CERTIFICATION TEST REPORT

Report Number. : R12570795-E1

Applicant	:	Bose Corporation 100 The Mountain Framingham, MA 01701, USA
Model	:	423352
FCC ID	:	A94423352
IC	:	3232A-423352
EUT Description	:	Wireless Headset
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
January 29, 2019

Prepared by:
UL LLC
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NVLAP TESTING
NVLAP Lab code: 200246-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
1	2019-01-29	Initial Issue	Brian T. 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: 423352

SERIAL NUMBER: Radiated SN: 078702Z8319C125AE, 078702Z8319C047AE
Conducted SN: 079616Z8321I005AE

DATE TESTED: 2019-01-08 to 2019-01-18

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Compliant
ISED RSS-247 Issue 2	Compliant
ISED RSS-GEN Issue 5	Compliant

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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Approved & Released
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, RSS-GEN Issue 5, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Drive, Research Triangle Park, North Carolina 27709, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, North Carolina 27560, USA. 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.

12 Laboratory Dr.	2800 Perimeter Park Dr.
☐ Chamber A (ISED:2180C-1)	☒ Chamber North (ISED:2180C-3)
☐ Chamber C (ISED:2180C-2)	☒ Chamber South (ISED:2180C-4)

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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

RADIATED EMISSIONS
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

MAINS CONDUCTED EMISSIONS
Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	2.00%
RF output power, conducted	1.3 dB (PK), 0.45 dB (AV)
RF output power, radiated (SAC)	4.52 dB
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	2.50 dB
All emissions, radiated	4.88 dB
Time	3.39%

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

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a wireless headset with BT/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	-1.19	0.76

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The highest gain antenna assembly has a peak gain of 4.8 dBi in the 2.4 GHz band.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 0.7.8-107+a36ecaa2f
The EUT driver software installed in the host support equipment during testing was 100.0.0.0
The test utility software, BlueTest3, used during testing was 3.1.4

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

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

Additionally, the radios do not transmit when the USB charging cable is connected. Therefore, line conducted emissions was not performed.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
None				

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
None						

TEST SETUP

EUT is configured as a standalone device during testing.

SETUP DIAGRAMS

Please refer to R12570795-EP1 for setup diagrams

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6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Conducted Room 2					
T177	Spectrum Analyzer	Agilent Technologies	E4446A	2018-04-12	2019-04-12
SN 181474341	Environmental Meter	Fisherbrand	15-077-963	2018-07-27	2020-07-27
PWM005	Power Meter	Keysight	N1912A	2018-04-29	2019-04-29
PWS002	Power Sensor	Keysight	N1921A	2018-07-30	2019-07-30

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

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
1-18 GHz					
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2018-04-30	2019-04-30
Gain-Loss Chains					
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2018-03-20	2019-03-20
Receiver & Software					
SA0026	Spectrum Analyzer	Agilent	N9030A	2018-03-20	2019-03-20
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
s/n 181474409	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27

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

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz (Loop Ant.)					
AT0059	Active Loop Antenna	EMCO	6502	2018-07-20	2019-07-20
30-1000 MHz					
AT0073	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2018-08-06	2019-08-06
18-40 GHz					
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2018-11-08	2019-11-08
Gain-Loss Chains					
N-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2018-09-06	2019-09-06
N-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2018-05-20	2019-05-20
N-SAC04	Gain-loss string: 18-40GHz	Various	Various	2018-09-30	2019-03-31
Receiver & Software					
SA0027	Spectrum Analyzer	Agilent	N9030A	2018-04-04	2019-04-04
SA0025 (18-40GHz RSE)	Spectrum Analyzer	Agilent	N9030A	2018-11-20	2019-11-20
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
s/n 181474409	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27

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7. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.10 Section 11.6

6 dB BW: ANSI C63.10 Subclause 11.8.1

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Output Power: ANSI C63.10 Subclause 11.9.1.3 (PKPM1)

PSD: ANSI C63.10 Subclause 11.10.2 (Peak PSD)

Out-of-band emissions in non-restricted bands: ANSI C63.10-2013 Section 11.11 & 6.10.4

Out-of-band emissions in restricted bands: ANSI C63.10-2013 Section 11.12 & 6.10.5

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

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8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

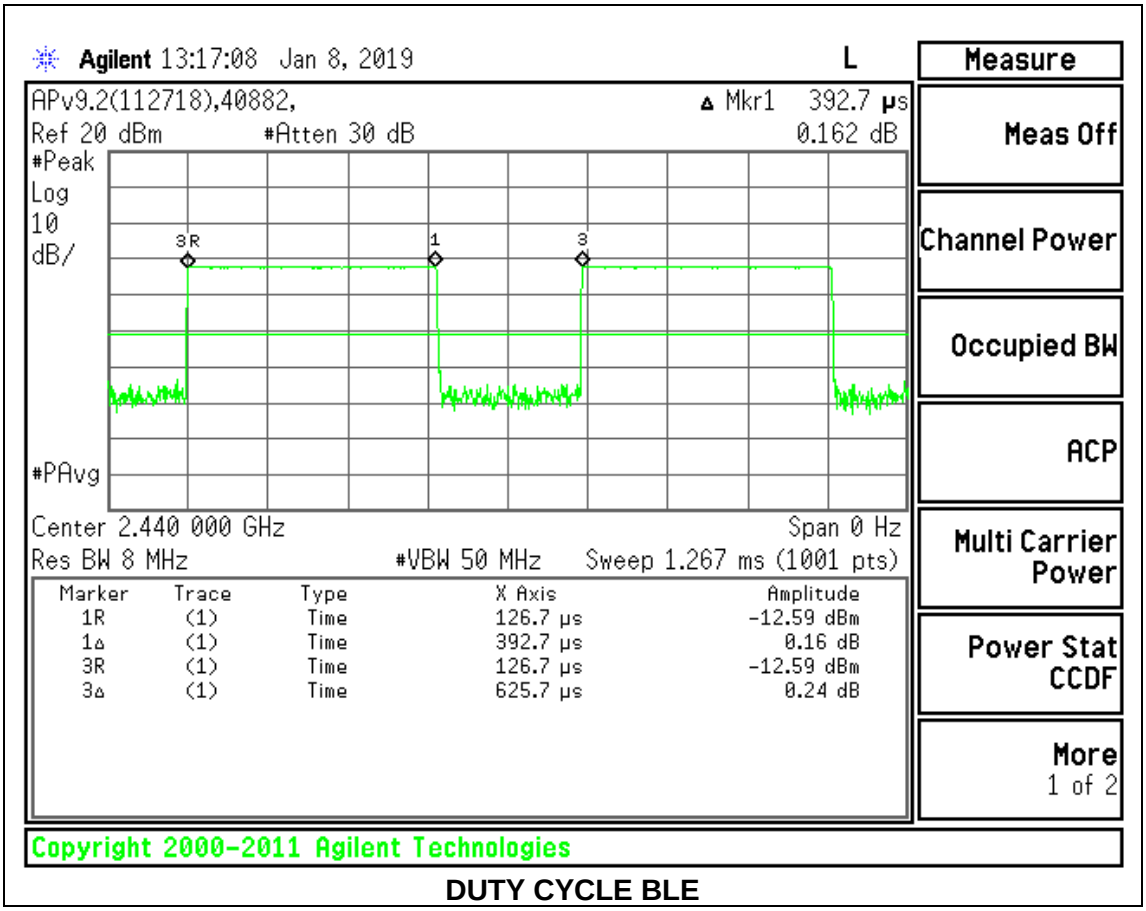
PROCEDURE

ANSI C63.10, Section 11.6 : 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)
2.4GHz Band						
BLE	0.393	0.626	0.628	62.76%	2.02	2.546

DUTY CYCLE PLOTS



DUTY CYCLE BLE

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8.2. 99% BANDWIDTH

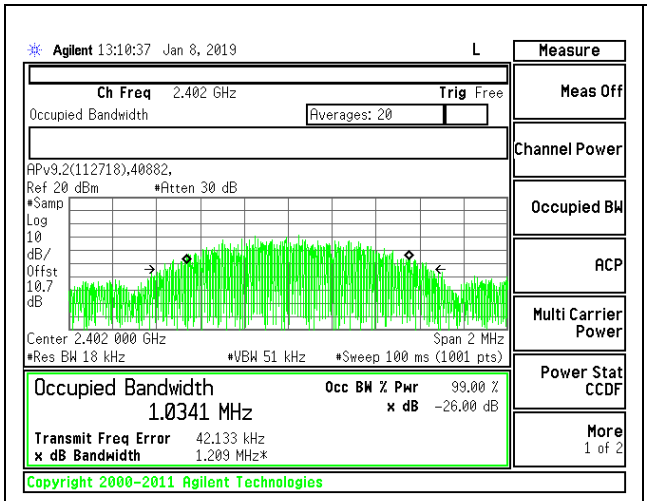
LIMITS

None; for reporting purposes only.

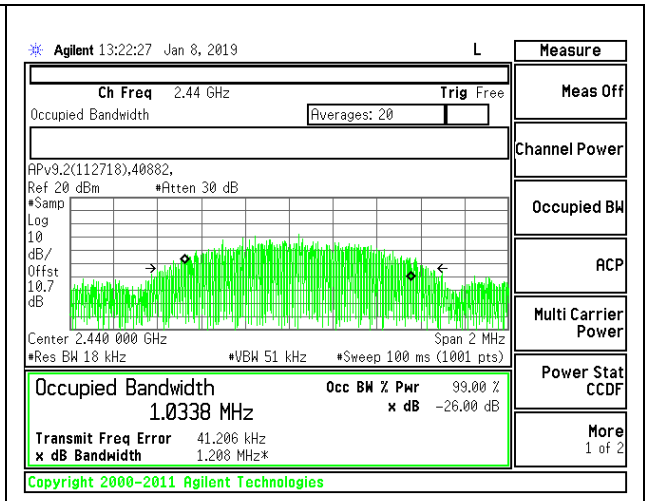
RESULTS

8.2.1. BLE (1Mbps)

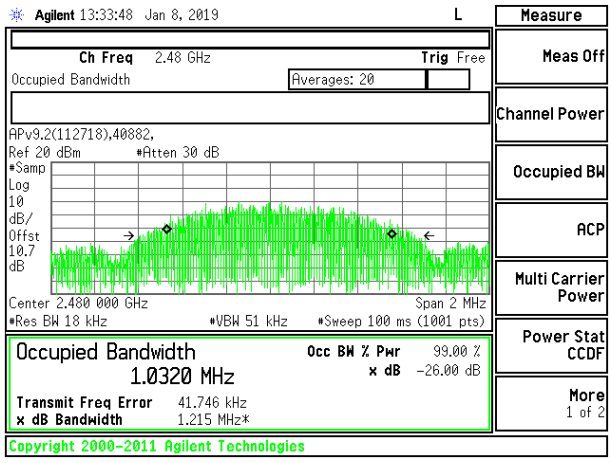
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0341
Middle	2440	1.0338
High	2480	1.0320



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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8.1. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-247 5.4 (d)

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	-1.19	30	-31.190
Middle	2440	-1.53	30	-31.530
High	2480	-1.52	30	-31.520

TEST INFORMATION

Test Date: 2019-01-08
Project: 12570795
Tested By: 12015 / 40882

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8.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

The cable assembly insertion loss of 10.7 dB (including 10 dB pad and 0.7 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	-1.59
Middle	2440	-2.03
High	2480	-1.89

TEST INFORMATION
Test Date: 2019-01-08
Project: 12570795
Tested By: 12015 / 40882

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8.3. 6 dB BANDWIDTH

LIMITS

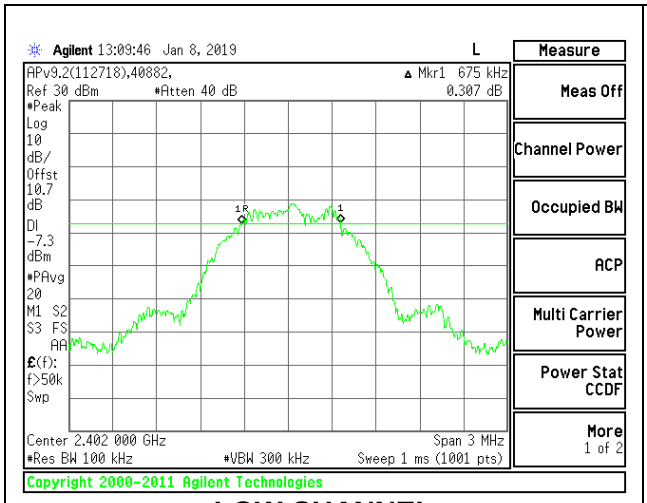
FCC §15.247 (a) (2)
RSS-247 5.2 (a)

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

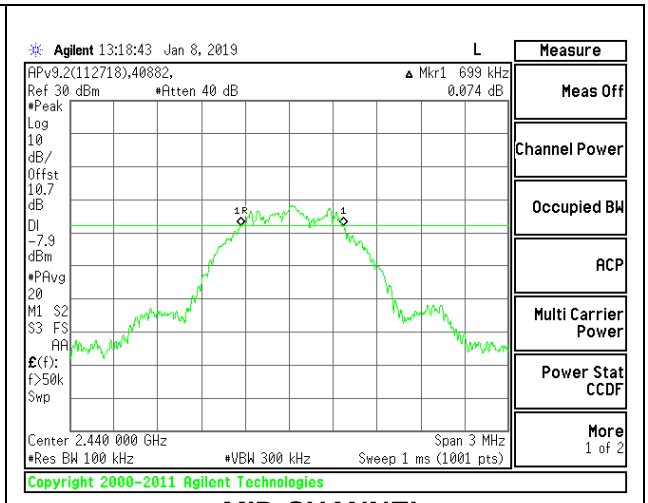
RESULTS

8.3.1. BLE (1Mbps)

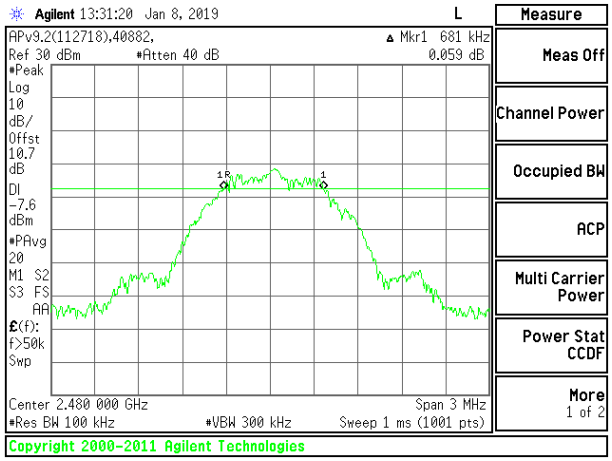
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6750	0.5
Middle	2440	0.6990	0.5
High	2480	0.6810	0.5



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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8.4. POWER SPECTRAL DENSITY

LIMITS

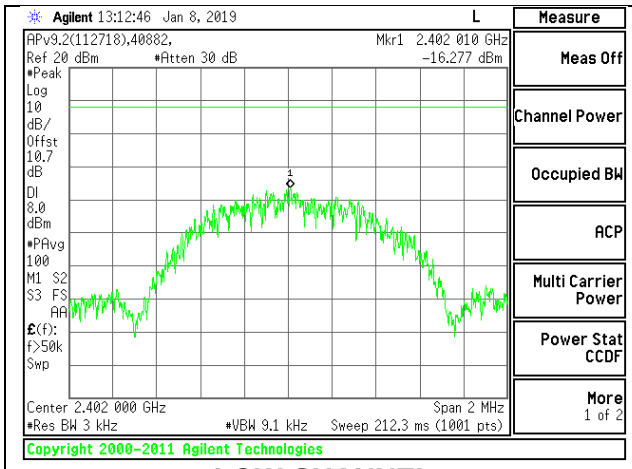
FCC §15.247 (e)
RSS-247 (5.2) (b)

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.

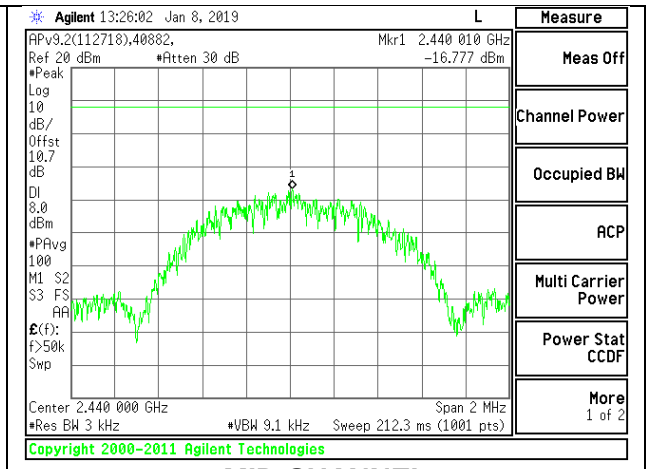
RESULTS

8.4.1. BLE (1Mbps)

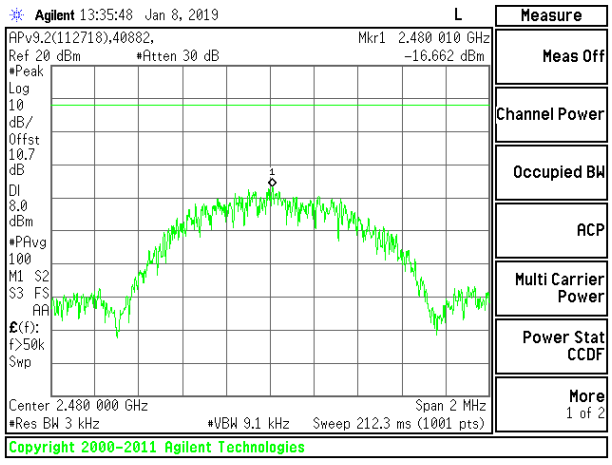
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-16.277	8	-24.28
Middle	2440	-16.777	8	-24.78
High	2480	-16.662	8	-24.66



LOW CHANNEL



MID CHANNEL



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8.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

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

RESULTS

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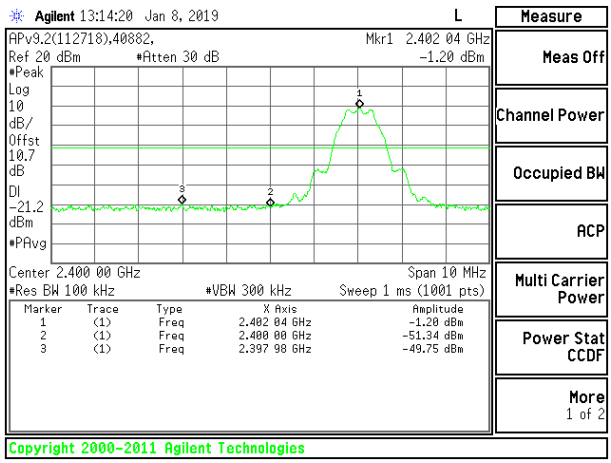
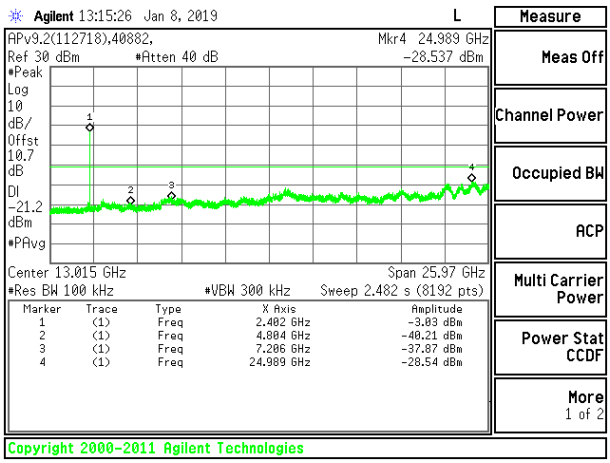
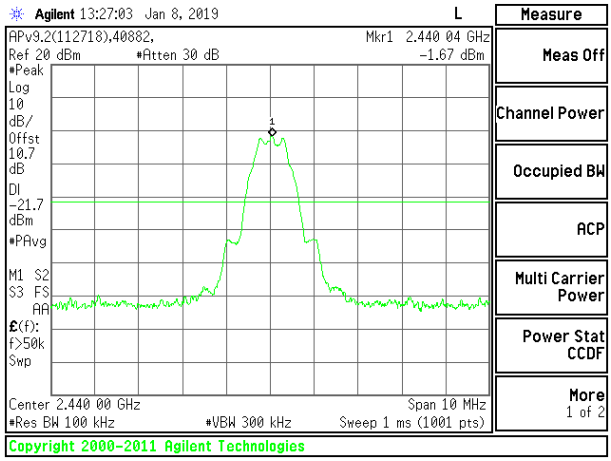
8.5.1. BLE (1Mbps)



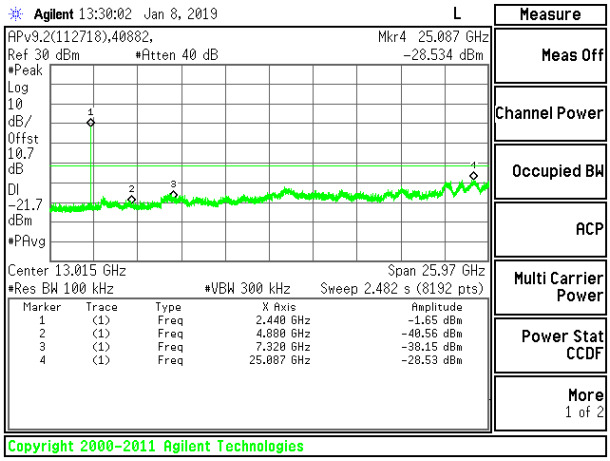
LOW CHANNEL BANDEDGE



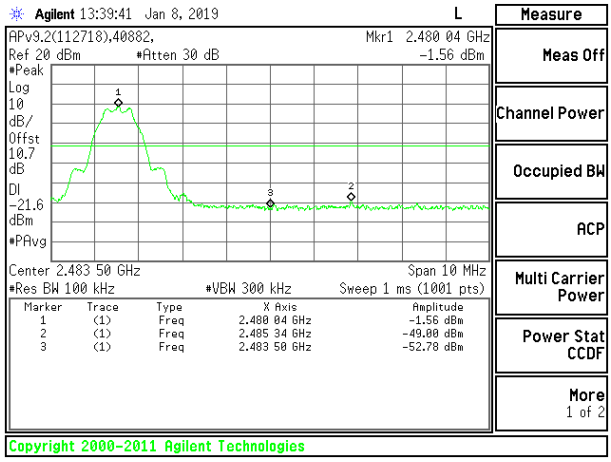
OUT-OF-BAND LOW CHANNEL



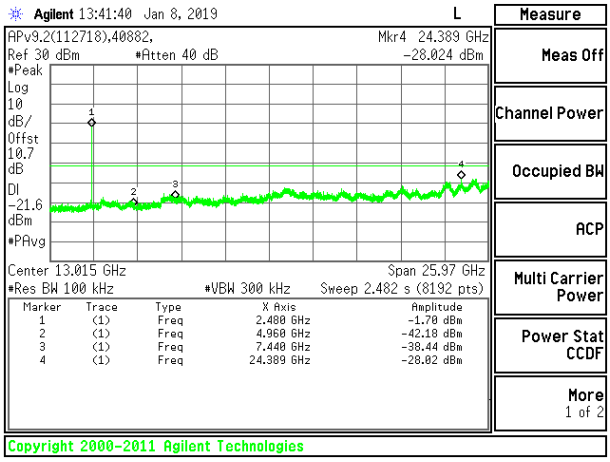
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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9. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209
RSS-GEN, Section 8.9 and 8.10.

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 measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

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

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements. 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 RMS.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

KDB 414788 OATS and Chamber Correlation Justification

Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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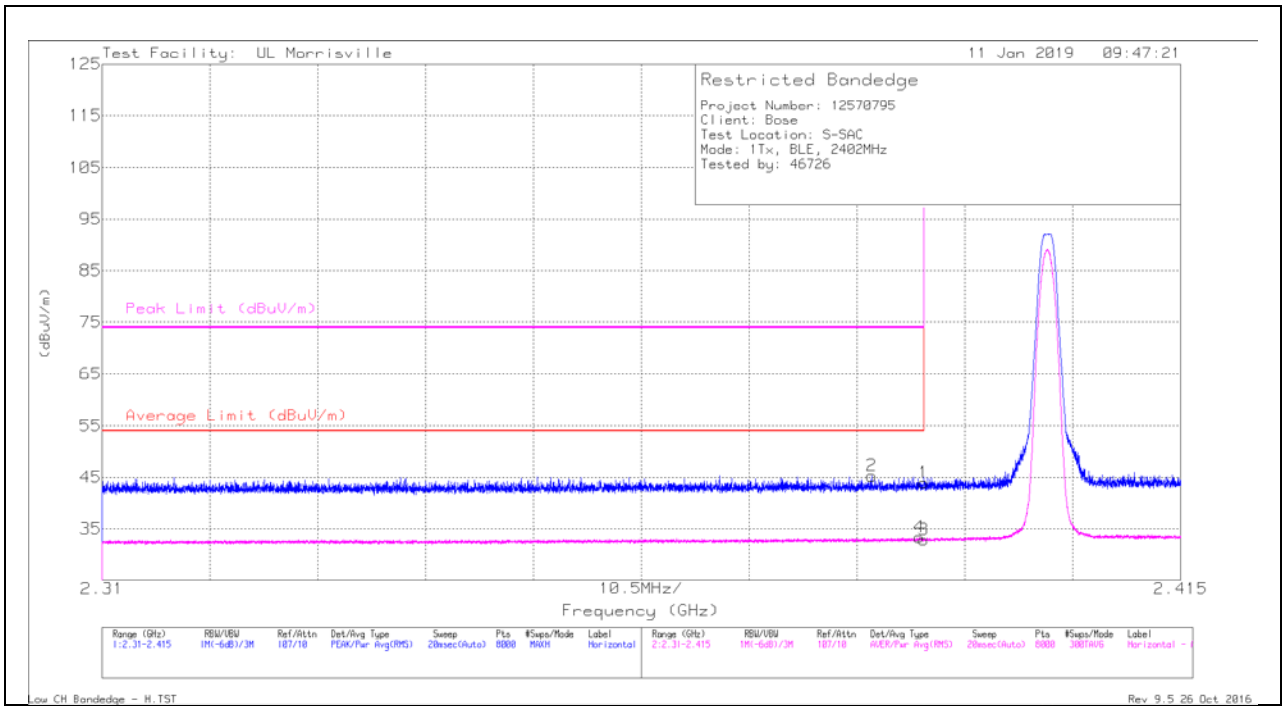
9.1. TRANSMITTER ABOVE 1 GHz

9.1.1. BLE (1Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	36.02	Pk	32	-24.1	0	43.92	-	-	74	-30.08	1	123	H
2	* ** 2.385	37.36	Pk	32	-24.1	0	45.26	-	-	74	-28.74	1	123	H
3	* ** 2.39	24.98	RMS	32	-24.1	2.02	34.90	54	-19.10	-	-	1	123	H
4	* ** 2.39	25.44	RMS	32	-24.1	2.02	35.36	54	-18.64	-	-	1	123	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
RMS - RMS detection

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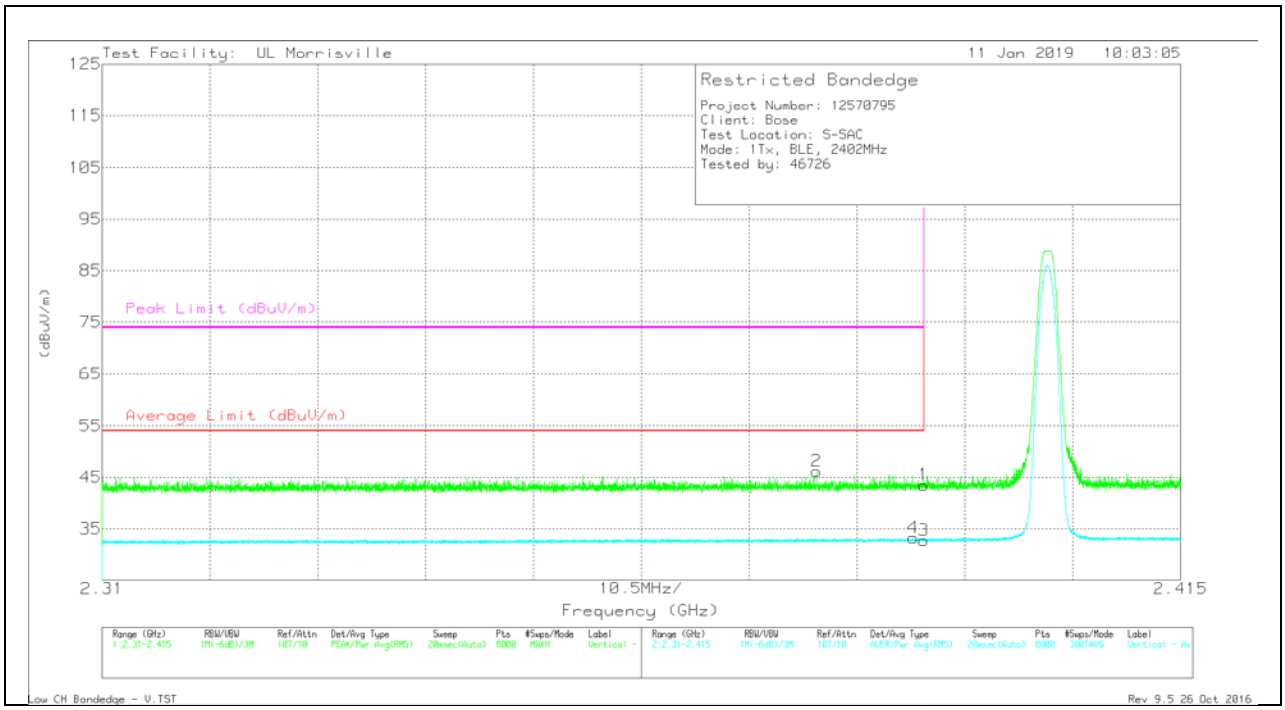
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (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	35.61	Pk	32	-24.1	0	43.51	-	-	74	-30.49	128	392	V
2	* ** 2.38	38.25	Pk	32	-24.1	0	46.15	-	-	74	-27.85	128	392	V
3	* ** 2.39	24.87	RMS	32	-24.1	2.02	34.79	54	-19.21	-	-	128	392	V
4	* ** 2.389	25.38	RMS	32	-24.1	2.02	35.30	54	-18.70	-	-	128	392	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
RMS - RMS detection

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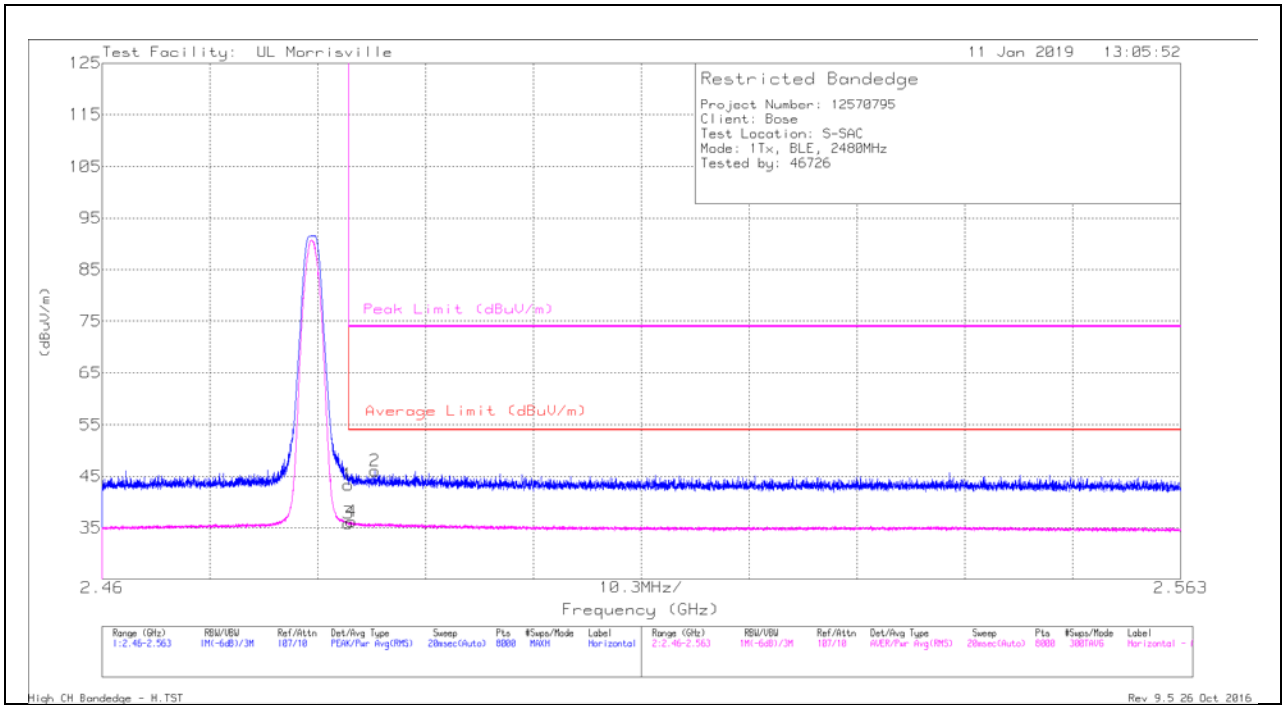
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (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	35.57	Pk	32.4	-24.6	0	43.37	-	-	74	-30.63	91	351	H
2	* ** 2.486	38.23	Pk	32.4	-24.6	0	46.03	-	-	74	-27.97	91	351	H
3	* ** 2.484	26.07	RMS	32.4	-24.6	2.02	35.89	54	-18.11	-	-	91	351	H
4	* ** 2.484	26.38	RMS	32.4	-24.6	2.02	36.2	54	-17.8	-	-	91	351	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
RMS - RMS detection

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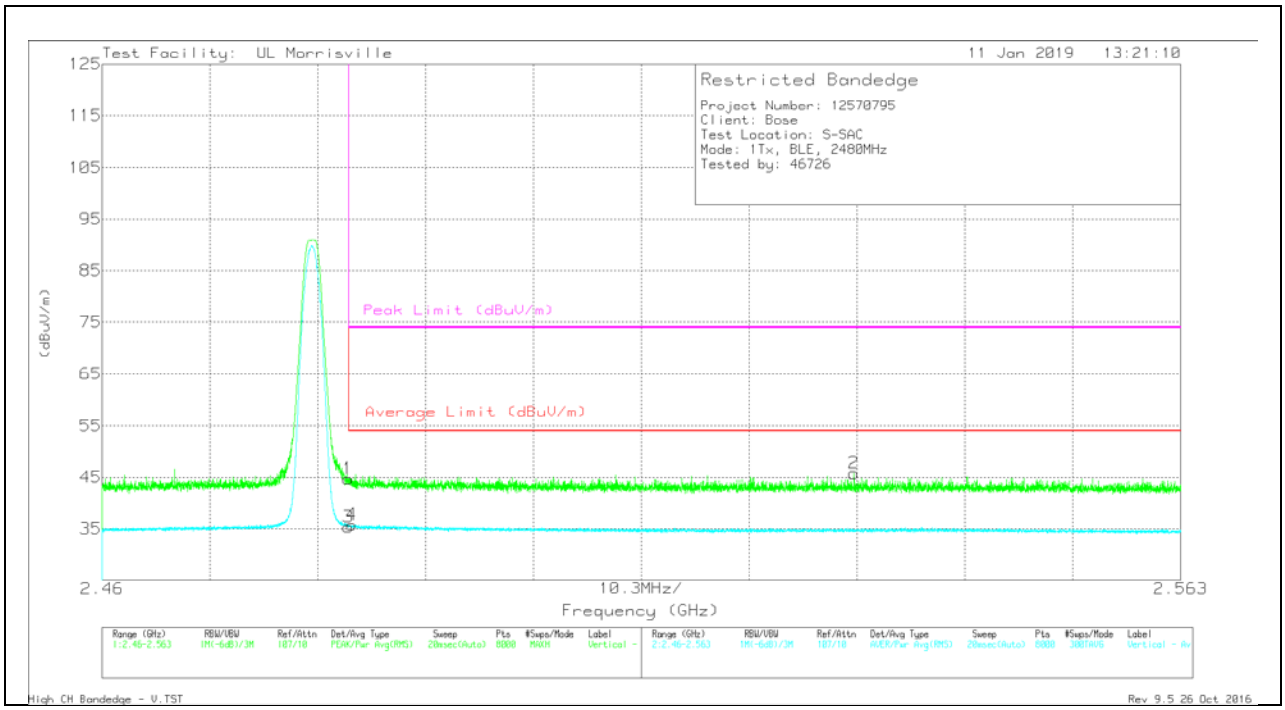
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.484	36.92	Pk	32.4	-24.6	0	44.72	-	-	74	-29.28	125	360	V
3	* ** 2.484	25.51	RMS	32.4	-24.6	2.02	35.33	54	-18.67	-	-	125	360	V
4	* ** 2.484	25.94	RMS	32.4	-24.6	2.02	35.76	54	-18.24	-	-	125	360	V
2	2.532	38.25	Pk	32.4	-24.9	0	45.75	-	-	74	-28.25	125	360	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
RMS - RMS detection

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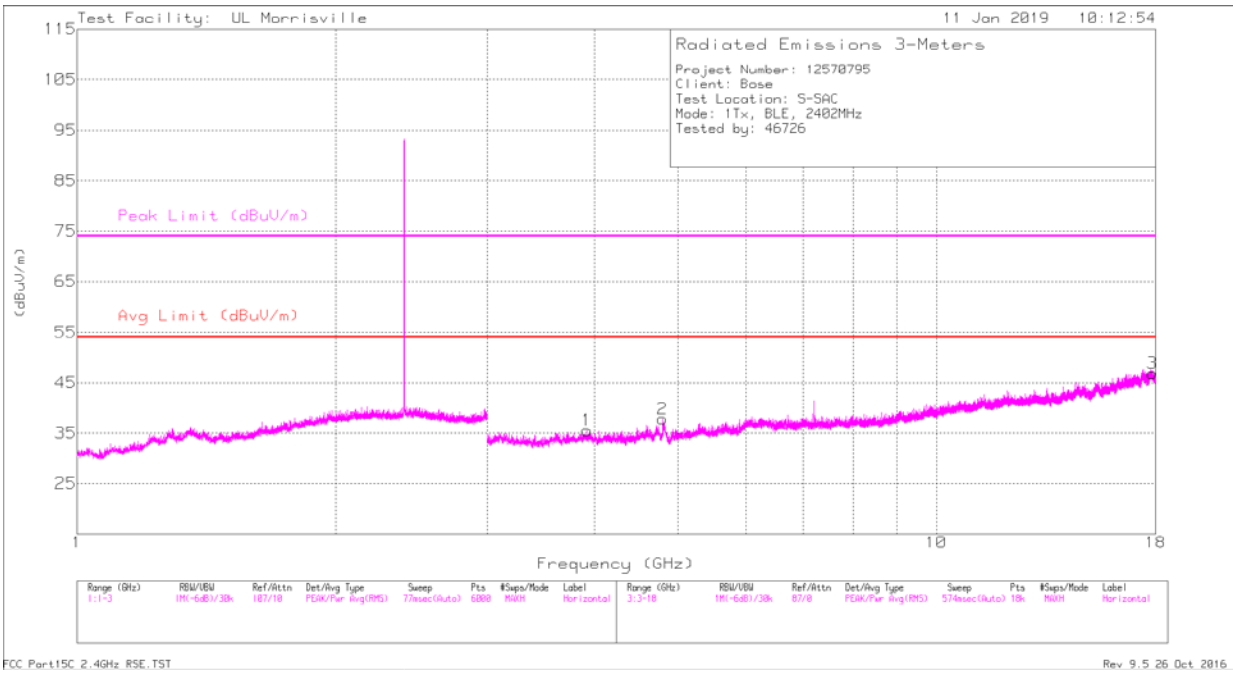
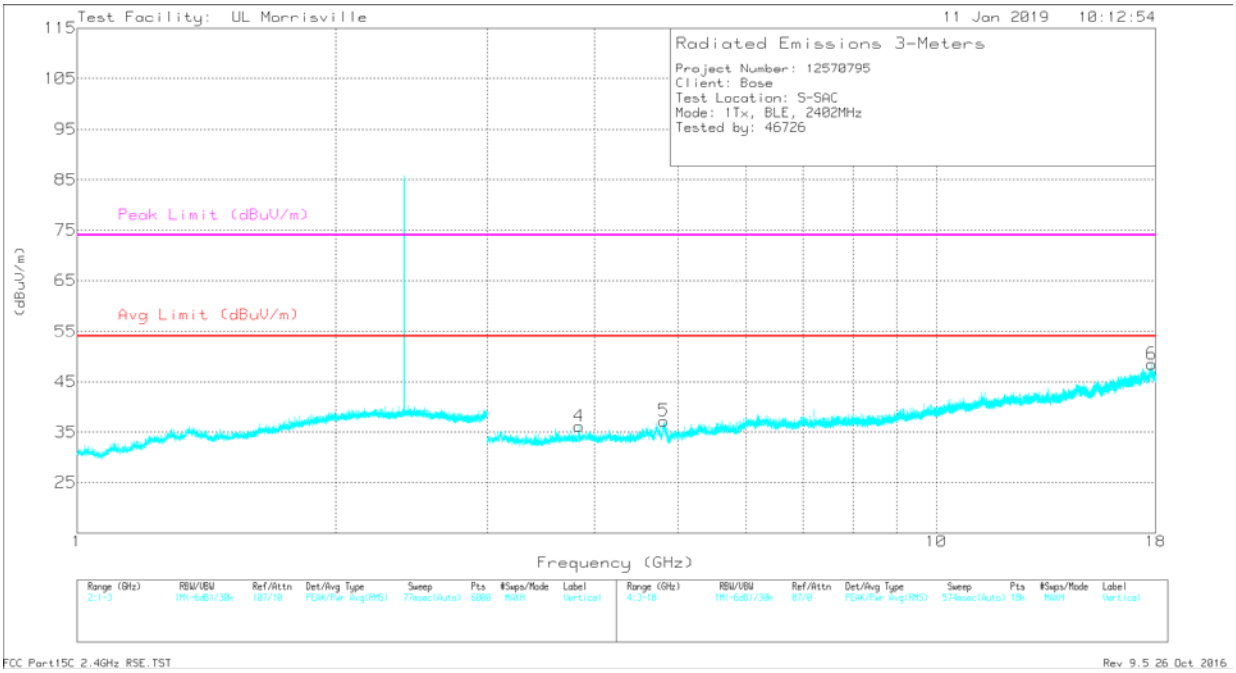
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



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RADIATED EMISSIONS

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 3.92	39.66	PK2	33.4	-31.9	0	41.16	-	-	74	-32.84	344	140	H
	* ** 3.923	28.24	MAv1	33.4	-31.9	2.02	31.76	54	-22.24	-	-	344	140	H
2	* ** 4.804	42.37	PK2	34	-31.2	0	45.17	-	-	74	-28.83	16	144	H
	* ** 4.804	30.63	MAv1	34	-31.2	2.02	35.45	54	-18.55	-	-	16	144	H
3	* ** 17.844	33.49	PK2	41.3	-21	0	53.79	-	-	74	-20.21	178	343	H
	* ** 17.844	21.36	MAv1	41.3	-21	2.02	43.68	54	-10.32	-	-	178	343	H
4	* ** 3.838	40.19	PK2	33.4	-32.3	0	41.29	-	-	74	-32.71	135	110	V
	* ** 3.838	28.13	MAv1	33.4	-32.3	2.02	31.25	54	-22.75	-	-	135	110	V
5	* ** 4.817	40.94	PK2	34	-31.1	0	43.84	-	-	74	-30.16	41	194	V
	* ** 4.817	28.63	MAv1	34	-31.1	2.02	33.55	54	-20.45	-	-	41	194	V
6	* ** 17.817	33.65	PK2	41.3	-20.8	0	54.15	-	-	74	-19.85	354	208	V
	* ** 17.817	21.62	MAv1	41.3	-20.8	2.02	44.14	54	-9.86	-	-	354	208	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

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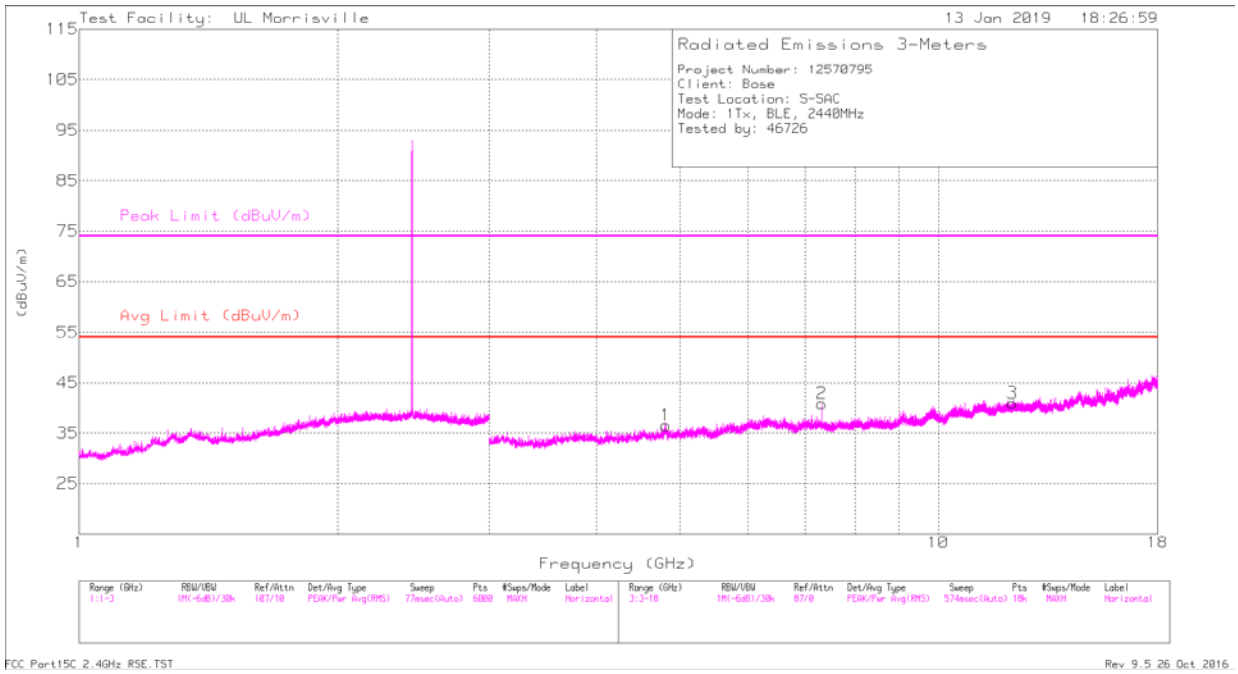
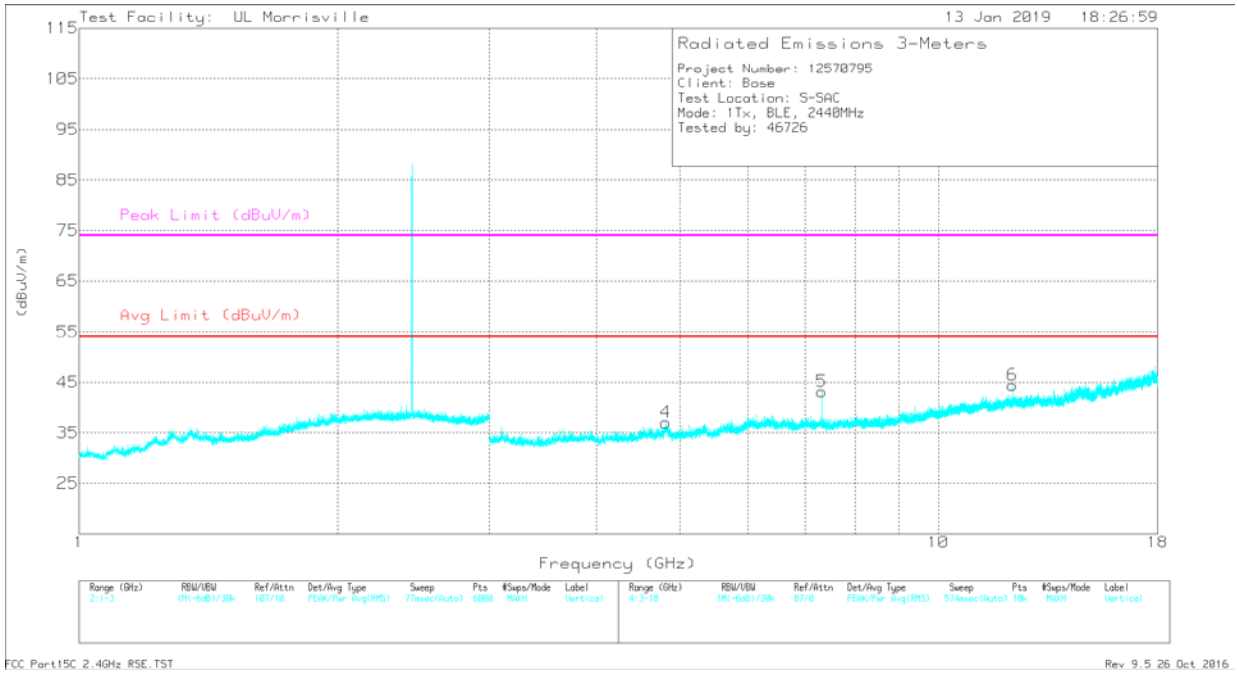
MID CHANNEL RESULTS



HORIZONTAL



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RADIATED EMISSIONS

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.818	40.45	PK2	34	-31.1	0	43.35	-	-	74	-30.65	99	259	H
	* ** 4.818	28.35	MAv1	34	-31.1	2.02	33.27	54	-20.73	-	-	99	259	H
2	* ** 7.32	40.2	PK2	35.5	-27.6	0	48.1	-	-	74	-25.9	148	360	H
	* ** 7.32	27.94	MAv1	35.5	-27.6	2.02	37.86	54	-16.14	-	-	148	360	H
3	* ** 12.199	35.91	PK2	38.8	-24.3	0	50.41	-	-	74	-23.59	265	271	H
	* ** 12.199	23.06	MAv1	38.8	-24.3	2.02	39.58	54	-14.42	-	-	265	271	H
4	* ** 4.818	40.61	PK2	34	-31.1	0	43.51	-	-	74	-30.49	89	311	V
	* ** 4.818	28.35	MAv1	34	-31.1	2.02	33.27	54	-20.73	-	-	89	311	V
5	* ** 7.32	39.89	PK2	35.5	-27.6	0	47.79	-	-	74	-26.21	325	116	V
	* ** 7.32	26.78	MAv1	35.5	-27.6	2.02	36.7	54	-17.3	-	-	325	116	V
6	* ** 12.202	35.51	PK2	38.8	-24.2	0	50.11	-	-	74	-23.89	107	124	V
	* ** 12.201	23.71	MAv1	38.8	-24.2	2.02	40.33	54	-13.67	-	-	107	124	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

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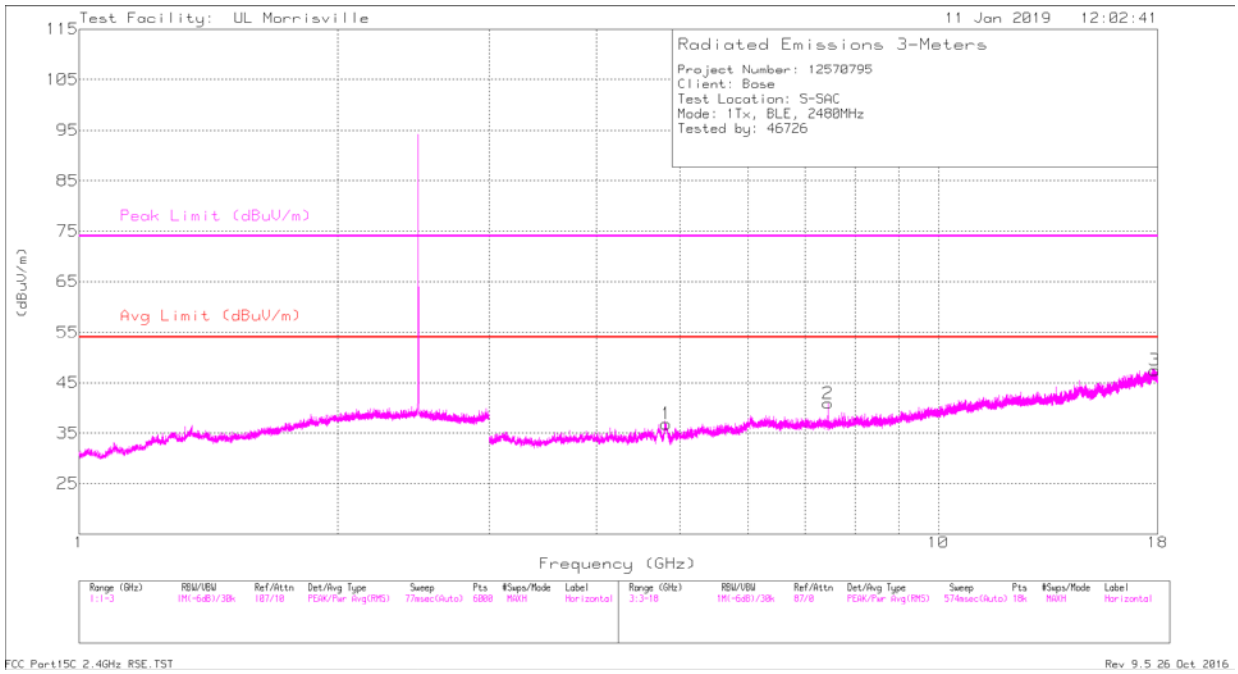
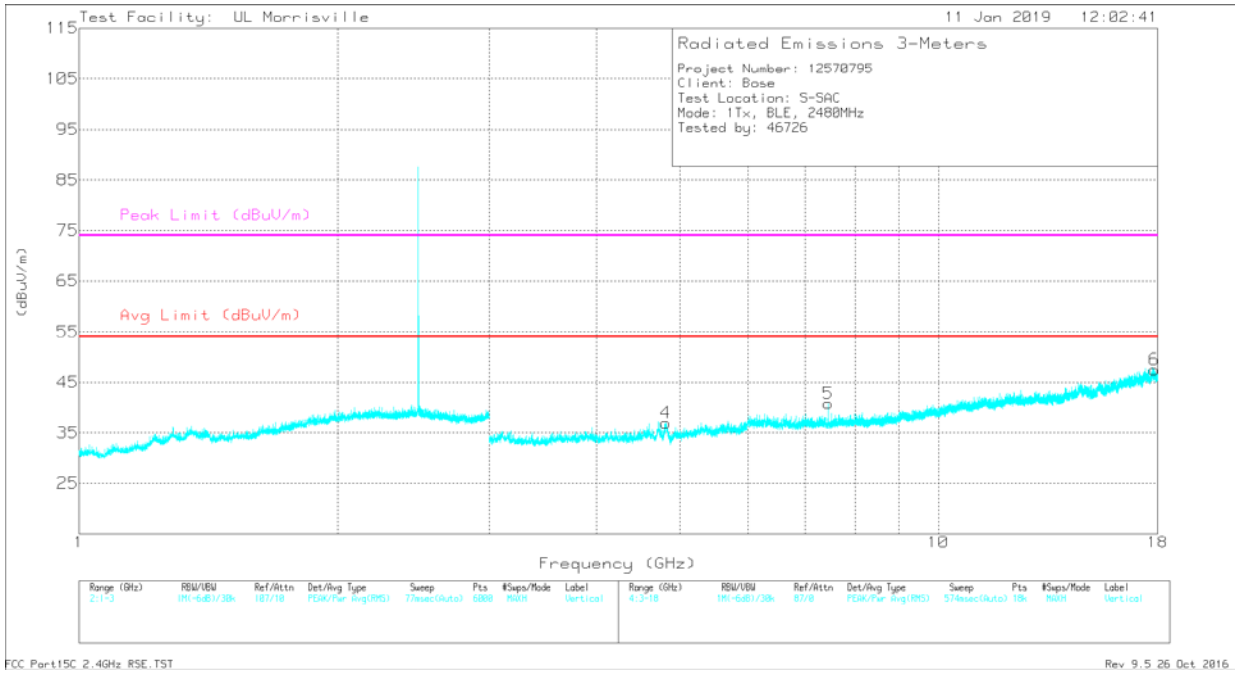
HIGH CHANNEL RESULTS



HORIZONTAL



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RADIATED EMISSIONS

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.821	41.42	PK2	34	-31	0	44.42	-	-	74	-29.58	15	263	H
	* ** 4.821	28.89	MAv1	34	-31	2.02	33.91	54	-20.09	-	-	15	263	H
2	* ** 7.44	40.22	PK2	35.5	-27.9	0	47.82	-	-	74	-26.18	341	109	H
	* ** 7.44	28.76	MAv1	35.5	-27.9	2.02	38.38	54	-15.62	-	-	341	109	H
3	* ** 17.731	33.45	PK2	41.2	-21.8	0	52.85	-	-	74	-21.15	14	388	H
	* ** 17.708	22.47	MAv1	41.2	-22.2	2.02	43.49	54	-10.51	-	-	14	388	H
4	* ** 4.819	41.11	PK2	34	-31.1	0	44.01	-	-	74	-29.99	173	141	V
	* ** 4.82	28.77	MAv1	34	-31.1	2.02	33.69	54	-20.31	-	-	173	141	V
5	* ** 7.44	35.92	PK2	35.5	-27.9	0	43.52	-	-	74	-30.48	173	199	V
	* ** 7.439	24.96	MAv1	35.5	-27.9	2.02	34.58	54	-19.42	-	-	173	199	V
6	* ** 17.854	33.47	PK2	41.3	-20.9	0	53.87	-	-	74	-20.13	234	332	V
	* ** 17.854	21.41	MAv1	41.3	-20.9	2.02	43.83	54	-10.17	-	-	234	332	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

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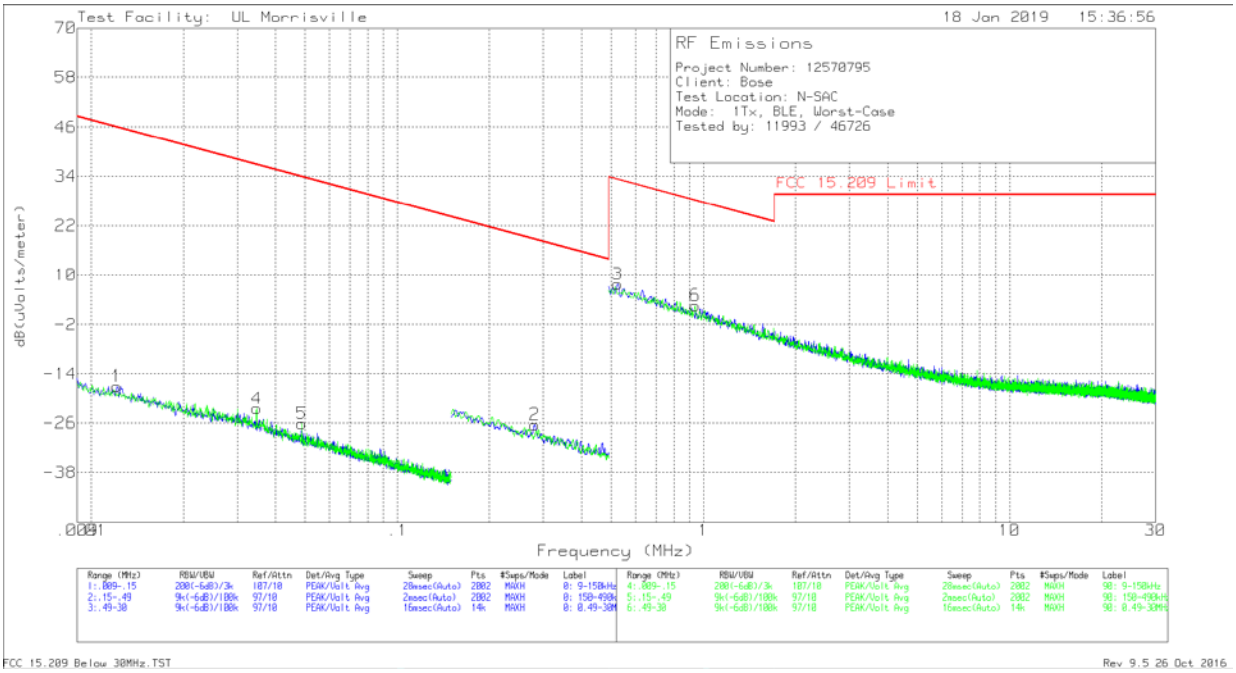
9.2. WORST-CASE BELOW 30MHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) 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 (test distance / specification distance).



ANTENNA - TWO ORIENTATIONS FACE ON/FACE OFF

BELOW 30MHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uV/m)	FCC QP 15.209 Limit	FCC AV 15.209 Limit	FCC PK 15.209 Limit	Worst-Case Margin (dB)	Azimuth (Degs)
1	.01215	44.59	Pk	18.3	.1	-80	-17.01	-	45.91	65.91	-62.92	0-360
4	.03469	44.45	Pk	13	.1	-80	-22.45	-	36.8	56.8	-59.25	0-360
5	.04869	42.28	Pk	11.5	.1	-80	-26.12	-	33.86	53.86	-59.98	0-360
2	.28107	43.28	Pk	10.2	.1	-80	-26.42	-	18.63	-38.63	-45.05	0-360
3	.52373	37.3	Pk	10.4	.1	-40	7.8	33.22	-	-	-25.42	0-360
6	.939	31.89	Pk	10.5	.2	-40	2.59	28.15	-	-	-25.56	0-360

Pk - Peak detector

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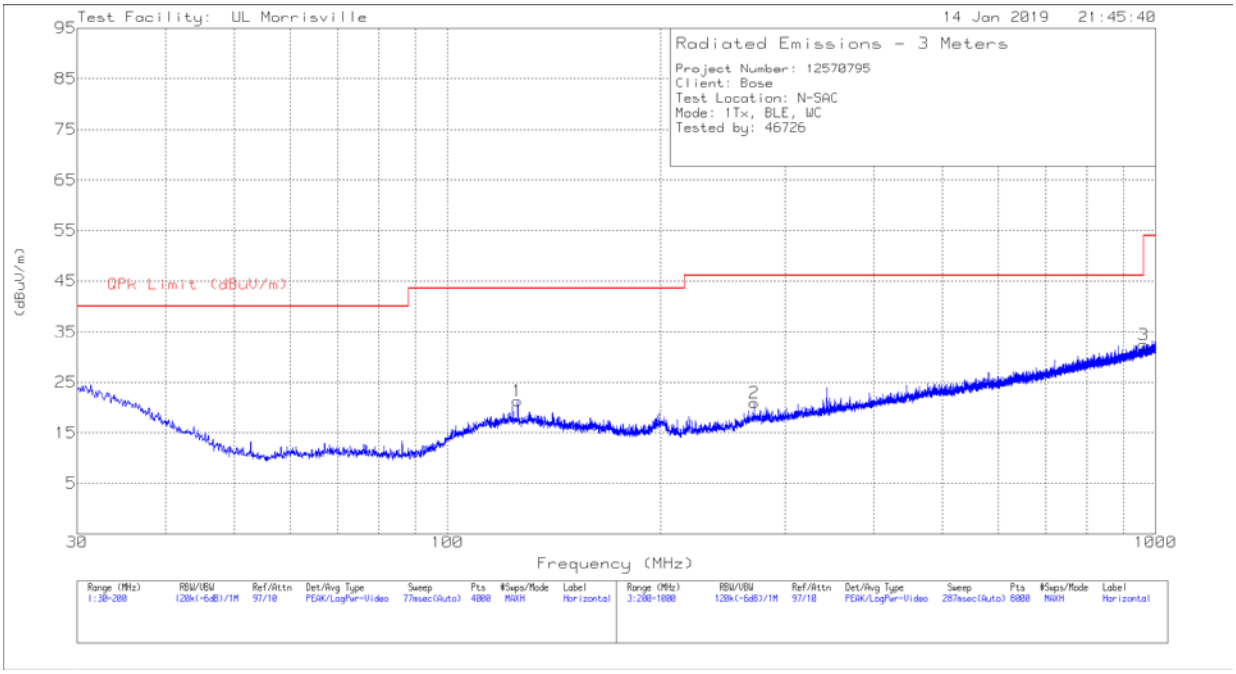
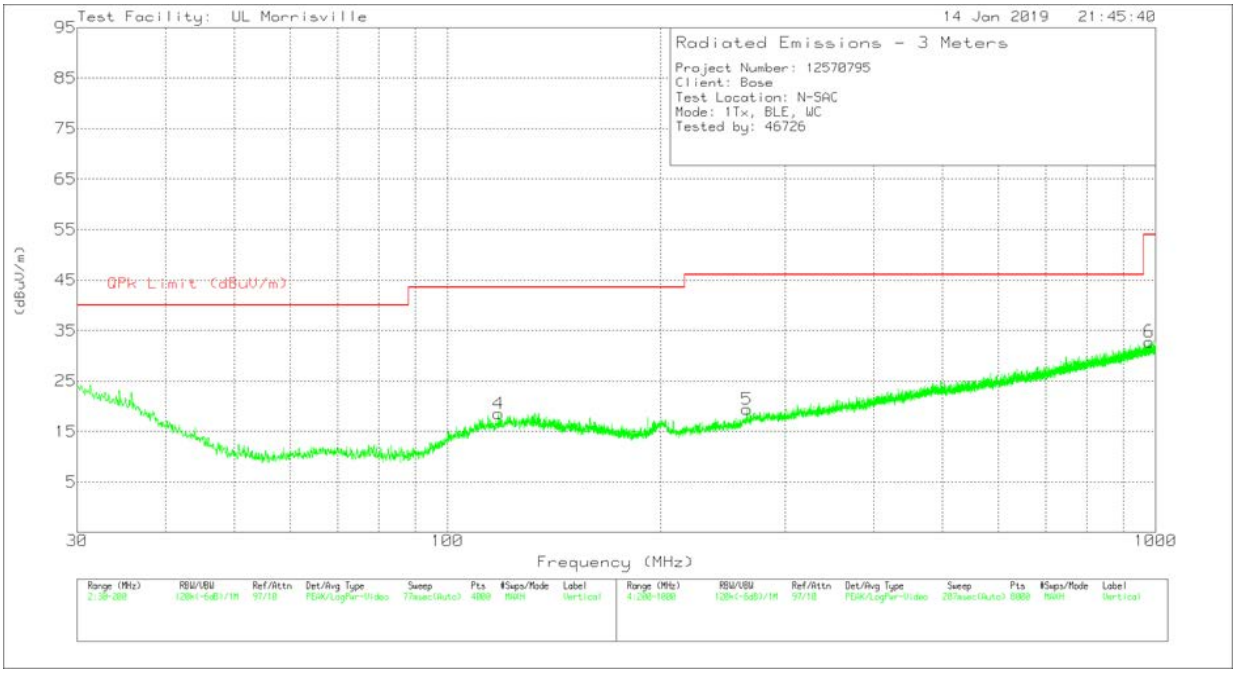
9.3. WORST-CASE 30 TO 1000MHz

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



HORIZONTAL



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30 TO 1000 MHz DATA

Markers	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0073 ACF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 125.4716	25.4	Qp	20.1	-30.7	14.8	43.52	-28.72	60	196	H
2	* ** 271.1552	22.93	Qp	19.8	-29.6	13.13	46.02	-32.89	289	165	H
3	* ** 962.0459	21.89	Qp	29.5	-25.6	25.79	53.97	-28.18	204	275	H
4	* ** 118.0273	23.33	Qp	19.9	-30.8	12.43	43.52	-31.09	171	344	V
5	* ** 264.8742	23.07	Qp	19.4	-29.7	12.77	46.02	-33.25	104	366	V
6	* ** 979.3069	21.69	Qp	29.6	-25.3	25.99	53.97	-27.98	80	311	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Qp - Quasi-Peak detector

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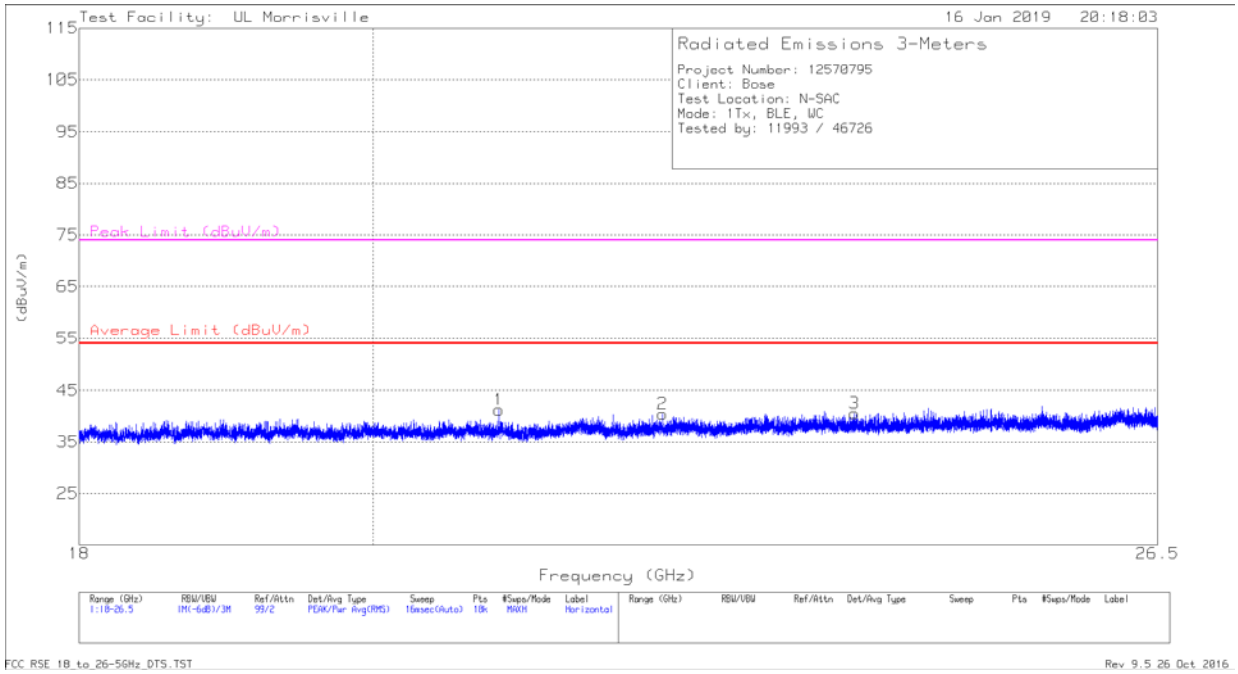
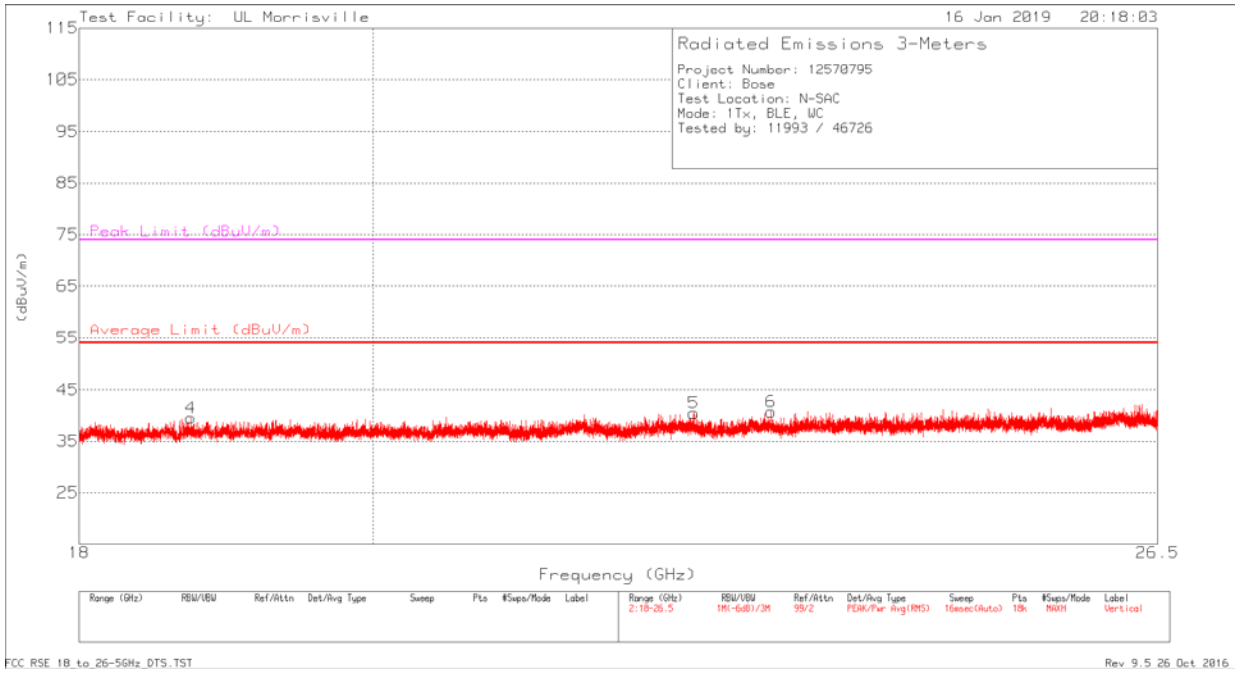
9.1. WORST-CASE 18 TO 26GHz

SPURIOUS EMISSIONS 18 TO 26Hz (WORST-CASE CONFIGURATION)



HORIZONTAL



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18 TO 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 20.924	47.85	Pk	33.1	-39.8	41.15	54	-12.85	74	-32.85	0-360	199	H
2	* ** 22.189	46.1	Pk	33.6	-39.3	40.4	54	-13.6	74	-33.6	0-360	102	H
3	* ** 23.77	45.5	Pk	34	-39	40.5	54	-13.5	74	-33.5	0-360	299	H
4	* ** 18.733	46.28	Pk	32.5	-39.3	39.48	54	-14.52	74	-34.52	0-360	299	V
5	* ** 22.439	46.12	Pk	33.5	-39.2	40.42	54	-13.58	74	-33.58	0-360	299	V
6	* ** 23.071	46.26	Pk	33.7	-39.3	40.66	54	-13.34	74	-33.34	0-360	299	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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10. SETUP PHOTOS

Please refer to R12570795--EP1 for setup photos

END OF TEST REPORT

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