CERTIFICATION TEST REPORT

Report Number. : R12761322-E2

Applicant	:	Weber-Stephen Products LLC 1415 S Roselle Rd Palatine, IL, 60067, US
Model	:	CONNECT1
FCC ID	:	2AHSR-CONNECT1
IC	:	21267-CONNECT1
EUT Description	:	2.4 WLAN and BLE Radio module
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
2019-06-13

Prepared by:
UL LLC
12 Laboratory Dr.
Research Triangle Park, NC 27709 USA
Tel: (919) 549-1400

NVLAP TESTING

NVLAP Lab code: 200246-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2019-06-13	Initial Issue	Niklas Haydon
V2	2019-07-25	Corrected model name	Lariah Ijames

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Weber-Stephen Products LLC
1415 S Roselle Rd
Palatine, IL, 60067, US

EUT DESCRIPTION: 2.4 WLAN and BLE Radio module

MODEL: CONNECT1

SERIAL NUMBER: Non-serialized

DATE TESTED: 2019-05-13 to 2019-05-15

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

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.

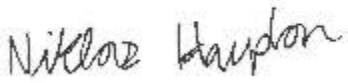
The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. 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.

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

Jeffrey Moser
Operations Leader
Consumer Technology Division
UL LLC

Prepared By:



Niklas Haydon
Engineer
Consumer Technology Division
UL LLC

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, KDB 558074 D01 15.247 Meas Guidance v05r02, 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, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, North Carolina, 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., Suite B
ISED Site Code: 2180C	
☐ Chamber A RTP	☐ North Chamber
☐ Chamber C RTP	☒ South Chamber

The above test sites and facilities are covered under FCC Test Firm Registration # 703469. Chambers above are covered under Industry Canada company address and respective code.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

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)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	2.50 dB
All emissions, radiated	4.88 dB
Temperature	2.26°C
Humidity	6.79%
DC Supply voltages	1.70%
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 CONNECT1 is an 802.11 b/g/n (1x1, 20 MHz) and BLE radio module. The CONNECT1 is referred to in this report as the Pulse and Saber units. The differences are described below.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Pulse

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	4.76	2.99

Saber

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	5.49	3.54

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an OnBoard SMD antenna, with a maximum gain of 3 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 01-68e4a7a6.
The test utility software used during testing was 7.45.98.50 (r688715 CY WLTEST).

5.5. DESCRIPTION OF MODEL DIFFERENCES

The manufacturer is producing units of varying trace lengths. The shortest and longest of the trace lengths were selected to represent all variations. The trace lengths between the Pulse and Saber units vary between 15mm and 20mm. Both units were tested for antenna port conducted power, power line conducted emissions, and radiated emissions. The unit with the higher antenna port conducted power was tested for antenna port conducted emissions to represent all models.

5.6. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power and PSD 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 Pulse 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 Pulse EUT in Z orientation.

The fundamental of the Saber 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 Saber EUT in X orientation.

Worst-case data rates as provided by the client were:

BLE: 1 Mbps

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	L470	PF0ZV674	NA
Laptop Charger	Lenovo	ADLX65NCC2A	11S45N0263Z1ZS995256HR	NA

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB Type A	1	USB-Micro B	USB	<3M	None

TEST SETUP

The EUT is connected to a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM

Please refer to R12761322-EP1 for setup diagrams

6. 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 Method PKPM1 Peak-reading power meter

Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

PSD: ANSI C63.10 Subclause -11.10.2 Method PKPSD (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 11.12.1 & 6.10.5

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

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

7. 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.
	Common Equipment				
76022	DC Regulated Power Supply	CircuitSpecialists .Com	CSI3005X5	N/A	N/A
	Conducted Room 2				
72822 (PRE0100902)	Spectrum Analyzer	Agilent Technologies	E4446A	2018-11-19	2019-11-19
PWM004 (PRE0137346)	RF Power Meter	Keysight Technologies	N1911A	2018-07-30	2019-07-30
PWS002 (PRE0137348)	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2018-07-30	2019-07-30
SN 181474341	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27
76021	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.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2018-06-19	2019-06-19
s/n 181562858	Environmental Meter	Fisher Scientific	14-650-118	2018-09-04	2020-09-04
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2018-08-21	2019-08-21
75141 (PRE0101521)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2018-08-22	2019-08-22
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2018-06-13	2019-06-13
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
MM0169	Multi-meter	Agilent	U1232A	2019-03-15	2020-03-15

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

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	0.009-30MHz	**(Loop Ant.)**			
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2019-01-24	2020-01-31
	30-1000 MHz				
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2018-07-24	2019-07-24
	1-18 GHz				
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2018-04-30	2019-04-30
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2019-04-22	2020-04-22
	18-40 GHz				
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2018-11-08	2019-11-08
	Gain-Loss Chains				
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2018-09-06	2019-09-06
S-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2018-05-20	2019-05-20
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2019-03-13	2020-03-13
S-SAC04	Gain-loss string: 18-40GHz	Various	Various	2018-09-30	2019-09-30
	Receiver & Software				
SA0025	Spectrum Analyzer	Agilent	N9030A	2019-02-28	2020-02-28
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

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

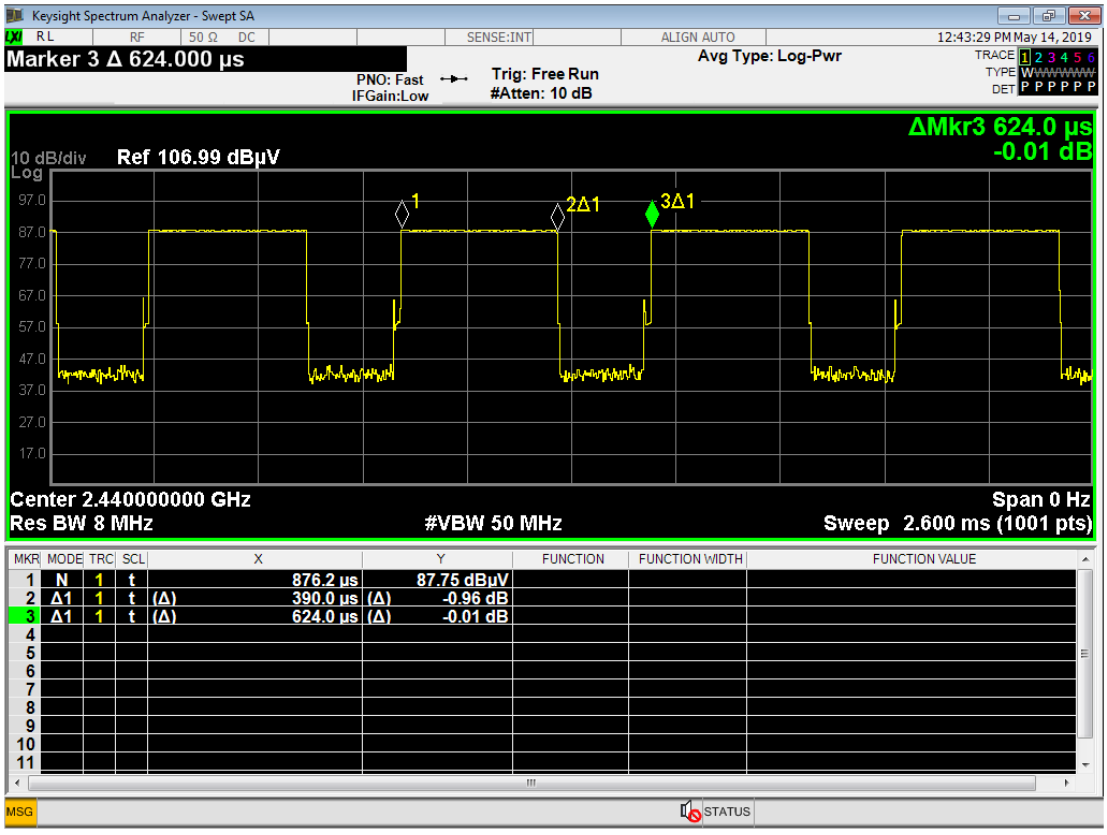
PROCEDURE

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)
2.4GHz Band						
BLE	0.390	0.624	0.625	62.50%	2.04	2.564

DUTY CYCLE PLOTS



DUTY CYCLE BLE

8.2. 99% BANDWIDTH

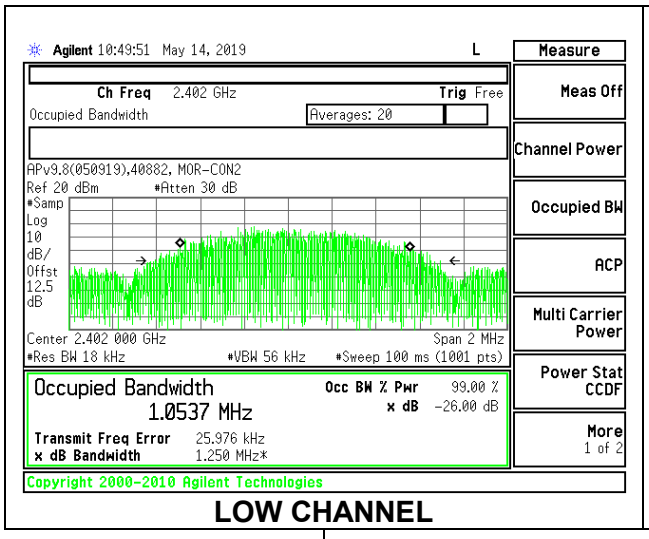
LIMITS

None; for reporting purposes only.

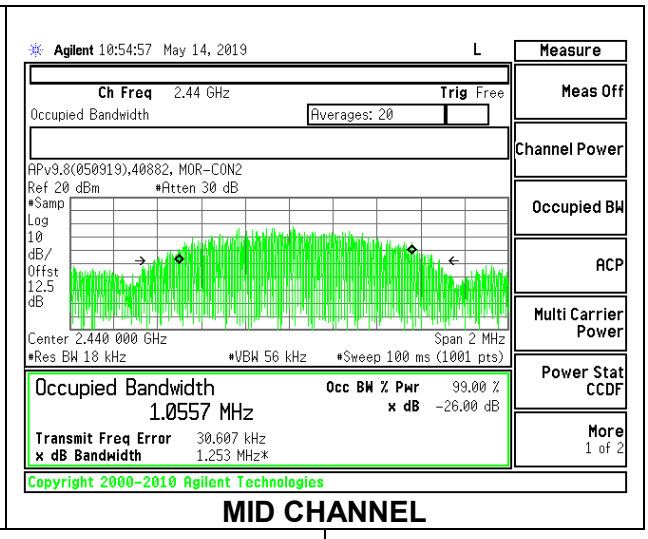
RESULTS

8.2.1. BLE (1Mbps)

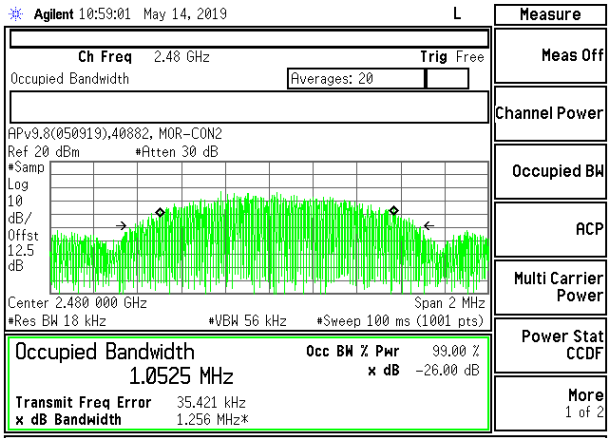
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.054
Middle	2440	1.056
High	2480	1.052



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.3. 6 dB BANDWIDTH

LIMITS

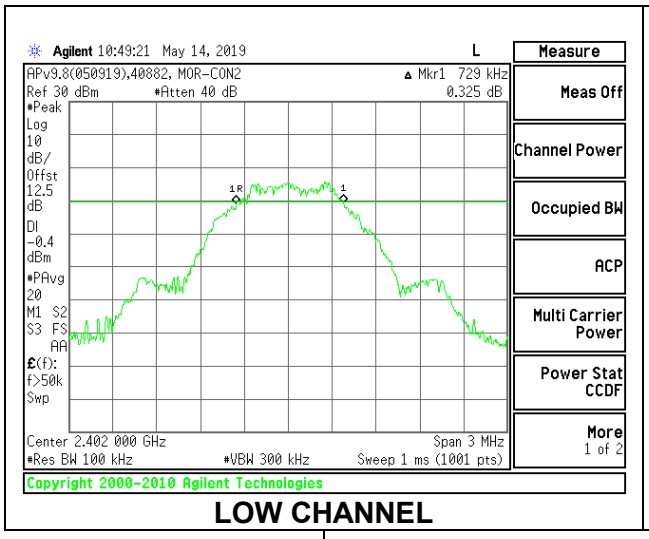
FCC §15.247 (a) (2)
RSS-247 5.2 (a)

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

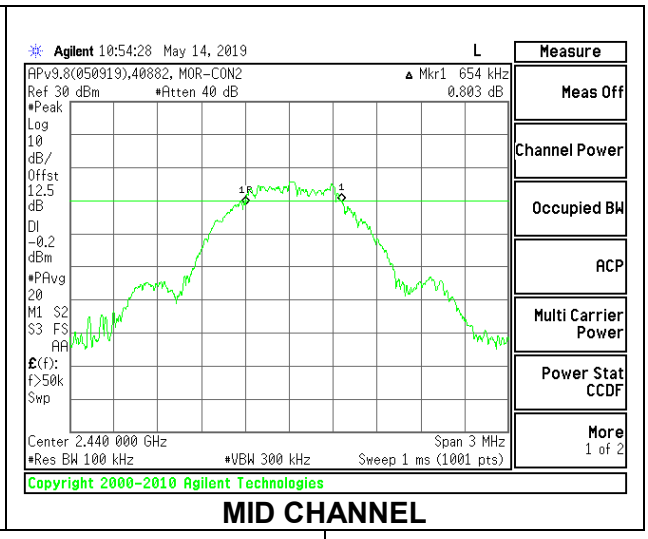
RESULTS

8.3.1. BLE (1Mbps)

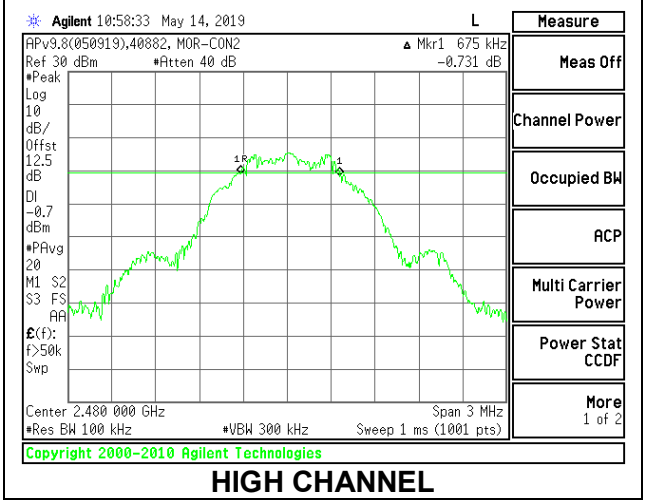
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7290	0.5
Middle	2440	0.6540	0.5
High	2480	0.6750	0.5



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)
RSS-247 5.4 (d)

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

TEST PROCEDURE
The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for a peak reading of power.

RESULTS

8.4.1. BLE (1Mbps)

Pulse

Tested By:	12015/40882
Date:	2019-05-13

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	4.68	30	-25.320
Middle	2440	4.76	30	-25.240
High	2480	4.55	30	-25.450

Saber

Tested By:	12015/40882
Date:	2019-05-13

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	5.49	30	-24.510
Middle	2440	5.39	30	-24.610
High	2480	5.09	30	-24.910

8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

RESULTS

8.5.1. BLE (1Mbps)

Pulse

Tested By:	12015/40882
Date:	2019-05-13

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	4.39
Middle	2440	4.47
High	2480	4.14

Saber

Tested By:	12015/40882
Date:	2019-05-13

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	5.18
Middle	2440	5.09
High	2480	4.57

8.6. POWER SPECTRAL DENSITY

LIMITS

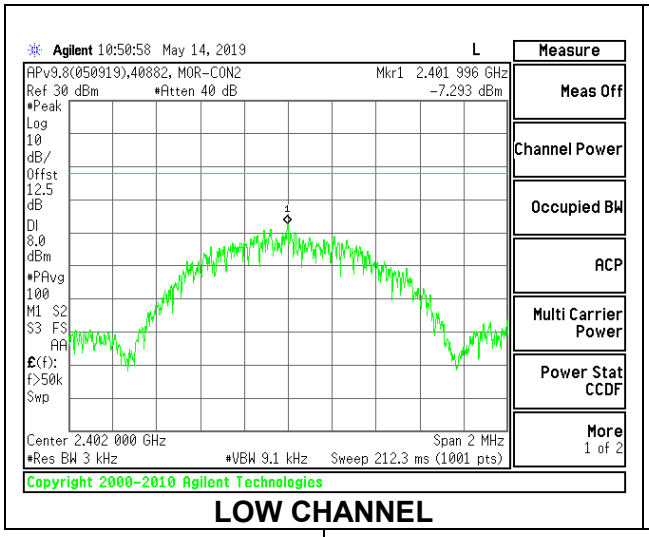
FCC §15.247 (e)
RSS-247 (5.2) (b)

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.

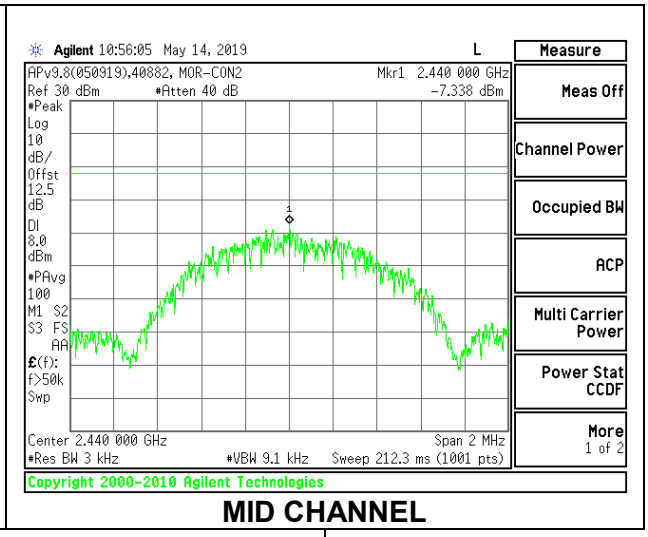
RESULTS

8.6.1. BLE (1Mbps)

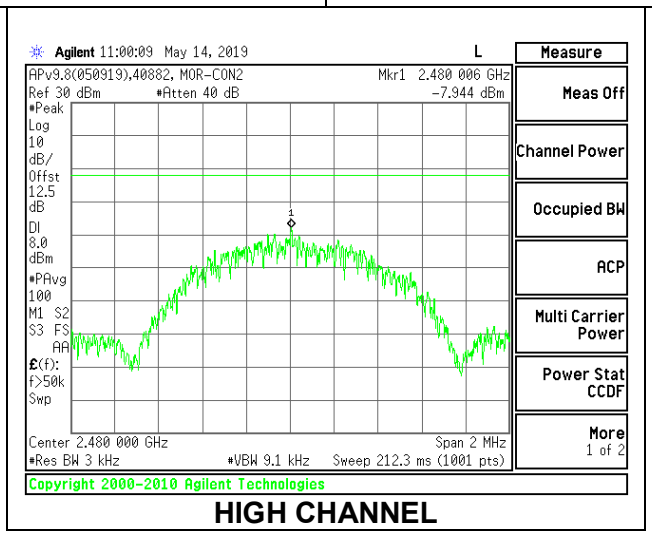
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-7.29	8	-15.29
Middle	2440	-7.34	8	-15.34
High	2480	-7.94	8	-15.94



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

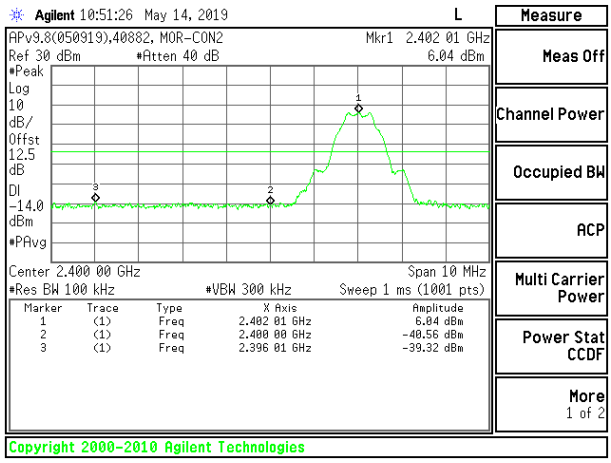
FCC §15.247 (d)

RSS-247 5.5

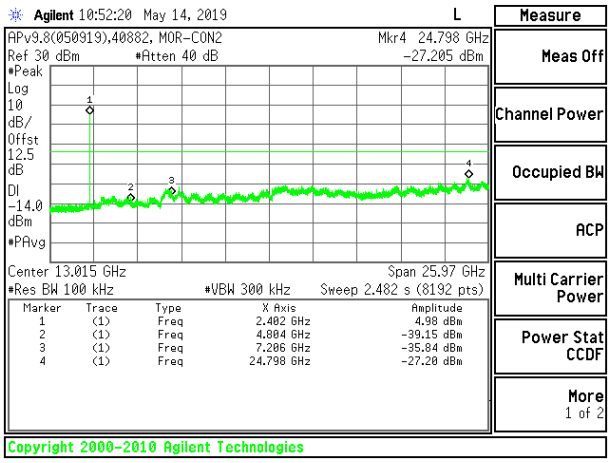
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS

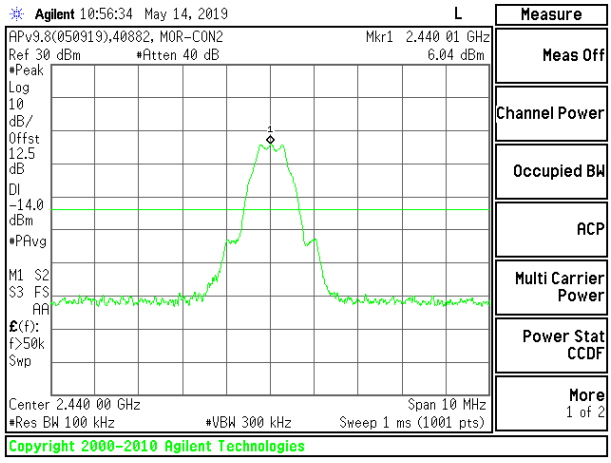
8.7.1. BLE (1Mbps)



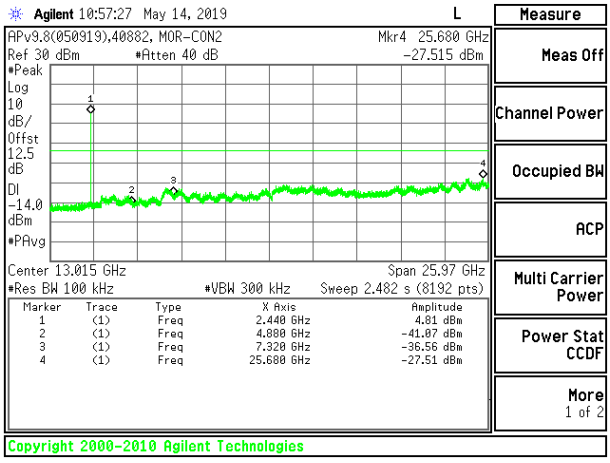
LOW CHANNEL BANDEDGE



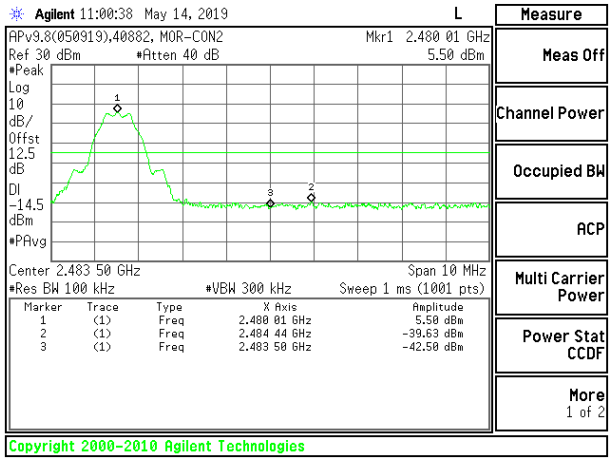
OUT-OF-BAND LOW CHANNEL



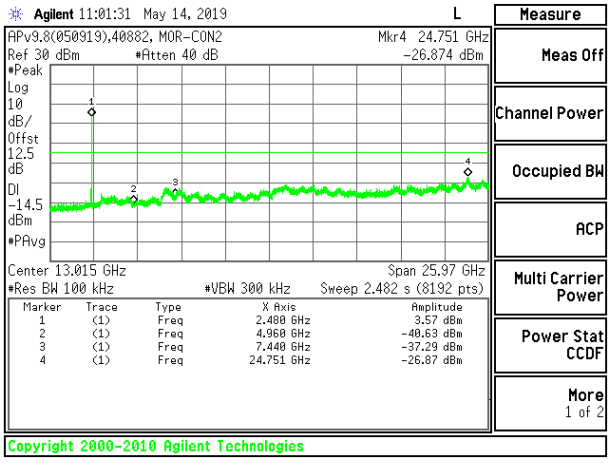
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

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

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 and PSD 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.

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

Base 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.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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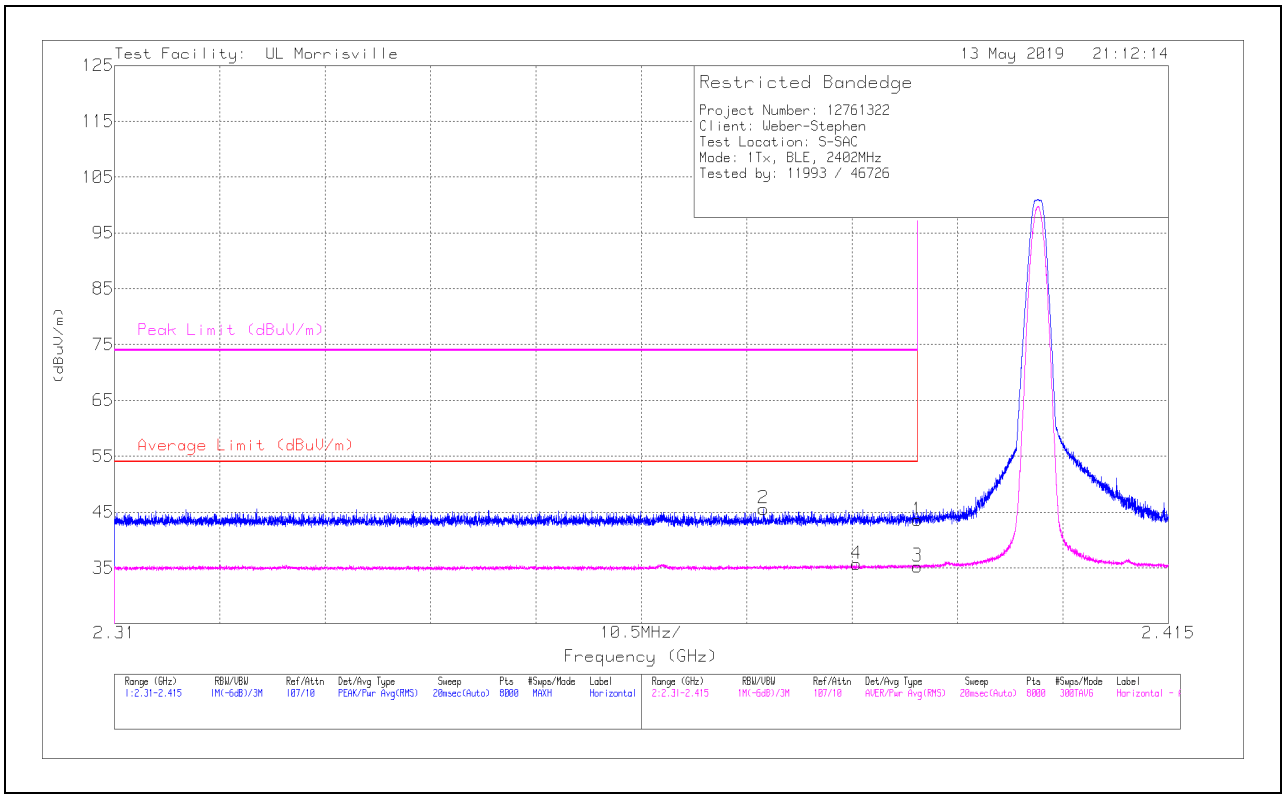
9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BLE (1Mbps)

Pulse

BANDEDGE (LOW CHANNEL)

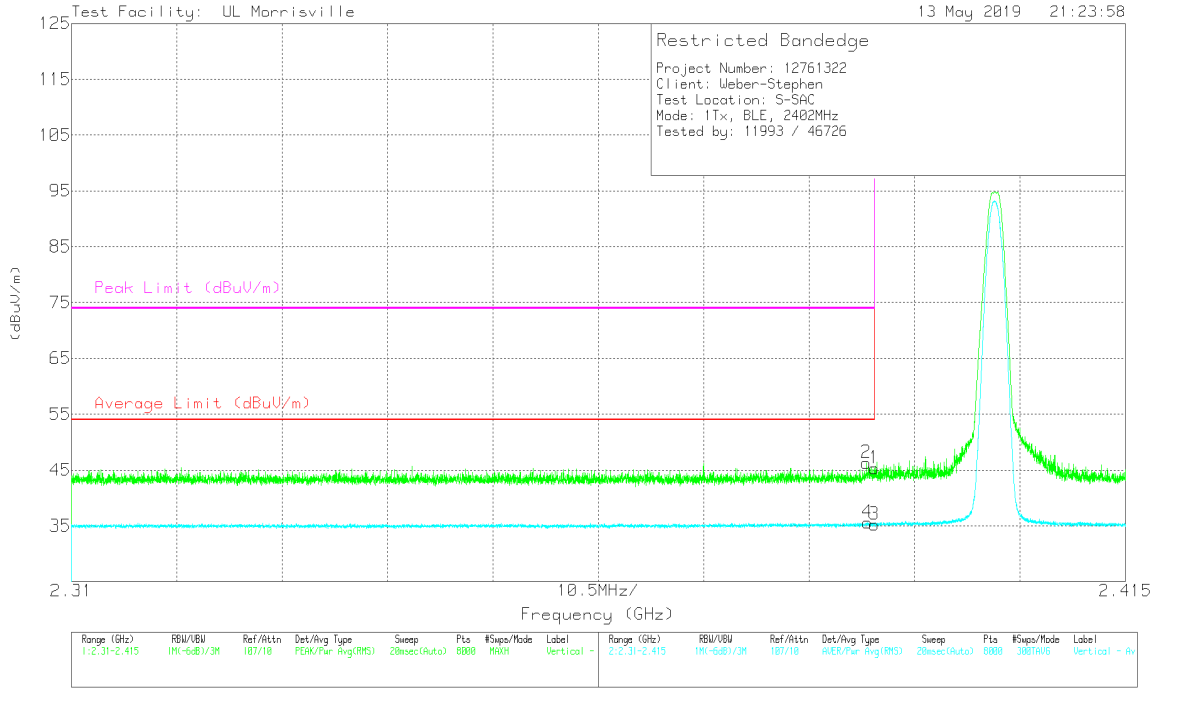
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	35.68	Pk	31.9	-24	0	43.58	-	-	74	-30.42	227	183	H
2	* ** 2.375	37.81	Pk	31.8	-24	0	45.61	-	-	74	-28.39	227	183	H
3	* ** 2.39	25.33	RMS	31.9	-24	2.04	35.27	54	-18.73	-	-	227	183	H
4	* ** 2.384	25.65	RMS	31.9	-23.9	2.04	35.69	54	-18.31	-	-	227	183	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

VERTICAL RESULT

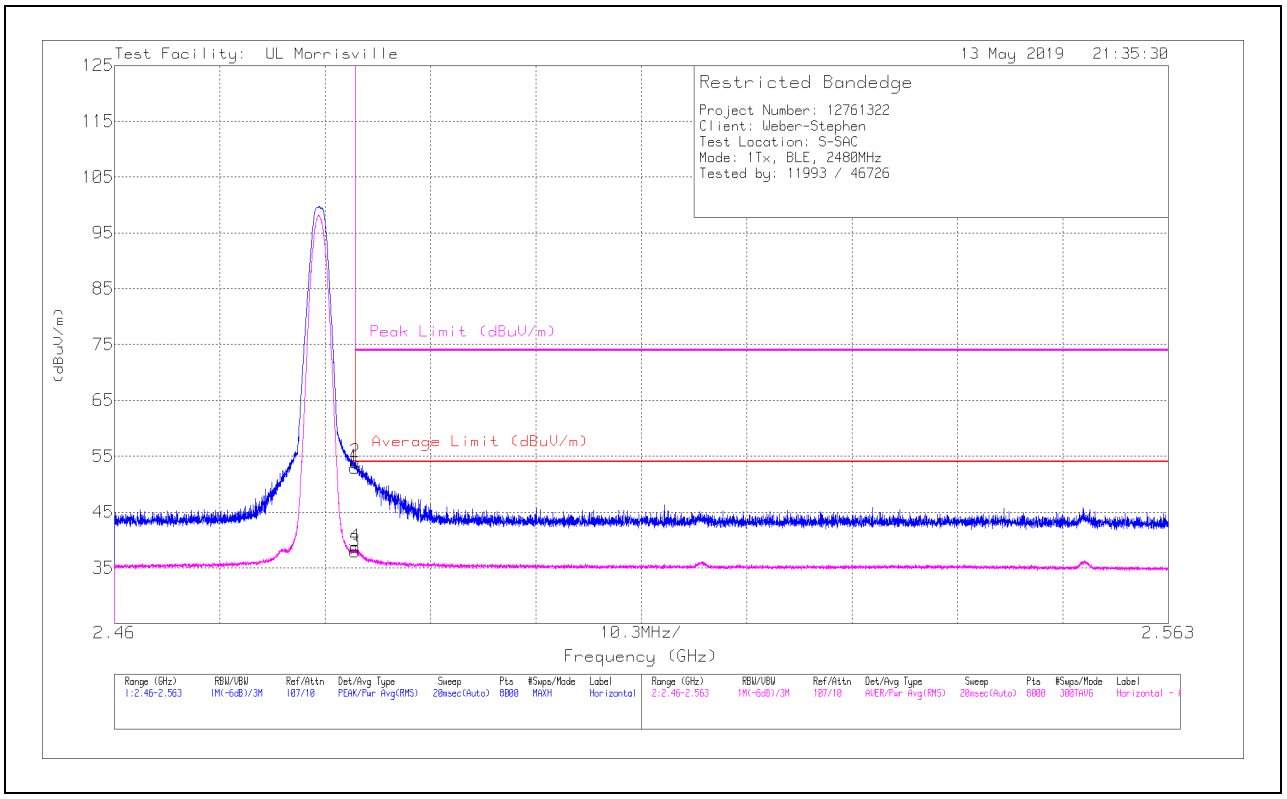


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 2.389	38.37	Pk	31.9	-24	0	46.27	-	-	74	-27.73	221	193	V
4	* ** 2.389	25.65	RMS	31.9	-24	2.04	35.59	54	-18.41	-	-	221	193	V
1	* ** 2.39	37.39	Pk	31.9	-24	0	45.29	-	-	74	-28.71	221	193	V
3	* ** 2.39	25.27	RMS	31.9	-24	2.04	35.21	54	-18.79	-	-	221	193	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

BANDEDGE (HIGH CHANNEL)

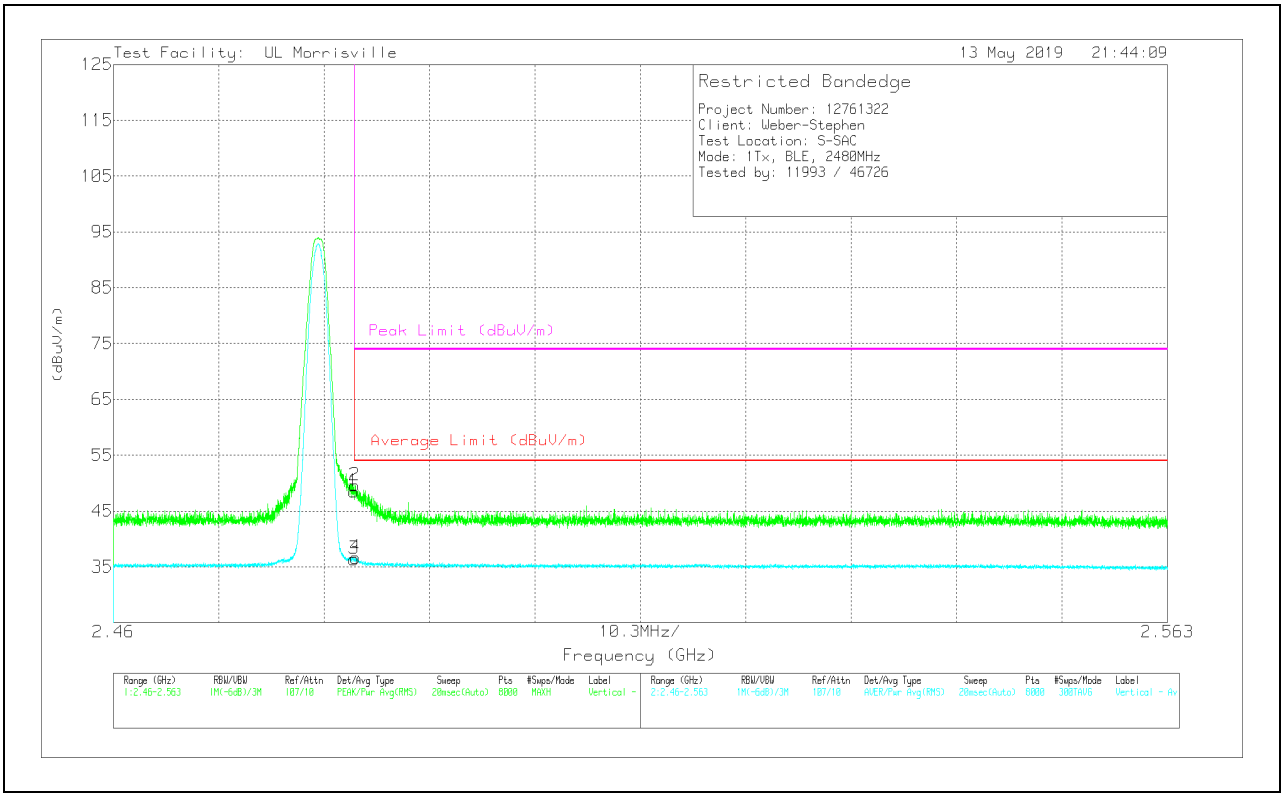
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	45.2	Pk	32.3	-24.5	0	53	-	-	74	-21	221	184	H
2	* ** 2.484	46.14	Pk	32.3	-24.5	0	53.94	-	-	74	-20.06	221	184	H
3	* ** 2.484	28.07	RMS	32.3	-24.5	2.04	37.91	54	-16.09	-	-	221	184	H
4	* ** 2.484	28.94	RMS	32.3	-24.5	2.04	38.78	54	-15.22	-	-	221	184	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

VERTICAL RESULT

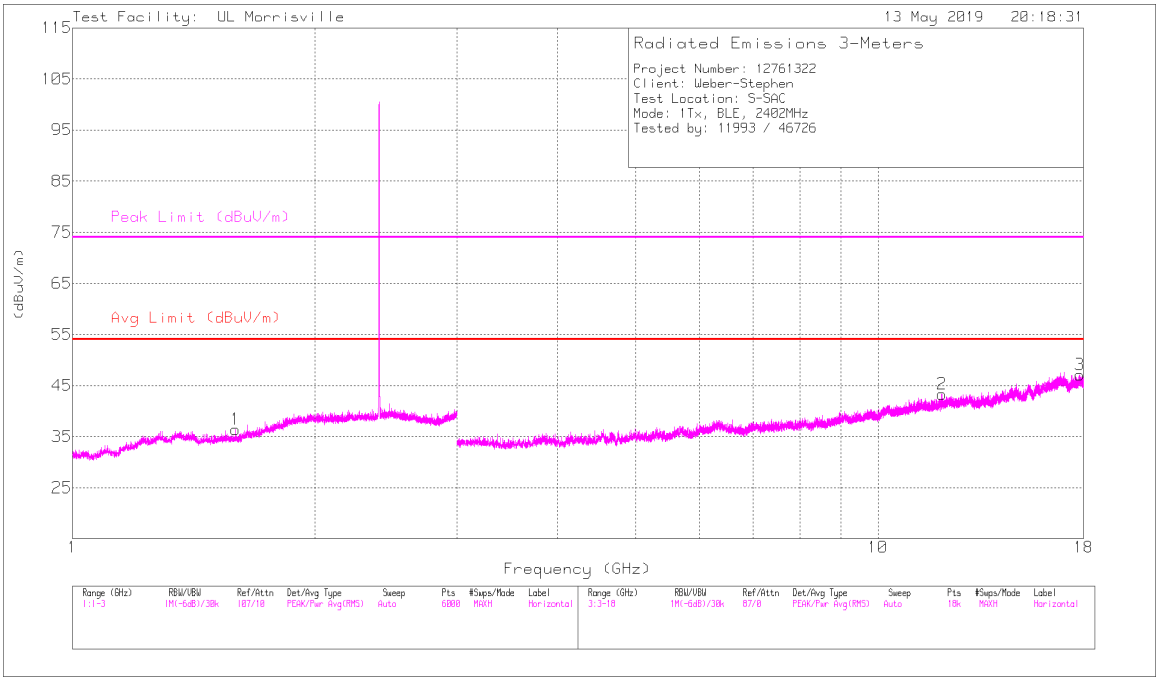


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.484	40.67	Pk	32.3	-24.5	0	48.47	-	-	74	-25.53	215	186	V
2	* ** 2.484	41.82	Pk	32.3	-24.5	0	49.62	-	-	74	-24.38	215	186	V
3	* ** 2.484	26.56	RMS	32.3	-24.5	2.04	36.4	54	-17.6	-	-	215	186	V
4	* ** 2.484	26.81	RMS	32.3	-24.5	2.04	36.65	54	-17.35	-	-	215	186	V

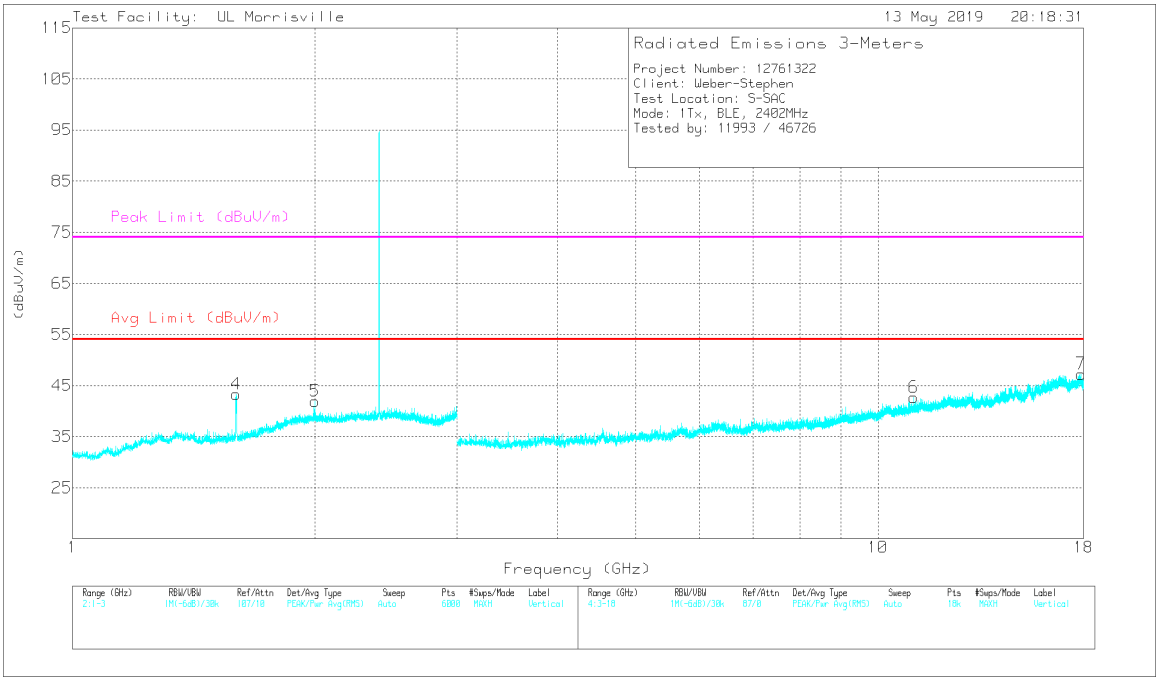
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 1.594	40.45	PK2	27.8	-22.2	0	46.05	-	-	74	-27.95	193	223	H
	* ** 1.595	24.14	MAv1	27.8	-22.2	2.04	31.78	54	-22.22	-	-	193	223	H
4	* ** 1.598	47.79	PK2	27.8	-22.2	0	53.39	-	-	74	-20.61	201	188	V
	* ** 1.596	25.83	MAv1	27.8	-22.2	2.04	33.47	54	-20.53	-	-	201	188	V
2	* ** 12.017	33.24	PK2	38.7	-23.6	0	48.34	-	-	74	-25.66	19	219	H
	* ** 12.017	21.91	MAv1	38.7	-23.6	2.04	39.05	54	-14.95	-	-	19	219	H
3	* ** 17.807	33.56	PK2	41.2	-20.8	0	53.96	-	-	74	-20.04	227	321	H
	* ** 17.808	21.87	MAv1	41.2	-20.8	2.04	44.31	54	-9.69	-	-	227	321	H
6	* ** 11.073	34.35	PK2	37.9	-24	0	48.25	-	-	74	-25.75	281	369	V
	* ** 11.073	22.23	MAv1	37.9	-24	2.04	38.17	54	-15.83	-	-	281	369	V
7	* ** 17.877	33.59	PK2	41.2	-20.6	0	54.19	-	-	74	-19.81	148	283	V
	* ** 17.875	21.73	MAv1	41.2	-20.6	2.04	44.37	54	-9.63	-	-	148	283	V
5	1.999	33.12	Pk	31.4	-22.6	0	41.92	-	-	-	-	0-360	200	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
Pk - Peak detector

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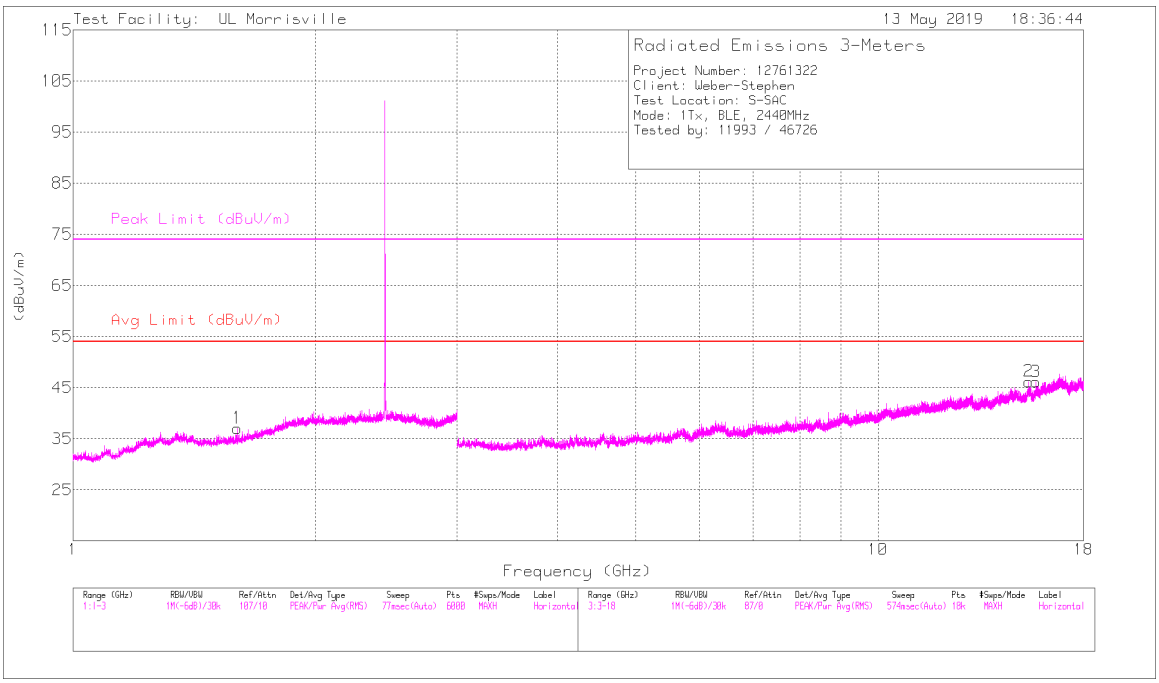
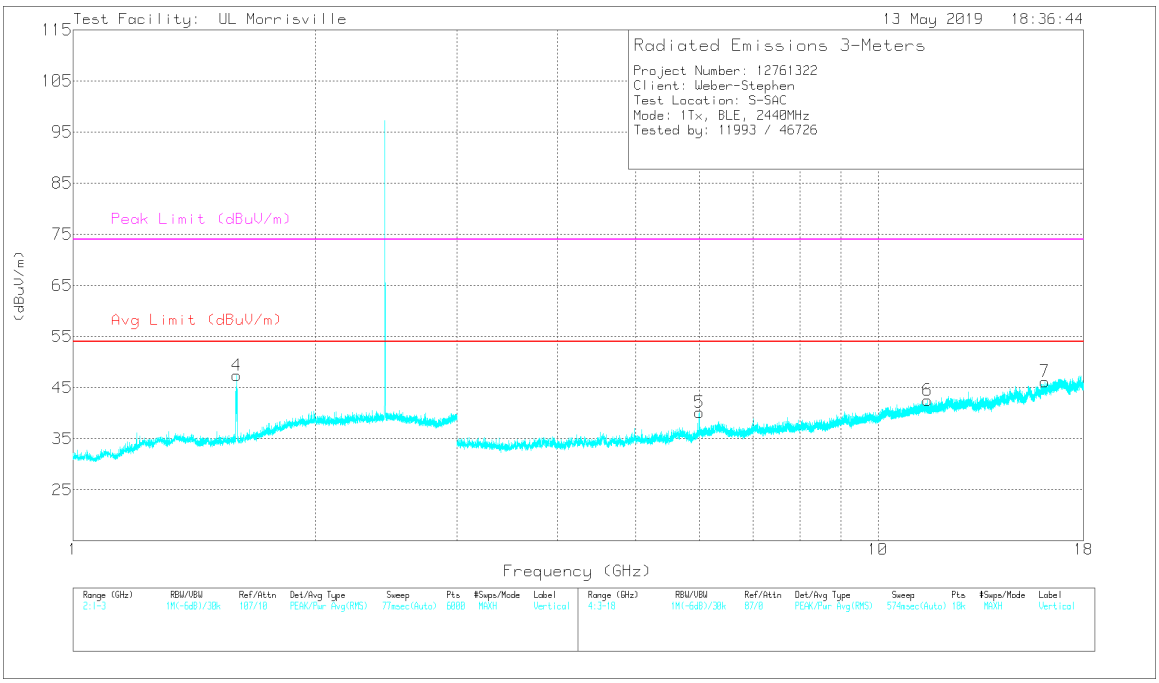
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 1.599	39.18	PK2	27.8	-22.2	0	44.78	-	-	74	-29.22	26	117	H
	* ** 1.599	24.06	MAv1	27.8	-22.2	2.04	31.7	54	-22.3	-	-	26	117	H
4	* ** 1.599	46.3	PK2	27.8	-22.2	0	51.9	-	-	74	-22.1	222	158	V
	* ** 1.598	26.06	MAv1	27.8	-22.2	2.04	33.7	54	-20.3	-	-	222	158	V
2	* ** 15.378	34.05	PK2	39.9	-21.7	0	52.25	-	-	74	-21.75	63	289	H
	* ** 15.378	21.93	MAv1	39.9	-21.7	2.04	42.17	54	-11.83	-	-	63	289	H
3	* ** 15.715	34.2	PK2	40.2	-22.3	0	52.1	-	-	74	-21.9	306	377	H
	* ** 15.714	21.67	MAv1	40.2	-22.3	2.04	41.61	54	-12.39	-	-	306	377	H
6	* ** 11.527	34.72	PK2	38.2	-24.2	0	48.72	-	-	74	-25.28	326	124	V
	* ** 11.527	22.46	MAv1	38.2	-24.2	2.04	38.5	54	-15.5	-	-	326	124	V
7	* ** 16.124	34.49	PK2	40.9	-23.7	0	51.69	-	-	74	-22.31	17	158	V
	* ** 16.124	22.59	MAv1	40.9	-23.7	2.04	41.83	54	-12.17	-	-	17	158	V
5	5.999	33.34	Pk	35	-28.2	0	40.14	-	-	-	-	0-360	101	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
Pk - Peak detector

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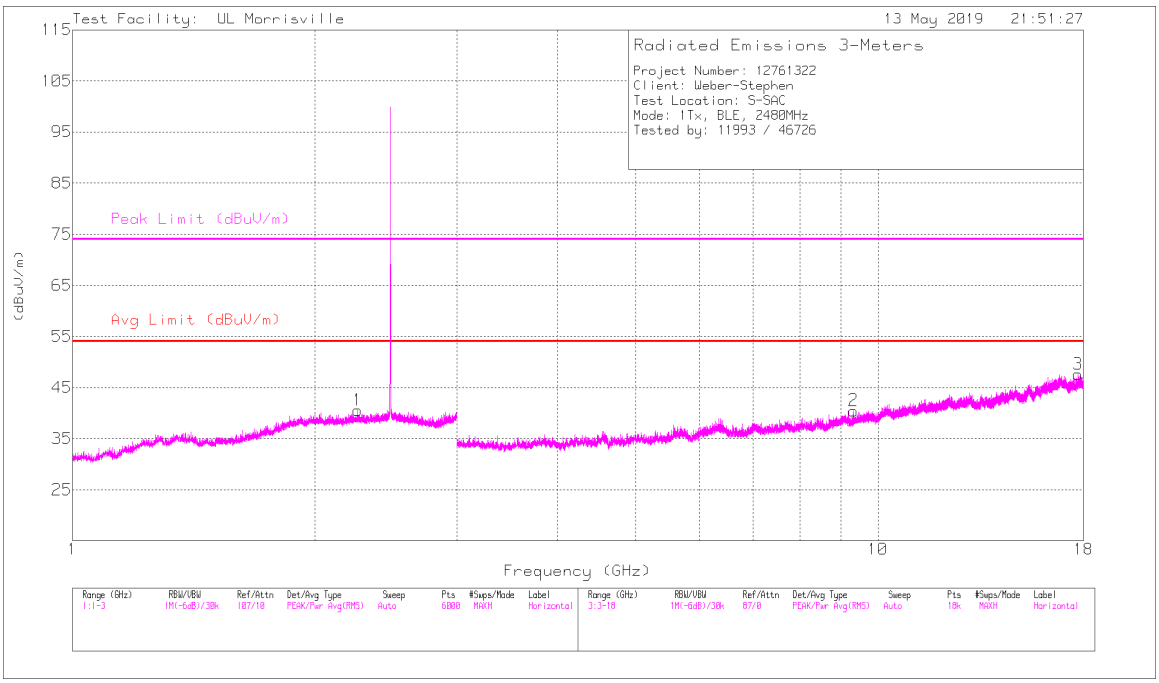
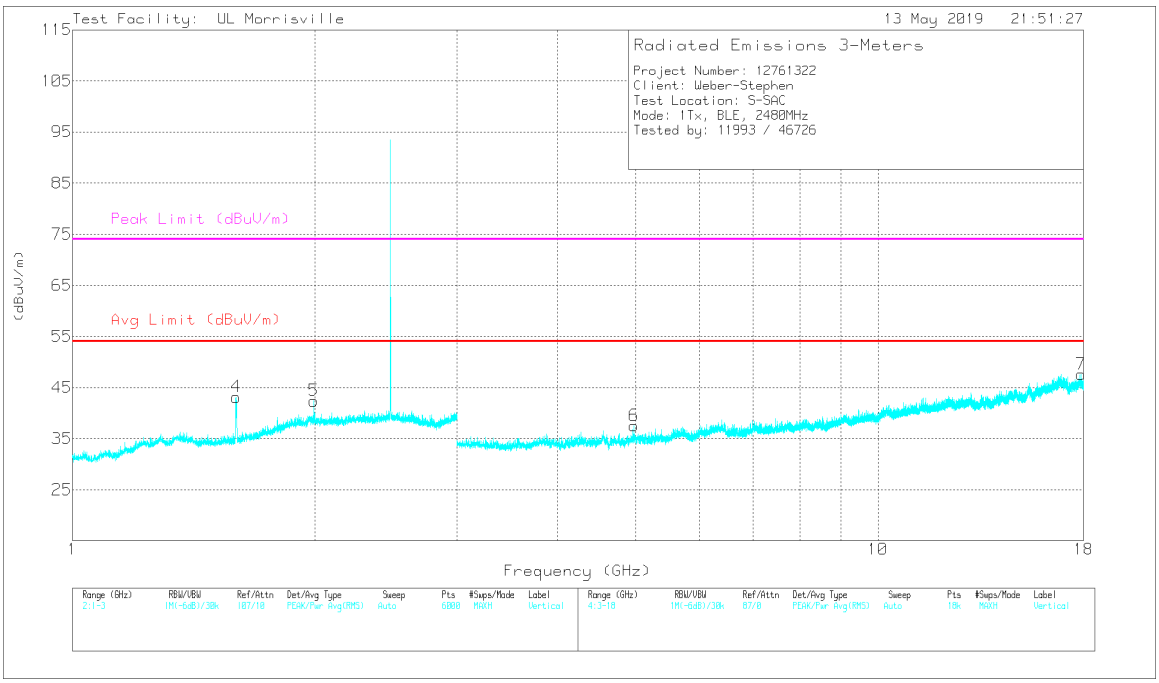
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 2.259	37.26	PK2	31.7	-23.4	0	45.56	-	-	74	-28.44	50	177	H
	* ** 2.259	24.93	MAv1	31.7	-23.4	2.04	35.27	54	-18.73	-	-	50	177	H
4	* ** 1.598	48.13	PK2	27.8	-22.2	0	53.73	-	-	74	-20.27	217	141	V
	* ** 1.598	27.64	MAv1	27.8	-22.2	2.04	35.28	54	-18.72	-	-	217	141	V
2	* ** 9.33	35.42	PK2	36.8	-26.3	0	45.92	-	-	74	-28.08	22	181	H
	* ** 9.33	23.47	MAv1	36.8	-26.3	2.04	36.01	54	-17.99	-	-	22	181	H
3	* ** 17.732	33.95	PK2	41.2	-21.8	0	53.35	-	-	74	-20.65	183	400	H
	* ** 17.732	22.04	MAv1	41.2	-21.9	2.04	43.38	54	-10.62	-	-	183	400	H
6	* ** 4.977	44.22	PK2	34.1	-31.1	0	47.22	-	-	74	-26.78	21	108	V
	* ** 4.979	27.55	MAv1	34.1	-31.1	2.04	32.59	54	-21.41	-	-	21	108	V
7	* ** 17.861	33.61	PK2	41.2	-20.7	0	54.11	-	-	74	-19.89	65	400	V
	* ** 17.861	21.26	MAv1	41.2	-20.7	2.04	43.8	54	-10.2	-	-	65	400	V
5	1.992	33.5	Pk	31.4	-22.5	0	42.4	-	-	-	-	0-360	101	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
Pk - Peak detector

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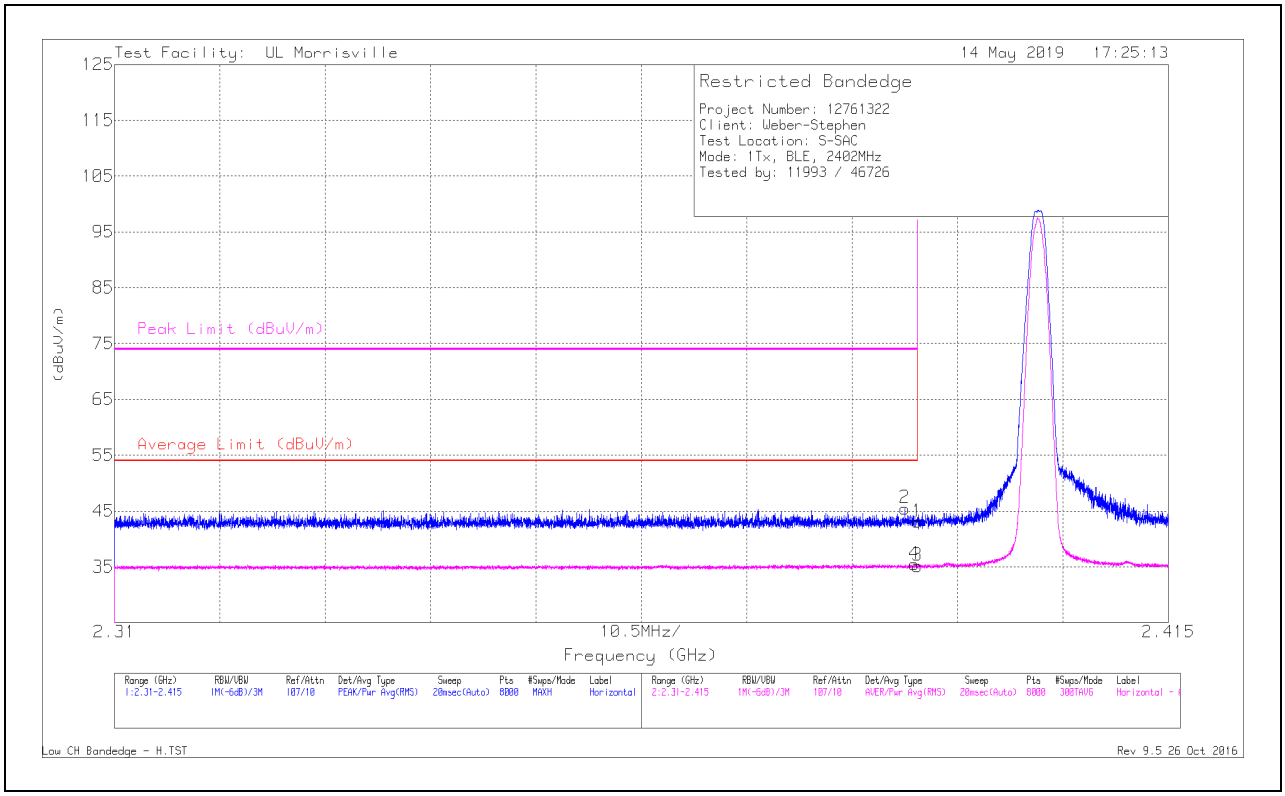
Saber

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	35.21	Pk	31.9	-24	0	43.11	-	-	74	-30.89	325	346	H
2	* ** 2.389	37.59	Pk	31.9	-24	0	45.49	-	-	74	-28.51	325	346	H
3	* ** 2.39	25.23	RMS	31.9	-24	2.04	35.17	54	-18.83	-	-	325	346	H
4	* ** 2.39	25.51	RMS	31.9	-24	2.04	35.45	54	-18.55	-	-	325	346	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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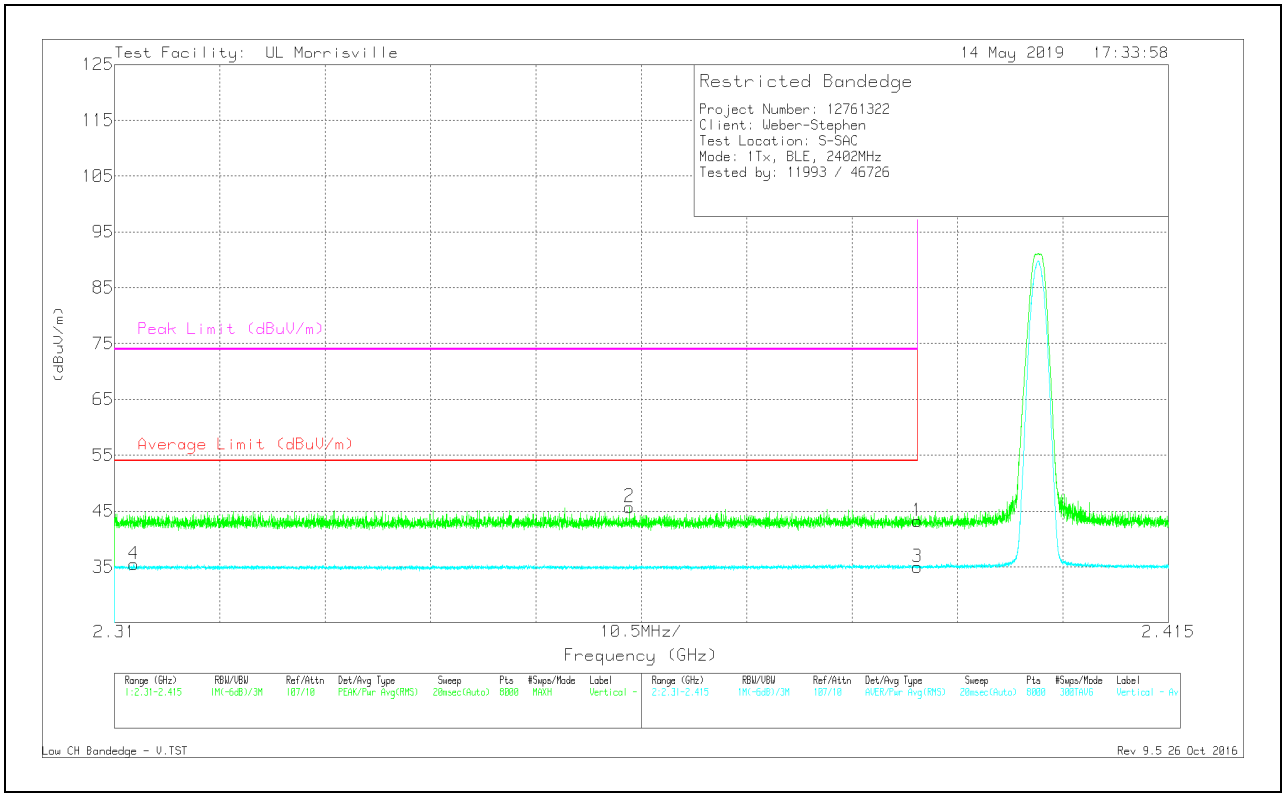
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	35.34	Pk	31.9	-24	0	43.24	-	-	74	-30.76	157	278	V
2	* ** 2.361	37.92	Pk	31.7	-23.9	0	45.72	-	-	74	-28.28	157	278	V
3	* ** 2.39	25.04	RMS	31.9	-24	2.04	34.98	54	-19.02	-	-	157	278	V
4	* ** 2.312	25.43	RMS	31.7	-23.7	2.04	35.47	54	-18.53	-	-	157	278	V

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Pk - Peak detector
RMS - RMS detection

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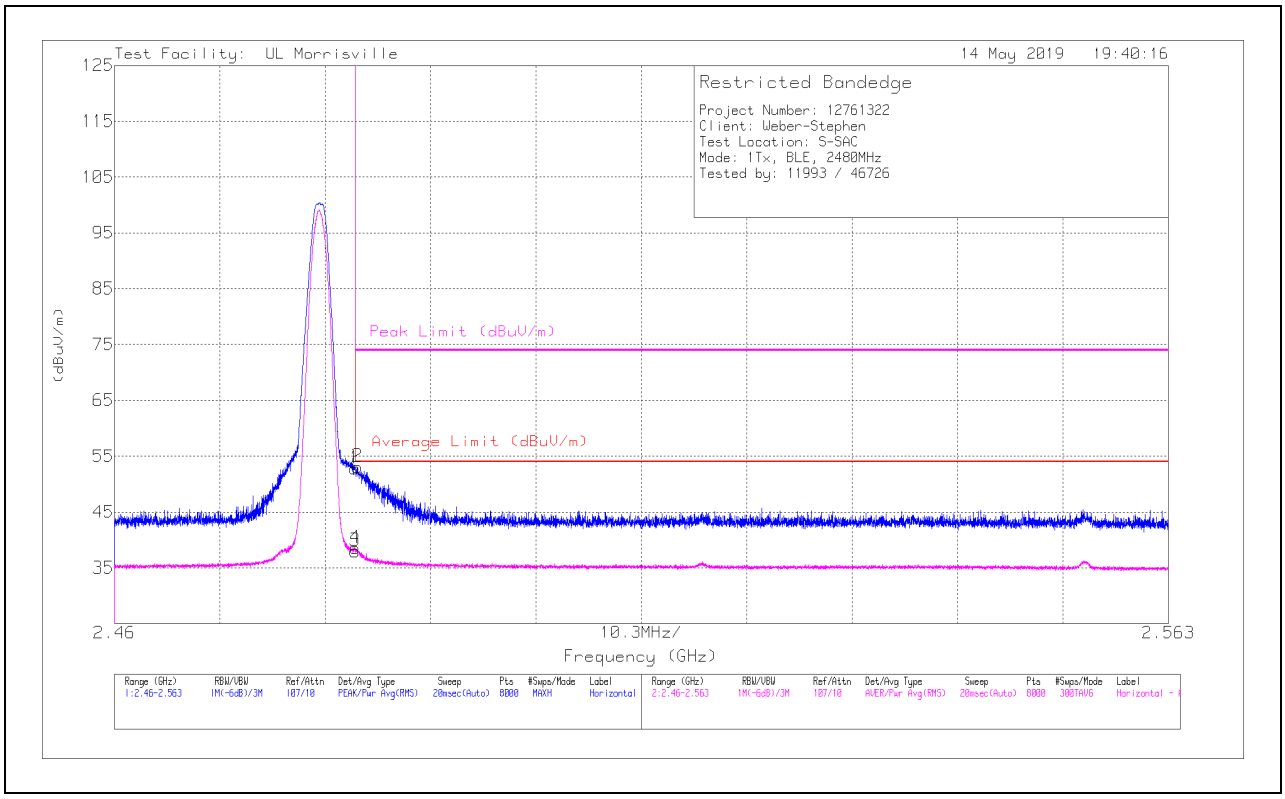
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	45.02	Pk	32.3	-24.5	0	52.82	-	-	74	-21.18	310	138	H
2	* ** 2.484	45.3	Pk	32.3	-24.5	0	53.1	-	-	74	-20.9	310	138	H
3	* ** 2.484	28.17	RMS	32.3	-24.5	2.04	38.01	54	-15.99	-	-	310	138	H
4	* ** 2.484	28.7	RMS	32.3	-24.5	2.04	38.54	54	-15.46	-	-	310	138	H

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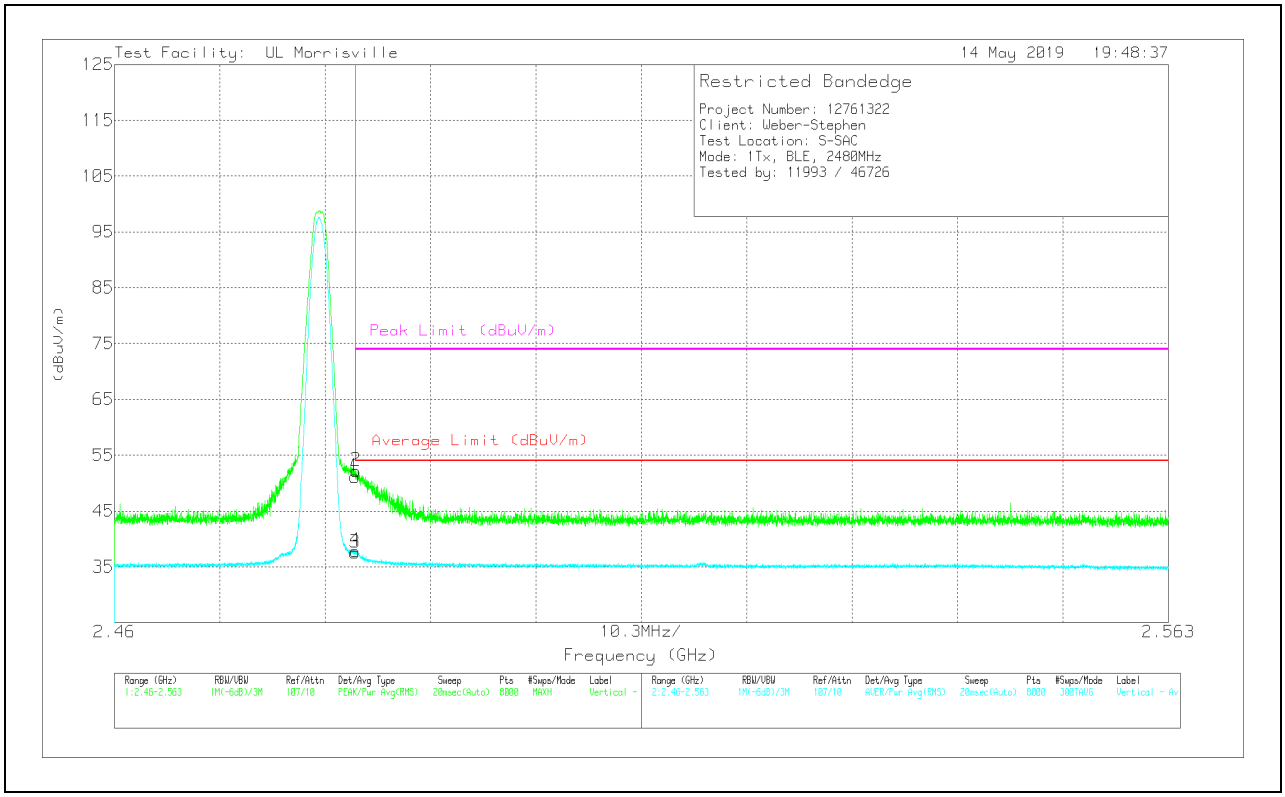
RMS - RMS detection

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	43.36	Pk	32.3	-24.5	0	51.16	-	-	74	-22.84	27	138	V
2	* ** 2.484	44.44	Pk	32.3	-24.5	0	52.24	-	-	74	-21.76	27	138	V
3	* ** 2.484	27.68	RMS	32.3	-24.5	2.04	37.52	54	-16.48	-	-	27	138	V
4	* ** 2.484	28.02	RMS	32.3	-24.5	2.04	37.86	54	-16.14	-	-	27	138	V

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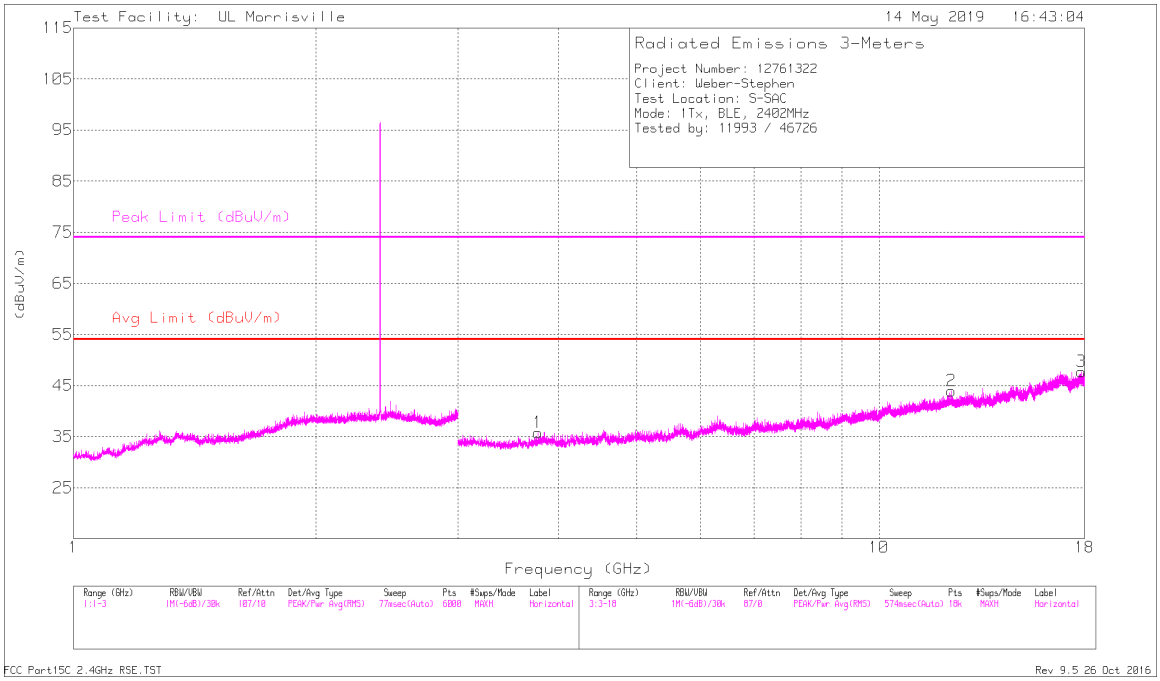
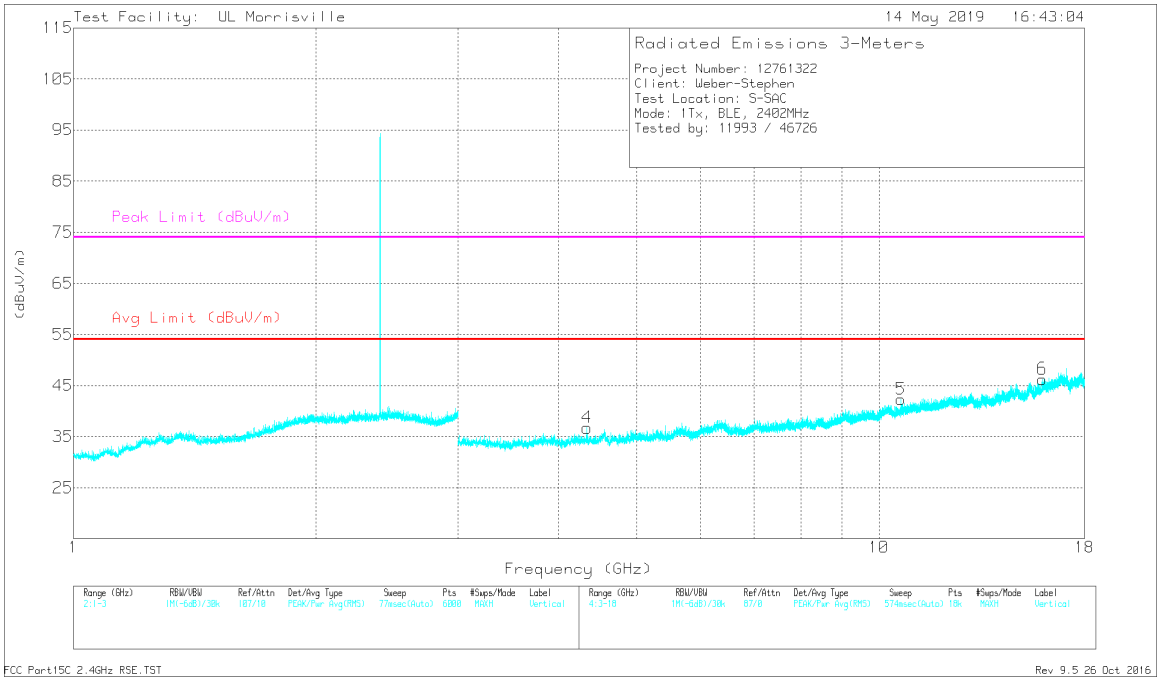
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 3.774	40.55	PK2	33.4	-32.7	0	41.25	-	-	74	-32.75	8	271	H
	* ** 3.774	28.77	MAv1	33.4	-32.7	2.04	31.51	54	-22.49	-	-	8	271	H
2	* ** 12.297	35.19	PK2	38.8	-23.6	0	50.39	-	-	74	-23.61	256	181	H
	* ** 12.296	22.42	MAv1	38.8	-23.6	2.04	39.66	54	-14.34	-	-	256	181	H
3	* ** 17.849	32.97	PK2	41.2	-20.9	0	53.27	-	-	74	-20.73	297	392	H
	* ** 17.85	21.21	MAv1	41.2	-20.9	2.04	43.55	54	-10.45	-	-	297	392	H
4	* ** 4.339	40.28	PK2	33.6	-32	0	41.88	-	-	74	-32.12	156	356	V
	* ** 4.339	28.23	MAv1	33.6	-32	2.04	31.87	54	-22.13	-	-	156	356	V
5	* ** 10.654	34.03	PK2	37.7	-24.3	0	47.43	-	-	74	-26.57	339	266	V
	* ** 10.653	22.25	MAv1	37.7	-24.3	2.04	37.69	54	-16.31	-	-	339	266	V
6	* ** 15.959	34.64	PK2	40.6	-23.3	0	51.94	-	-	74	-22.06	59	400	V
	* ** 15.959	22.74	MAv1	40.6	-23.3	2.04	42.08	54	-11.92	-	-	59	400	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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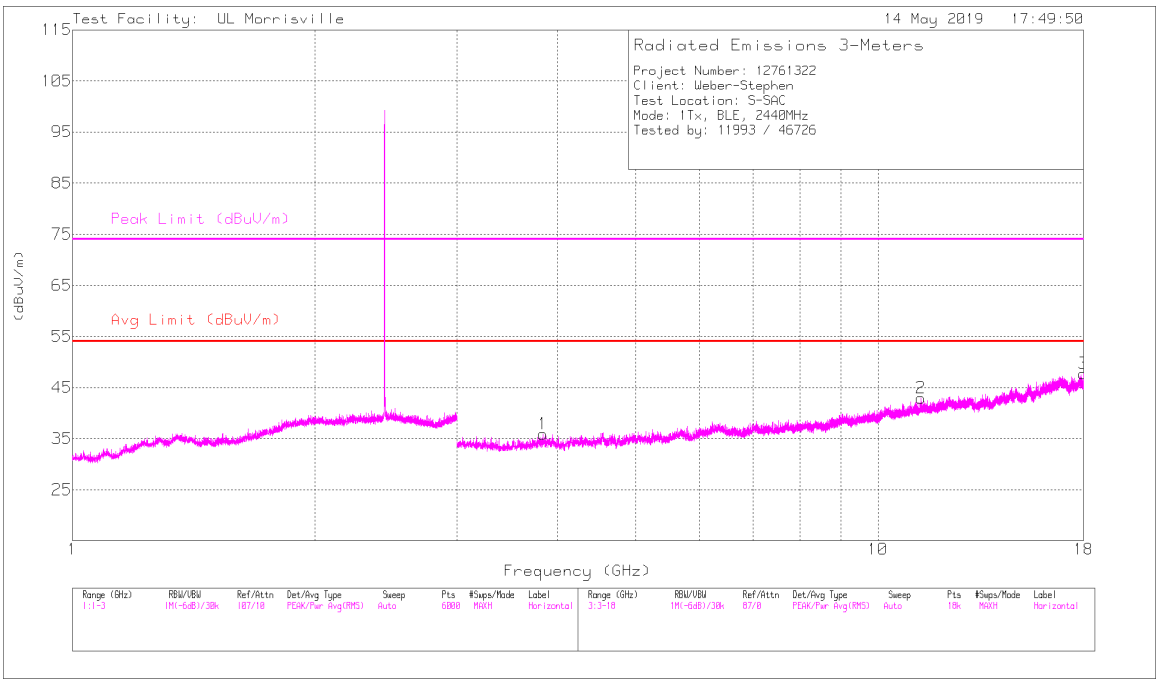
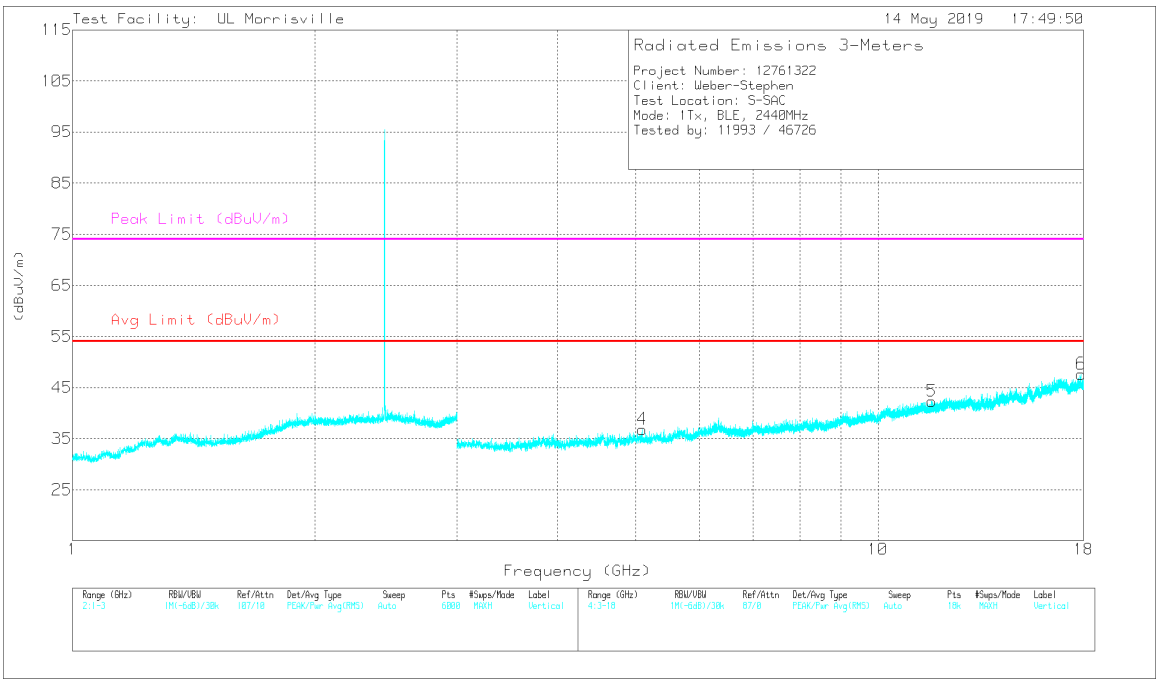
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 3.837	40.79	PK2	33.5	-32	0	42.29	-	-	74	-31.71	20	145	H
	* ** 3.836	28.65	MAv1	33.5	-32	2.04	32.19	54	-21.81	-	-	20	145	H
2	* ** 11.315	33.16	PK2	38	-22.9	0	48.26	-	-	74	-25.74	158	172	H
	* ** 11.313	21.63	MAv1	38	-22.9	2.04	38.77	54	-15.23	-	-	158	172	H
3	* ** 17.999	34.46	PK2	41.2	-21.5	0	54.16	-	-	74	-19.84	165	261	H
	* ** 17.998	21.71	MAv1	41.2	-21.5	2.04	43.45	54	-10.55	-	-	165	261	H
4	* ** 5.098	39.16	PK2	34.2	-31	0	42.36	-	-	74	-31.64	172	174	V
	* ** 5.097	27.09	MAv1	34.2	-31	2.04	32.33	54	-21.67	-	-	172	174	V
5	* ** 11.663	34.73	PK2	38.4	-24.1	0	49.03	-	-	74	-24.97	51	302	V
	* ** 11.664	22.35	MAv1	38.4	-24.1	2.04	38.69	54	-15.31	-	-	51	302	V
6	* ** 17.875	33.2	PK2	41.2	-20.6	0	53.8	-	-	74	-20.2	62	396	V
	* ** 17.875	21.37	MAv1	41.2	-20.6	2.04	44.01	54	-9.99	-	-	62	396	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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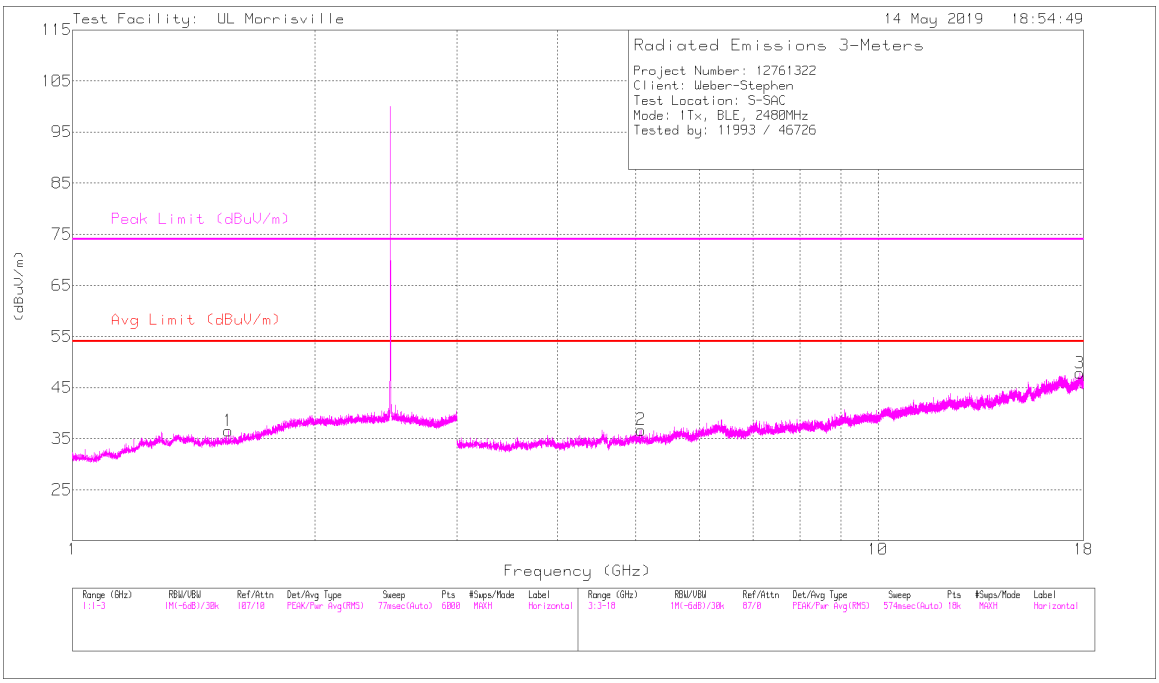
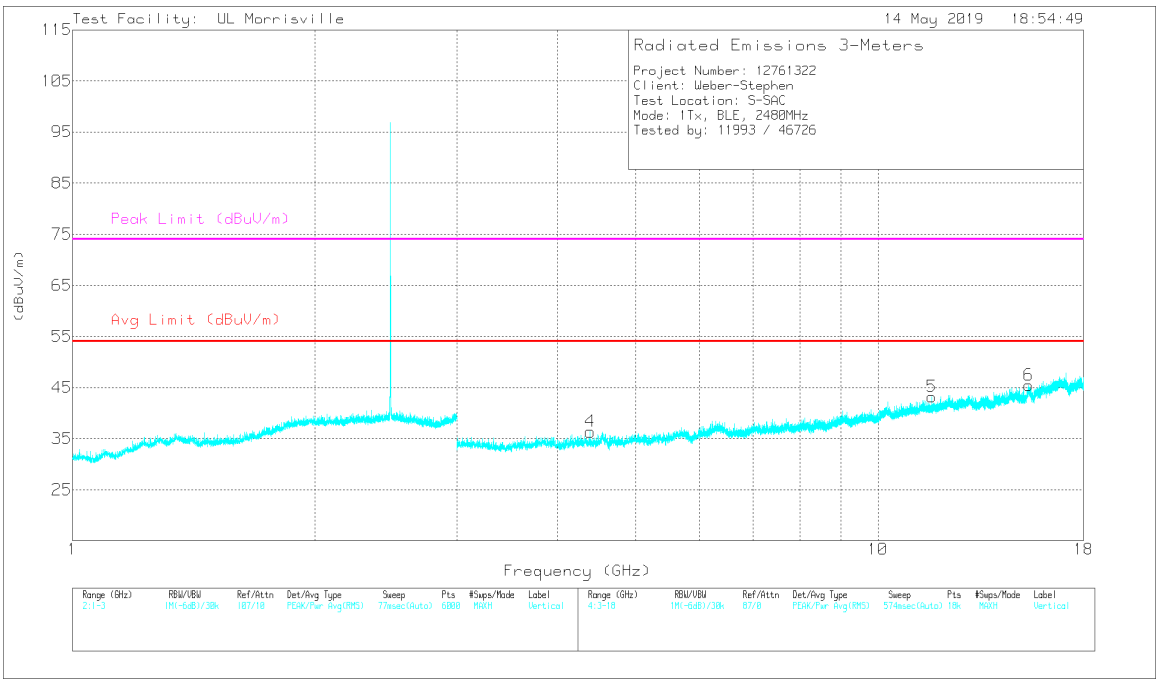
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 1.562	36.59	PK2	27.9	-22.3	0	42.19	-	-	74	-31.81	328	175	H
	* ** 1.562	23.77	MAv1	27.9	-22.3	2.04	31.41	54	-22.59	-	-	328	175	H
2	* ** 5.078	39.6	PK2	34.2	-31.1	0	42.7	-	-	74	-31.3	5	324	H
	* ** 5.077	27.17	MAv1	34.2	-31.1	2.04	32.31	54	-21.69	-	-	5	324	H
3	* ** 17.81	34.83	PK2	41.2	-20.8	0	55.23	-	-	74	-18.77	95	249	H
	* ** 17.811	22.09	MAv1	41.2	-20.8	2.04	44.53	54	-9.47	-	-	95	249	H
4	* ** 4.393	40.69	PK2	33.6	-32.1	0	42.19	-	-	74	-31.81	238	322	V
	* ** 4.392	28.28	MAv1	33.6	-32.1	2.04	31.82	54	-22.18	-	-	238	322	V
5	* ** 11.664	34.12	PK2	38.4	-24.1	0	48.42	-	-	74	-25.58	291	284	V
	* ** 11.664	22.3	MAv1	38.4	-24.1	2.04	38.64	54	-15.36	-	-	291	284	V
6	* ** 15.376	33.92	PK2	39.9	-21.7	0	52.12	-	-	74	-21.88	342	259	V
	* ** 15.377	21.96	MAv1	39.9	-21.7	2.04	42.2	54	-11.8	-	-	342	259	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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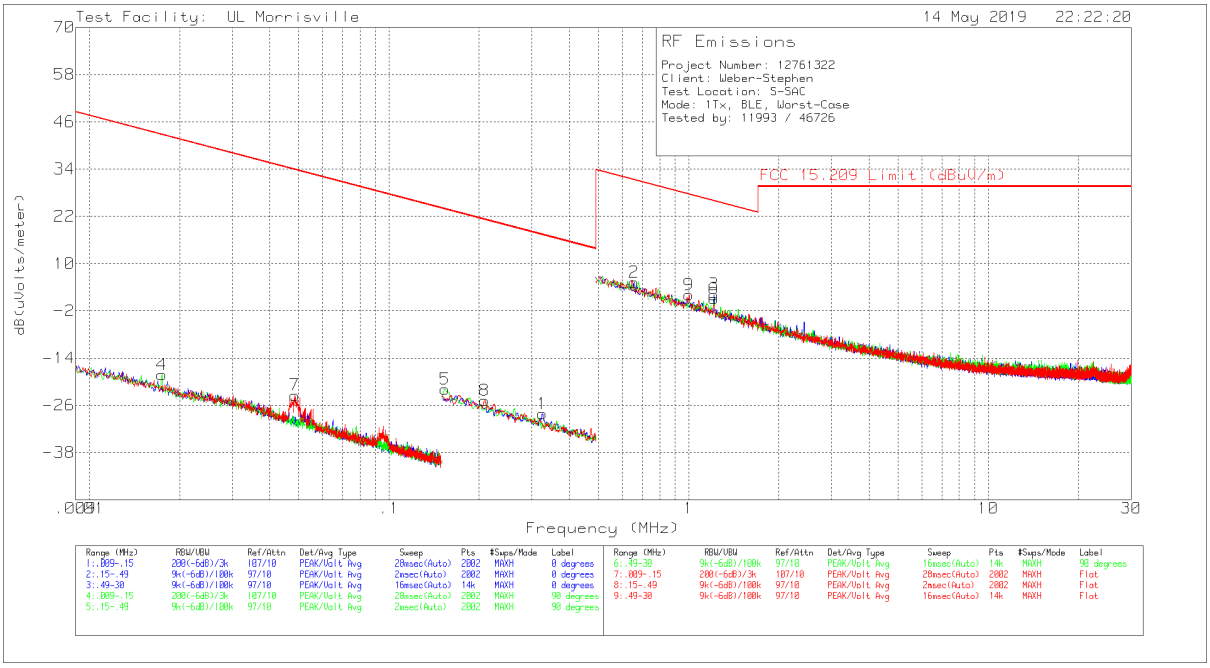
9.3. WORST CASE BELOW 30MHZ

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).

Pulse



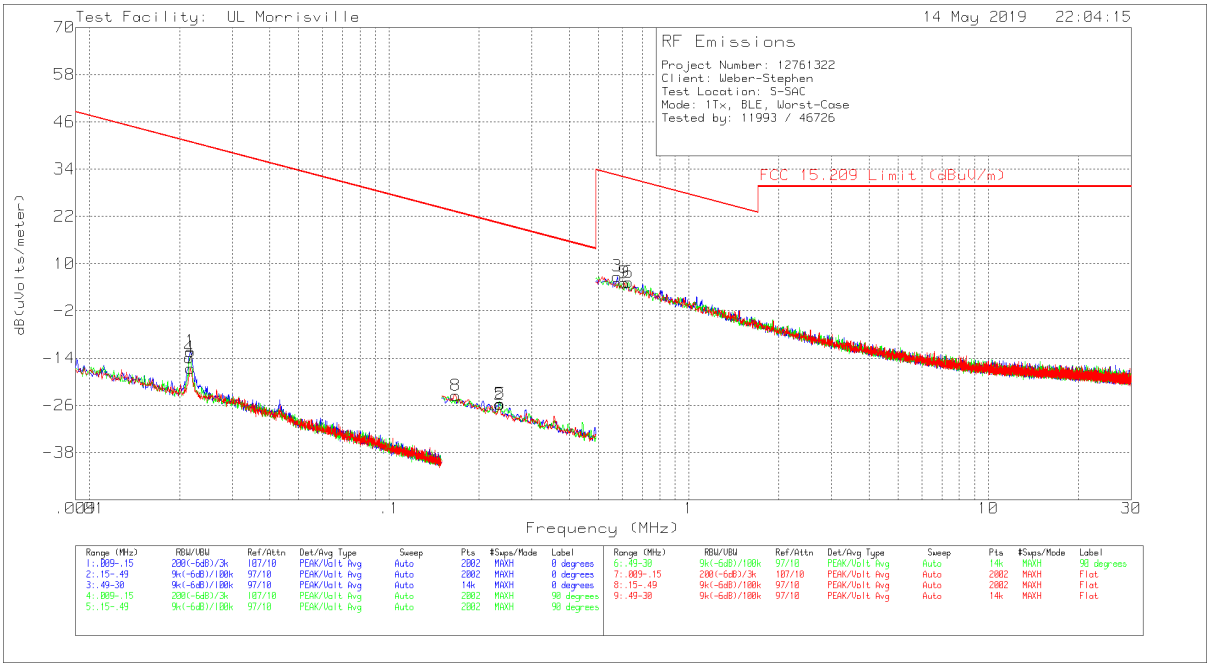
ANTENNA- THREE ORIENTATIONS

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP FCC 15.209 Limit (dBuV/m)	Avg FCC 15.209 Limit (dBuV/m)	Pk FCC 15.209 Limit (dBuV/m)	Worst-Case Margin (dB)	Azimuth (Degs)
4	.01747	46.54	Pk	15.1	.1	-80	-18.26	-	42.76	62.76	-61.02	0-360
7	.04855	44.88	Pk	11.6	.1	-80	-23.42	-	33.88	53.88	-57.3	0-360
5	.15349	47.33	Pk	10.7	.1	-80	-21.87	-	23.88	43.88	-45.75	0-360
8	.20857	44.4	Pk	10.7	.1	-80	-24.8	-	21.22	41.22	-46.02	0-360
1	.32485	41.12	Pk	10.6	.1	-80	-28.18	-	17.37	37.37	-45.55	0-360
2	.65653	34.31	Pk	10.8	.1	-40	5.21	31.26	-	-	-26.05	0-360
9	1.00224	30.95	Pk	11	.1	-40	2.05	27.58	-	-	-25.53	0-360
3	1.21515	30.91	Pk	11	.2	-40	2.11	25.91	-	-	-23.8	0-360
6	1.21515	29.9	Pk	11	.2	-40	1.1	25.91	-	-	-24.81	0-360

Pk - Peak detector

Saber



ANTENNA- THREE ORIENTATIONS

Below 30MHz Data

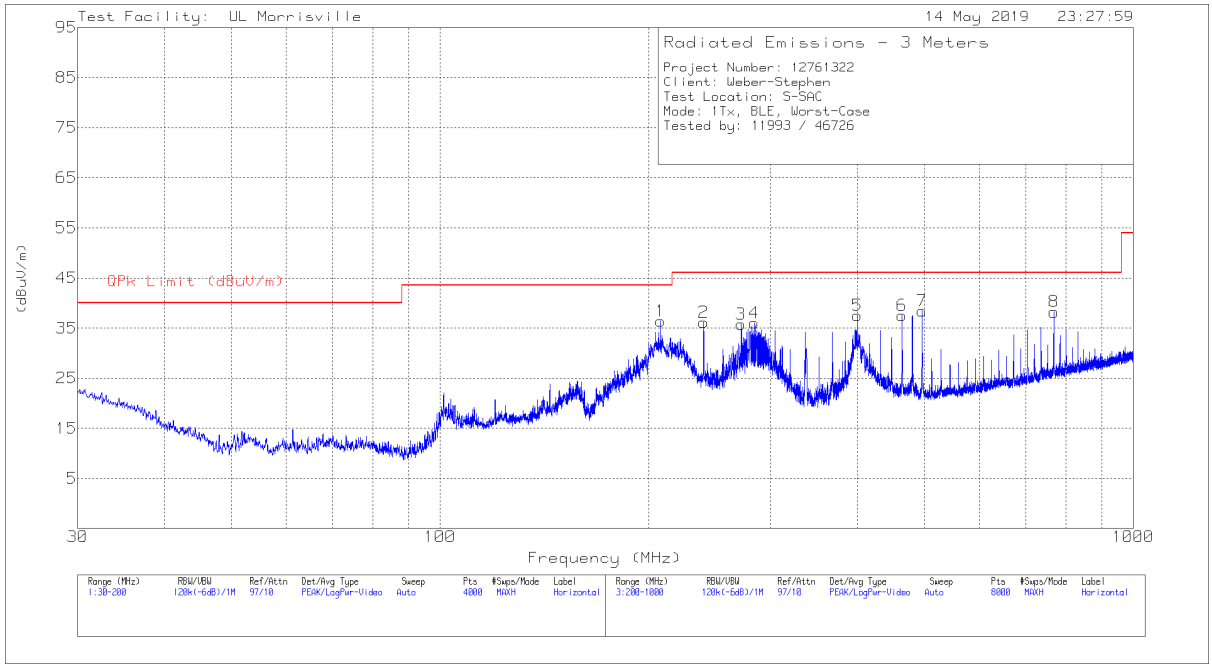
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP FCC 15.209 Limit (dBuV/m)	Avg FCC 15.209 Limit (dBuV/m)	Pk FCC 15.209 Limit (dBuV/m)	Worst-Case Margin (dB)	Azimuth (Degs)	Antenna Face
4	.02153	52.15	Pk	13.9	.1	-80	-13.85	-	40.94	60.94	-54.79	0-360	Off
1	.02174	53.74	Pk	13.9	.1	-80	-12.26	-	40.86	60.86	-53.12	0-360	On
7	.02174	49.42	Pk	13.9	.1	-80	-16.58	-	40.86	60.86	-57.44	0-360	Flat
8	.16683	45.68	Pk	10.7	.1	-80	-23.52	-	23.16	43.16	-46.68	0-360	Flat
2	.23381	43.46	Pk	10.7	.1	-80	-25.74	-	20.23	40.23	-45.97	0-360	On
5	.23551	43.55	Pk	10.7	.1	-80	-25.65	-	20.16	40.16	-45.81	0-360	Off
3	.57854	35.87	Pk	10.8	.1	-40	6.77	32.36	-	-	-25.59	0-360	On
9	.61016	34.26	Pk	10.8	.1	-40	5.16	31.9	-	-	-26.74	0-360	Flat
6	.63018	34.4	Pk	10.8	.1	-40	5.3	31.61	-	-	-26.31	0-360	Off

Pk - Peak detector

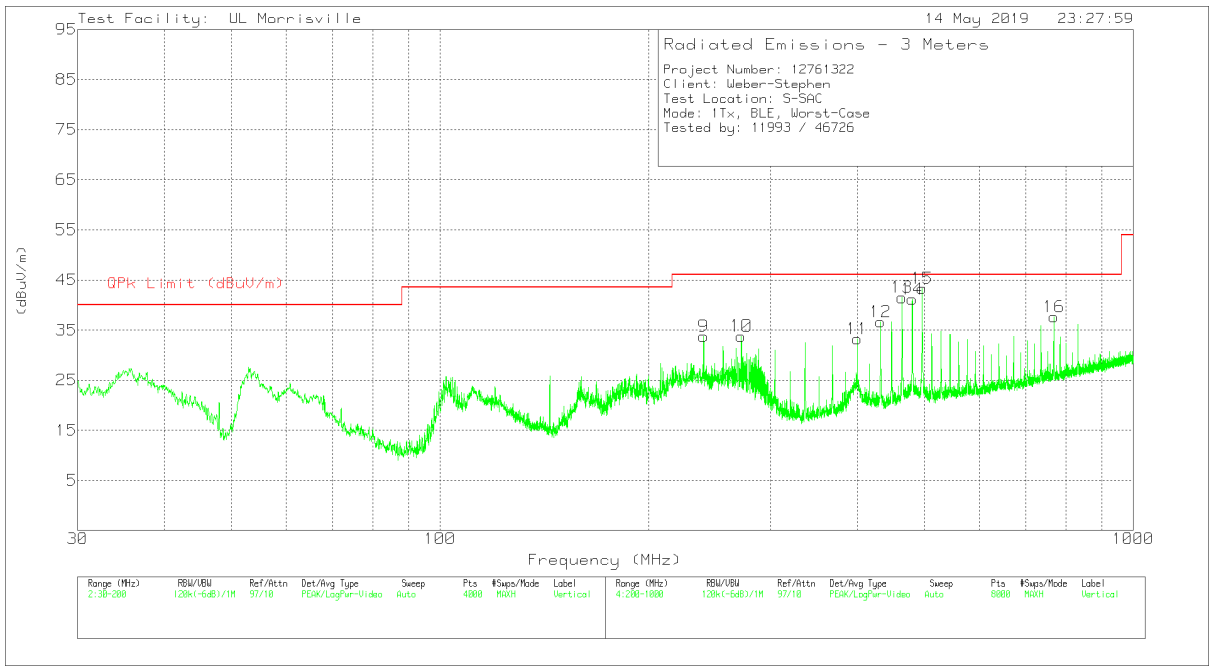
9.4. WORST CASE BELOW 1 GHZ

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

Pulse



HORIZONTAL



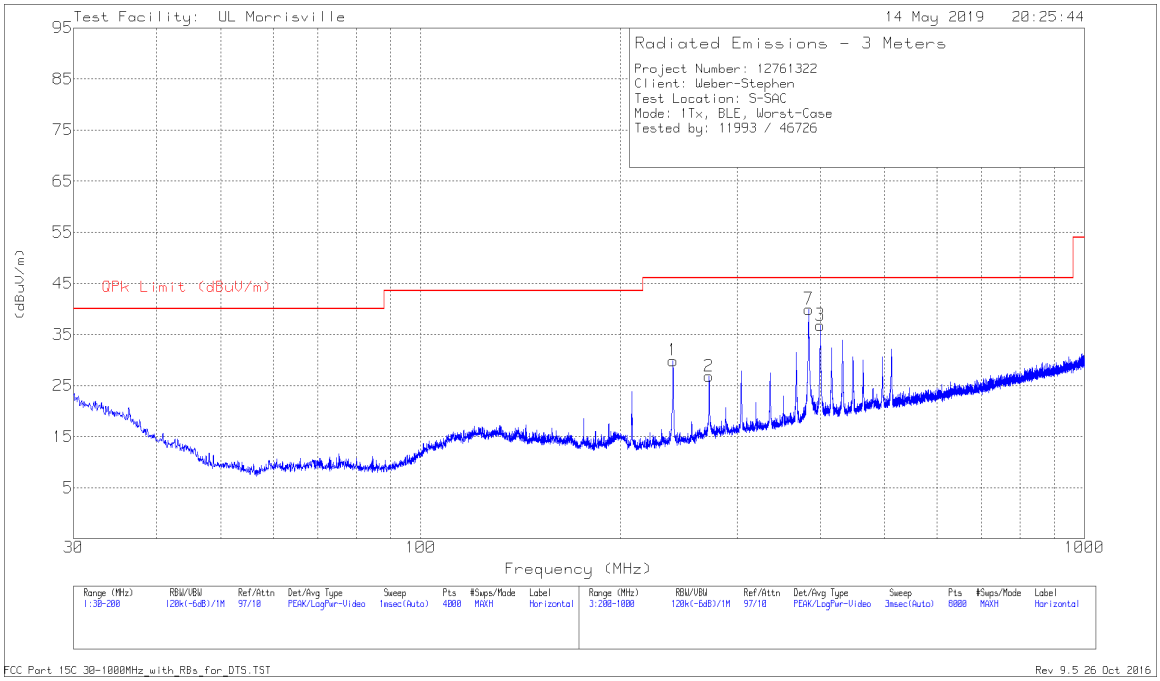
VERTICAL

Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 240.0052	49.84	Pk	16.3	-30	36.14	46.02	-9.88	0-360	102	H
3	* ** 272.0094	47.57	Pk	17.9	-29.7	35.77	46.02	-10.25	0-360	198	H
4	* ** 284.2109	47.71	Pk	18	-29.7	36.01	46.02	-10.01	0-360	102	H
5	* ** 400.026	46.48	Pk	20.3	-29.3	37.48	46.02	-8.54	0-360	102	H
9	* ** 240.0052	47.43	Pk	16.3	-30	33.73	46.02	-12.29	0-360	102	V
10	* ** 272.0094	45.6	Pk	17.9	-29.7	33.8	46.02	-12.22	0-360	102	V
11	* ** 400.026	42.22	Pk	20.3	-29.3	33.22	46.02	-12.8	0-360	102	V
1	208.001	51.07	Pk	15.4	-30.1	36.37	-	-	0-360	102	H
12	432.0302	44.61	Pk	21	-29	36.61	-	-	0-360	102	V
6	464.0343	44.88	Pk	21.6	-29	37.48	-	-	0-360	102	H
13	464.0343	48.89	Pk	21.6	-29	41.49	-	-	0-360	102	V
14	480.0364	47.93	Pk	22.2	-29	41.13	-	-	0-360	102	V
7	496.0385	44.88	Pk	22.2	-28.7	38.38	-	-	0-360	102	H
15	496.0385	49.83	Pk	22.2	-28.7	43.33	-	-	0-360	102	V
8	767.9738	40.83	Pk	25.7	-28.3	38.23	-	-	0-360	198	H
16	767.9738	40.22	Pk	25.7	-28.3	37.62	-	-	0-360	102	V

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

Saber



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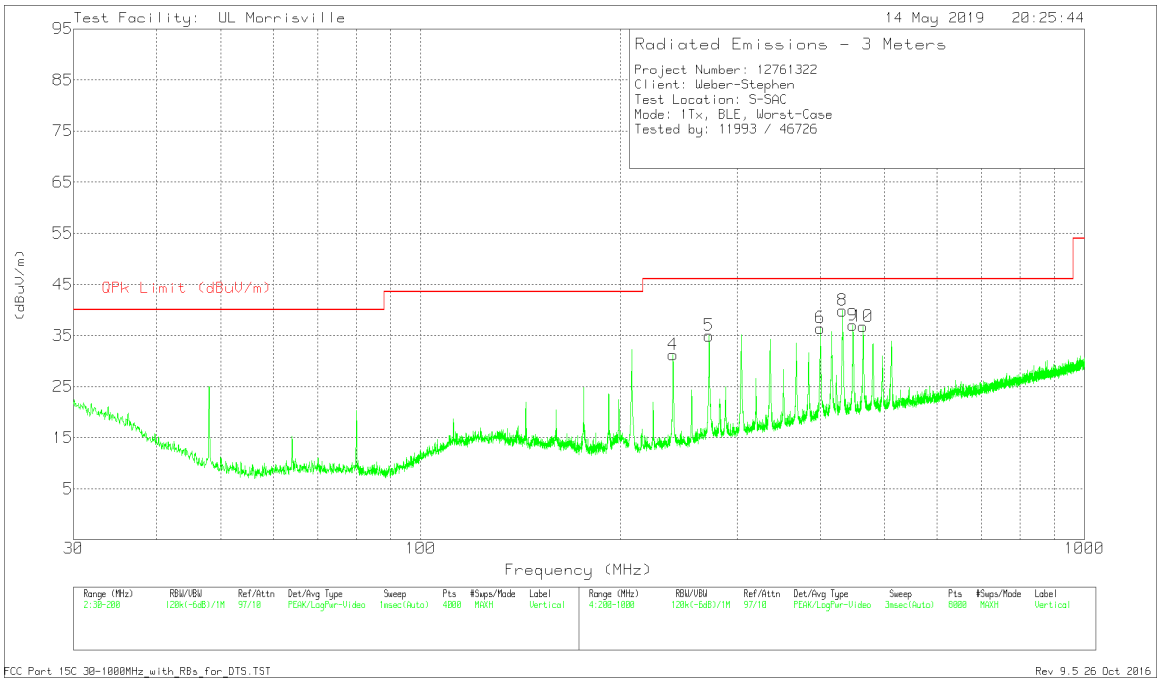

VERTICAL

Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 240.0052	43.62	Pk	16.3	-30	29.92	46.02	-16.1	0-360	199	H
2	* ** 272.0094	38.62	Pk	17.9	-29.7	26.82	46.02	-19.2	0-360	102	H
3	* ** 400.026	45.82	Pk	20.3	-29.3	36.82	46.02	-9.2	0-360	102	H
4	* ** 240.0052	44.94	Pk	16.3	-30	31.24	46.02	-14.78	0-360	102	V
5	* ** 272.0094	46.76	Pk	17.9	-29.7	34.96	46.02	-11.06	0-360	102	V
6	* ** 400.026	45.45	Pk	20.3	-29.3	36.45	46.02	-9.57	0-360	102	V
7	384.0239	49.36	Pk	19.9	-29.3	39.96	-	-	0-360	102	H
8	432.0302	47.86	Pk	21	-29	39.86	-	-	0-360	102	V
9	447.9322	44.82	Pk	21.2	-29	37.02	-	-	0-360	102	V
10	464.0343	44.19	Pk	21.6	-29	36.79	-	-	0-360	102	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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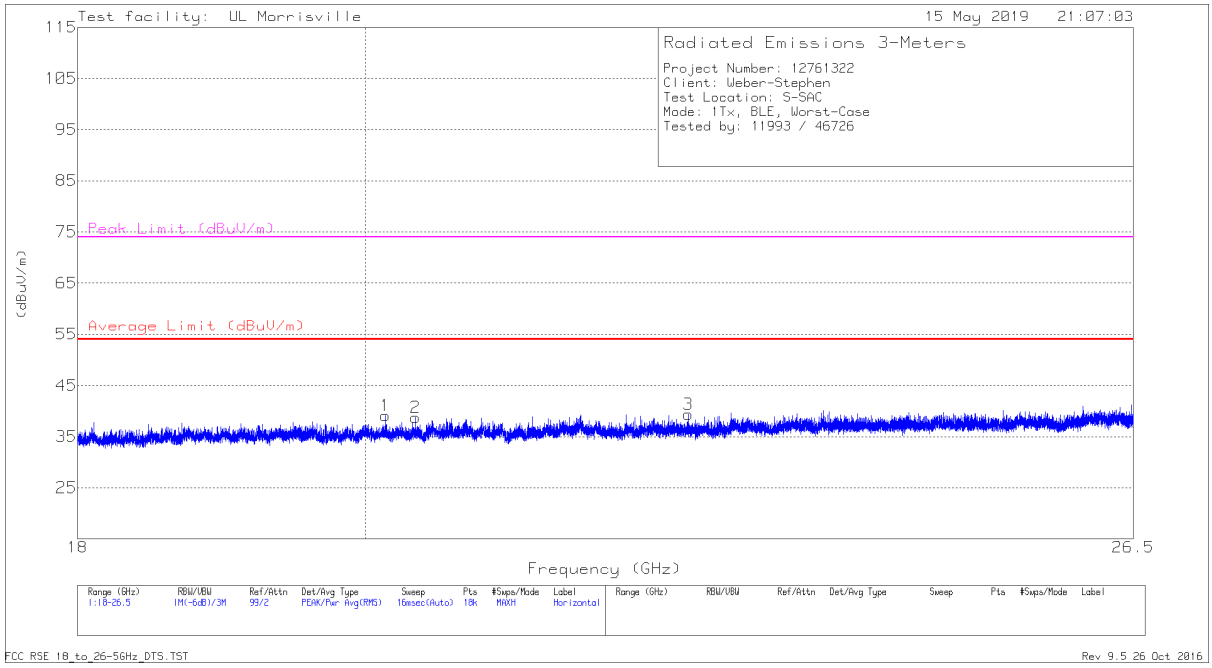
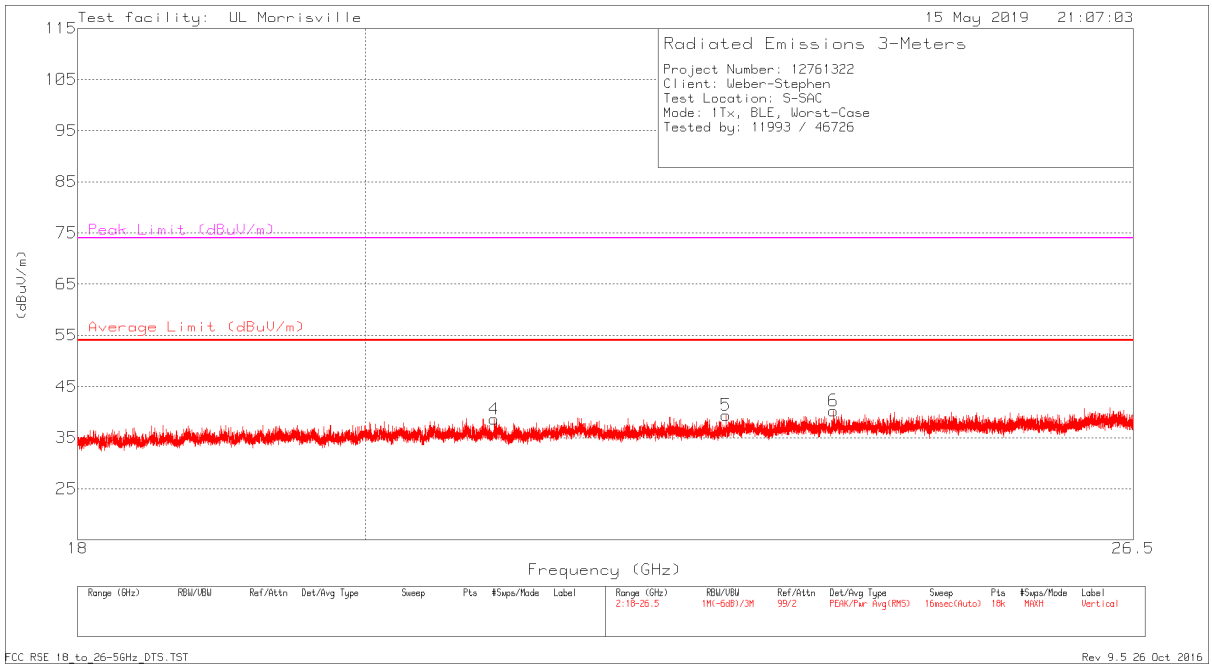
9.5. WORST CASE 18-26 GHZ

SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION)

Pulse



HORIZONTAL



VERTICAL

18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 20.148	44.84	Pk	32.8	-38.5	39.14	54	-14.86	74	-34.86	0-360	149	H
2	* ** 20.373	44.07	Pk	33	-38.3	38.77	54	-15.23	74	-35.23	0-360	102	H
3	* ** 22.513	43.96	Pk	33.5	-38.1	39.36	54	-14.64	74	-34.64	0-360	249	H
4	* ** 20.968	43.9	Pk	33.2	-38.5	38.6	54	-15.4	74	-35.4	0-360	299	V
5	* ** 22.825	43.5	Pk	33.6	-37.7	39.4	54	-14.6	74	-34.6	0-360	251	V
6	* ** 23.745	43.56	Pk	34	-37.3	40.26	54	-13.74	74	-33.74	0-360	201	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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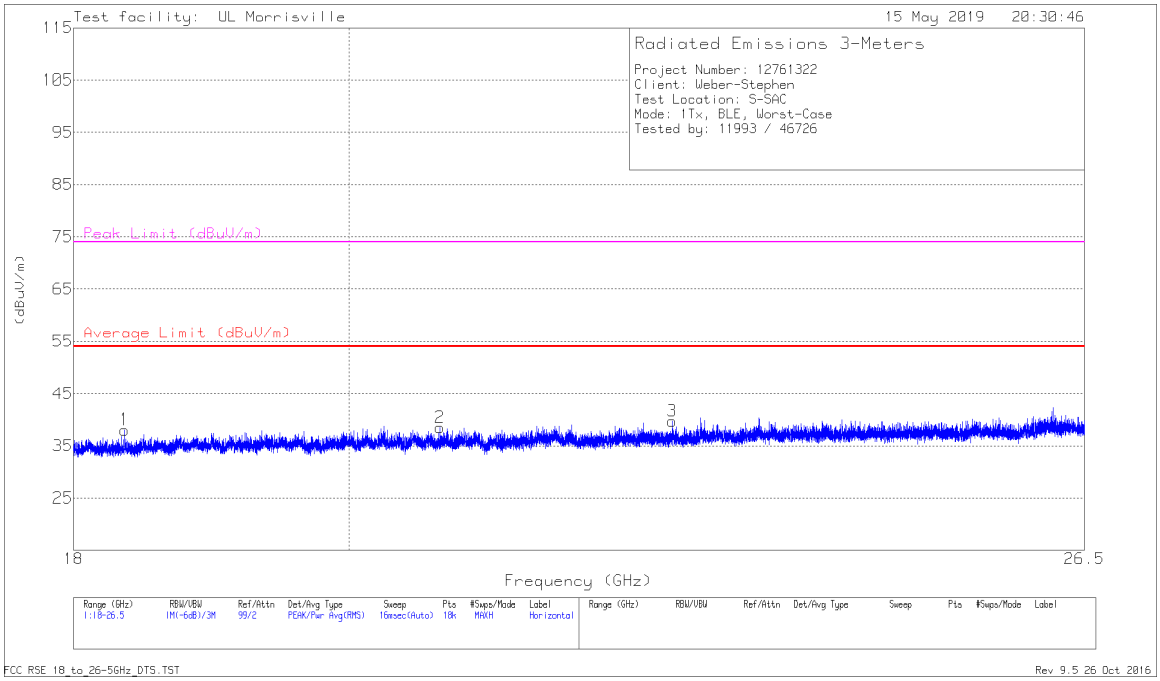
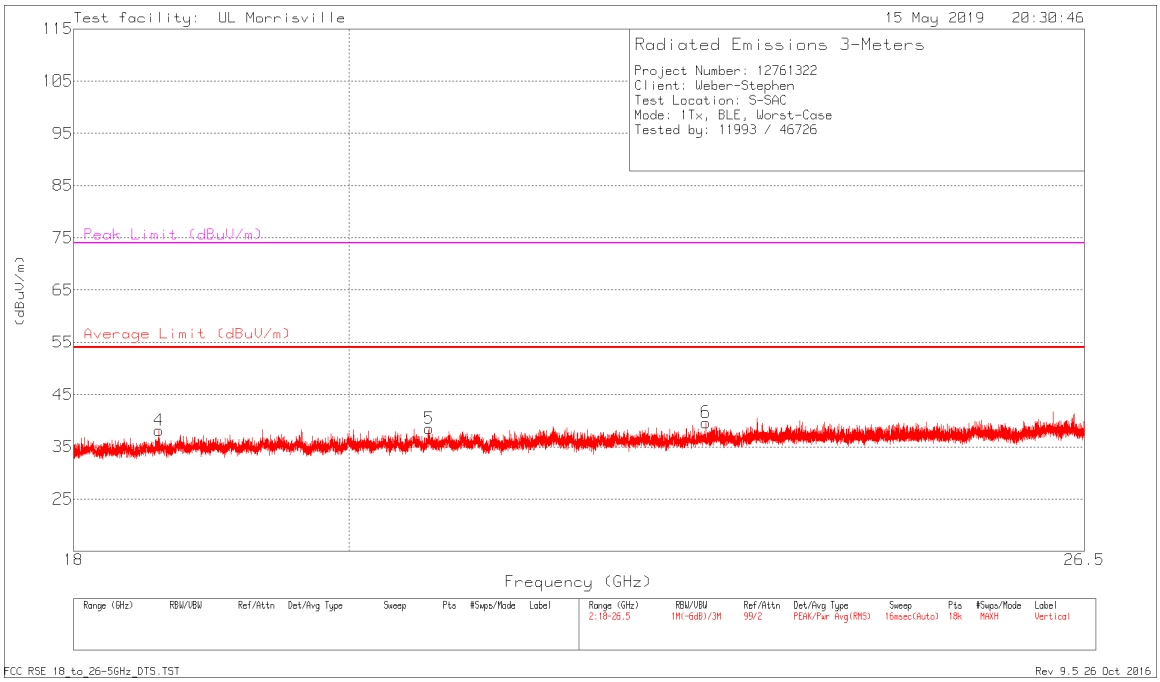
Saber



HORIZONTAL



VERTICAL

18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 18.354	44.86	Pk	32.3	-39.1	38.06	54	-15.94	74	-35.94	0-360	299	H
2	* ** 20.706	43.59	Pk	33.1	-38.2	38.49	54	-15.51	74	-35.51	0-360	199	H
3	* ** 22.633	44.33	Pk	33.4	-38	39.73	54	-14.27	74	-34.27	0-360	249	H
4	* ** 18.596	44.3	Pk	32.7	-38.9	38.1	54	-15.9	74	-35.9	0-360	151	V
5	* ** 20.621	43.6	Pk	32.9	-38	38.5	54	-15.5	74	-35.5	0-360	201	V
6	* ** 22.927	43.75	Pk	33.7	-37.8	39.65	54	-14.35	74	-34.35	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

UL LLC
12 Laboratory Dr., RTP, NC 27709; USA TEL: (919) 549-1400

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

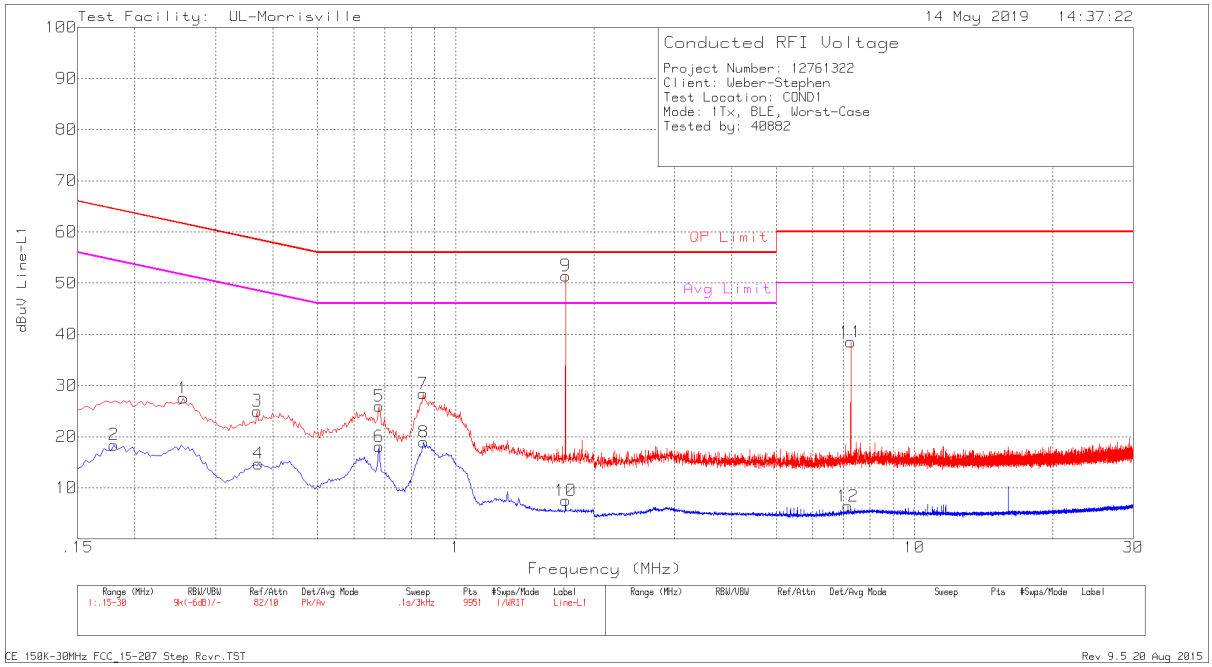
* Decreases with the logarithm of the frequency.

RESULTS

10.1. AC Power Line Host

Pulse

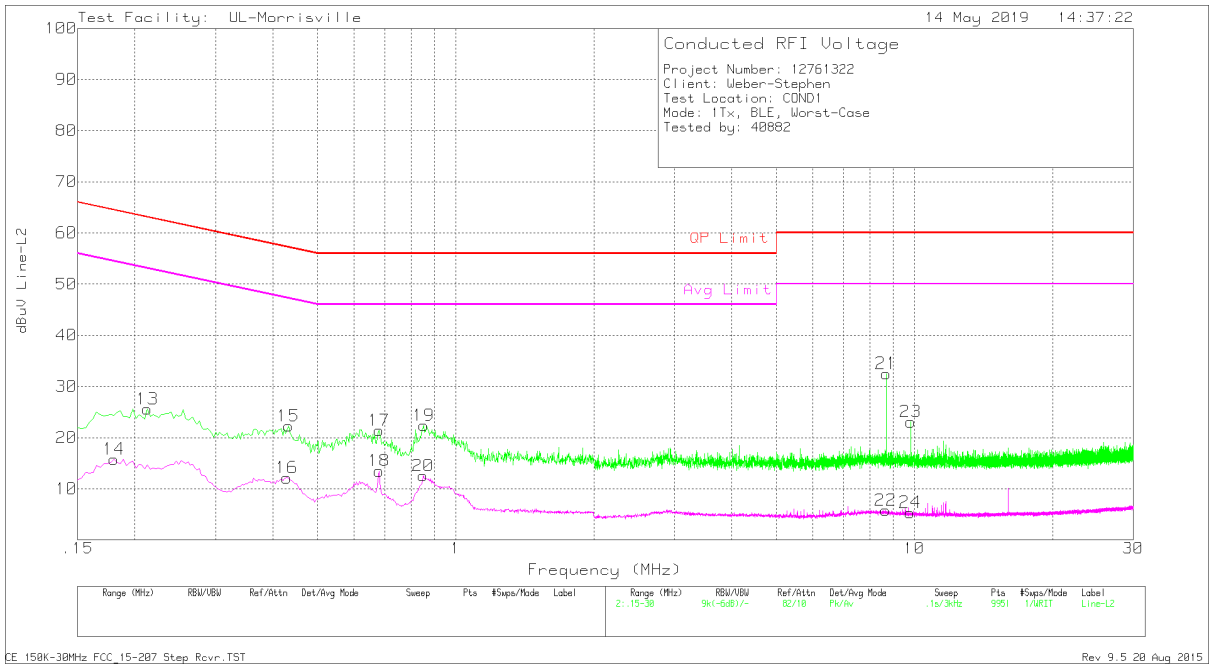
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	**Frequency (MHz)**	**Meter Reading (dBuV)**	**Det**	**LISN VCF (dB)**	**Cbl/Limiter (dB)**	**Corrected Reading dBuV**	**QP Limit**	**Margin (dB)**	**Avg Limit**	**Margin (dB)**
1	.255	17.44	Pk	.1	10	27.54	61.59	-34.05	-	-
2	.18	8.2	Av	.2	10	18.4	-	-	54.49	-36.09
3	.369	14.91	Pk	.1	10	25.01	58.52	-33.51	-	-
4	.372	4.62	Av	.1	10	14.72	-	-	48.46	-33.74
5	.681	15.95	Pk	0	10	25.95	56	-30.05	-	-
6	.681	8.07	Av	0	10	18.07	-	-	46	-27.93
7	.849	18.38	Pk	0	10	28.38	56	-27.62	-	-
8	.852	8.93	Av	0	10	18.93	-	-	46	-27.07
9	1.7446	-7.09	Av	0	10	2.91	-	-	46	-43.09
	1.7446	-4.27	Qp	0	10	5.73	56	-50.27	-	-
10	1.737	-2.5	Av	0	10	7.5	-	-	46	-38.5
11	7.266	28.21	Pk	.1	10.2	38.51	60	-21.49	-	-
12	7.17	-3.86	Av	.1	10.2	6.44	-	-	50	-43.56

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector

LINE 2 RESULTS

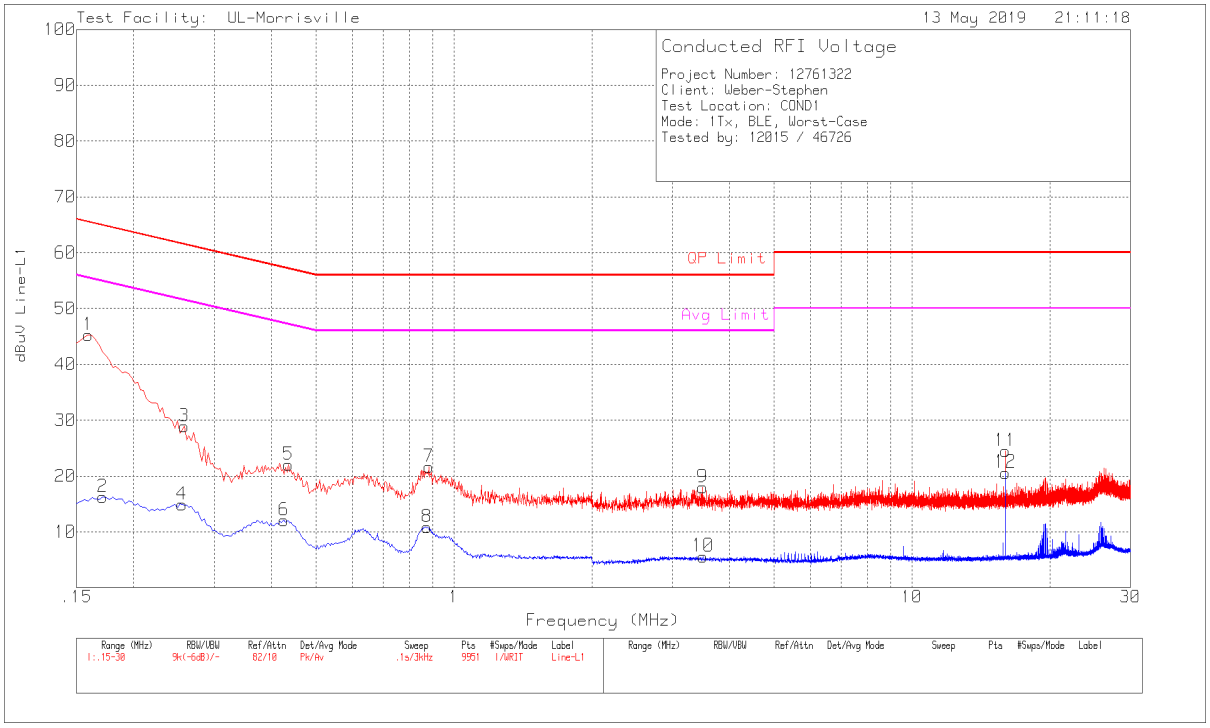


Range 2: Line-L2 .15 - 30MHz										
Marker	**Frequency (MHz)**	**Meter Reading (dBuV)**	**Det**	**LISN VCF (dB)**	**Cbl/Limiter (dB)**	**Corrected Reading dBuV**	**QP Limit**	**Margin (dB)**	**Avg Limit**	**Margin (dB)**
13	.213	15.46	Pk	.1	10	25.56	63.09	-37.53	-	-
14	.18	5.59	Av	.2	10	15.79	-	-	54.49	-38.7
15	.432	12.15	Pk	.1	10	22.25	57.21	-34.96	-	-
16	.429	2.04	Av	.1	10	12.14	-	-	47.27	-35.13
17	.681	11.41	Pk	0	10	21.41	56	-34.59	-	-
18	.681	3.49	Av	0	10	13.49	-	-	46	-32.51
19	.852	12.4	Pk	0	10	22.4	56	-33.6	-	-
20	.849	2.58	Av	0	10	12.58	-	-	46	-33.42
21	8.685	22.11	Pk	.1	10.3	32.51	60	-27.49	-	-
22	8.655	-4.63	Av	.1	10.3	5.77	-	-	50	-44.23
23	9.81	12.68	Pk	.1	10.3	23.08	60	-36.92	-	-
24	9.801	-5.04	Av	.1	10.3	5.36	-	-	50	-44.64

Pk - Peak detector
Av - Average detection

Saber

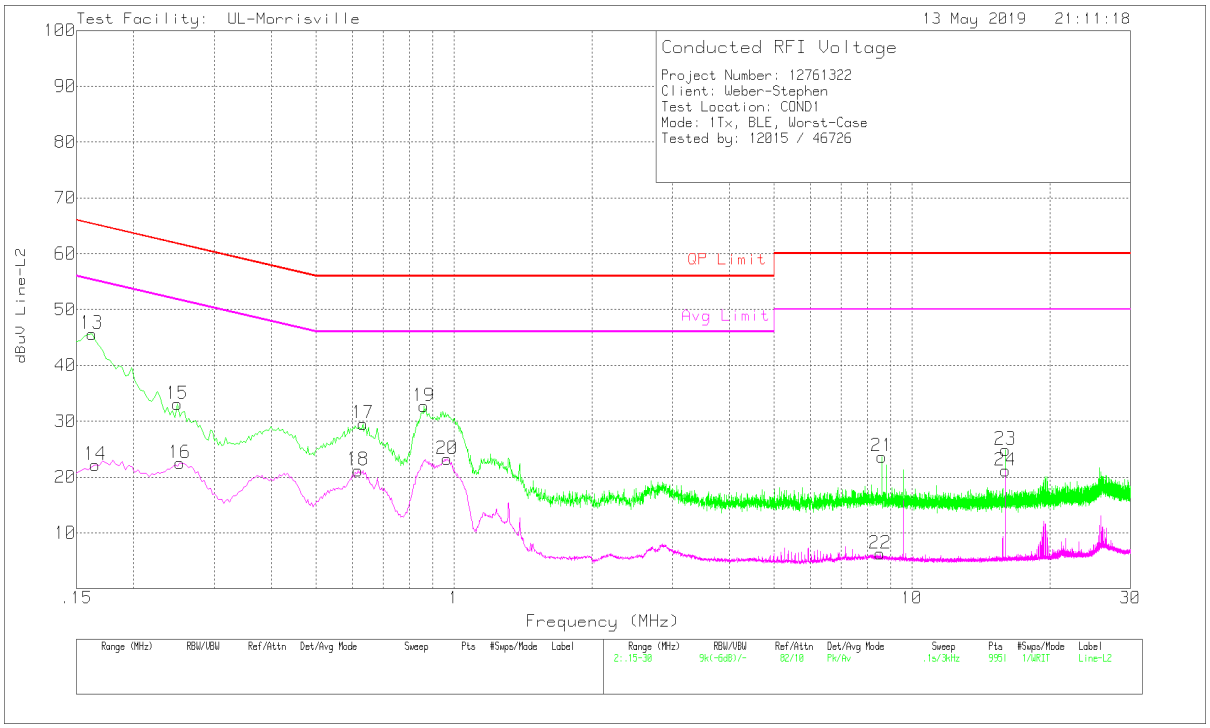
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	**Frequency (MHz)**	**Meter Reading (dBuV)**	**Det**	**LISN VCF (dB)**	**Cbl/Limiter (dB)**	**Corrected Reading dBuV**	**QP Limit**	**Margin (dB)**	**Avg Limit**	**Margin (dB)**
1	.159	35.07	Pk	.2	10	45.27	65.52	-20.25	-	-
2	.171	6.03	Av	.2	10	16.23	-	-	54.91	-38.68
3	.258	18.78	Pk	.1	10	28.88	61.5	-32.62	-	-
4	.255	4.79	Av	.1	10	14.89	-	-	51.59	-36.7
5	.435	11.95	Pk	.1	10	22.05	57.16	-35.11	-	-
6	.426	1.96	Av	.1	10	12.06	-	-	47.33	-35.27
7	.882	11.67	Pk	0	10	21.67	56	-34.33	-	-
8	.873	.86	Av	0	10	10.86	-	-	46	-35.14
9	3.495	7.89	Pk	0	10.1	17.99	56	-38.01	-	-
10	3.498	-4.5	Av	0	10.1	5.6	-	-	46	-40.4
11	15.999	13.85	Pk	.1	10.5	24.45	60	-35.55	-	-
12	15.999	10	Av	.1	10.5	20.6	-	-	50	-29.4

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	**Frequency (MHz)**	**Meter Reading (dBuV)**	**Det**	**LISN VCF (dB)**	**Cbl/Limiter (dB)**	**Corrected Reading dBuV**	**QP Limit**	**Margin (dB)**	**Avg Limit**	**Margin (dB)**
13	.162	35.48	Pk	.2	10	45.68	65.36	-19.68	-	-
14	.165	11.99	Av	.2	10	22.19	-	-	55.21	-33.02
15	.249	22.95	Pk	.1	10	33.05	61.79	-28.74	-	-
16	.252	12.42	Av	.1	10	22.52	-	-	51.69	-29.17
17	.633	19.58	Pk	0	10	29.58	56	-26.42	-	-
18	.618	11.21	Av	0	10	21.21	-	-	46	-24.79
19	.861	22.72	Pk	0	10	32.72	56	-23.28	-	-
20	.966	13.24	Av	0	10	23.24	-	-	46	-22.76
21	8.604	13.28	Pk	.1	10.3	23.68	60	-36.32	-	-
22	8.529	-4.12	Av	.1	10.3	6.28	-	-	50	-43.72
23	15.999	14.3	Pk	.1	10.5	24.9	60	-35.1	-	-
24	15.999	10.58	Av	.1	10.5	21.18	-	-	50	-28.82

Pk - Peak detector
Av - Average detection

11. SETUP PHOTOS

Please refer to R12761322-EP1 for setup photos.

END OF TEST REPORT

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