



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8
BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

solo2 wireless

MODEL NUMBER: B0534

FCC ID: BCG- B0534

IC: 579C- B0534

REPORT NUMBER: 14U18945-E2, Revision B

ISSUE DATE: NOVEMBER 06, 2014

Prepared for
**APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.**

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/31/2014	Initial Issue	M. Mekuria
A	11/03/2014	Correct above 18GHz limit & add AC line emission data	M. Mekuria
B	11/06/2014	Re-arrange the conducted spurious plots	M. Mekuria

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: solo2 wireless

MODEL: B0534

SERIAL NUMBER: FL6NJ01AG8PT (CONDUCTED) & FL6NK0ALG8PP (RADIATED)

DATE TESTED: 10/16/2014 – 11/03/2014

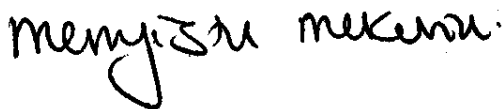
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

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.

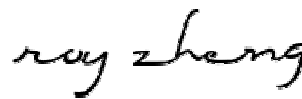
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. 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.

Approved & Released For
UL Verification Services Inc. By:

Tested By:



MENGISTU MEKURIA
SENIOR ENGINEER
UL Verification Services Inc.



ROY ZHENG
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
☐ 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. 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:

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

4.3. MEASUREMENT UNCERTAINTY

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

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 Beats Solo2 wireless headset with Bluetooth and BLE radios.

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	5.09	3.23

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Monopole antenna with a maximum gain of 1.5 dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was CSR Bluetest3, Ver. 2.5.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission, 30-1000MHz and 18-26GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

All testing was performed with the EUT in normal use orientation as described by the manufacturer.

5.6. DESCRIPTION OF TEST SETUP

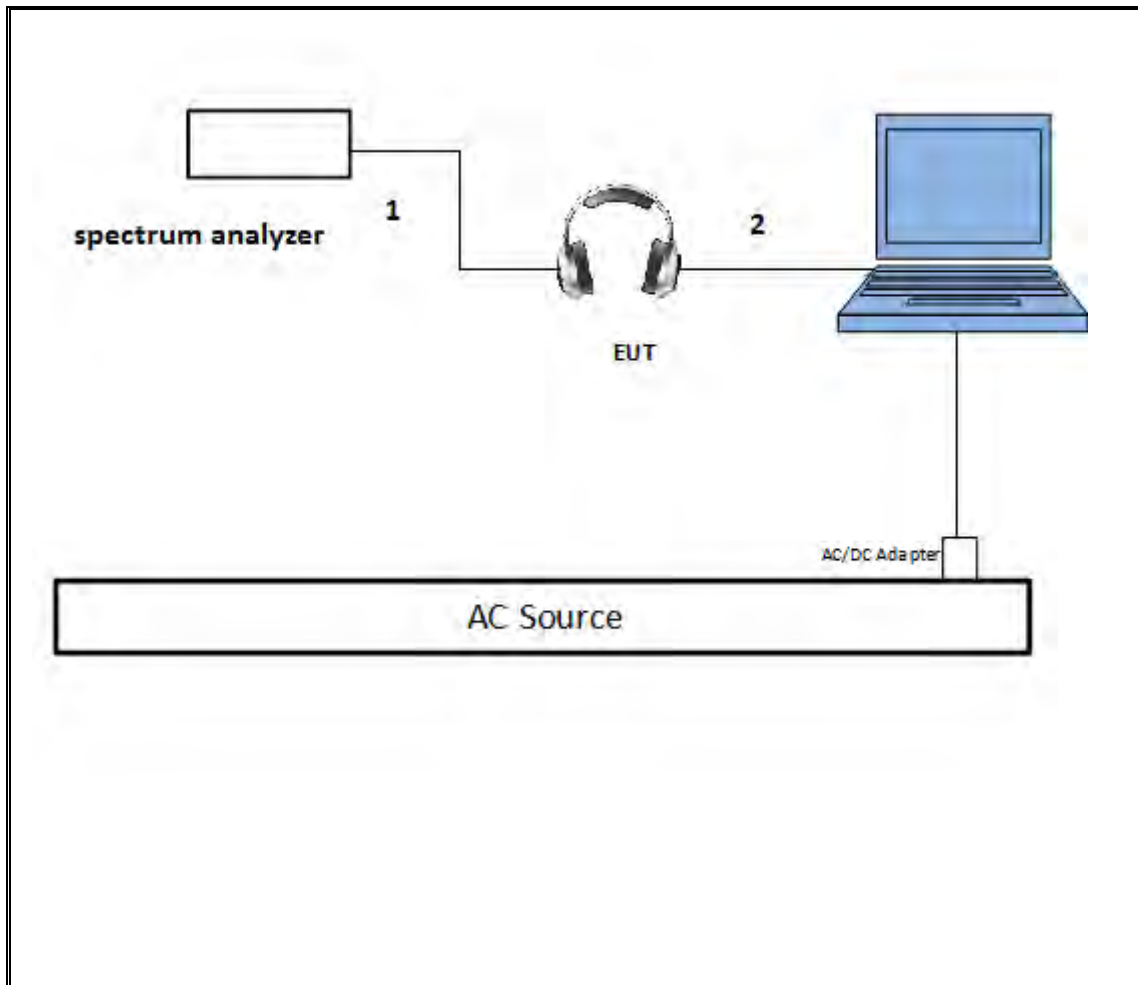
SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/ DC Adapter	Apple Inc.	A1540	C4H433700AZFPWW1E	N/A
Laptop PC	Apple Inc.	MacBook Pro	N/A	N/A
Rechargeable Power Bank	Anker	3000	05D141	Doc
AC/ DC Adapter	Apple Inc.	A1385	D293062E3ZDDHLHCR	N/A

I/O CABLES

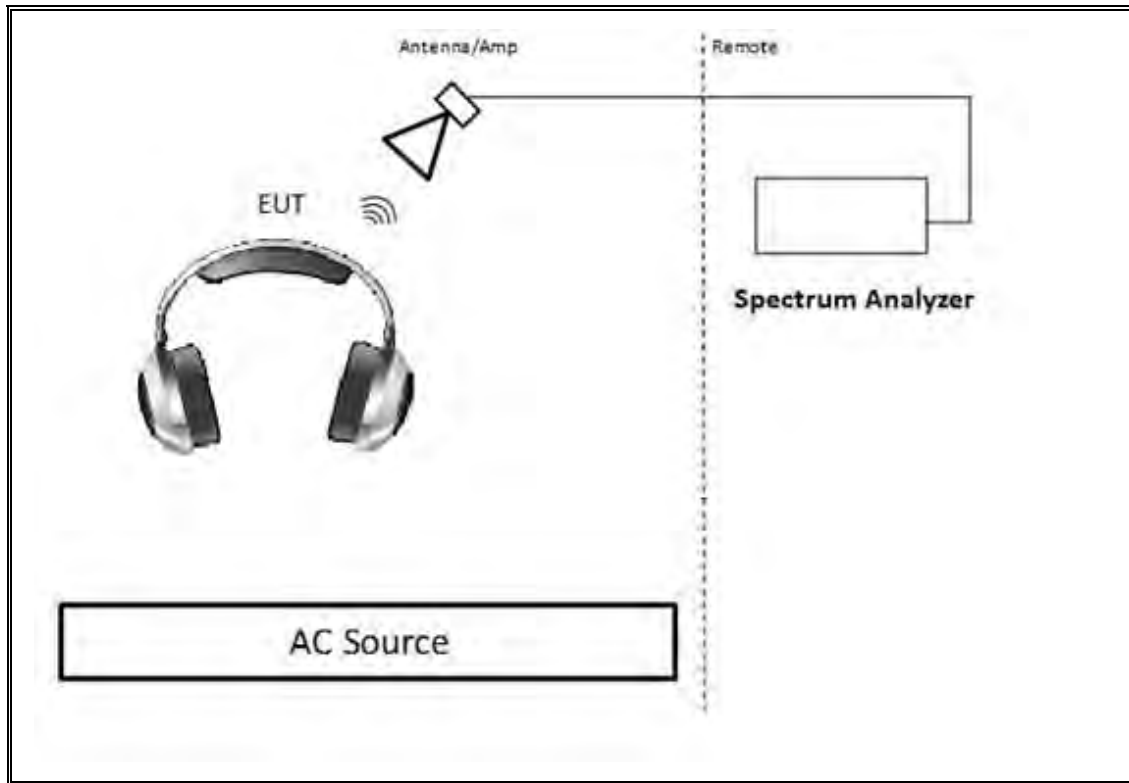
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-Shielded	0.2	To Spectrum Analyzer
2	USB	1	USB	Shielded	0.5	PC to EUT
3	USB	1	USB	Shielded	0.2	N/A
4	USB	1	USB	Shielded	1.0	N/A

ANTENNA PORT TEST SETUP

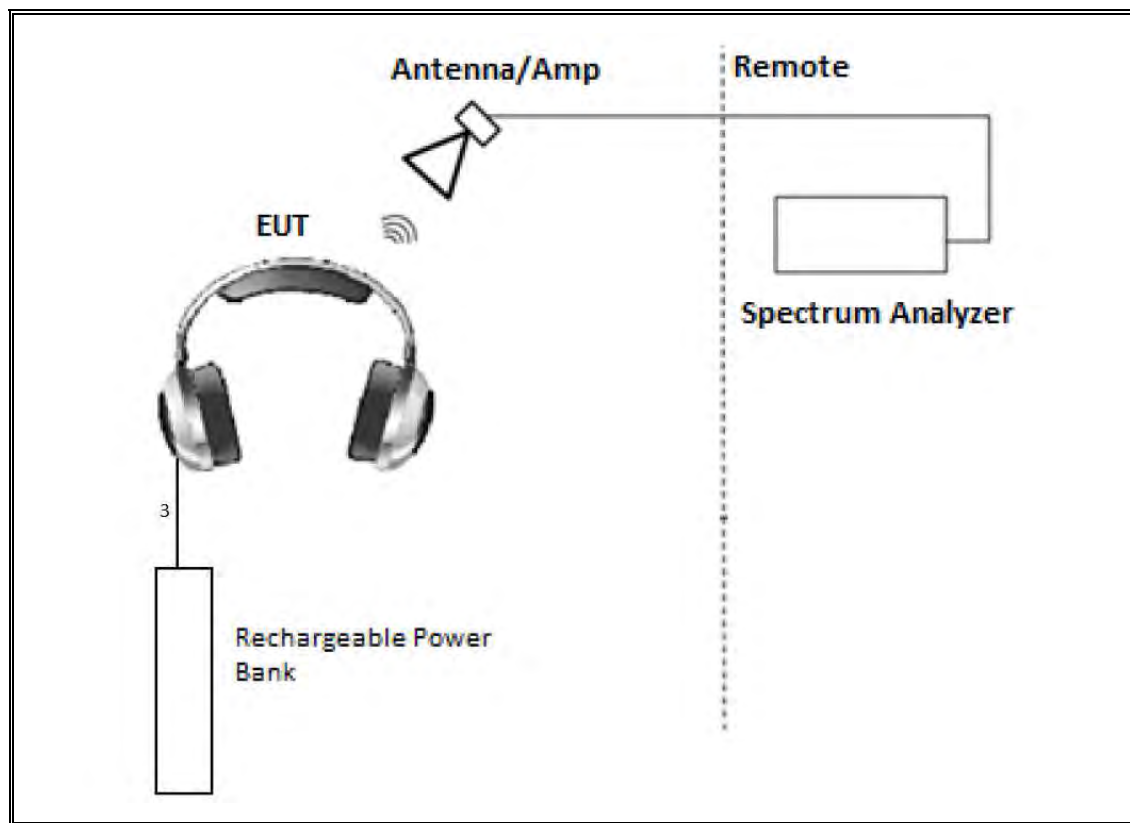


RADIATED TEST SETUP

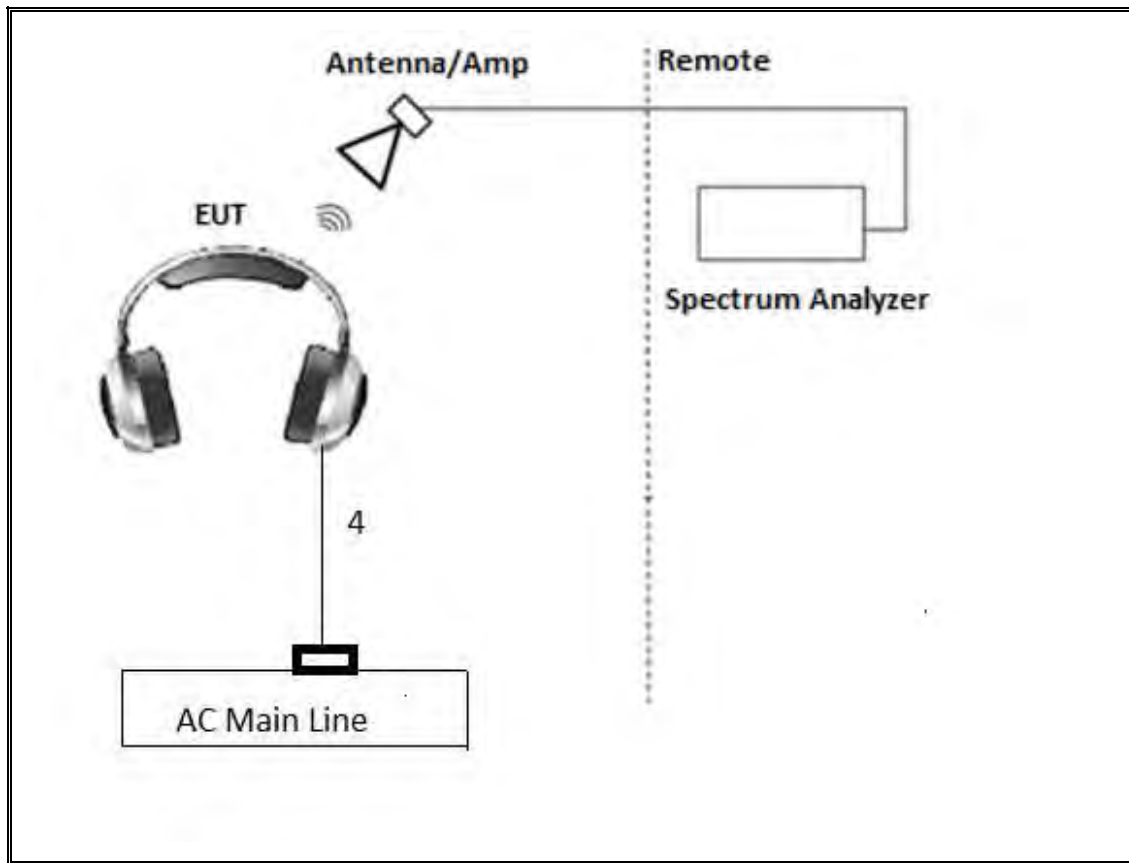
EUT ALONE



EUT POWRED VIA RECHARGEABLE POWER BAND VIA USB CABLE



EUT POWRED VIA AC/DC ADAPTER VIA USB CABLE



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
PXA Signal Analyzer	Agilent	N9030A	T342	06/25/15
Power Meter	Agilent	N1911A	T382	04/09/15
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T344	02/18/15
Antenna, Hybrid 30MHz to 2GHz	Sunol Sciences	JB3	T407	05/05/15
PXA Signal Analyzer 3Hz to 44GHz	Agilent	N9030A	T340	03/11/15
Amplifier, 10KHz to 1GHz	Sonoma	310N	T286	04/23/15
Amplifier, 1 to 18GHz	Miteq	AFS42-00101	T740	01/11/15
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T346	02/25/15
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T408	03/28/15
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T741	02/07/15
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T285	05/28/15
Amplifier, 1 to 26.5 Ghz	Agilent	8449B	T404	03/25/15
Antenna Horn 18 to 26.5 Ghz	ARA	MWH-1826/B	T89	11/26/14
Spectrum Analyzer	Agilent	8564E	T106	08/06/15
Bluetooth Tester	Rohde & Schwarz	CBT	T258	08/07/15
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T863	04/14/15
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T495	06/05/15
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T900	05/14/15
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	T906	05/07/15
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	T284	09/16/15
LISN, 30 MHz	FCC	LISN-50/250-25-2	T24	01/17/15

7. MEASUREMENT METHODS

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

Output Power: KDB 558074 D01 v03r02, Section 9.1.1.

Power Spectral Density: KDB 558074 D01 v03r02, Section 10.2.

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.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r02, Section 12.2.

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

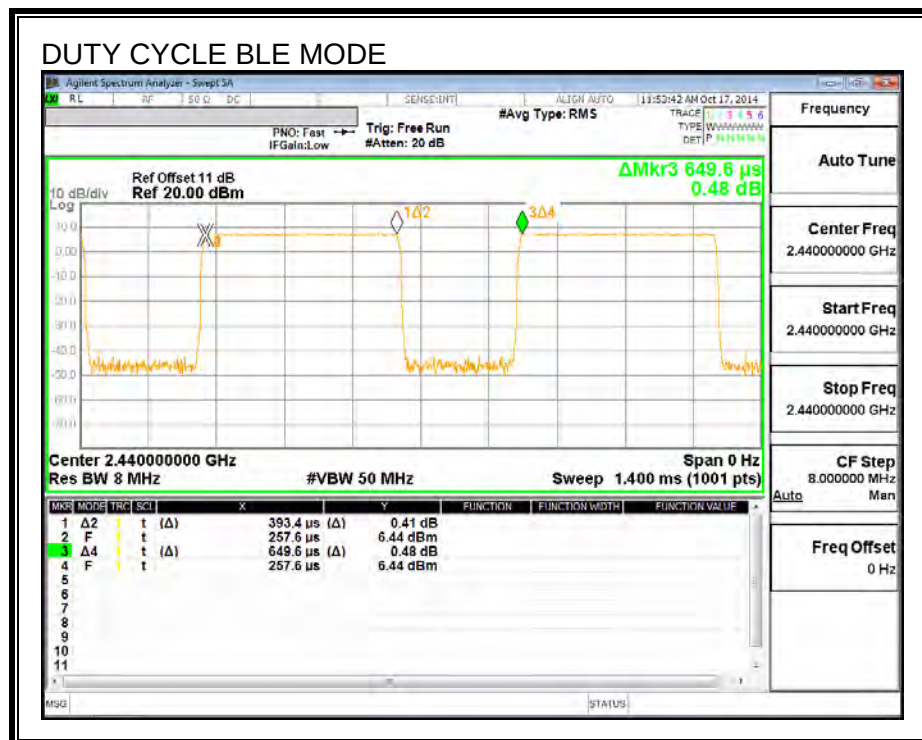
PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

8.1. 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	0.393	0.650	0.606	60.56%	2.18	2.542

8.2. DUTY CYCLE PLOTS



9. ANTENNA PORT TEST RESULTS

9.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

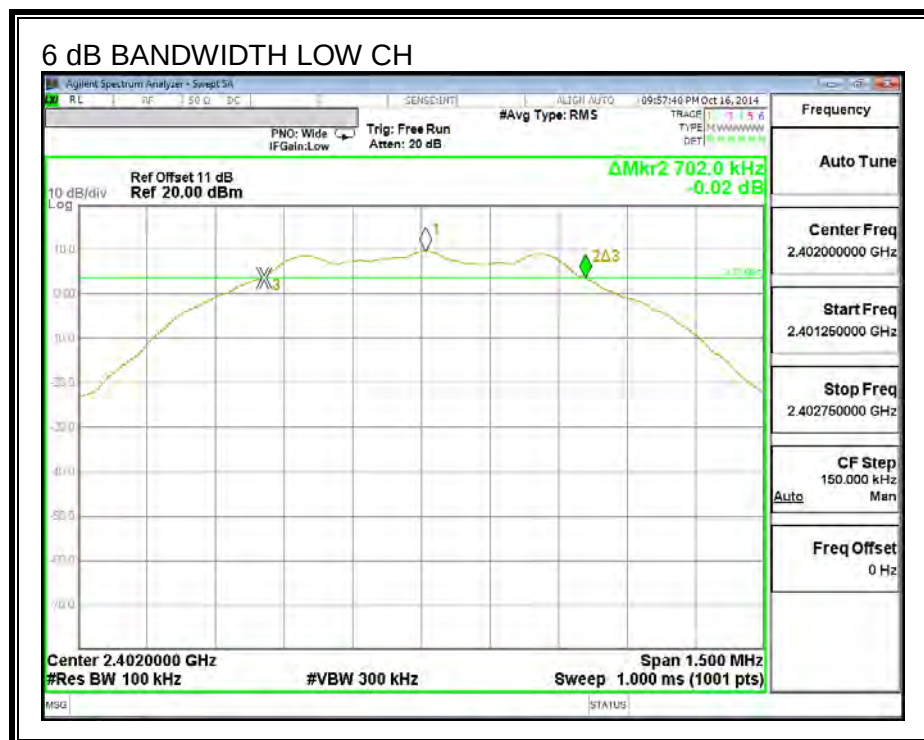
IC RSS-210 A8.2 (a)

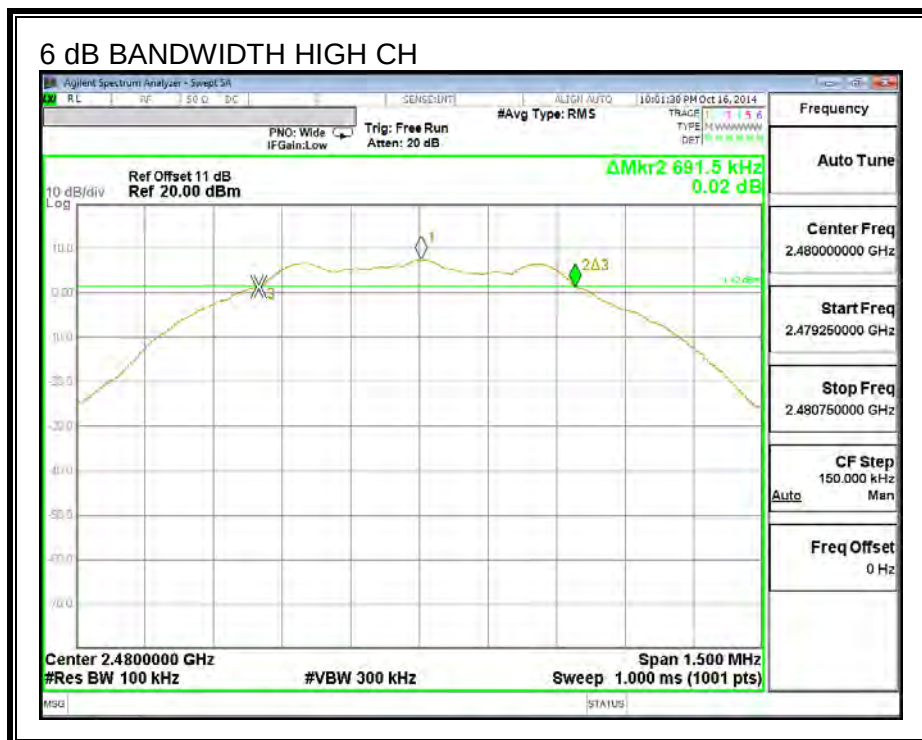
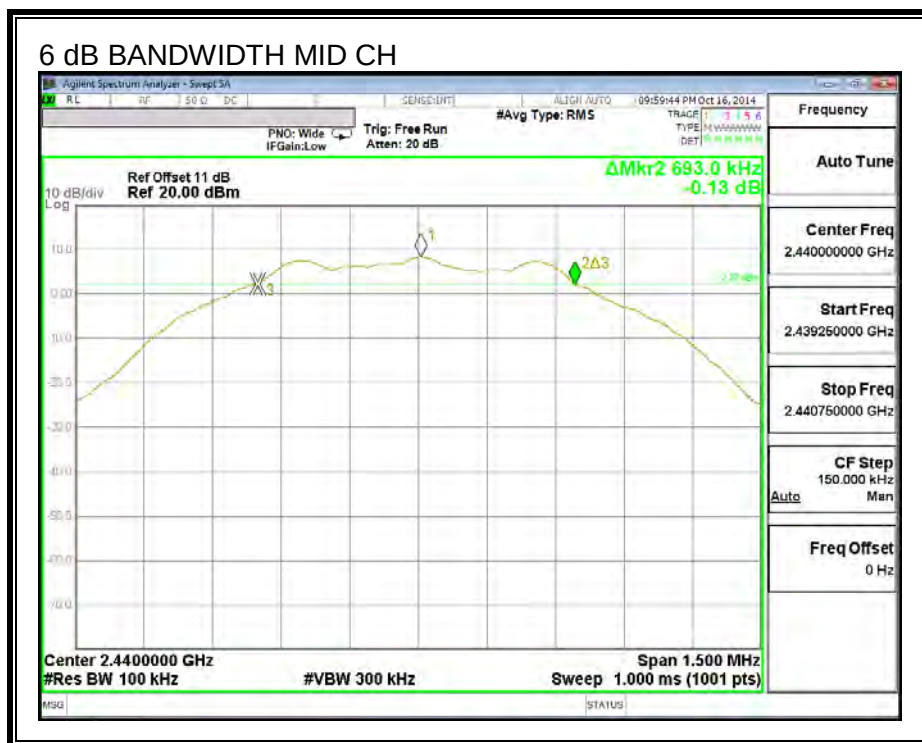
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7020	0.5
Middle	2440	0.6930	0.5
High	2480	0.6915	0.5

6 dB BANDWIDTH





9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

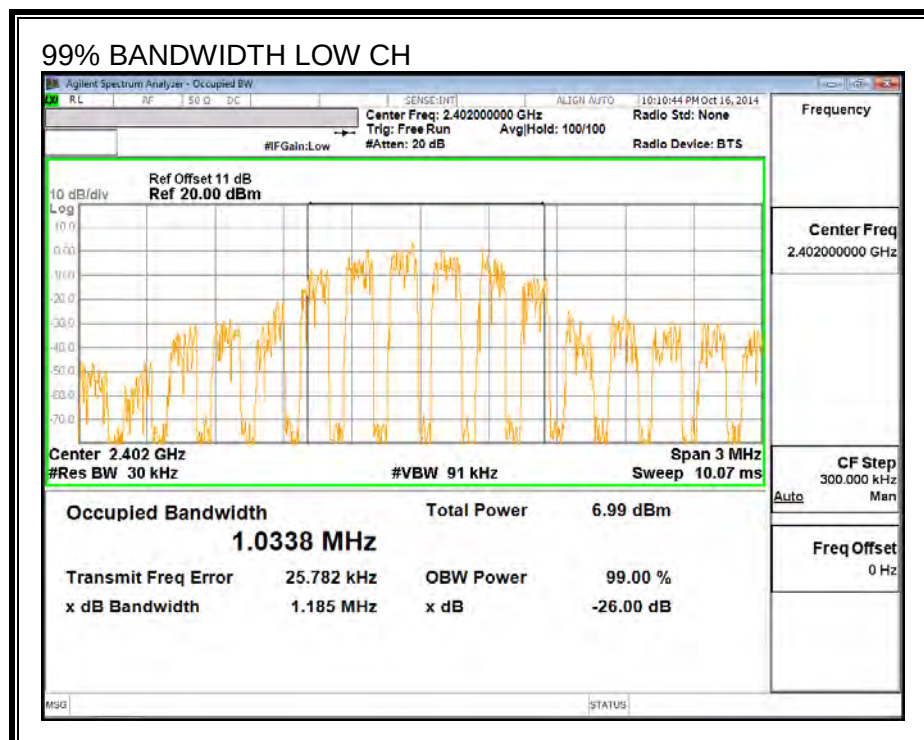
TEST PROCEDURE

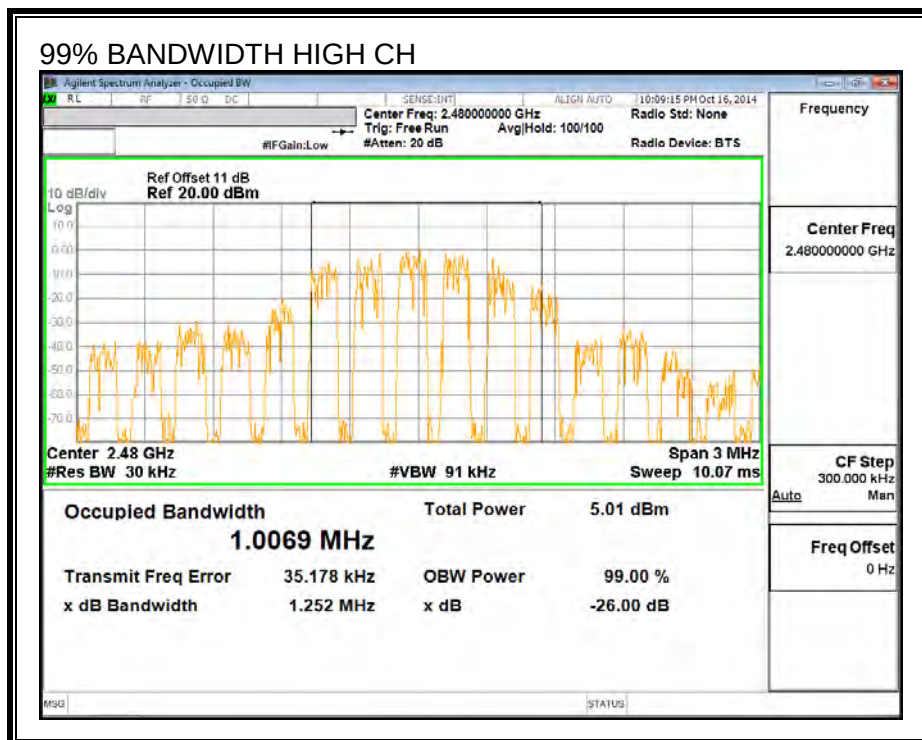
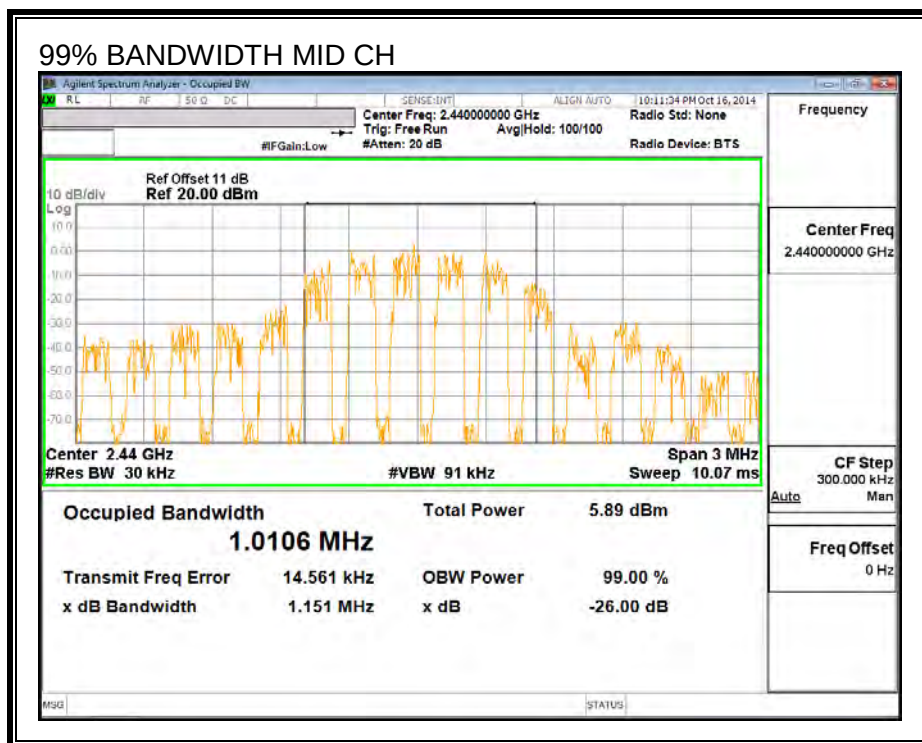
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0338
Middle	2440	1.0106
High	2480	1.0069

99% BANDWIDTH





9.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

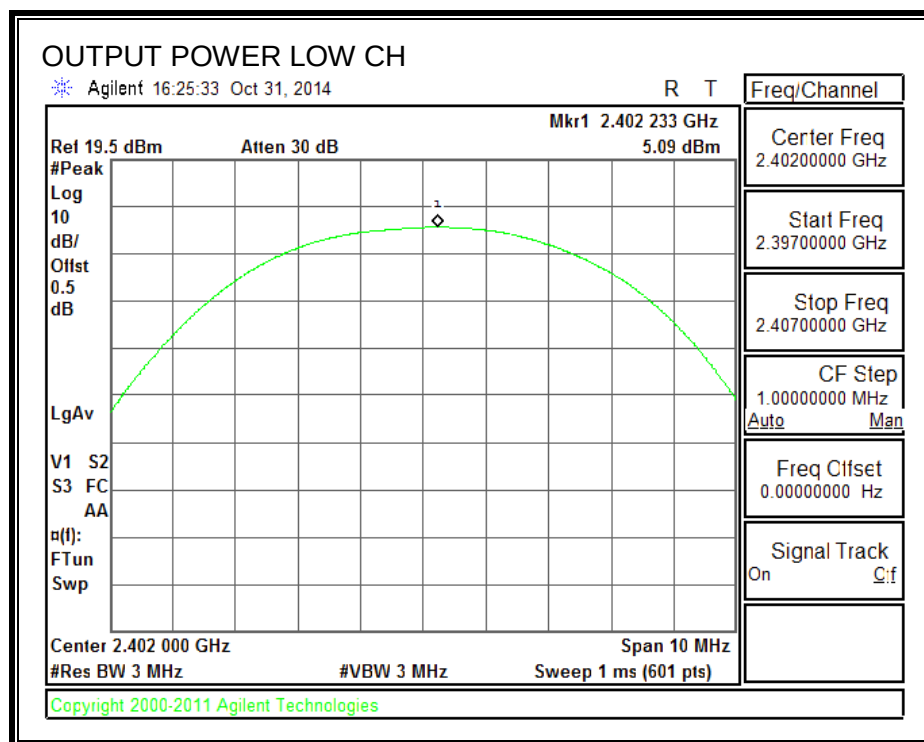
IC RSS-210 A8.4

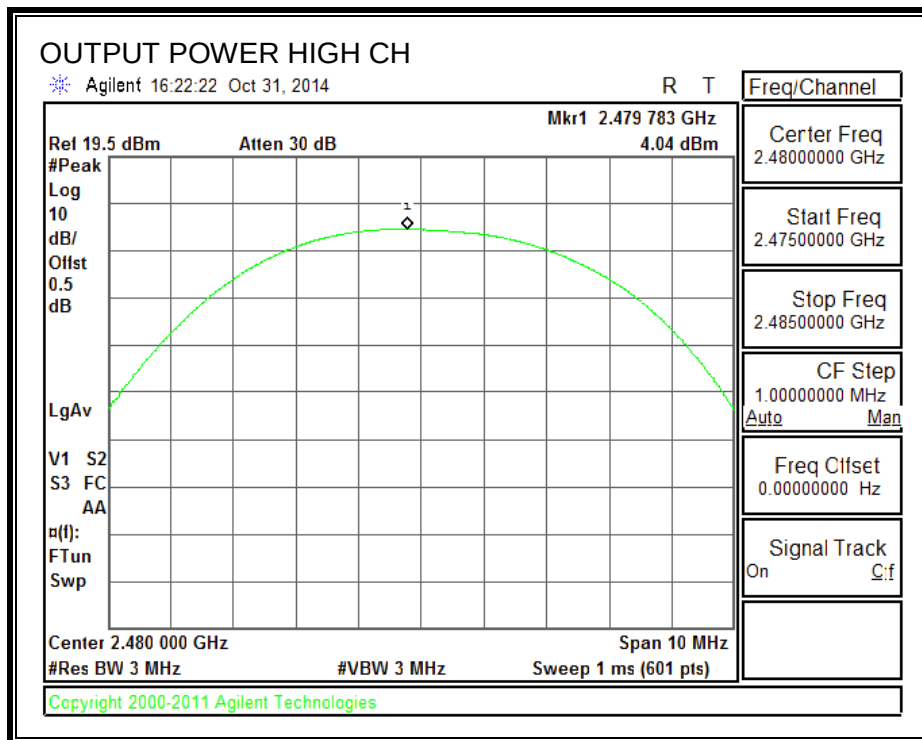
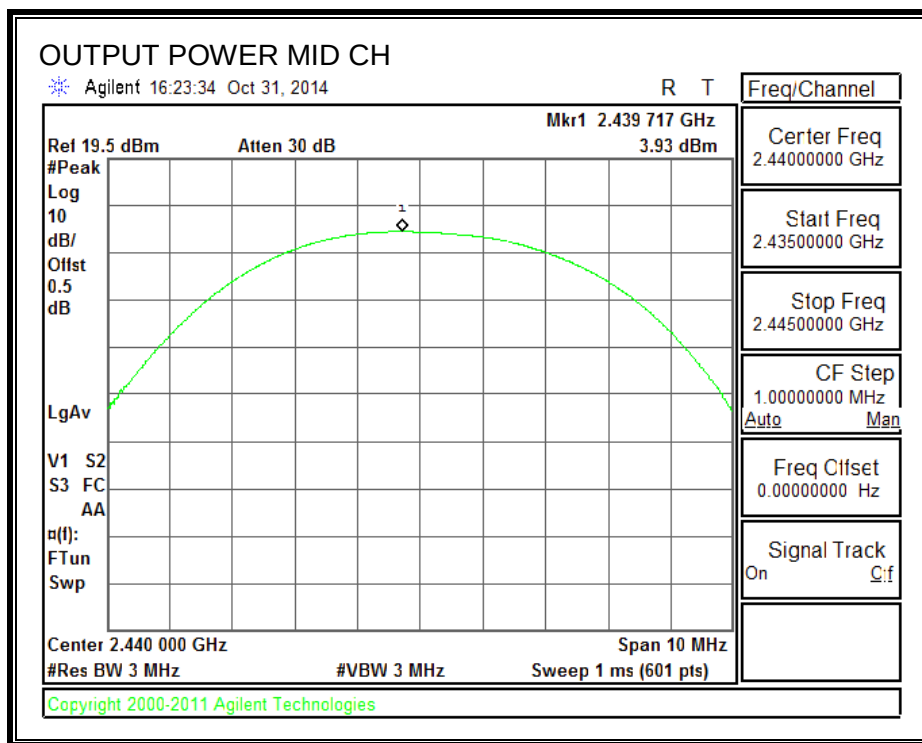
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	5.090	30	-24.910
Middle	2440	3.930	30	-26.070
High	2480	4.040	30	-25.960

OUTPUT POWER





9.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

The cable assembly insertion loss of 11.0 dB (including 10.0 dB pad and 1.0 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	3.93
Middle	2440	3.71
High	2480	3.66

9.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

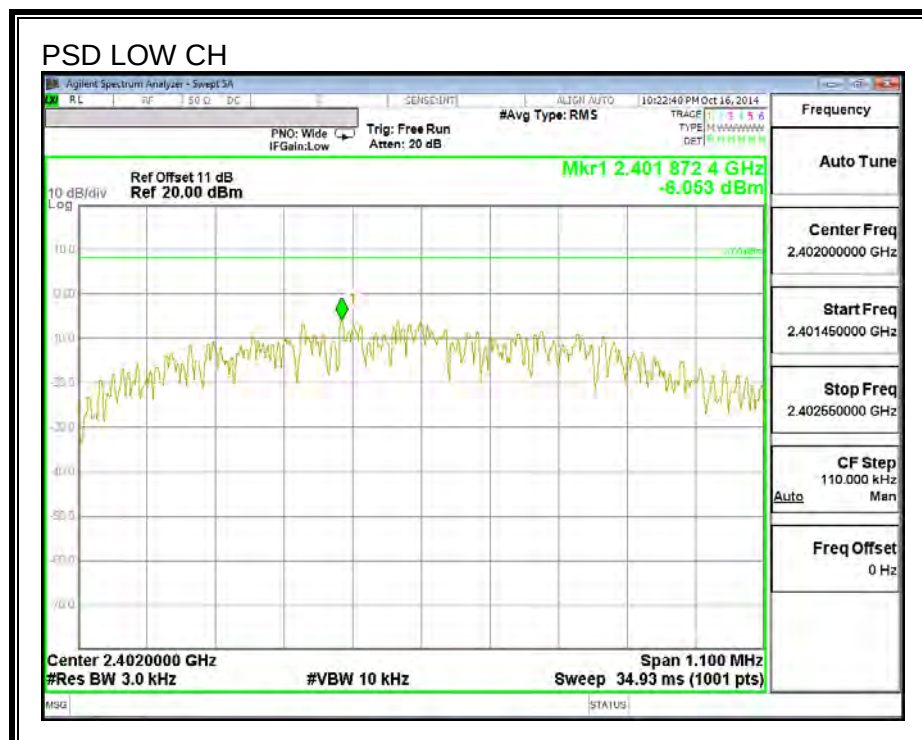
IC RSS-210 A8.2 (b)

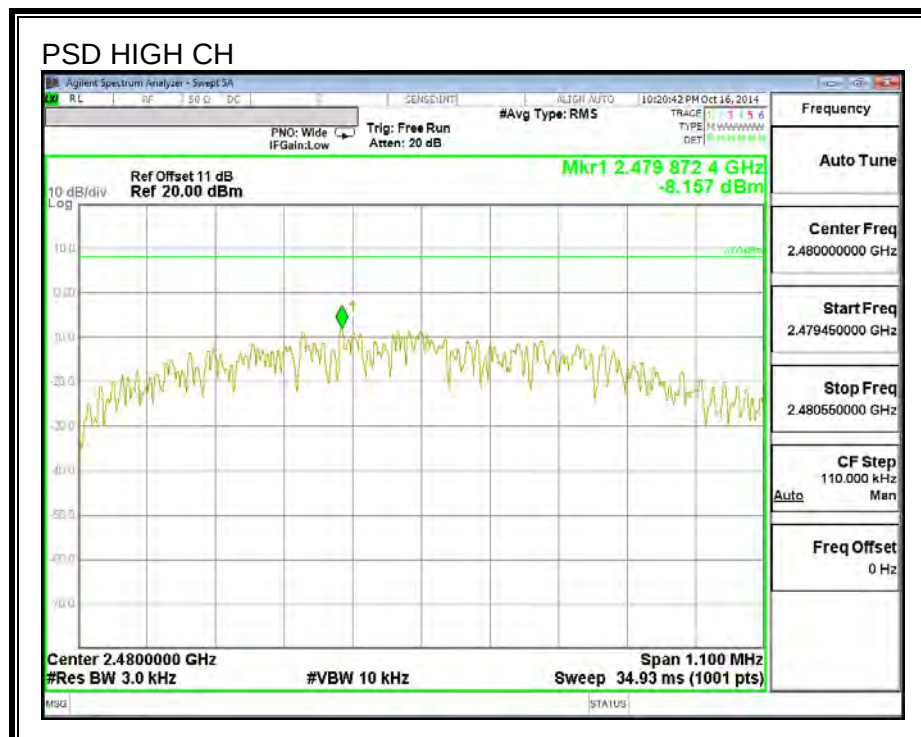
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-6.05	8	-14.05
Middle	2440	-7.39	8	-15.39
High	2480	-8.16	8	-16.16

POWER SPECTRAL DENSITY





9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

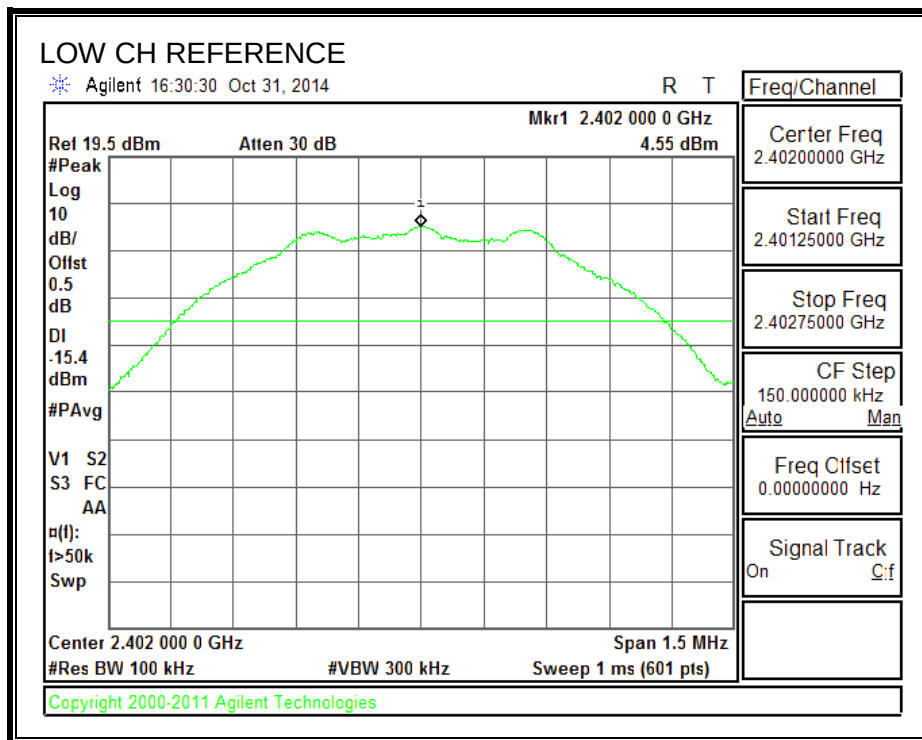
FCC §15.247 (d)

IC RSS-210 A8.5

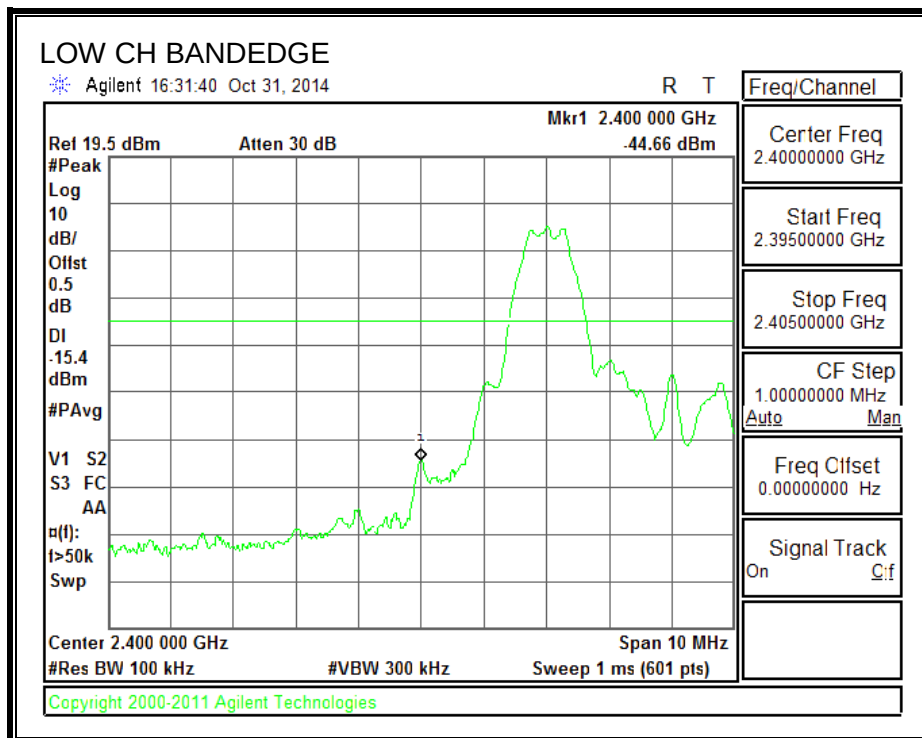
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

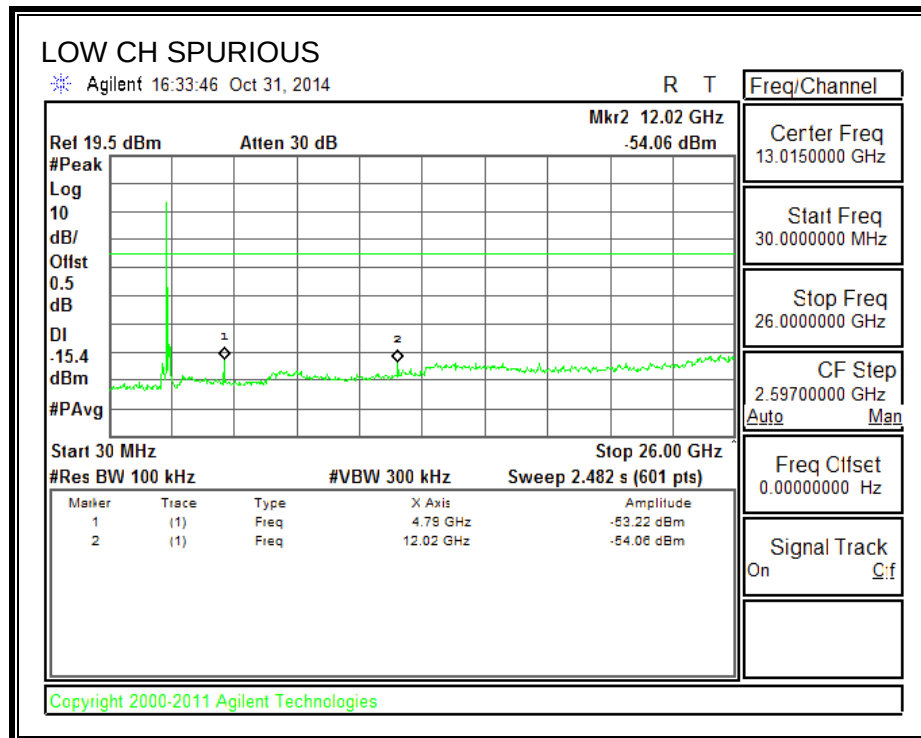
RESULTS

REFERENCE, LOW CHANNEL

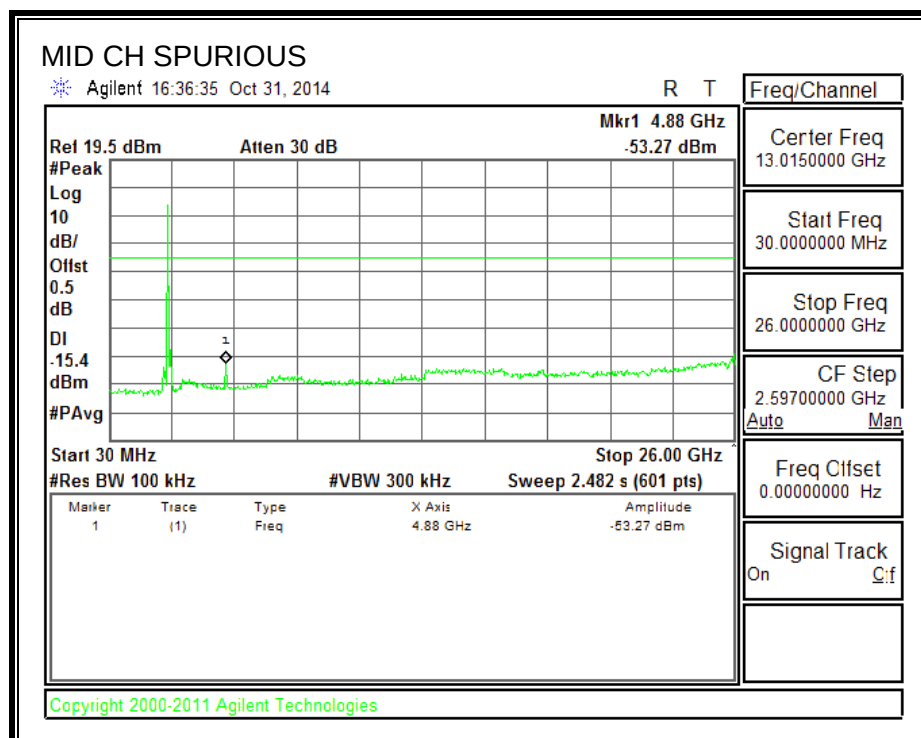


SPURIOUS EMISSIONS, LOW CHANNEL

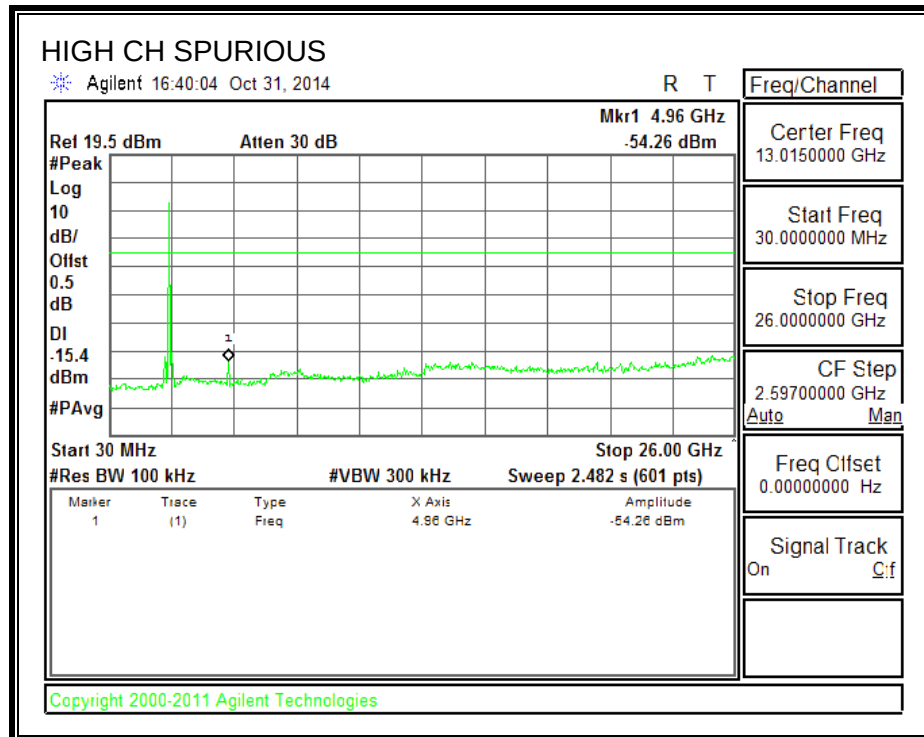
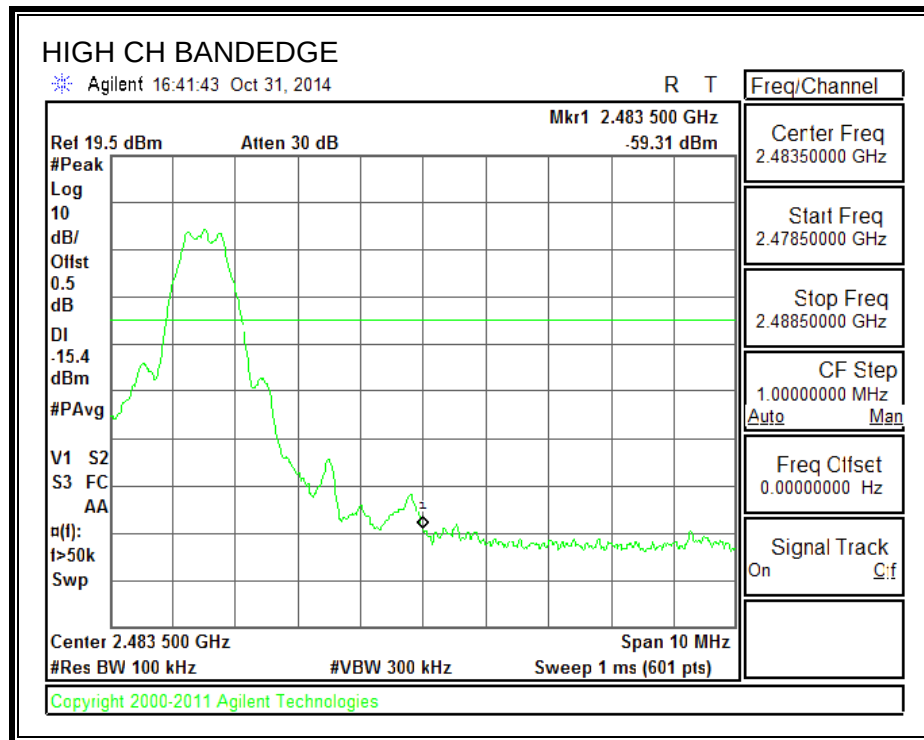




SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



10. RADIATED TEST RESULTS

10.1. LIMITS

LIMITS

FCC §15.205 and §15.209

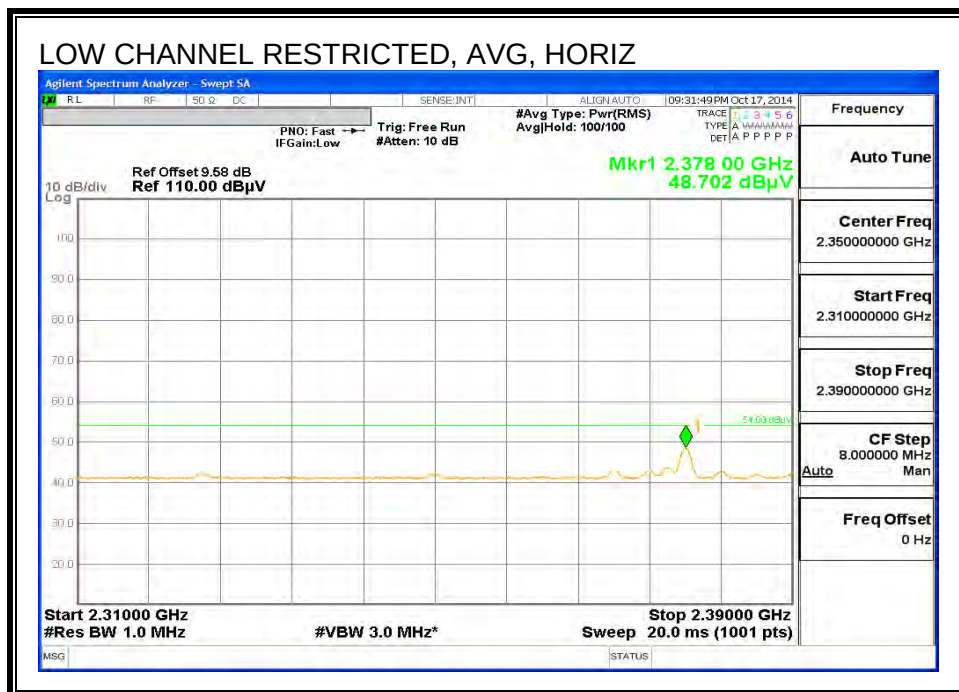
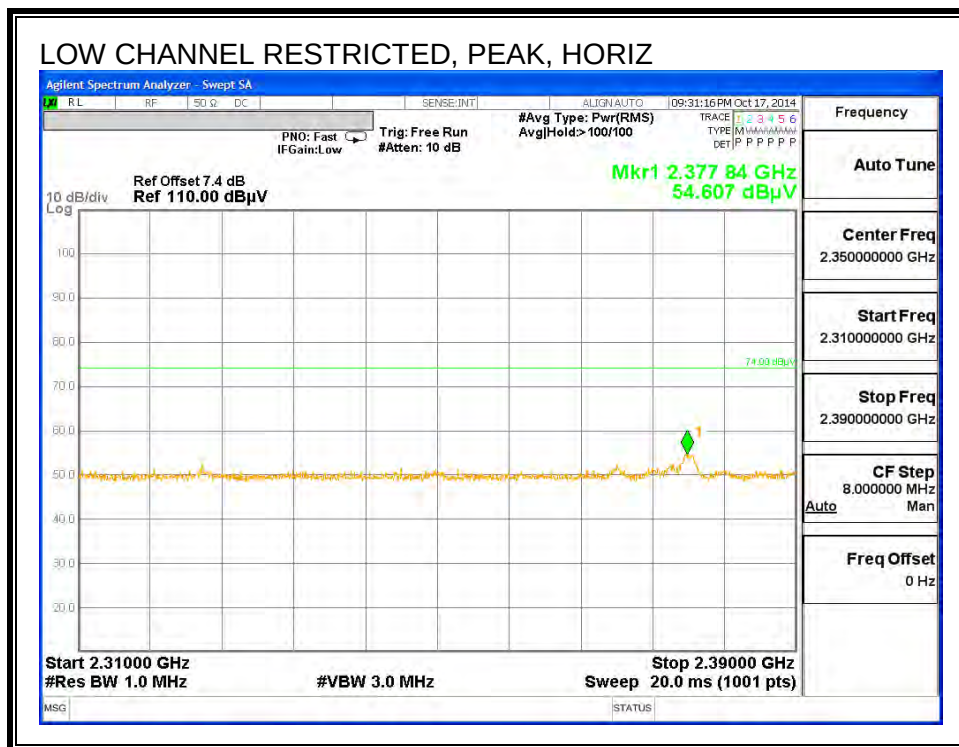
IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (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

10.2. TRANSMITTER ABOVE 1 GHz

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Agilent Spectrum Analyzer - Sweep SA

RL SQ DC REF OFF

PN0: Fast IF Gain: Low Trig: Free Run #Atten: 10 dB

#Avg Type: Pwr(RMS) Avg/Hold: 100/100

09:27:56 PM Oct 17, 2014

TRACE 1 2 3 4 TYPE: Max Hold REF: P P P P P

Ref Offset 7.4 dB Ref 110.00 dBμV

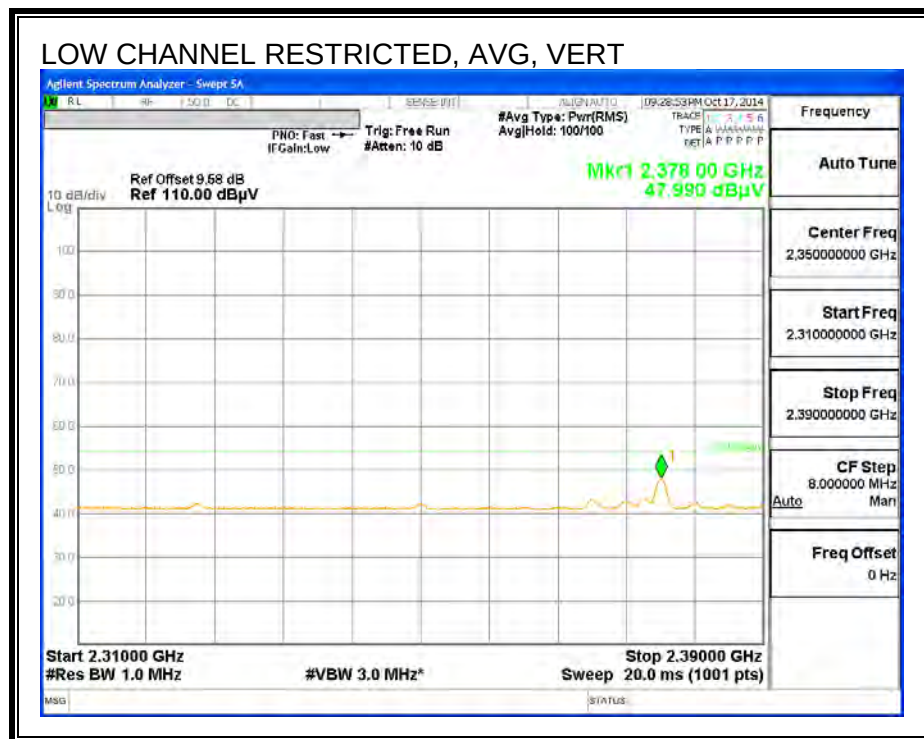
Mkr1 2.37032 GHz 54.599 dBμV

10 dB/div 1.00

100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0

Start 2.31000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 2.39000 GHz Sweep 20.0 ms (1001 pts)

Frequency
Auto Tune
Center Freq 2.350000000 GHz
Start Freq 2.310000000 GHz
Stop Freq 2.390000000 GHz
CF Step 8.0000000 MHz Auto Man
Freq Offset 0 Hz



HIGH CHANNEL RESTRICTED, PEAK, HORIZ

Agilent Spectrum Analyzer - Sweep SA

RL SQ DC SSB FFT

PHO: Far Trg: Free Run #Atn: 10 dB

#Avg Type: Pwr(RMS) Avg(Hold): 100/100

09:38:33 PM Oct 17, 2014

TRADE 3.456 TYPE: MASH/MASH DET: P P P P P

Ref Offset 7.6 dB Ref 110.00 dBuV

Mkr1 2.483 516 5 GHz 56.198 dBuV

Frequency

Auto Tune

Center Freq 2.491750000 GHz

Start Freq 2.483500000 GHz

Stop Freq 2.500000000 GHz

CF Step 1.650000 MHz

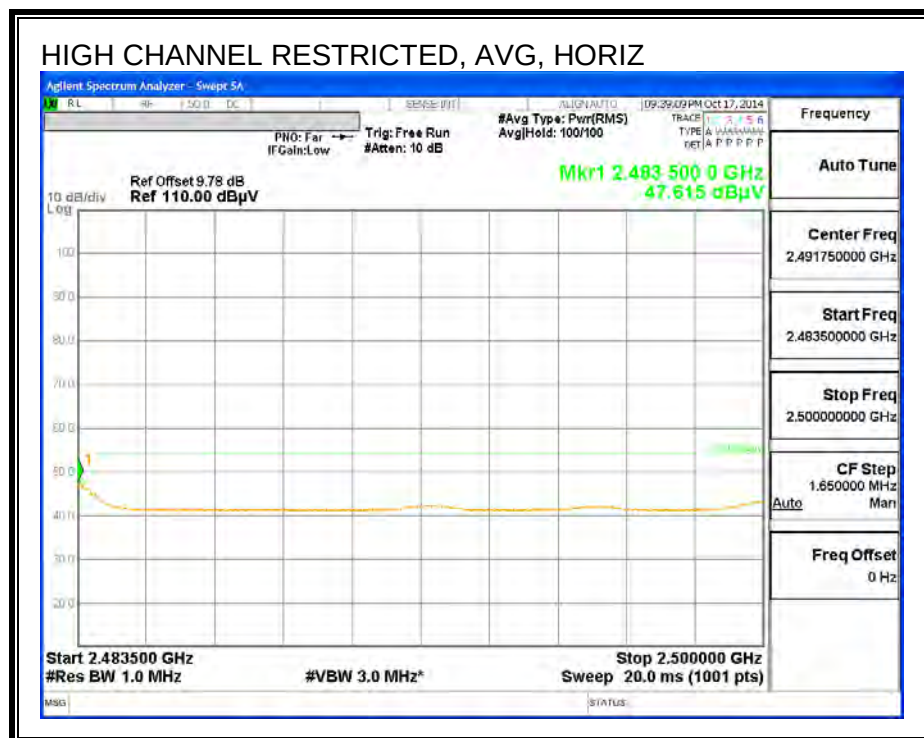
Auto Man

Freq Offset 0 Hz

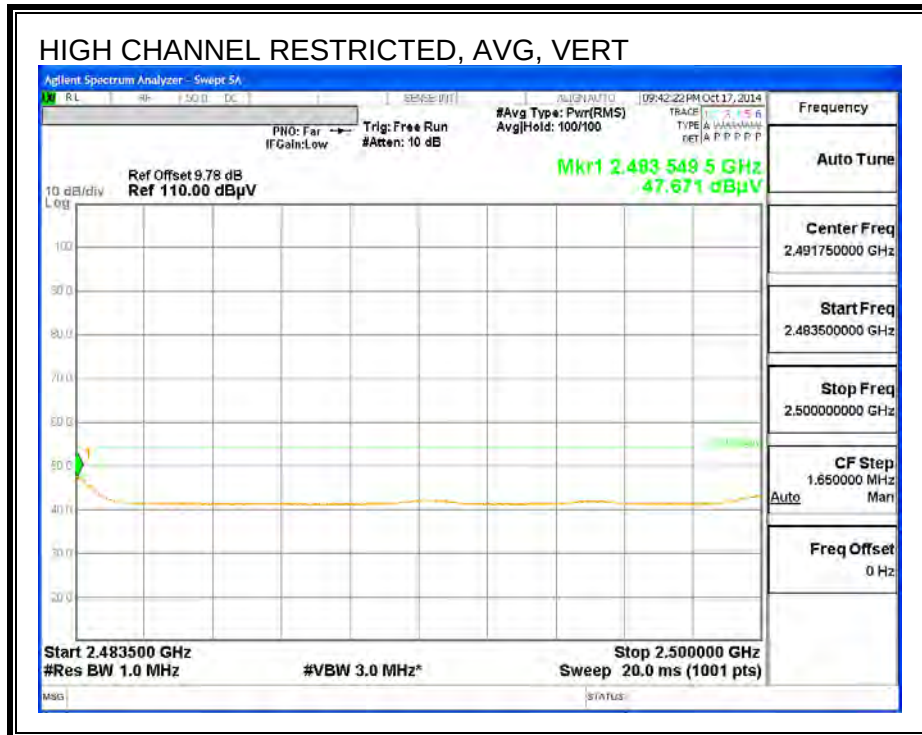
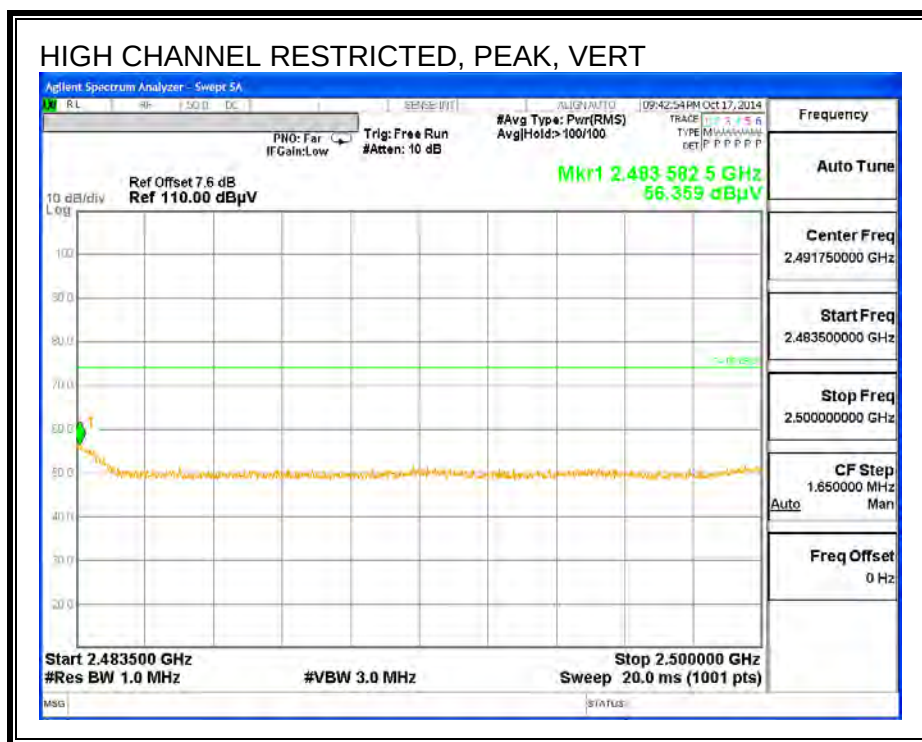
Start 2.483500 GHz #Res BW 1.0 MHz #VBW 3.0 MHz

Stop 2.500000 GHz Sweep 20.0 ms (1001 pts)

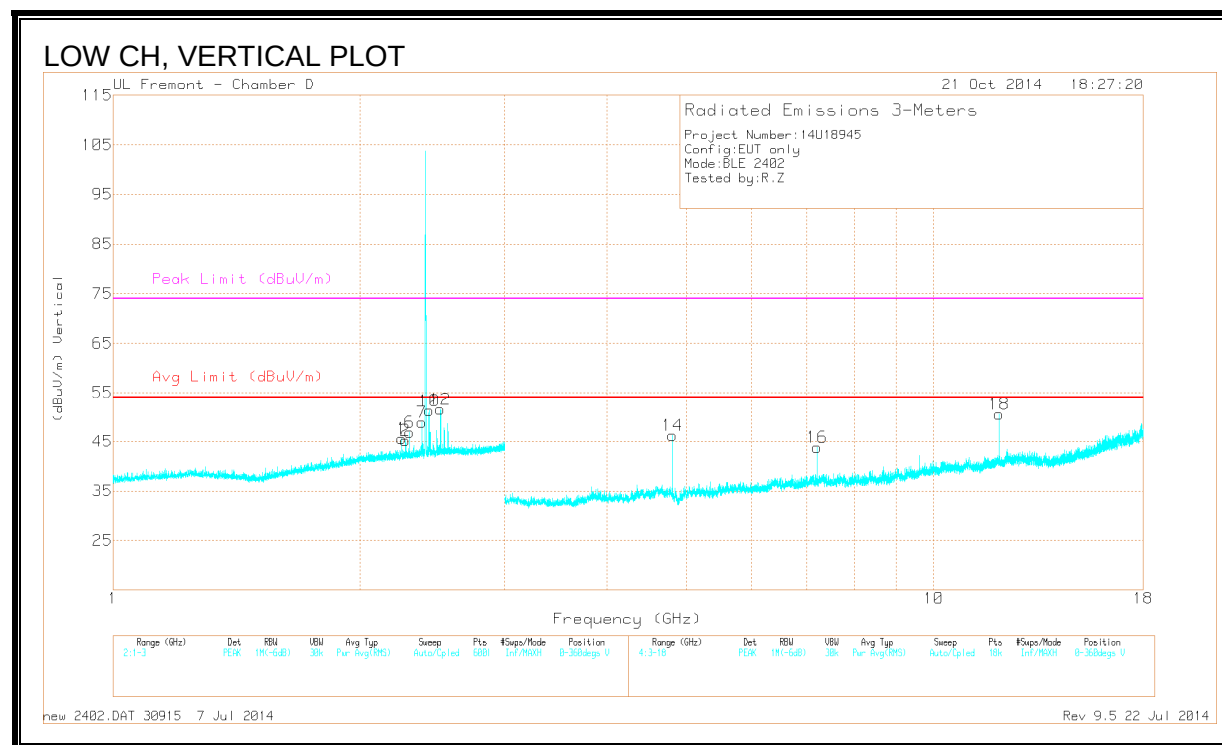
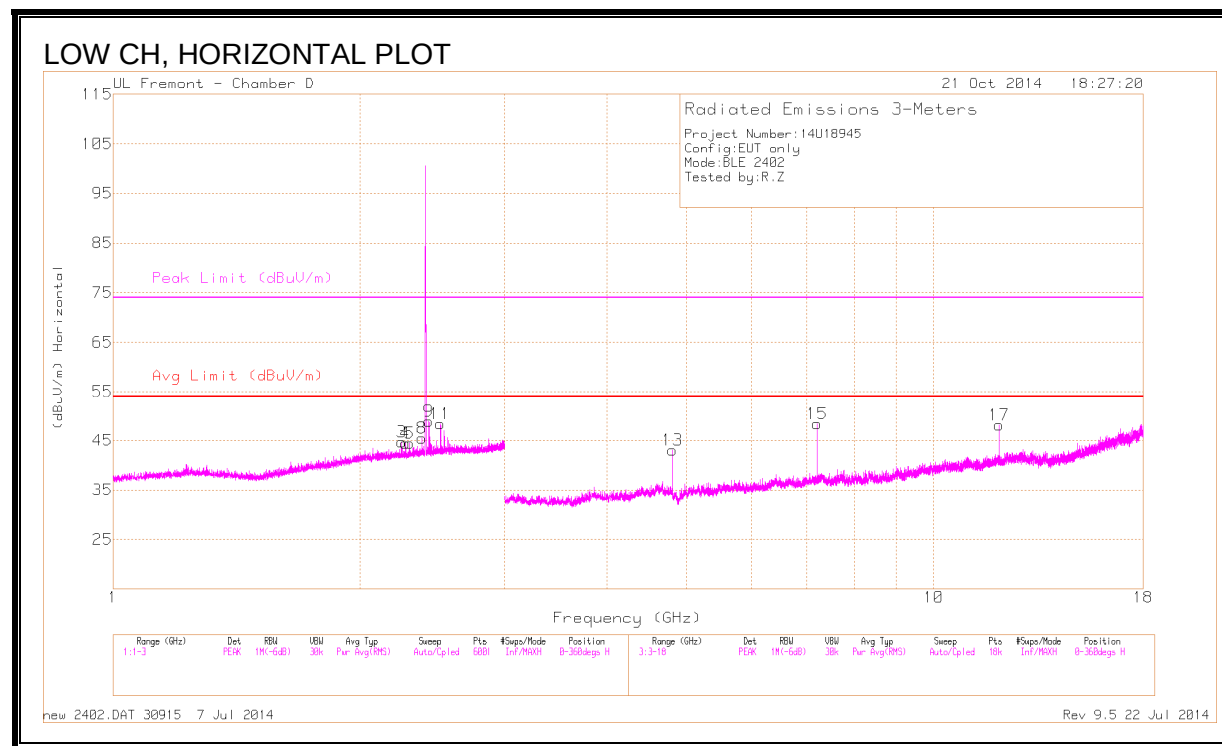
MSG STATUS



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS



DATA

Radiated Emissions

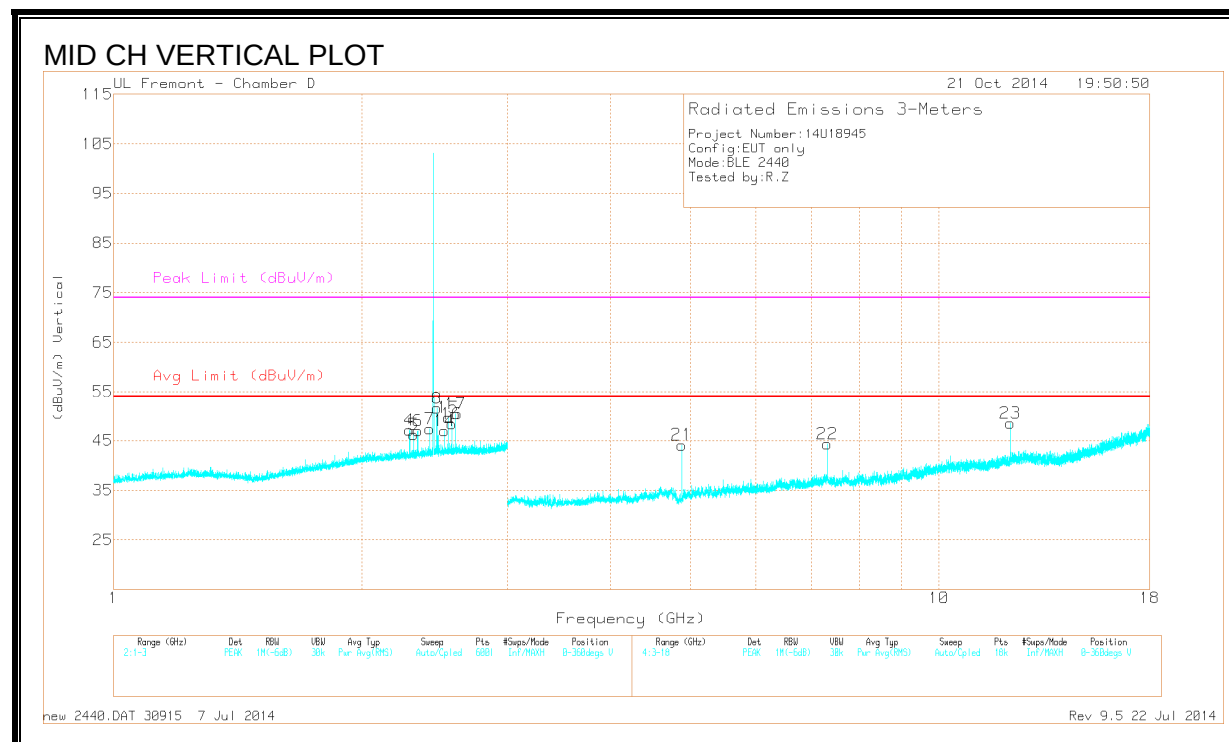
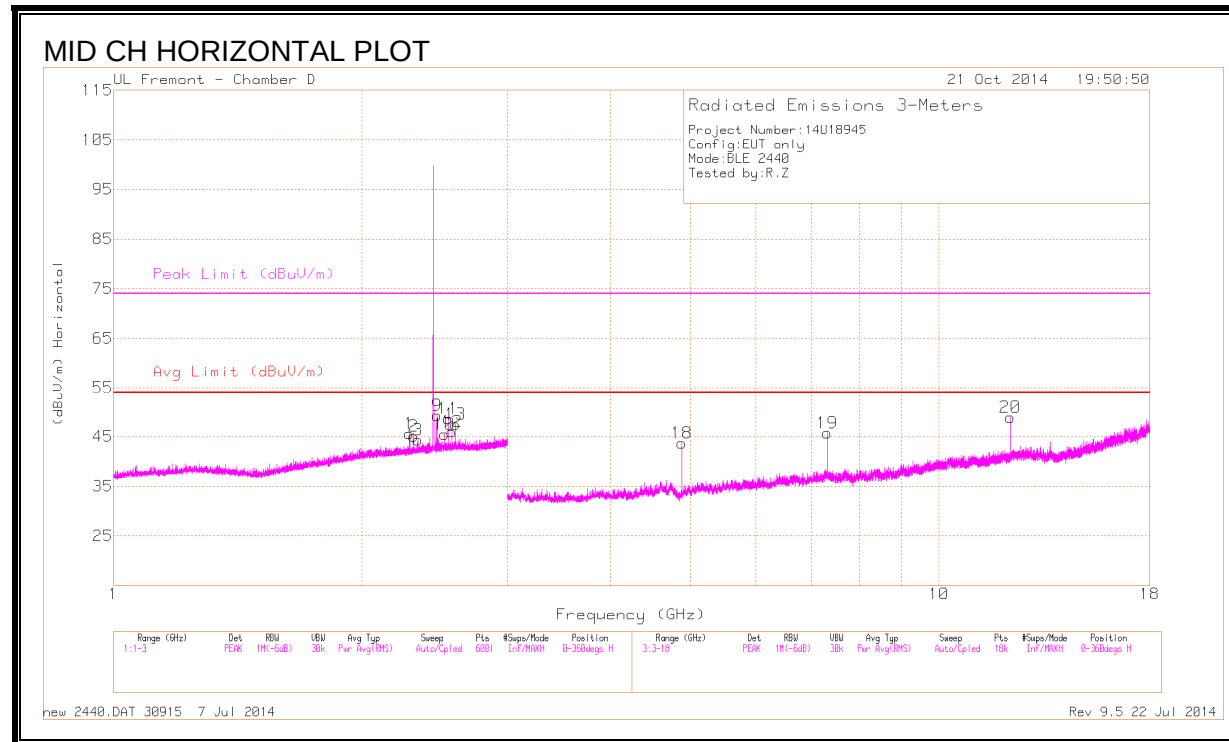
Marker	Frequenc y (GHz)	Meter Readi ng (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl /Fitr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.246	45.92	PK2	31.7	-24.6	0	53.02	-	-	74	-20.98	278	164	V
	* 2.246	35.26	MAv1	31.7	-24.6	2.18	44.54	54	-9.46	-	-	278	164	V
2	* 2.272	45.08	PK2	31.7	-24.6	0	52.18	-	-	74	-21.82	298	117	V
	* 2.272	35.49	MAv1	31.7	-24.6	2.18	44.77	54	-9.23	-	-	298	117	V
3	* 2.246	44.96	PK2	31.7	-24.6	0	52.06	-	-	74	-21.94	282	145	H
	* 2.246	34.63	MAv1	31.7	-24.6	2.18	43.91	54	-10.09	-	-	282	145	H
4	* 2.272	44.69	PK2	31.7	-24.6	0	51.79	-	-	74	-22.21	279	186	H
	* 2.272	34.62	MAv1	31.7	-24.6	2.18	43.9	54	-10.1	-	-	279	186	H
5	* 2.298	44.39	PK2	31.8	-24.6	0	51.59	-	-	74	-22.41	257	226	H
	* 2.298	33.89	MAv1	31.8	-24.6	2.18	43.27	54	-10.73	-	-	257	226	H
6	* 2.298	46.02	PK2	31.8	-24.6	0	53.22	-	-	74	-20.78	297	159	V
	* 2.298	36.54	MAv1	31.8	-24.6	2.18	45.92	54	-8.08	-	-	297	159	V
7	* 2.378	46.87	PK2	32.0	-24.6	0	54.27	-	-	74	-19.73	286	294	V
	* 2.378	38.1	MAv1	32.0	-24.6	2.18	47.68	54	-6.32	-	-	286	294	V
8	* 2.378	46.12	PK2	32.0	-24.6	0	53.52	-	-	74	-20.48	281	210	H
	* 2.378	36.68	MAv1	32.0	-24.6	2.18	46.26	54	-7.74	-	-	281	210	H
9	2.426	47.14	PK2	32.1	-24.6	0	54.64	-	-	-	-	281	201	H
10	2.426	47.97	PK2	32.1	-24.6	0	55.47	-	-	-	-	286	100	V
11	2.506	46.38	PK2	32.2	-24.4	0	54.18	-	-	-	-	281	201	H
12	2.506	47.89	PK2	32.2	-24.4	0	55.69	-	-	-	-	286	100	V
13	* 4.805	48.35	PK2	34.3	-32.5	0	50.15	-	-	74	-23.85	51	294	H
	* 4.804	42.18	MAv1	34.3	-32.5	2.18	46.16	54	-7.84	-	-	51	294	H
14	* 4.804	48.42	PK2	34.3	-32.5	0	50.22	-	-	74	-23.78	202	378	V
	* 4.804	41.88	MAv1	34.3	-32.5	2.18	45.86	54	-8.14	-	-	202	378	V
15	7.207	44.85	PK2	36.1	-30.6	0	50.35	-	-	-	-	51	201	H
16	7.206	40.11	PK2	36.1	-30.6	0	45.61	-	-	-	-	202	201	V
17	* 12.011	41.04	PK2	38.8	-25.1	0	54.74	-	-	74	-19.26	206	311	H
	* 12.011	31.73	MAv1	38.8	-25.1	2.18	47.61	54	-6.39	-	-	206	311	H
18	* 12.011	41.77	PK2	38.8	-25.1	0	55.47	-	-	74	-18.53	147	337	V
	* 12.011	32.61	MAv1	38.8	-25.1	2.18	48.49	54	-5.51	-	-	147	337	V

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

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HARMONICS AND SPURIOUS EMISSIONS



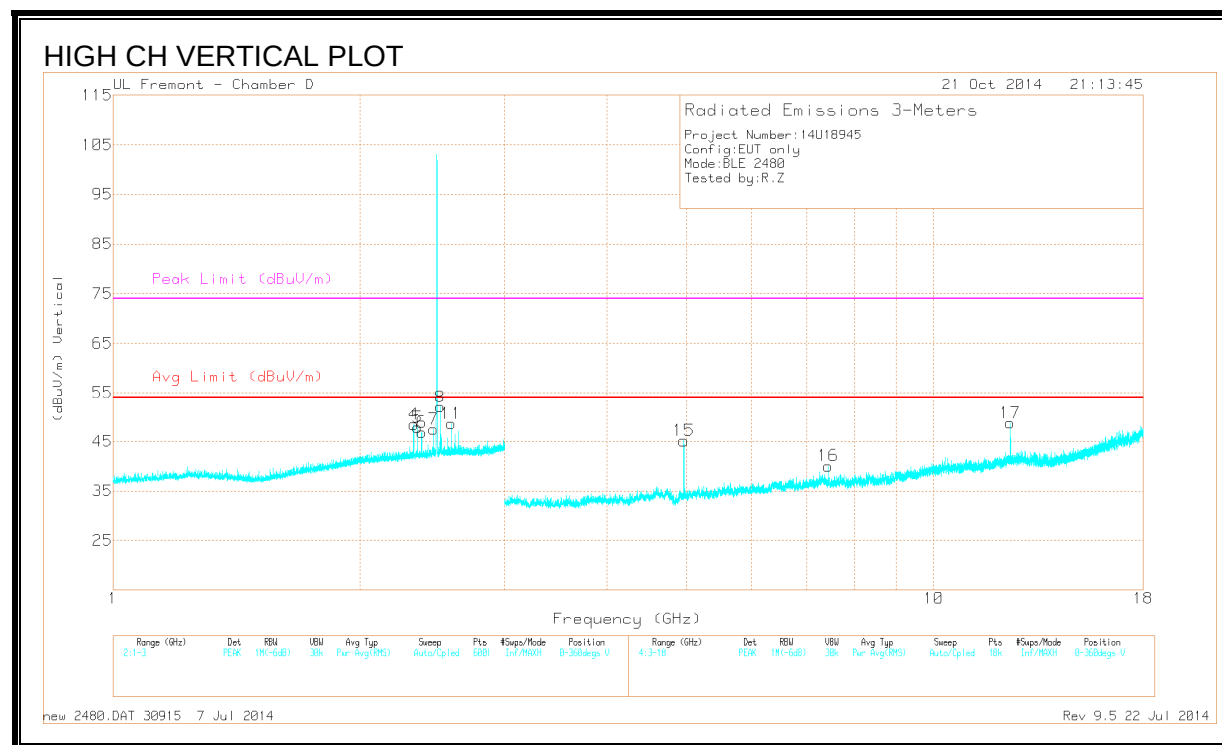
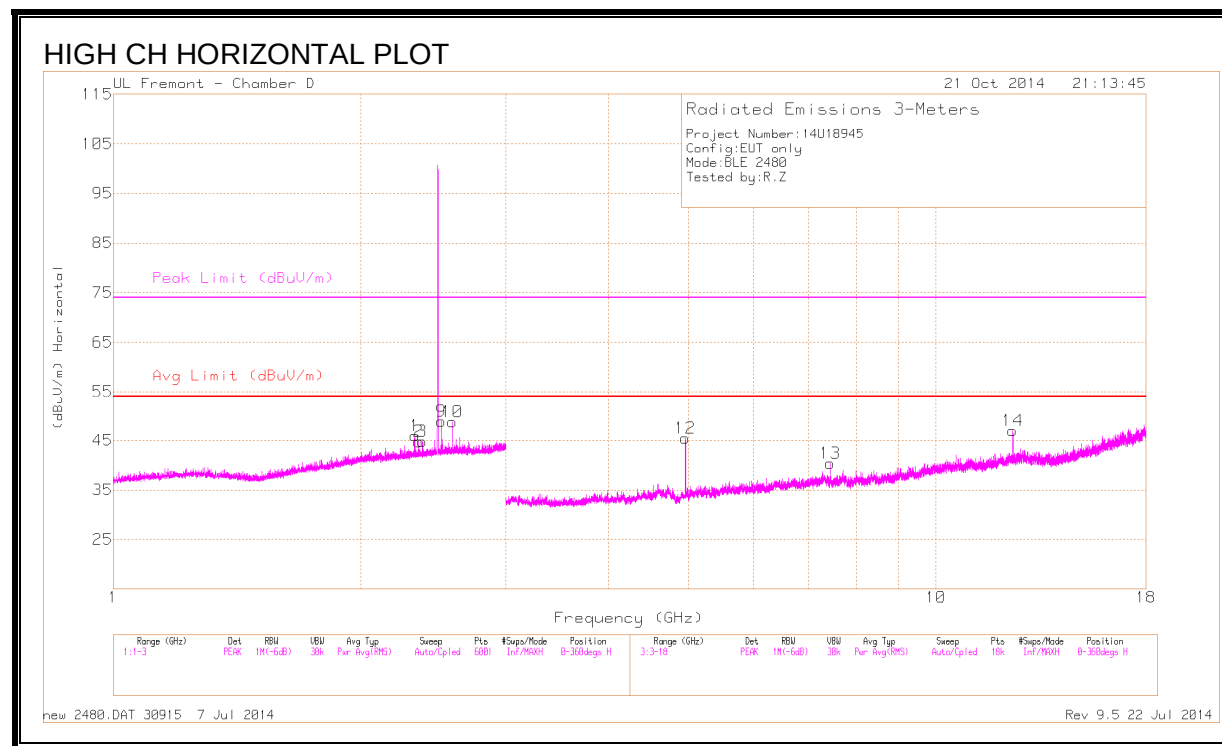
DATA

Radiated Emissions

Marker	Frequenc y (GHz)	Meter Readin g (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl /Filtr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.284	45.18	PK2	31.8	-24.6	0	52.38	-	-	74	-21.62	250	179	H
	* 2.284	35.2	MAv1	31.8	-24.6	2.18	44.58	54	-9.42	-	-	250	179	H
2	* 2.31	45.6	PK2	31.8	-24.6	0	52.8	-	-	74	-21.2	279	178	H
	* 2.31	34.43	MAv1	31.8	-24.6	2.18	43.81	54	-10.19	-	-	279	178	H
3	* 2.336	44.27	PK2	31.9	-24.6	0	51.57	-	-	74	-22.43	249	174	H
	* 2.336	34.03	MAv1	31.9	-24.6	2.18	43.51	54	-10.49	-	-	249	174	H
9	2.464	46.65	PK2	32.1	-24.5	0	54.25	-	-	-	-	249	202	H
10	2.518	43.99	PK2	32.2	-24.4	0	51.79	-	-	-	-	249	202	H
11	2.544	45.96	PK2	32.2	-24.4	0	53.76	-	-	-	-	249	100	H
12	2.57	44.38	PK2	32.2	-24.3	0	52.28	-	-	-	-	249	202	H
13	2.596	45.65	PK2	32.2	-24.3	0	53.55	-	-	-	-	249	100	H
4	* 2.284	46.15	PK2	31.8	-24.6	0	53.35	-	-	74	-20.65	293	168	V
	* 2.284	37.12	MAv1	31.8	-24.6	2.18	46.5	54	-7.5	-	-	293	168	V
5	2.31	46.16	PK2	31.8	-24.6	0	53.36	-	-	-	-	293	202	V
6	* 2.336	45.38	PK2	31.9	-24.6	0	52.68	-	-	74	-21.32	293	153	V
	* 2.336	36.28	MAv1	31.9	-24.6	2.18	45.76	54	-8.24	-	-	293	153	V
7	2.416	45.27	PK2	32.0	-24.5	0	52.77	-	-	-	-	293	100	V
8	2.464	47.01	PK2	32.1	-24.5	0	54.61	-	-	-	-	293	100	V
14	2.518	45.57	PK2	32.2	-24.4	0	53.37	-	-	-	-	293	100	V
15	2.544	46.66	PK2	32.2	-24.4	0	54.46	-	-	-	-	293	202	V
16	2.57	44.81	PK2	32.2	-24.3	0	52.71	-	-	-	-	293	100	V
17	2.596	44.54	PK2	32.2	-24.3	0	52.44	-	-	-	-	293	100	V
18	* 4.881	46.54	PK2	34.3	-32.1	0	48.74	-	-	74	-25.26	42	285	H
	* 4.88	40.1	MAv1	34.3	-32.1	2.18	44.48	54	-9.52	-	-	42	285	H
19	* 7.319	43.91	PK2	36.2	-29	0	51.11	-	-	74	-22.89	287	171	H
	* 7.32	35.34	MAv1	36.2	-28.9	2.18	44.82	54	-9.18	-	-	287	171	H
20	* 12.201	41.37	PK2	39.0	-25.4	0	54.97	-	-	74	-19.03	274	133	H
	* 12.199	31.6	MAv1	39.0	-25.4	2.18	47.38	54	-6.62	-	-	274	133	H
21	* 4.879	45.88	PK2	34.3	-32.2	0	47.98	-	-	74	-26.02	198	202	V
	* 4.88	38.28	MAv1	34.3	-32.1	2.18	42.66	54	-11.34	-	-	198	202	V
22	* 7.319	42.8	PK2	36.2	-29	0	50	-	-	74	-24	42	186	V
	* 7.319	33.33	MAv1	36.2	-28.9	2.18	42.81	54	-11.19	-	-	42	186	V
23	* 12.199	42.7	PK2	39.0	-25.4	0	56.3	-	-	74	-17.7	293	138	V
	* 12.199	33.47	MAv1	39.0	-25.4	2.18	49.25	54	-4.75	-	-	293	138	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS



DATA

Radiated Emissions

Marker	Frequenc y (GHz)	Meter Readi ng (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl /Fitr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.324	45.08	PK2	31.8	-24.6	0	52.28	-	-	74	-21.72	263	116	H
	* 2.324	35.51	MAv1	31.8	-24.6	2.18	44.89	54	-9.11	-	-	263	116	H
2	* 2.35	44.94	PK2	31.9	-24.6	0	52.24	-	-	74	-21.76	273	179	H
	* 2.35	34.51	MAv1	31.9	-24.6	2.18	43.99	54	-10.01	-	-	273	179	H
3	* 2.376	45.21	PK2	32.0	-24.6	0	52.61	-	-	74	-21.39	283	331	H
	* 2.376	34.42	MAv1	32.0	-24.6	2.18	44	54	-10	-	-	283	331	H
9	2.504	46.72	PK2	32.2	-24.4	0	54.52	-	-	-	-	283	201	H
10	2.584	45.57	PK2	32.2	-24.3	0	53.47	-	-	-	-	283	100	H
4	* 2.376	46.25	PK2	32.0	-24.6	0	53.65	-	-	74	-20.35	270	197	V
	* 2.376	37.04	MAv1	32.0	-24.6	2.18	46.62	54	-7.38	-	-	270	197	V
5	* 2.324	46.89	PK2	31.8	-24.6	0	54.09	-	-	74	-19.91	269	198	V
	* 2.324	39.9	MAv1	31.8	-24.6	2.18	49.28	54	-4.72	-	-	269	198	V
6	* 2.35	46.03	PK2	31.9	-24.6	0	53.33	-	-	74	-20.67	238	114	V
	* 2.35	36.79	MAv1	31.9	-24.6	2.18	46.27	54	-7.73	-	-	238	114	V
7	2.456	46.04	PK2	32.1	-24.5	0	53.64	-	-	-	-	238	100	V
8	2.504	47.28	PK2	32.2	-24.4	0	55.08	-	-	-	-	238	100	V
11	2.584	46.17	PK2	32.2	-24.3	0	54.07	-	-	-	-	238	202	V
12	* 4.96	48.38	PK2	34.3	-31.8	0	50.88	-	-	74	-23.12	38	163	H
	* 4.96	42.17	MAv1	34.3	-31.8	2.18	46.85	54	-7.15	-	-	38	163	H
13	* 7.439	41.83	PK2	36.1	-29.3	0	48.63	-	-	74	-25.37	297	147	H
	* 7.439	32.74	MAv1	36.1	-29.3	2.18	41.72	54	-12.28	-	-	297	147	H
14	* 12.4	40.31	PK2	39.1	-25.9	0	53.51	-	-	74	-20.49	272	133	H
	* 12.399	30.13	MAv1	39.1	-25.9	2.18	45.51	54	-8.49	-	-	272	133	H
15	* 4.96	47.38	PK2	34.3	-31.8	0	49.88	-	-	74	-24.12	314	113	V
	* 4.96	40.08	MAv1	34.3	-31.8	2.18	44.76	54	-9.24	-	-	314	113	V
16	* 7.441	40.87	PK2	36.1	-29.3	0	47.67	-	-	74	-26.33	145	301	V
	* 7.439	30.54	MAv1	36.1	-29.3	2.18	39.52	54	-14.48	-	-	145	301	V
17	* 12.399	42.61	PK2	39.1	-25.9	0	55.81	-	-	74	-18.19	288	144	V
	* 12.399	33.25	MAv1	39.1	-25.9	2.18	48.63	54	-5.37	-	-	288	144	V

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

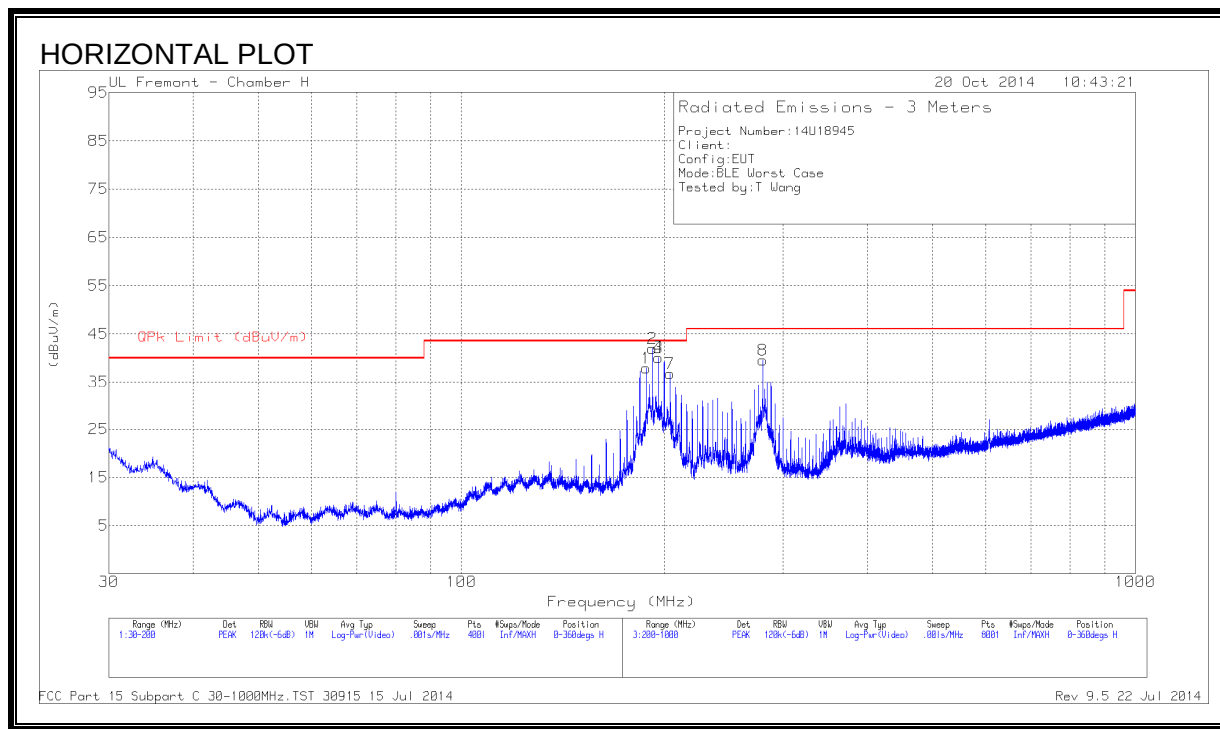
PK2 - KDB558074 Method: Maximum Peak

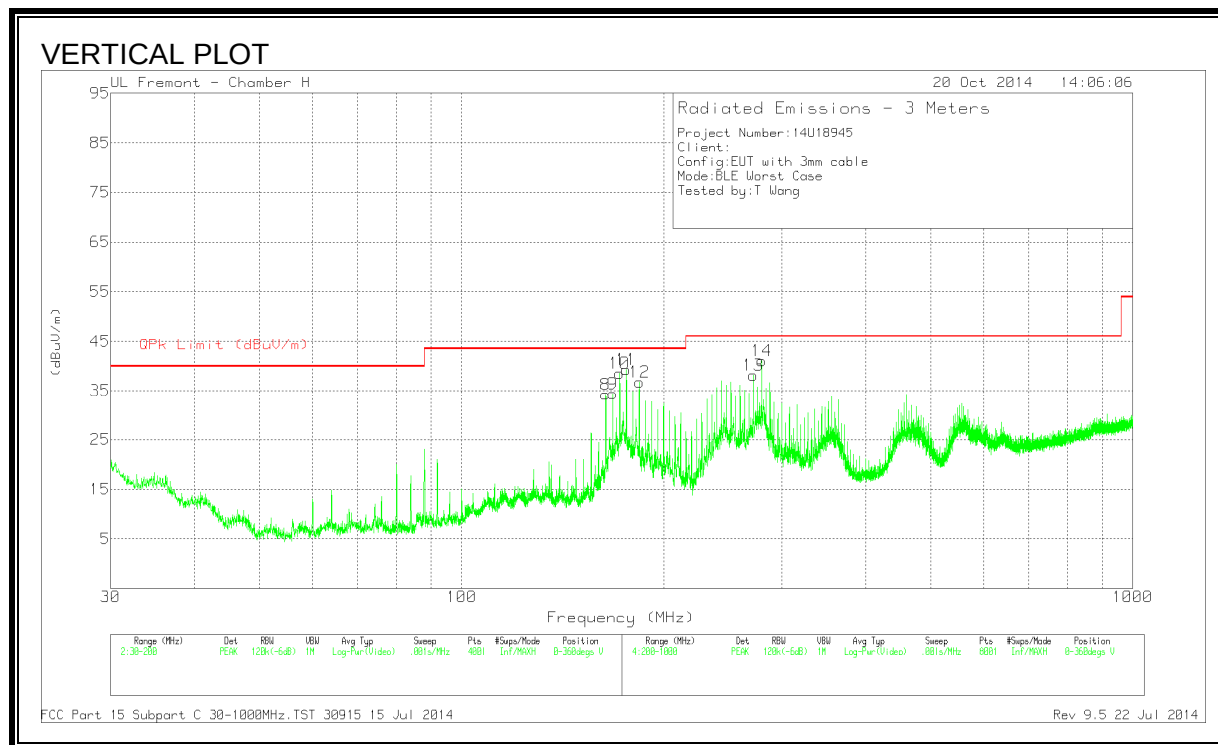
MAv1 - KDB558074 Option 1 Maximum RMS Average

10.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (HORIZONTAL & VERTICAL)

EUT ALONE CONFIGURATION





HORIZONTAL AND VERTICAL DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	SS JB3 SN A051314-1	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 167.9975	47.85	PK	14.9	-29.5	33.25	43.52	-10.27	0-360	201	H
2	* 172.0051	48.85	QP	14.7	-29.5	34.05	43.52	-9.47	73	100	H
3	175.9875	50.27	PK	14.6	-29.4	35.47	43.52	-8.05	0-360	201	H
4	184.0200	48.28	PK	14.3	-29.4	33.18	43.52	-10.34	0-360	100	H
5	* 251.9985	55.46	QP	15	-28.8	41.66	46.02	-4.36	73	100	H
6	* 271.9990	55.61	QP	15.9	-28.7	42.81	46.02	-3.21	73	100	H
7	* 279.9948	57.11	QP	16.3	-28.7	44.71	46.02	-1.31	73	100	H
8	* 164.0025	48.7	PK	15	-29.5	34.2	43.52	-9.32	0-360	100	V
9	* 167.9975	49.01	PK	14.9	-29.5	34.41	43.52	-9.11	0-360	100	V
10	* 172.0020	53.12	QP	14.7	-29.5	38.32	43.52	-5.2	341	101	V
11	176.0003	53.72	QP	14.6	-29.4	38.92	43.52	-4.6	341	101	V
12	183.9987	51.57	QP	14.3	-29.4	36.47	43.52	-7.05	341	101	V
13	* 271.9995	51.27	QP	15.9	-28.7	38.47	46.02	-7.55	198	162	V
14	* 280.0033	53.41	QP	16.3	-28.7	41.01	46.02	-5.01	198	162	V

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

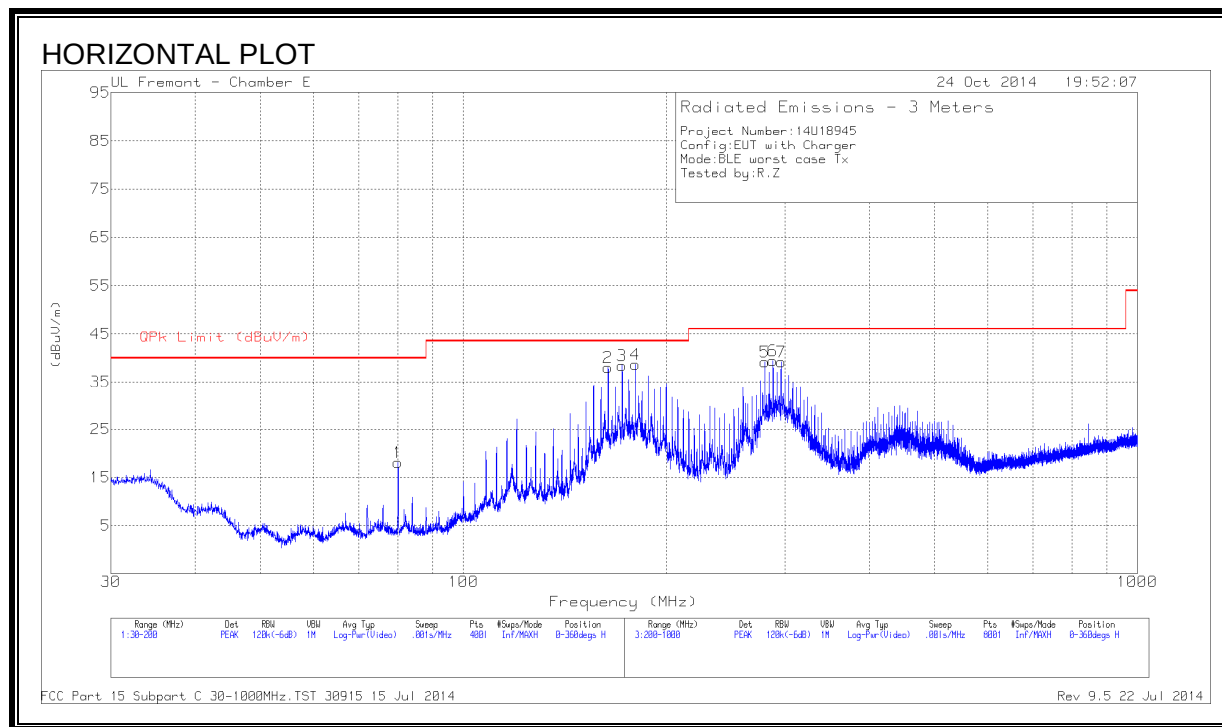
PK - Peak detector

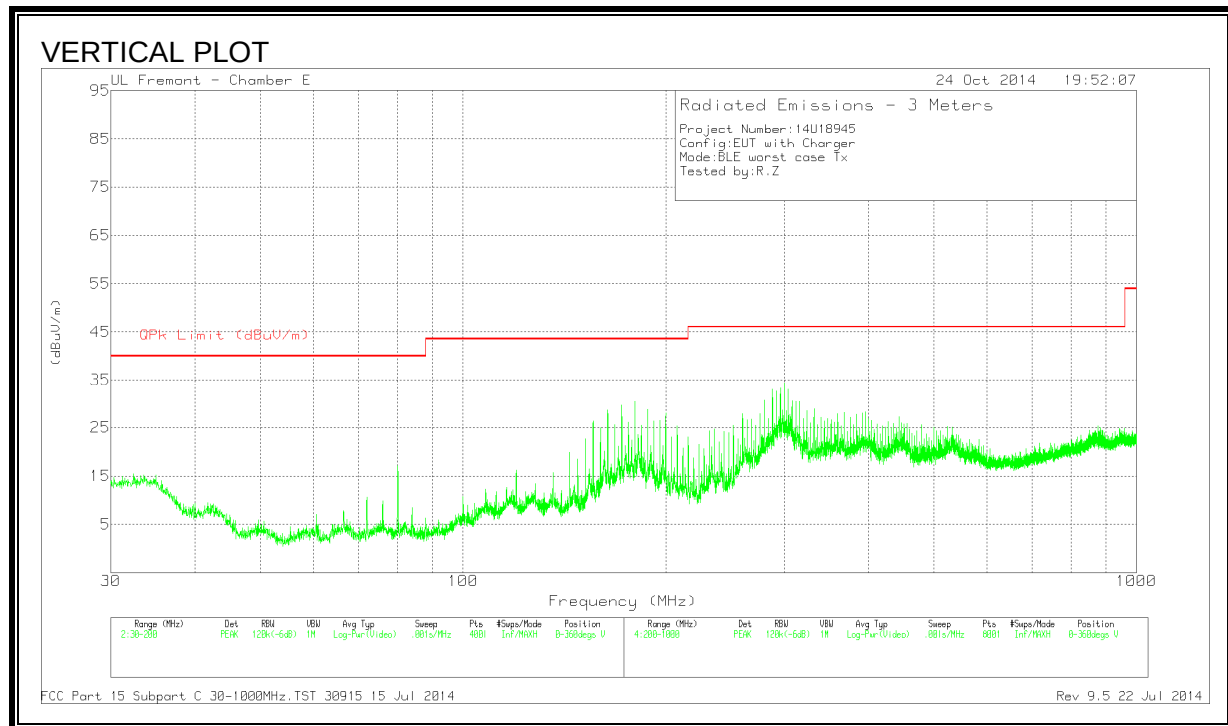
QP - Quasi-Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014

Rev 9.5 22 Jul 2014

EUT POWRED VIA RECHARGEABLE POWER BAND VIA USB CABLE CONFIGURATION





HORIZONTAL AND VERTICAL DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	80.0225	42.01	PK	7.6	-31.5	18.11	40	-21.89	0-360	301	H
2	*164.0025	56.91	PK	12	-30.9	38.01	43.52	-5.51	0-360	201	H
	*163.9976	57.52	QP	12	-30.9	38.62	43.52	-4.9	29	168	H
3	*172.035	57.71	PK	11.6	-30.9	38.41	43.52	-5.11	0-360	201	H
	*172.000	58.14	QP	11.6	-30.9	38.84	43.52	-4.68	30	162	H
4	180.025	58.44	PK	11.2	-31	38.64	43.52	-4.88	0-360	201	H
	180.0015	58.17	QP	11.2	-31	38.37	43.52	-5.15	21	118	H
5	* 280	56.29	PK	13.3	-30.4	39.19	46.02	-6.83	0-360	99	H
6	288	56.49	PK	13.3	-30.4	39.39	46.02	-6.63	0-360	99	H
7	296	56.16	PK	13.3	-30.3	39.16	46.02	-6.86	0-360	99	H

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

QP - Quasi-Peak detector

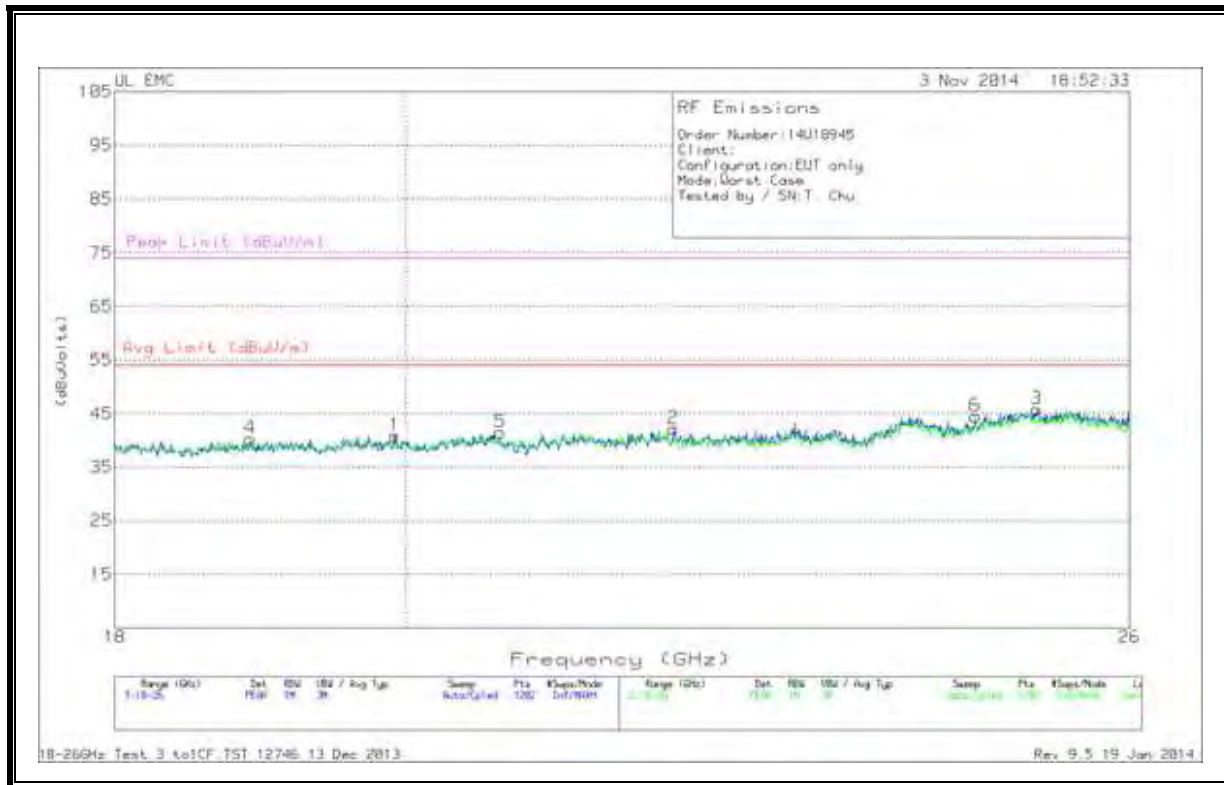
PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014

Rev 9.5 22 Jul 2014

10.4. WORST-CASE ABOVE 18 GHz

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION, HORIZONTAL & VERTICAL)



DATA

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	19.922	41.83	PK	32.8	-24.3	-9.5	40.833	54	-13.167	74	-33.167
2	22.037	41.97	PK	33.3	-23.6	-9.5	42.167	54	-11.833	74	-31.833
3	25.141	44.33	PK	33.9	-22.9	-9.5	45.833	54	-8.167	74	-28.167
4	18.906	41.93	PK	32.5	-24.6	-9.5	40.333	54	-13.667	74	-33.667
5	20.698	42.4	PK	32.9	-24.3	-9.5	41.5	54	-12.5	74	-32.5
6	24.588	43	PK	33.8	-22.8	-9.5	44.5	54	-9.5	74	-29.5

PK - Peak detector

11. 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

ANSI C63.4

RESULTS

WORST EMISSIONS

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	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.1635	45.5	PK	1.2	0	46.7	65.3	-18.6	-	-
2	.1635	23.54	Av	1.2	0	24.74	-	-	55.3	-30.56
3	.249	41.72	PK	.7	0	42.42	61.8	-19.38	-	-
4	.249	24.2	Av	.7	0	24.9	-	-	51.8	-26.9
5	.807	43.94	PK	.3	0	44.24	56	-11.76	-	-
6	.807	29.43	Av	.3	0	29.73	-	-	46	-16.27
7	2.3415	34.8	PK	.2	.1	35.1	56	-20.9	-	-
8	2.3415	20.36	Av	.2	.1	20.66	-	-	46	-25.34

Line-L2 .15 - 30MHz

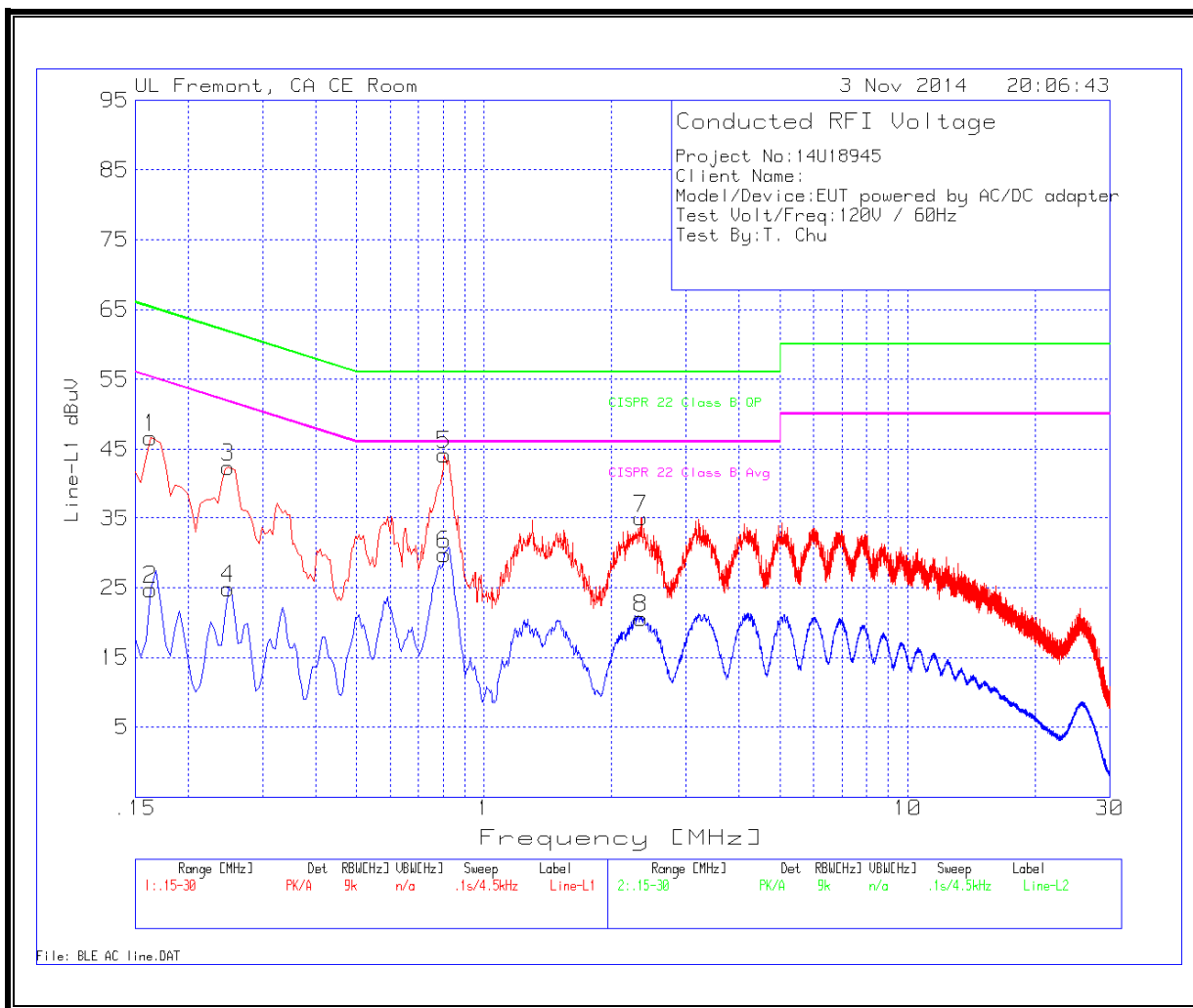
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
9	.1635	42.26	PK	1.3	0	43.56	65.3	-21.74	-	-
10	.1635	16.6	Av	1.3	0	17.9	-	-	55.3	-37.4
11	.2535	39.25	PK	.7	0	39.95	61.6	-21.65	-	-
12	.2535	16.42	Av	.7	0	17.12	-	-	51.6	-34.48
13	.807	41.89	PK	.3	0	42.19	56	-13.81	-	-
14	.807	24.4	Av	.3	0	24.7	-	-	46	-21.3
15	1.482	28.31	PK	.2	.1	28.61	56	-27.39	-	-
16	1.482	16.16	Av	.2	.1	16.46	-	-	46	-29.54

PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS

