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

CERTIFICATION TEST REPORT

FOR

eTap System, Blip Box

MODEL NUMBER: 00201

FCC ID: C9O-BOXED
IC: 10161A-BOXED

REPORT NUMBER: 15U21450-E1V4

ISSUE DATE: OCTOBER 16, 2015

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	09/24/15	Initial Issue	C.S.OOI
V2	10/08/15	Revised section 5.5 Added notes on page 8 Added radiated emission below 30MHz data	C.S.OOI
V3	10/09/15	Updated IC ID Revised radiated emission below 30MHz data	C.S.OOI
V4	10/16/15	Revised calibration date of test equipment	C.S.OOI

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SRAM LLC

EUT DESCRIPTION: eTap System, Blip Box

MODEL: 00201

SERIAL NUMBER: Radiated: 12; Conducted: 93

DATE TESTED: SEPTEMBER 8 -October 09, 2015

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

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

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

Approved & Released For
UL Verification Services Inc. By:

CHOON OOI
EMC PROJECT LEAD
UL Verification Services Inc.

Tested By:

JEFFREY WU
EMC ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ 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:

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, 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 an eTap System, Blip Box with 802.15.4 SRAMLink technology.

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)
2405 - 2480	802.15.4 SRAMLink	0.19	1.04

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a ceramic antenna (P/N W3008) by Pulse Engineering, with a maximum gain of 1.7 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 1.0.0.

The test utility software used during testing was Bootloader, Rev. 0.7.0.0; Bootstick, Rev. 0.7.0.0

5.5. WORST-CASE CONFIGURATION AND MODE

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

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

Preliminary radiated emissions were performed to confirm the performance of EUT with Blip buttons and without Blip buttons remain consistent.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	T410S	R8-0BWT6	N/A
AC Adapter	Lenovo	45N0054	N/A	N/A
Laptop	ACER	P1EV6	LUSFT02292260C8E83400	N/A
AC Adapter	ACER	W10-040N1A	F13061332048621	N/A
Regulated DC Power Supply	Kenwood	PA36-3A	7060074	N/A

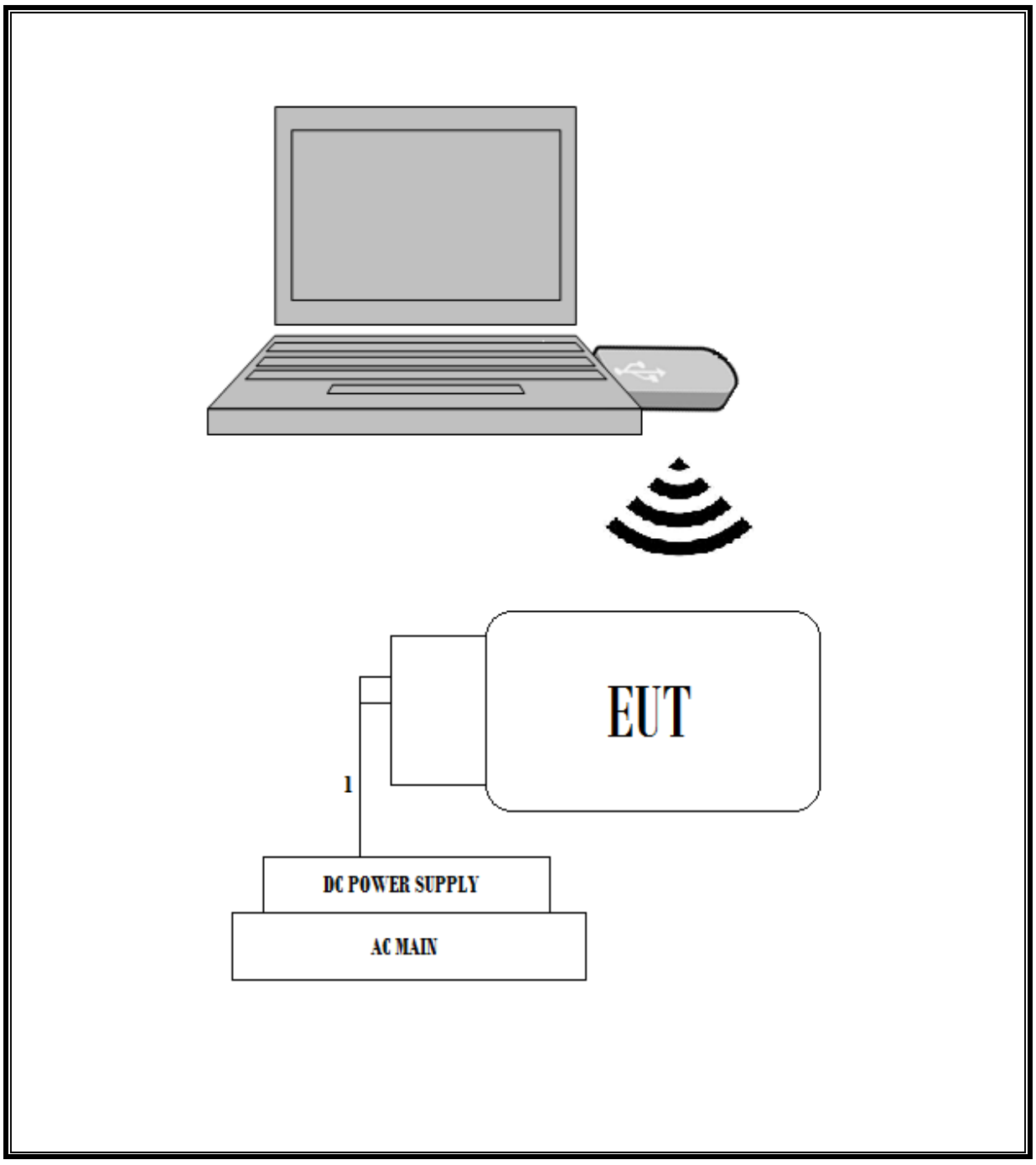
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	Banand Plug	Shielded	0.5m	N/A

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	**Manufacturer**	**Model**	**T No.**	**Cal Date**	**Cal Due**
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014		
Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015		
Bilog Antenna 30-1000MHz	Sunol	JB1	477	06/10/15	06/10/16
Bilog Antenna 30-1000MHz	Sunol	JB1	185	02/18/15	02/18/16
Horn Antenna 1-18GHz	ETS	3117	119	01/15/15	01/15/16
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	39	01/29/15	01/29/16
Horn Antenna 1-18GHz	ETS	3117	136	03/03/15	03/03/16
Preamp 10kHz-1000MHz	Sonoma	310	300	11/01/14	11/18/15
Preamp 1-8GHz	Miteq	AMF-4D-01000800-30-29P	782	11/18/14	11/17/15
Preamp 1-18GHz	Miteq	AFS42-00101800-25-2-42	493	01/16/15	01/16/16
Preamp 1-26.5GHz	Agilent	8449B	404	04/06/15	05/26/16
Coaxial Switchbox	Agilent	SP6T	927	03/03/15	03/03/16
Spectrum Analzer 3Hz to 44GHz	Agilent	E4446A	99	06/10/15	06/10/16
3GHz HPF	Micro-Tronics	HPM17543	486	11/18/14	11/18/15
5GHz LPF	Micro-Tronics	LPS17541	481	11/18/14	11/18/15
6GHz HPF	Micro-Tronics	HPS17542	484	11/18/14	09/16/16
EMI Test Receiver	Rohde & Schwarz	ECSI 7	284	09/16/15	11/01/16
Power Meter	Agilent	N1911A	1264	11/01/15	03/09/16
Power Sensor	Agilent	E9327A	117	03/09/15	01/16/16
LISN for Conducted Emissions	FCC	50/250-25-2	24	01/16/15	01/16/16
Antenna, Loop, 30 MHz	EMCO	6502	C00593	02/20/15	02/21/16

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 558074 D01 v03r03, Section 6.0.

6 dB BW: KDB 558074 D01 v03r03, Section 8.1.

99% BW: ANSI C63.10-2013, Section 6.9.3.

Output Power: KDB 558074 D01 v03r03, Section 9.2.3.2.

Power Spectral Density: KDB 558074 D01 v03r03, Section 10.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r03, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r03, Section 12.1.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

8. ANTENNA PORT TEST RESULTS

8.1. 802.15.4 SRAMLink MODE IN THE 2.4 GHz BAND

8.1.1. ON TIME AND DUTY CYCLE

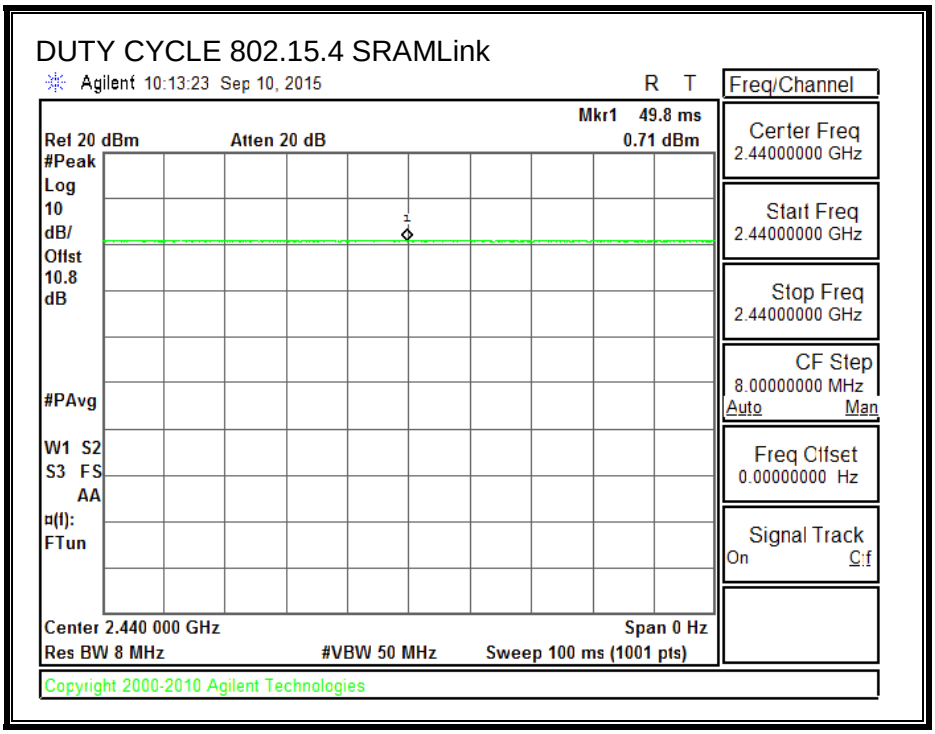
LIMITS

None; for reporting purposes only.

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)
2.4GHz Band						
802.15.4 Zigbee	10.000	10.000	1.000	100.00%	0.00	0.010

8.1.2. DUTY CYCLE PLOT



8.1.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 Clause 5.2.1

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

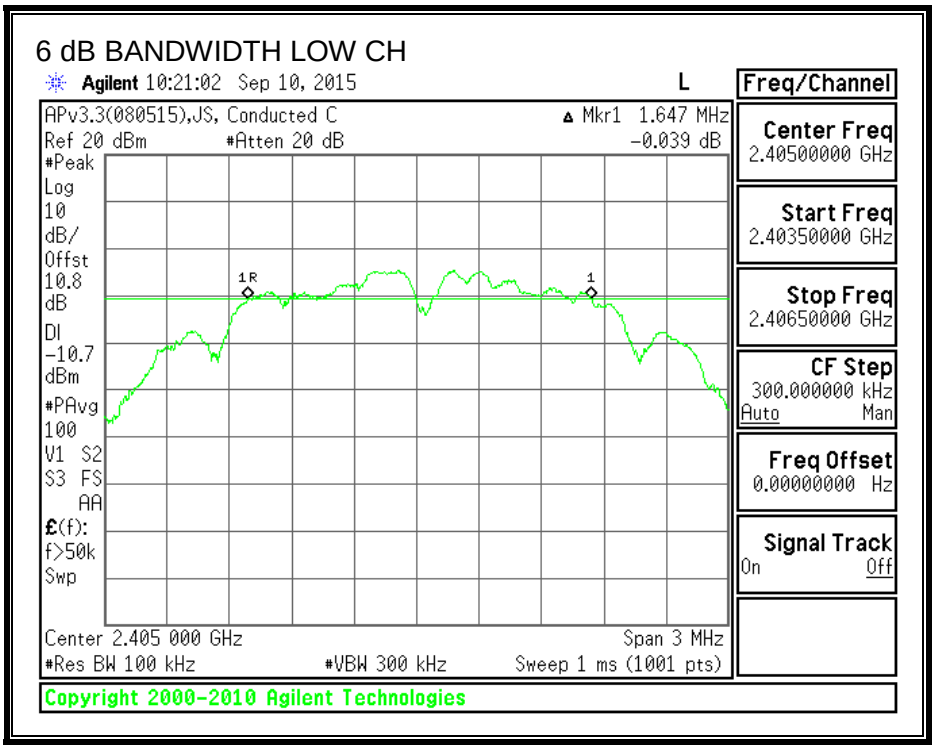
TEST PROCEDURE

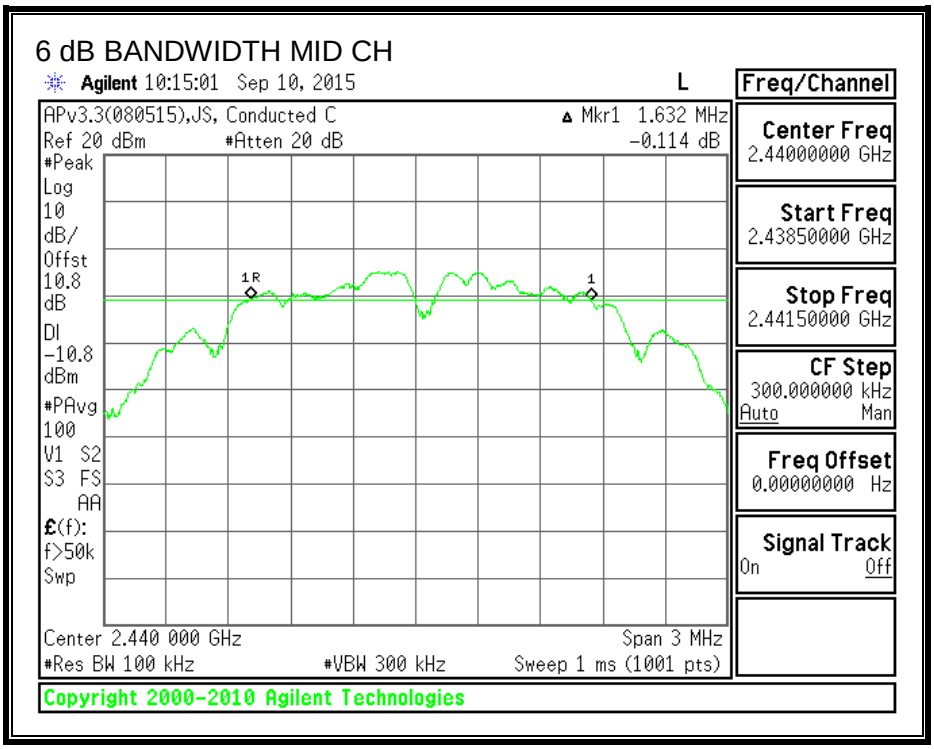
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

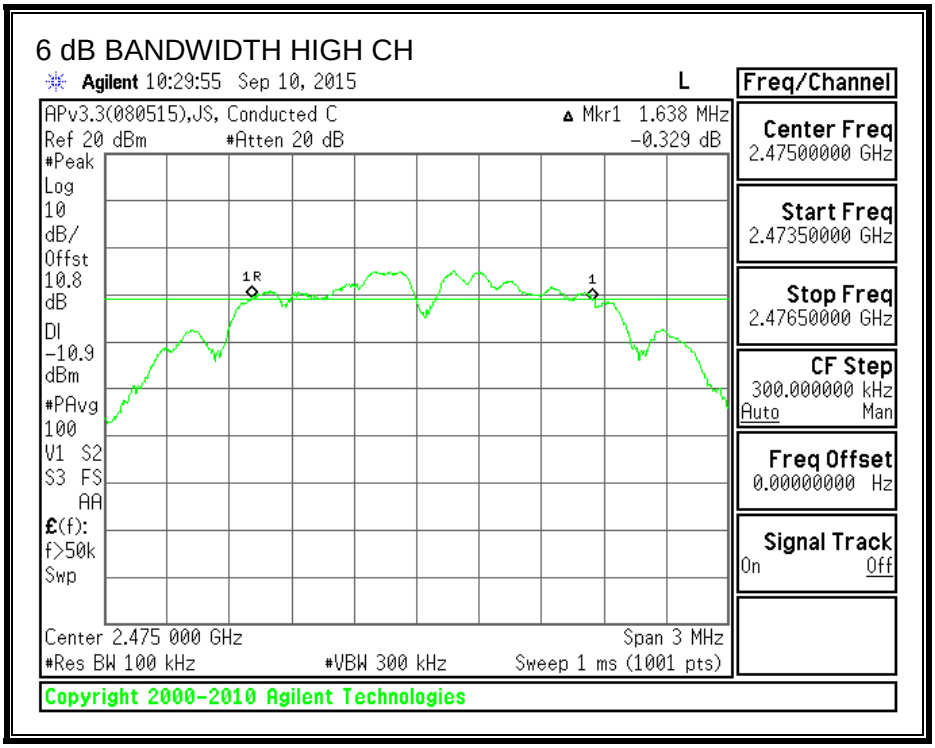
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2405	1.647	0.5
Middle	2440	1.632	0.5
High	2475	1.638	0.5

6 dB BANDWIDTH







8.1.4. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

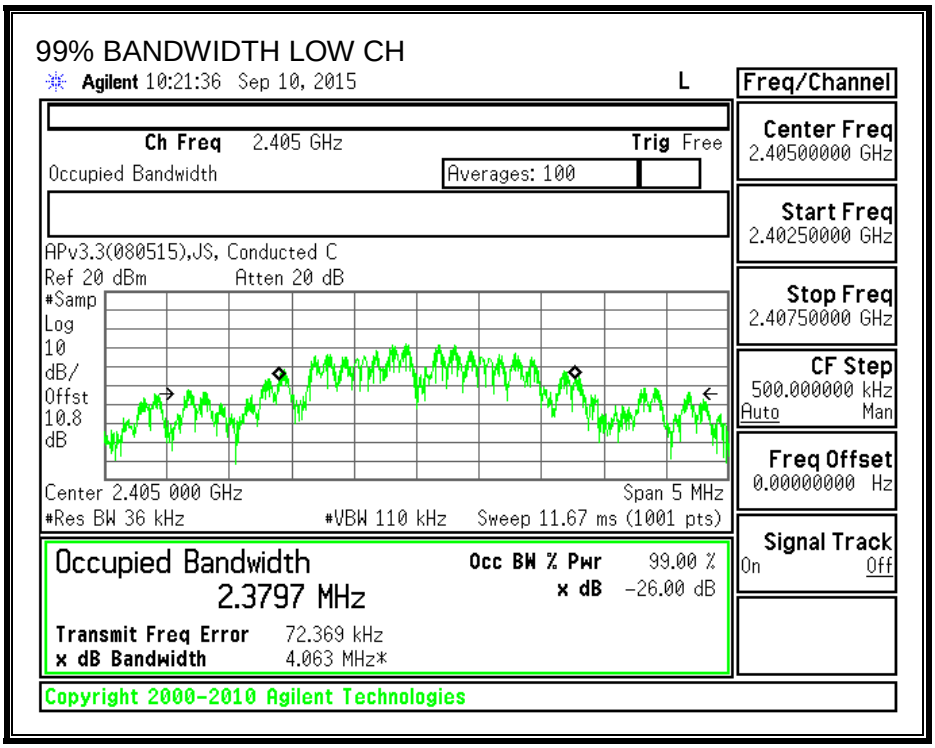
TEST PROCEDURE

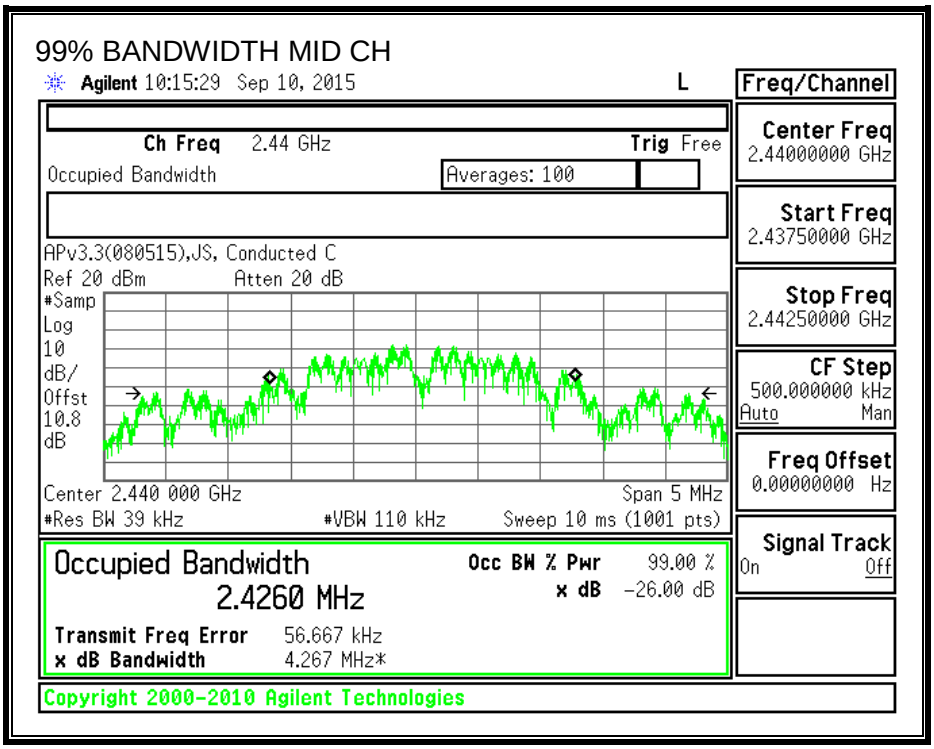
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

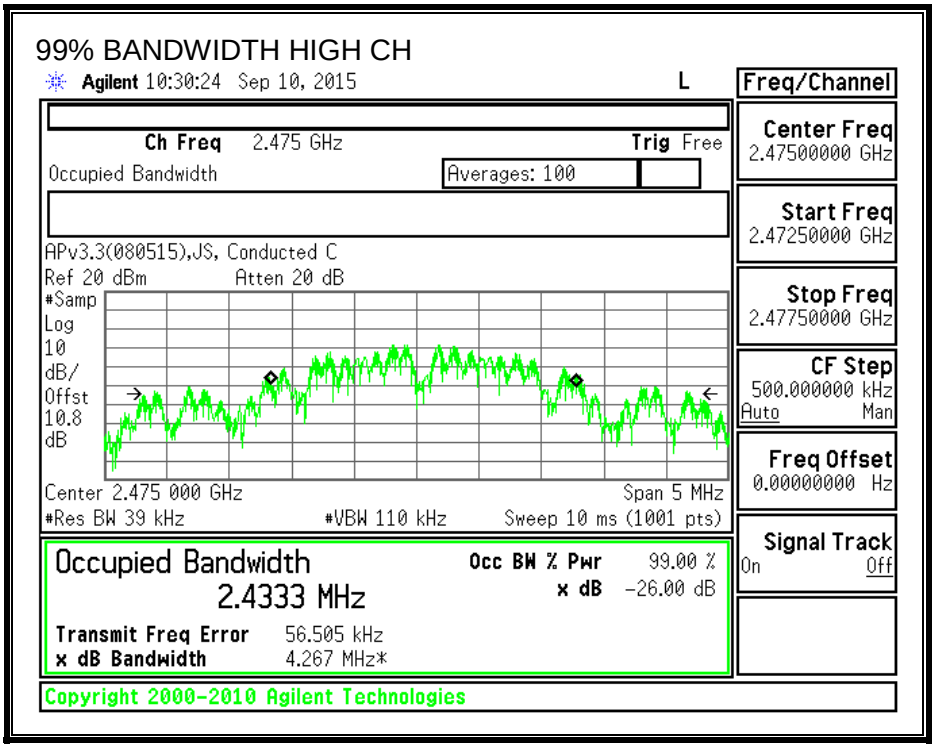
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.3797
Middle	2440	2.426
High	2475	2.4333

99% BANDWIDTH







8.1.5. AVERAGE POWER

LIMITS

FCC §15.247

IC RSS-247 Clause 5.4(4)

For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section 5.4 (5), the e.i.r.p. shall not exceed 4 W.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2405	-0.07
Middle	2440	0.10
High	2475	0.19

8.1.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

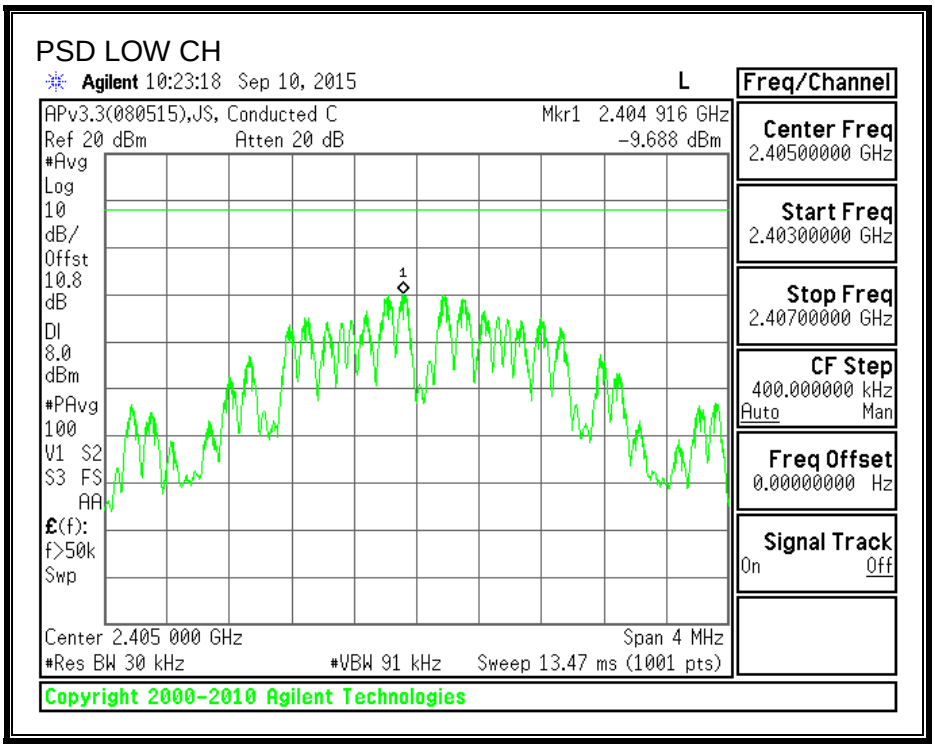
IC RSS-247 Clause 5.2.2

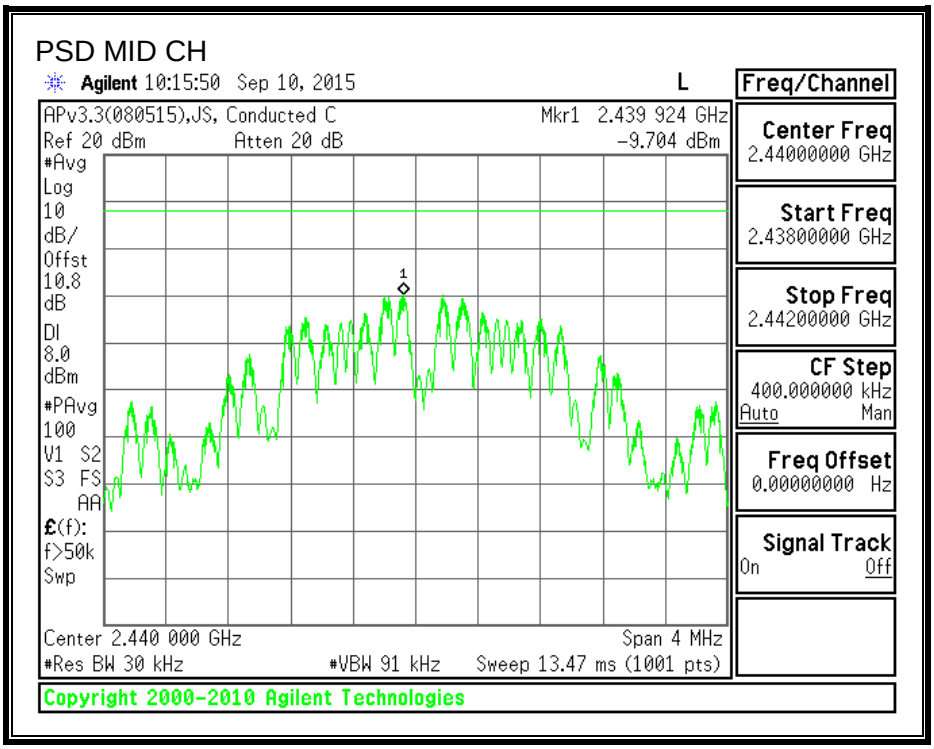
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

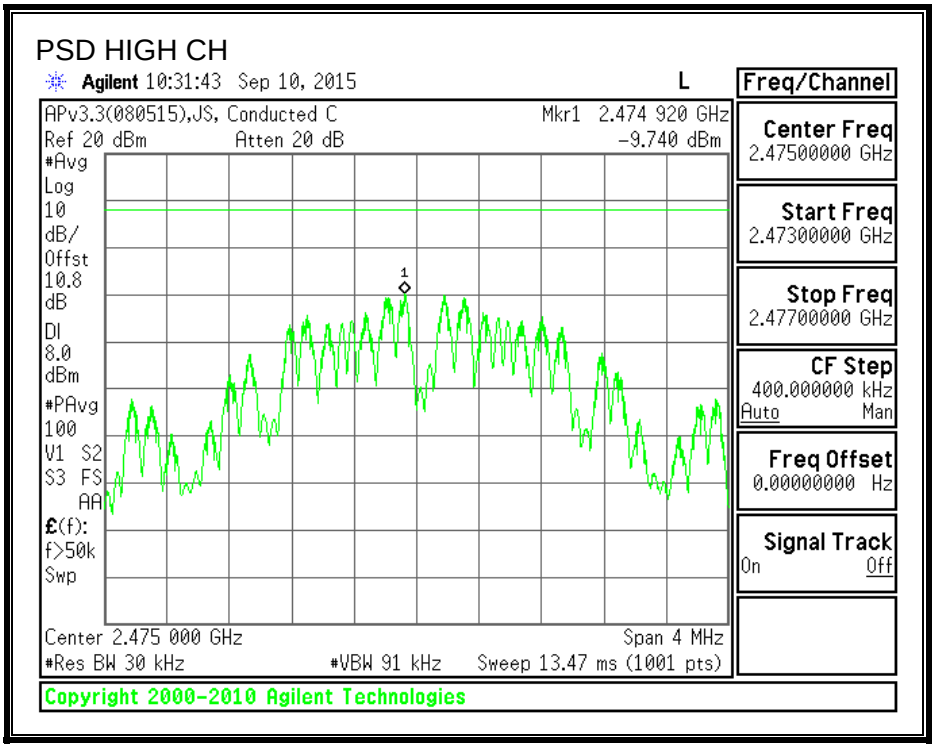
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2405	-9.69	8	-17.69
Middle	2440	-9.70	8	-17.70
High	2475	-9.74	8	-17.74

POWER SPECTRAL DENSITY





PSD HIGH CH



8.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

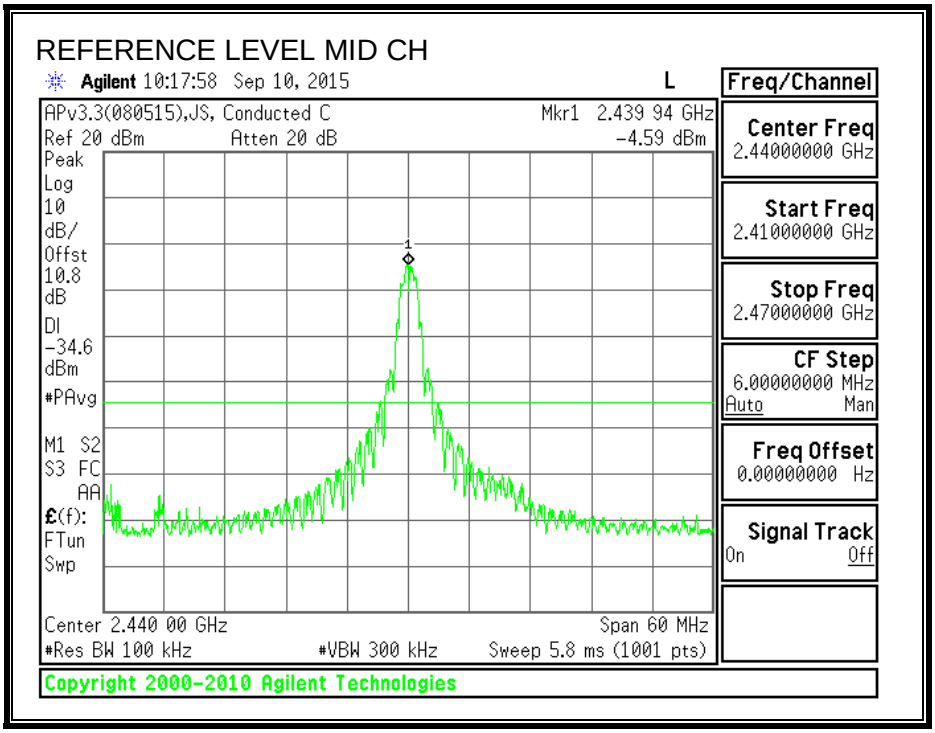
FCC §15.247 (d)

IC RSS-247 Clause 5.5

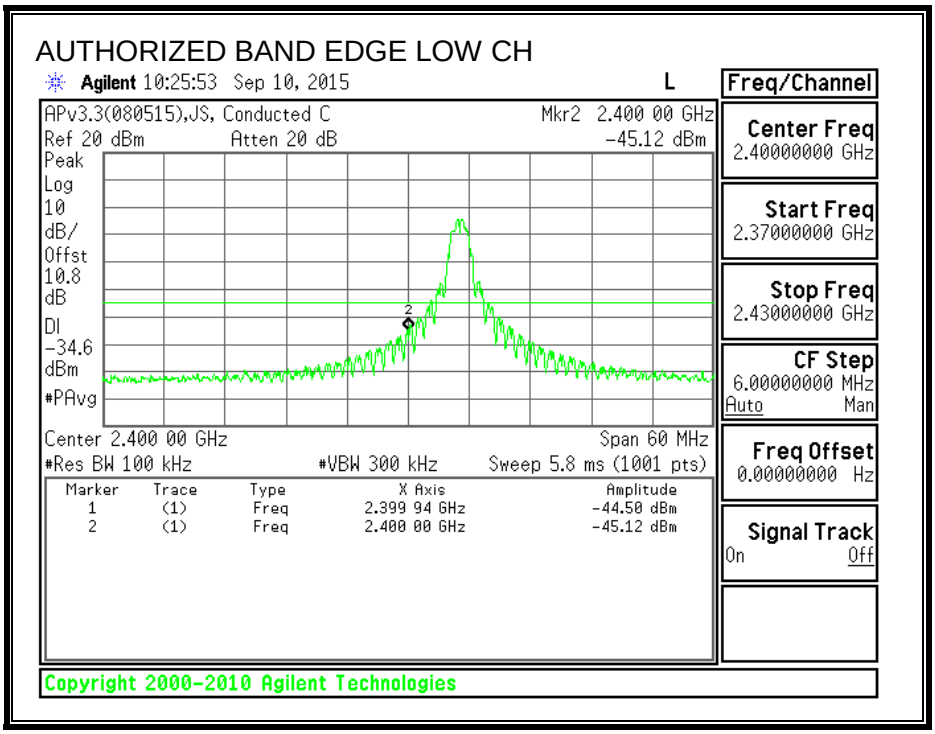
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

RESULTS

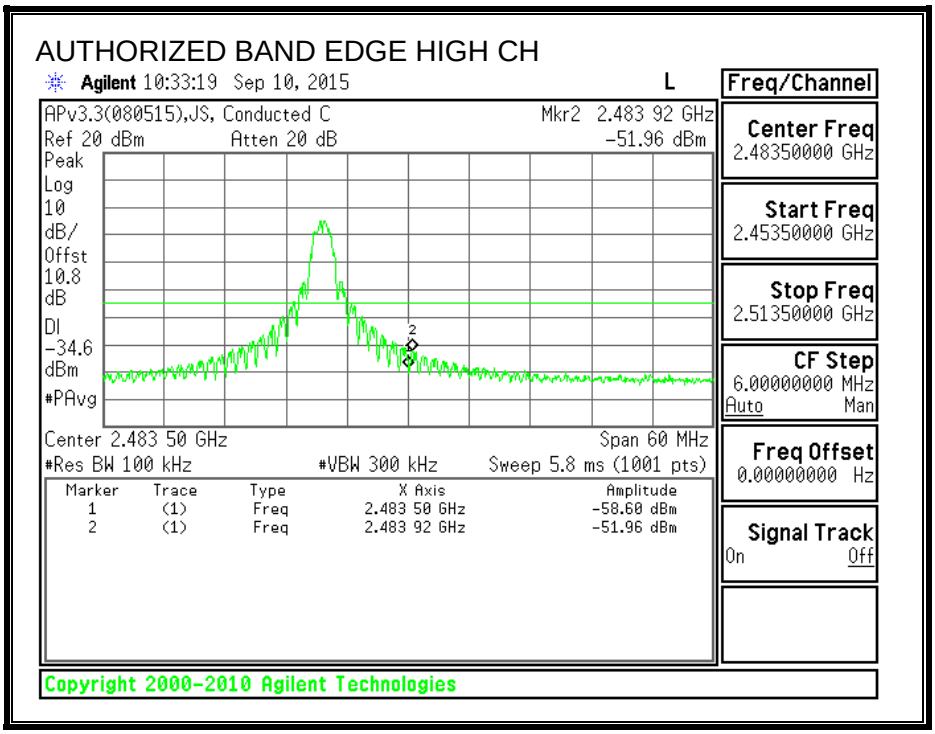
IN-BAND REFERENCE LEVEL



LOW CHANNEL BANDEDGE

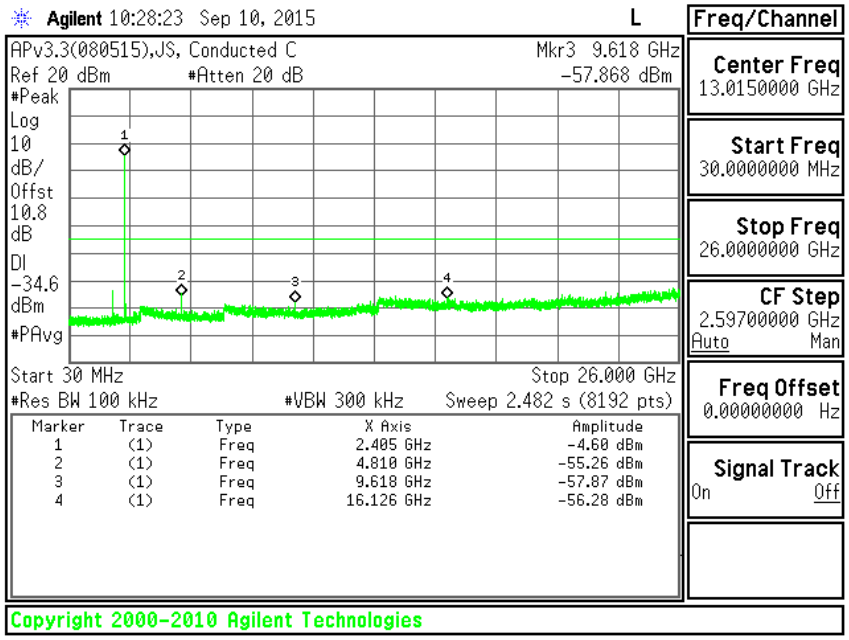


HIGH CHANNEL BANDEDGE

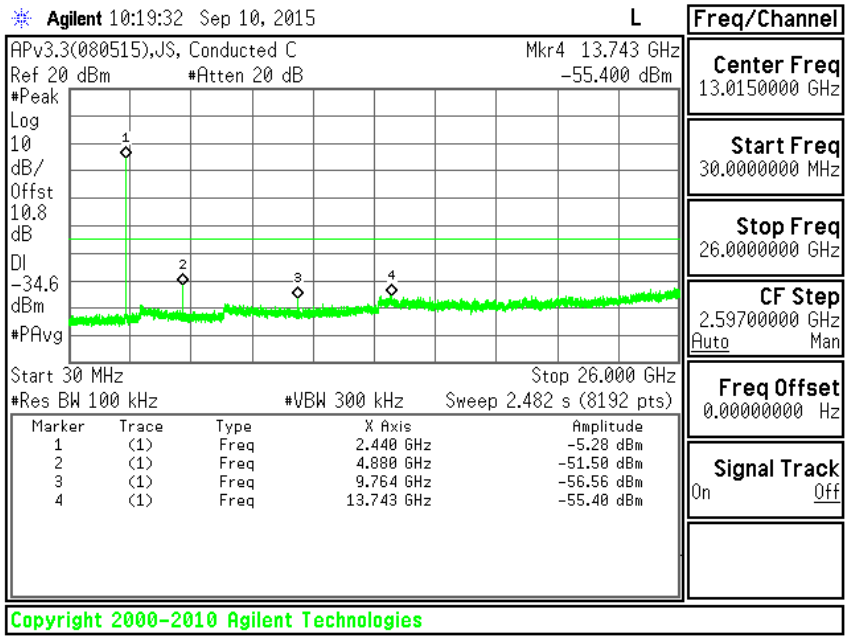


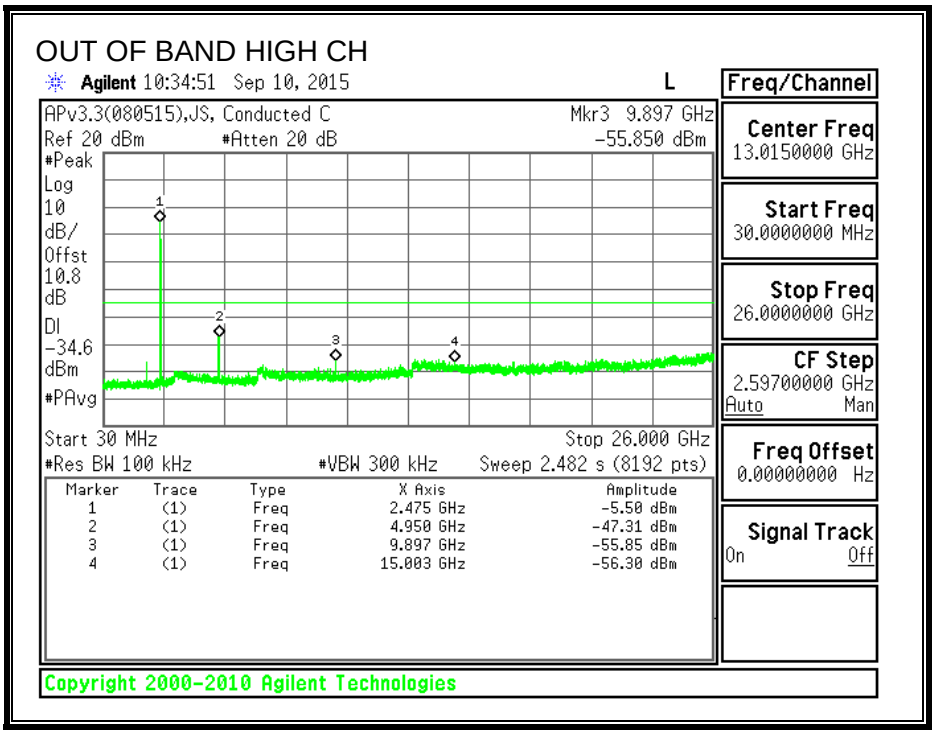
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



OUT OF BAND MID CH





9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

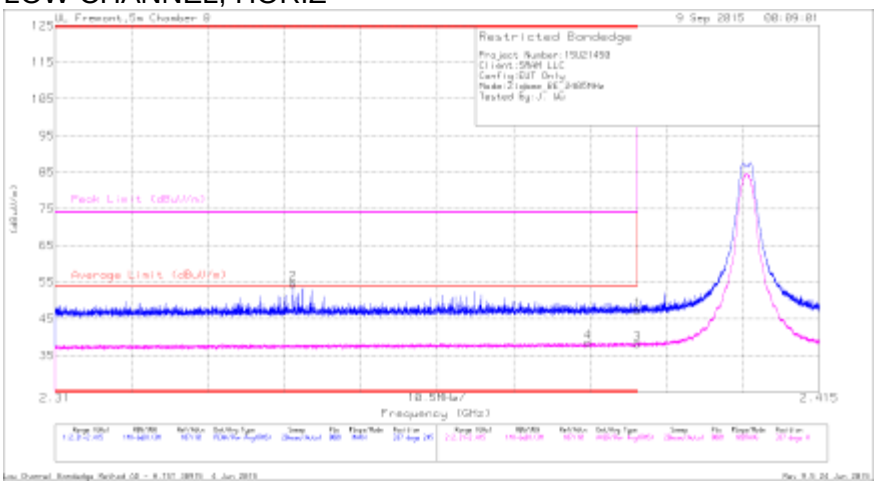
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

9.2. TRANSMITTER ABOVE 1 GHz

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

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL, HORIZ



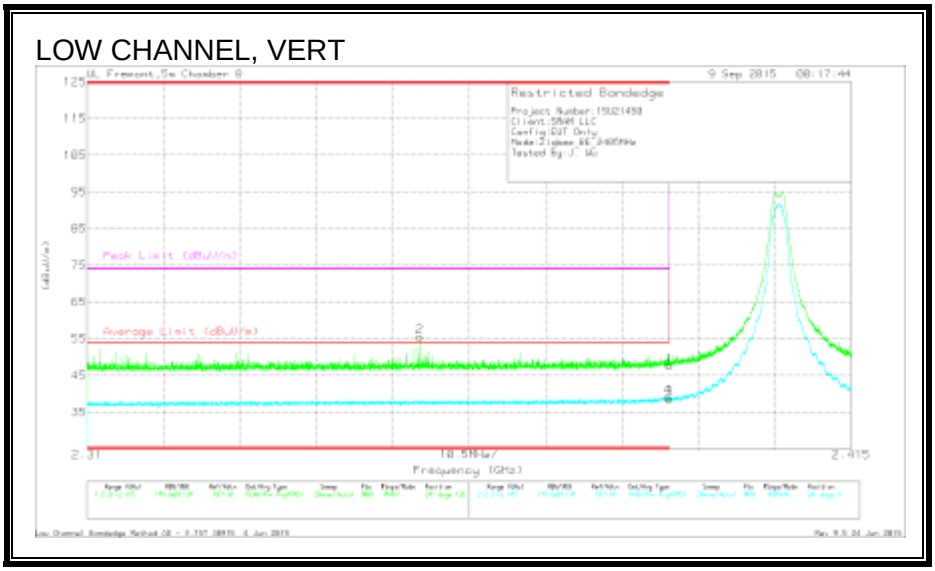
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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	39.44	Pk	32	-24.1	0	47.34	-	-	74	-26.66	337	245	H
2	* 2.343	46.98	Pk	31.8	-24.2	0	54.58	-	-	74	-19.42	337	245	H
3	* 2.39	30.37	RMS	32	-24.1	0	38.27	54	-15.73	-	-	337	245	H
4	* 2.383	30.72	RMS	32	-24.1	0	38.62	54	-15.38	-	-	337	245	H

PK - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



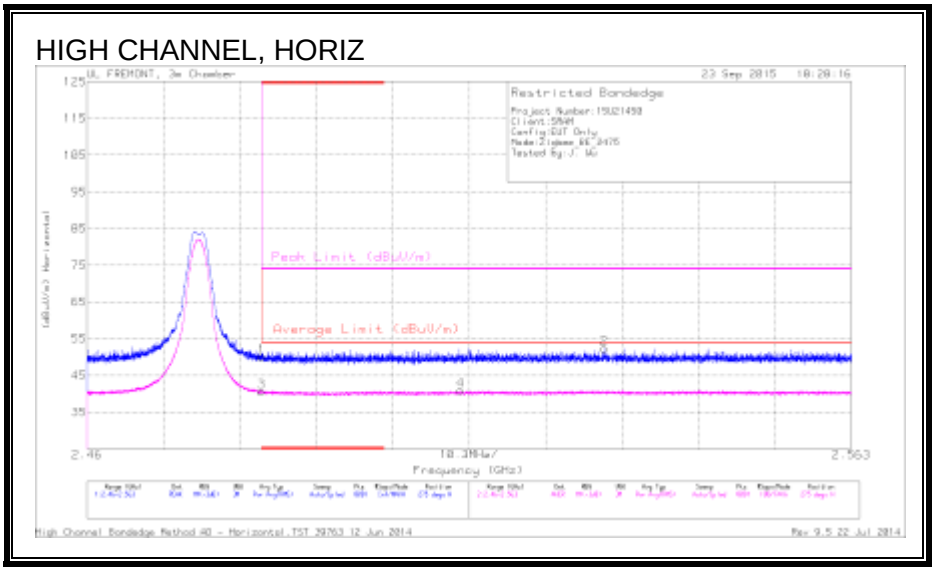
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
2	* 2.356	47.93	Pk	31.8	-24.2	0	55.53	-	-	74	-18.47	241	126	V
1	* 2.39	39.79	Pk	32	-24.1	0	47.69	-	-	74	-26.31	241	126	V
3	* 2.39	30.78	RMS	32	-24.1	0	38.68	54	-15.32	-	-	241	126	V
4	* 2.39	31.2	RMS	32	-24.1	0	39.1	54	-14.9	-	-	241	126	V

PK - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



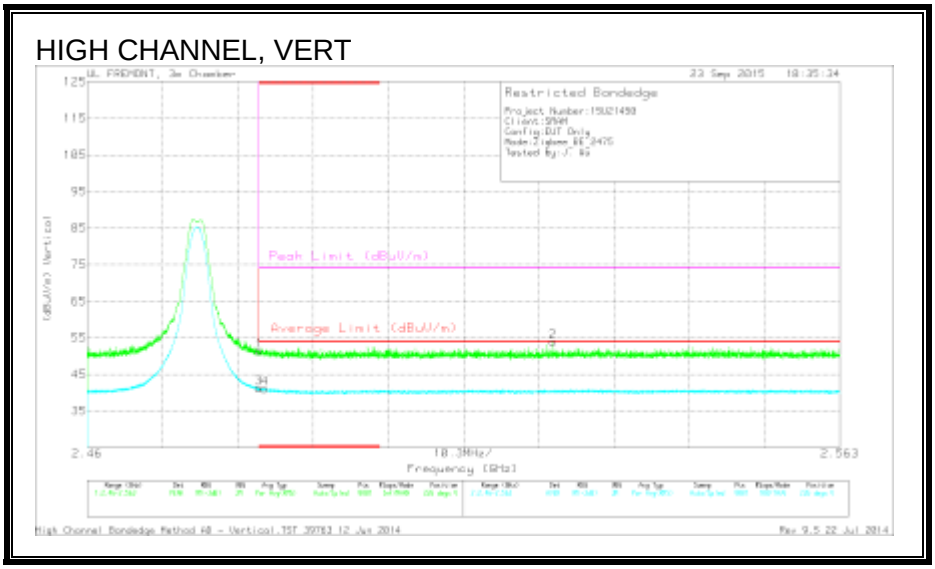
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (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	39.98	PK	32.3	-22.1	0	50.18	-	-	74	-23.82	275	373	H
3	* 2.484	30.37	RMS	32.3	-22.1	0	40.57	54	-13.43	-	-	275	373	H
4	2.51	30.82	RMS	32.3	-22.1	0	41.02	54	-12.98	-	-	275	373	H
2	2.53	42.05	PK	32.4	-22	0	52.45	-	-	74	-21.55	275	373	H

PK - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/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	41.21	PK	32.3	-22.1	0	51.41	-	-	74	-22.59	226	327	V
3	* 2.484	31.05	RMS	32.3	-22.1	0	41.25	54	-12.75	-	-	226	327	V
4	* 2.484	30.92	RMS	32.3	-22.1	0	41.12	54	-12.88	-	-	226	327	V
2	2.524	43.5	PK	32.4	-22	0	53.9	-	-	74	-20.1	226	327	V

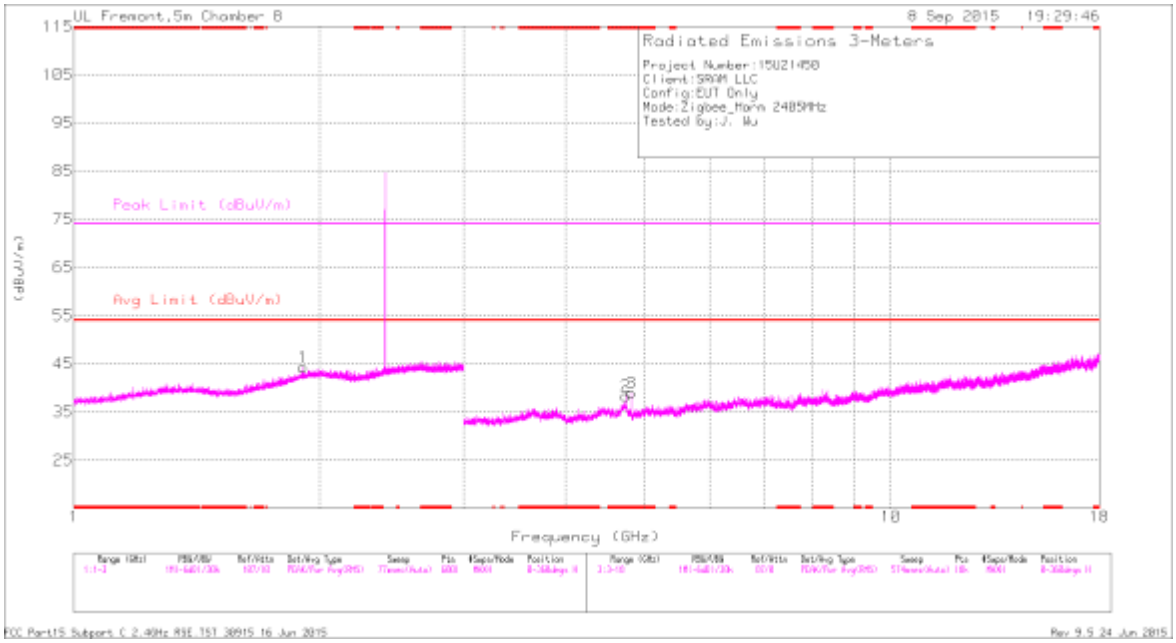
PK - Peak detector

RMS - RMS detection

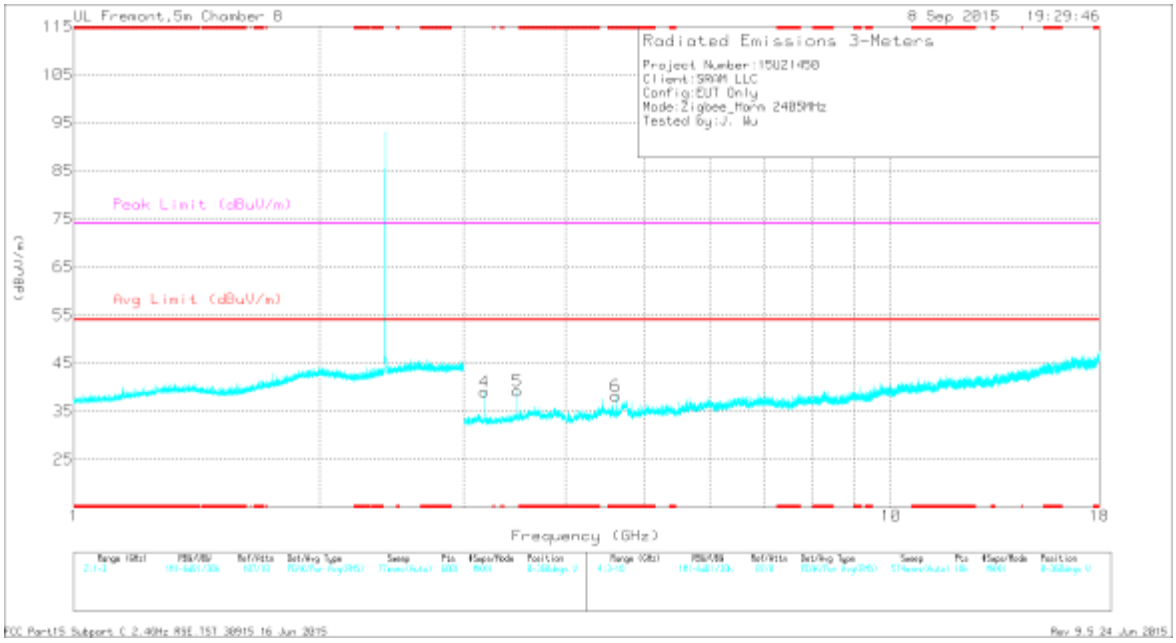
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL

HORIZONTAL



VERTICAL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
2	* 4.737	41.76	PK2	34.3	-30.7	0	45.36	-	-	74	-28.64	63	314	H
	* 4.737	30.09	MAv1	34.3	-30.7	0	33.69	54	-20.31	-	-	63	314	H
3	* 4.81	41.07	PK2	34.3	-31.2	0	44.17	-	-	74	-29.83	335	212	H
	* 4.811	28.5	MAv1	34.3	-31.2	0	31.6	54	-22.4	-	-	335	212	H
6	* 4.608	42.05	PK2	34	-32.7	0	43.35	-	-	74	-30.65	360	341	V
	* 4.608	30.72	MAv1	34	-32.7	0	32.02	54	-21.98	-	-	360	341	V
1	1.908	37.08	Pk	31.8	-24.6	0	44.28	-	-	-	-	0-360	101	H
4	3.181	38.81	Pk	32.4	-32.1	0	39.11	-	-	-	-	0-360	199	V
5	3.487	38.54	Pk	33.5	-32.8	0	39.24	-	-	-	-	0-360	199	V

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

-Compliance for emissions in non-restricted bands is shown in conducted out of band testing

PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

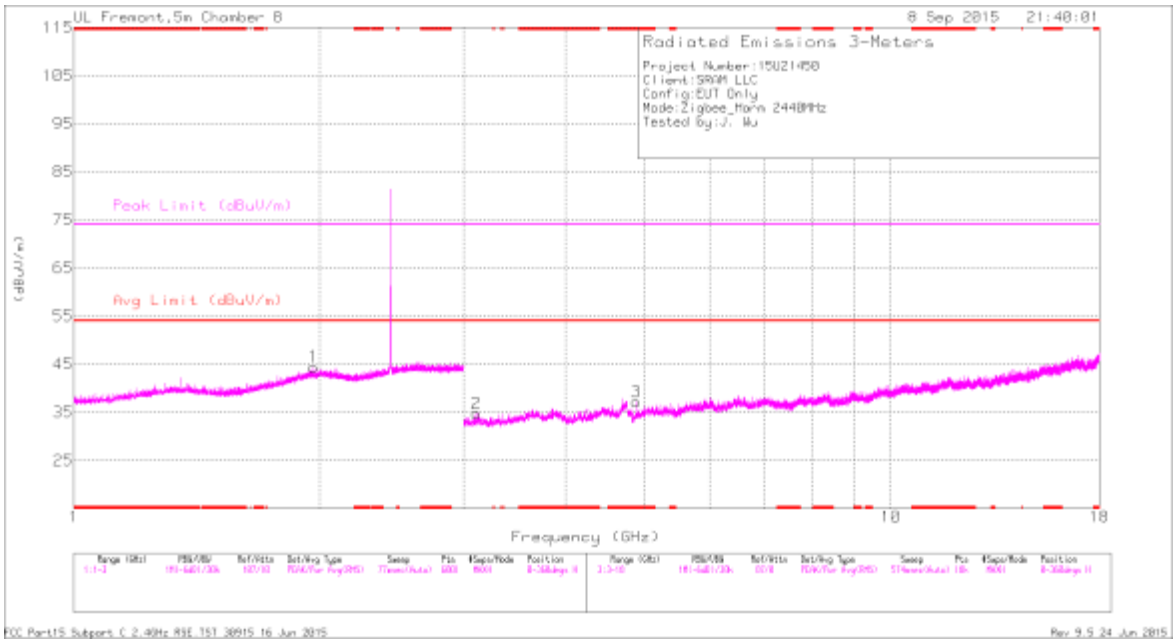
MAv1 - KDB558074 Option 1 Maximum RMS Average

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

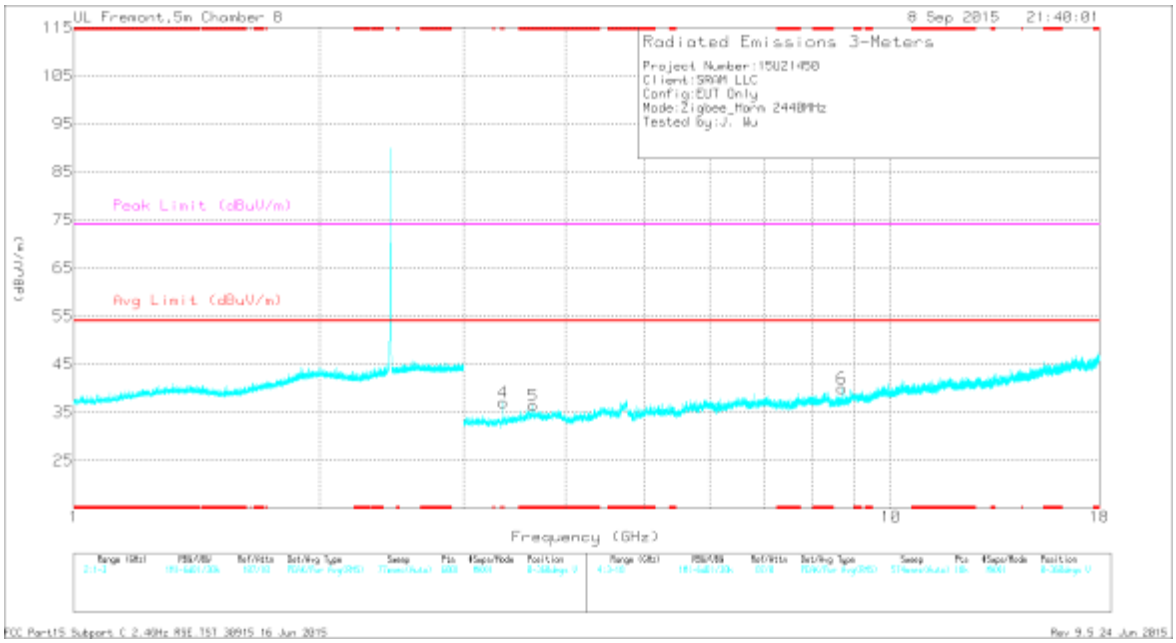
HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL

HORIZONTAL



VERTRICAL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
3	* 4.879	45.01	PK2	34.2	-32.5	0	46.71	-	-	74	-27.29	328	336	H
	* 4.879	35.18	MAv1	34.2	-32.5	0	36.88	54	-17.12	-	-	328	336	H
4	* 3.357	42.88	PK2	32.9	-32.7	0	43.08	-	-	74	-30.92	81	152	V
	* 3.355	30.14	MAv1	32.9	-32.7	0	30.34	54	-23.66	-	-	81	152	V
5	* 3.653	42.26	PK2	33.7	-32.6	0	43.36	-	-	74	-30.64	360	351	V
	* 3.653	30.25	MAv1	33.7	-32.6	0	31.35	54	-22.65	-	-	360	351	V
1	1.964	36.82	Pk	32.2	-24.5	0	44.52	-	-	-	-	0-360	101	H
2	3.107	34.99	Pk	32.7	-32.9	0	34.79	-	-	-	-	0-360	199	H
6	8.708	32.06	Pk	35.8	-27.8	0	40.06	-	-	-	-	0-360	101	V

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

-Compliance for emissions in non-restricted bands is shown in conducted out of band testing

PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

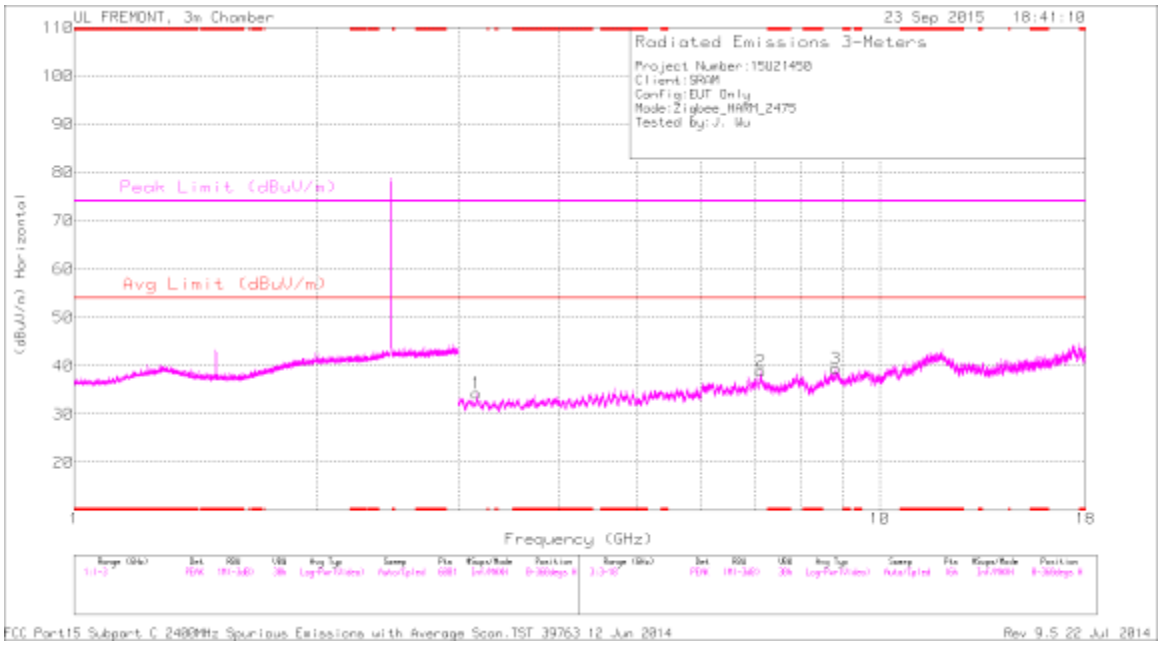
MAv1 - KDB558074 Option 1 Maximum RMS Average

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

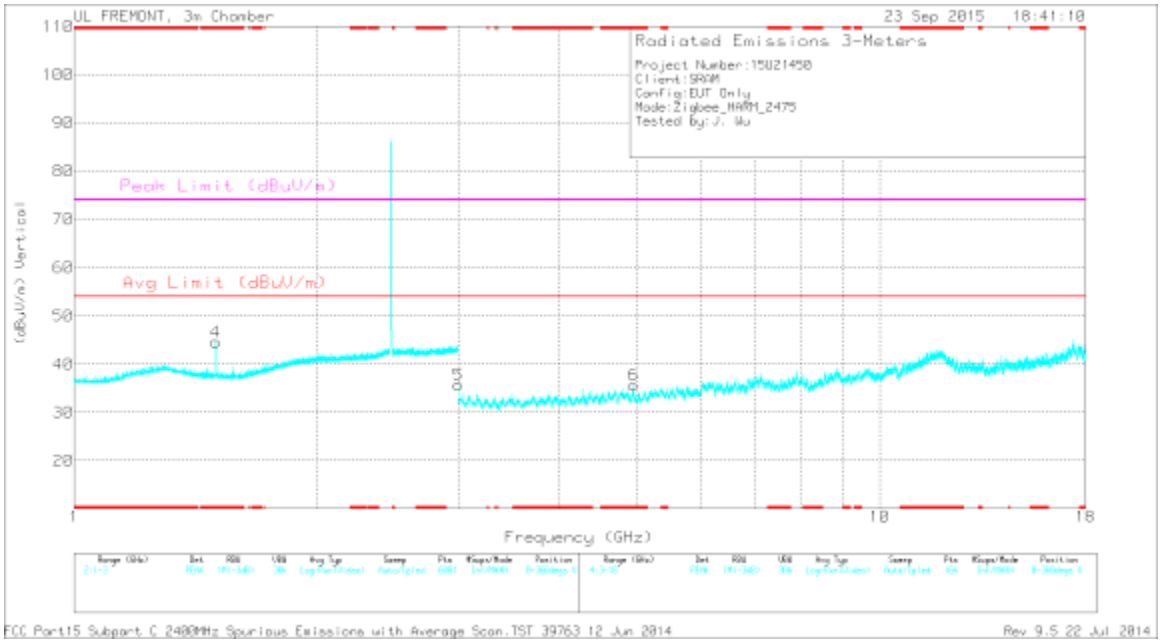
HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL

HORIZONTAL



VERTICAL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (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
4	* 1.5	45.87	PK2	28.1	-22.9	0	51.07	-	-	74	-22.93	195	213	V
	* 1.5	37.13	MAv1	28.1	-22.9	0	42.33	54	-11.67	-	-	195	213	V
6	* 4.949	43.09	PK2	34	-30.1	0	46.99	-	-	74	-27.01	136	242	V
	* 4.949	32.05	MAv1	34	-30.1	0	35.95	54	-18.05	-	-	136	242	V
5	3	33.44	PK	32.7	-30.4	0	35.74	-	-	-	-	0-360	200	V
1	3.16	32.01	PK	32.7	-30.4	0	34.31	-	-	-	-	0-360	200	H
2	7.123	30.67	PK	35.6	-27.4	0	38.87	-	-	-	-	0-360	200	H
3	8.819	28.9	PK	35.9	-25.3	0	39.5	-	-	-	-	0-360	100	H

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

-Compliance for emissions in non-restricted bands is shown in conducted out of band testing

PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

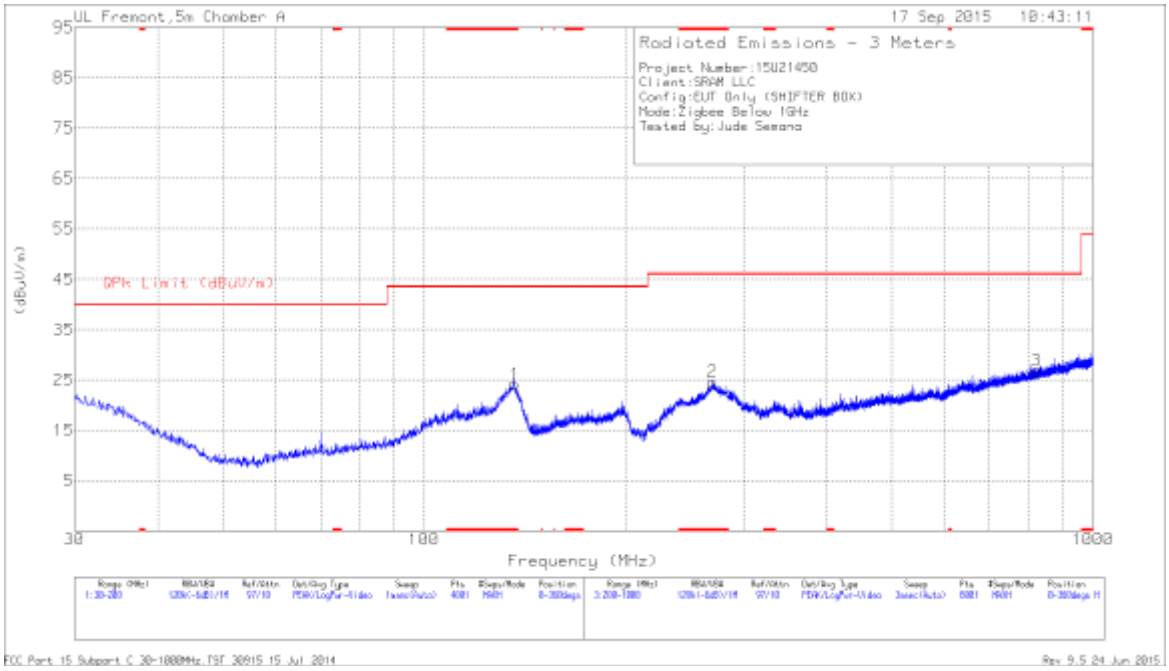
MAv1 - KDB558074 Option 1 Maximum RMS Average

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

9.3. WORST-CASE BELOW 1 GHz

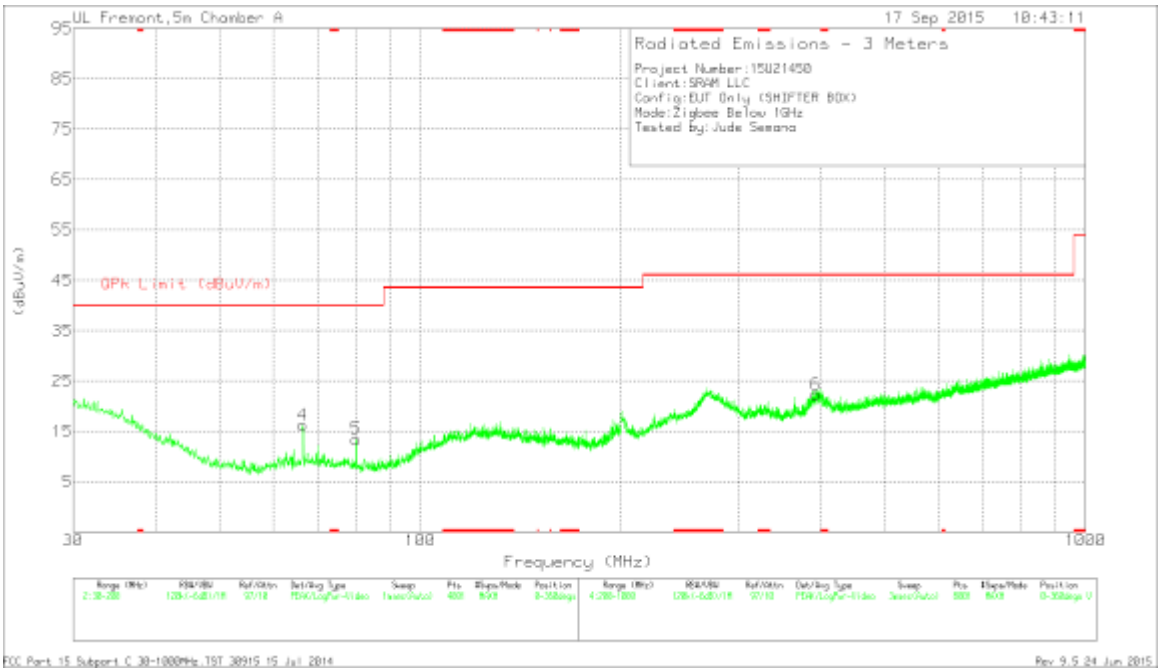
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



Trace Markers

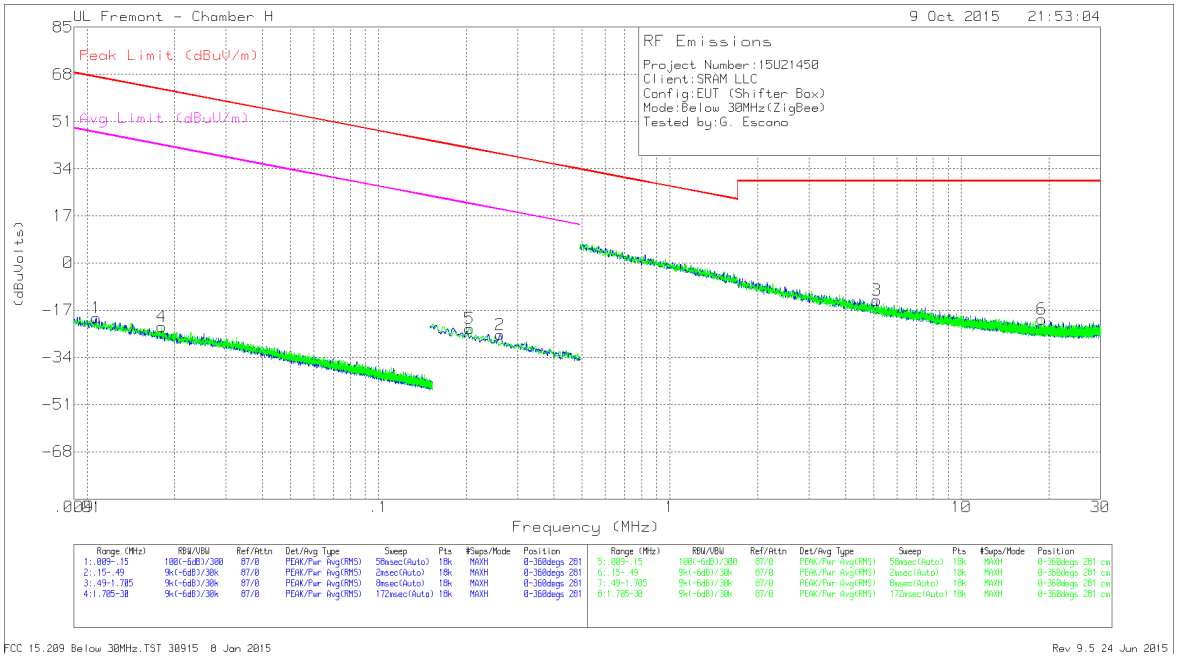
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 136.5475	37.23	Pk	17.2	-30.3	24.13	43.52	-19.39	0-360	399	H
2	* 270	37.07	Pk	17.1	-29.5	24.67	46.02	-21.35	0-360	101	H
4	66.5075	35.38	Pk	11.8	-30.9	16.28	40	-23.72	0-360	101	V
5	79.98	32.77	Pk	11.4	-30.7	13.47	40	-26.53	0-360	101	V
6	393.4	32.2	Pk	19.3	-29.1	22.4	46.02	-23.62	0-360	299	V
3	823.4	29.15	Pk	25.6	-27.9	26.85	46.02	-19.17	0-360	399	H

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

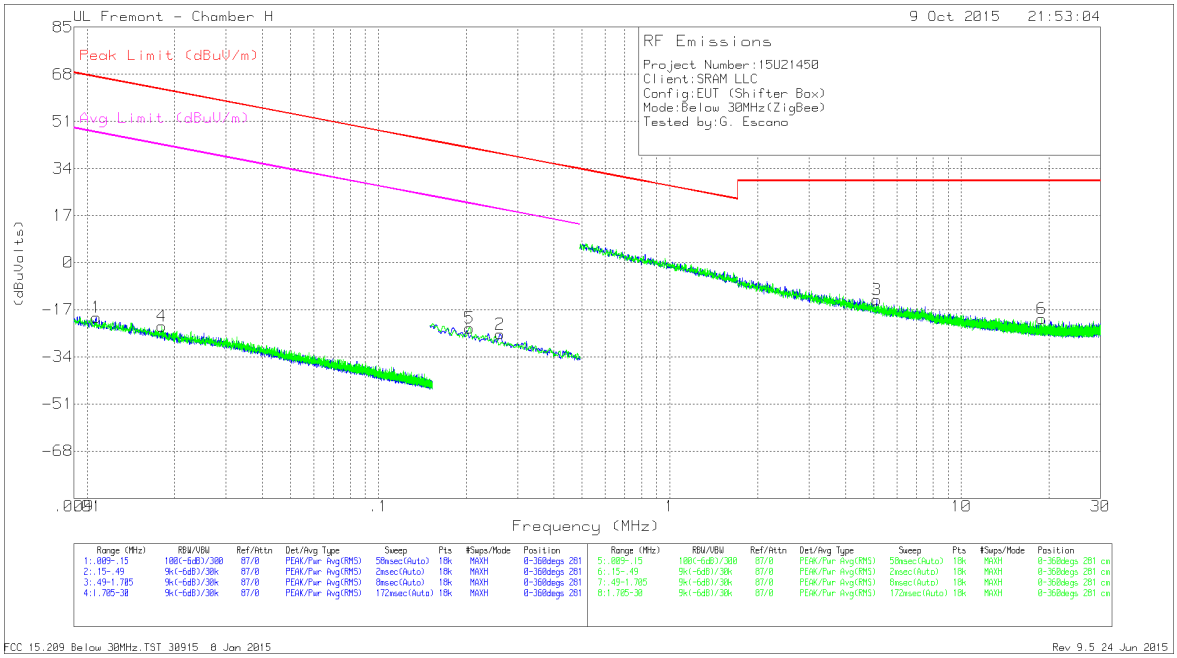
Pk - Peak detector

9.4. RADIATED EMISSION BELOW 30MHz

LOOP ANTENNA FACE ON



LOOP ANTENNA FACE OFF



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01076	41.67	Pk	18.5	.1	-80	-19.73	66.97	-86.7	46.97	-66.7	0-360
4	.01806	41.41	Pk	15.6	.1	-80	-22.89	62.47	-85.36	42.47	-65.36	0-360
5	.20534	45.89	Pk	10.5	.1	-80	-23.51	41.36	-64.87	21.36	-44.87	0-360
2	.2615	43.83	Pk	10.3	.1	-80	-25.77	39.26	-65.03	19.26	-45.03	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
3	5.13353	15.74	Pk	10.5	.3	-40	-13.46	29.54	-43	-	-	0-360
6	18.86495	9.22	Pk	9.9	.6	-40	-20.28	29.54	-49.82	-	-	0-360

Pk - Peak detector
FCC 15.209 Below 30MHz.TST 30915 8 Jan 2015
Rev 9.5 24 Jun 2015