



CERTIFICATION TEST REPORT

Report Number. : R13048573-E1

Applicant : LEVITON MFG CO INC
20497 SW TETON
PO BOX 2210
TUALATIN, OR 97062-2210

Model : BLE-B8200 Modular Logic Board

FCC ID : 2ASLN-IDZ01

IC : 25037-IDZ01

EUT Description : BLE-8200 BLE Logic Board

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 2
ISED RSS-GEN ISSUE 5

Date Of Issue:

2020-06-12

Prepared by:

UL LLC

12 Laboratory Dr.

Research Triangle Park, NC 27709 U.S.A.

Tel: (919) 549-1400



NVLAP Lab code: 200246-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
1	2020-03-04	Initial Issue	Cristian Melara
2	2020-03-27	Updated Antenna gain to 1.5dBi	Cristian Melara
3	2020-06-12	Updated all output power values	Cristian Melara

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
TABLE OF CONTENTS	3
1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. MEASURING INSTRUMENT CALIBRATION	7
4.2. SAMPLE CALCULATION	7
4.3. MEASUREMENT UNCERTAINTY.....	7
5. EQUIPMENT UNDER TEST	8
5.1. EUT DESCRIPTION	8
5.2. MAXIMUM OUTPUT POWER.....	8
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	8
5.4. SOFTWARE AND FIRMWARE.....	8
5.5. WORST-CASE CONFIGURATION AND MODE.....	8
5.6. DESCRIPTION OF TEST SETUP.....	9
6. MEASUREMENT METHOD.....	11
7. TEST AND MEASUREMENT EQUIPMENT	12
8. ANTENNA PORT TEST RESULTS.....	14
8.1. ON TIME AND DUTY CYCLE.....	14
8.2. 99% BANDWIDTH.....	15
8.2.1. ODD10-000-IDZ.....	15
8.3. 6 dB BANDWIDTH.....	16
8.3.1. ODD10-000-IDZ.....	17
8.4. OUTPUT POWER.....	18
8.4.1. ODD10-000-IDZ.....	18
8.4.2. ODS15-000-IDZ.....	18
8.4.3. ODD24-000-IDZ.....	19
8.5. AVERAGE POWER.....	20
8.5.1. ODD10-000-IDZ.....	20
8.5.2. ODS15-000-IDZ.....	20
8.5.3. ODD24-000-IDZ.....	21
8.6. POWER SPECTRAL DENSITY	22

8.6.1.	ODD10-000-IDZ.....	23
8.7.	CONDUCTED SPURIOUS EMISSIONS.....	24
8.7.1.	ODD-10-000-IDZ	25
9.	RADIATED TEST RESULTS.....	26
9.1.	LIMITS AND PROCEDURE.....	26
9.2.	TRANSMITTER ABOVE 1 GHZ.....	28
9.2.1.	ODD10-000-IDZ.....	28
9.2.2.	ODS15-000-IDZ.....	38
9.2.3.	ODD24-000-IDZ.....	48
9.3.	WORST CASE BELOW 30MHZ.....	58
9.3.1.	ODD10-000-IDZ.....	58
9.3.2.	ODS15-000- IDZ.....	59
9.3.3.	ODD24-000-IDZ.....	60
9.4.	WORST CASE BELOW 1 GHZ.....	61
9.4.1.	ODD10-000-IDZ.....	61
9.4.2.	ODS15-000-IDZ.....	63
9.4.3.	ODD24-000-IDZ.....	65
9.5.	WORST CASE 18-26 GHZ.....	67
9.5.1	ODD10-000-IDZ.....	67
9.5.2	ODS15-000-IDZ.....	69
9.5.3	ODD24-000-IDZ.....	71
10.	AC POWER LINE CONDUCTED EMISSIONS	73
10.1.1.	ODD10-000-IDZ.....	74
10.1.2.	ODS15-000-IDZ	76
10.1.3.	ODD24-000-IDZ.....	78
11.	SETUP PHOTOS	80

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LEVITON MFG CO INC
20497 SW TETON
PO BOX 2210
TUALATIN, OR 97062-2210

MODEL: BLE-B8200 Modular Logic Board

EUT DESCRIPTION: BLE-8200 Module Logic Board

SERIAL NUMBER: Non-serialized

DATE RECEIVED: 2020-01-24

DATE TESTED: 2020-01-29 to 2020-06-10

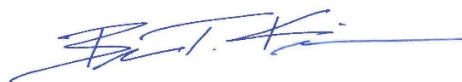
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

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. to

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.

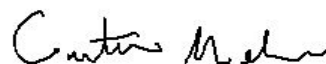
This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government.

Approved & Released For
UL LLC. By:



Brian Kiewra
Project Engineer
Consumer Technology Division
UL LLC

Prepared By:



Cristian Melara
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:

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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Final Voltage (dBuV)} &= \text{Measured Voltage (dBuV)} + \text{Cable Loss (dB)} + \text{Limiter Factor (dB)} + \\ &\text{LISN Insertion Loss.} \\ 36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} &= 46.6 \text{ dBuV} \end{aligned}$$

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%.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a BLE-B8200 Module Logic Board. Three different product models were tested, the ODD10-000-IDZ(a Provolt PIR Wallbox Sensor, On/Off and 0-10V Dimming Control), the ODS15-000-IDZ(a Provolt PIR Wallbox Sensor, On/Off Control), and the ODD24-000-IDZ(a Provolt PIR Wallbox Sensor, 12-24V input, On/Off and 0-10V Dimming Control). Each product model contains the same Wall Station Controller logic board B8200 that holds a 2.4GHz BLE radio.

This report covers the antenna port conducted results from the ODD10-000-IDZ as worst-case, along with radiated emission results for the ODD10-000-IDZ, ODS15-000-IDZ, and ODD24-000-IDZ. Leviton has declared that the ODD10-000-IDZ is worst-case setup of the three units.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power of all three units is as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	8.72	7.45

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was CyBlueTool version 0.1.82.1

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz and 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 selected EUT configuration was chosen to maximize emissions. EUT intended to operate in only one orientation. Therefore, all testing performed with the EUT in its intended orientation

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
76021	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	N/A
Light Bulb Load	General Electric	FG2145-EY5	Non-serialized	N/A

I/O CABLES

ODD10

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Line (in)	AC	N	N	None
2	Ground	I/O	N	N	None
3	Neutral	I/O	N	N	Connected to AC mains and Load setup
4	Load	I/O	N	N	Connected to Light Bulb load
5	0-10V Load	I/O	N	N	Terminated with 1kOhm resistor per manufacturer request
6	0-10V Load	I/O	N	N	Terminated with 1kOhm resistor per manufacturer request

*Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

ODS15

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Line (in)	AC	N	N	None
2	Ground	I/O	N	N	None
3	Neutral	I/O	N	N	Connected to AC mains and Load setup
4	Load	I/O	N	N	Connected to Light Bulb load

*Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

ODD24

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	DC	N	N	None
2	Mains	DC	N	N	None
3	Light OCC	I/O	N	N	Terminated with 26kOhm resistor per manufacturer request
4	Plug OCC	I/O	N	N	Terminated with 26kOhm resistor per manufacturer request
5	Ground	I/O	N	N	None
6	0-10V Load	I/O	N	N	Terminated with 1kOhm resistor per manufacturer request
7	0-10V Load	I/O	N	N	Terminated with 1kOhm resistor per manufacturer request
*Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical I/O = Signal Input or Output Port (Not Involved in Process Control) TP = Telecommunication Ports					

SETUP DIAGRAMS

Please refer to R13048573-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 –
For Reference only)

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

AC 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 - 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	2019-08-08	2020-08-08
	30-1000 MHz				
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2019-07-16	2020-07-16
	1-18 GHz				
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	2019-11-07	2020-11-07
	Gain-Loss Chains				
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2019-05-02	2020-05-02
S-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2019-05-02	2020-05-02
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2019-03-13	2020-03-13
S62/AMP017/ CBL269426-001 (Effective 09/20/2019)	Gain-loss string: 18-40GHz	Huber+Suhner Miteq MegaPhase	SUCOFLEX 102EA TTA1840-35-HG NC12-K1K1-216	2019-03-21	2020-03-21
	Receiver & Software				
SA0025	Spectrum Analyzer	Agilent	N9030A	2019-02-28	2020-02-28
SA0027 (18-40GHz RSE)	Spectrum Analyzer	Agilent	N9030A	2019-05-15	2020-05-15
SOFTEMI	EMI Software	UL	Version 9.5 June 15, 2019	NA	NA
	Additional Equipment used				
s/n 181474409	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27
PS214	AC Power Source	Elgar	CW2501M (s/n 1523A02396)	NA	NA
76021	DC Regulated Power Supply	CircuitSpecialist s.Com	CSI3005X5	N/A	N/A

Test Equipment Used - Wireless Conducted Measurement Equipment

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Common Equipment				
	Conducted Room 2				
T177 (PRE0079253)	Spectrum Analyzer	Agilent Technologies	E4446A	2019-04-22	2020-04-22
PWM004 (PRE0137346)	RF Power Meter	Keysight Technologies	N1911A	2019-08-23	2020-08-23
PWS004	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	E1921A	2019-08-23	2020-08-23
76023 (EC0225)	Temp/Humid Chamber	Cincinnati Sub-Zero	ZPH-8-3.5-SCT/AC	2019-06-14	2020-06-14
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
SOFTEMI	EMC Software	UL	Version 2020.1.8	NA	NA

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

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2019-05-29	2020-05-29
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	2019-08-19	2020-08-19
75141 (PRE0101521)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2019-08-20	2020-08-20
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2019-05-29	2020-05-29
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Miscellaneous (if needed)					
76022	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	N/A	N/A

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

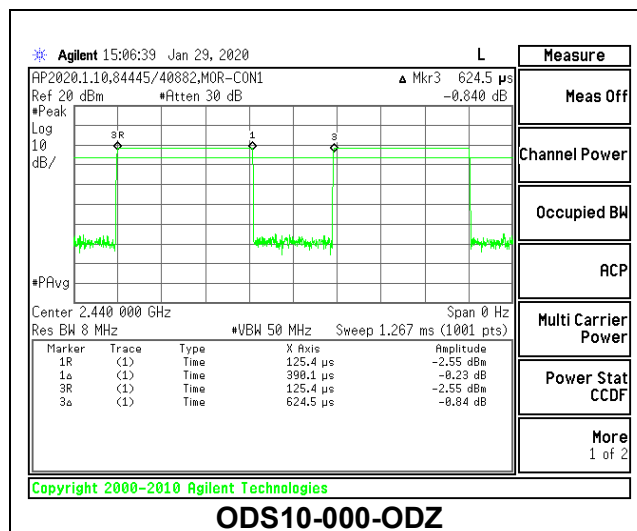
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

SAMPLE	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
ODD10-000-IDZ	0.390	0.625	0.625	62.47%	4.09	2.563

DUTY CYCLE PLOTS



8.2. 99% BANDWIDTH

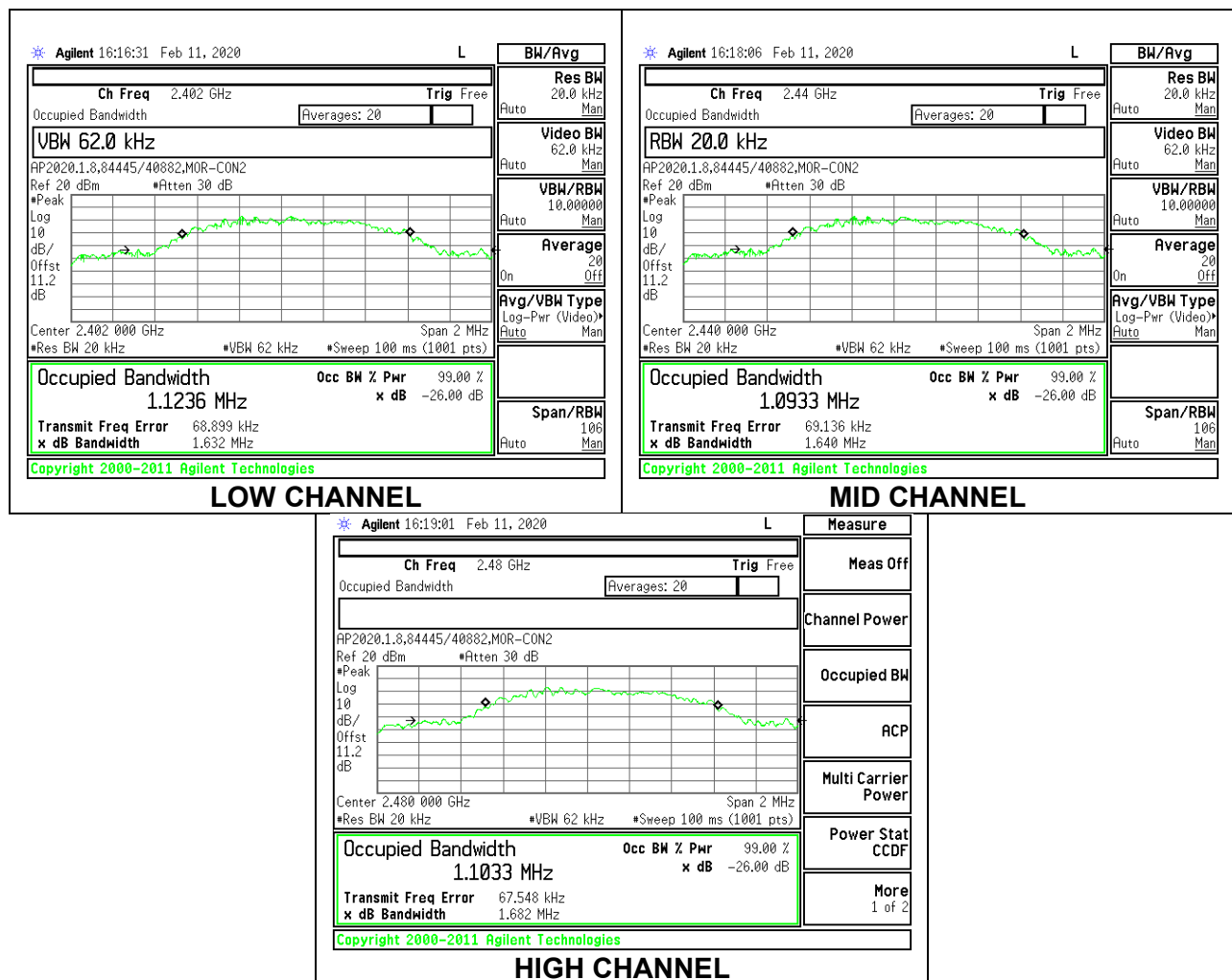
LIMITS

None; for reporting purposes only.

RESULTS

8.2.1. ODD10-000-IDZ

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.1236
Middle	2440	1.0933
High	2480	1.1033



8.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

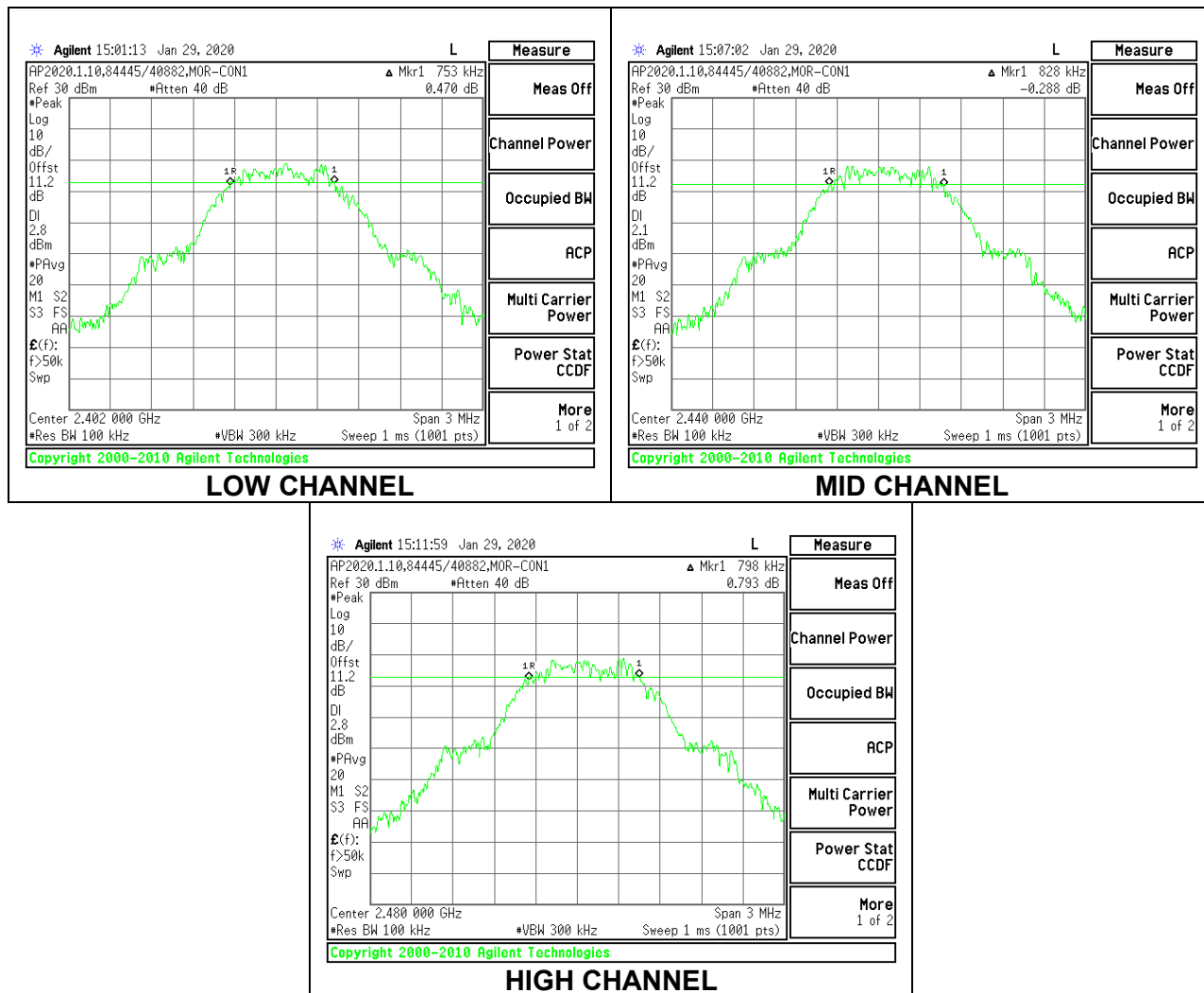
RSS-247 5.2 (a)

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

RESULTS

8.3.1. ODD10-000-IDZ

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.753	0.5
Middle	2440	0.828	0.5
High	2480	0.798	0.5



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 11.42 dB (including 10.49 dB pad and 0.93 dB cable) was entered as an offset in the power meter to allow for a peak reading of power.

RESULTS

8.4.1. ODD10-000-IDZ

Tested By:	24293/40882
Date:	2020-06-10

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.32	30	-21.680
Middle	2440	8.19	30	-21.810
High	2480	8.30	30	-21.700

8.4.2. ODS15-000-IDZ

Tested By:	24293/40882
Date:	2020-06-10

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.30	30	-21.700
Middle	2440	8.26	30	-21.740
High	2480	8.58	30	-21.420

8.4.3. ODD24-000-IDZ

Tested By:	24293/40882
Date:	2020-06-10

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.72	30	-21.280
Middle	2440	8.49	30	-21.510
High	2480	8.55	30	-21.450

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 11.42 dB (including 10.49 dB pad and 0.93 dB cable) was entered as an offset in the power meter to allow for an averaging reading of power.

RESULTS

8.5.1. ODD10-000-IDZ

Tested By:	24293/40882
Date:	2020-06-10

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	8.17
Middle	2440	8.04
High	2480	8.14

8.5.2. ODS15-000-IDZ

Tested By:	24293/40882
Date:	2020-06-10

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	8.16
Middle	2440	8.10
High	2480	8.42

8.5.3. ODD24-000-IDZ

Tested By:	24293/40882
Date:	2020-06-10

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	8.57
Middle	2440	8.32
High	2480	8.39

8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

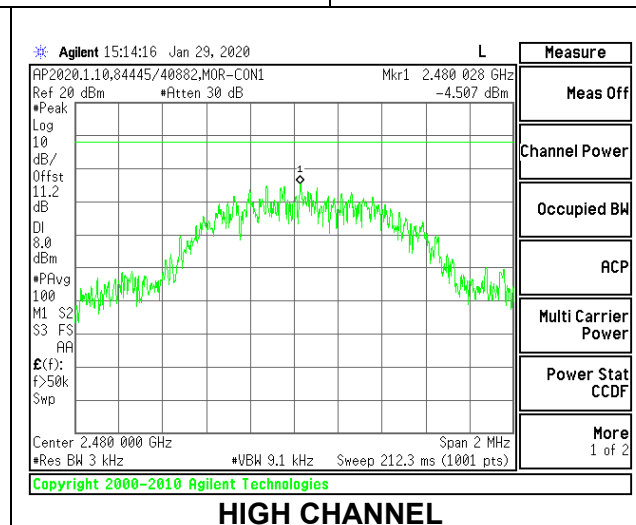
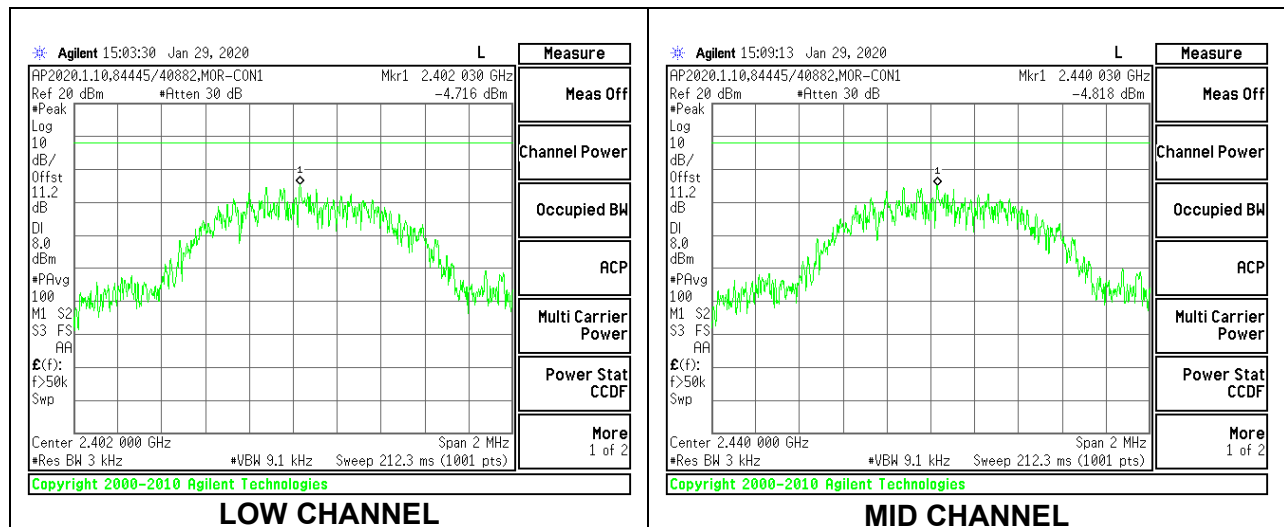
RSS-247 (5.2) (b)

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. ODD10-000-IDZ

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-4.716	8	-12.72
Middle	2440	-4.818	8	-12.82
High	2480	-4.507	8	-12.51



8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

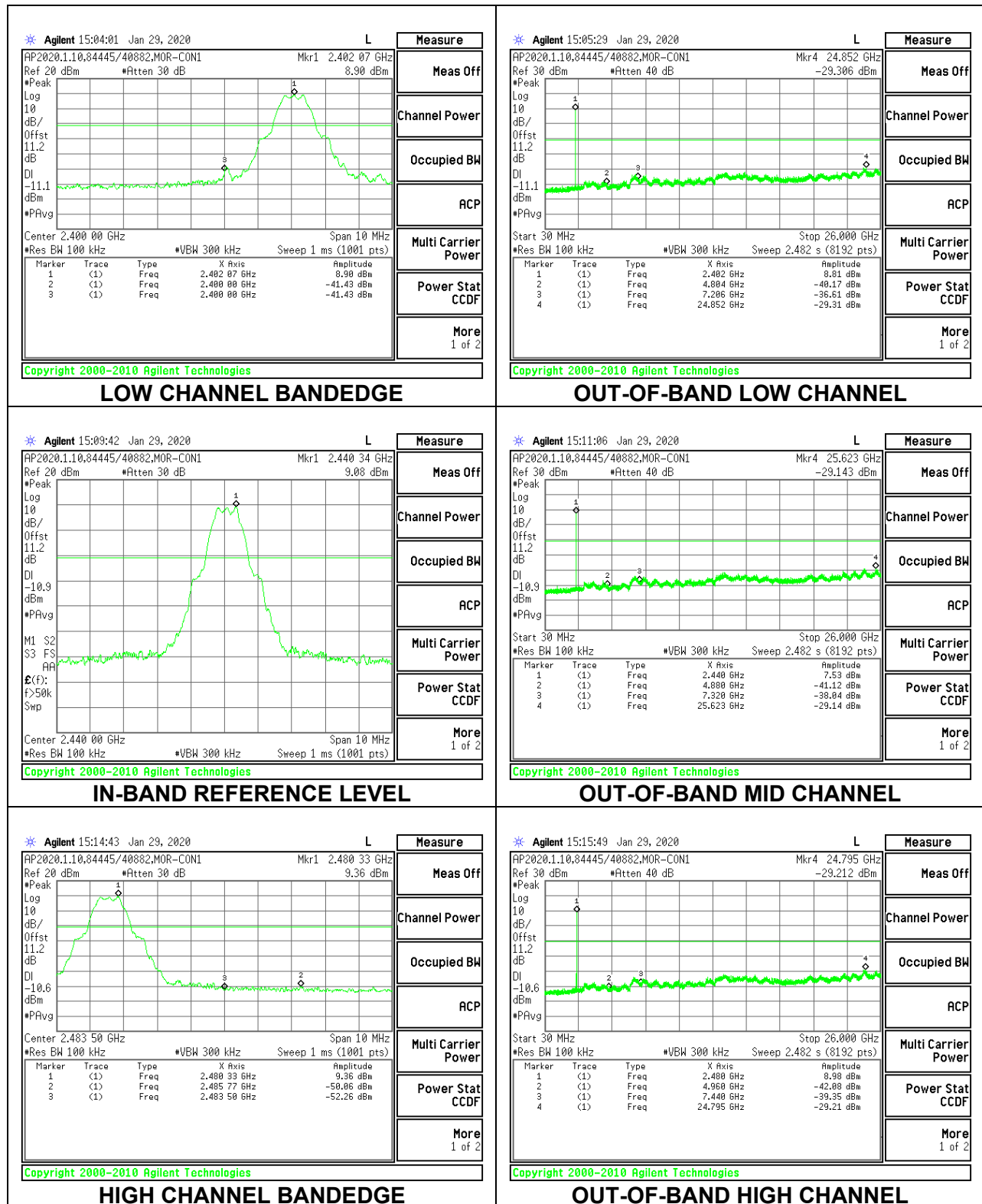
FCC §15.247 (d)

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. ODD-10-000-IDZ



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 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 and as applicable for voltage averaging measurements.

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.

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

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.

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

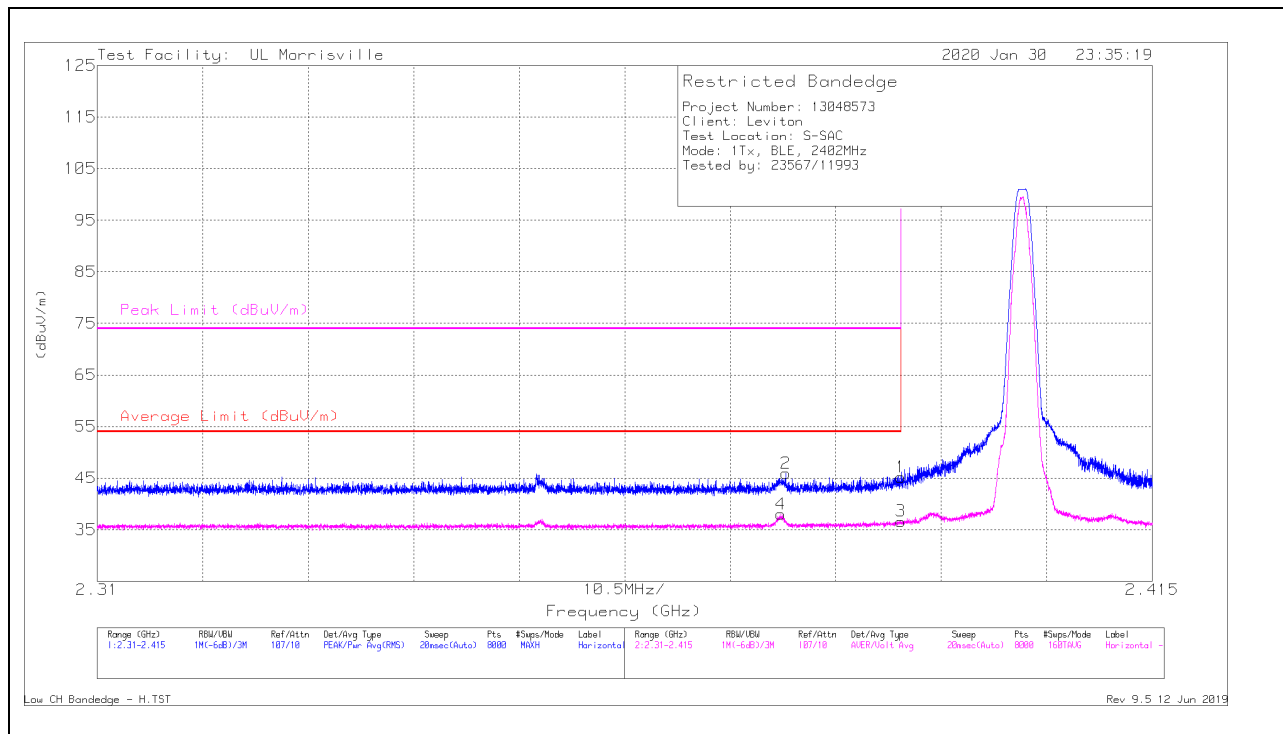
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. ODD10-000-IDZ

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Amp/Cbl/Fitr/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	37.27	Pk	31.9	-24	0	45.17	-	-	74	-28.83	299	343	H
2	* ** 2.37854	38.13	Pk	31.8	-24	0	45.93	-	-	74	-28.07	299	343	H
3	* ** 2.39	24.63	ADV	31.9	-24	4.09	36.62	54	-17.38	-	-	299	343	H
4	* ** 2.37802	26.14	ADV	31.8	-24	4.09	38.03	54	-15.97	-	-	299	343	H

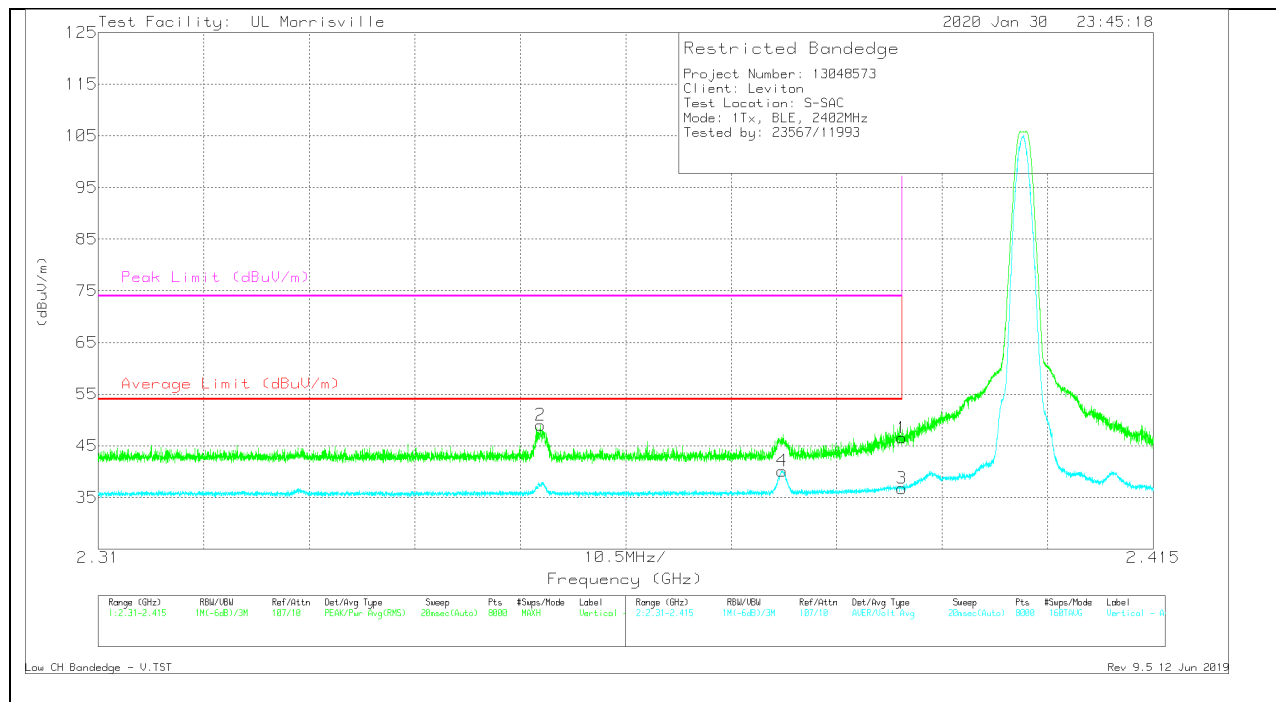
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - AD primary method, Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	38.64	Pk	31.9	-24	0	46.54	-	-	74	-27.46	77	326	V
2	* ** 2.35403	41.1	Pk	31.7	-23.8	0	49	-	-	74	-25	77	326	V
3	* ** 2.39	24.78	ADV	31.9	-24	4.09	36.77	54	-17.23	-	-	77	326	V
4	* ** 2.37806	28.25	ADV	31.8	-24	4.09	40.14	54	-13.86	-	-	77	326	V

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

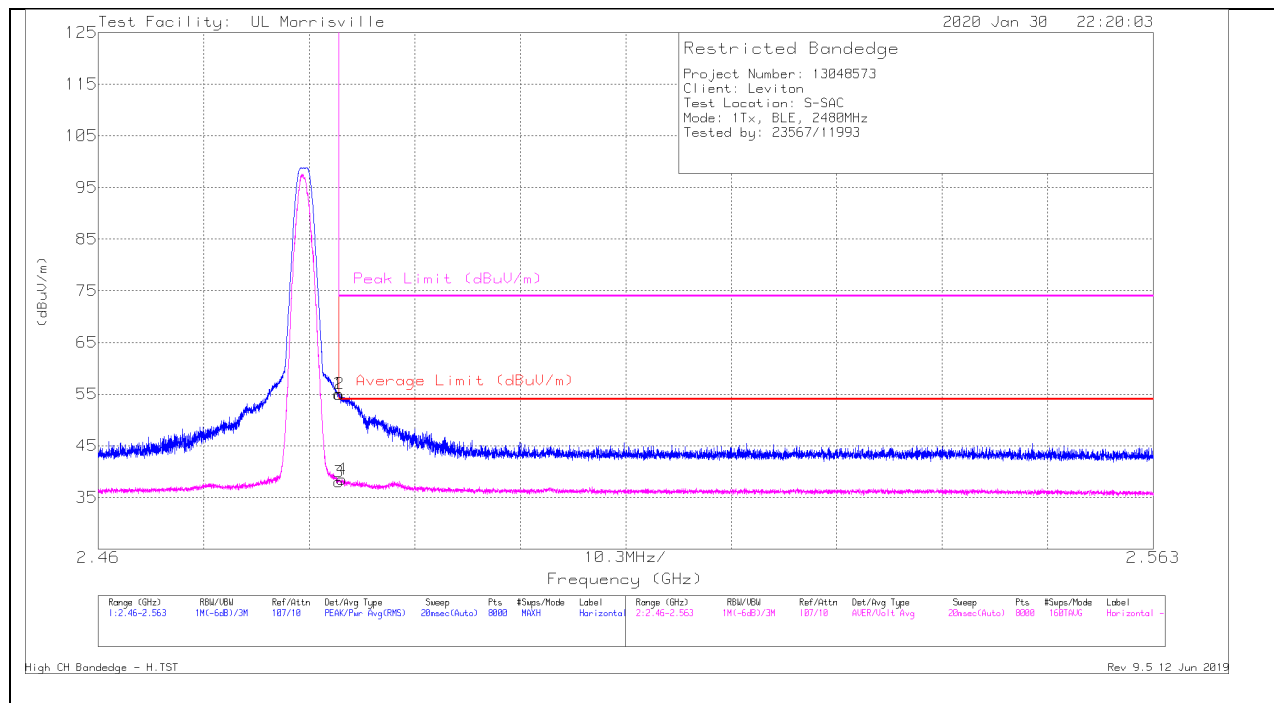
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - AD primary method, Linear Voltage Average

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 2.4835	47.22	Pk	32.3	-24.5	0	55.02	-	-	74	-18.98	286	354	H
2	* ** 2.48357	47.2	Pk	32.3	-24.5	0	55	-	-	74	-19	286	354	H
3	* ** 2.4835	26.11	ADV	32.3	-24.5	4.09	38	54	-16.00	-	-	286	354	H
4	* ** 2.48378	26.62	ADV	32.3	-24.5	4.09	38.51	54	-15.49	-	-	286	354	H

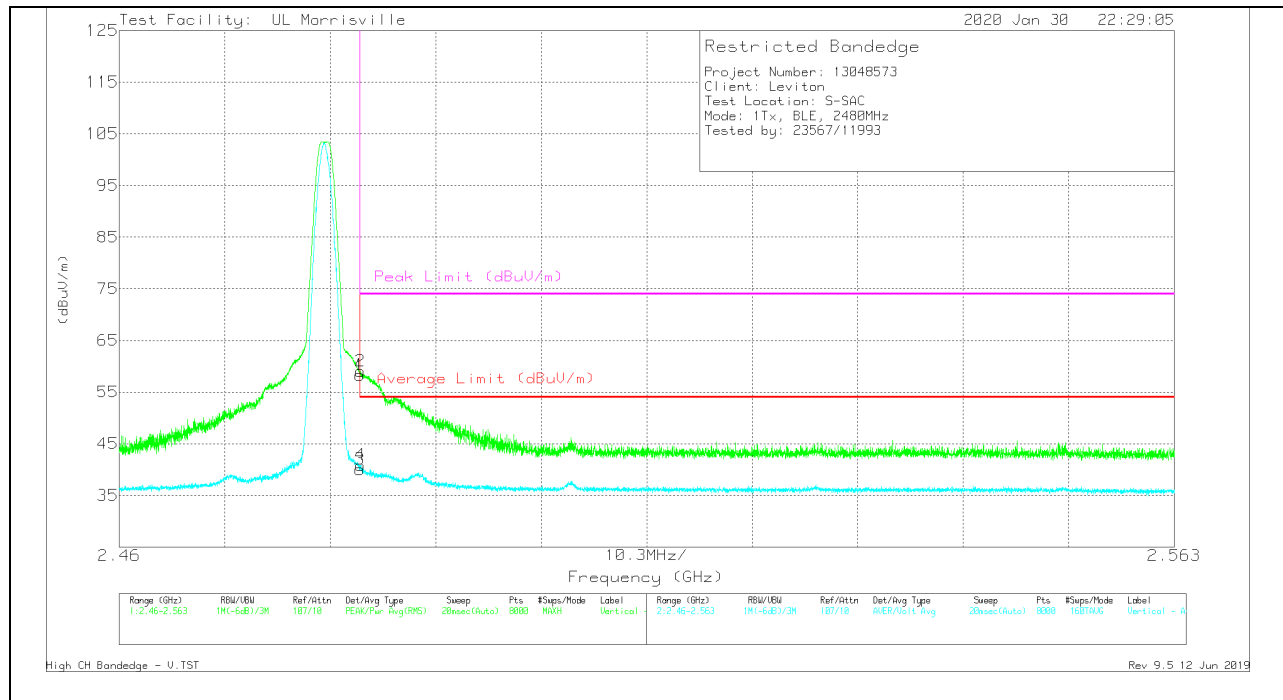
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - AD primary method, Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 2.4835	50.52	Pk	32.3	-24.5	0	58.32	-	-	74	-15.68	9	286	V
2	* ** 2.48357	51.25	Pk	32.3	-24.5	0	59.05	-	-	74	-14.95	9	286	V
3	* ** 2.4835	28.17	ADV	32.3	-24.5	4.09	40.06	54	-13.94	-	-	9	286	V
4	* ** 2.48357	28.99	ADV	32.3	-24.5	4.09	40.88	54	-13.12	-	-	9	286	V

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

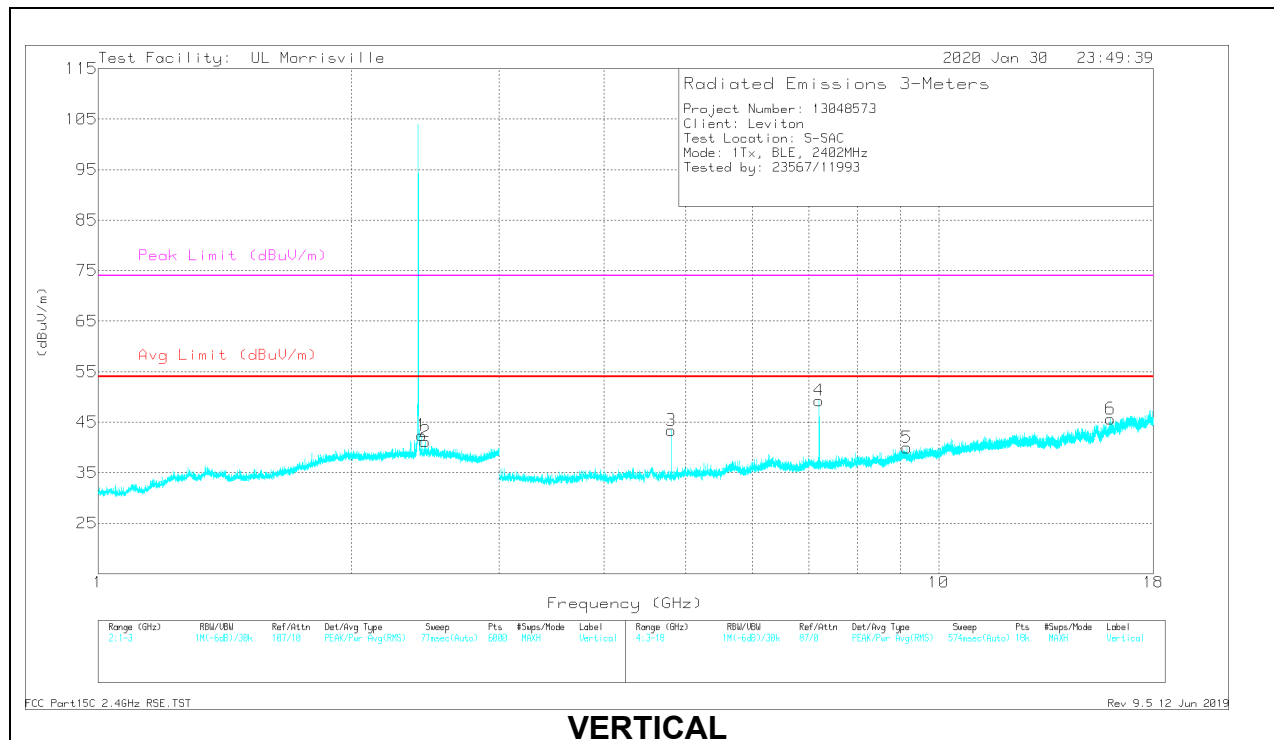
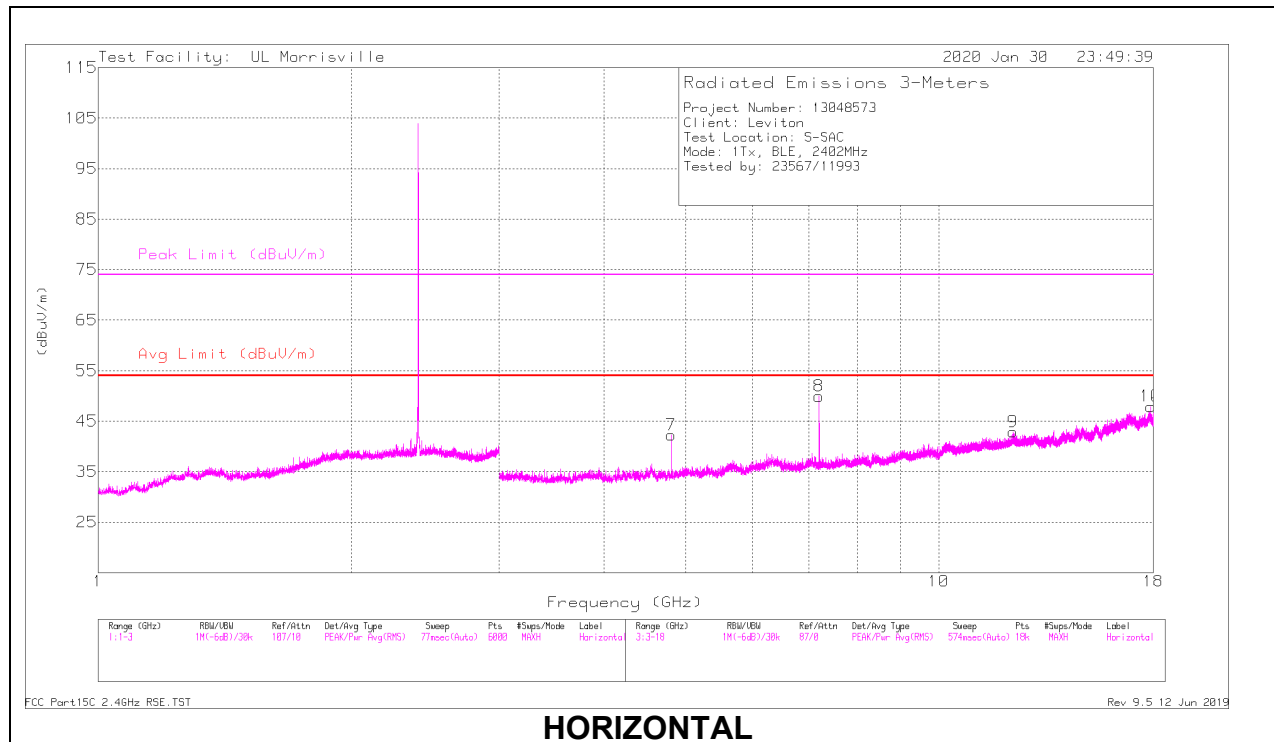
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - AD primary method, Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
7	* ** 4.80472	44.4	PK2	34.2	-31	0	47.6	-	-	74	-26.4	312	215	H
	* ** 4.80406	33.27	ADV	34.2	-31	4.09	40.56	54	-13.44	-	-	312	215	H
9	* ** 12.26257	34.85	PK2	38.9	-23.7	0	50.05	-	-	74	-23.95	241	295	H
	* ** 12.26245	21.19	ADV	38.9	-23.7	4.09	40.48	54	-13.52	-	-	241	295	H
10	* ** 17.88094	33.26	PK2	41.2	-20.6	0	53.86	-	-	74	-20.14	201	390	H
	* ** 17.88084	19.72	ADV	41.2	-20.6	4.09	44.41	54	-9.59	-	-	201	390	H
3	* ** 4.80394	44.16	PK2	34.2	-31	0	47.36	-	-	74	-26.64	114	102	V
	* ** 4.80399	33.6	ADV	34.2	-31	4.09	40.89	54	-13.11	-	-	114	102	V
5	* ** 9.16959	35.16	PK2	36.7	-25.9	0	45.96	-	-	74	-28.04	130	121	V
	* ** 9.16923	21.79	ADV	36.7	-25.9	4.09	36.68	54	-17.32	-	-	130	121	V
6	* ** 16.00381	34.39	PK2	40.7	-23.5	0	51.59	-	-	74	-22.41	38	285	V
	* ** 16.00383	21.29	ADV	40.7	-23.5	4.09	42.58	54	-11.42	-	-	38	285	V
1	2.42591	34.53	Pk	32.1	-24.2	0	42.43	-	-	-	-	0-360	101	V
2	2.44958	33.25	Pk	32.1	-24.2	0	41.15	-	-	-	-	0-360	199	V
4	7.20524	41.59	Pk	35.7	-28	0	49.29	-	-	-	-	0-360	101	V
8	7.20607	42.23	Pk	35.7	-28	0	49.93	-	-	-	-	0-360	101	H

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

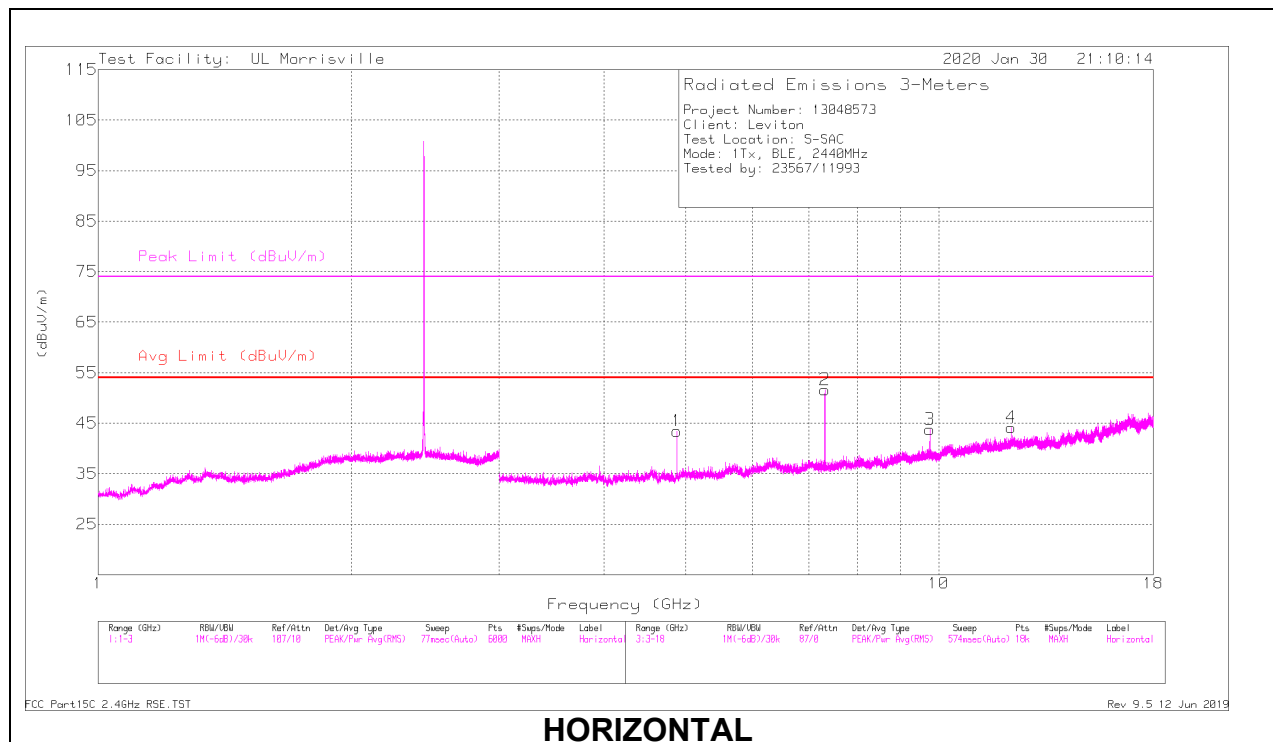
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

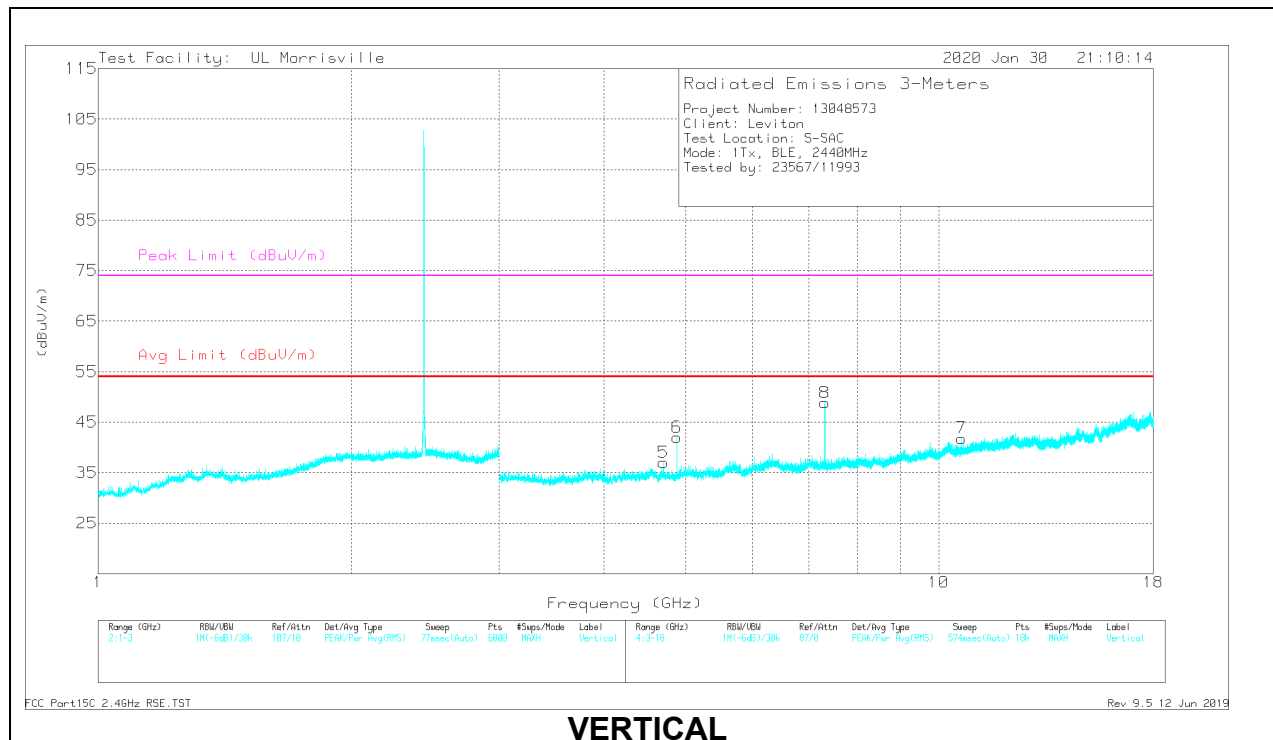
ADV - primary method, Linear Voltage Average

Pk - Peak detector

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
1	* ** 4.88044	44.8	PK2	34	-30.6	0	48.2	-	-	74	-25.8	184	102	H
	* ** 4.8802	33.53	ADV	34	-30.6	4.09	41.02	54	-12.98	-	-	184	102	H
2	* ** 7.31938	44.66	PK2	35.7	-27.5	0	52.86	-	-	74	-21.14	254	118	H
	* ** 7.31955	33.46	ADV	35.7	-27.5	4.09	45.75	54	-8.25	-	-	254	118	H
4	* ** 12.20177	37.58	PK2	38.9	-23.8	0	52.68	-	-	74	-21.32	22	180	H
	* ** 12.20158	23.78	ADV	38.9	-23.8	4.09	42.97	54	-11.03	-	-	22	180	H
5	* ** 4.70375	39.48	PK2	34	-31.7	0	41.78	-	-	74	-32.22	61	276	V
	* ** 4.70347	26.47	ADV	34	-31.7	4.09	32.86	54	-21.14	-	-	61	276	V
6	* ** 4.87961	44.75	PK2	34	-30.6	0	48.15	-	-	74	-25.85	153	306	V
	* ** 4.87986	33.77	ADV	34	-30.6	4.09	41.26	54	-12.74	-	-	153	306	V
7	* ** 10.64146	34.51	PK2	37.7	-24.3	0	47.91	-	-	74	-26.09	239	266	V
	* ** 10.64147	20.85	ADV	37.7	-24.3	4.09	38.34	54	-15.66	-	-	239	266	V
8	* ** 7.31958	45.55	PK2	35.7	-27.5	0	53.75	-	-	74	-20.25	143	337	V
	* ** 7.31957	35.15	ADV	35.7	-27.5	4.09	47.44	54	-6.56	-	-	143	337	V
3	9.75871	32.27	Pk	37.1	-25.6	0	43.77	-	-	-	-	0-360	101	H

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

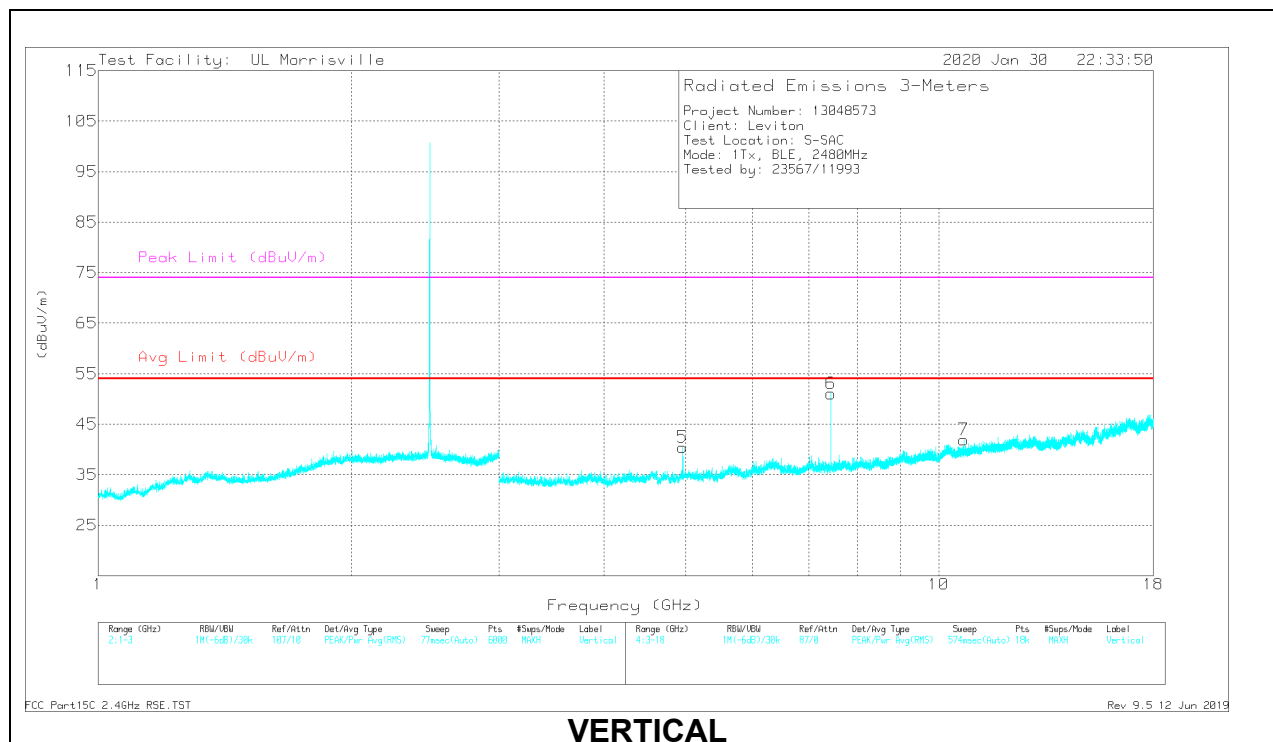
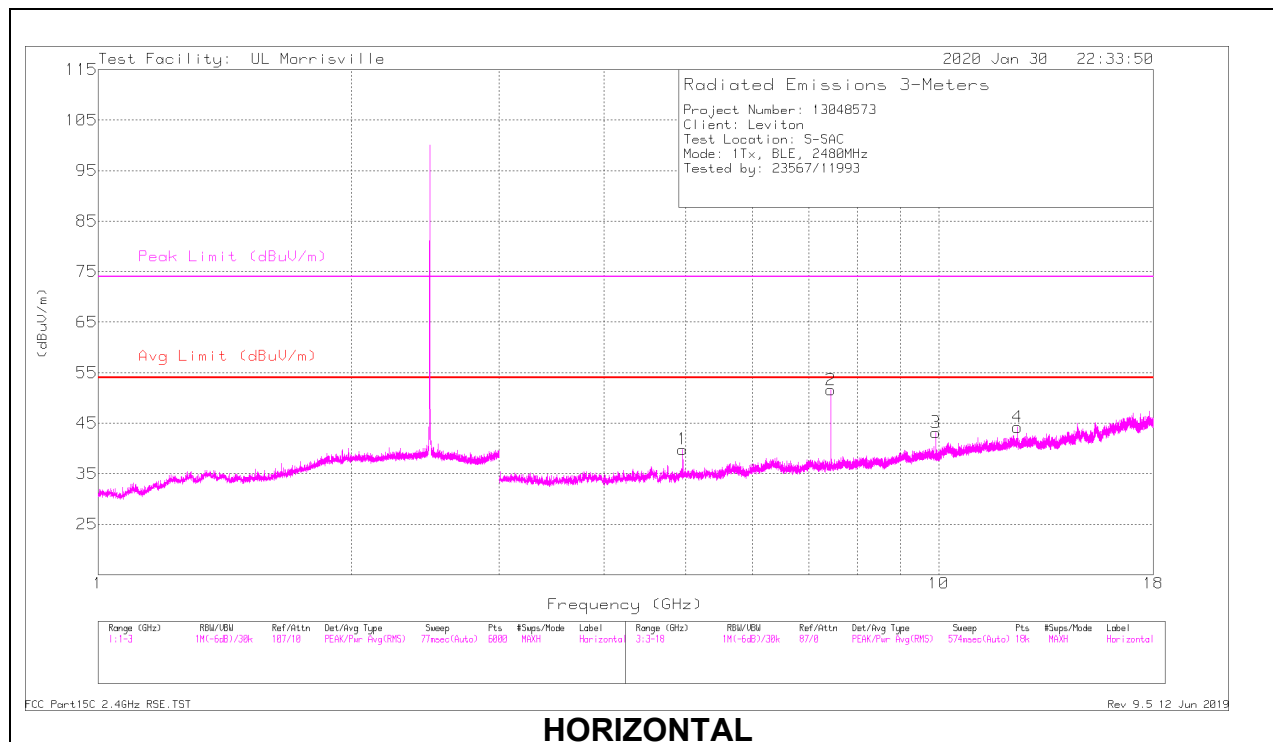
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

ADV - primary method, Linear Voltage Average

Pk - Peak detector

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Amp/Cbl/Fitr/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	* ** 4.96065	44.04	PK2	34.1	-31.1	0	47.04	-	-	74	-26.96	283	213	H
	* ** 4.96022	32.13	ADV	34.1	-31.1	4.09	39.22	54	-14.78	-	-	283	213	H
2	* ** 7.44085	47.93	PK2	35.8	-27.8	0	55.93	-	-	74	-18.07	259	105	H
	* ** 7.44079	36.6	ADV	35.8	-27.8	4.09	48.69	54	-5.31	-	-	259	105	H
4	* ** 12.40166	37.06	PK2	38.8	-23.9	0	51.96	-	-	74	-22.04	17	333	H
	* ** 12.40163	23.88	ADV	38.8	-23.9	4.09	42.87	54	-11.13	-	-	17	333	H
5	* ** 4.9599	42.92	PK2	34.1	-31.1	0	45.92	-	-	74	-28.08	68	226	V
	* ** 4.95976	31.26	ADV	34.1	-31	4.09	38.45	54	-15.55	-	-	68	226	V
6	* ** 7.43943	47.15	PK2	35.8	-27.8	0	55.15	-	-	74	-18.85	133	354	V
	* ** 7.4395	36.82	ADV	35.8	-27.8	4.09	48.91	54	-5.09	-	-	133	354	V
7	* ** 10.70987	34.56	PK2	37.7	-24.3	0	47.96	-	-	74	-26.04	132	274	V
	* ** 10.71017	20.99	ADV	37.7	-24.3	4.09	38.48	54	-15.52	-	-	132	274	V
3	9.92122	31.44	Pk	37.2	-25.5	0	43.14	-	-	-	-	0-360	101	H

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Method: Maximum Peak

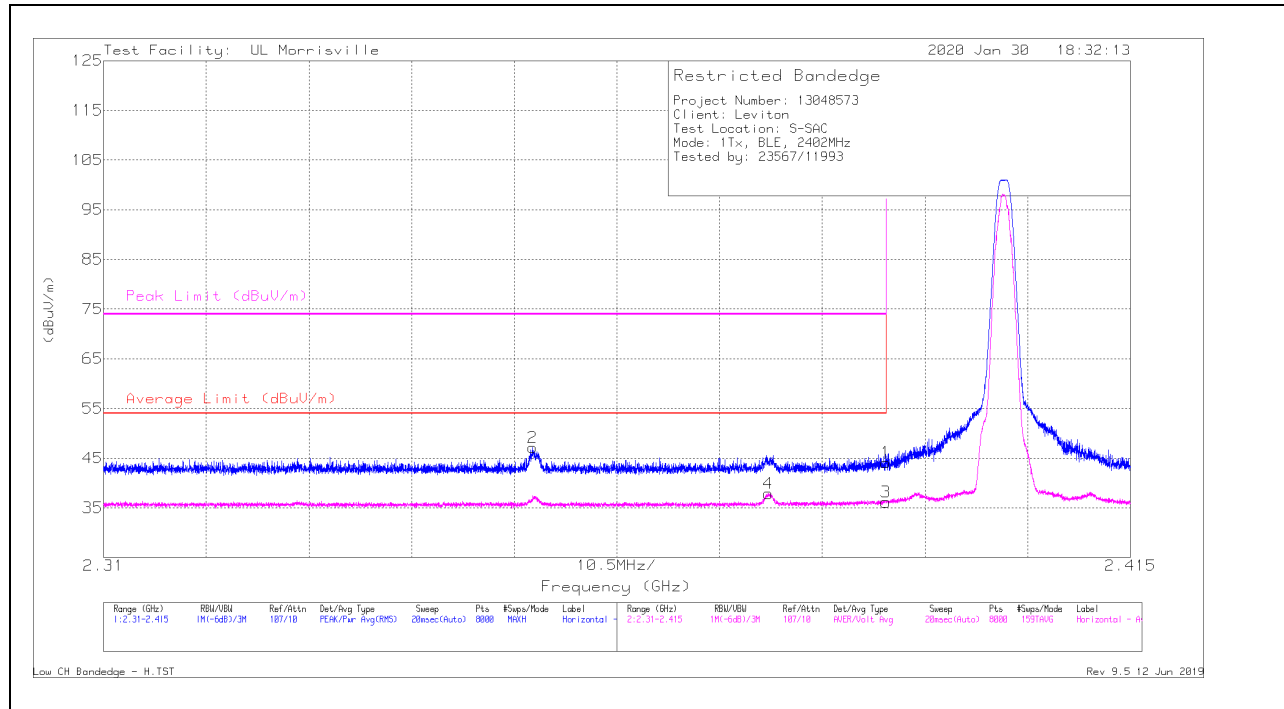
ADV - AD primary method, Linear Voltage Average

Pk - Peak detector

9.2.2. ODS15-000-IDZ

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	36.22	Pk	31.9	-24	0	44.12	-	-	74	-29.88	61	100	H
2	** 2.35386	39.24	Pk	31.7	-23.8	0	47.14	-	-	74	-26.86	61	100	H
3	* ** 2.39	24.2	ADV	31.9	-24	4.09	36.19	54	-17.81	-	-	61	100	H
4	* ** 2.378	26.02	ADV	31.8	-24	4.09	37.91	54	-16.09	-	-	61	100	H

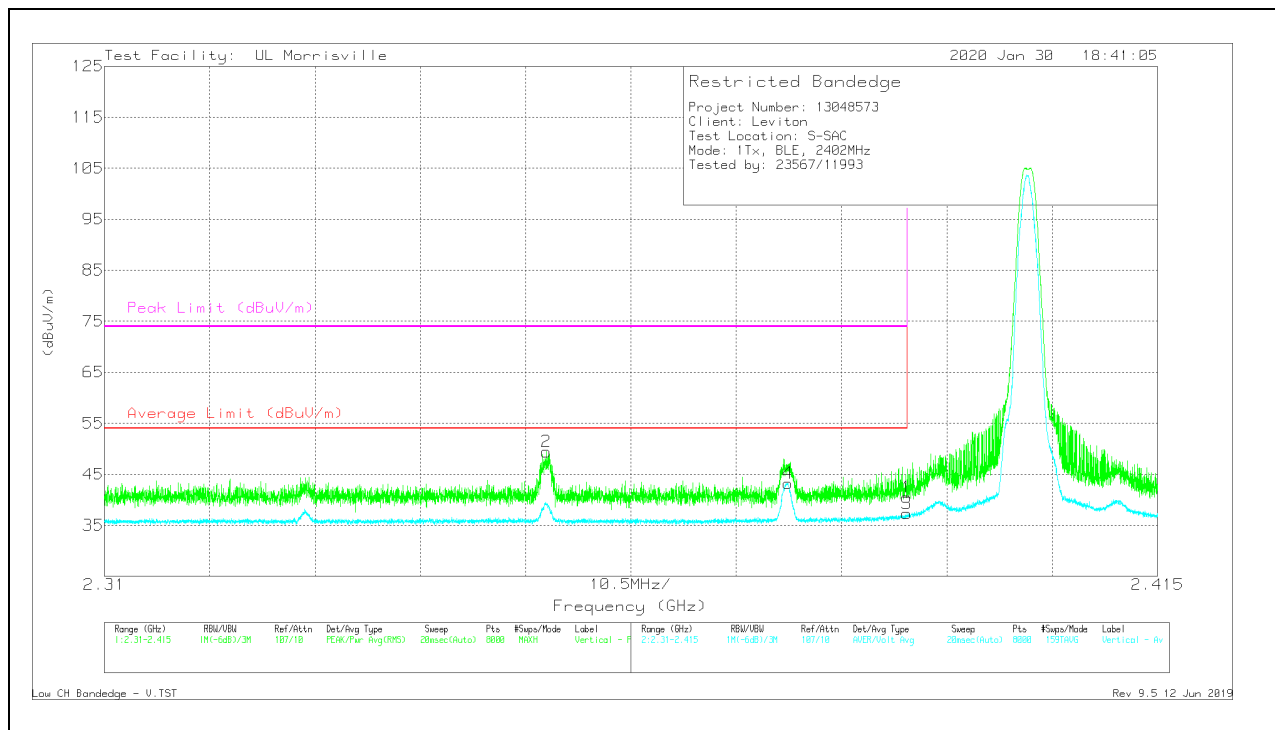
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	32.58	Pk	31.9	-24	0	40.48	-	-	74	-33.52	71	319	V
2	* ** 2.35405	41.53	Pk	31.7	-23.8	0	49.43	-	-	74	-24.57	71	319	V
3	* ** 2.39	25.38	ADV	31.9	-24	4.09	37.37	54	-16.63	-	-	71	319	V
4	* ** 2.37814	31.4	ADV	31.8	-24	4.09	43.29	54	-10.71	-	-	71	319	V

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

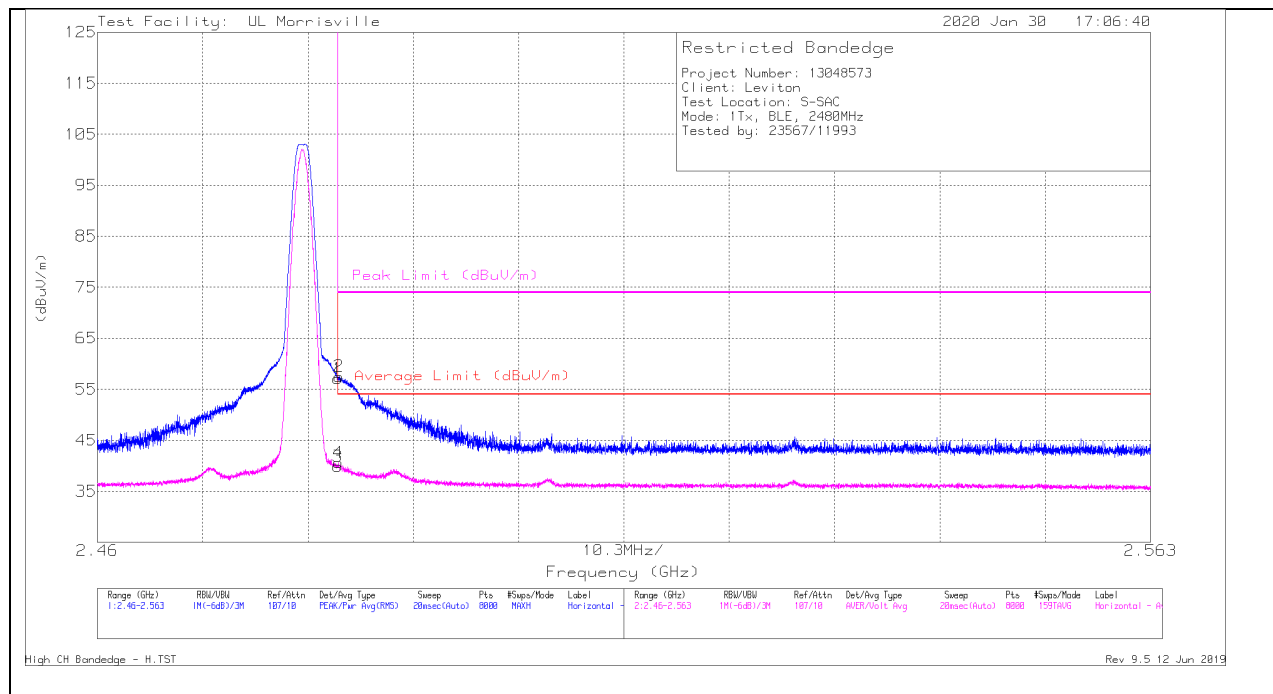
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	*** 2.4835	49.3	Pk	32.3	-24.5	0	57.1	-	-	74	-16.9	25	104	H
2	*** 2.48362	49.72	Pk	32.3	-24.5	0	57.52	-	-	74	-16.48	25	104	H
3	*** 2.4835	28.01	ADV	32.3	-24.5	4.09	39.90	54	-14.10	-	-	25	104	H
4	*** 2.48358	28.78	ADV	32.3	-24.5	4.09	40.67	54	-13.33	-	-	25	104	H

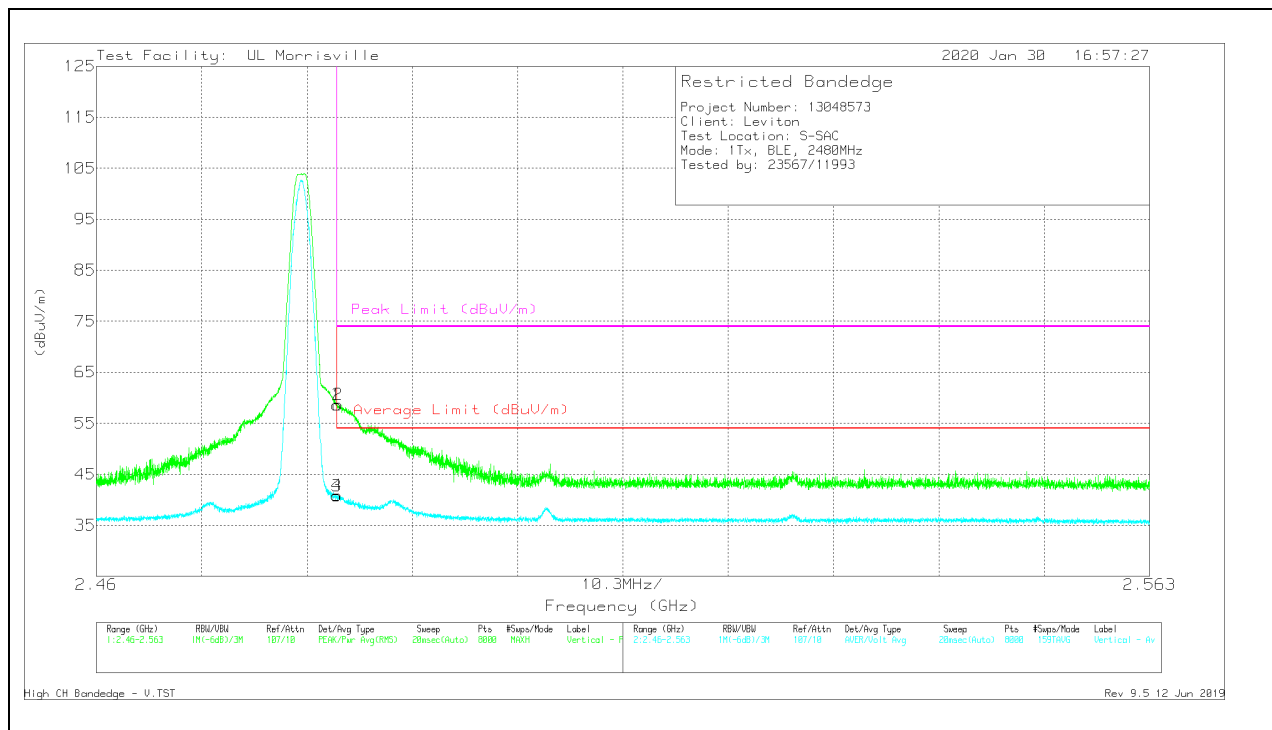
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	* ** 2.4835	50.81	Pk	32.3	-24.5	0	58.61	-	-	74	-15.39	119	149	V
2	* ** 2.48364	50.85	Pk	32.3	-24.5	0	58.65	-	-	74	-15.35	119	149	V
3	* ** 2.4835	28.9	ADV	32.3	-24.5	4.09	40.79	54	-13.21	-	-	119	149	V
4	* ** 2.48354	28.99	ADV	32.3	-24.5	4.09	40.88	54	-13.14	-	-	119	149	V

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

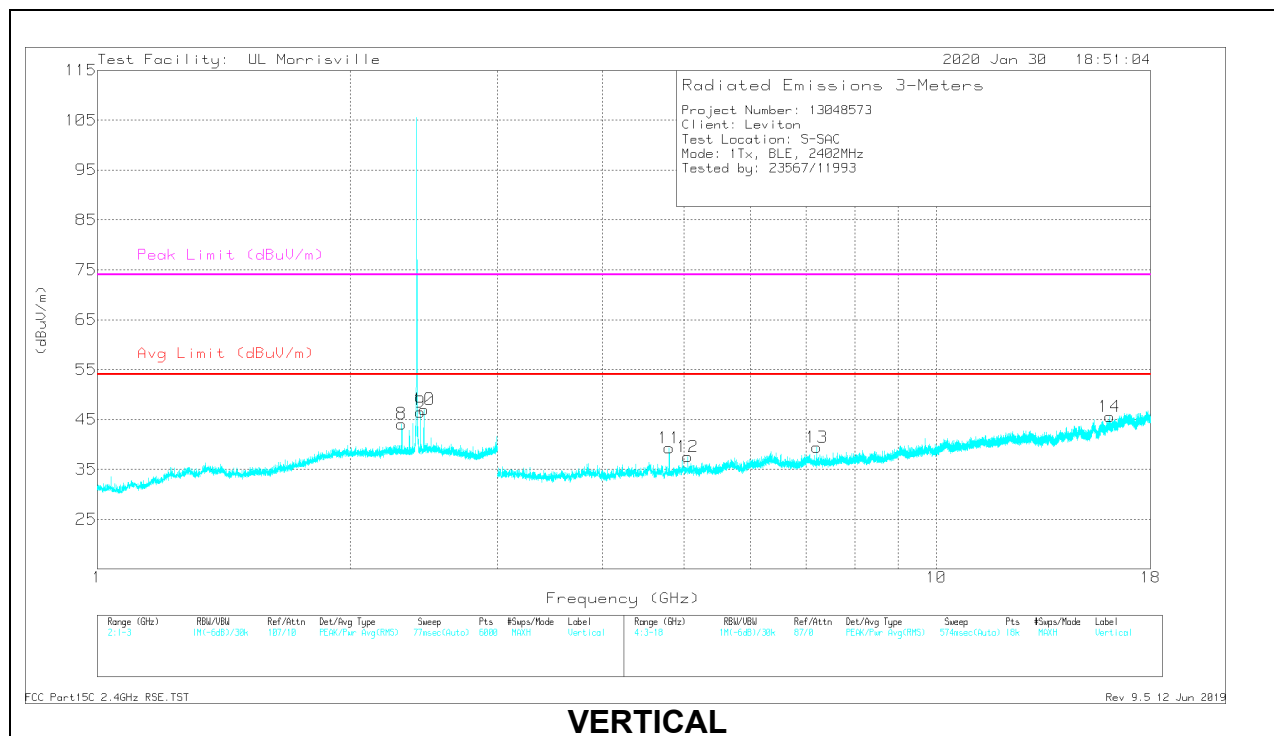
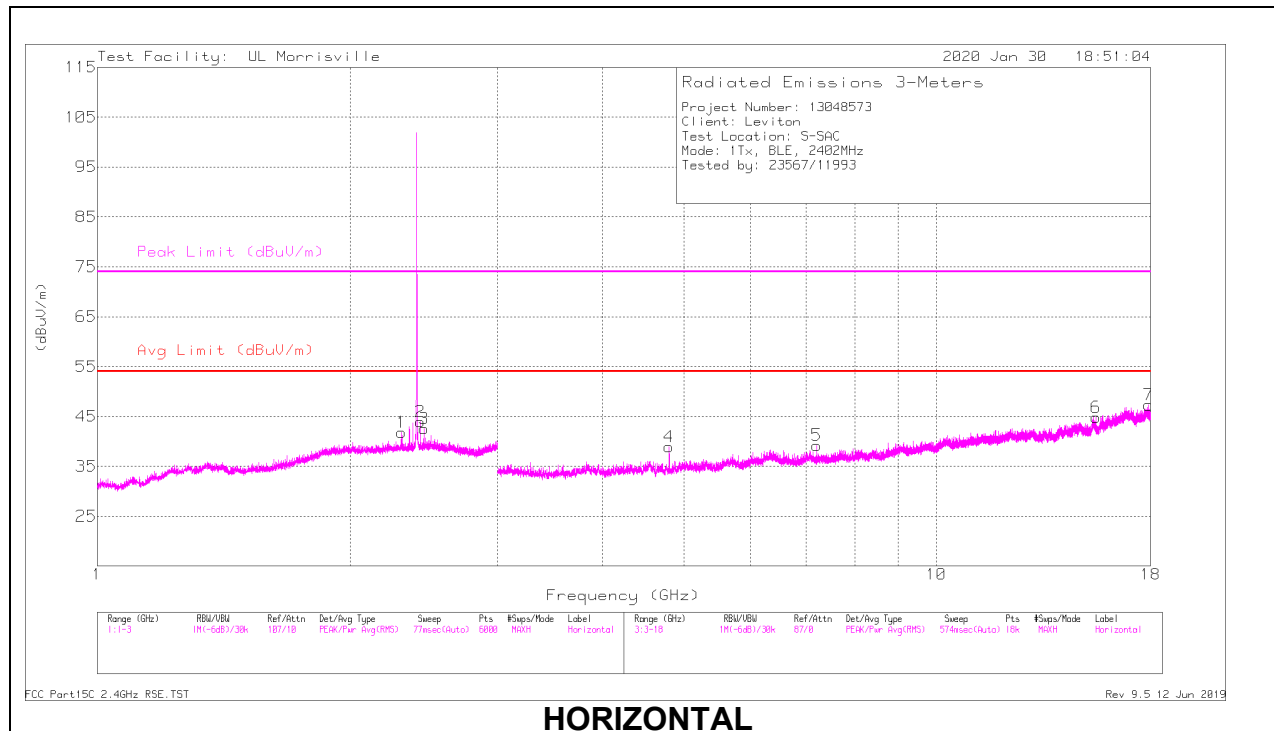
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
4	* ** 4.80382	42.98	PK2	34.2	-31	0	46.18	-	-	74	-27.82	96	221	H
	* ** 4.80395	31.47	ADV	34.2	-31	4.09	38.76	54	-15.24	-	-	96	221	H
6	* ** 15.50384	34.08	PK2	39.9	-23.2	0	50.78	-	-	74	-23.22	87	234	H
	* ** 15.50421	20.93	ADV	39.9	-23.2	4.09	41.72	54	-12.28	-	-	87	234	H
7	* ** 17.90762	33.92	PK2	41.2	-20.9	0	54.22	-	-	74	-19.78	59	263	H
	* ** 17.90854	20.04	ADV	41.2	-21	4.09	44.33	54	-9.67	-	-	59	263	H
11	* ** 4.80347	44.34	PK2	34.2	-31	0	47.54	-	-	74	-26.46	173	191	V
	* ** 4.80392	32.72	ADV	34.2	-31	4.09	40.01	54	-13.99	-	-	173	191	V
12	* ** 5.05562	39.48	PK2	34.2	-31.1	0	42.58	-	-	74	-31.42	148	108	V
	* ** 5.05524	26.21	ADV	34.2	-31.1	4.09	33.4	54	-20.6	-	-	148	108	V
14	* ** 16.08651	35.5	PK2	40.9	-23.7	0	52.7	-	-	74	-21.3	352	284	V
	* ** 16.08643	21.71	ADV	40.9	-23.7	4.09	43	54	-11	-	-	352	284	V
1	2.30622	33.79	Pk	31.7	-23.7	0	41.79	-	-	-	-	0-360	199	H
8	2.30622	36.13	Pk	31.7	-23.7	0	44.13	-	-	-	-	0-360	199	V
2	2.42591	36.02	Pk	32.1	-24.2	0	43.92	-	-	-	-	0-360	199	H
9	2.42591	38.57	Pk	32.1	-24.2	0	46.47	-	-	-	-	0-360	199	V
10	2.44991	39.1	Pk	32.1	-24.2	0	47	-	-	-	-	0-360	199	V
3	2.45024	34.66	Pk	32.1	-24.2	0	42.56	-	-	-	-	0-360	199	H
5	7.2069	31.52	Pk	35.7	-28	0	39.22	-	-	-	-	0-360	199	H
13	7.2069	31.7	Pk	35.7	-28	0	39.4	-	-	-	-	0-360	101	V

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

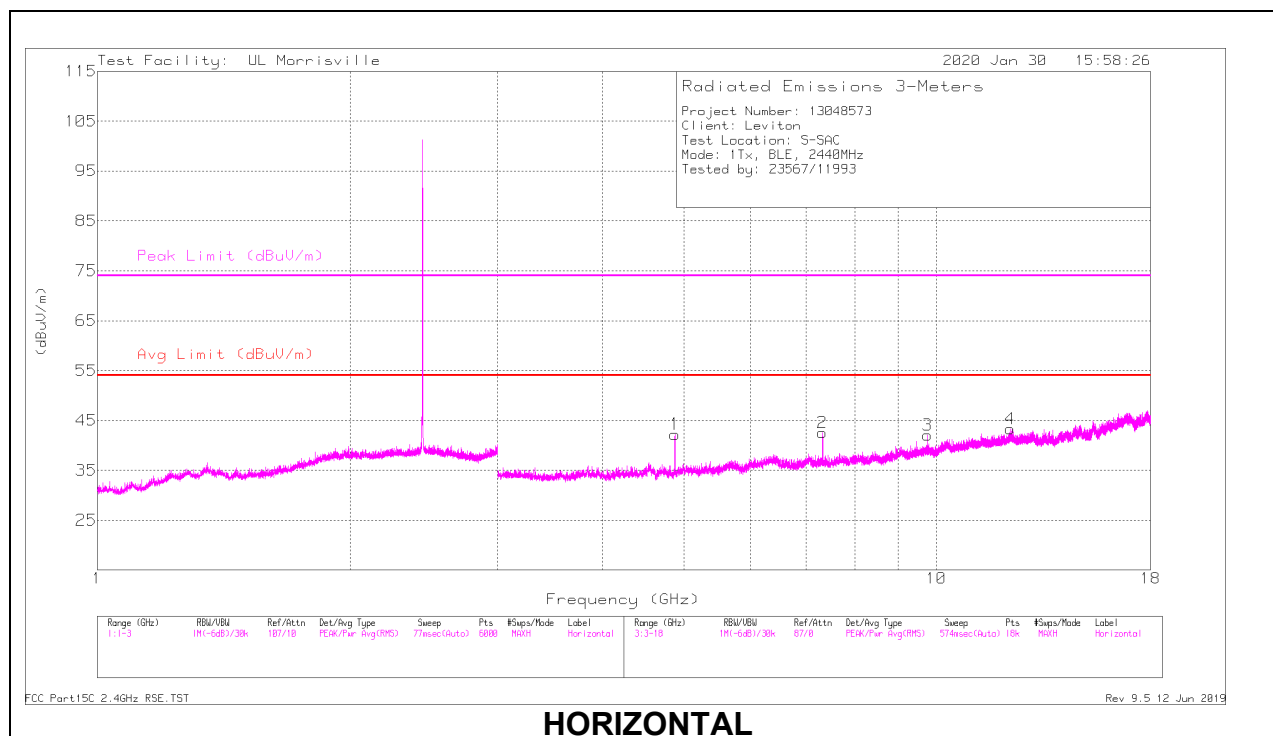
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

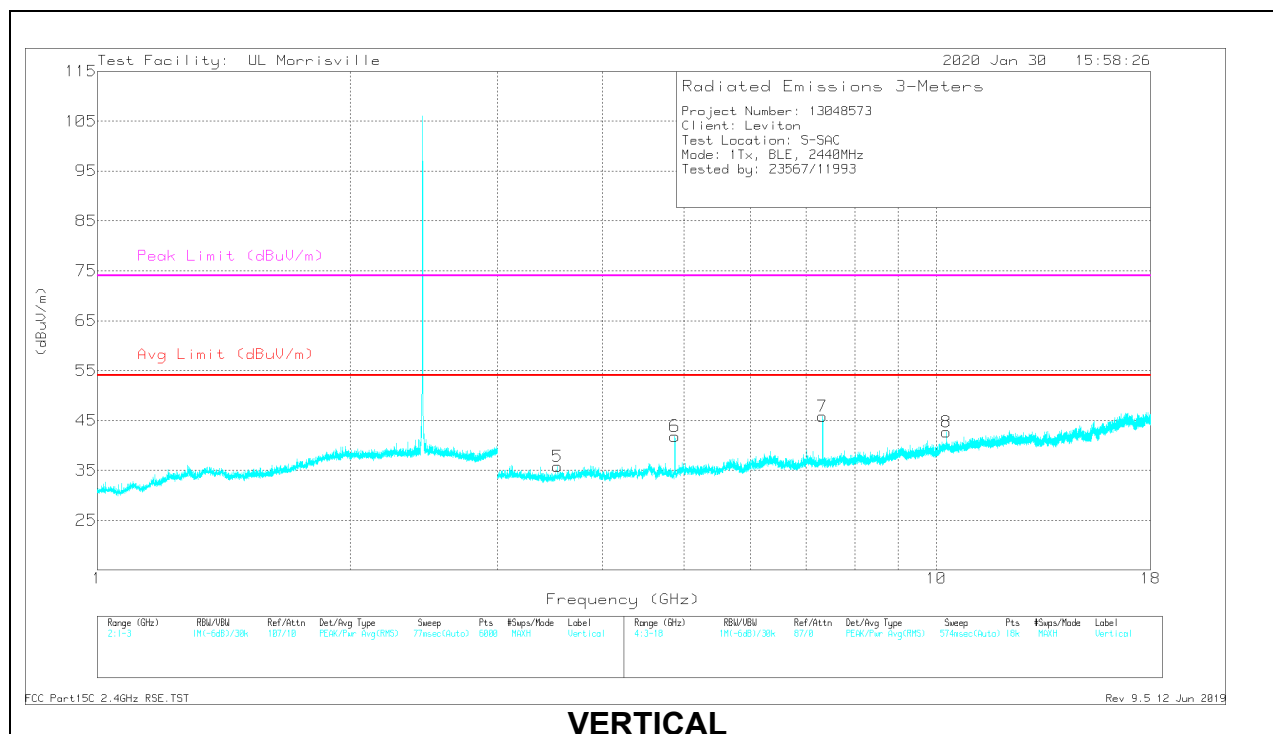
ADV - primary method, Linear Voltage Average

Pk - Peak detector

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
1	* ** 4.8795	44.63	PK2	34	-30.6	0	48.03	-	-	74	-25.97	29	221	H
	* ** 4.87976	33.74	ADV	34	-30.6	4.09	41.23	54	-12.77	-	-	29	221	H
2	* ** 7.31946	40.39	PK2	35.7	-27.5	0	48.59	-	-	74	-25.41	89	238	H
	* ** 7.31954	28.63	ADV	35.7	-27.5	4.09	40.92	54	-13.08	-	-	89	238	H
4	* ** 12.25018	33.8	PK2	38.9	-23.7	0	49	-	-	74	-25	89	130	H
	* ** 12.24999	20.73	ADV	38.9	-23.7	4.09	40.02	54	-13.98	-	-	89	130	H
5	* ** 3.53211	41.03	PK2	32.9	-32.6	0	41.33	-	-	74	-32.67	350	300	V
	* ** 3.53241	27.81	ADV	32.9	-32.6	4.09	32.2	54	-21.8	-	-	350	300	V
6	* ** 4.87965	44.42	PK2	34	-30.6	0	47.82	-	-	74	-26.18	195	268	V
	* ** 4.87982	33.81	ADV	34	-30.6	4.09	41.3	54	-12.7	-	-	195	268	V
7	* ** 7.31947	43.07	PK2	35.7	-27.5	0	51.27	-	-	74	-22.73	132	105	V
	* ** 7.31955	31.74	ADV	35.7	-27.5	4.09	44.03	54	-9.97	-	-	132	105	V
3	9.75871	30.58	Pk	37.1	-25.6	0	42.08	-	-	-	-	0-360	199	H
8	10.27457	29.52	Pk	37.5	-24.3	0	42.72	-	-	-	-	0-360	101	V

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

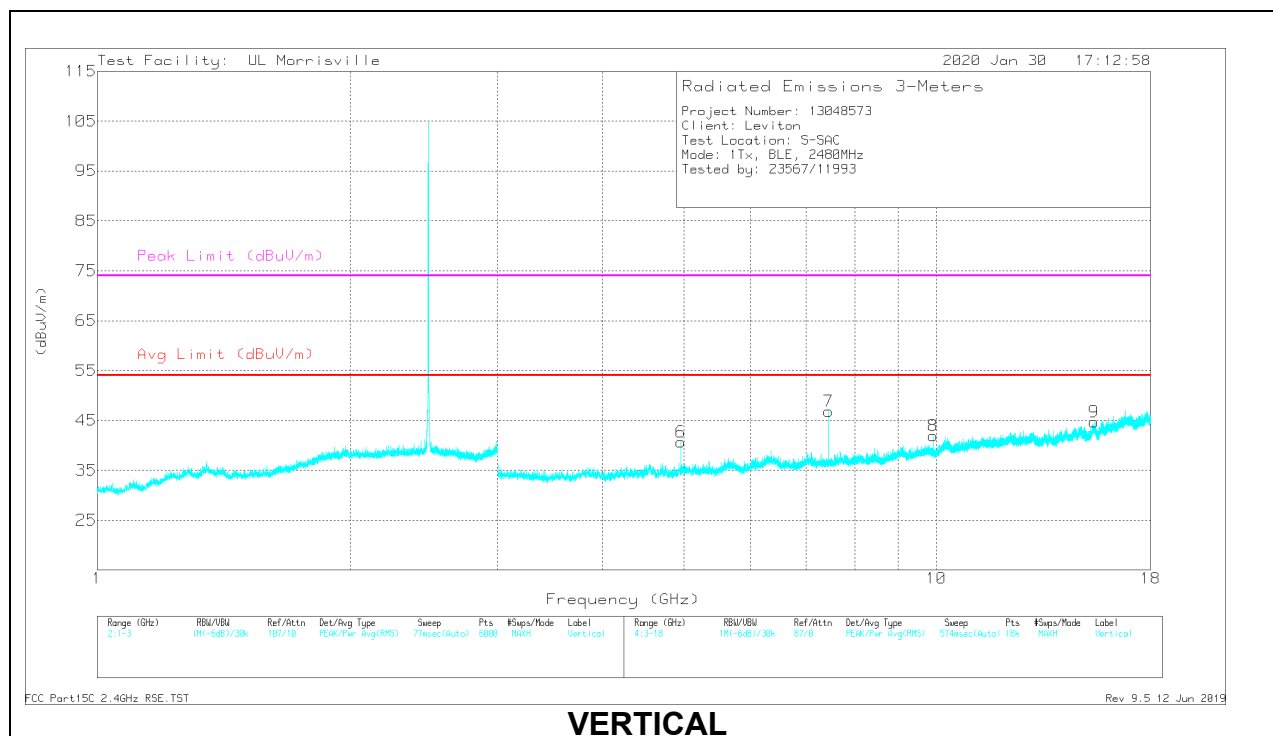
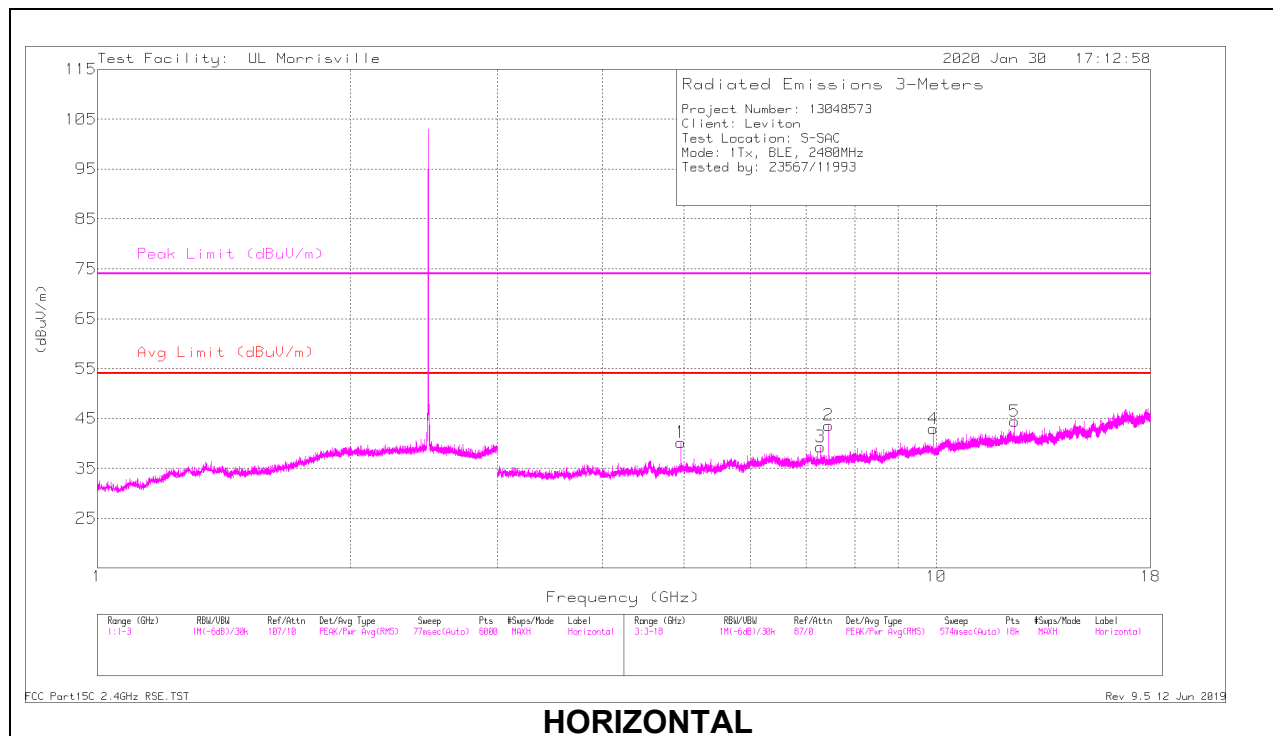
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

ADV - AD primary method, Linear Voltage Average

Pk - Peak detector

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
1	* ** 4.96066	45.11	PK2	34.1	-31.1	0	48.11	-	-	74	-25.89	71	268	H
	* ** 4.96024	33.64	ADV	34.1	-31.1	4.09	40.73	54	-13.27	-	-	71	268	H
2	* ** 7.44085	42.78	PK2	35.8	-27.8	0	50.78	-	-	74	-23.22	150	230	H
	* ** 7.44082	30.81	ADV	35.8	-27.8	4.09	42.9	54	-11.1	-	-	150	230	H
3	* ** 7.28191	36.35	PK2	35.7	-27.6	0	44.45	-	-	74	-29.55	329	219	H
	* ** 7.28214	23	ADV	35.7	-27.6	4.09	35.19	54	-18.81	-	-	329	219	H
5	* ** 12.40158	35.82	PK2	38.8	-23.9	0	50.72	-	-	74	-23.28	110	229	H
	* ** 12.40159	22.75	ADV	38.8	-23.9	4.09	41.74	54	-12.26	-	-	110	229	H
6	* ** 4.95952	43.05	PK2	34.1	-31	0	46.15	-	-	74	-27.85	50	120	V
	* ** 4.95981	30.67	ADV	34.1	-31	4.09	37.86	54	-16.14	-	-	50	120	V
7	* ** 7.4393	43.96	PK2	35.8	-27.8	0	51.96	-	-	74	-22.04	112	116	V
	* ** 7.43951	31.96	ADV	35.8	-27.8	4.09	44.05	54	-9.95	-	-	112	116	V
9	* ** 15.42165	33.79	PK2	39.9	-21.8	0	51.89	-	-	74	-22.11	157	285	V
	* ** 15.42157	20.31	ADV	39.9	-21.8	4.09	42.5	54	-11.5	-	-	157	285	V
4	9.91872	31.27	Pk	37.2	-25.5	0	42.97	-	-	-	-	0-360	101	H
8	9.91872	30.25	Pk	37.2	-25.5	0	41.95	-	-	-	-	0-360	199	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

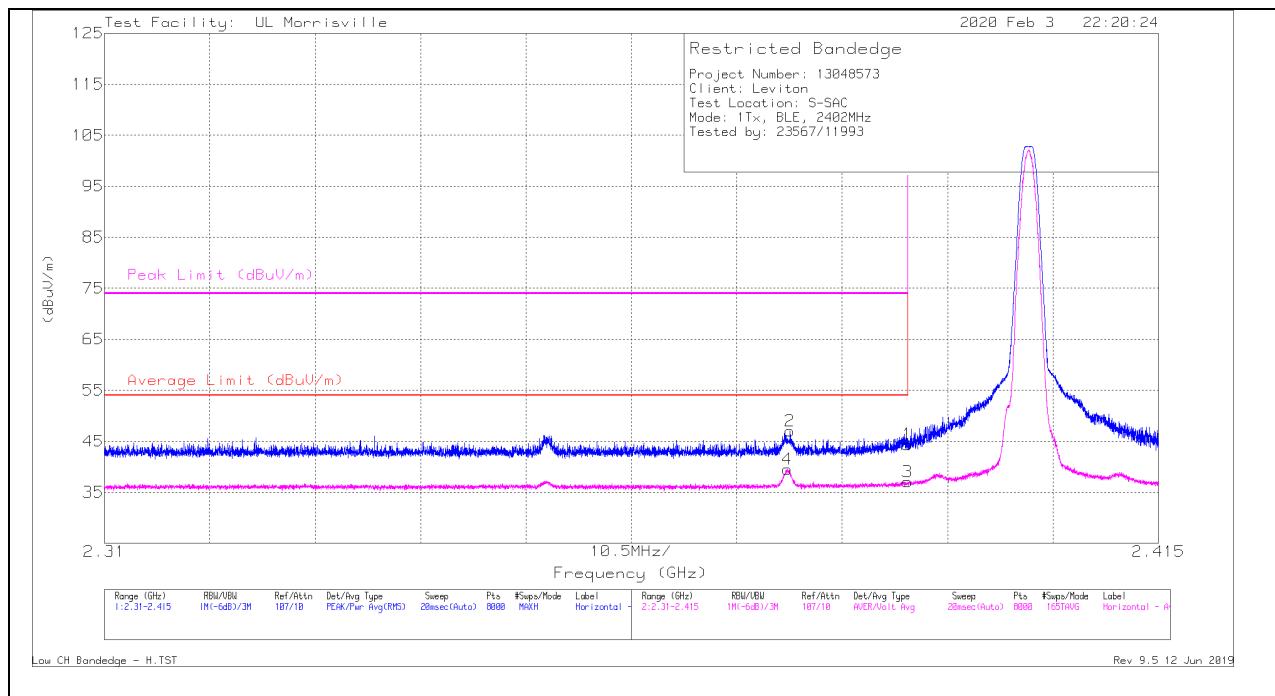
ADV - AD primary method, Linear Voltage Average

Pk - Peak detector

9.2.3. ODD24-000-IDZ

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	36.47	Pk	31.9	-24	0	44.37	-	-	74	-29.63	93	151	H
2	* ** 2.37827	39.22	Pk	31.8	-24	0	47.02	-	-	74	-26.98	93	151	H
3	* ** 2.39	24.79	ADV	31.9	-24	4.09	36.78	54	-17.22	-	-	93	151	H
4	* ** 2.37806	27.31	ADV	31.8	-24	4.09	39.20	54	-14.80	-	-	93	151	H

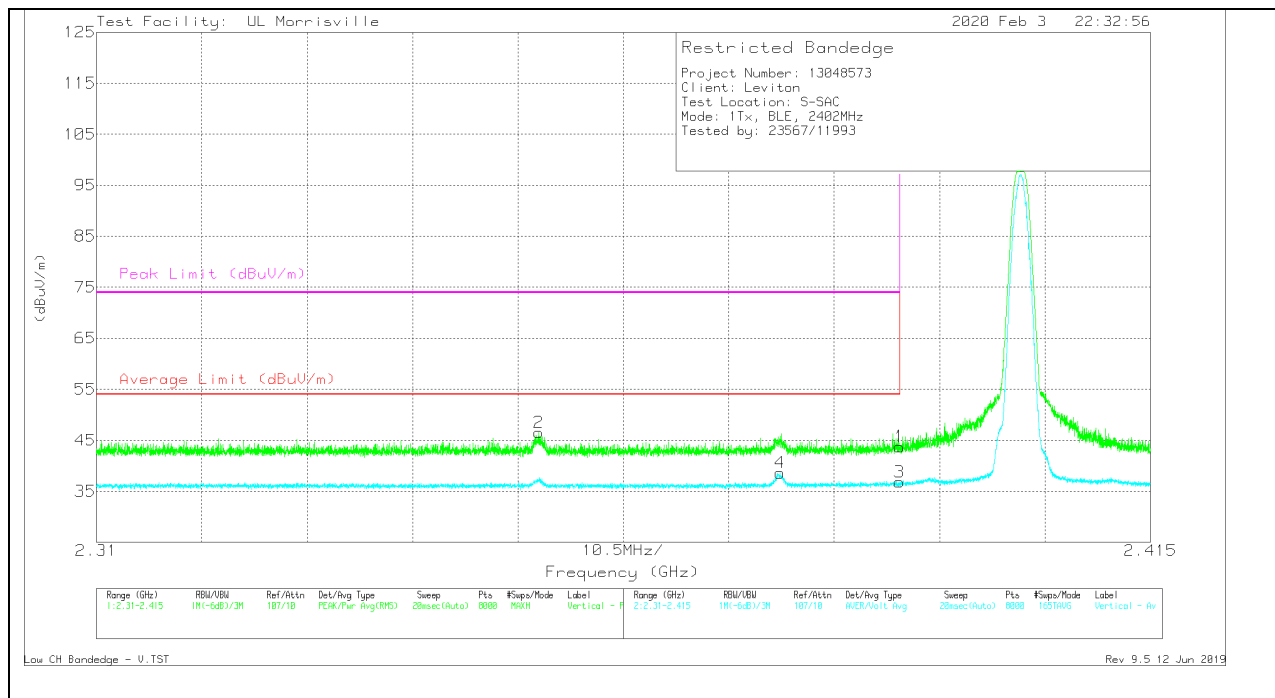
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	35.84	Pk	31.9	-24	0	43.74	-	-	74	-30.26	237	156	V
2	* ** 2.35404	38.63	Pk	31.7	-23.8	0	46.53	-	-	74	-27.47	237	156	V
3	* ** 2.39	24.54	ADV	31.9	-24	4.09	36.53	54	-17.49	-	-	237	156	V
4	* ** 2.37809	26.42	ADV	31.8	-24	4.09	38.31	54	-15.69	-	-	237	156	V

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

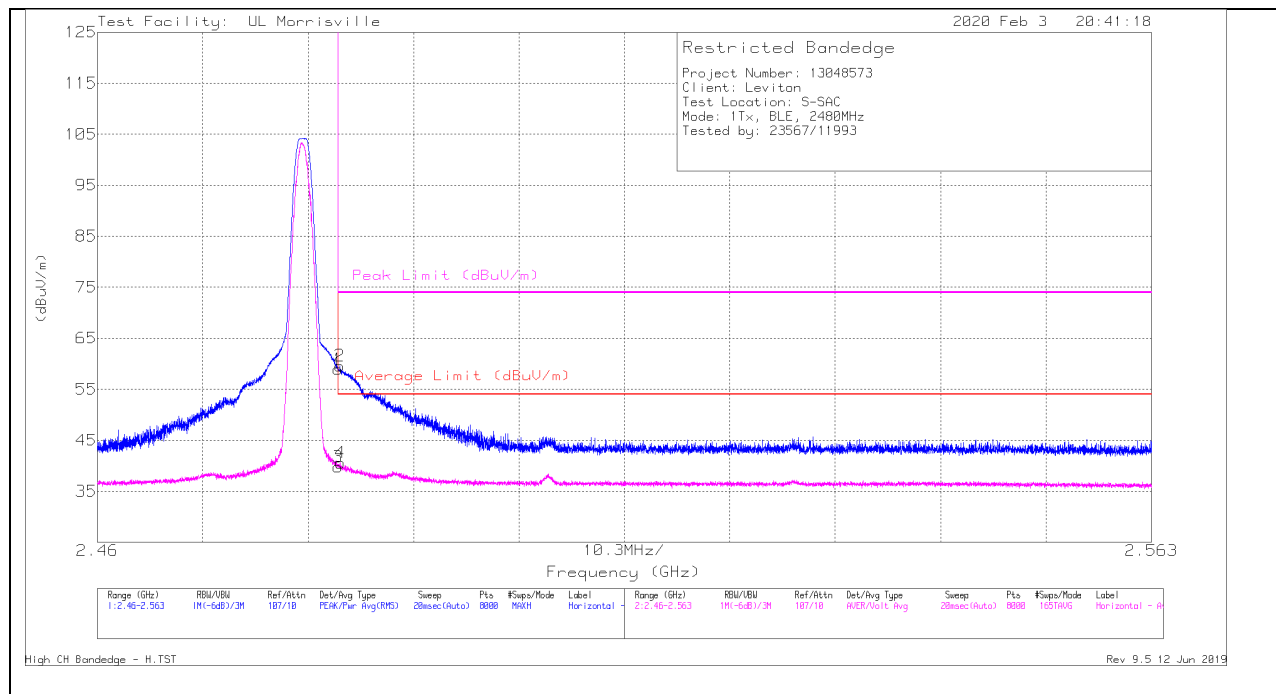
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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	*** 2.4835	51.16	Pk	32.3	-24.5	0	58.96	-	-	74	-15.04	58	331	H
2	*** 2.48371	51.8	Pk	32.3	-24.5	0	59.6	-	-	74	-14.4	58	331	H
3	*** 2.4835	27.59	ADV	32.3	-24.5	4.09	39.48	54	-14.52	-	-	58	331	H
4	*** 2.48376	28.39	ADV	32.3	-24.5	4.09	40.28	54	-13.72	-	-	58	331	H

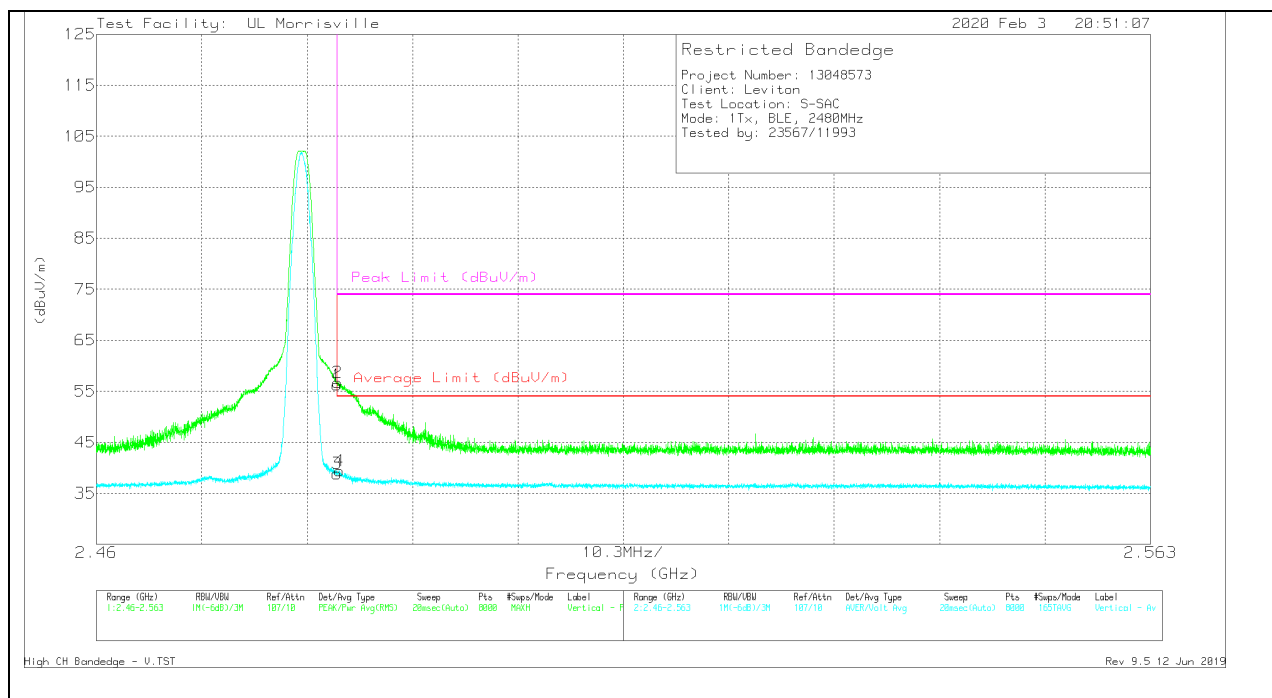
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	AT0072 (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	* ** 2.4835	48.46	Pk	32.3	-24.5	0	56.26	-	-	74	-17.74	354	340	V
2	* ** 2.48358	48.96	Pk	32.3	-24.5	0	56.76	-	-	74	-17.24	354	340	V
3	* ** 2.4835	26.66	ADV	32.3	-24.5	4.09	38.55	54	-15.45	-	-	354	340	V
4	* ** 2.48373	27.22	ADV	32.3	-24.5	4.09	39.11	54	-14.89	-	-	354	340	V

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

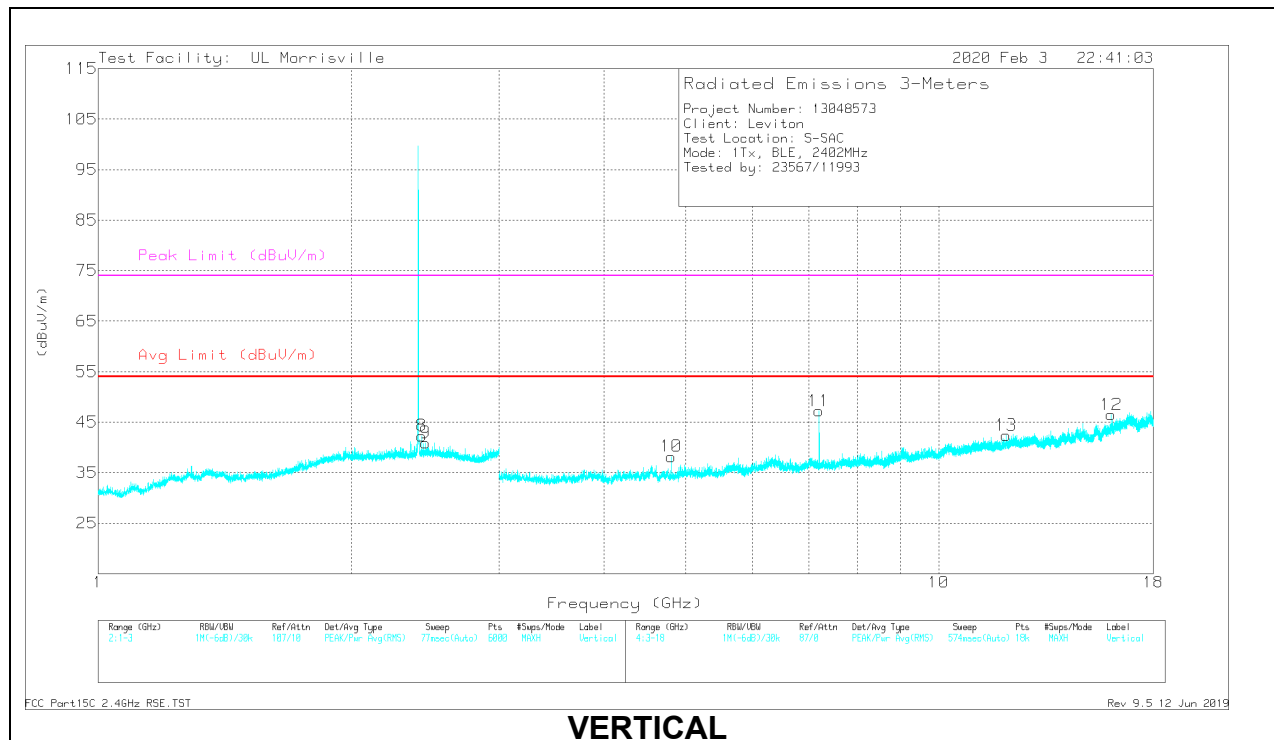
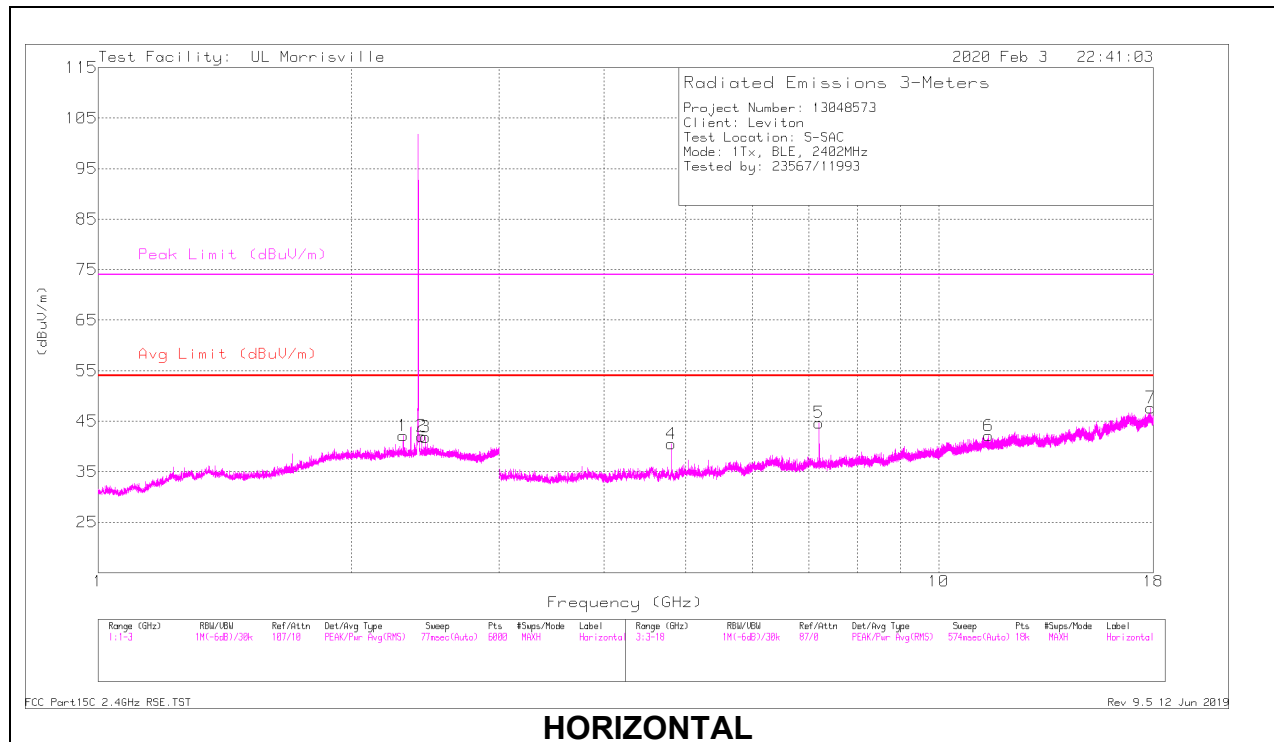
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - primary method, Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
4	* ** 4.80479	43.36	PK2	34.2	-31	0	46.56	-	-	74	-27.44	83	230	H
	* ** 4.8042	31.66	ADV	34.2	-31	4.09	38.95	54	-15.05	-	-	83	230	H
6	* ** 11.46441	34.45	PK2	38.1	-24	0	48.55	-	-	74	-25.45	357	265	H
	* ** 11.46472	21.02	ADV	38.1	-24	4.09	39.21	54	-14.79	-	-	357	265	H
7	* ** 17.88022	33.67	PK2	41.2	-20.6	0	54.27	-	-	74	-19.73	177	241	H
	* ** 17.88095	20.23	ADV	41.2	-20.6	4.09	44.92	54	-9.08	-	-	177	241	H
10	* ** 4.80422	42.05	PK2	34.2	-31	0	45.25	-	-	74	-28.75	1	264	V
	* ** 4.80419	30.05	ADV	34.2	-31	4.09	37.34	54	-16.66	-	-	1	264	V
12	* ** 16.04414	34.96	PK2	40.8	-23.5	0	52.26	-	-	74	-21.74	276	232	V
	* ** 16.04439	22	ADV	40.8	-23.5	4.09	43.39	54	-10.61	-	-	276	232	V
13	* ** 12.02561	34.15	PK2	38.7	-23.5	0	49.35	-	-	74	-24.65	214	268	V
	* ** 12.0264	20.64	ADV	38.7	-23.5	4.09	39.93	54	-14.07	-	-	214	268	V
1	2.30589	34.13	Pk	31.7	-23.7	0	42.13	-	-	-	-	0-360	101	H
2	2.42591	34.15	Pk	32.1	-24.2	0	42.05	-	-	-	-	0-360	199	H
8	2.42591	34.41	Pk	32.1	-24.2	0	42.31	-	-	-	-	0-360	101	V
3	2.44991	33.94	Pk	32.1	-24.2	0	41.84	-	-	-	-	0-360	101	H
9	2.44991	33.03	Pk	32.1	-24.2	0	40.93	-	-	-	-	0-360	199	V
11	7.20524	39.52	Pk	35.7	-28	0	47.22	-	-	-	-	0-360	101	V
5	7.20607	36.98	Pk	35.7	-28	0	44.68	-	-	-	-	0-360	199	H

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

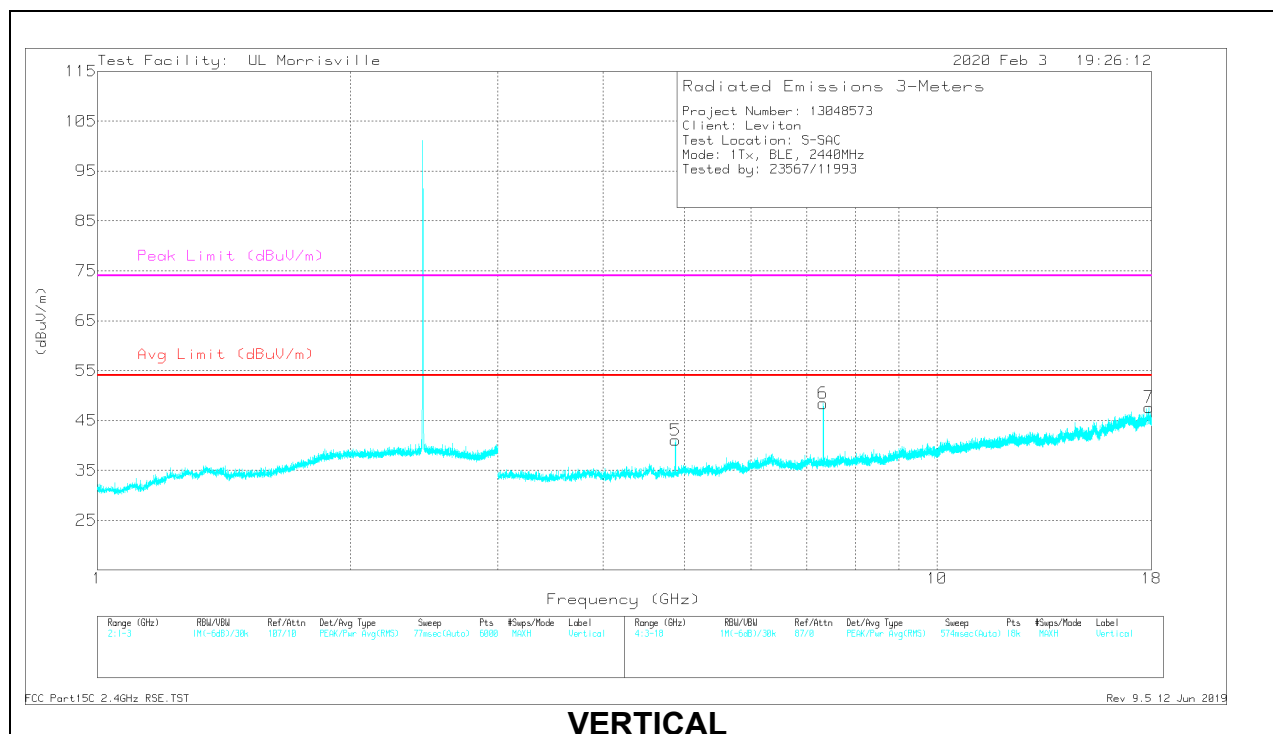
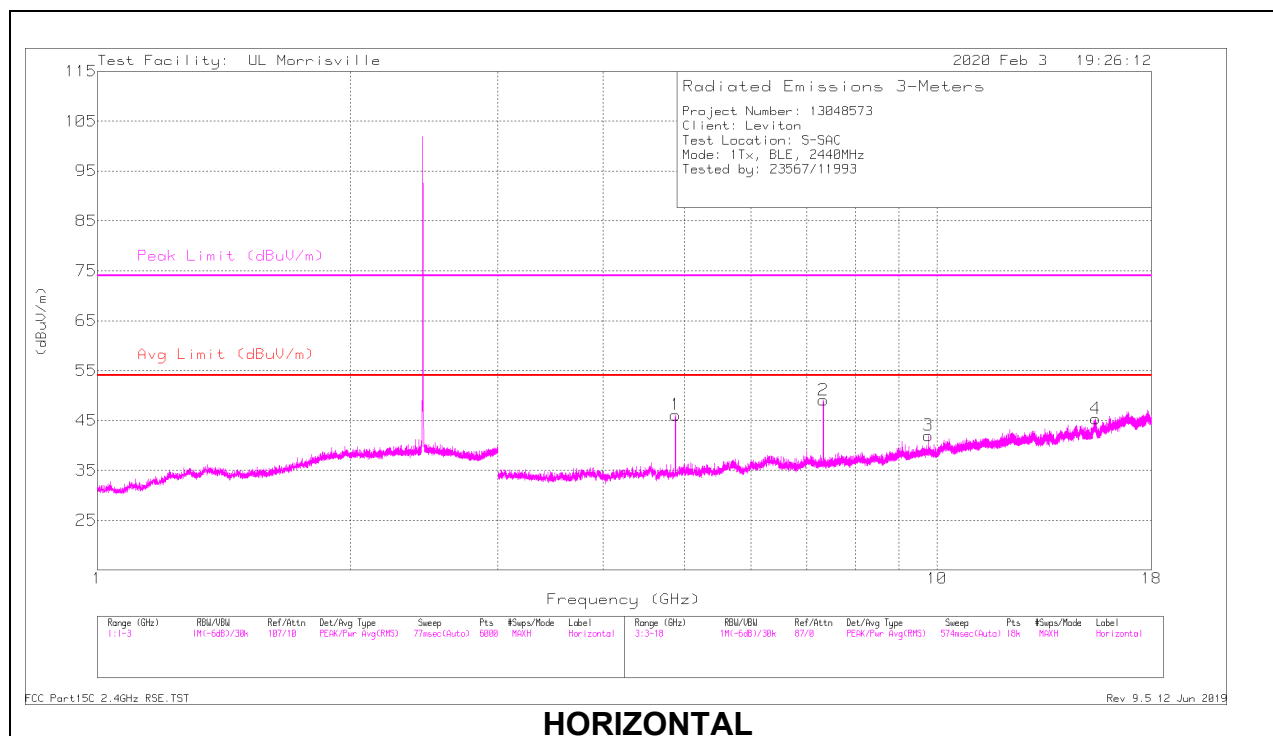
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

ADV - primary method, Linear Voltage Average

Pk - Peak detector

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
1	* ** 4.87963	46.68	PK2	34	-30.6	0	50.08	-	-	74	-23.92	77	214	H
	* ** 4.87991	36.76	ADV	34	-30.6	4.09	44.25	54	-9.75	-	-	77	214	H
2	* ** 7.3195	44.94	PK2	35.7	-27.5	0	53.14	-	-	74	-20.86	243	215	H
	* ** 7.31961	34.06	ADV	35.7	-27.5	4.09	46.35	54	-7.65	-	-	243	215	H
4	* ** 15.43999	33.57	PK2	39.9	-22.1	0	51.37	-	-	74	-22.63	229	276	H
	* ** 15.44032	20.35	ADV	39.9	-22.1	4.09	42.24	54	-11.76	-	-	229	276	H
5	* ** 4.8796	43.51	PK2	34	-30.6	0	46.91	-	-	74	-27.09	161	250	V
	* ** 4.87998	32.59	ADV	34	-30.6	4.09	40.08	54	-13.92	-	-	161	250	V
6	* ** 7.31943	45.36	PK2	35.7	-27.5	0	53.56	-	-	74	-20.44	125	103	V
	* ** 7.31961	34.44	ADV	35.7	-27.5	4.09	46.73	54	-7.27	-	-	125	103	V
7	* ** 17.86843	33.64	PK2	41.2	-20.6	0	54.24	-	-	74	-19.76	209	278	V
	* ** 17.86824	20.23	ADV	41.2	-20.6	4.09	44.92	54	-9.08	-	-	209	278	V
3	9.76121	30.5	Pk	37.1	-25.6	0	42	-	-	-	-	0-360	199	H

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

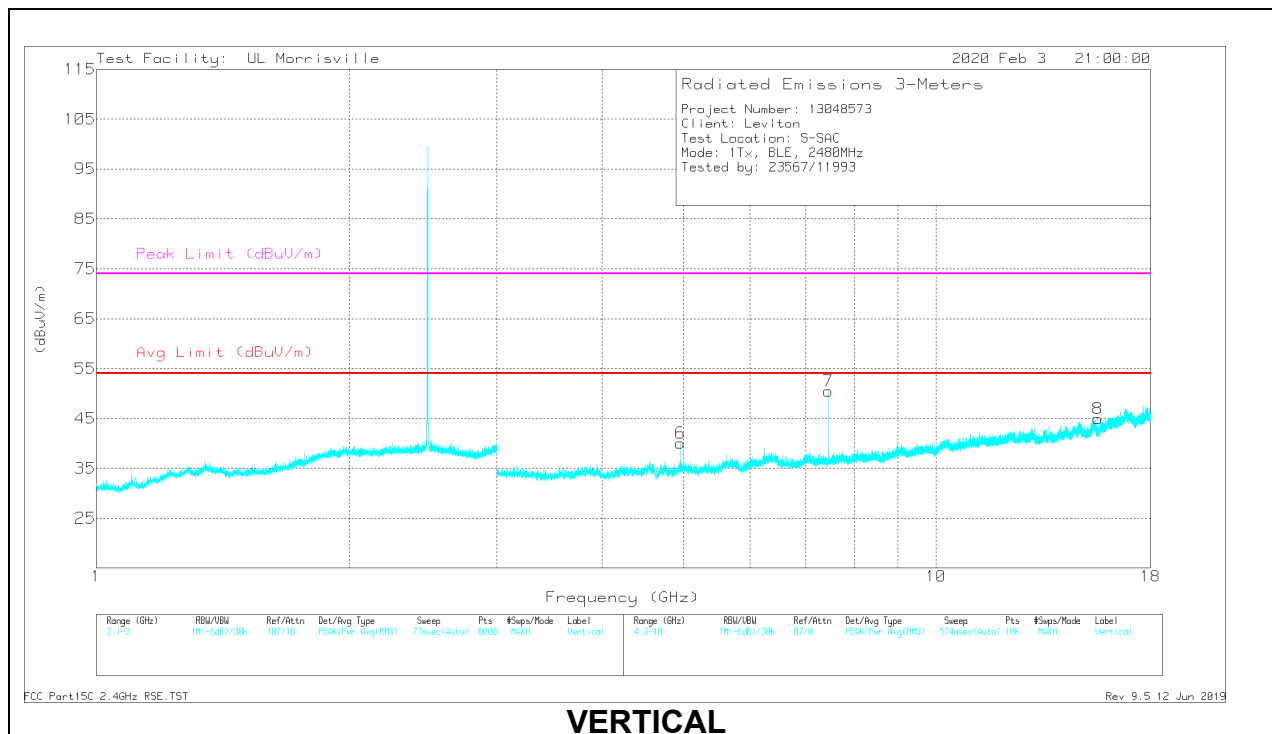
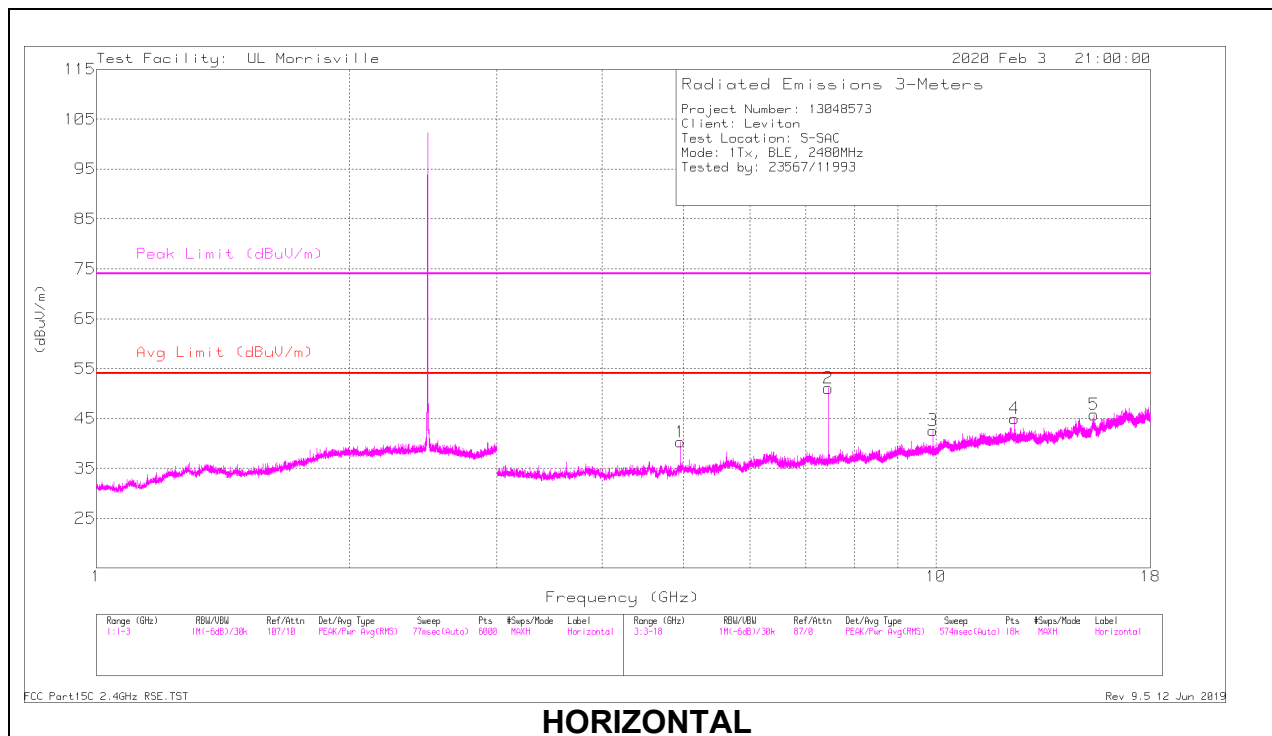
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

ADV - primary method, Linear Voltage Average

Pk - Peak detector

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (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
1	* ** 4.96058	43.01	PK2	34.1	-31.1	0	46.01	-	-	74	-27.99	293	219	H
	* ** 4.96009	31.29	ADV	34.1	-31.1	4.09	38.38	54	-15.62	-	-	293	219	H
2	* ** 7.4395	45.9	PK2	35.8	-27.8	0	53.9	-	-	74	-20.1	234	189	H
	* ** 7.43955	34.96	ADV	35.8	-27.8	4.09	47.05	54	-6.95	-	-	234	189	H
4	* ** 12.39902	36.33	PK2	38.8	-23.9	0	51.23	-	-	74	-22.77	91	278	H
	* ** 12.39905	22.21	ADV	38.8	-23.9	4.09	41.2	54	-12.8	-	-	91	278	H
5	* ** 15.41835	34.23	PK2	39.9	-21.7	0	52.43	-	-	74	-21.57	226	234	H
	* ** 15.41916	20.57	ADV	39.9	-21.7	4.09	42.86	54	-11.14	-	-	226	234	H
6	* ** 4.95955	42.82	PK2	34.1	-31	0	45.92	-	-	74	-28.08	179	185	V
	* ** 4.95998	31.37	ADV	34.1	-31.1	4.09	38.46	54	-15.54	-	-	179	185	V
7	* ** 7.43931	46.59	PK2	35.8	-27.8	0	54.59	-	-	74	-19.41	124	101	V
	* ** 7.4396	35.79	ADV	35.8	-27.8	4.09	47.88	54	-6.12	-	-	124	101	V
8	* ** 15.58639	34.81	PK2	40	-24.3	0	50.51	-	-	74	-23.49	273	224	V
	* ** 15.58634	21.71	ADV	40	-24.3	4.09	41.5	54	-12.5	-	-	273	224	V
3	9.92122	30.91	Pk	37.2	-25.5	0	42.61	-	-	-	-	0-360	199	H

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK2 - Maximum Peak

ADV - AD primary method, Linear Voltage Average

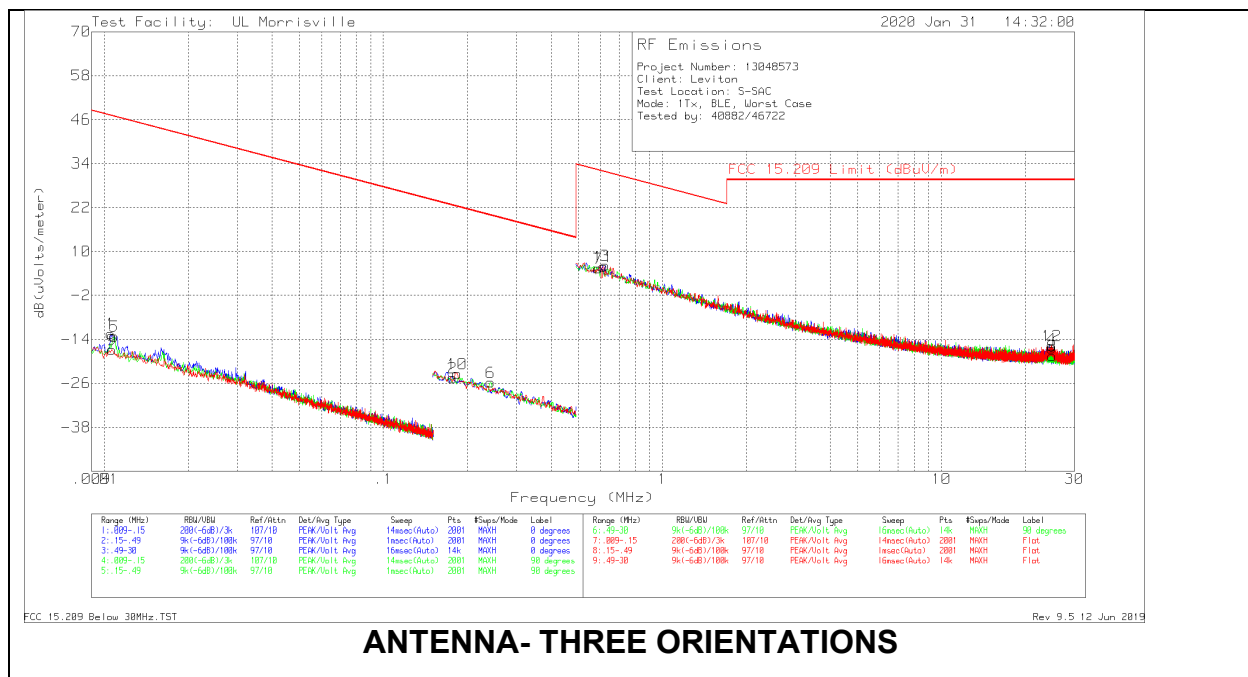
Pk - Peak detector

9.3. WORST CASE BELOW 30MHZ

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).

9.3.1. ODD10-000-IDZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



ANTENNA- THREE ORIENTATIONS

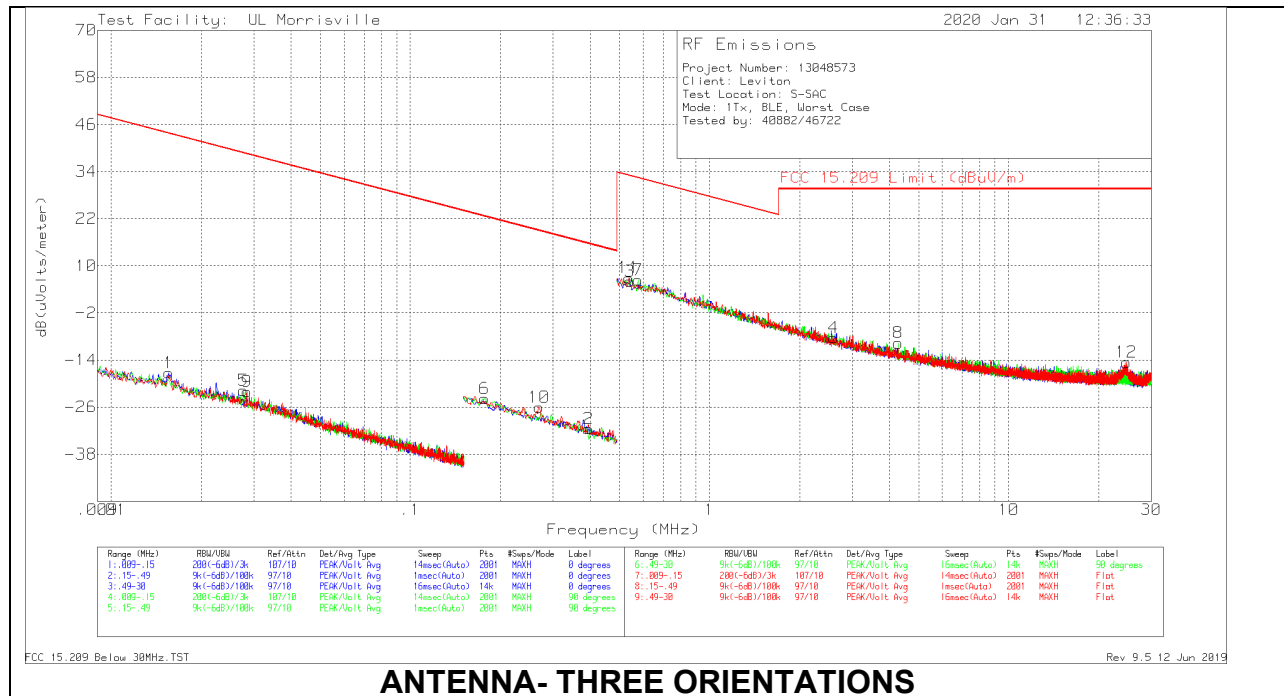
Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 QP/AV Limit (dBuV/m)	FCC 15.209 Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01056	49.48	Pk	18	.1	-80	-12.42	47.13	67.13	-59.55	0-360
9	.01063	45.22	Pk	17.9	.1	-80	-16.78	47.07	67.07	-63.85	0-360
5	.01085	48.92	Pk	17.8	.1	-80	-13.18	46.9	66.9	-60.08	0-360
2	.1772	44.38	Pk	11	.1	-80	-24.52	22.63	42.63	-47.15	0-360
10	.18383	45.57	Pk	11	.1	-80	-23.33	22.32	42.32	-45.65	0-360
6	.24257	43.13	Pk	11	.1	-80	-25.77	19.91	39.91	-45.68	0-360
7	.58908	34.33	Pk	11	.1	-40	5.43	32.2	-	-26.77	0-360
11	.61437	34.78	Pk	11	.1	-40	5.88	31.84	-	-25.96	0-360
3	.62491	35.1	Pk	11	.1	-40	6.2	31.69	-	-25.49	0-360
4	24.85743	13.91	Pk	8.8	.8	-40	-16.49	29.54	-	-46.03	0-360
12	24.88061	14.76	Pk	8.8	.8	-40	-15.64	29.54	-	-45.18	0-360
8	25.00815	11.89	Pk	8.8	.8	-40	-18.51	29.54	-	-48.05	0-360

Pk - Peak detector

9.3.2. ODS15-000- IDZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



ANTENNA- THREE ORIENTATIONS

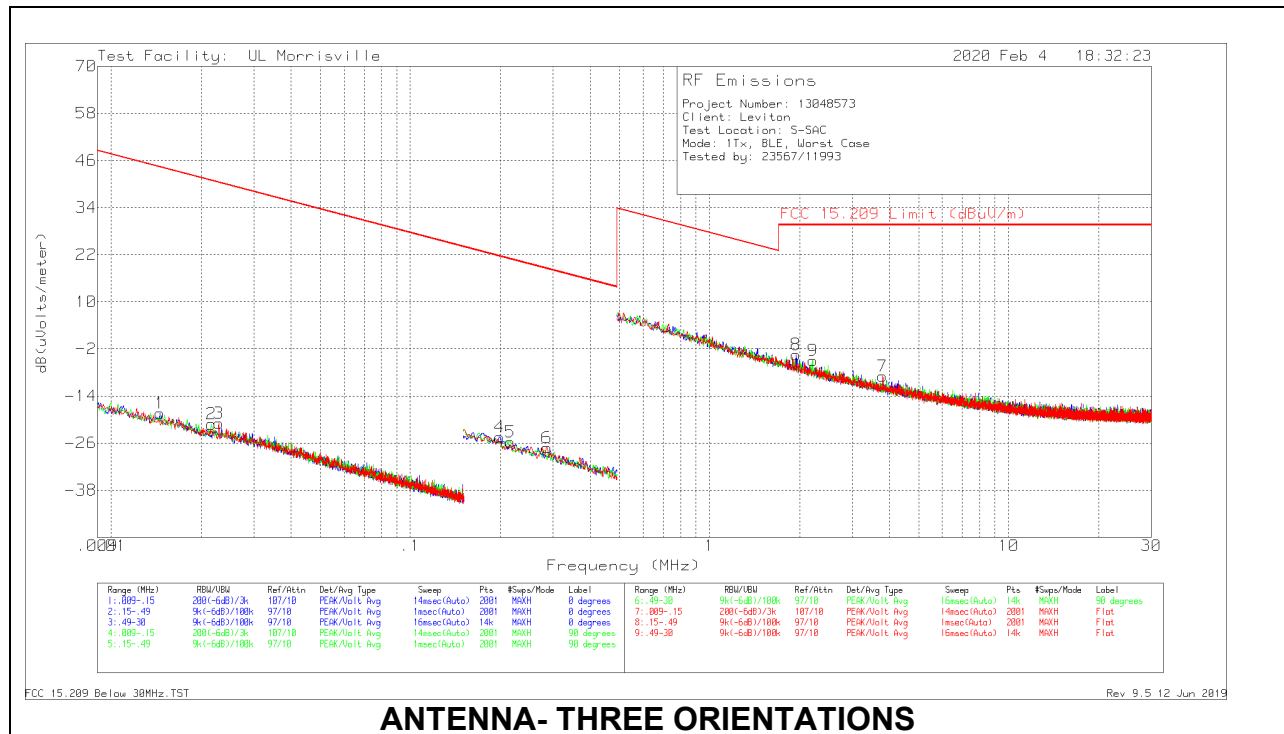
Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 QP/AV Limit (dBuV/m)	FCC 15.209 Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0156	46.86	Pk	15.8	.1	-80	-17.24	43.74	63.74	-60.98	0-360
5	.02767	44.8	Pk	13.3	.1	-80	-21.8	38.76	58.76	-60.56	0-360
9	.02845	44.52	Pk	13.3	.1	-80	-22.08	38.52	58.52	-60.6	0-360
6	.17746	45.05	Pk	11	.1	-80	-23.85	22.62	42.62	-46.47	0-360
10	.26943	42.88	Pk	11	.1	-80	-26.02	19	39	-45.02	0-360
2	.39497	37.39	Pk	11	.1	-80	-31.51	15.67	35.67	-47.18	0-360
11	.53638	35.82	Pk	11	.1	-40	6.92	33.01	-	-26.09	0-360
3	.5427	34.97	Pk	11	.1	-40	6.07	32.91	-	-26.84	0-360
7	.57854	35.25	Pk	11	.1	-40	6.35	32.36	-	-26.01	0-360
4	2.60432	20.2	Pk	11.2	.3	-40	-8.3	29.54	-	-37.84	0-360
8	4.26964	18.82	Pk	11.1	.4	-40	-9.68	29.54	-	-39.22	0-360
12	24.73727	15.78	Pk	8.8	.8	-40	-14.62	29.54	-	-44.16	0-360

Pk - Peak detector

9.3.3. ODD24-000-IDZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



ANTENNA- THREE ORIENTATIONS

Below 30MHz Data

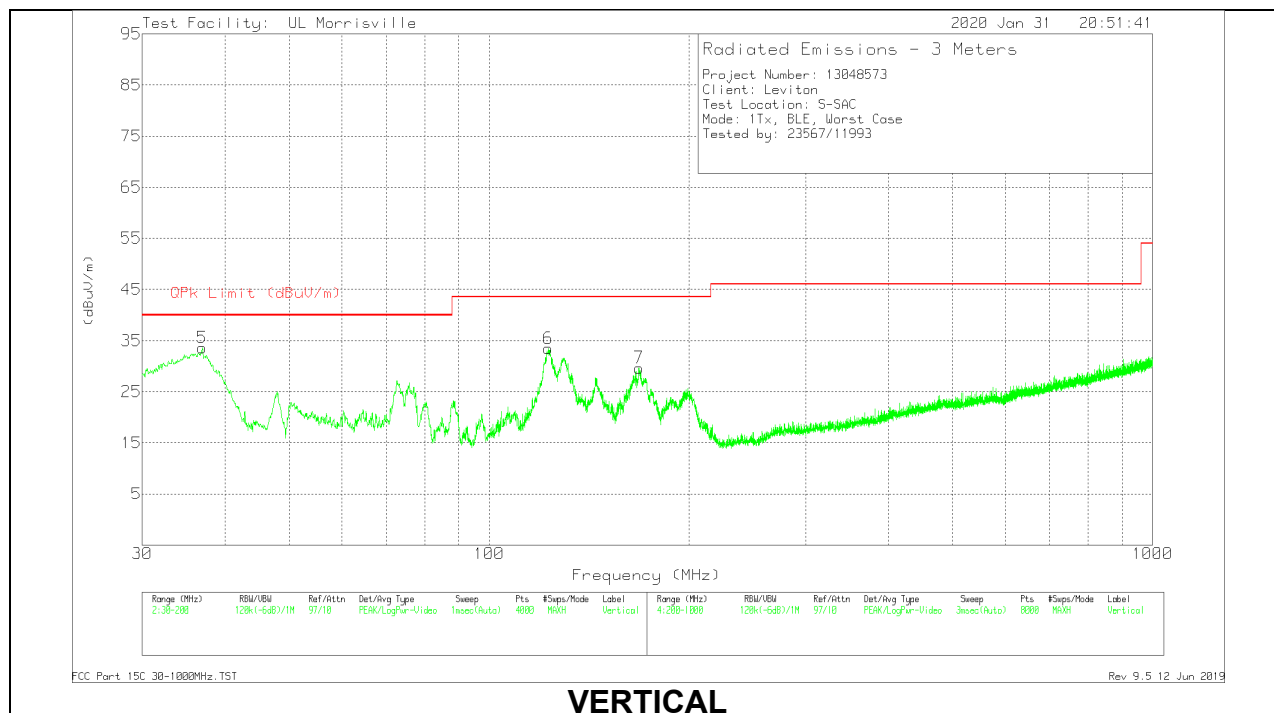
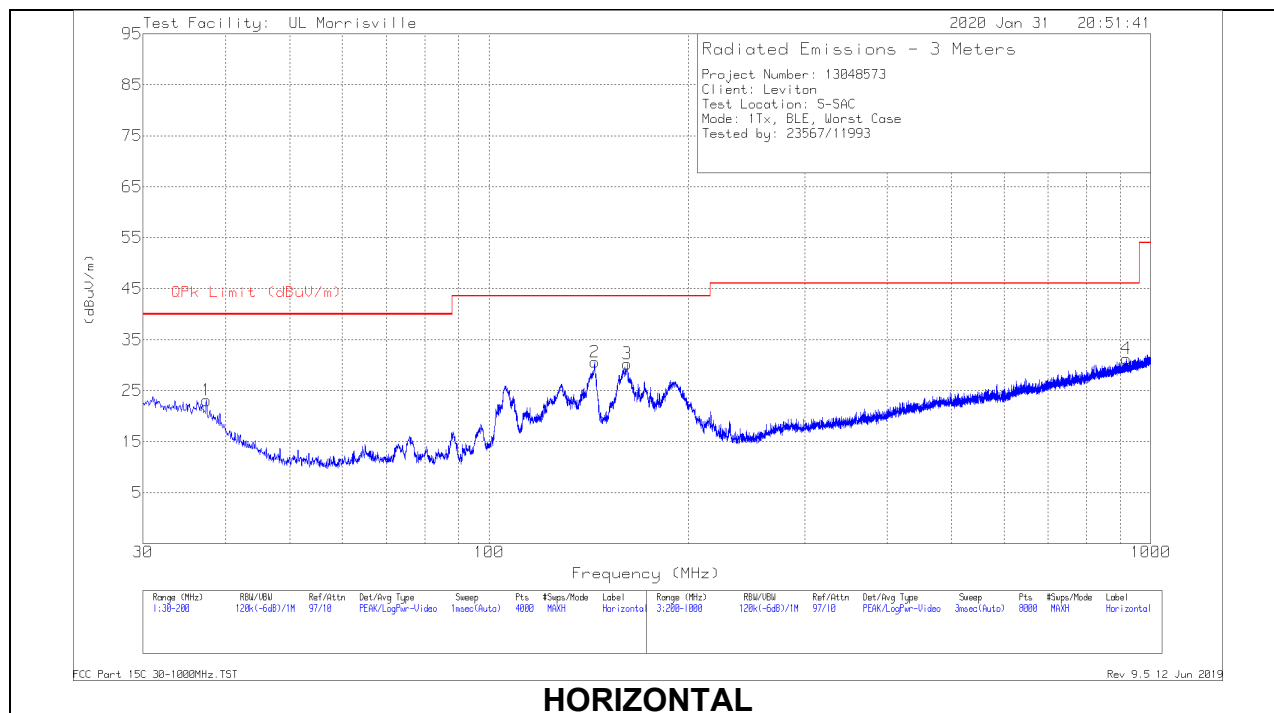
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 QP/AV Limit (dBuV/m)	FCC 15.209 PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01454	45.19	Pk	16.3	.1	-80	-18.41	44.35	64.35	-62.76	0-360
2	.02164	44.92	Pk	13.8	.1	-80	-21.18	40.9	60.9	-62.08	0-360
3	.02292	45.21	Pk	13.7	.1	-80	-20.99	40.4	60.4	-61.39	0-360
4	.19871	44.47	Pk	11	.1	-80	-24.43	21.64	41.64	-46.07	0-360
5	.21613	43.15	Pk	11	.1	-80	-25.75	20.91	40.91	-46.66	0-360
6	.28634	41.67	Pk	11	.1	-80	-27.23	18.47	38.47	-45.7	0-360
8	1.94452	25.11	Pk	11.2	.2	-40	-3.49	29.54	-	-33.03	0-360
9	2.21434	23.66	Pk	11.2	.2	-40	-4.94	29.54	-	-34.48	0-360
7	3.79534	19.66	Pk	11.1	.3	-40	-8.94	29.54	-	-38.48	0-360

Pk - Peak detector

9.4. WORST CASE BELOW 1 GHZ

9.4.1. ODD10-000-IDZ

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



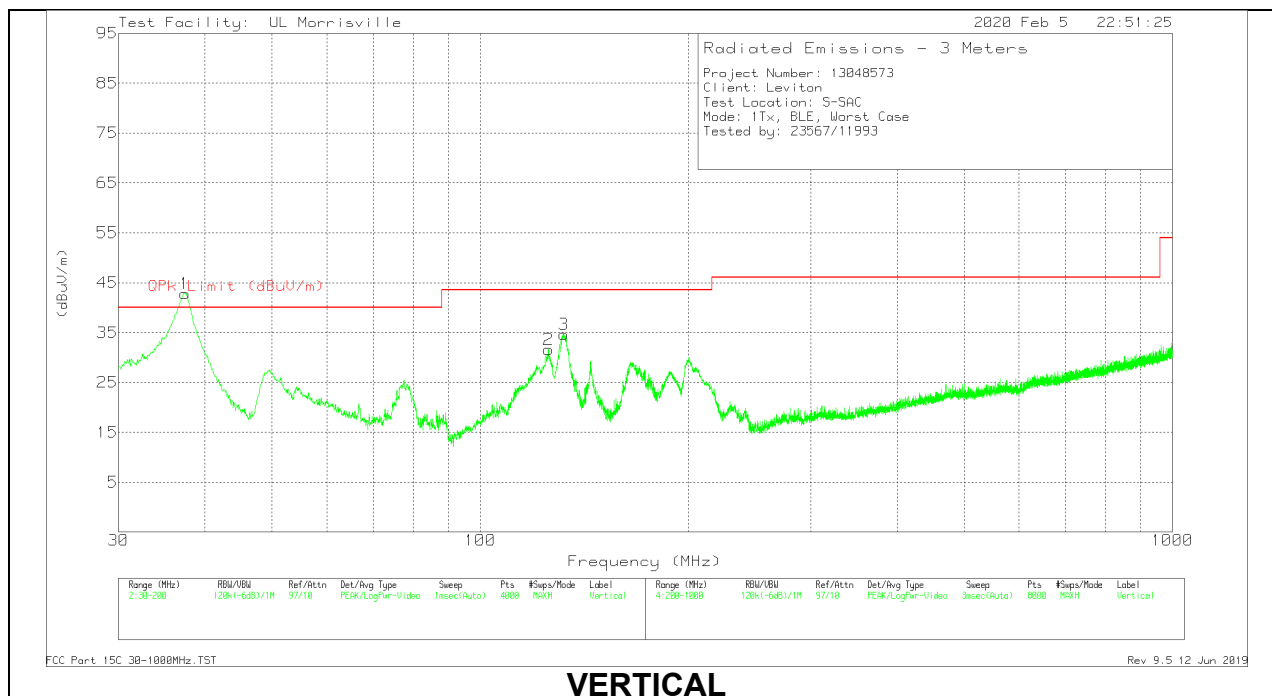
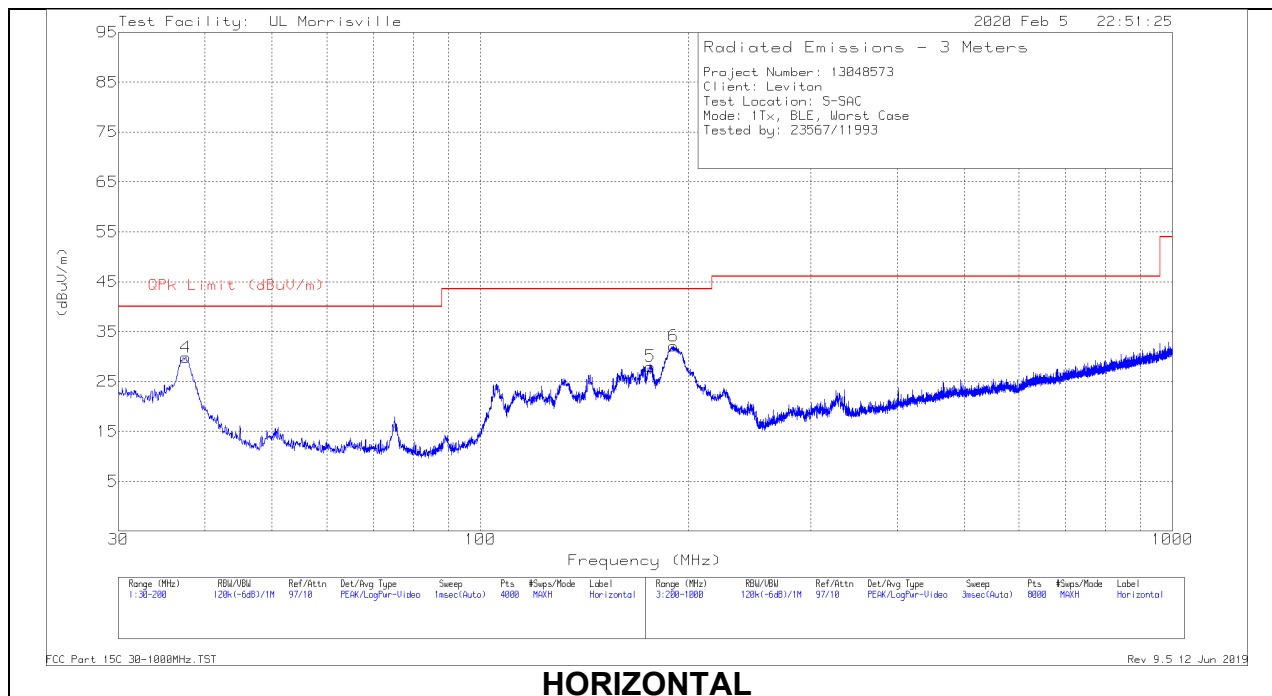
Below 1GHz Data

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
5	36.9718	43.19	Pk	22.1	-31.7	33.59	40	-6.41	0-360	101	V
1	37.3969	32.98	Pk	21.8	-31.7	23.08	40	-16.92	0-360	398	H
6	122.8653	44.37	Pk	19.9	-30.8	33.47	43.52	-10.05	0-360	101	V
2	144.4396	42.39	Pk	18.9	-30.7	30.59	43.52	-12.93	0-360	199	H
3	161.7416	42.35	Pk	18.4	-30.5	30.25	43.52	-13.27	0-360	199	H
7	168.2458	41.93	Pk	18.1	-30.4	29.63	43.52	-13.89	0-360	101	V
4	918.6934	29.57	Pk	28.5	-26.8	31.27	46.02	-14.75	0-360	399	H

Pk - Peak detector

9.4.2. ODS15-000-IDZ

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



Below 1GHz Data

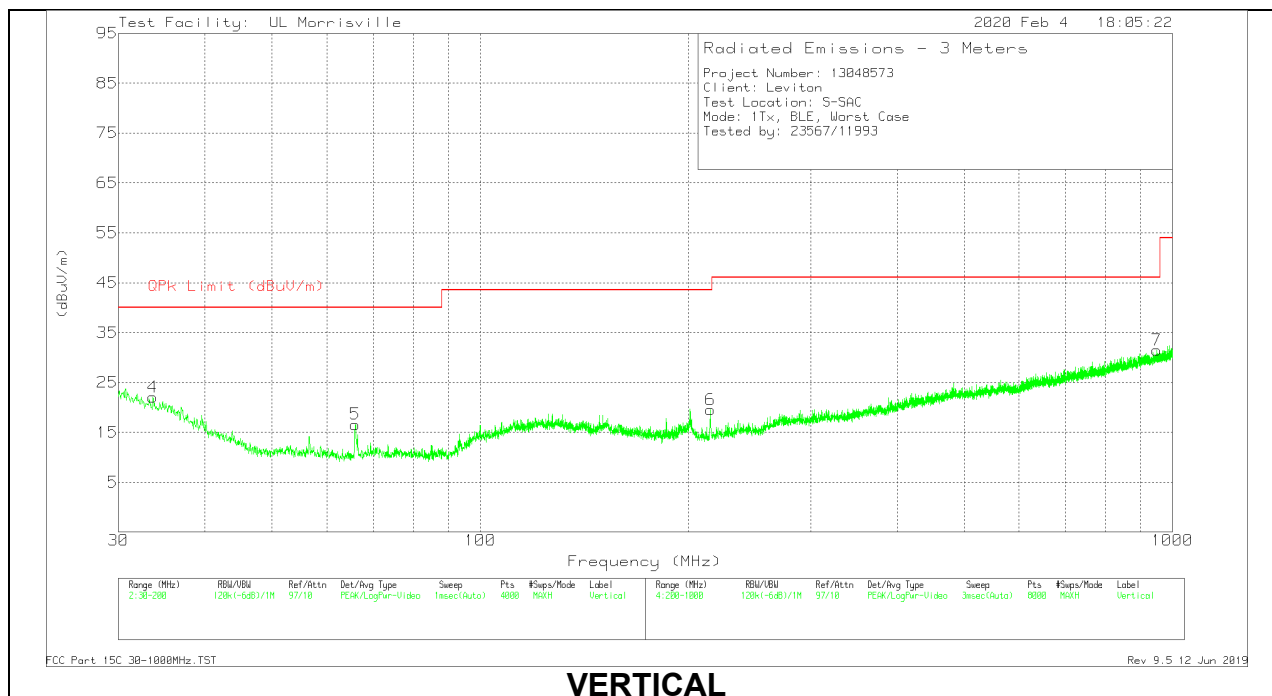
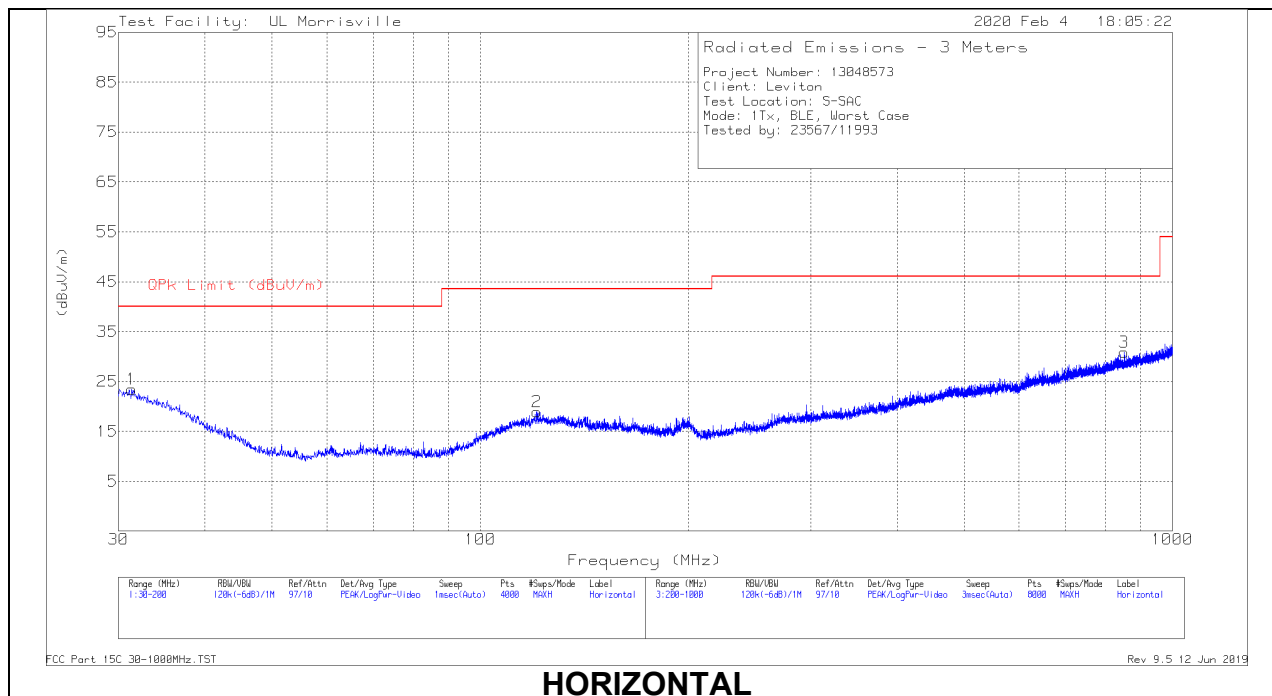
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	37.258	40	Qp	21.9	-31.7	30.2	40	-9.8	216	102	V
4	37.5244	39.85	Pk	21.7	-31.7	29.85	40	-10.15	0-360	399	H
2	125.4797	42.43	Pk	19.9	-30.7	31.63	43.52	-11.89	0-360	101	V
3	132.0264	45.69	Pk	19.7	-30.8	34.59	43.52	-8.93	0-360	101	V
5	176.0678	40.83	Pk	17.6	-30.4	28.03	43.52	-15.49	0-360	198	H
6	190.224	44.93	Pk	17.5	-30.3	32.13	43.52	-11.39	0-360	101	H

Pk - Peak detector

Qp - Quasi-Peak detector

9.4.3. ODD24-000-IDZ

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



Below 1GHz Data

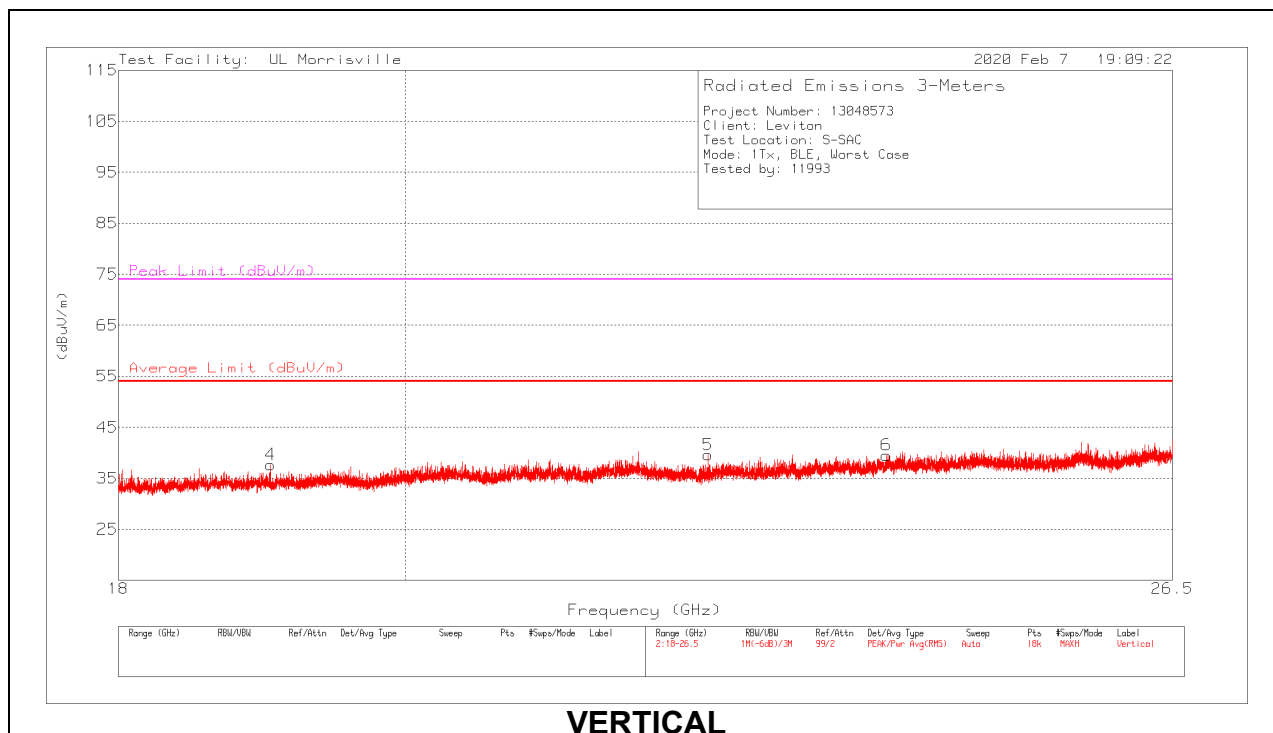
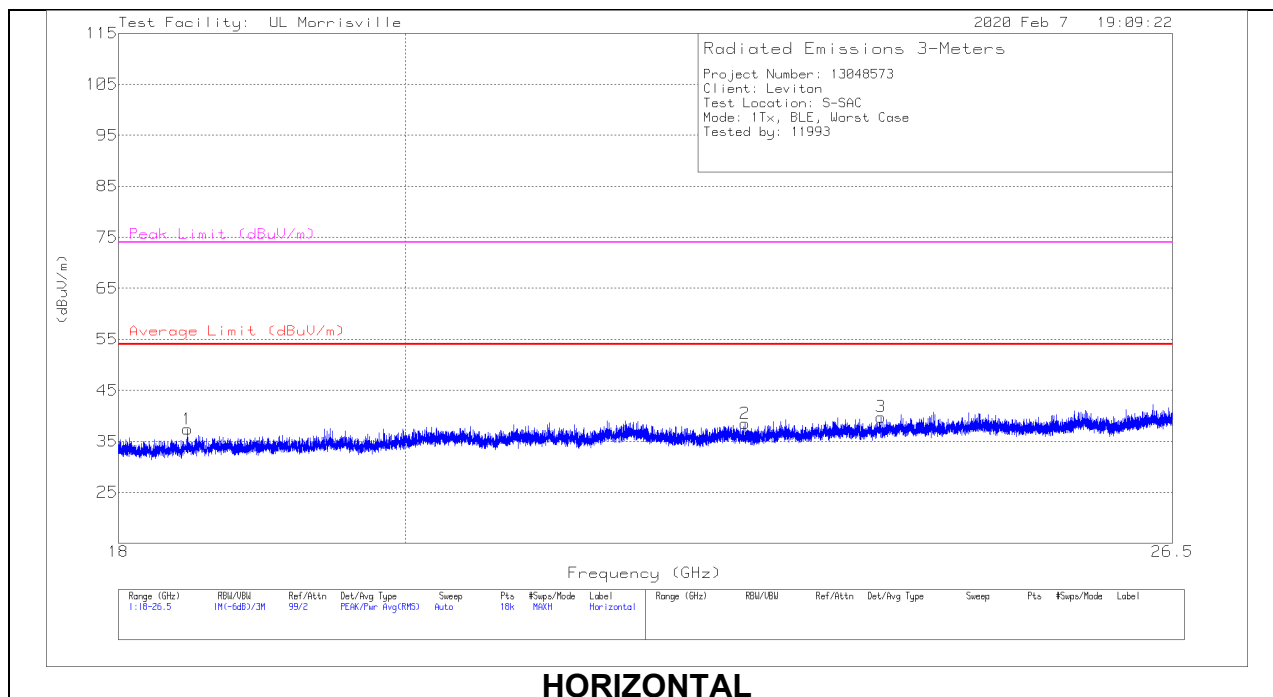
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.3604	29.11	Pk	26.1	-31.8	23.41	40	-16.59	0-360	198	H
4	33.6559	29.47	Pk	24.3	-31.7	22.07	40	-17.93	0-360	101	V
5	66.0068	33.9	Pk	14	-31.3	16.6	40	-23.4	0-360	101	V
2	120.6335	29.82	Pk	19.9	-30.8	18.92	43.52	-24.6	0-360	198	H
6	215.002	33.05	Pk	16.6	-30.1	19.55	43.52	-23.97	0-360	199	V
3	850.9846	30.48	Pk	27.9	-27.5	30.88	46.02	-15.14	0-360	398	H
7	949.0974	29.1	Pk	28.9	-26.5	31.5	46.02	-14.52	0-360	298	V

Pk - Peak detector

9.5 WORST CASE 18-26 GHZ

9.5.1 ODD10-000-IDZ

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



18 – 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	* ** 18.46233	40.71	Pk	32.5	-35.8	37.41	54	-16.59	74	-36.59	0-360	102	H
2	* ** 22.65495	39.31	Pk	33.5	-34.3	38.51	54	-15.49	74	-35.49	0-360	248	H
3	* ** 23.8129	39.29	Pk	34.1	-33.6	39.79	54	-14.21	74	-34.21	0-360	248	H
4	* ** 19.03328	40.67	Pk	32.7	-35.7	37.67	54	-16.33	74	-36.33	0-360	102	V
5	* ** 22.34704	40.48	Pk	33.6	-34.5	39.58	54	-14.42	74	-34.42	0-360	152	V
6	* ** 23.85918	39.04	Pk	34.1	-33.6	39.54	54	-14.46	74	-34.46	0-360	202	V

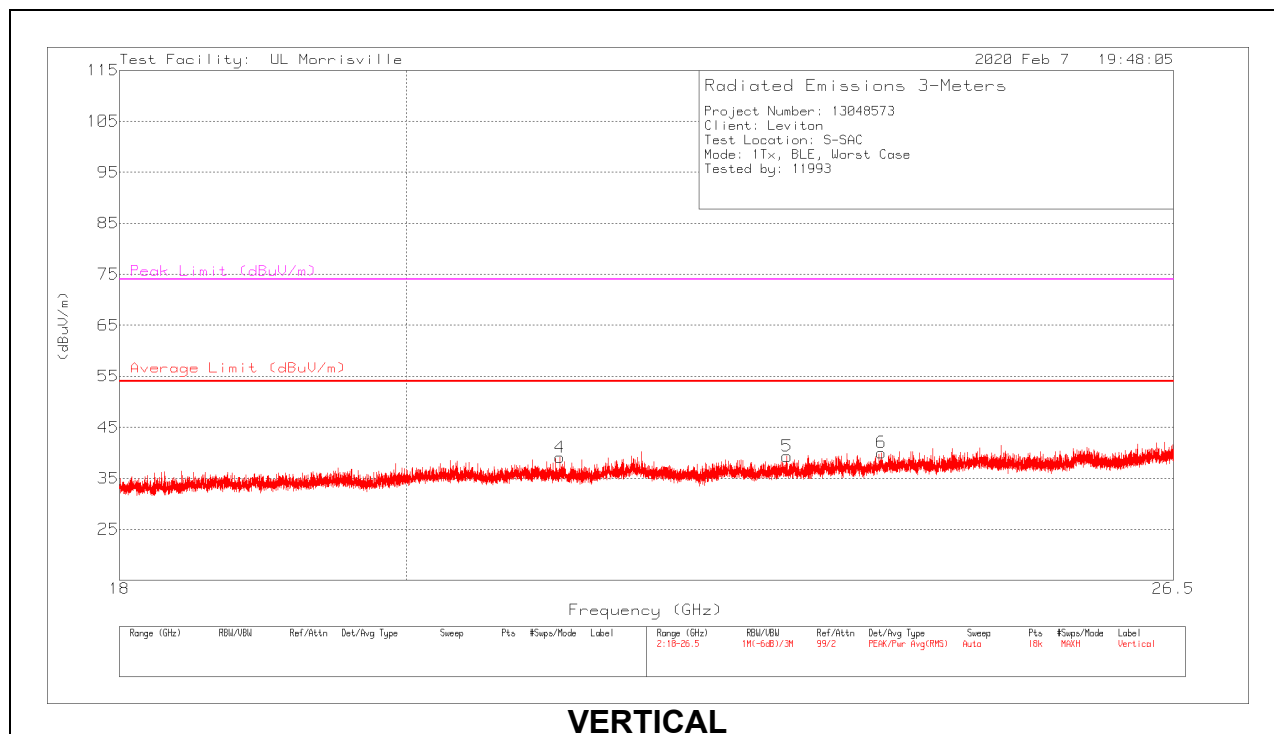
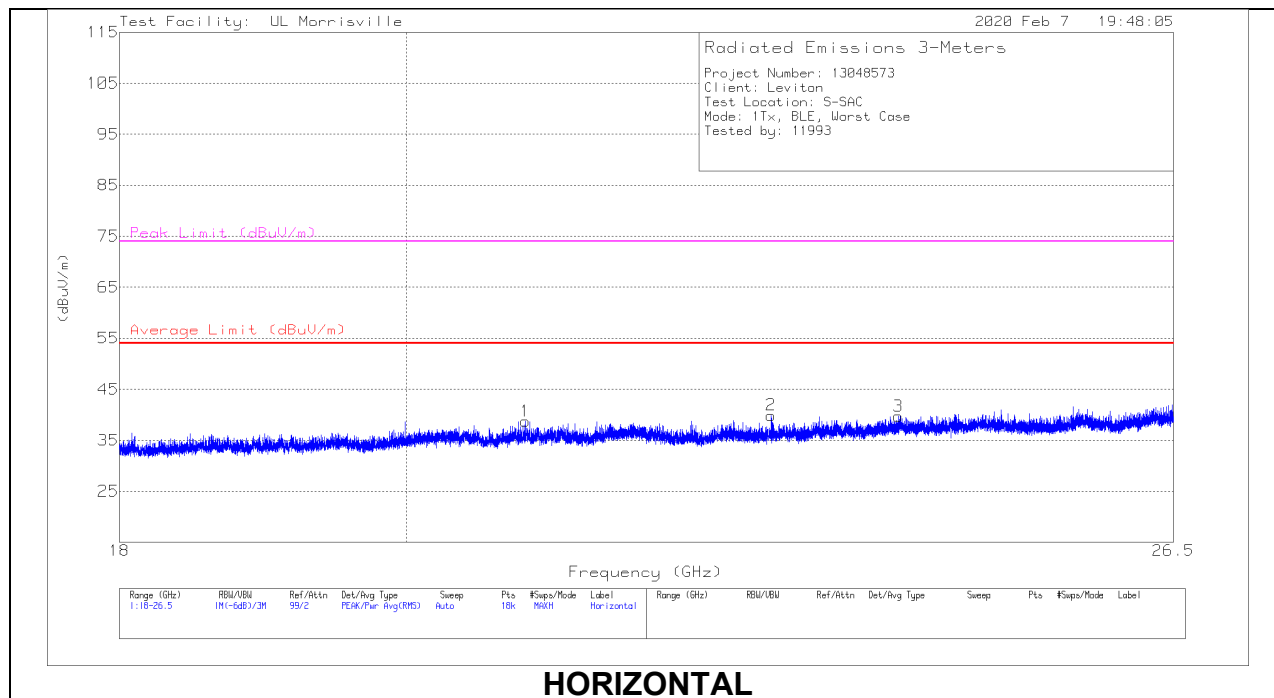
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

9.5.2 ODS15-000-IDZ

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



18 – 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	* ** 20.89158	40.26	Pk	33.2	-34.7	38.76	54	-15.24	74	-35.24	0-360	102	H
2	* ** 22.86368	40.11	Pk	33.7	-33.9	39.91	54	-14.09	74	-34.09	0-360	102	H
3	* ** 23.95646	39.1	Pk	34.1	-33.5	39.7	54	-14.3	74	-34.3	0-360	102	H
4	* ** 21.15934	40.54	Pk	33.1	-34.5	39.14	54	-14.86	74	-34.86	0-360	202	V
5	* ** 22.99686	39.31	Pk	33.8	-33.8	39.31	54	-14.69	74	-34.69	0-360	298	V
6	* ** 23.80487	39.54	Pk	34.1	-33.6	40.04	54	-13.96	74	-33.96	0-360	102	V

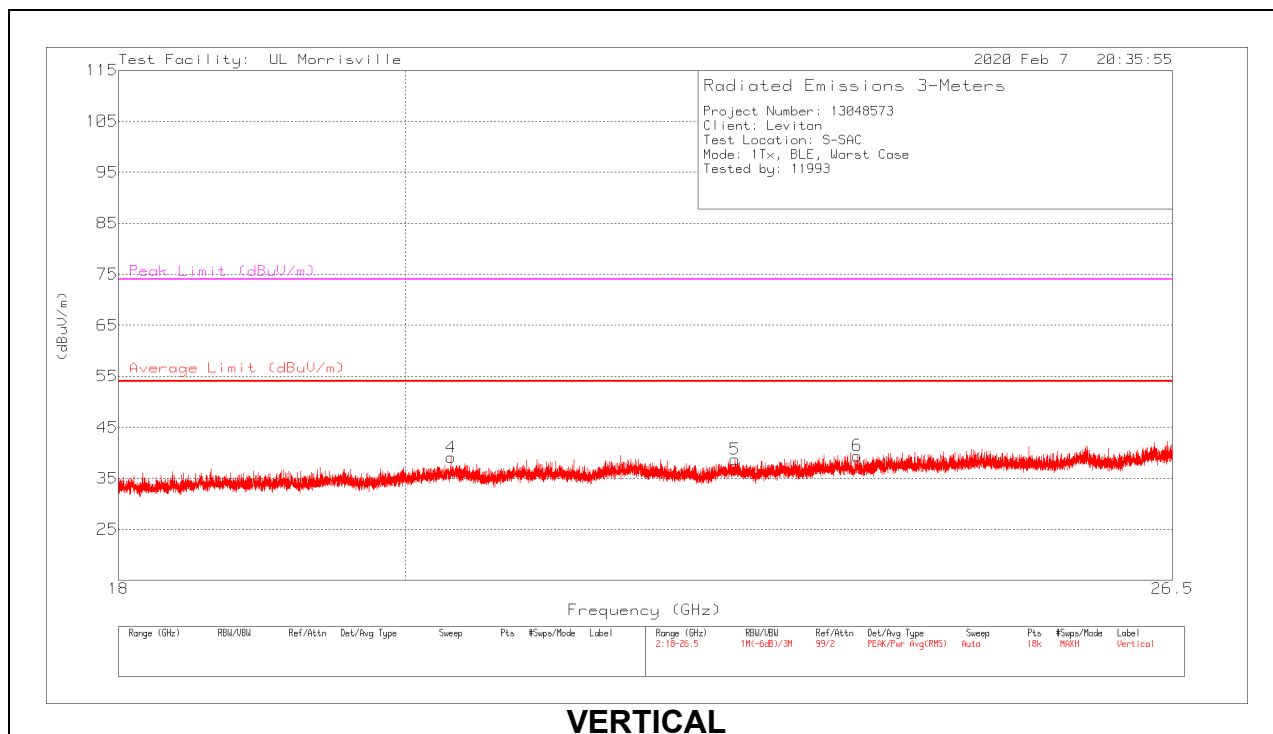
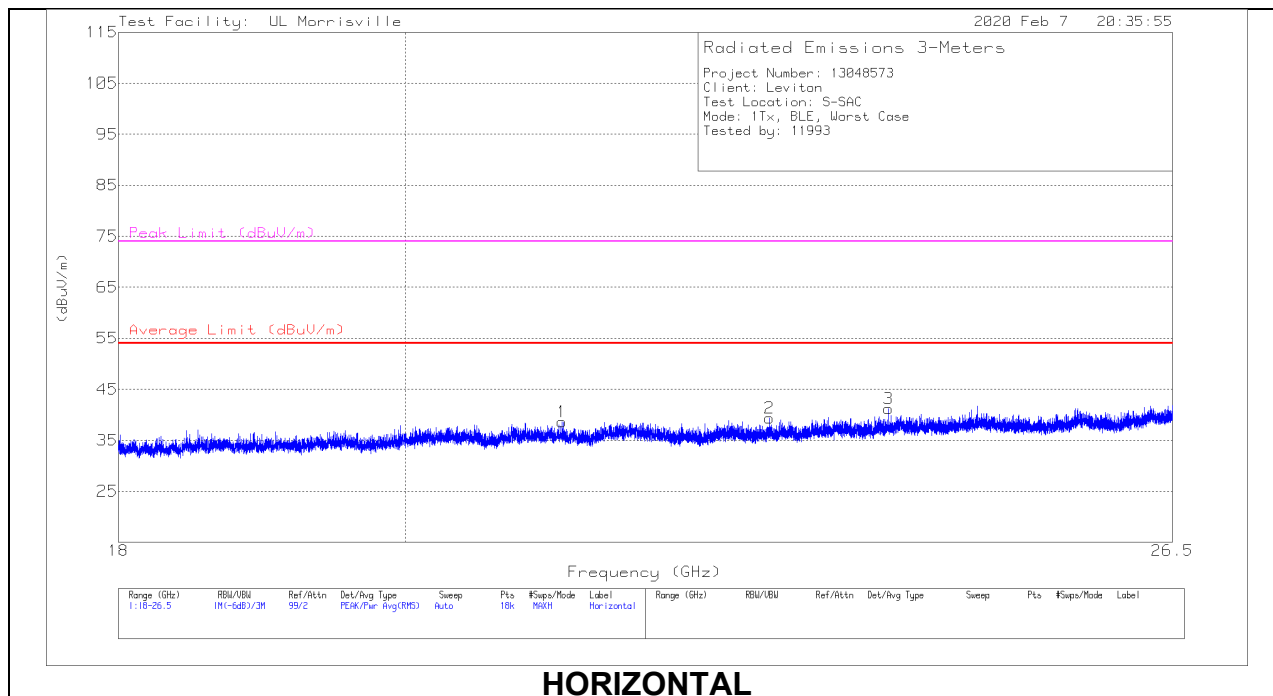
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

9.5.3 ODD24-000-IDZ

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



18 – 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	* ** 21.18295	40.02	Pk	33.1	-34.5	38.62	54	-15.38	74	-35.38	0-360	198	H
2	* ** 22.85849	39.52	Pk	33.7	-33.9	39.32	54	-14.68	74	-34.68	0-360	102	H
3	* ** 23.87807	40.68	Pk	34.1	-33.6	41.18	54	-12.82	74	-32.82	0-360	248	H
4	* ** 20.33621	40.54	Pk	33.1	-34.5	39.14	54	-14.86	74	-34.86	0-360	102	V
5	* ** 22.57089	39.6	Pk	33.5	-34.4	38.7	54	-15.3	74	-35.3	0-360	152	V
6	* ** 23.607	39.12	Pk	34	-33.7	39.42	54	-14.58	74	-34.58	0-360	202	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

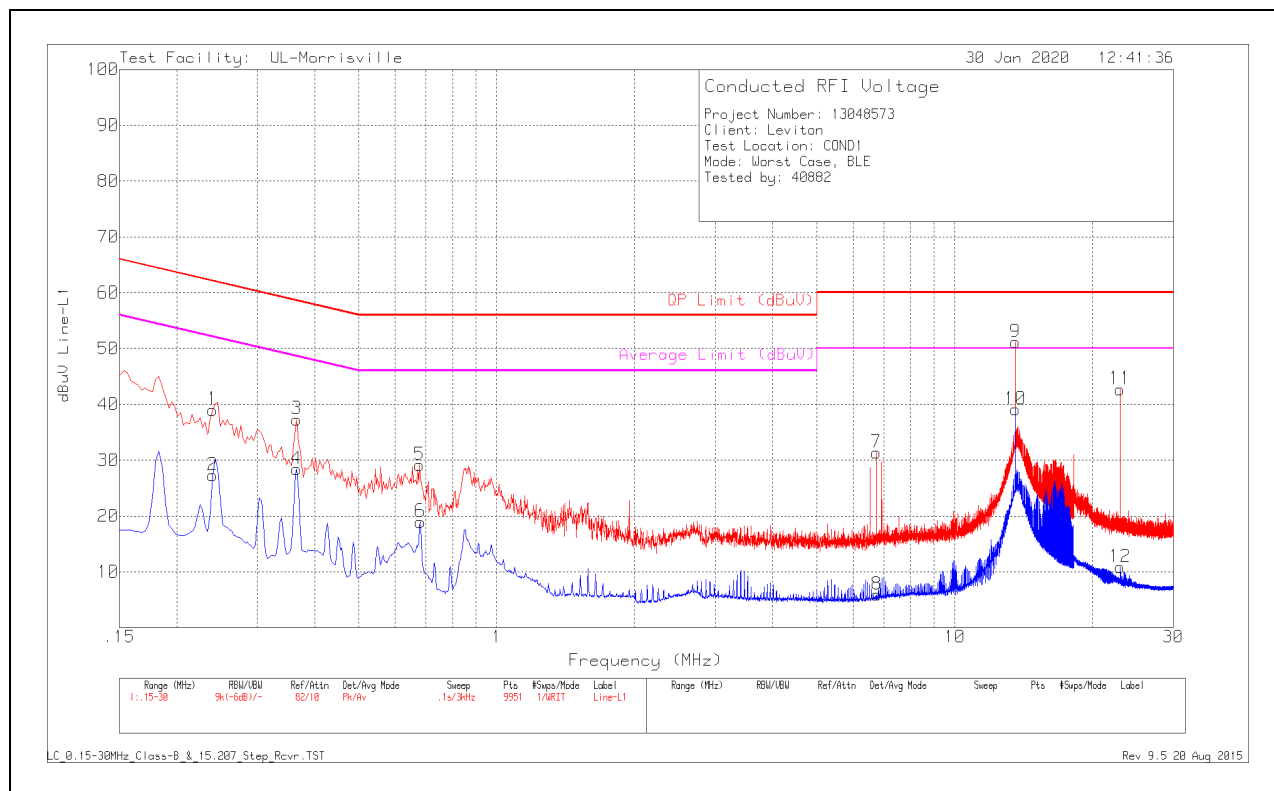
RSS-Gen 8.8

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

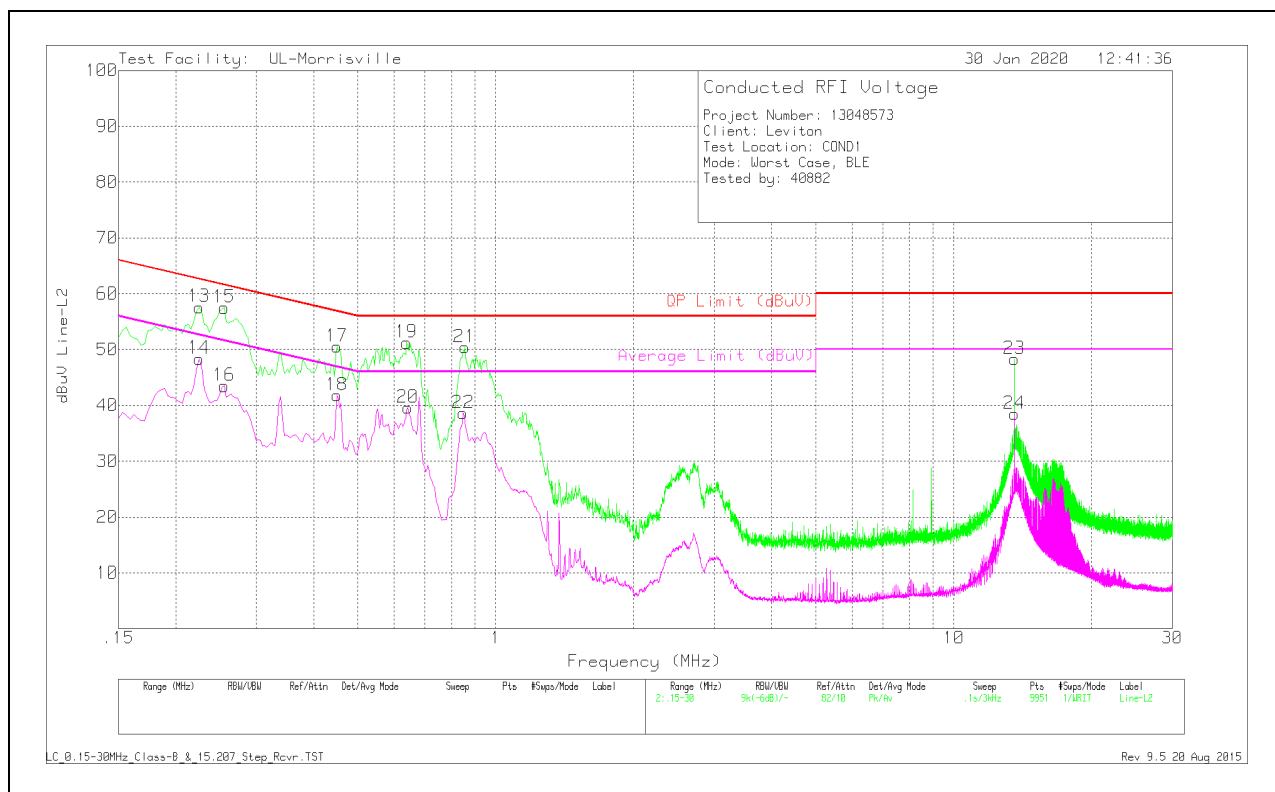
10.1.1. ODD10-000-IDZ LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.24	28.94	Pk	.1	10	39.04	62.1	-23.06	-	-
2	.24	17.22	Av	.1	10	27.32	-	-	52.1	-24.78
3	.366	27.23	Pk	.1	10	37.33	58.59	-21.26	-	-
4	.366	18.34	Av	.1	10	28.44	-	-	48.59	-20.15
5	.678	19.04	Pk	.1	10	29.14	56	-26.86	-	-
6	.681	8.89	Av	.1	10	18.99	-	-	46	-27.01
7	6.735	21.04	Pk	.1	10.2	31.34	60	-28.66	-	-
8	6.753	-4.39	Av	.1	10.2	5.91	-	-	50	-44.09
9	13.56	40.67	Pk	.1	10.4	51.17	60	-8.83	-	-
10	13.56	28.61	Av	.1	10.4	39.11	-	-	50	-10.89
11	22.953	31.93	Pk	.2	10.6	42.73	60	-17.27	-	-
12	22.953	.04	Av	.2	10.6	10.84	-	-	50	-39.16

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS

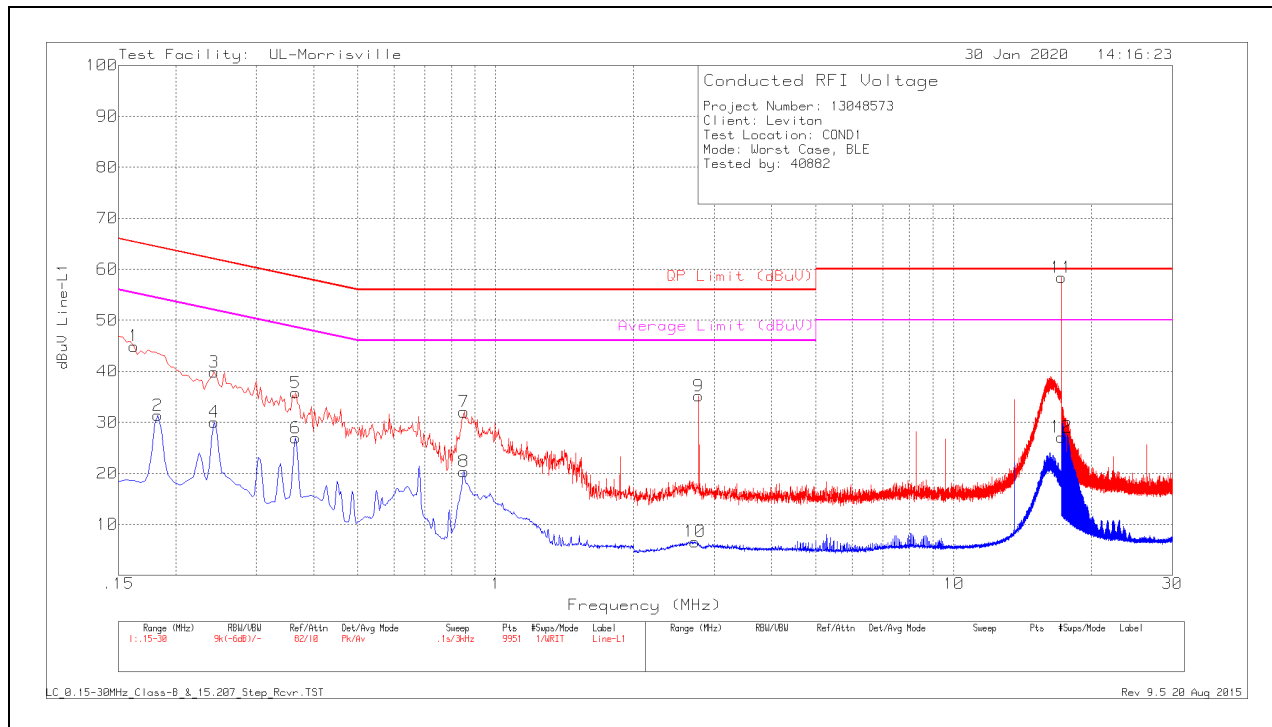


Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.225	15.53	Qp	.1	10	25.63	62.63	-37	-	-
14	.225	11.44	Av	.1	10	21.54	-	-	52.63	-31.09
15	.255	11.91	Qp	.1	10	22.01	61.59	-39.58	-	-
16	.255	33.39	Av	.1	10	43.49	-	-	51.59	-8.1
17	.45	40.44	Pk	.1	10	50.54	56.88	-6.34	-	-
18	.45	5.48	Av	.1	10	15.58	-	-	46.88	-31.3
19	.639	4.7	Qp	0	10	14.7	56	-41.3	-	-
20	.642	-.73	Av	0	10	9.27	-	-	46	-36.73
21	.855	6.47	Qp	0	10	16.47	56	-39.53	-	-
22	.849	28.6	Av	0	10	38.6	-	-	46	-7.4
23	13.563	37.82	Pk	.1	10.4	48.32	60	-11.68	-	-
24	13.56	28.02	Av	.1	10.4	38.52	-	-	50	-11.48

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

10.1.2. ODS15-000-IDZ

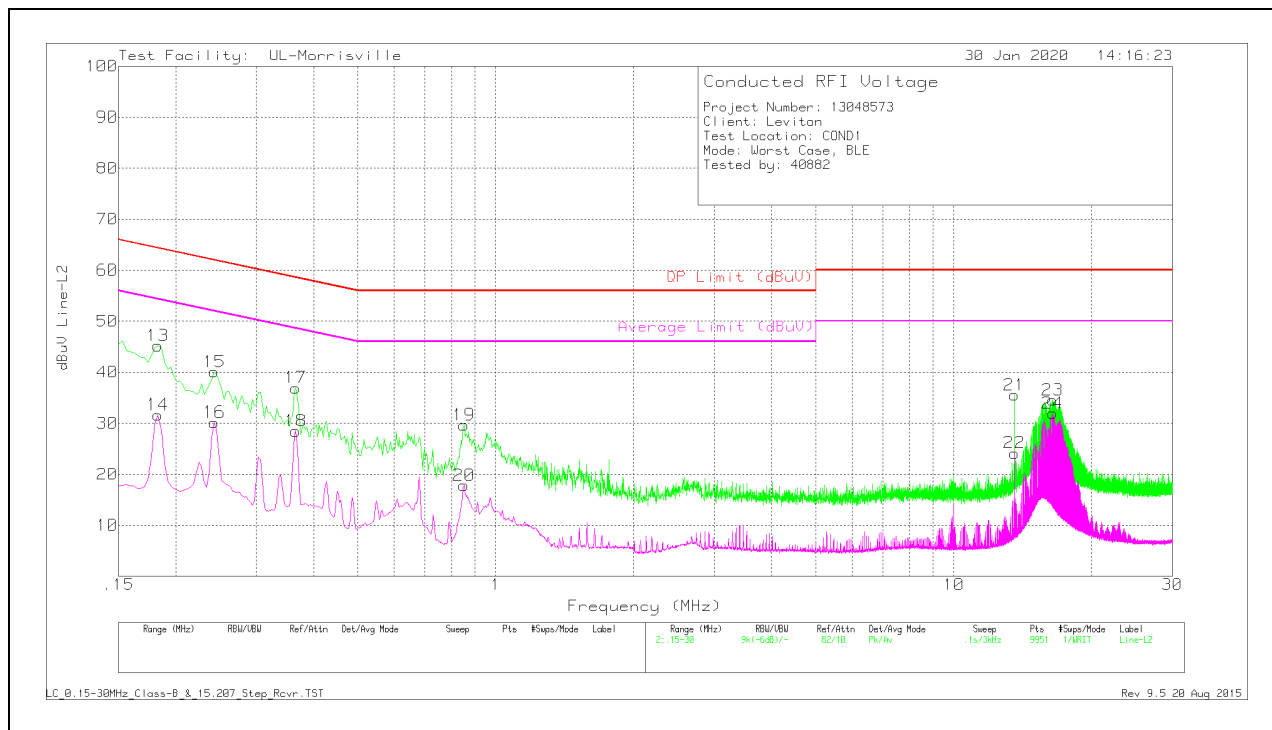
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.162	34.75	Pk	.2	10	44.95	65.36	-20.41	-	-
2	.183	21.19	Av	.2	10	31.39	-	-	54.35	-22.96
3	.243	29.76	Pk	.1	10	39.86	61.99	-22.13	-	-
4	.243	19.95	Av	.1	10	30.05	-	-	51.99	-21.94
5	.366	25.66	Pk	.1	10	35.76	58.59	-22.83	-	-
6	.366	16.84	Av	.1	10	26.94	-	-	48.59	-21.65
7	.852	22.06	Pk	0	10	32.06	56	-23.94	-	-
8	.852	10.36	Av	0	10	20.36	-	-	46	-25.64
9	2.775	25.09	Pk	0	10.1	35.19	56	-20.81	-	-
10	2.721	-3.5	Av	0	10.1	6.6	-	-	46	-39.4
11	17.184	3.64	Qp	.1	10.5	14.24	60	-45.76	-	-
12	17.19	16.52	Av	.1	10.5	27.12	-	-	50	-22.88

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS



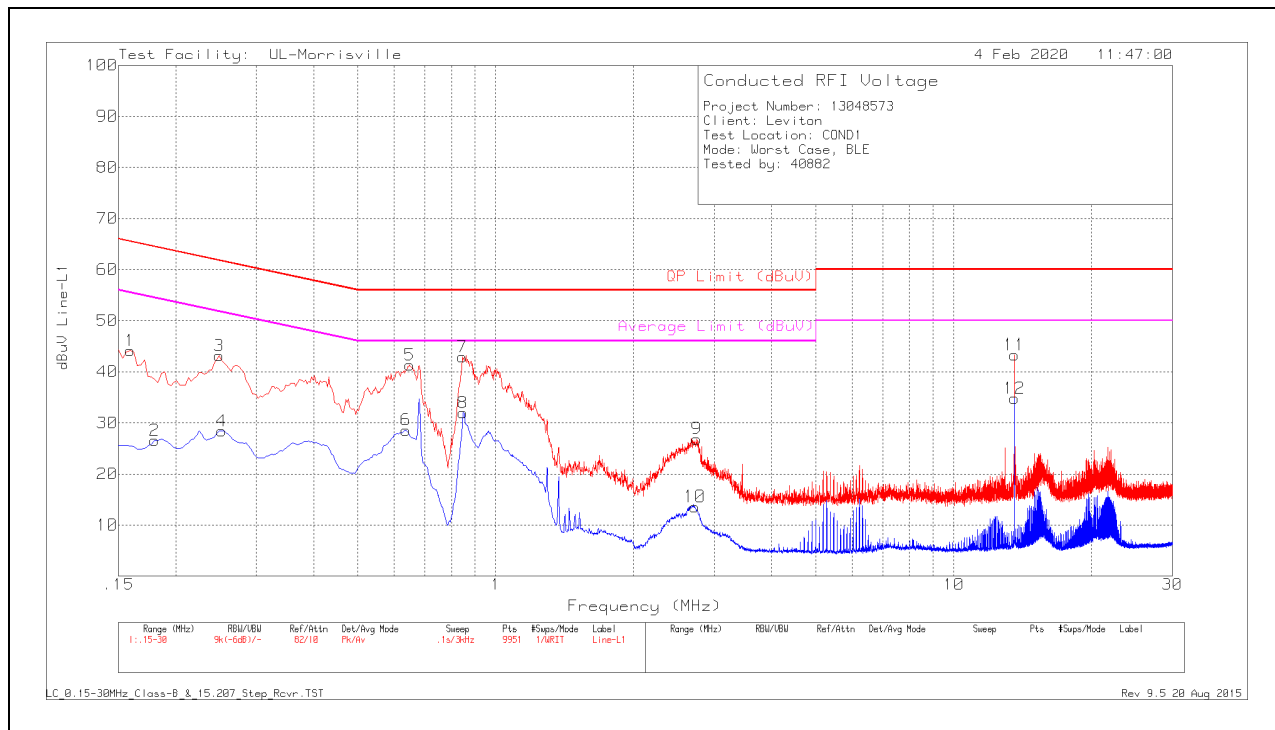
Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.183	35.01	Pk	.2	10	45.21	64.35	-19.14	-	-
14	.183	21.45	Av	.2	10	31.65	-	-	54.35	-22.7
15	.243	29.97	Pk	.1	10	40.07	61.99	-21.92	-	-
16	.243	20.08	Av	.1	10	30.18	-	-	51.99	-21.81
17	.366	26.86	Pk	.1	10	36.96	58.59	-21.63	-	-
18	.366	18.39	Av	.1	10	28.49	-	-	48.59	-20.1
19	.852	19.68	Pk	0	10	29.68	56	-26.32	-	-
20	.852	7.83	Av	0	10	17.83	-	-	46	-28.17
21	13.563	25.01	Pk	.1	10.4	35.51	60	-24.49	-	-
22	13.56	13.68	Av	.1	10.4	24.18	-	-	50	-25.82
23	16.425	23.99	Pk	.1	10.5	34.59	60	-25.41	-	-
24	16.425	21.41	Av	.1	10.5	32.01	-	-	50	-17.99

Pk - Peak detector

Av - Average detection

Qp - Quasi-Peak detector

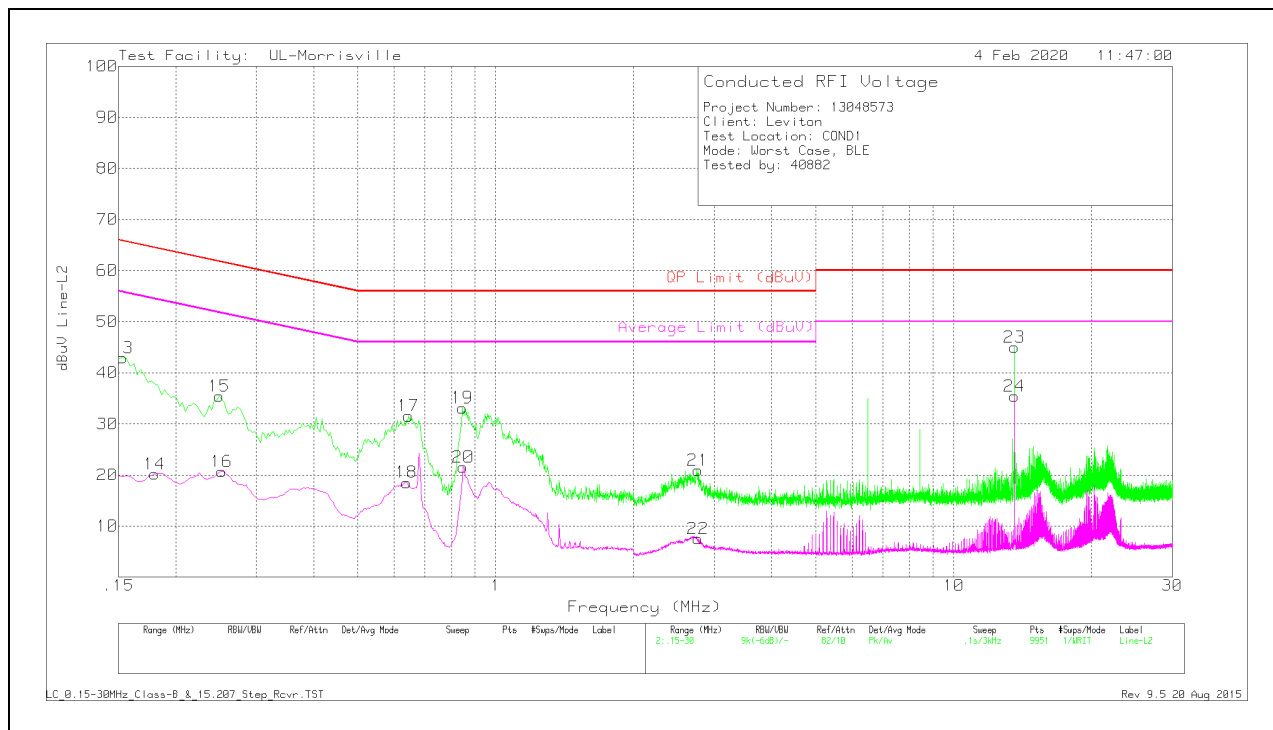
10.1.3. ODD24-000-IDZ LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.159	33.91	Pk	.2	10	44.11	65.52	-21.41	-	-
2	.18	16.34	Av	.2	10	26.54	-	-	54.49	-27.95
3	.249	33.09	Pk	.1	10	43.19	61.79	-18.6	-	-
4	.252	18.28	Av	.1	10	28.38	-	-	51.69	-23.31
5	.648	31.23	Pk	.1	10	41.33	56	-14.67	-	-
6	.636	18.5	Av	.1	10	28.6	-	-	46	-17.4
7	.846	32.93	Pk	0	10	42.93	56	-13.07	-	-
8	.849	22.01	Av	0	10	32.01	-	-	46	-13.99
9	2.748	16.78	Pk	0	10.1	26.88	56	-29.12	-	-
10	2.721	3.49	Av	0	10.1	13.59	-	-	46	-32.41
11	13.56	32.82	Pk	.1	10.4	43.32	60	-16.68	-	-
12	13.56	24.28	Av	.1	10.4	34.78	-	-	50	-15.22

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)	Cb/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.153	32.73	Pk	.2	10	42.93	65.84	-22.91	-	-
14	.18	10	Av	.2	10	20.2	-	-	54.49	-34.29
15	.249	25.3	Pk	.1	10	35.4	61.79	-26.39	-	-
16	.252	10.55	Av	.1	10	20.65	-	-	51.69	-31.04
17	.645	21.56	Pk	0	10	31.56	56	-24.44	-	-
18	.639	8.52	Av	0	10	18.52	-	-	46	-27.48
19	.846	23.13	Pk	0	10	33.13	56	-22.87	-	-
20	.849	11.56	Av	0	10	21.56	-	-	46	-24.44
21	2.766	10.78	Pk	0	10.1	20.88	56	-35.12	-	-
22	2.763	-2.56	Av	0	10.1	7.54	-	-	46	-38.46
23	13.56	34.49	Pk	.1	10.4	44.99	60	-15.01	-	-
24	13.56	24.92	Av	.1	10.4	35.42	-	-	50	-14.58

Pk - Peak detector
Av - Average detection

11. SETUP PHOTOS

Please refer to R13048573-EP1 for setup photos

END OF TEST REPORT