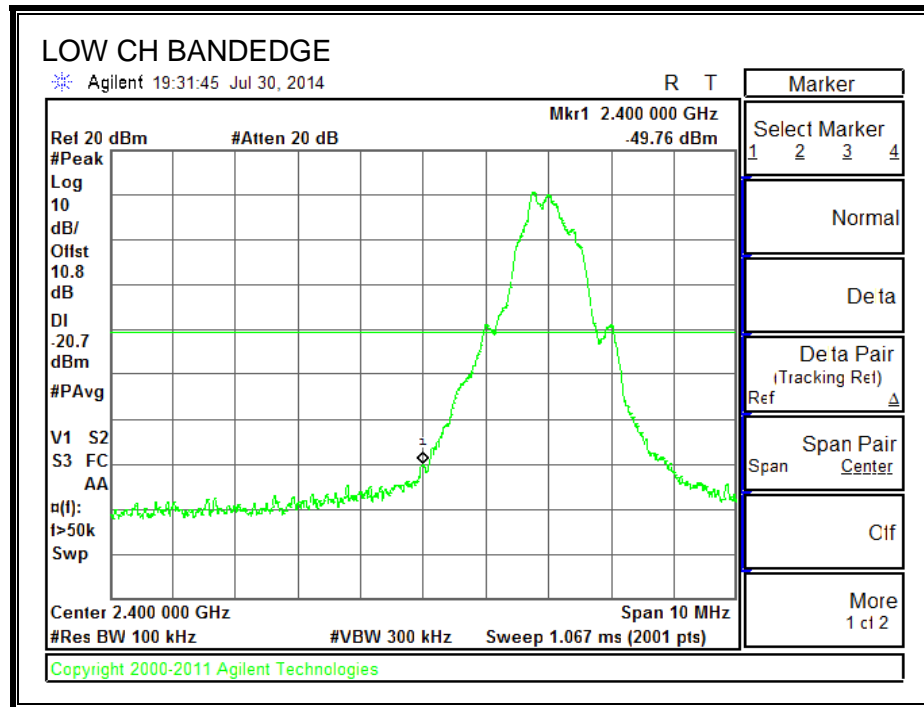
FCC §15.247 (d)

IC RSS-210 A8.5

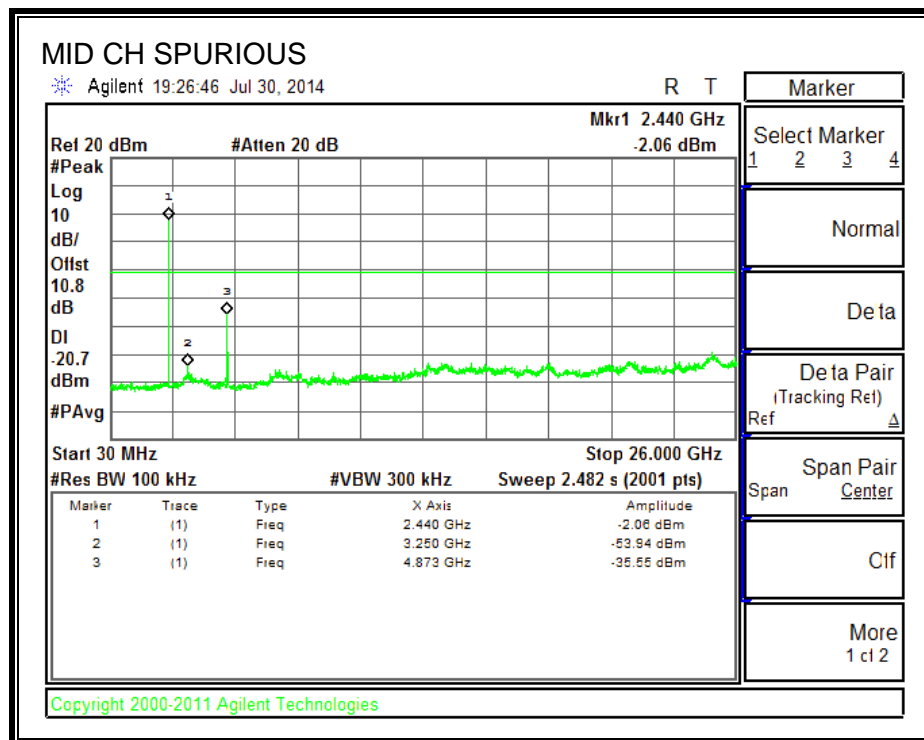
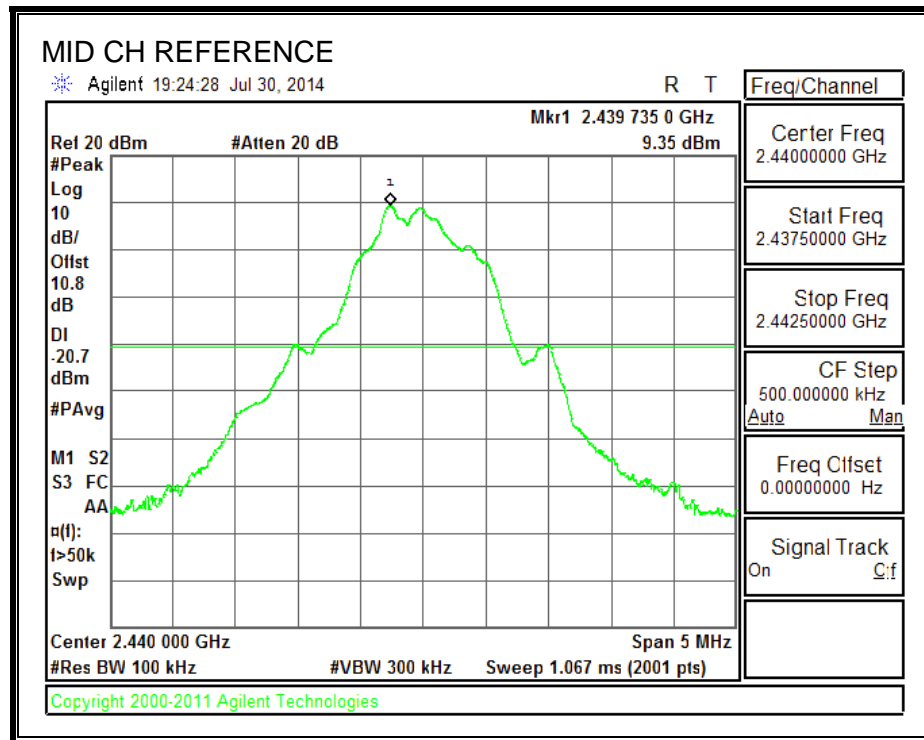
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

## RESULTS

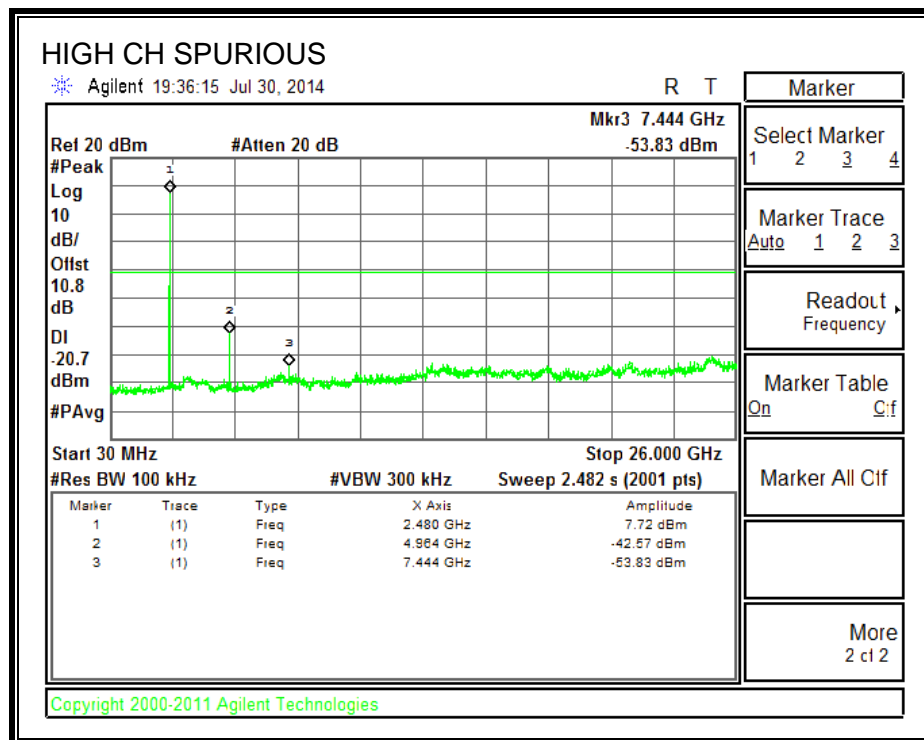
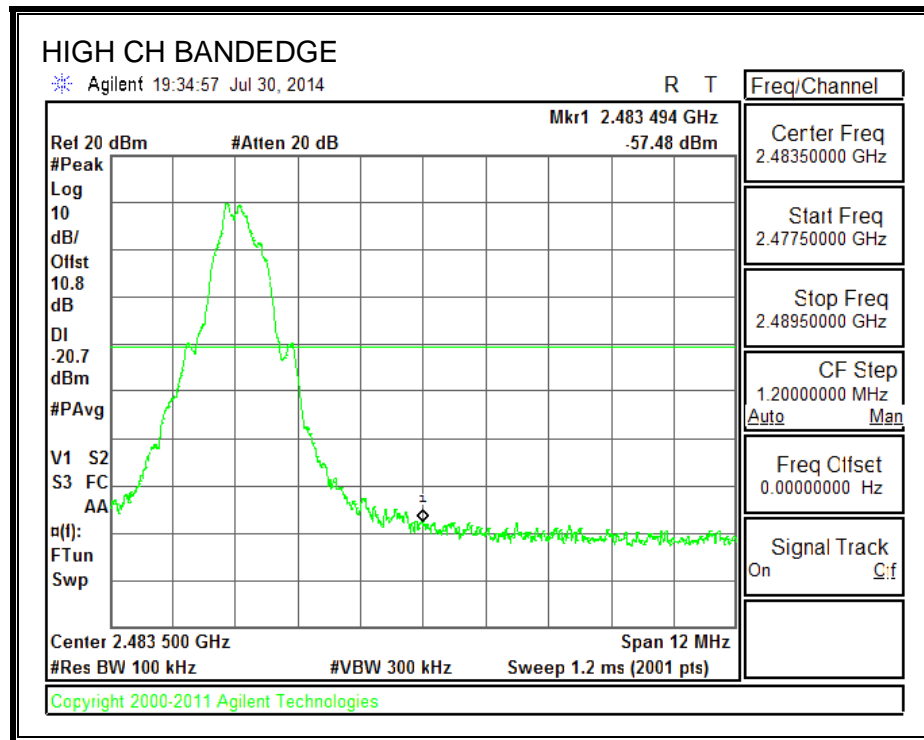
### SPURIOUS EMISSIONS, LOW CHANNEL



# **SPURIOUS EMISSIONS, MID CHANNEL**

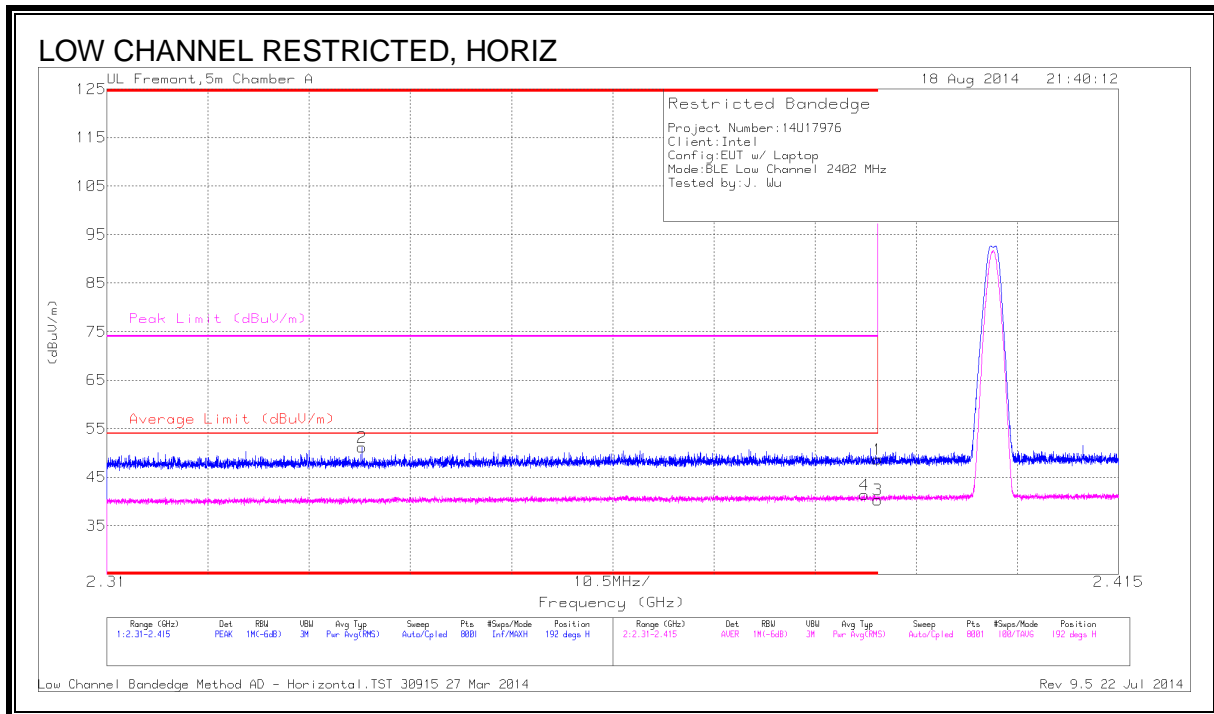


# SPURIOUS EMISSIONS, HIGH CHANNEL



## 7.11. TX ABOVE 1 GHz FOR BLE MODE IN THE 2.4 GHz BAND

### BANDEDGE (LOW CHANNEL)



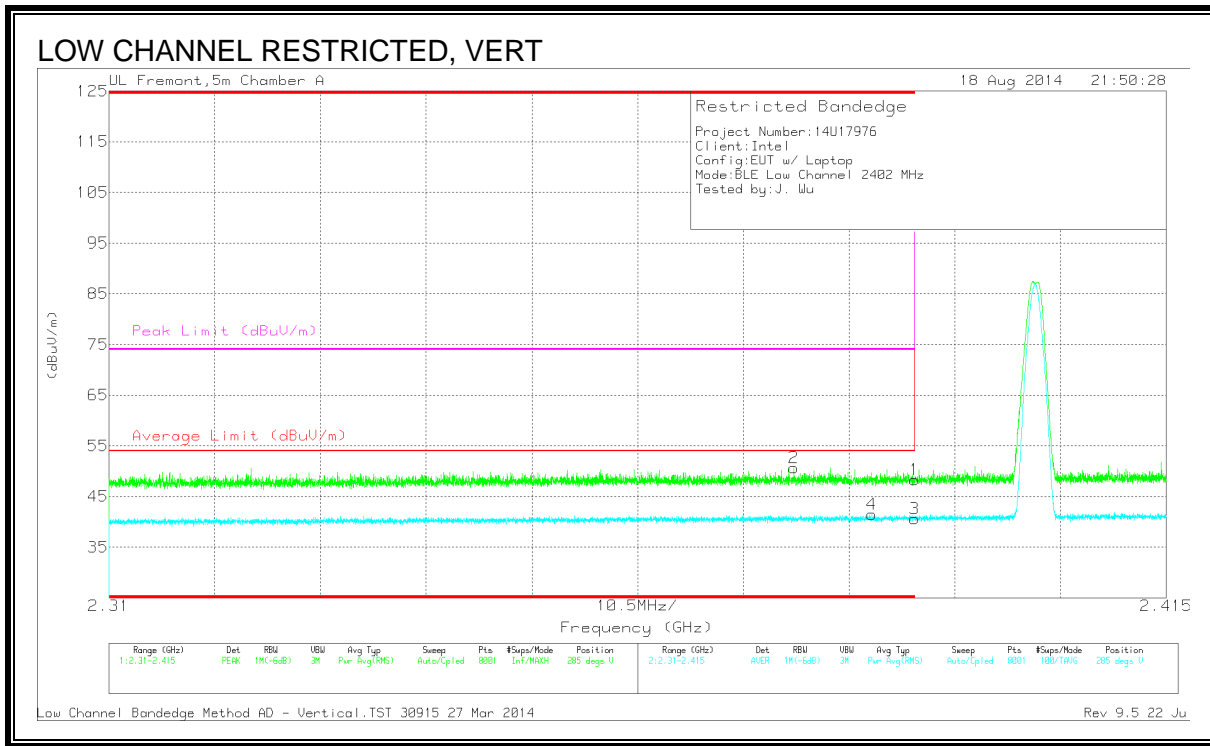
### Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/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
2	* 2.336	42.35	PK	31.8	-23	0	51.15	-	-	74	-22.85	192	238	H
4	* 2.389	29.59	RMS	32.2	-23	2.53	41.32	54	-12.68	-	-	192	238	H
1	* 2.39	39.44	PK	32.2	-23	0	48.64	-	-	74	-25.36	192	238	H
3	* 2.39	28.57	RMS	32.2	-23	2.53	40.3	54	-13.7	-	-	192	238	H

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

PK - Peak detector

RMS - RMS detection



## Trace Markers

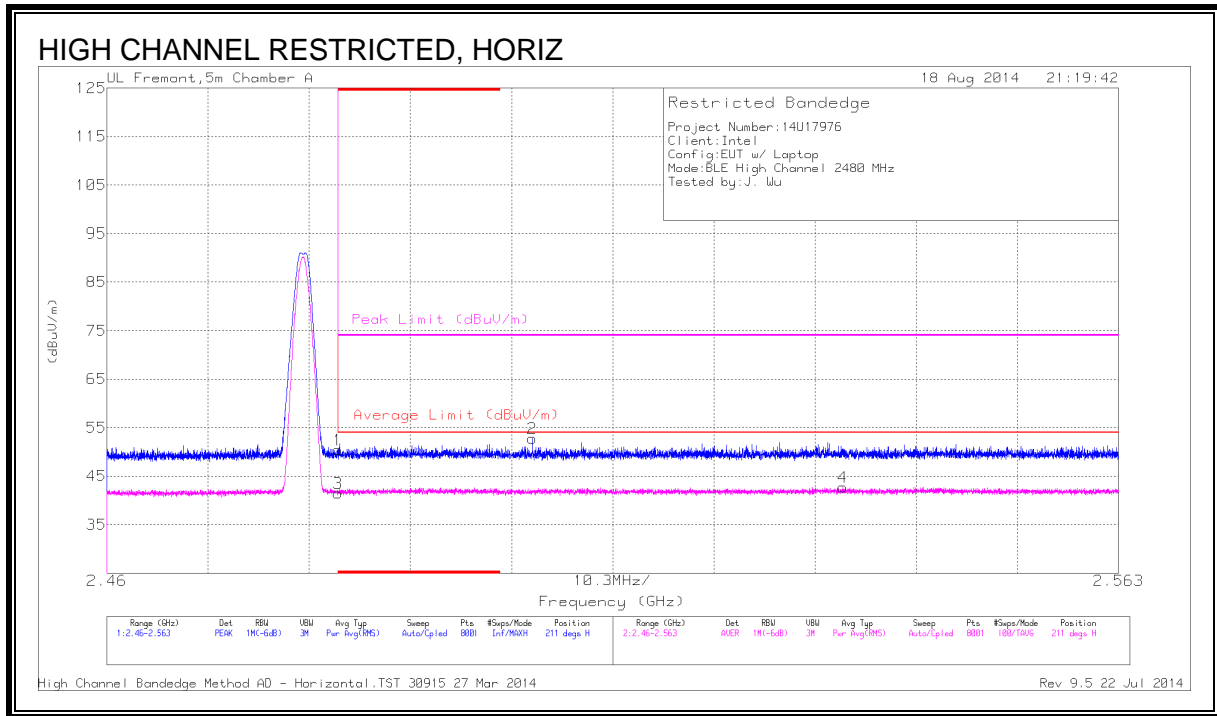
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.378	41.59	PK	32.1	-23	0	50.69	-	-	74	-23.31	285	285	V
4	* 2.386	29.67	RMS	32.2	-23	2.53	41.40	54	-12.60	-	-	285	285	V
1	* 2.39	39.13	PK	32.2	-23	0	48.33	-	-	74	-25.67	285	285	V
3	* 2.39	28.88	RMS	32.2	-23	2.53	40.61	54	-13.39	-	-	285	285	V

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

PK - Peak detector

RMS - RMS detection

# BANDEGE (HIGH CHANNEL)



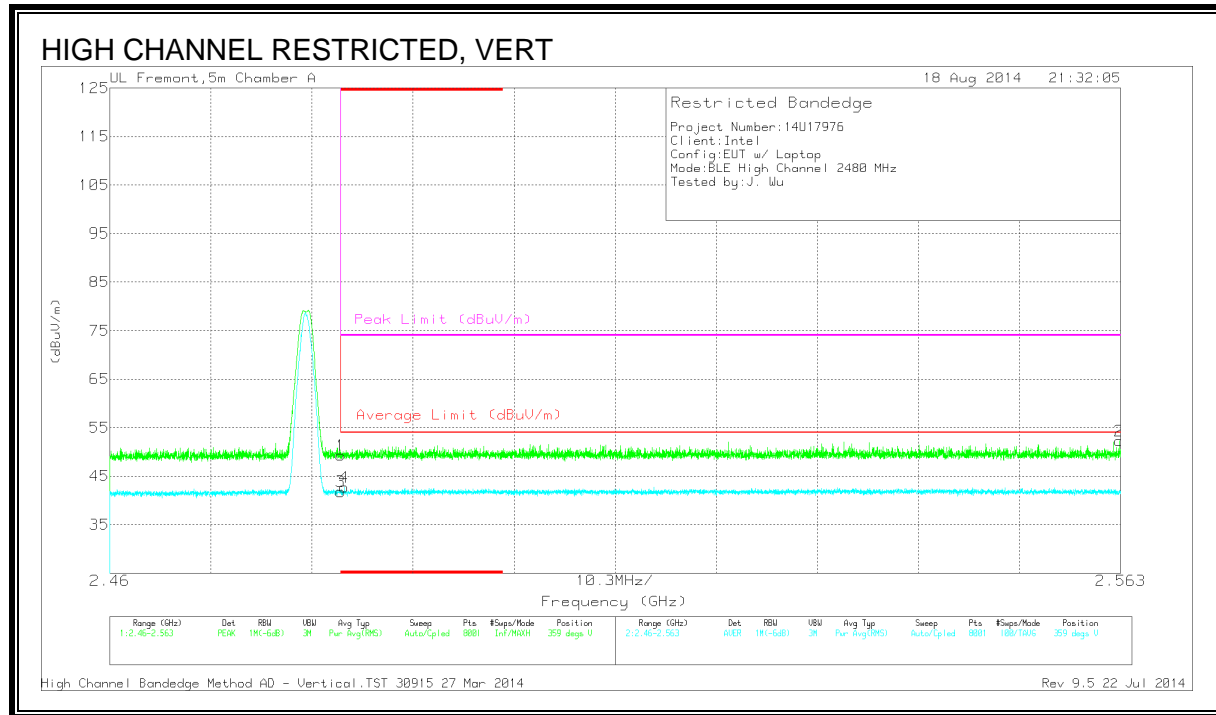
## Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/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	40.36	PK	32.7	-22.7	0	50.36	-	-	74	-23.64	211	231	H
3	* 2.484	28.95	RMS	32.7	-22.7	2.53	41.48	54	-12.52	-	-	211	231	H
2	2.503	42.72	PK	32.8	-22.7	0	52.82	-	-	74	-21.18	211	231	H
4	2.535	29.76	RMS	32.9	-22.5	2.53	42.69	54	-11.31	-	-	211	231	H

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

PK - Peak detector

RMS - RMS detection



## Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Flt r/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	39.35	PK	32.7	-22.7	0	49.35	-	-	74	-24.65	359	246	V
3	* 2.484	29.26	RMS	32.7	-22.7	2.53	41.79	54	-12.21	-	-	359	246	V
4	* 2.484	30.17	RMS	32.7	-22.7	2.53	42.7	54	-11.3	-	-	359	246	V
2	2.563	41.93	PK	32.9	-22.6	0	52.23	-	-	74	-21.77	359	246	V

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

PK - Peak detector

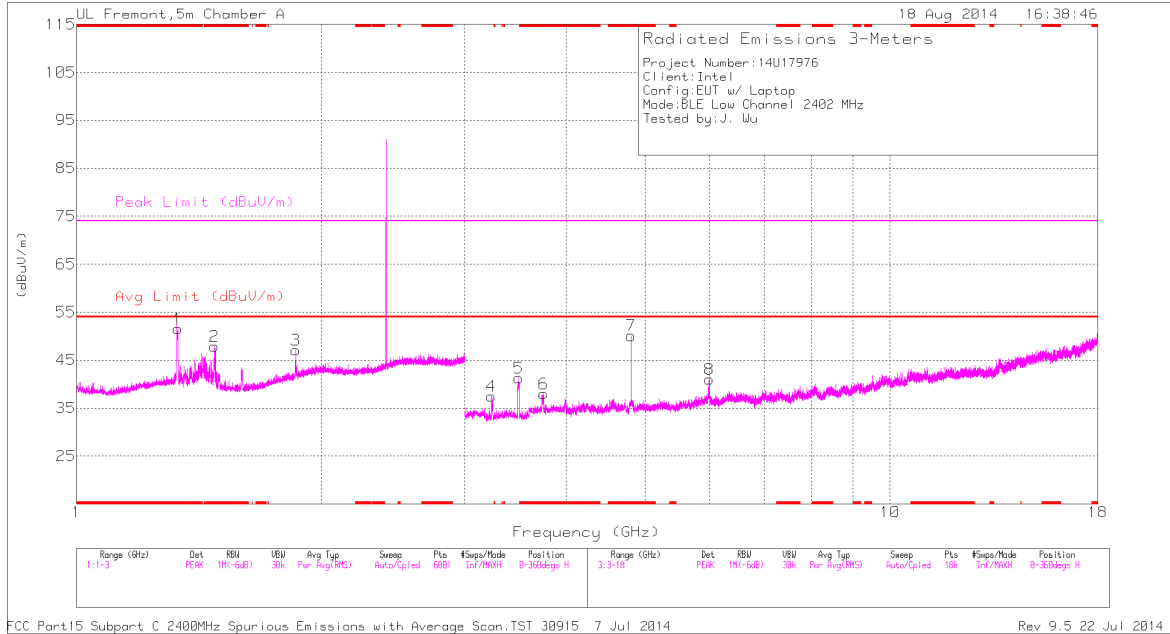
RMS - RMS detection



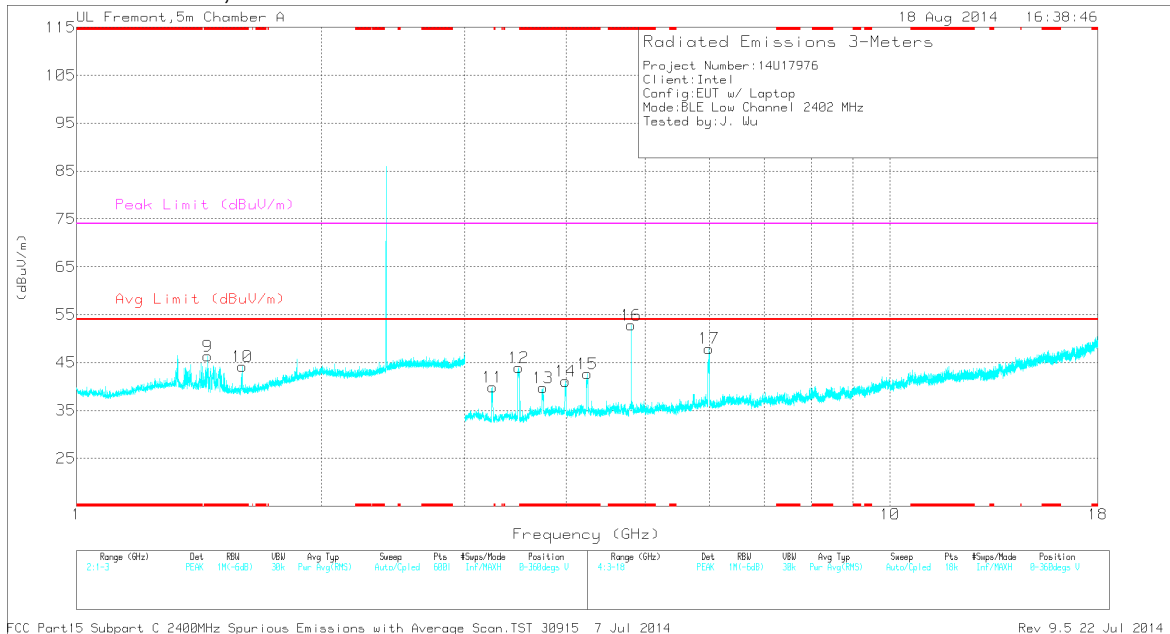
## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL

#### LOW CHANNEL, HORIZONTAL



#### LOW CHANNEL, VERTICAL



## Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Fitr /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	* 1.327	51.57	PK2	30.1	-25	0	56.67	-	-	74	-17.33	219	254	H
	* 1.33	32.47	MAv1	30.1	-25	2.53	40.1	54	-13.9	-	-	219	254	H
2	* 1.485	47.42	PK2	28.9	-24.5	0	51.82	-	-	74	-22.18	250	183	H
	* 1.467	31.81	MAv1	29.1	-24.7	2.53	38.74	54	-15.26	-	-	250	183	H
9	* 1.443	55.04	PK2	29.3	-24.7	0	59.64	-	-	74	-14.36	135	304	V
	* 1.443	33.25	MAv1	29.3	-24.7	2.53	40.38	54	-13.62	-	-	135	304	V
10	* 1.596	48.79	PK2	28.8	-24.4	0	53.19	-	-	74	-20.81	325	277	V
	* 1.596	32.14	MAv1	28.8	-24.4	2.53	39.07	54	-14.93	-	-	325	277	V
6	* 3.74	43.25	PK2	33.5	-30.3	0	46.45	-	-	74	-27.55	230	157	H
	* 3.743	29.79	MAv1	33.5	-30.2	2.53	35.62	54	-18.38	-	-	230	157	H
7	* 4.804	48.96	PK2	34	-29.1	0	53.86	-	-	74	-20.14	145	244	H
	* 4.804	43.18	MAv1	34	-29.1	2.53	50.61	54	-3.39	-	-	145	244	H
13	* 3.741	45.08	PK2	33.5	-30.3	0	48.28	-	-	74	-25.72	107	239	V
	* 3.744	31.24	MAv1	33.5	-30.2	2.53	37.07	54	-16.93	-	-	107	239	V
14	* 3.987	45.7	PK2	33.7	-30.3	0	49.1	-	-	74	-24.9	120	194	V
	* 3.983	32.09	MAv1	33.7	-30.2	2.53	38.12	54	-15.88	-	-	120	194	V
15	* 4.246	45.22	PK2	34	-29.2	0	50.02	-	-	74	-23.98	98	129	V
	* 4.247	29.52	MAv1	34	-29.2	2.53	36.85	54	-17.15	-	-	98	100	V
16	* 4.804	51.03	PK2	34	-29.1	0	55.93	-	-	74	-18.07	142	102	V
	* 4.804	45.95	MAv1	34	-29.1	2.53	53.38	54	-6.2	-	-	142	102	V
3	1.859	39.87	PK	31.2	-23.9	0	47.17	-	-	-	-	0-360	100	H
4	3.237	36.1	PK	32.7	-31.3	0	37.5	-	-	-	-	0-360	201	H
11	3.247	38.46	PK	32.8	-31.4	0	39.86	-	-	-	-	0-360	201	V
12	3.494	41.74	PK	33	-30.8	0	43.94	-	-	-	-	0-360	100	V
5	3.498	39.22	PK	33	-30.9	0	41.32	-	-	-	-	0-360	201	H
17	5.992	40.25	PK	35.3	-27.6	0	47.95	-	-	-	-	0-360	201	V
8	5.997	33.46	PK	35.3	-27.7	0	41.06	-	-	-	-	0-360	201	H

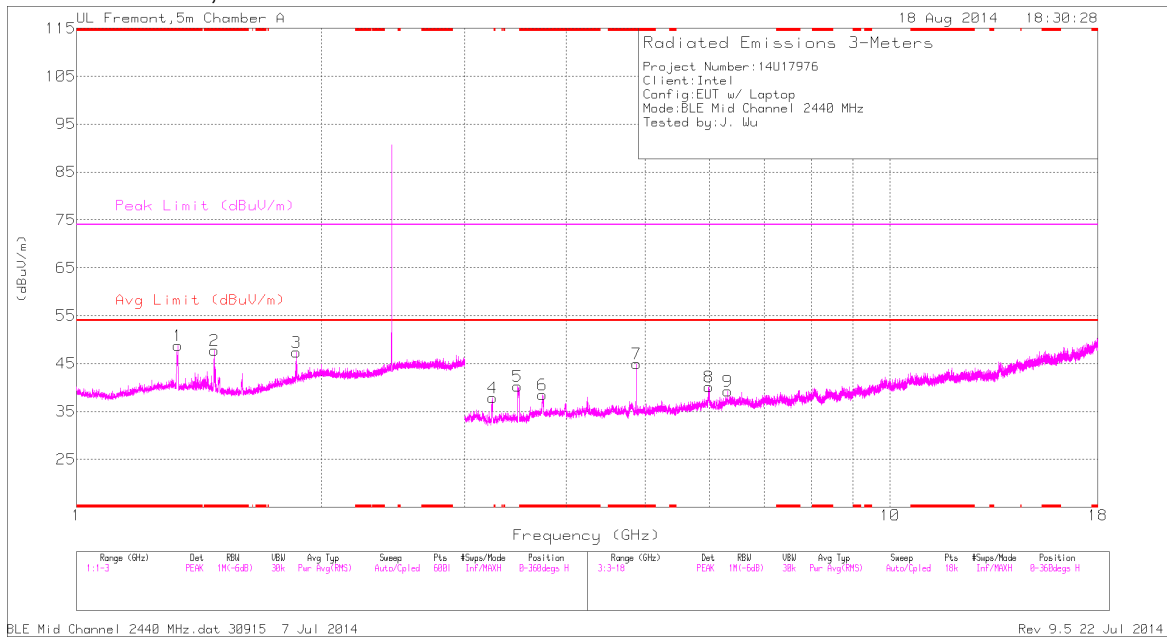
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

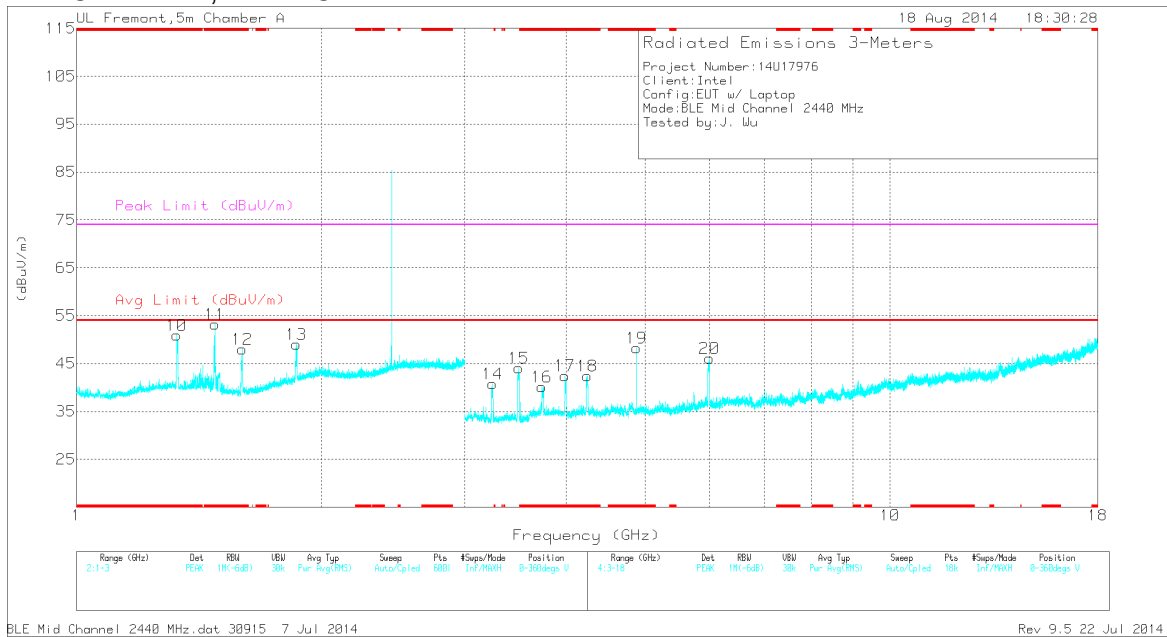
MAv2 - KDB558074 Option 2 Slow Sweep RMS Average

■ **MID CHANNEL**

**MID CHANNEL, HORIZONTAL**



**MID CHANNEL, VERTICAL**



## Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Fitr /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	* 1.342	44.19	PK2	30.1	-25	0	49.29	-	-	74	-24.71	253	116	H
	* 1.331	32.03	MAv1	30.1	-25	2.53	39.66	54	-14.34	-	-	253	116	H
2	* 1.482	43.27	PK2	28.9	-24.5	0	47.67	-	-	74	-26.33	74	328	H
	* 1.482	31.66	MAv1	28.9	-24.5	2.53	38.59	54	-15.41	-	-	74	328	H
10	* 1.329	47.13	PK2	30.1	-25	0	52.23	-	-	74	-21.77	203	291	V
	* 1.32	32.16	MAv1	30.2	-25	2.53	39.89	54	-14.11	-	-	203	291	V
11	* 1.471	46.5	PK2	29	-24.7	0	50.8	-	-	74	-23.2	118	275	V
	* 1.489	32.24	MAv1	28.8	-24.6	2.53	38.97	54	-15.03	-	-	118	275	V
12	* 1.599	44.55	PK2	28.8	-24.4	0	48.95	-	-	74	-25.05	262	106	V
	* 1.598	32.17	MAv1	28.8	-24.4	2.53	39.1	54	-14.9	-	-	262	106	V
6	* 3.74	43.05	PK2	33.5	-30.3	0	46.25	-	-	74	-27.75	242	208	H
	* 3.739	30.01	MAv1	33.5	-30.3	2.53	35.74	54	-18.26	-	-	242	208	H
7	* 4.88	44.48	PK2	34	-28.3	0	50.18	-	-	74	-23.82	151	264	H
	* 4.88	37.77	MAv1	34	-28.3	2.53	46	54	-8	-	-	151	264	H
16	* 3.734	45.85	PK2	33.5	-30.3	0	49.05	-	-	74	-24.95	164	202	V
	* 3.737	32.02	MAv1	33.5	-30.3	2.53	37.75	54	-16.25	-	-	164	202	V
17	* 3.983	46.21	PK2	33.7	-30.2	0	49.71	-	-	74	-24.29	148	201	V
	* 3.983	32.59	MAv1	33.7	-30.2	2.53	38.62	54	-15.38	-	-	148	201	V
18	* 4.245	46.42	PK2	34	-29.2	0	51.22	-	-	74	-22.78	85	201	V
	* 4.247	32.87	MAv1	34	-29.2	2.53	40.2	54	-13.8	-	-	85	201	V
19	* 4.88	46.24	PK2	34	-28.3	0	51.94	-	-	74	-22.06	146	139	V
	* 4.88	40.19	MAv1	34	-28.3	2.53	48.42	54	-5.58	-	-	146	139	V
13	1.862	41.7	PK	31.2	-23.9	0	49	-	-	-	-	0-360	100	V
3	1.863	40.1	PK	31.2	-23.9	0	47.4	-	-	-	-	0-360	100	H
14	3.245	39.32	PK	32.8	-31.4	0	40.72	-	-	-	-	0-360	201	V
4	3.247	36.5	PK	32.8	-31.4	0	37.9	-	-	-	-	0-360	201	H
5	3.485	37.89	PK	33	-30.6	0	40.29	-	-	-	-	0-360	201	H
15	3.497	41.92	PK	33	-30.8	0	44.12	-	-	-	-	0-360	201	V
8	5.988	32.39	PK	35.3	-27.6	0	40.09	-	-	-	-	0-360	201	H
20	5.995	38.53	PK	35.3	-27.7	0	46.13	-	-	-	-	0-360	201	V
9	6.313	30.13	PK	35.5	-26.4	0	39.23	-	-	-	-	0-360	100	H

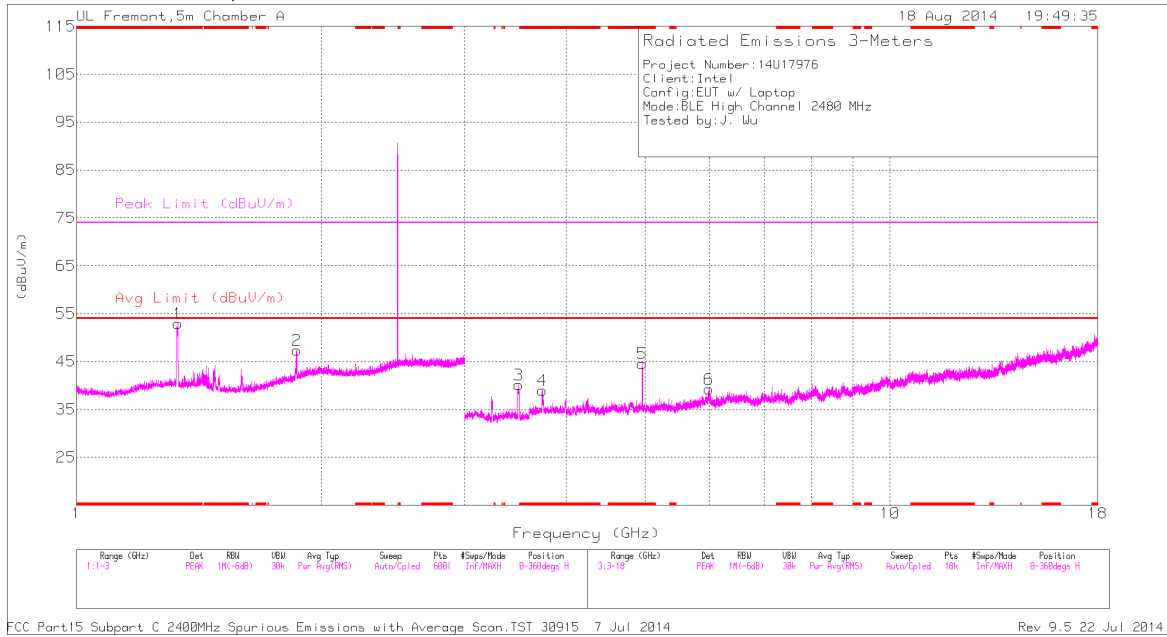
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

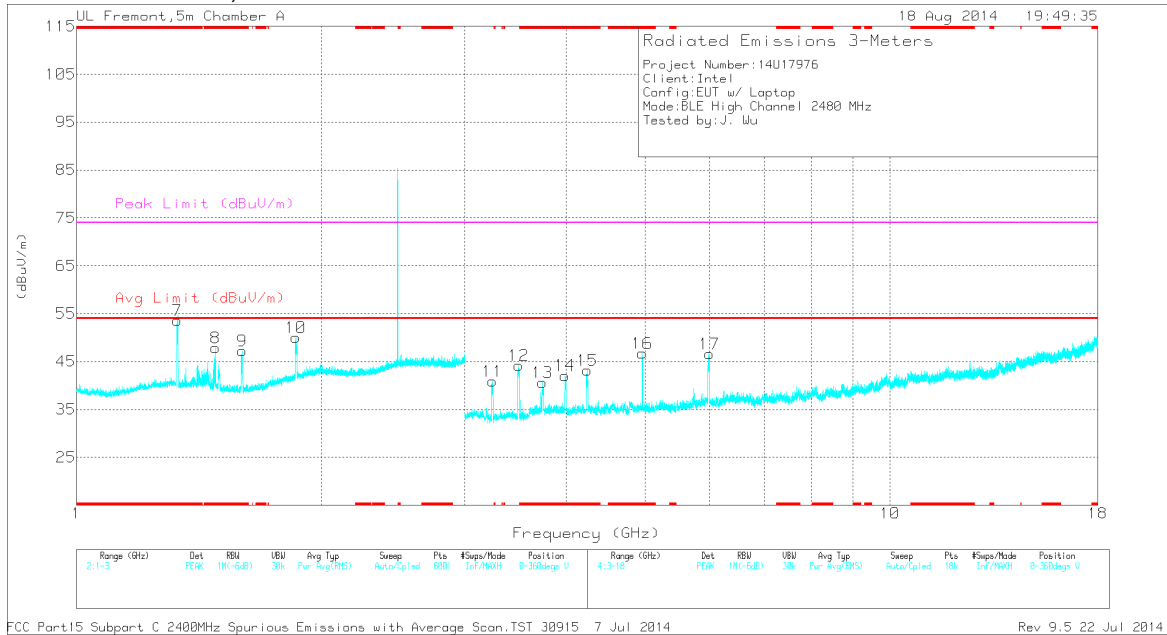
MAv1 - KDB558074 Option 1 Maximum RMS Average

■ **HIGH CHANNEL**

**HIGH CHANNEL, HORIZONTAL**



**HIGH CHANNEL, VERTICAL**



## Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Fitr /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	* 1.329	49.66	PK2	30.1	-25	0	54.76	-	-	74	-19.24	43	203	H
	* 1.329	32.28	MAv1	30.1	-25	2.53	39.91	54	-14.09	-	-	43	203	H
7	* 1.332	50.14	PK2	30.1	-25	0	55.24	-	-	74	-18.76	140	352	V
	* 1.33	32.83	MAv1	30.1	-25	2.53	40.46	54	-13.54	-	-	140	352	V
8	* 1.478	44.75	PK2	29	-24.6	0	49.15	-	-	74	-24.85	288	138	V
	* 1.486	32.12	MAv1	28.9	-24.5	2.53	39.05	54	-14.95	-	-	288	138	V
9	* 1.597	48.04	PK2	28.8	-24.4	0	52.44	-	-	74	-21.56	255	168	V
	* 1.596	32.6	MAv1	28.8	-24.4	2.53	39.53	54	-14.47	-	-	255	168	V
4	* 3.742	43.87	PK2	33.5	-30.3	0	47.07	-	-	74	-26.93	249	100	H
	* 3.734	30.36	MAv1	33.5	-30.3	2.53	36.09	54	-17.91	-	-	249	100	H
5	* 4.96	44.36	PK2	33.9	-28.7	0	49.56	-	-	74	-24.44	128	284	H
	* 4.96	37.67	MAv1	33.9	-28.7	2.53	45.4	54	-8.6	-	-	128	284	H
13	* 3.736	46.19	PK2	33.5	-30.3	0	49.39	-	-	74	-24.61	170	199	V
	* 3.737	32.1	MAv1	33.5	-30.3	2.53	37.83	54	-16.17	-	-	170	199	V
14	* 3.989	49	PK2	33.7	-30.3	0	52.4	-	-	74	-21.6	99	218	V
	* 3.984	35.34	MAv1	33.7	-30.2	2.53	41.37	54	-12.63	-	-	99	218	V
15	* 4.247	46.22	PK2	34	-29.2	0	51.02	-	-	74	-22.98	90	225	V
	* 4.247	32.18	MAv1	34	-29.2	2.53	39.51	54	-14.49	-	-	90	225	V
16	* 4.96	46.14	PK2	33.9	-28.7	0	51.34	-	-	74	-22.66	128	225	V
	* 4.96	39.7	MAv1	33.9	-28.7	2.53	47.43	54	-6.57	-	-	128	225	V
10	1.859	42.77	PK	31.2	-23.9	0	50.07	-	-	-	-	0-360	100	V
2	1.865	39.95	PK	31.3	-23.9	0	47.35	-	-	-	-	0-360	100	H
11	3.246	39.5	PK	32.8	-31.4	0	40.9	-	-	-	-	0-360	201	V
3	3.498	38.07	PK	33	-30.9	0	40.17	-	-	-	-	0-360	201	H
12	3.498	42.12	PK	33	-30.9	0	44.22	-	-	-	-	0-360	100	V
6	5.989	31.51	PK	35.3	-27.6	0	39.21	-	-	-	-	0-360	201	H
17	5.997	39.06	PK	35.3	-27.7	0	46.66	-	-	-	-	0-360	201	V

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

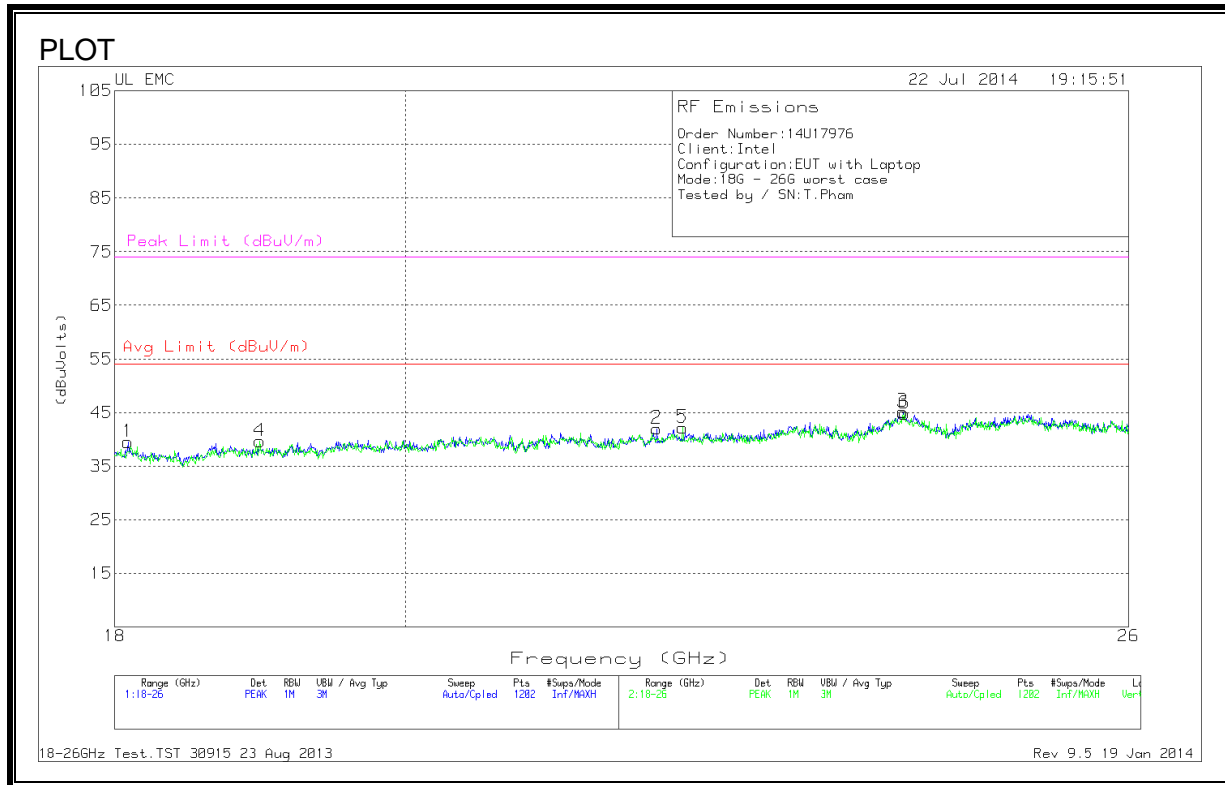
PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

## 7.12. WORST-CASE 18-26 GHz

### HARMONICS AND SPURIOUS EMISSIONS



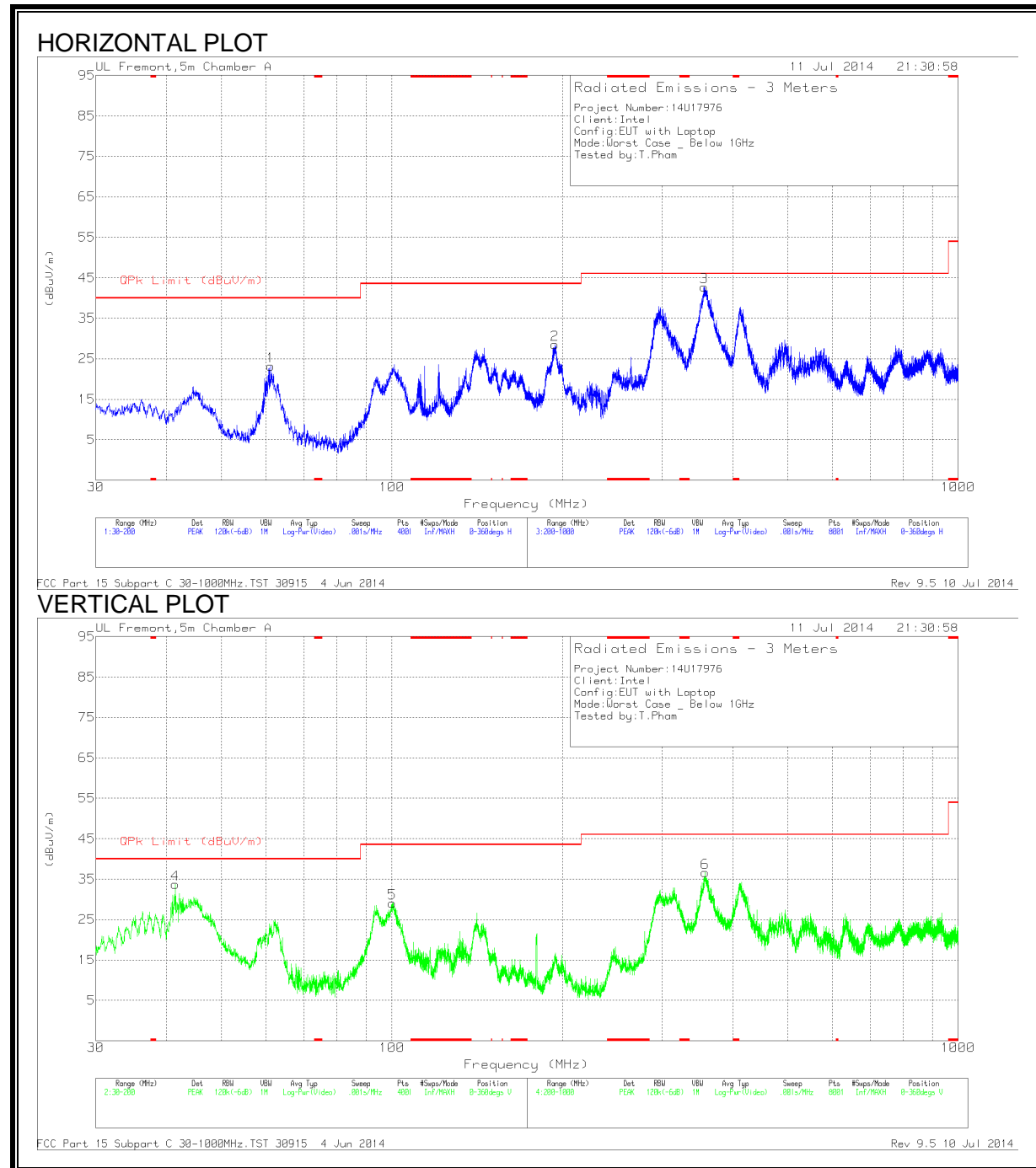
### Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.087	41.5	PK	32.4	-24.9	-9.5	39.5	54	-14.5	74	-34.5
2	21.91	42.2	PK	33.3	-24	-9.5	42	54	-12	74	-32
3	23.955	43.77	PK	33.6	-22.7	-9.5	45.17	54	-8.83	74	-28.83
4	18.973	41.17	PK	32.5	-24.5	-9.5	39.67	54	-14.33	74	-34.33
5	22.117	41.97	PK	33.3	-23.6	-9.5	42.17	54	-11.83	74	-31.83
6	23.968	43.33	PK	33.6	-22.6	-9.5	44.83	54	-9.17	74	-29.17

PK - Peak detector

## 7.13. WORST-CASE BELOW 1 GHz

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





Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AFT130 (dB/m)	Amp/Cbl (dB/m)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	41.4325	51.47	PK	13.2	-30.9	0	33.77	40	-6.23	0-360	101	V
1	61.0675	45.97	PK	7.8	-30.6	0	23.17	40	-16.83	0-360	400	H
5	100.0825	49.29	PK	10.2	-30.4	0	29.09	43.52	-14.43	0-360	101	V
2	194.0075	46.77	PK	11.8	-30	0	28.57	43.52	-14.95	0-360	101	H
3	355.833	53.13	QP	14.5	-28.9	0	38.73	46.02	-7.29	338	104	H
6	357.8	50.99	PK	14.6	-28.9	0	36.69	46.02	-9.33	0-360	300	V

PK - Peak detector  
QP - Quasi-Peak detector

## 8. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

\* Decreases with the logarithm of the frequency.

### 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 C63.4.

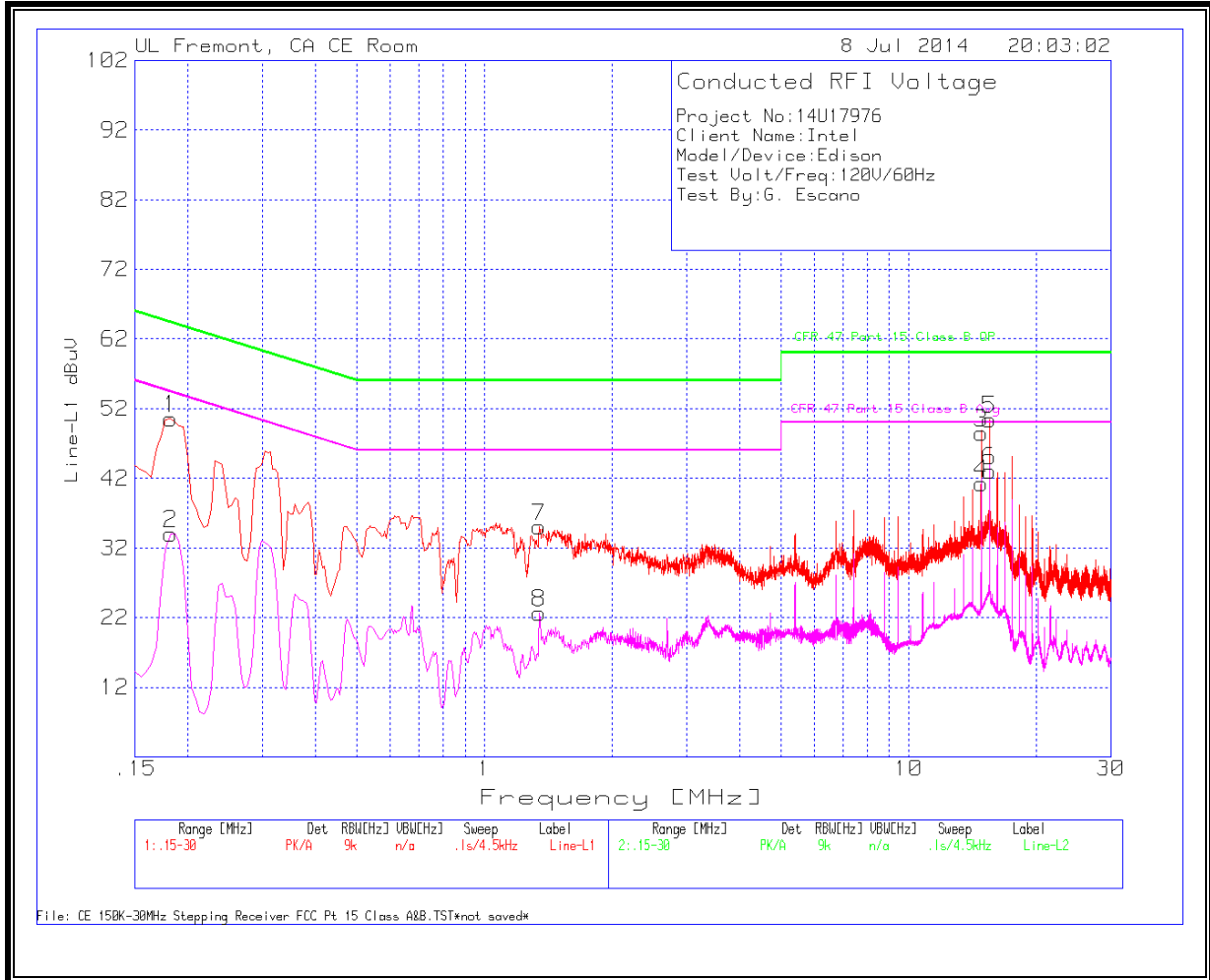
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

## RESULTS

### 6 WORST EMISSIONS

#### LINE 1 RESULTS

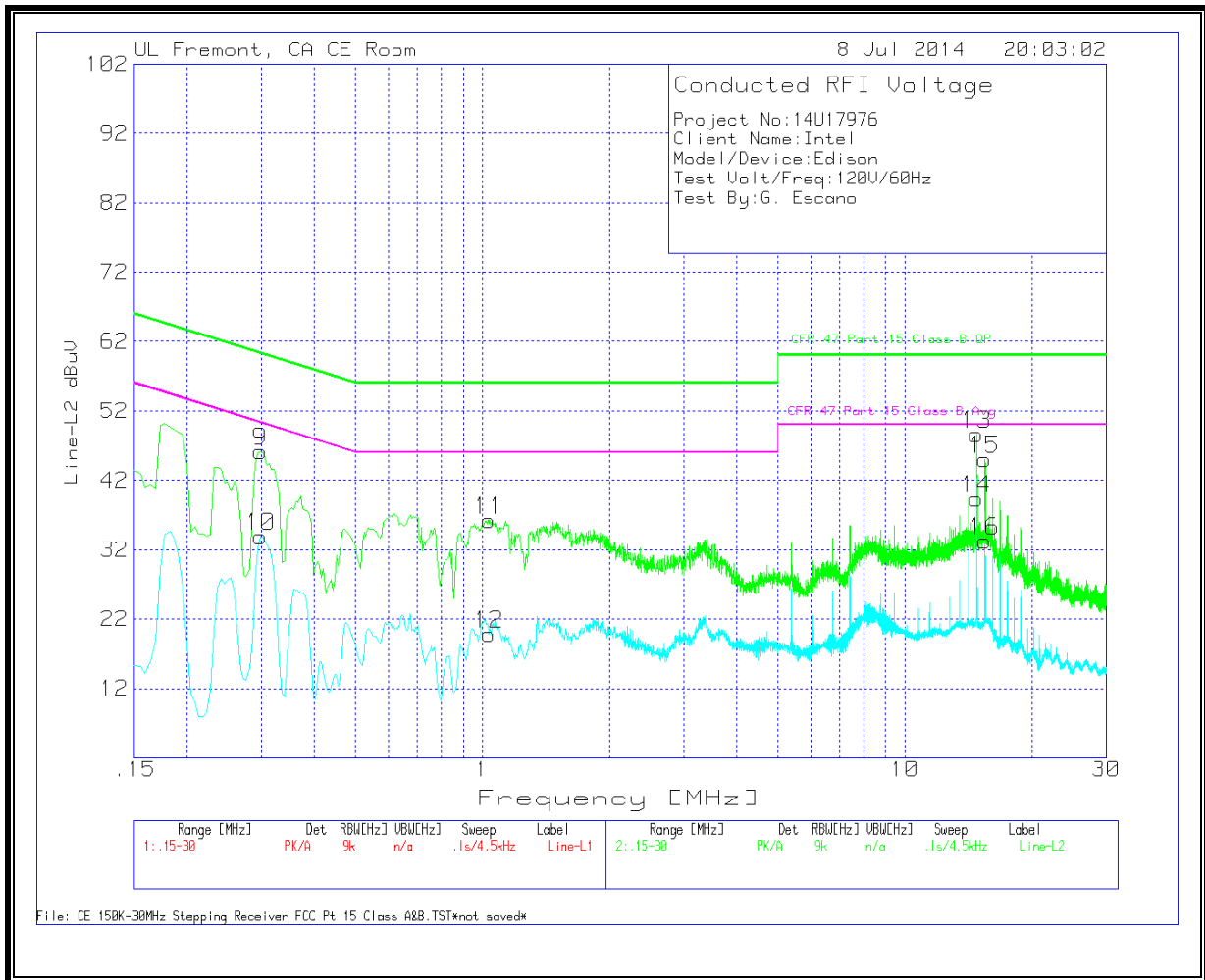


#### Line-L1 .15 - 30MHz

##### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin to Limit (dB)	CFR 47 Part 15 Class B Avg	Margin to Limit (dB)
1	.1815	49.42	PK	1.1	0	50.52	64.4	-13.88	-	-
2	.1815	32.97	Av	1.1	0	34.07	64.4	-30.33	54.4	-20.33
7	1.347	34.71	PK	.2	.1	35.01	56	-20.99	-	-
8	1.347	22.4	Av	.2	.1	22.7	56	-33.3	46	-23.3
3	14.8335	48.14	PK	.2	.2	48.54	60	-11.46	-	-
4	14.8335	40.82	Av	.2	.2	41.22	60	-18.78	50	-8.78
5	15.5085	49.95	PK	.3	.2	50.45	60	-9.55	-	-
6	15.5085	42.59	Av	.3	.2	43.09	60	-16.91	50	-6.91

## LINE 2 RESULTS



## Line-L2 .15 - 30MHz

### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin to Limit (dB)	CFR 47 Part 15 Class B Avg	Margin to Limit (dB)
9	.2985	45.54	PK	.6	0	46.14	60.3	-14.16	-	-
10	.2985	33.28	Av	.6	0	33.88	60.3	-26.42	50.3	-16.42
11	1.0365	35.96	PK	.3	0	36.26	56	-19.74	-	-
12	1.0365	19.49	Av	.3	0	19.79	56	-36.21	46	-26.21
13	14.811	48.08	PK	.3	.2	48.58	60	-11.42	-	-
14	14.811	38.81	Av	.3	.2	39.31	60	-20.69	50	-10.69
15	15.468	44.55	PK	.3	.2	45.05	60	-14.95	-	-
16	15.468	32.8	Av	.3	.2	33.3	60	-26.7	50	-16.7

PK - Peak detector  
Av - average detection