



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY (ISED) CANADA RSS-247 ISSUE 2**

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

WIRELESS HEADSET

MODEL NUMBER: 425948

FCC ID: A94425948

IC: 3232A-425948

REPORT NUMBER: R11602267-E3

ISSUE DATE: MARCH 23, 2017

**Prepared for
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NVLAP LAB CODE 200246-0

Revision History

<u>Ver.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
1	2017-03-23	Initial Issue	Brian Kiewra
2	2017-06-06	Updated RSS-247 to Issue 2	Brian Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Bose Corporation
100 The Mountain
Framingham, MA 01701 USA

EUT DESCRIPTION: Wireless Headset

MODEL: 425948

SERIAL NUMBER: DP1-A320 and DP1-N001

DATE TESTED: 2017-03-03 to 2017-03-10

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 2	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

UL LLC 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 LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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, or any agency of the U.S. Government.

Approved & Released
For UL LLC By:



Chin Pang
WISE Senior Engineer
UL – Consumer Technology Division

Prepared By:



Brian T. Kiewra
EMC Engineer
UL – Consumer Technology Division

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v03r05, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA.

12 Laboratory Dr., RTP, NC 27709
<input type="checkbox"/> Chamber A
<input type="checkbox"/> Chamber C

2800 Suite B Perimeter Park Dr., Morrisville, NC 27560
<input checked="" type="checkbox"/> Chamber NORTH
<input type="checkbox"/> Chamber SOUTH

The onsite chambers (A & C) are covered under Industry Canada company address code 2180C with site numbers 2180C -1 through 2180C-2, respectively.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <http://www.nist.gov/nvlap/>.

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
RF output power, conducted	±0.45 dB
Power Spectral Density, conducted	±1.50 dB
Unwanted Emissions, conducted	±2.94 dB
All emissions, radiated	±5.36 dB
Conducted Emissions (0.150 – 30MHz)	±3.65 dB
Temperature	±0.07 °C
Humidity	±2.26 %
DC and Low Frequency Voltages	±1.27 %

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth/Bluetooth Low Energy transceiver.

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	4.19	2.62

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an inverted-f antenna, with a maximum gain of 3.204 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 1.2.8.439M

The EUT driver software installed in the host support equipment during testing was 2.4.0.0

The test utility software used during testing was CSR BlueSuite, rev. 2.6.4.

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

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	T450s	PC-0A2UQS 16/01	NA
Power Supply	Lenovo	ADLX65NLC2A	11S45N0259Z1Z9743D21T	NA

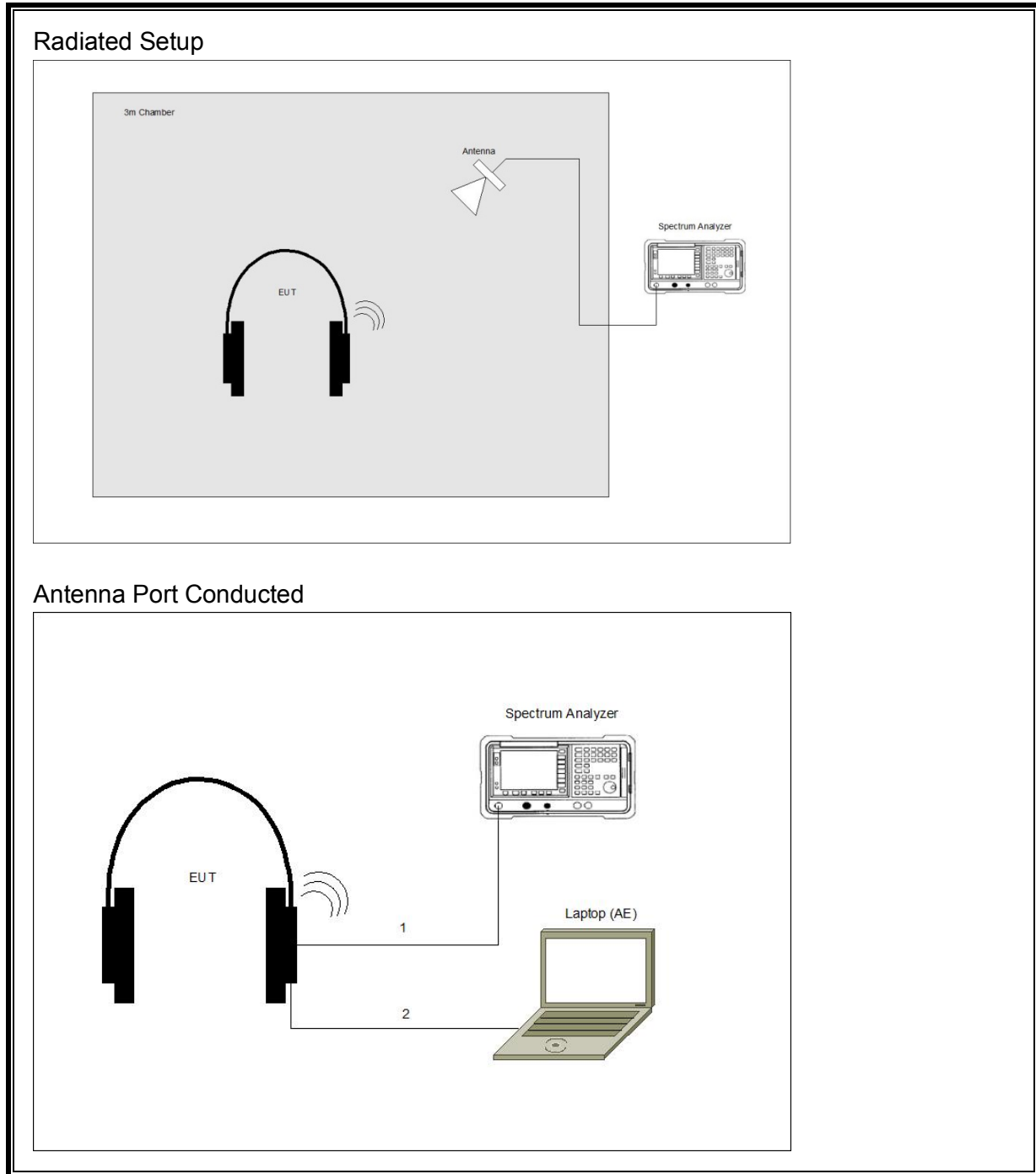
I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	RF	<3m	None
2	USB	1	μUSB	USB	<3m	Used to configure EUT

TEST SETUP

The EUT is installed as a standalone device.

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 Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	0.009-30MHz	(Loop Ant.)			
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2016-12-28	2017-12-31
	30-1000 MHz				
AT0073	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2016-06-27	2017-06-30
	1-18 GHz				
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2016-03-07	2017-03-31
	18-40 GHz				
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2016-09-06	2017-09-06
	Gain-Loss Chains				
N-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2016-10-04	2017-10-04
N-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2016-06-26	2017-06-30
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2016-08-28	2017-08-28
N-SAC04	Gain-loss string: 18-40GHz	Various	Various	2016-04-27	2017-04-30
	Receiver & Software				
SA0026	Spectrum Analyzer	Agilent	N9030A	2017-02-17	2018-07-28
SA0025 (18-40GHz)	Spectrum Analyzer	Agilent	N9030A	2016-03-17	2017-03-31
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Conducted Room 1					
72822 (SA0019)	Spectrum Analyzer	Agilent Technologies	E4446A	2016-08-25	2017-08-25
PWM004	RF Power Meter	Keysight Technologies	N1911A	2016-06-22	2017-06-22
PWS003	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2016-06-21	2017-06-21
139843	Temp/Humid/Pressure Meter	Control Co./Fisher	14-650-118	2016-02-19	2017-02-19
76022	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	N/A	N/A

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL077	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3476-240	2016-06-15	2017-06-30
HI0081	Environmental Meter	Springfield	91905	2016-04-26	2017-04-26
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2016-08-24	2017-08-24
PRE0101521 (75141)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2016-08-23	2017-08-23
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2016-06-09	2017-06-30
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Miscellaneous (if needed)					
MM0168	Multi-meter	Agilent	U1232A	2016-10-07	2017-10-31
CDECABLE001	ANSI C63.4 1m extension cable.	UL	Per Annex B of ANSI C63.4	2016-06-04	2017-06-30
LISN008	LISN, 50-ohm/50-uH, 2-conductor, 25A (For support gear only.)	Solar Electronics	8012-50-R-24-BNC	2016-10-31	2017-10-31

7. MEASUREMENT METHODS

Duty Cycle: KDB 558074 D01 v03r05 Section 6.0

6 dB BW: KDB 558074 D01 v03r05, Section 8.1.

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

Output Power: KDB 558074 D01 v03r05, Section 9.1.2

Power Spectral Density: KDB 558074 D01 v03r05, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r05, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r05, Section 12.1.

General Radiated Emissions: ANSI C63.10:2013 Sections 6.3-6.6

Line Conducted Emissions: ANSI C63.10:2013 Sections 6.2

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

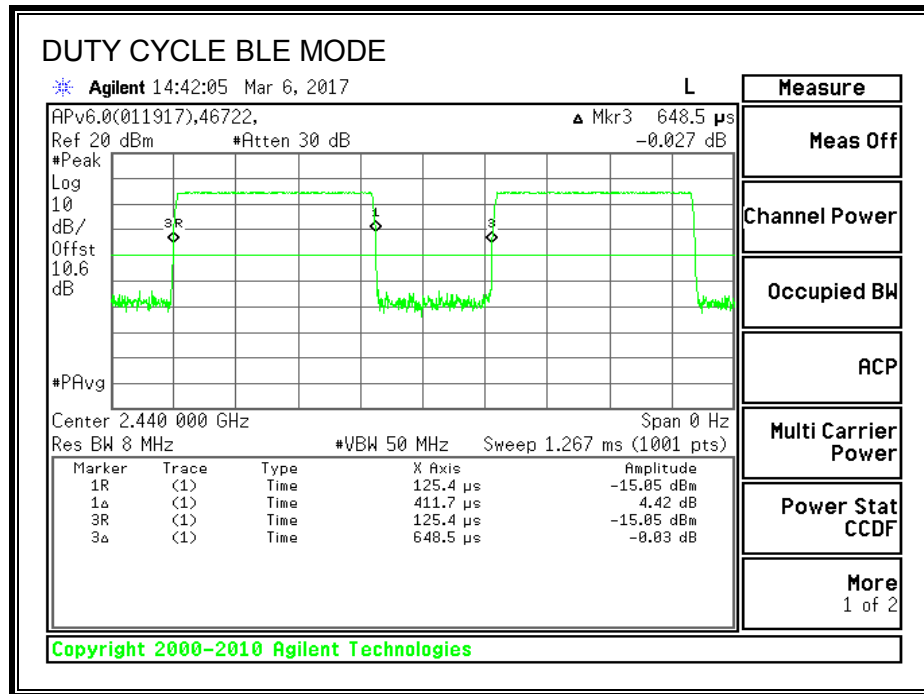
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

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	0.4117	0.4685	0.879	87.88%	0.56	2.429

DUTY CYCLE PLOTS



Test Information

Test Date: 2017-03-06

Project: 11602267

Tester: John Manser

**8.2. 6 dB BANDWIDTH
LIMITS**

FCC §15.247 (a) (2)

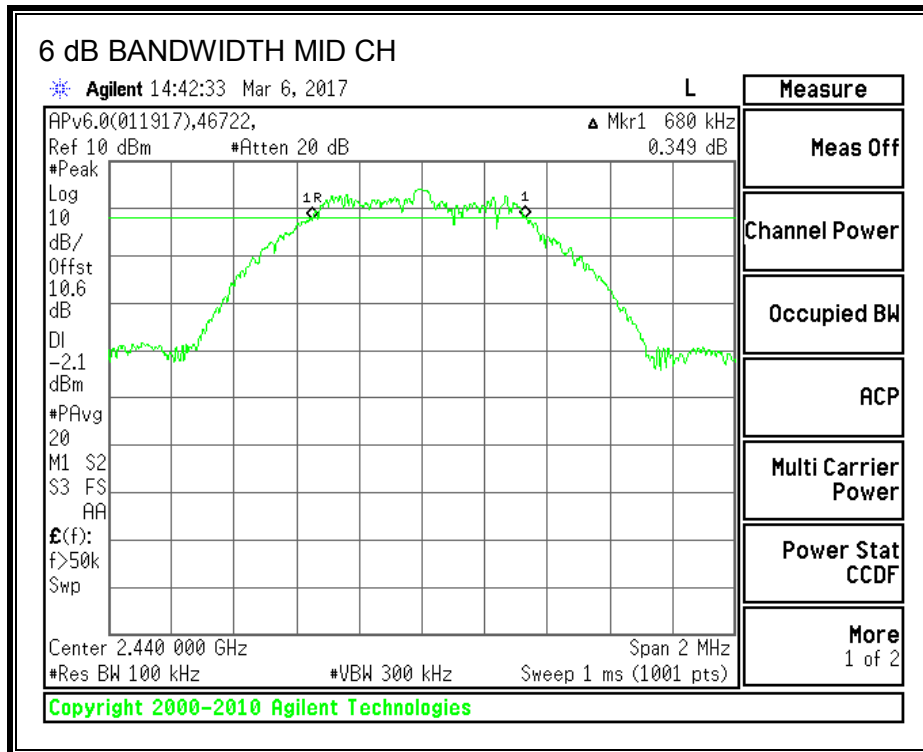
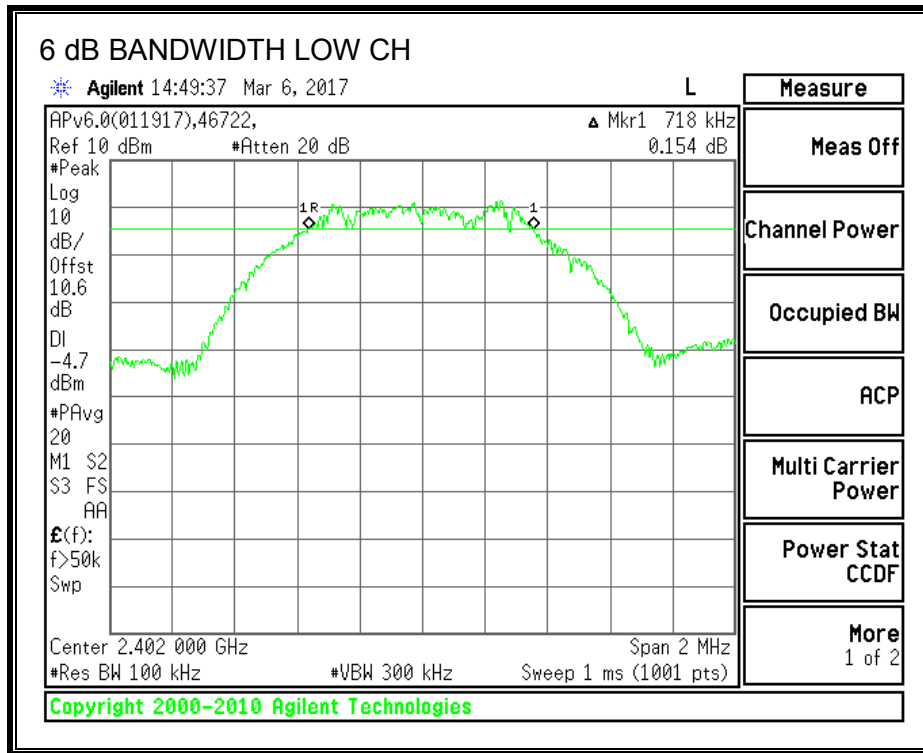
IC RSS-247 5.2 (1)

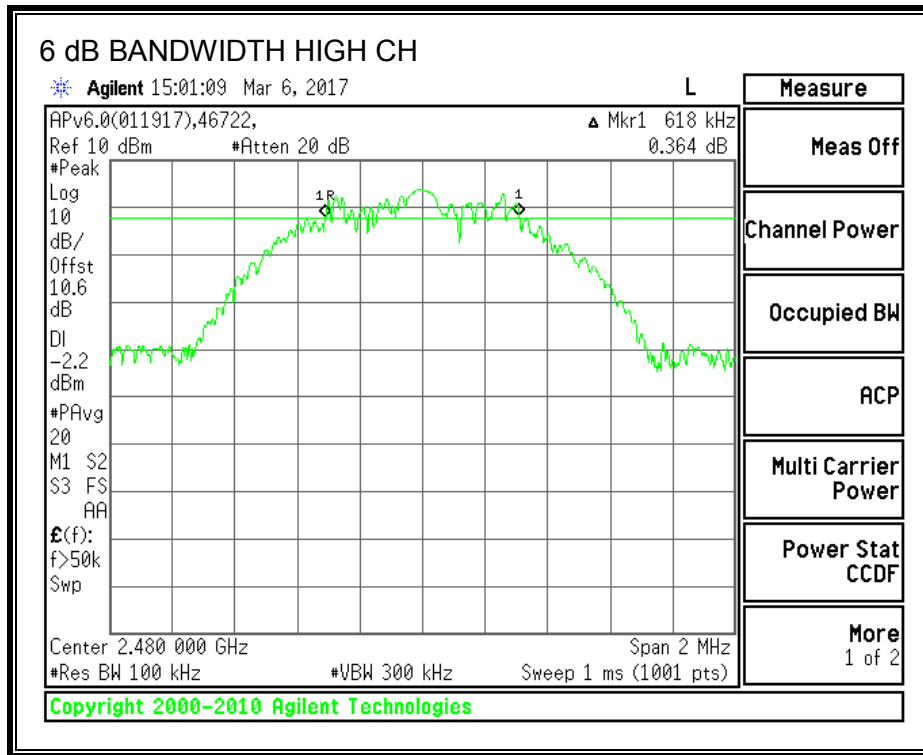
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7180	0.5
Middle	2440	0.6800	0.5
High	2480	0.6180	0.5

6 dB BANDWIDTH





Test Information

Test Date: 2017-03-06

Project: 11602267

Tester: John Manser

**8.3. 99% BANDWIDTH
LIMITS**

None; for reporting purposes only.
Testing per RSS-Gen Clause 6.6.

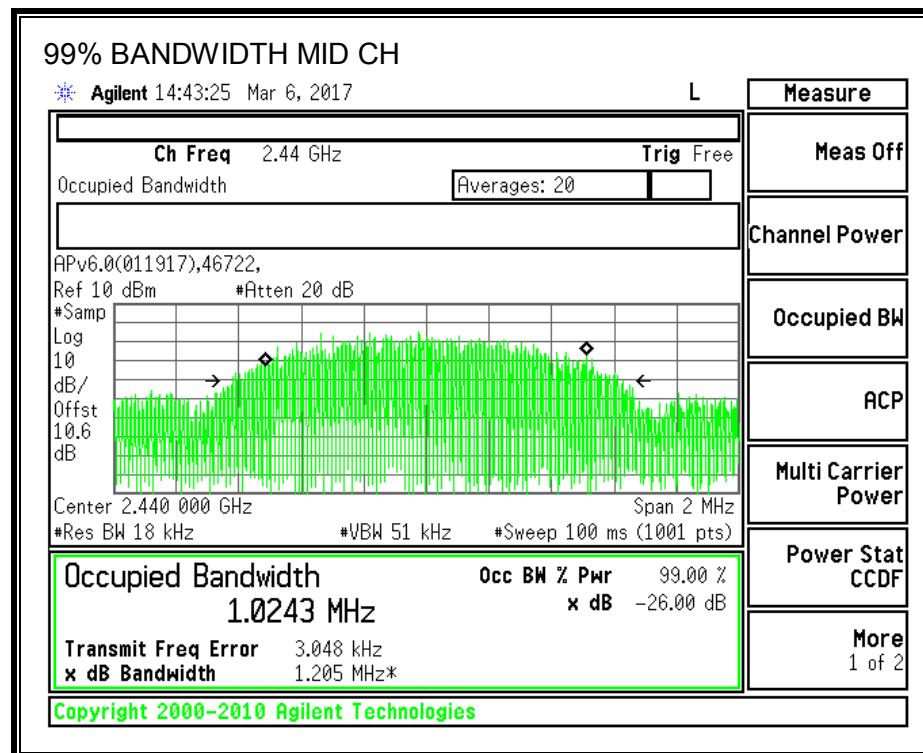
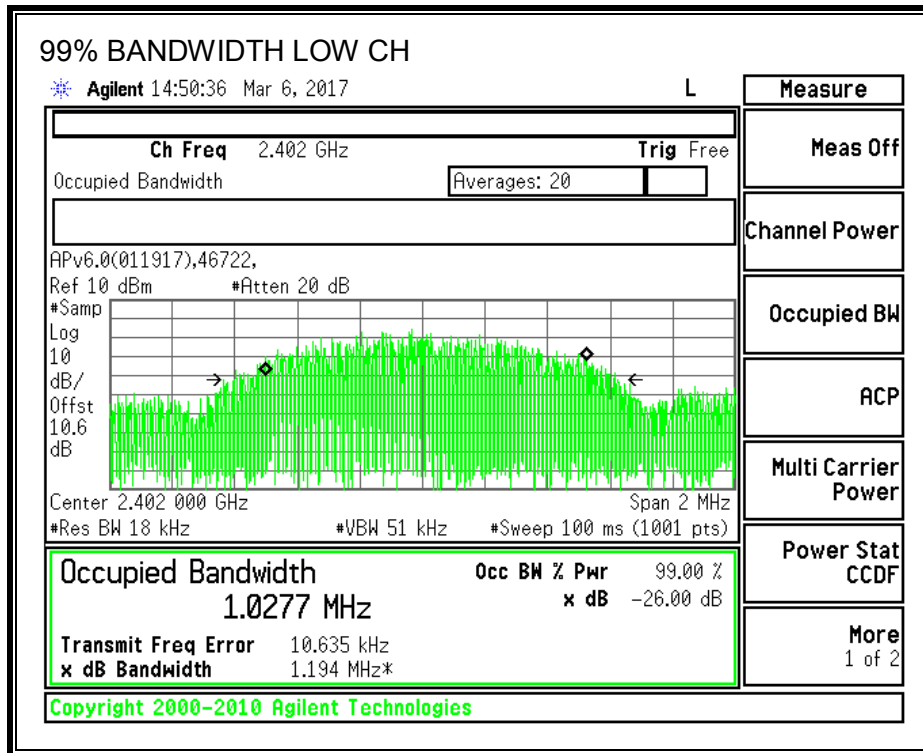
TEST PROCEDURE

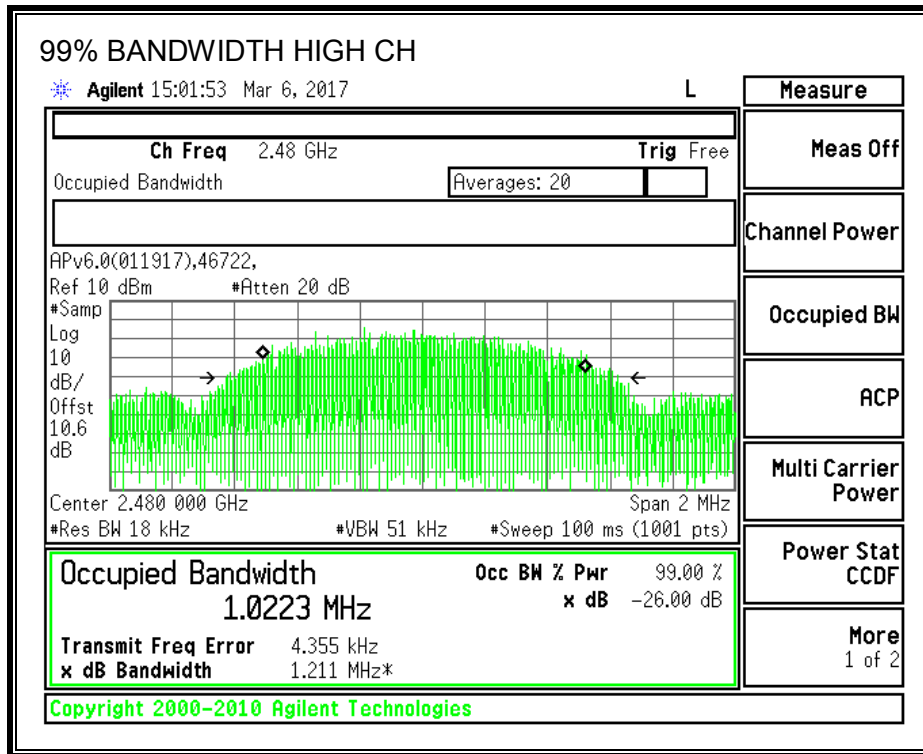
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0277
Middle	2440	1.0243
High	2480	1.0223

99% BANDWIDTH





Test Information

Test Date: 2017-03-06
 Project: 11602267
 Tester: John Manser

**8.4. OUTPUT POWER
LIMITS**

FCC §15.247 (b)

IC RSS-247 5.4 (4)

FCC - For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

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)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.310	30	-27.690
Middle	2440	4.190	30	-25.810
High	2480	4.070	30	-25.930

TEST INFORMATION

Date 03/03/2017

Project No: 11602267

Tester: John Manser

**8.5. AVERAGE POWER
LIMITS**

None; for reporting purposes only.

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)	AV power (dBm)
Low	2402	1.72
Middle	2440	3.55
High	2480	3.53

TEST INFORMATION

Date 03/03/2017

Project No: 11602267

Tester: John Manser

**8.6. POWER SPECTRAL DENSITY
LIMITS**

FCC §15.247 (e)

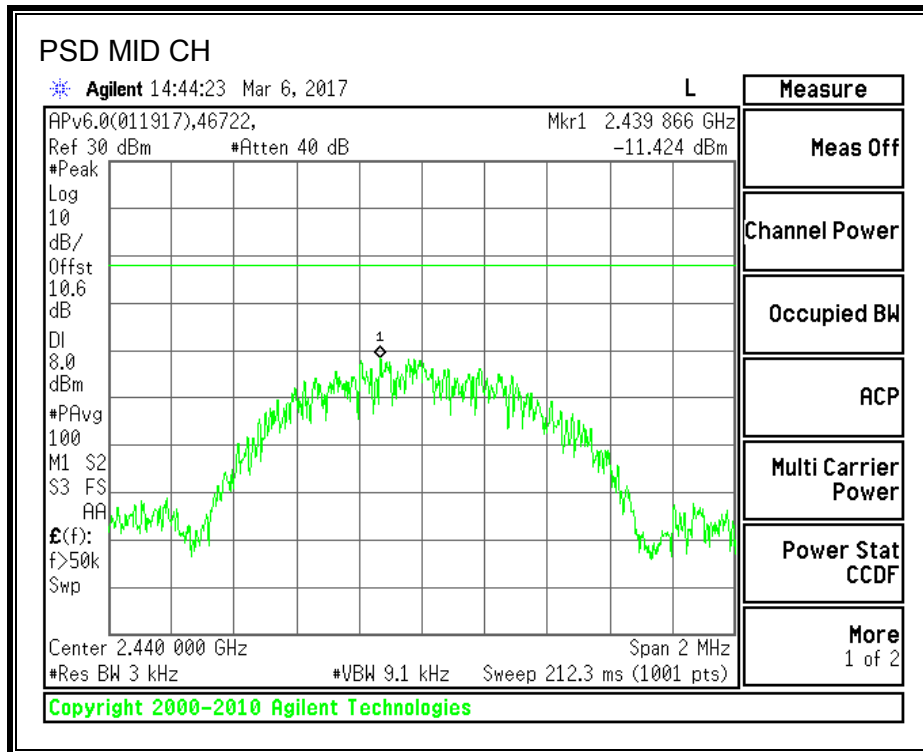
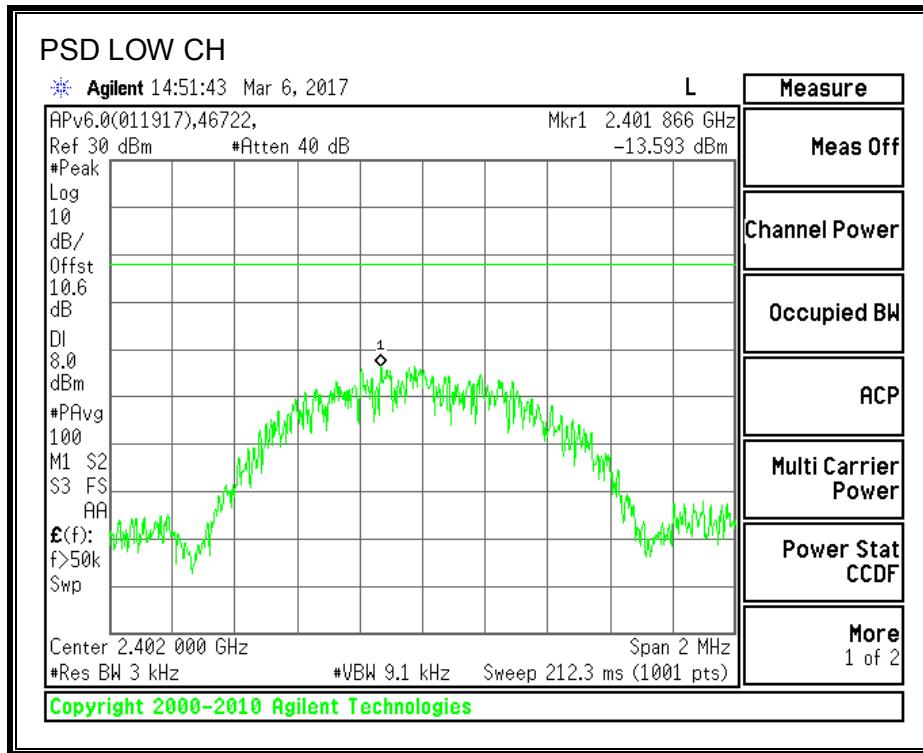
IC RSS-247 5.2 (2)

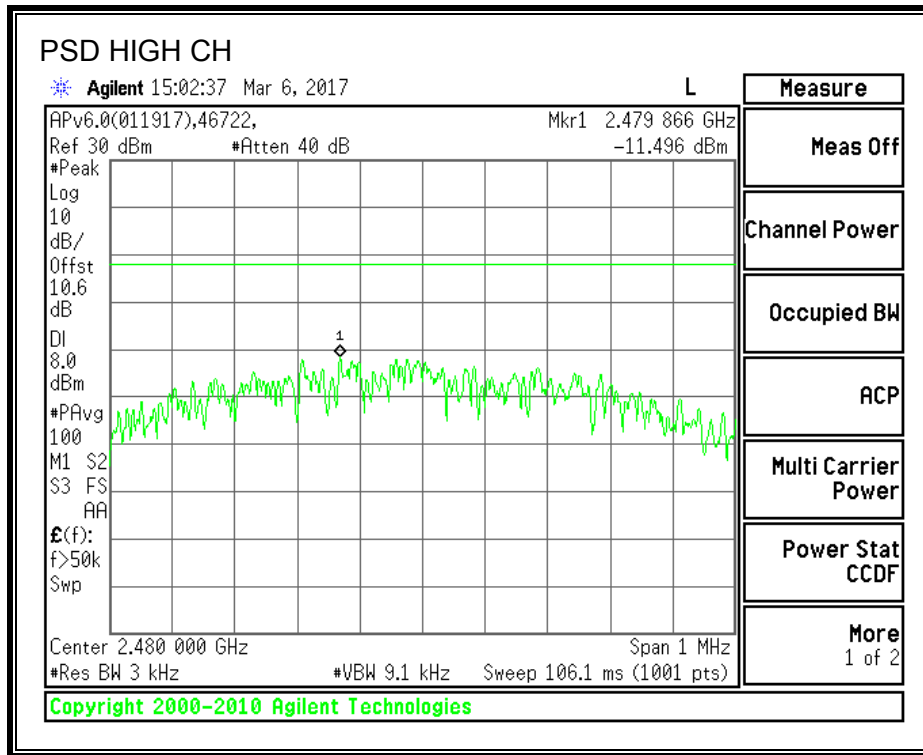
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-13.59	8	-21.59
Middle	2440	-11.42	8	-19.42
High	2480	-11.50	8	-19.50

POWER SPECTRAL DENSITY





TEST INFORMATION

Test Date 03/06/2017

Project No: 11602267

Tester: John Manser

8.7. CONDUCTED SPURIOUS EMISSIONS LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

FCC - 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.

RSS - In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

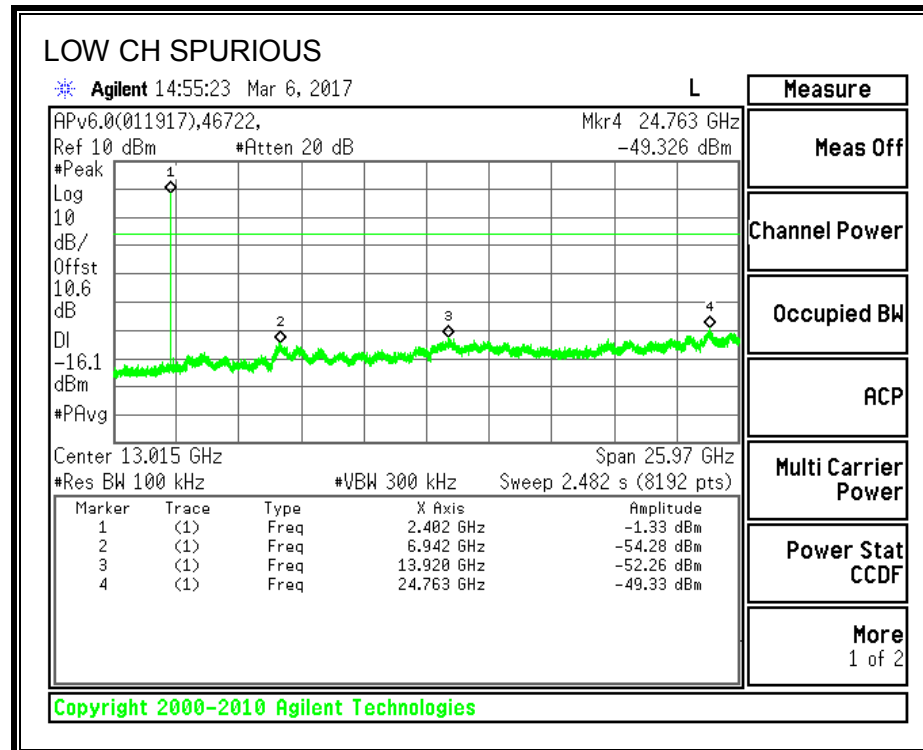
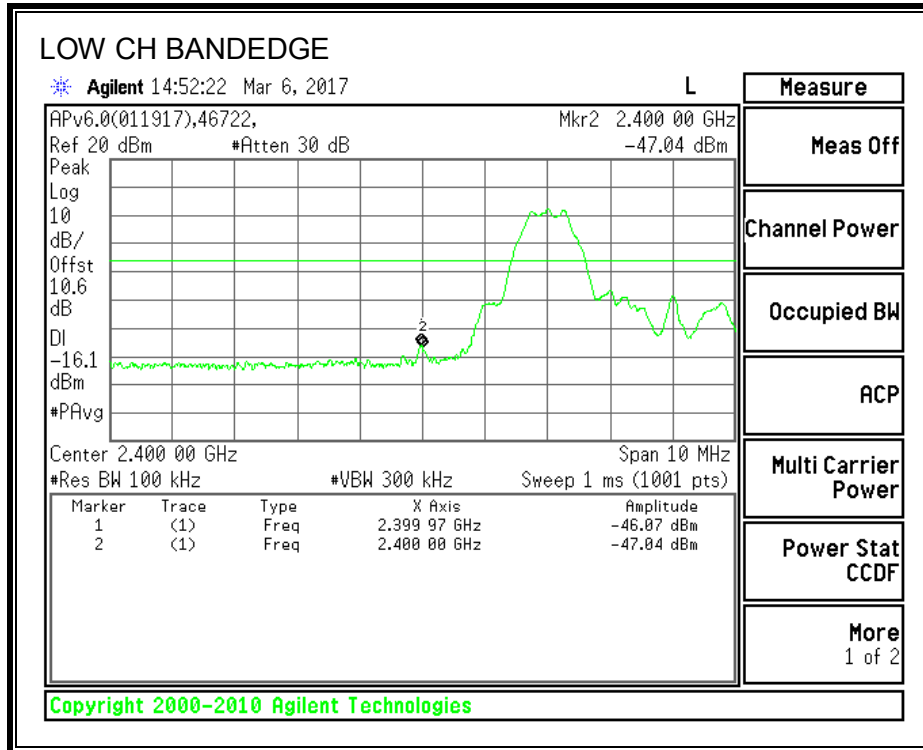
TEST INFORMATION

Date 03/06/2017

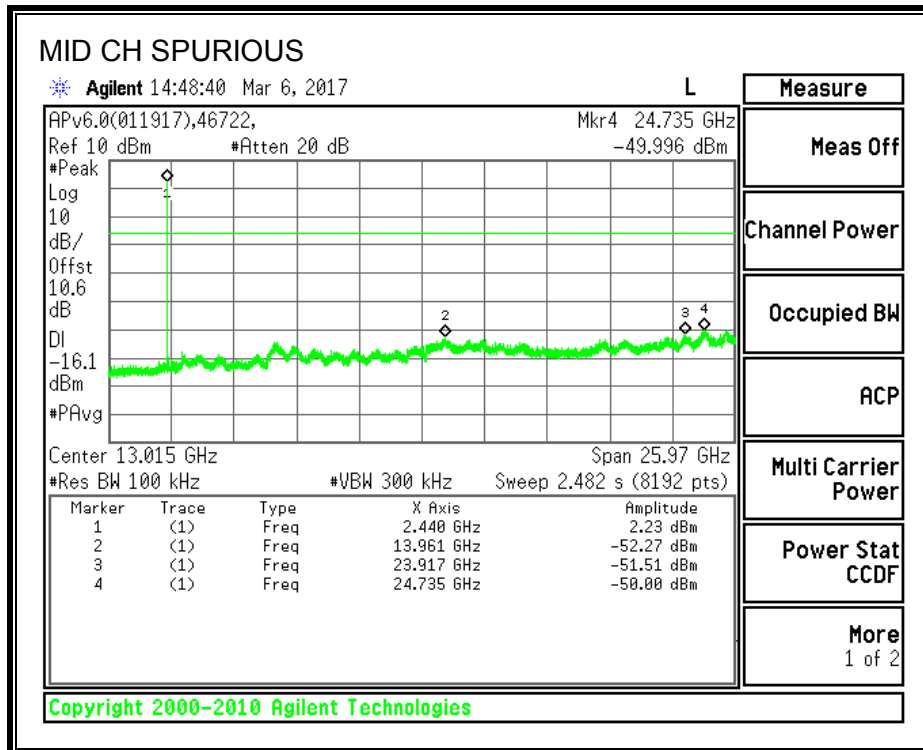
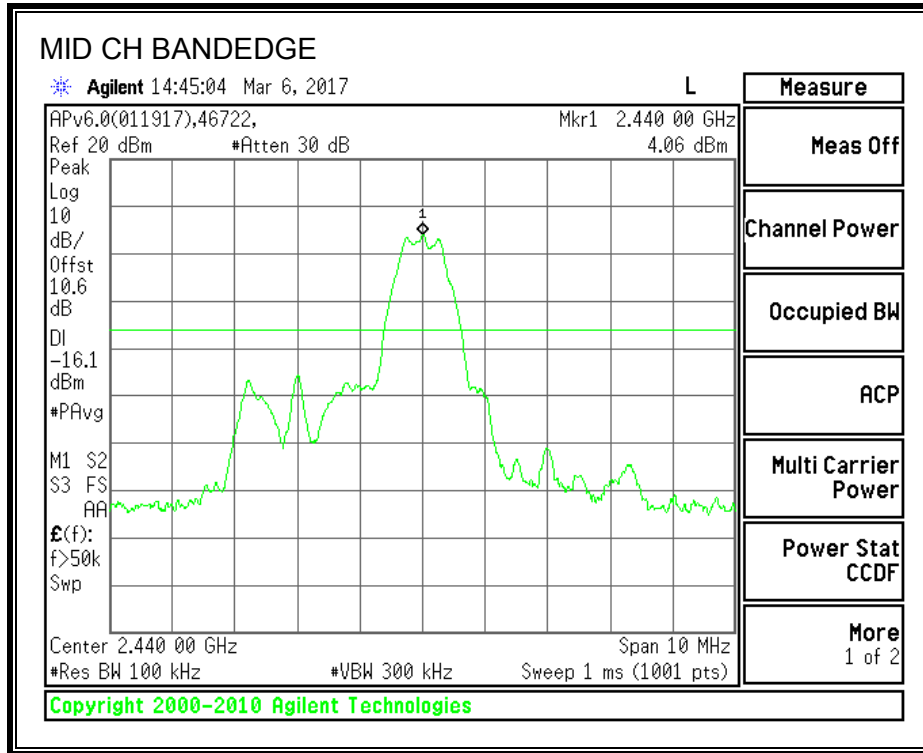
Project No: 11602267

Tester: John Manser

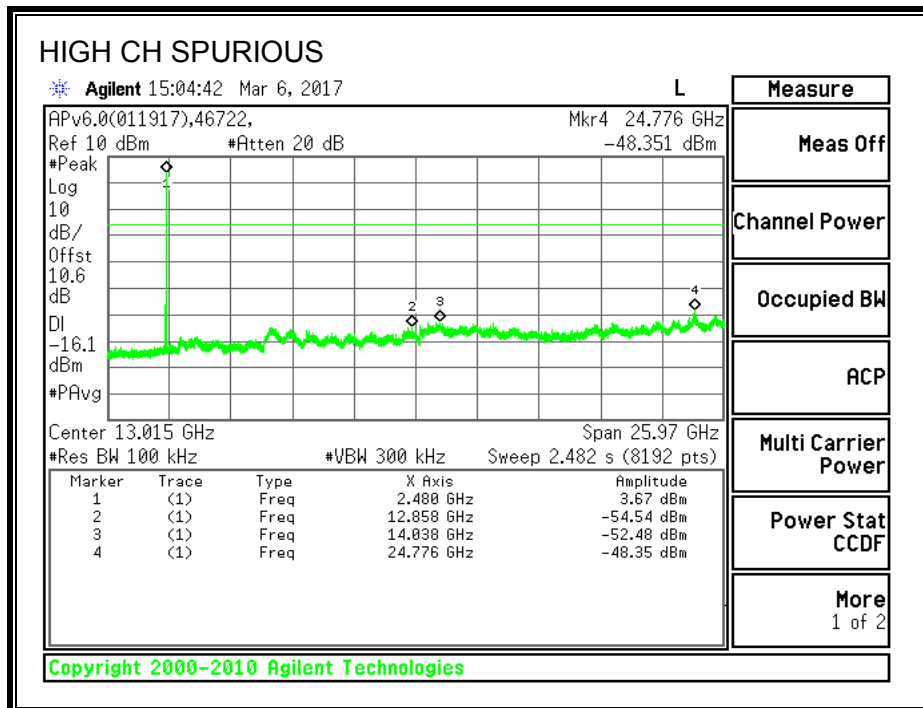
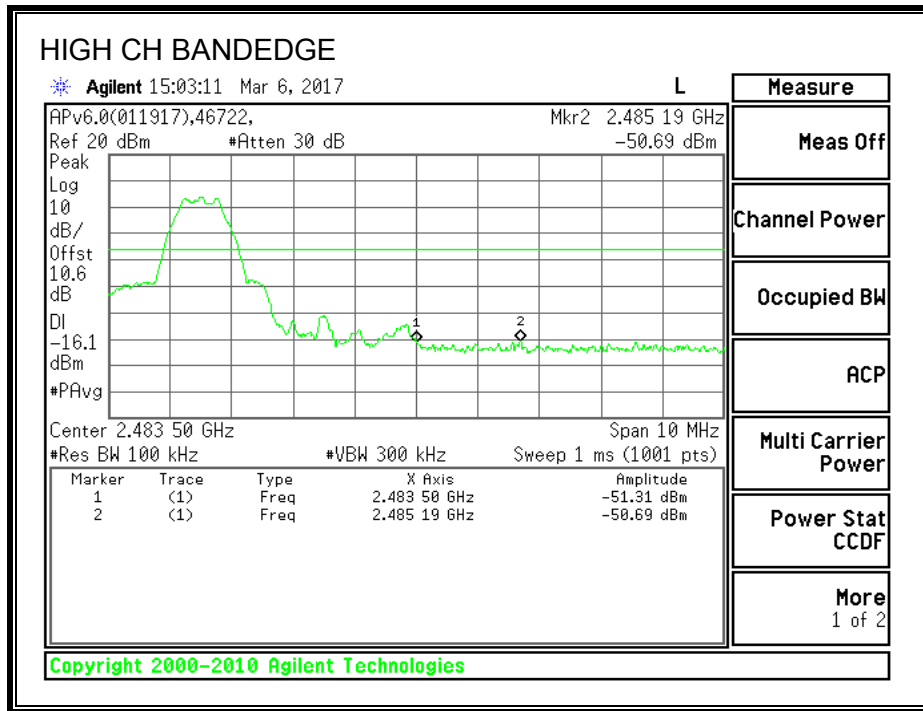
RESULTS
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205, §15.209, §15.247 (d)
IC RSS-GEN Clause 8.9 and 8.10(Transmitter)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
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 measurements and 1.5 m above the ground plane for above 1GHz measurements. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements for the 30-1000 MHz range, 9 kHz for peak detection measurements or 9 kHz for quasi-peak detection measurements for the 0.15-30 MHz range and 200 Hz for peak detection measurements or 200 Hz for quasi-peak detection measurements for the 9 to 150 kHz range. Peak detection is used unless otherwise noted as quasi-peak.

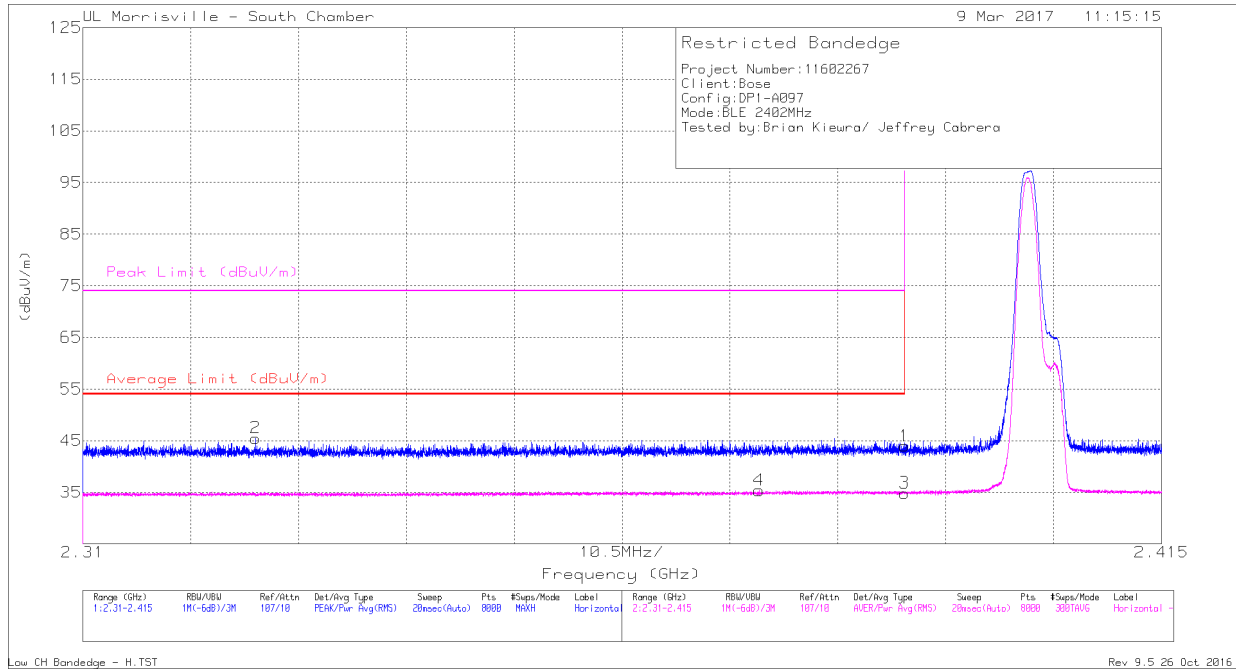
For peak measurements above 1 GHz, the resolution bandwidth is set to 1 MHz and the video bandwidth is set to 3 MHz. For average measurements above 1GHz, the resolution bandwidth and video bandwidth are set as described in ANSI C63.10:2013 for the applicable measurement. The particular averaging method used for this test program was by measuring using a Peak detector with the resolution bandwidth set to 1MHz and a reduced video bandwidth, based on $1/T_{on}$ where T_{on} is the transmit on time.

The spectrum from 9 kHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable 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.

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

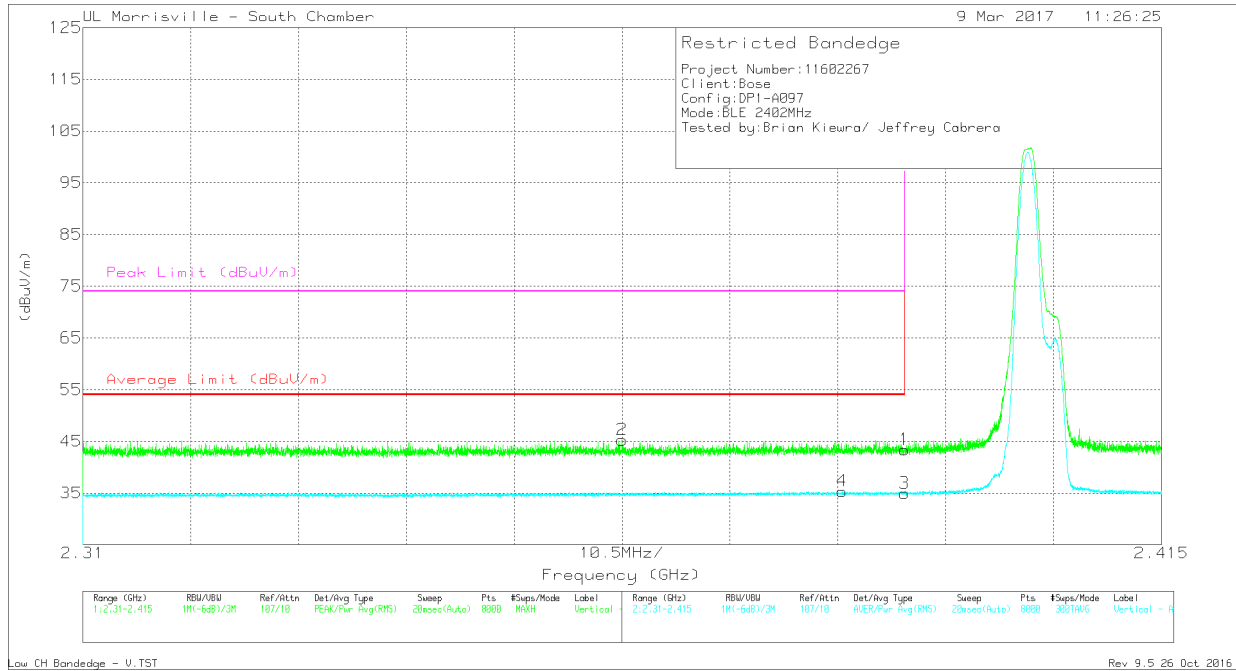
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl /Filtr/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	35.88	Pk	32.2	-24.1	0	43.98	-	-	74	-30.02	120	224	H
2	* 2.327	37.6	Pk	31.7	-23.8	0	45.5	-	-	74	-28.5	120	224	H
3	* 2.39	24.79	RMS	32.2	-24.1	1.97	34.86	54	-19.14	-	-	120	224	H
4	* 2.376	25.31	RMS	32.1	-24	1.97	35.38	54	-18.62	-	-	120	224	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

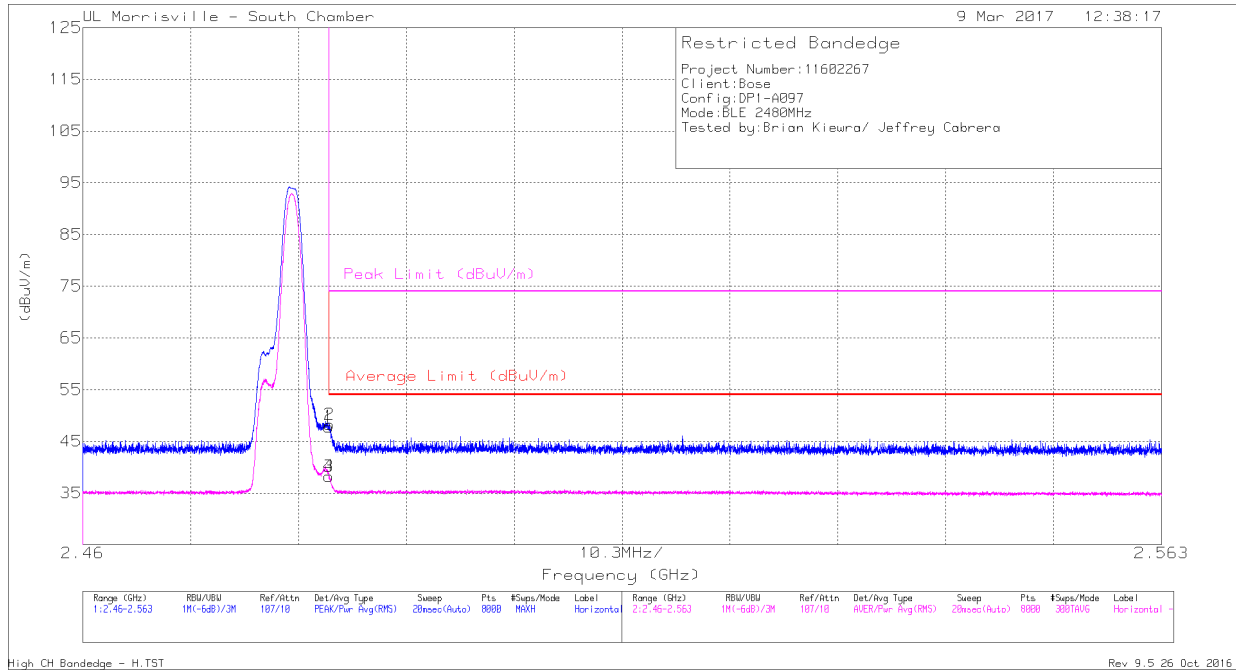
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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	35.29	Pk	32.2	-24.1	0	43.39	-	-	74	-30.61	53	282	V
2	* 2.362	37.27	Pk	31.9	-23.9	0	45.27	-	-	74	-28.73	53	282	V
3	* 2.39	24.88	RMS	32.2	-24.1	1.97	34.95	54	-19.05	-	-	53	282	V
4	* 2.384	25.29	RMS	32.1	-24	1.97	35.36	54	-18.64	-	-	53	282	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



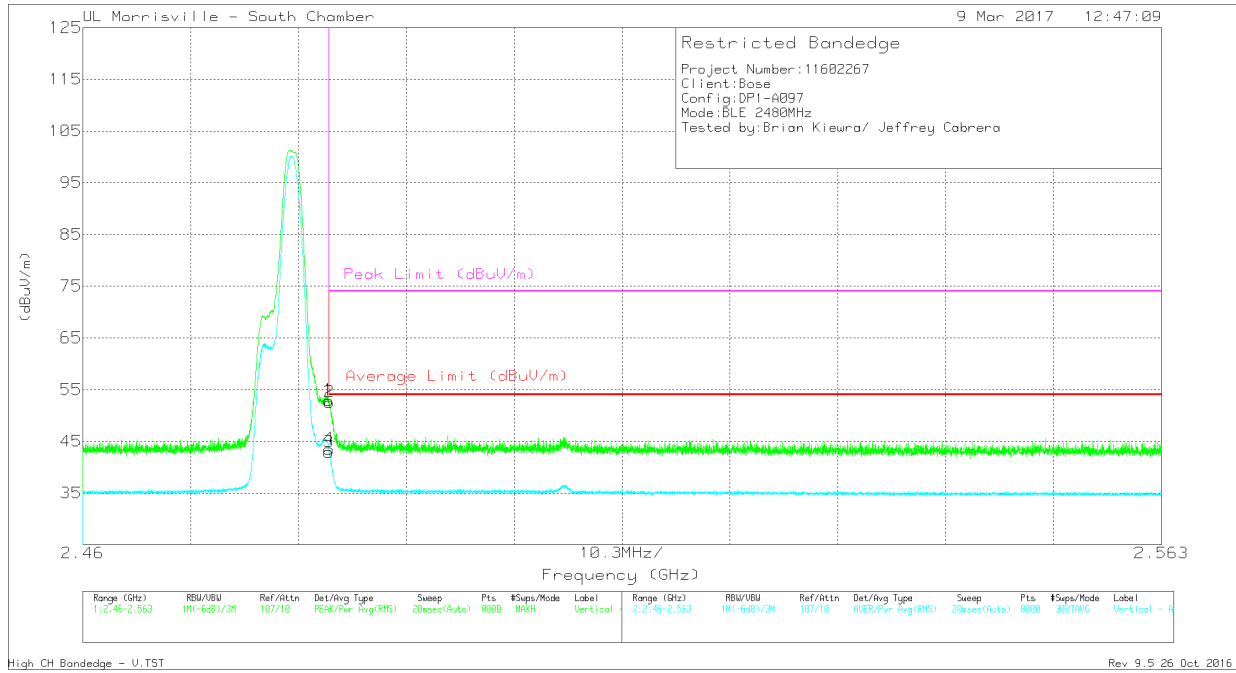
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40	Pk	32.4	-24.6	0	47.8	-	-	74	-26.2	99	239	H
2	* 2.484	40.42	Pk	32.4	-24.6	0	48.22	-	-	74	-25.78	99	239	H
3	* 2.484	28.43	RMS	32.4	-24.6	1.97	38.2	54	-15.8	-	-	99	239	H
4	* 2.484	28.48	RMS	32.4	-24.6	1.97	38.25	54	-15.75	-	-	99	239	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



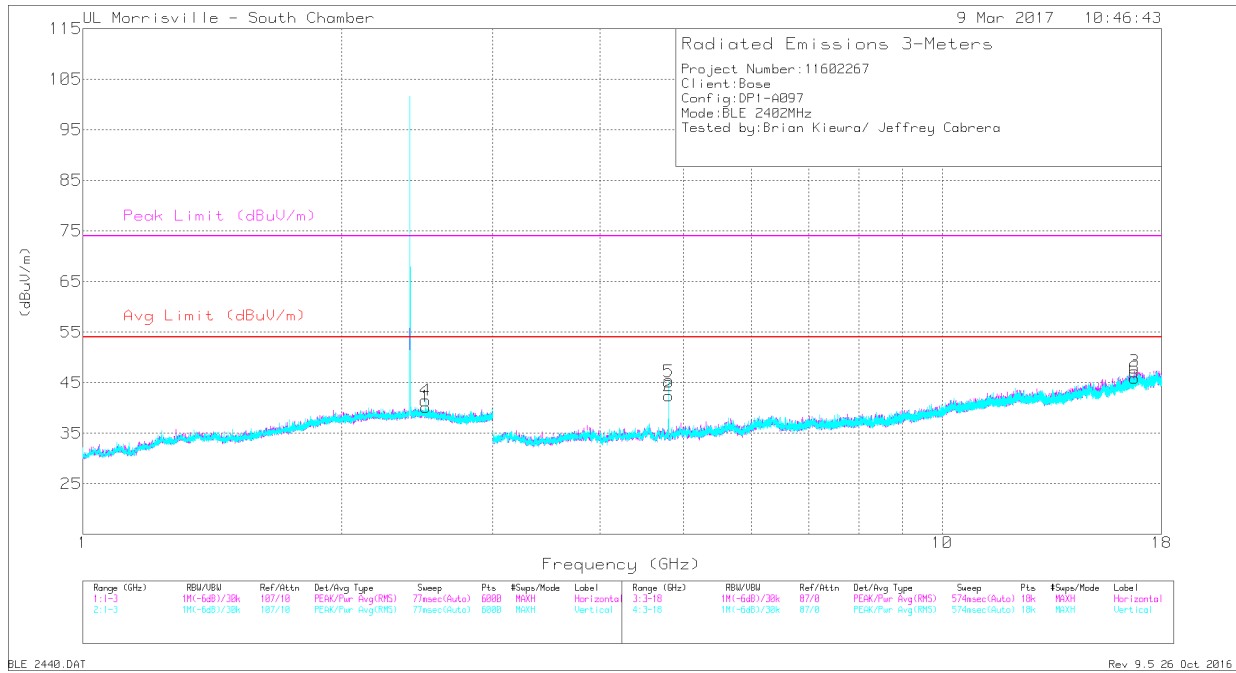
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.15	Pk	32.4	-24.6	0	52.95	-	-	74	-21.05	55	237	V
2	* 2.484	44.79	Pk	32.4	-24.6	0	52.59	-	-	74	-21.41	55	237	V
3	* 2.484	33.17	RMS	32.4	-24.6	1.97	42.94	54	-11.06	-	-	55	237	V
4	* 2.484	33.73	RMS	32.4	-24.6	1.97	43.5	54	-10.5	-	-	55	237	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS
 Low Channel



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl /Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.805	44.05	PK2	34	-31.1	0	46.95	-	-	74	-27.05	360	102	H
	* 4.804	34.55	MAV1	34	-31.1	1.97	39.42	54	-14.58	-	-	360	102	H
5	* 4.805	46.24	PK2	34	-31.1	0	49.14	-	-	74	-24.86	262	106	V
	* 4.804	38.62	MAV1	34	-31.1	1.97	43.49	54	-10.51	-	-	262	106	V
4	2.506	33.68	PK	32.5	-24.7	0	41.48	-	-	-	-	0-360	199	V
1	2.509	32.51	PK	32.5	-24.8	0	40.21	-	-	-	-	0-360	102	H
3	16.751	30.43	PK	41.6	-24.8	0	47.23	-	-	-	-	0-360	199	H
6	16.752	29.14	PK	41.6	-24.8	0	45.94	-	-	-	-	0-360	101	V

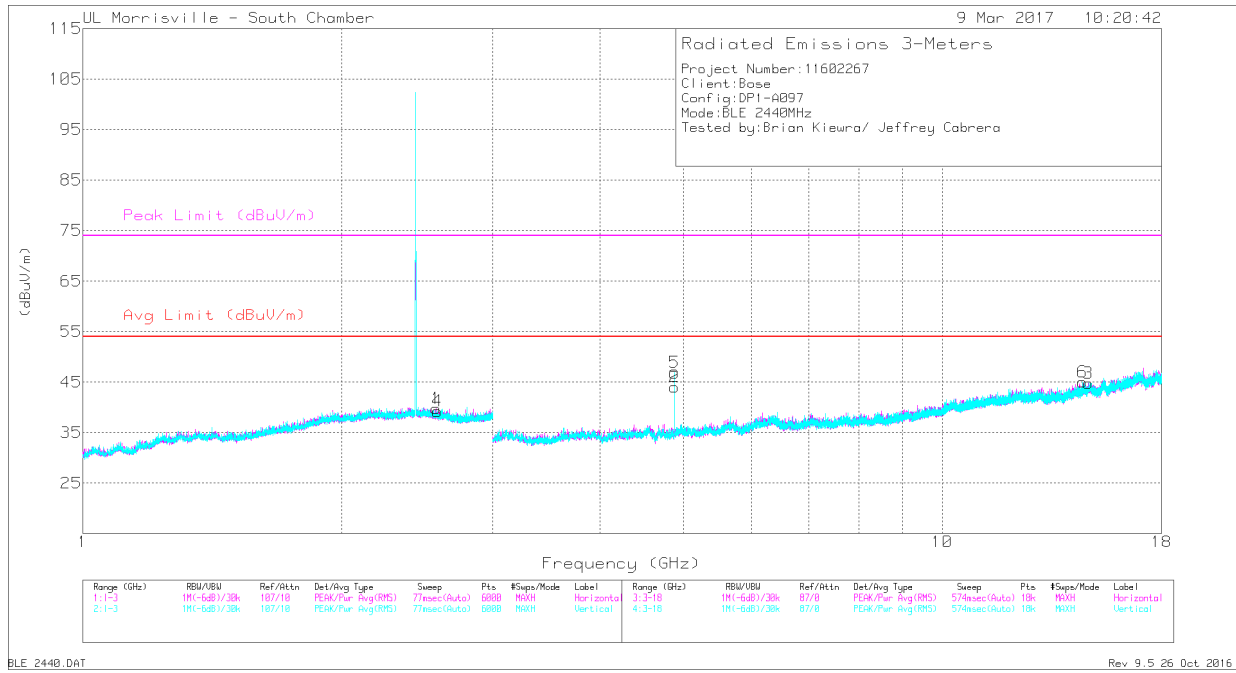
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

Mid Channel



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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	* 4.88	44.85	PK2	34.1	-31	0	47.95	-	-	74	-26.05	0	105	H
	* 4.88	36.98	MAv1	34.1	-31	1.97	42.05	54	-11.95	-	-	0	105	H
5	* 4.88	47.17	PK2	34.1	-31	0	50.27	-	-	74	-23.73	271	107	V
	* 4.88	39.9	MAv1	34.1	-31	1.97	44.97	54	-9.03	-	-	271	107	V
1	2.577	32.46	Pk	32.4	-25.1	0	39.76	-	-	-	-	0-360	102	H
3	14.792	29.48	Pk	39.9	-24.6	0	44.78	-	-	-	-	0-360	101	H
4	2.588	32.14	Pk	32.3	-25.2	0	39.24	-	-	-	-	0-360	200	V
6	14.566	28.93	Pk	39.7	-23.6	0	45.03	-	-	-	-	0-360	101	V

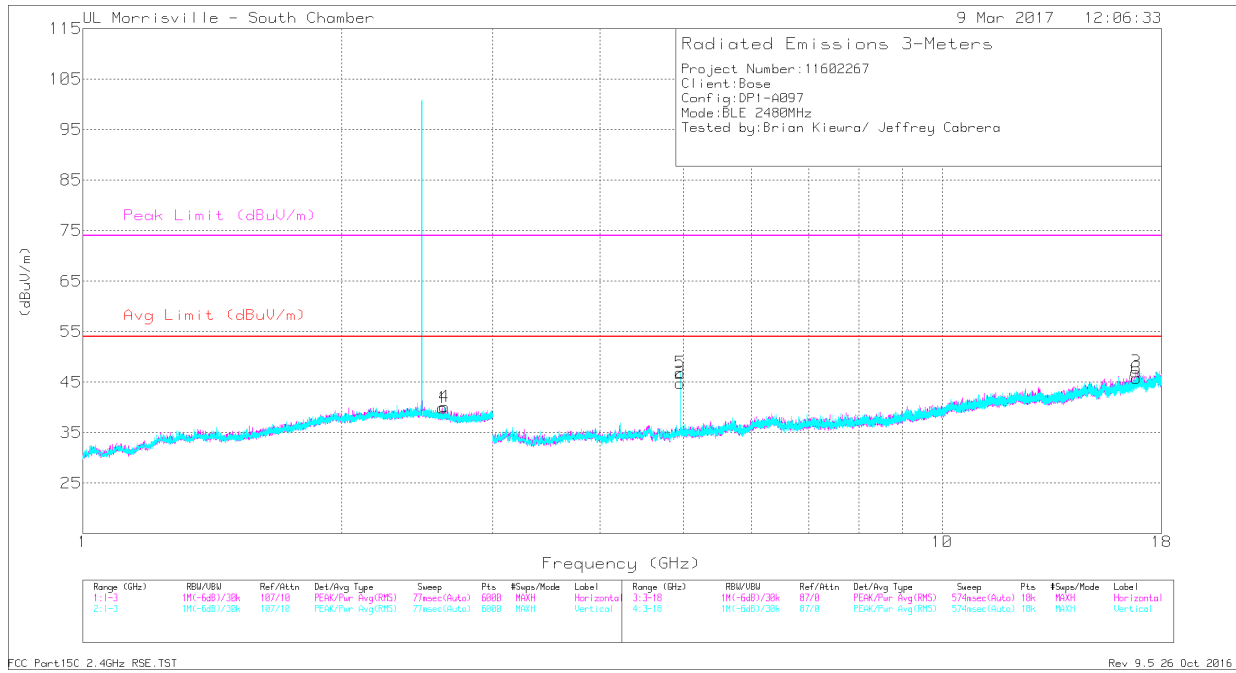
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

High Channel



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl /Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.961	45.48	PK2	34.1	-31.3	0	48.28	-	-	74	-25.72	10	108	H
	* 4.96	37.35	MAv1	34.1	-31.3	1.97	42.12	54	-11.88	-	-	10	108	H
5	* 4.959	48.5	PK2	34.1	-31.3	0	51.3	-	-	74	-22.7	279	125	V
	* 4.96	40.97	MAv1	34.1	-31.3	1.97	45.74	54	-8.26	-	-	279	125	V
1	2.624	32.88	Pk	32.4	-25.4	0	39.88	-	-	-	-	0-360	102	H
4	2.638	33.14	Pk	32.5	-25.5	0	40.14	-	-	-	-	0-360	101	V
3	16.811	29.24	Pk	41.6	-23.8	0	47.04	-	-	-	-	0-360	199	H
6	16.827	27.8	Pk	41.6	-23.6	0	45.8	-	-	-	-	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

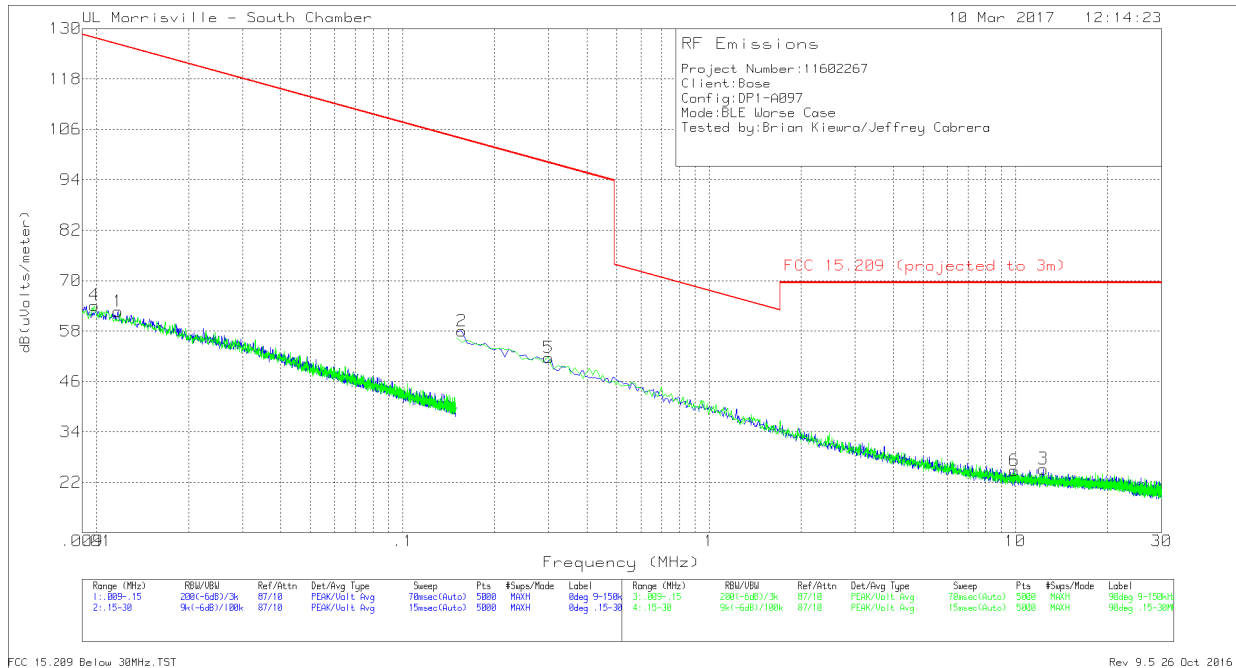
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

9.3. WORST-CASE BELOW 1 GHz
SPURIOUS EMISSIONS 9kHz to 30 MHz (WORST-CASE CONFIGURATION)

Note: All measurements were made at a test distance of 3 m. The limits in the plots and tabular data are the FCC/IC limits extrapolated from the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to the measurement distance to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (specification distance / test distance).

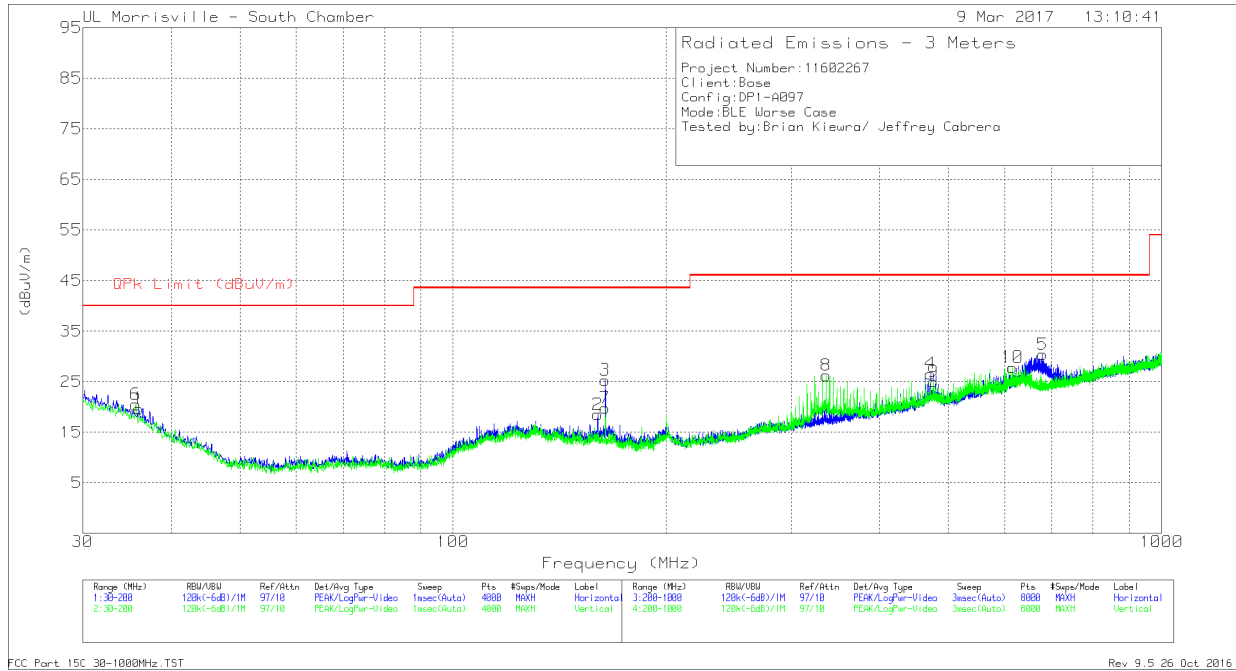
Although these tests were performed at a test site other than an open area test site, adequate comparison measurements were confirmed against an open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 (projected to 3m)	Margin (dB)	Azimuth (Degs)
4	.00984	45.52	Pk	18.5	.1	64.12	127.74	-63.62	0-360
1	.01177	45.04	PK	17.5	.1	62.64	126.19	-63.55	0-360
2	.15597	47.17	Pk	10.7	.1	57.97	103.74	-45.77	0-360
5	.29928	40.96	Pk	10.6	.1	51.66	98.08	-46.42	0-360
6	9.90661	13.87	Pk	10.5	.5	24.87	69.54	-44.67	0-360
3	12.32487	14.1	Pk	10.5	.6	25.2	69.54	-44.34	0-360

Pk - Peak detector

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



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Amp/Cbl (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 163.9989	38.04	Qp	16.7	-30.5	1.97	26.21	43.52	-17.31	322	169	H
7	* 163.9987	31.11	Qp	16.7	-30.5	1.97	19.28	43.52	-24.24	59	153	V
6	35.654	30.48	Pk	21.7	-31.7	0	20.48	40	-19.52	0-360	102	V
1	35.9941	29.97	Pk	21.4	-31.7	0	19.67	40	-20.33	0-360	199	H
2	159.9986	32.23	Pk	16.8	-30.5	0	18.53	43.52	-24.99	0-360	199	H
8	336.0177	36.72	Pk	18.9	-29.4	0	26.22	46.02	-19.8	0-360	198	V
4	472.0354	33.58	PK	21.9	-28.9	0	26.58	46.02	-19.44	0-360	198	H
9	476.0359	31.9	PK	22	-28.9	0	25	46.02	-21.02	0-360	102	V
10	616.0541	32.91	Pk	23.5	-28.6	0	27.81	46.02	-18.21	0-360	102	V
5	679.9624	34.28	Pk	24.5	-28.4	0	30.38	46.02	-15.64	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector