



TEST REPORT

Report Number : R14066249-E1

Applicant : Abbott Diabetes Care Inc.
1360 South Loop Road
Alameda, CA 94502, USA

Model : Project 45000

FCC ID : QXS-LIB03S

IC : 12106A-LIB03S

EUT Description : Freestyle Libre 3

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C:2022
ISED RSS-247 ISSUE 2: 2017
ISED RSS-GEN ISSUE 5 + A2: 2021

Date Of Issue:

2022-04-05

Prepared by:

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CERT #0751.06

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2022-03-29	Initial Issue	Haley Ackun
V2	2022-04-05	Updated Serial Number	Haley Ackun

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Abbott Diabetes Care
1360 South Loop Rd
Alameda, CA 94502, U.S.A.

EUT DESCRIPTION: Freestyle Libre 3

MODEL: Project 45000

SERIAL NUMBER: 068ZM2T1YQM71HY9Z32 & 068ZM2T1Y8L7Q2P4JJ7

SAMPLE RECEIPT DATE: 2022-01-27 & 2022-02-24

DATE TESTED: 2022-02-03 TO 2022-03-09

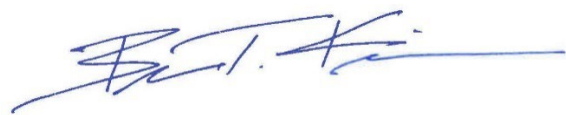
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C: 2022	Complies
ISED RSS-247 Issue 2: 2017	Complies
ISED RSS-GEN Issue 5 + A2: 2021	Complies

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 a2La, NIST, or any agency of the U.S. government.

Approved & Released For
UL LLC. By:



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2. TEST RESULTS SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Complies	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Complies	None.
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Complies	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Complies	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Complies	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Not Performed	Refer to Note.

This report contains data provided by the applicant which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

Note: The EUT is battery powered. Therefore, AC line conducted emissions were not performed.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15: 2022, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A2: 2021, and RSS-247 Issue 2: 2017.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification #0751.06, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input type="checkbox"/>	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
<input checked="" type="checkbox"/>	Building: 2800 Perimeter Park Dr Morrisville, NC 27560, U.S.A		27265	

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U _{Lab}
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\text{Final Voltage (dBuV)} = \text{Measured Voltage (dBuV)} + \text{Cable Loss (dB)} + \text{Limiter Factor (dB)} + \text{LISN Insertion Loss.}$$

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a Freestyle Libre 3 that supports BLE technology

6.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	4.12	2.58

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

The radio utilizes an PIFA antenna, with a maximum gain of -15 dBi.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 0.1.6.49.

The test utility software used during testing was PTU-Gen2.

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

The EUT only supports one data rate. Therefore, all final radiated emissions testing was performed with the EUT transmitting at 1 Mbps.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List					
Description	Manufacturer	Model	Serial Number	FCC ID	Notes
Laptop	HP	14-dq1039wm	5CD941FN5J	-	-
PCB	Texas Instruments	TRF7960	-	-	For Configuration Purposes Only

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	1	1	DC	Non-Shielded	<3m	Connects to Battery.

TEST SETUP

Test software exercised the radio card.

SETUP DIAGRAMS

Please refer to R14066249-EP1 for setup diagrams

7. MEASUREMENT METHOD

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)

Emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11 and 6.10.4

Emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1 and 6.10.5

General Radiated Spurious Emissions: Sections 6.3-6.6

8. 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 – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	0.009-30MHz				
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2021-08-19	2022-08-19
	30-1000 MHz				
206210	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2021-03-11	2022-03-11
	1-18 GHz				
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2021-03-11	2022-03-11
	Gain-Loss Chains				
C4-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2021-05-07	2022-05-07
C4-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2021-05-07	2022-05-07
C4-SAC03	Gain-loss string: 1-18GHz	Various	Various	2021-05-07	2022-05-07
	Receiver & Software				
214284	Spectrum Analyzer	Rohde & Schwarz	FSW50	2022-01-11	2023-01-11
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
s/n 210701942	Environmental Meter	Fisher Scientific	15-077-963 11724196	2021-8-16	2023-08-16

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	18-40 GHz				
AT0063	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2021-11-04	2022-11-04
	Gain-Loss Chains				
C2-SAC04	Gain-loss string: 18-40GHz	Various	Various	2021-07-09	2022-07-09
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2021-03-10	2022-03-10
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
s/n 181474409	Environmental Meter	Fisher Scientific	15-077-963	2021-09-27	2022-09-27

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
T177	Spectrum Analyzer	Keysight Technologies	E4446A	2021-05-19	2022-05-19
PWM003	RF Power Meter	Keysight Technologies	N1911A	2021-08-30	2022-08-30
PWS003	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2021-05-27	2022-05-27
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2021-07-12	2022-07-12
SOFTEMI	Antenna Port Software	UL	Version 2021.11.3	NA	NA

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

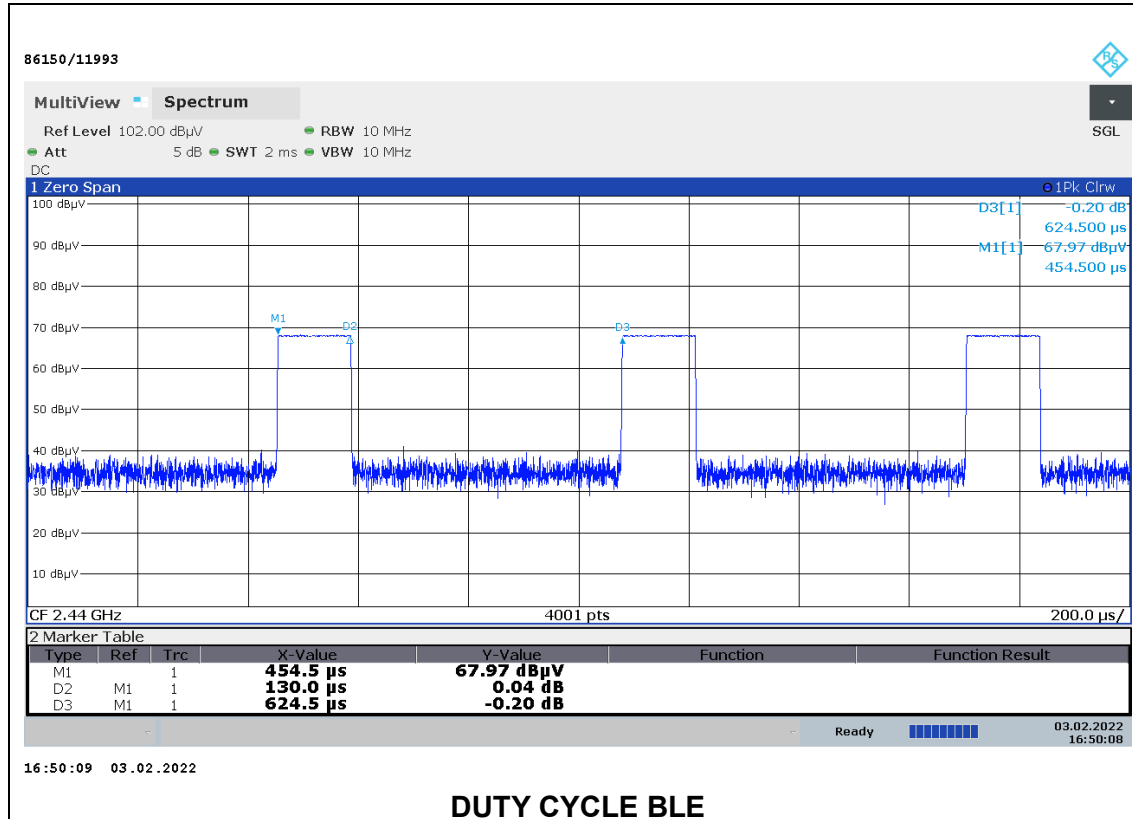
KDB 558074 Zero-Span Spectrum Analyzer Method.

ANSI C63.10 Section 11.6

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)
ANT 1						
BLE - 1Mbps	0.130	0.6245	0.208	20.82	6.82	7.692

DUTY CYCLE PLOT



9.2. 99% BANDWIDTH

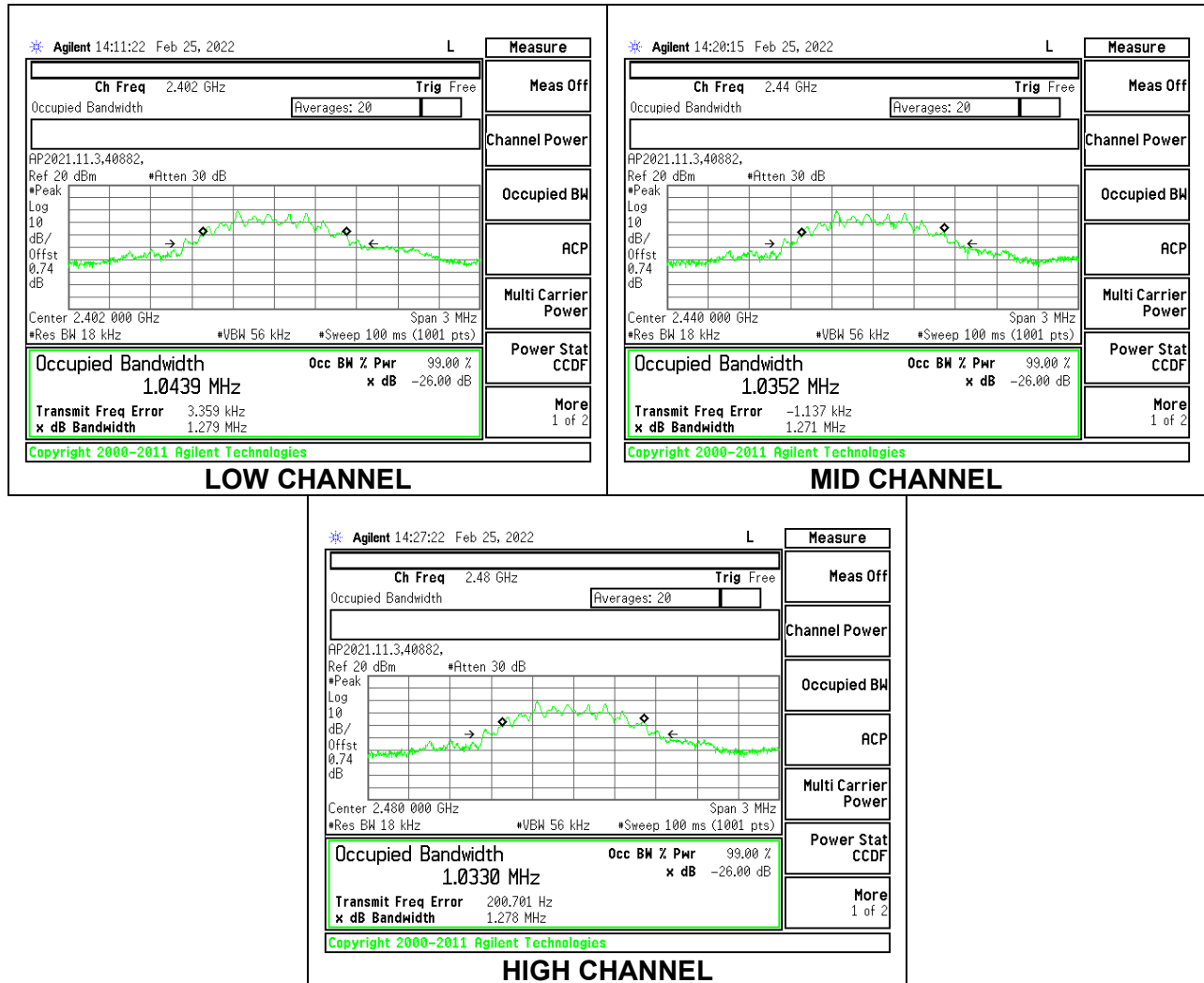
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0439
Middle	2440	1.0352
High	2480	1.0330

9.2.1. BLE (1Mbps)



9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

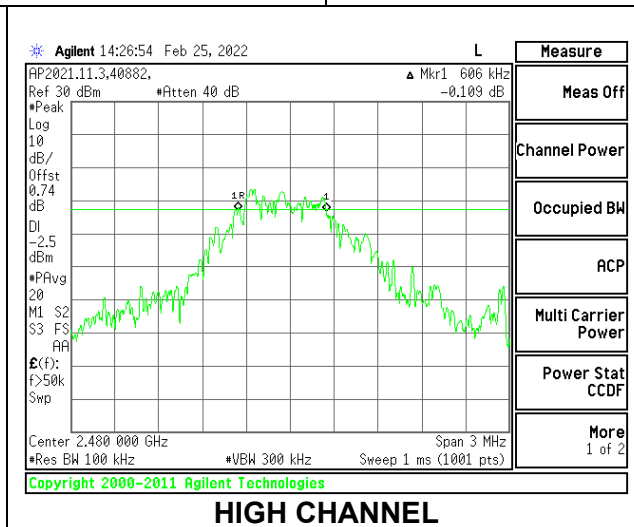
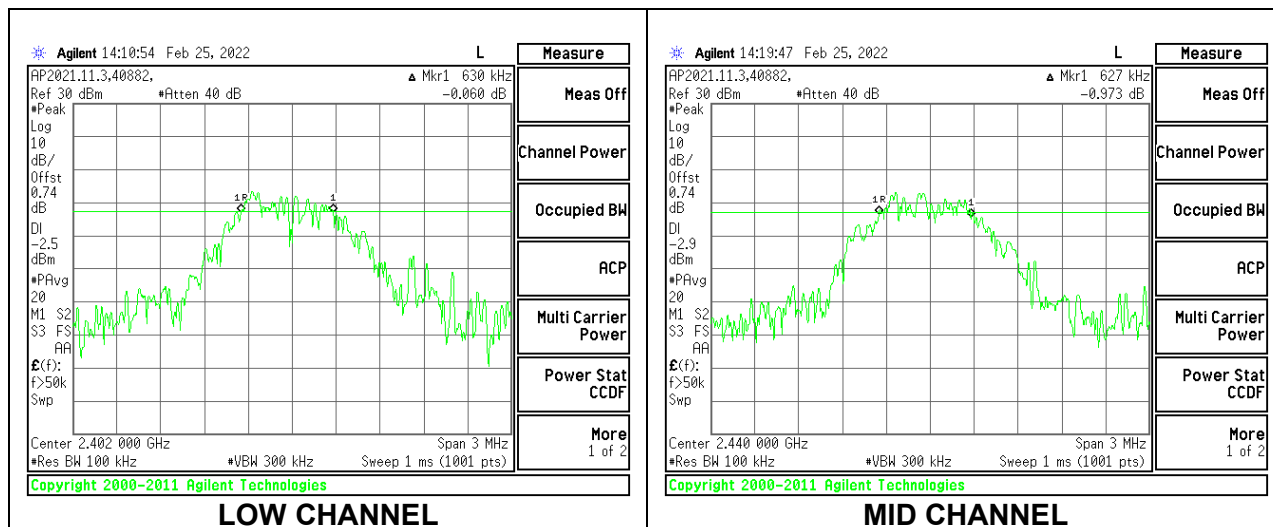
RSS-247 5.2 (a)

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

RESULTS

9.3.1. BLE (1Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6300	0.5
Middle	2440	0.6270	0.5
High	2480	0.6060	0.5



9.4. 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 peak power meter.

The cable assembly insertion loss of 0.75 dB (0.75 dB cable) was entered as an offset in the power meter.

RESULTS

9.4.1. BLE (1Mbps)

Tested By:	40882
Date:	2022-03-09

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	4.12	30	-25.880
Middle	2440	4.10	30	-25.900
High	2480	4.03	30	-25.970

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a gated average power meter.

The cable assembly insertion loss of 0.75 dB (0.75 dB cable) was entered as an offset in the power meter.

RESULTS

9.5.1. BLE (1Mbps)

Tested By:	40882
Date:	2022-03-09

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	4.04
Middle	2440	3.98
High	2480	3.91

9.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

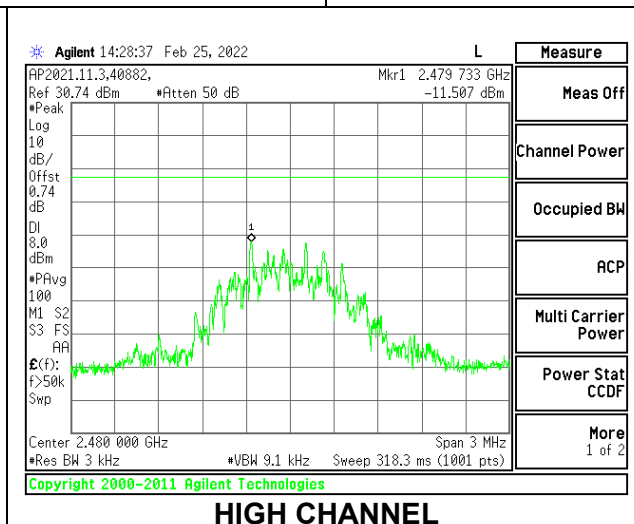
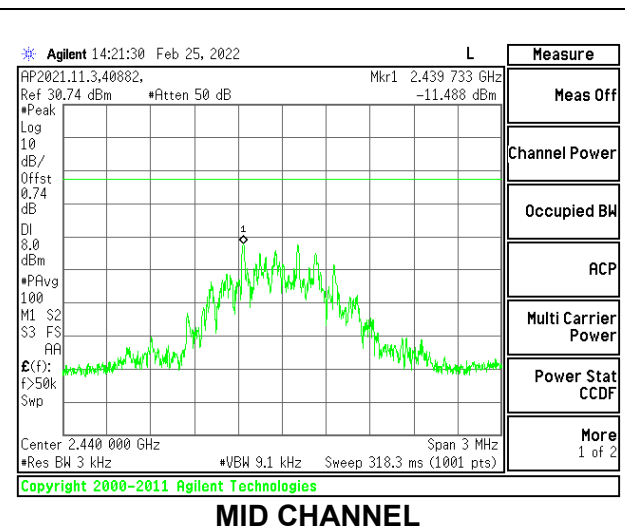
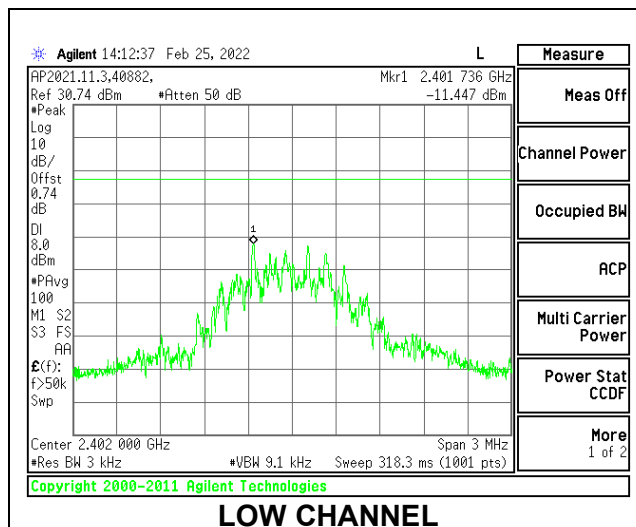
RSS-247 (5.2) (b)

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

9.6.1. BLE (1Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-11.447	8	-19.45
Middle	2440	-11.488	8	-19.49
High	2480	-11.507	8	-19.51



9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

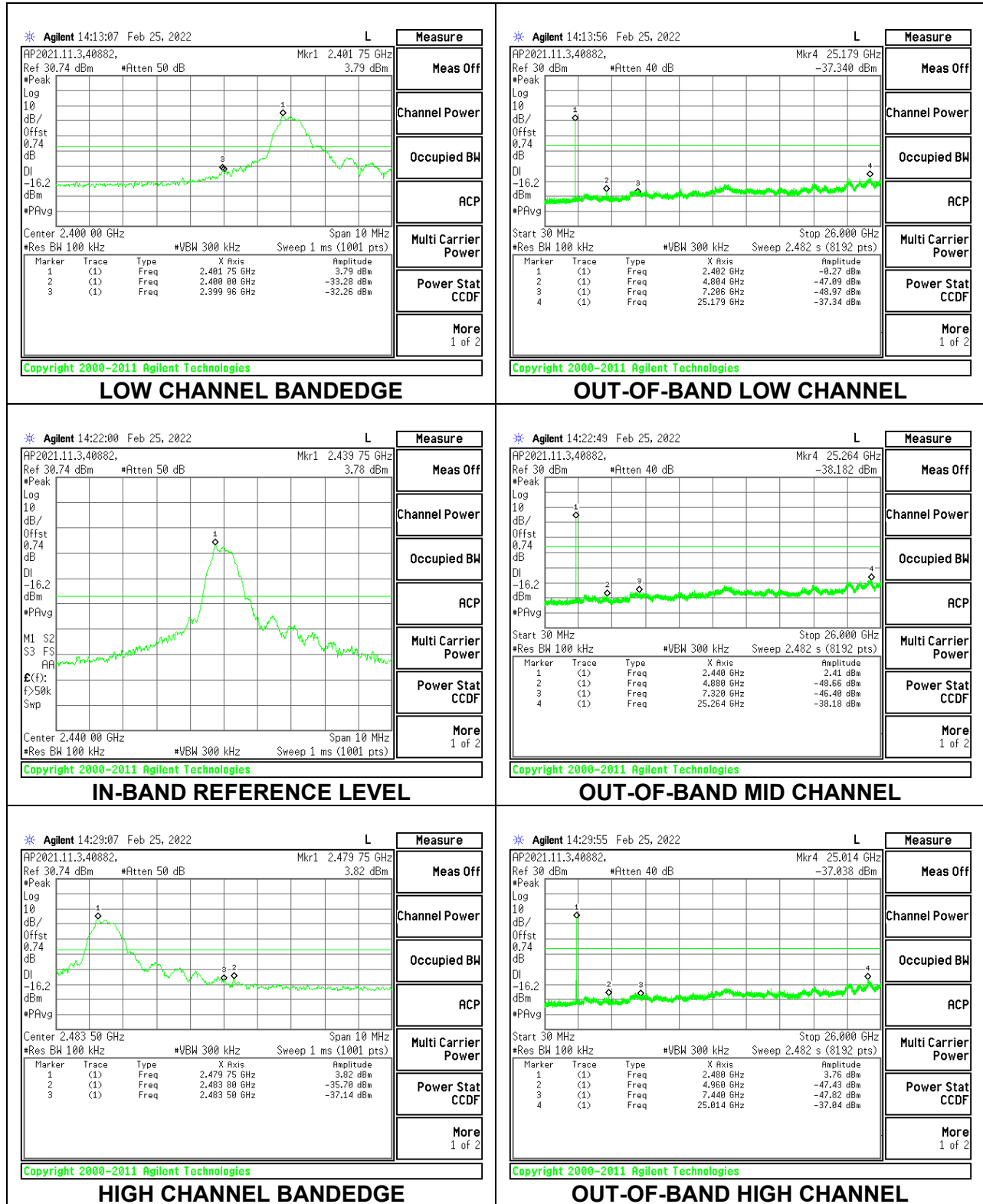
FCC §15.247 (d)

RSS-247 5.5

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

RESULTS

9.7.1. BLE (1Mbps)



10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuA/m) at 3 m
0.009-0.490	6.37/F(kHz) @ 300 m	-
0.490-1.705	63.7/F(kHz) @ 30 m	-
1.705 - 30	0.08 @ 30m	-
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

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 100 kHz for peak detection measurements or 120 kHz for 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 or average (9-90kHz and 110-490kHz).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz 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 RMS 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.

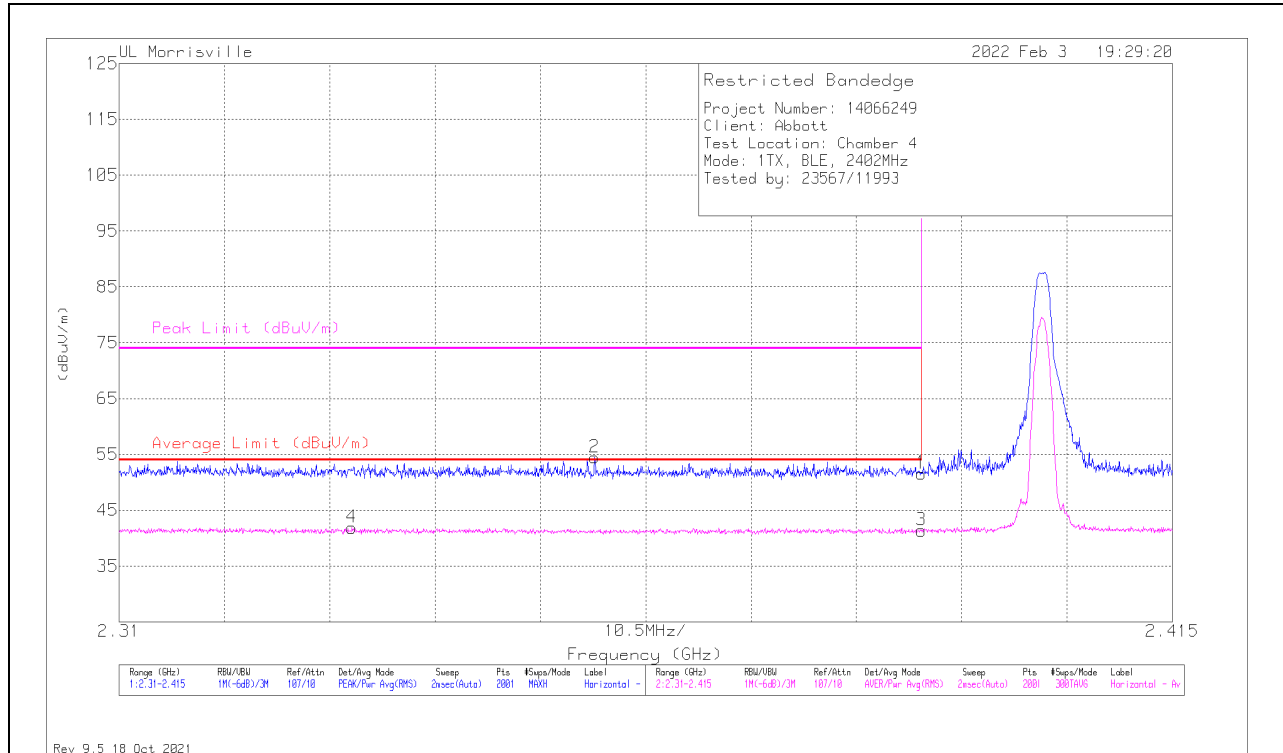
10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. BLE (1Mbps)

Antenna 1

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	*** 2.38996	33.37	Pk	32	-13.8	0	51.57	-	-	74	-22.43	260	125	H
2	*** 2.35741	36.43	Pk	31.9	-13.9	0	54.43	-	-	74	-19.57	260	125	H
3	*** 2.38996	16.36	RMS	32	-13.8	6.82	41.38	54	-12.62	-	-	260	125	H
4	*** 2.33321	17.06	RMS	31.9	-13.9	6.82	41.88	54	-12.12	-	-	260	125	H

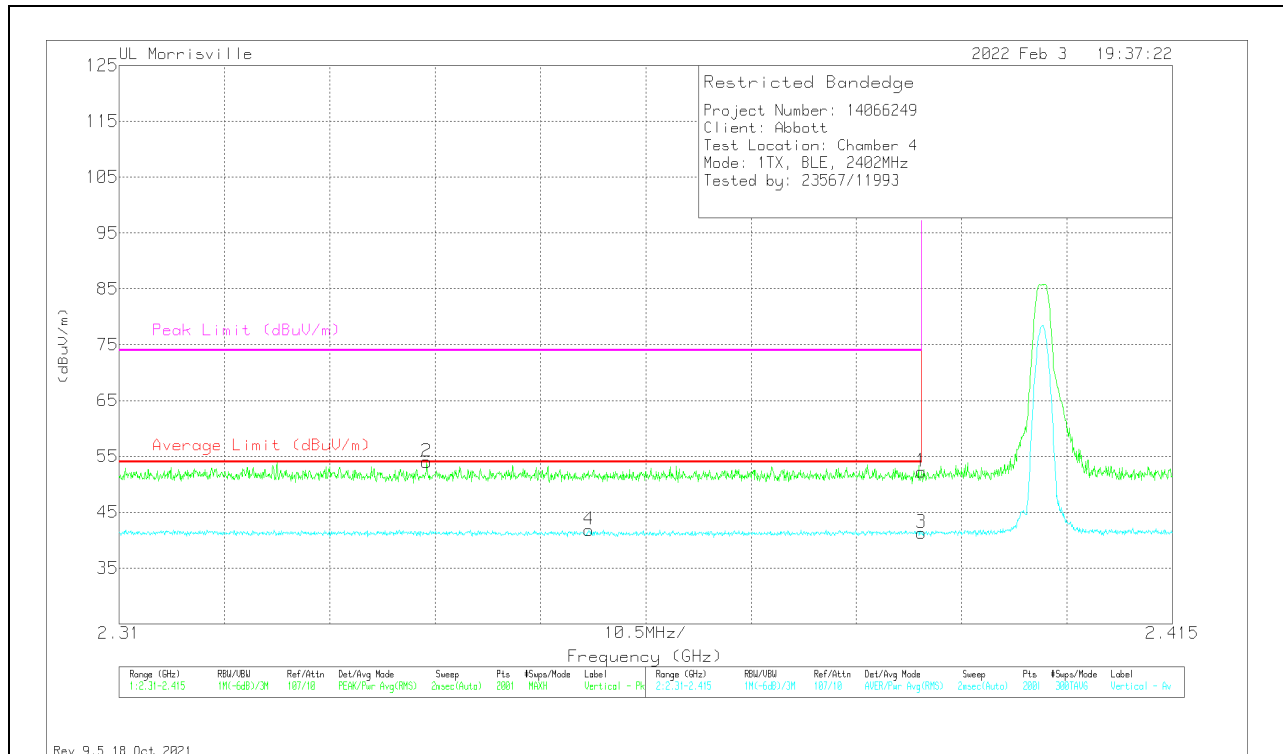
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT

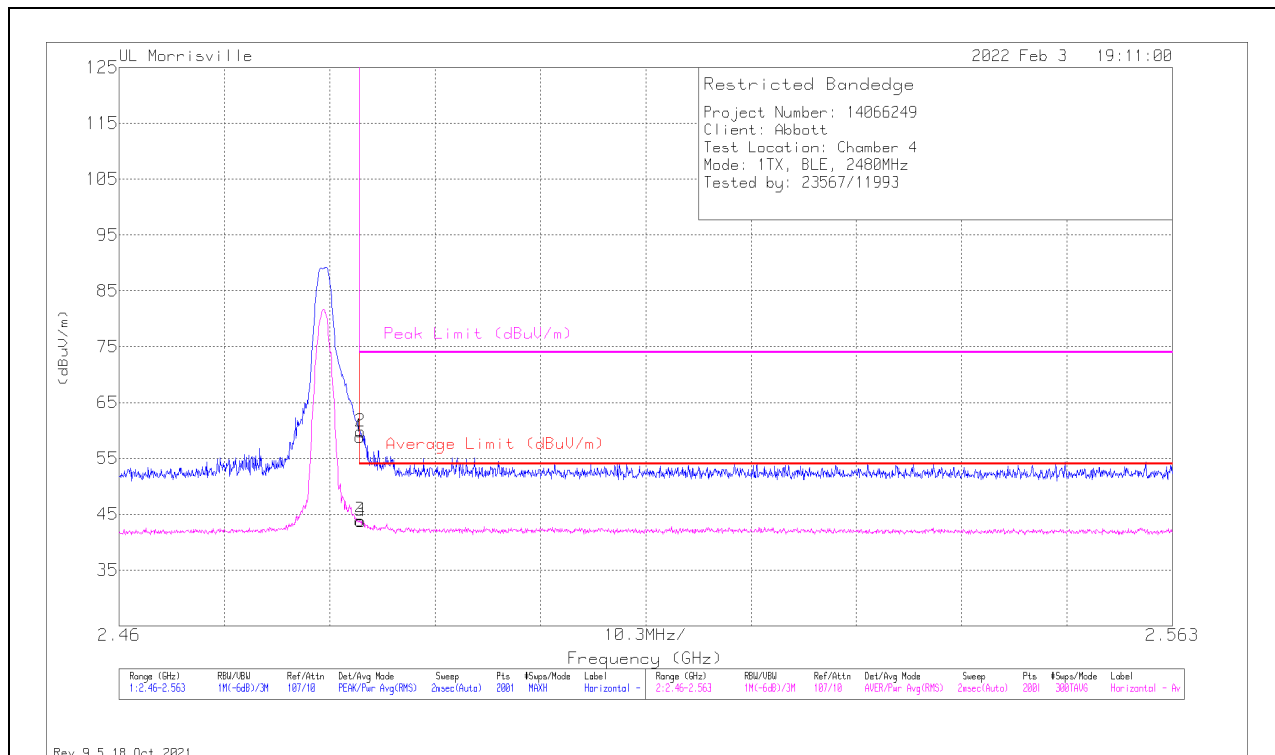


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	34.1	Pk	32	-13.8	0	52.3	-	-	74	-21.7	198	100	V
2	*** 2.34066	35.95	Pk	32	-13.9	0	54.05	-	-	74	-19.95	198	100	V
3	*** 2.38996	16.32	RMS	32	-13.8	6.82	41.34	54	-12.66	-	-	198	100	V
4	*** 2.35683	17.03	RMS	31.9	-13.9	6.82	41.85	54	-12.15	-	-	198	100	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

BANDEGE (HIGH CHANNEL)

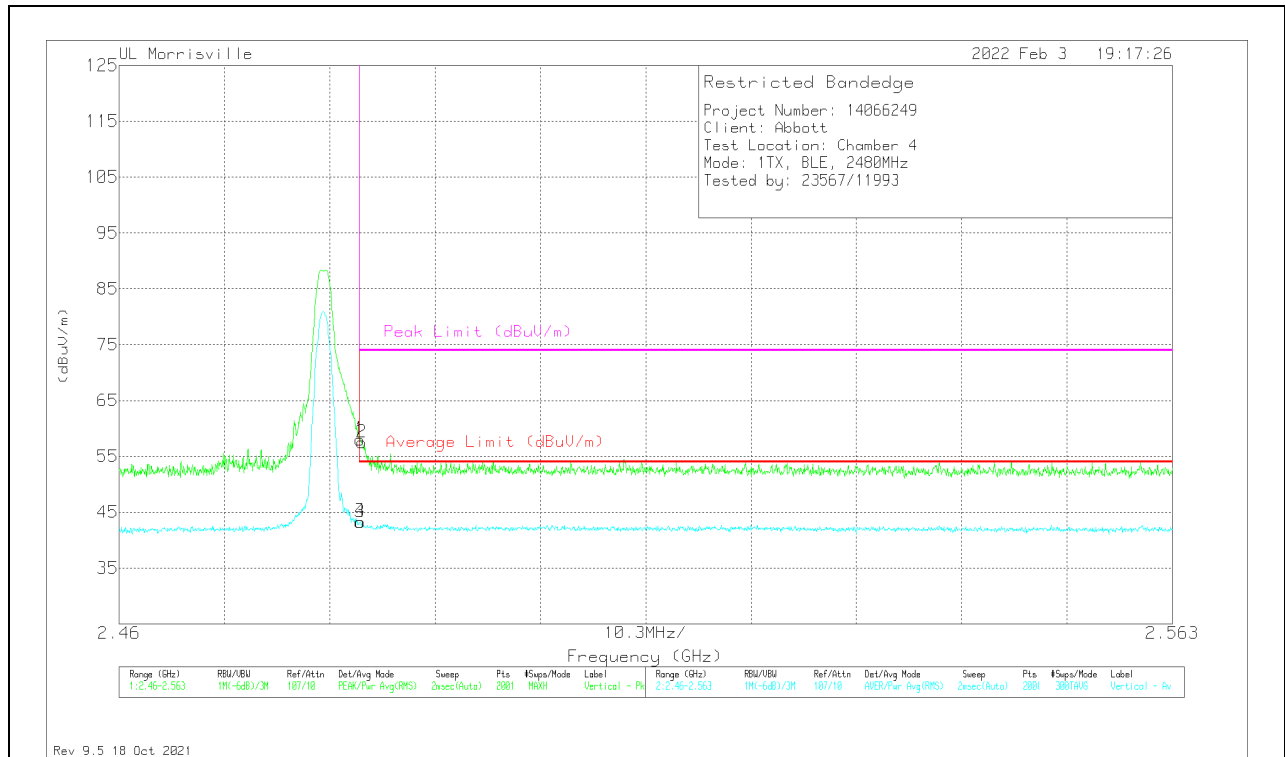
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	*** 2.48354	40	Pk	32.6	-13.7	0	58.9	-	-	74	-15.1	262	119	H
2	*** 2.48359	40.91	Pk	32.6	-13.7	0	59.81	-	-	74	-14.19	262	119	H
3	*** 2.48354	18.16	RMS	32.6	-13.7	6.82	43.88	54	-10.12	-	-	262	119	H
4	*** 2.48364	18.03	RMS	32.6	-13.7	6.82	43.75	54	-10.25	-	-	262	119	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

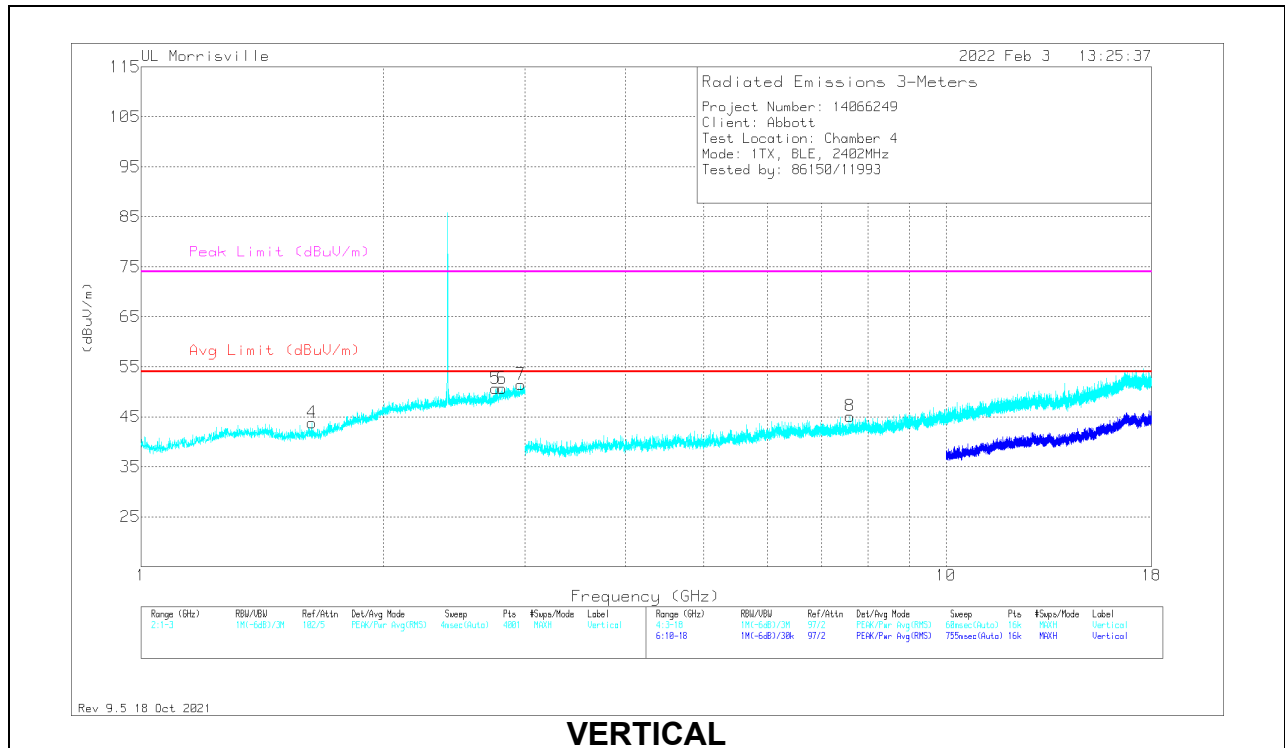
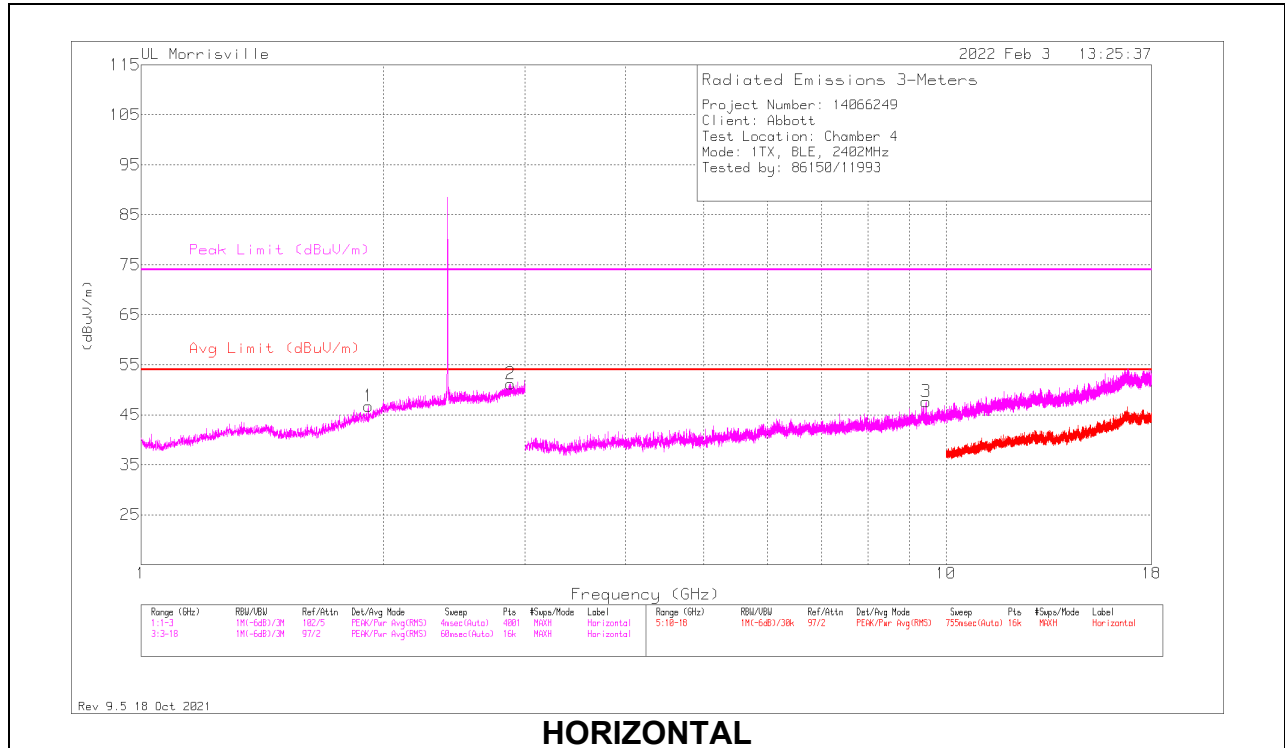


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.48354	39.13	Pk	32.6	-13.7	0	58.03	-	-	74	-15.97	154	103	V
2	*** 2.48374	38.6	Pk	32.6	-13.7	0	57.5	-	-	74	-16.5	154	103	V
3	*** 2.48354	17.54	RMS	32.6	-13.7	6.82	43.26	54	-10.74	-	-	154	103	V
4	*** 2.48359	17.57	RMS	32.6	-13.7	6.82	43.29	54	-10.71	-	-	154	103	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



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	** 1.9165	30.62	Pk	30.6	-14.5	46.72	54	-7.28	74	-27.28	0-360	100	H
2	* ** 2.87675	31.95	PK2	32.5	-12.8	51.65	54	-2.35	74	-22.35	234	162	H
5	* ** 2.7572	31.54	PK2	32	-13.2	50.34	54	-3.66	74	-23.66	100	235	V
6	* ** 2.80907	31.51	PK2	32.3	-13	50.81	54	-3.19	74	-23.19	140	242	V
3	* ** 9.44438	37.63	Pk	36.5	-26.5	47.63	54	-6.37	74	-26.37	0-360	100	H
8	* ** 7.60125	38.22	Pk	35.6	-28.7	45.12	54	-8.88	74	-28.88	0-360	200	V
4	1.6305	30.71	Pk	28.1	-15	43.81	54	-10.19	74	-30.19	0-360	200	V
7	2.9625	31.46	Pk	32.7	-12.7	51.46	54	-2.54	74	-22.54	0-360	200	V

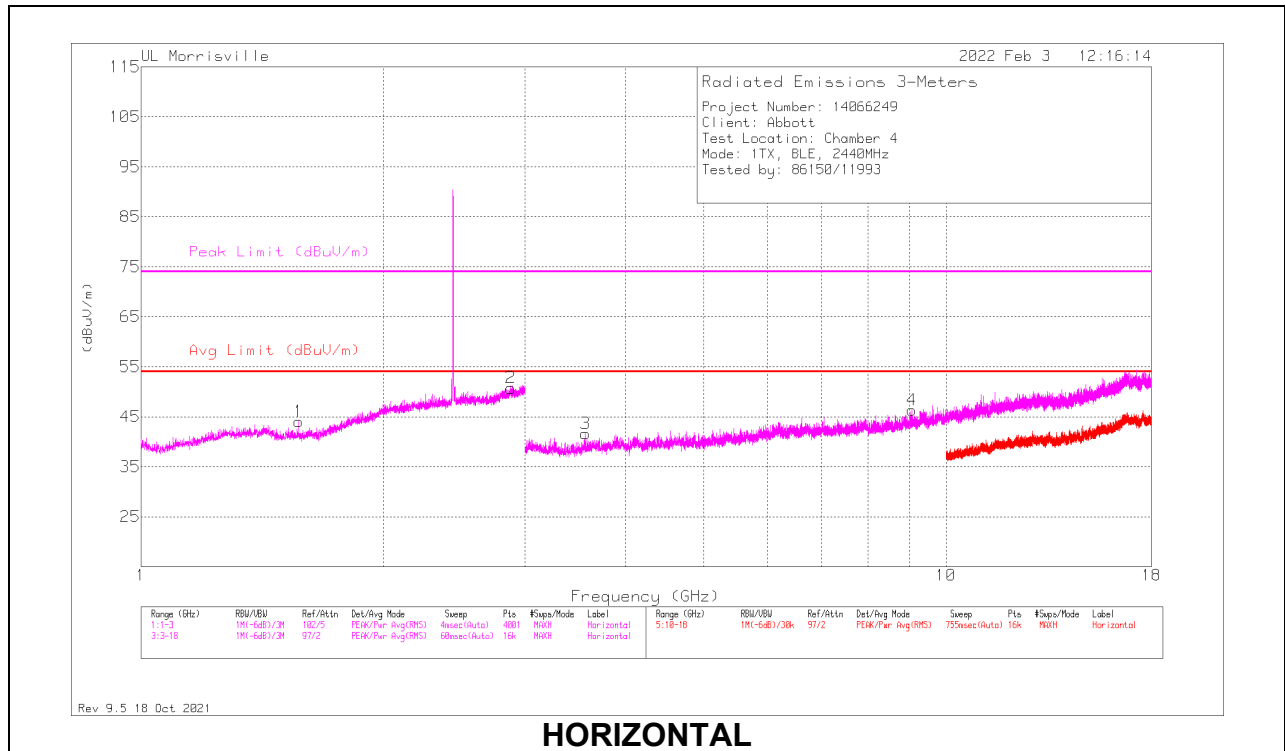
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

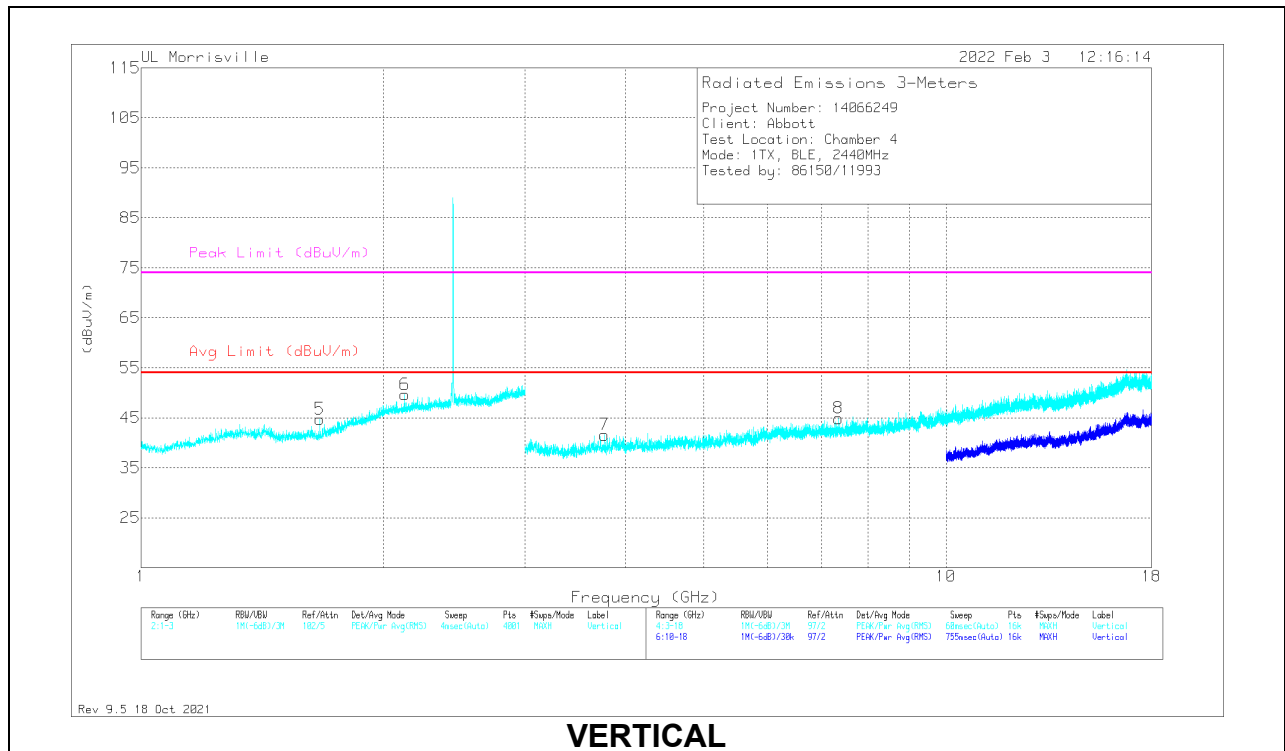
Pk - Peak detector

PK2 - Maximum Peak

MID CHANNEL RESULTS



HORIZONTAL



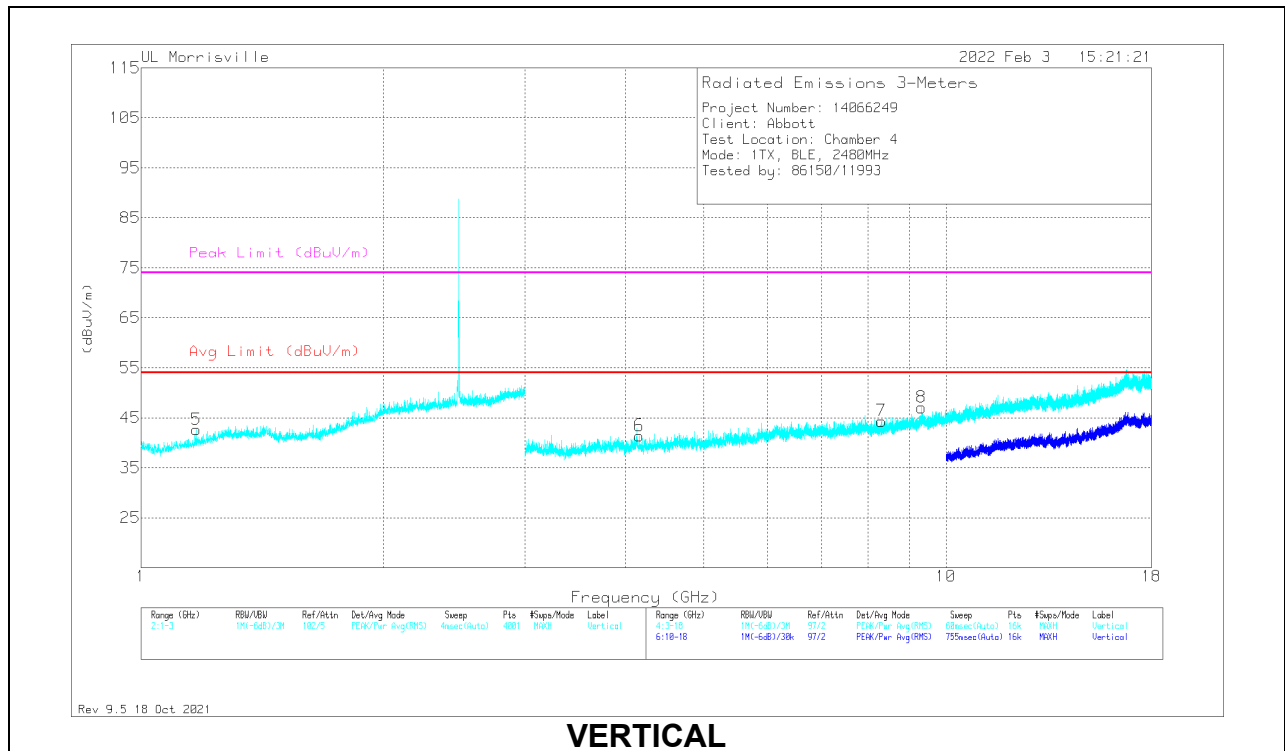
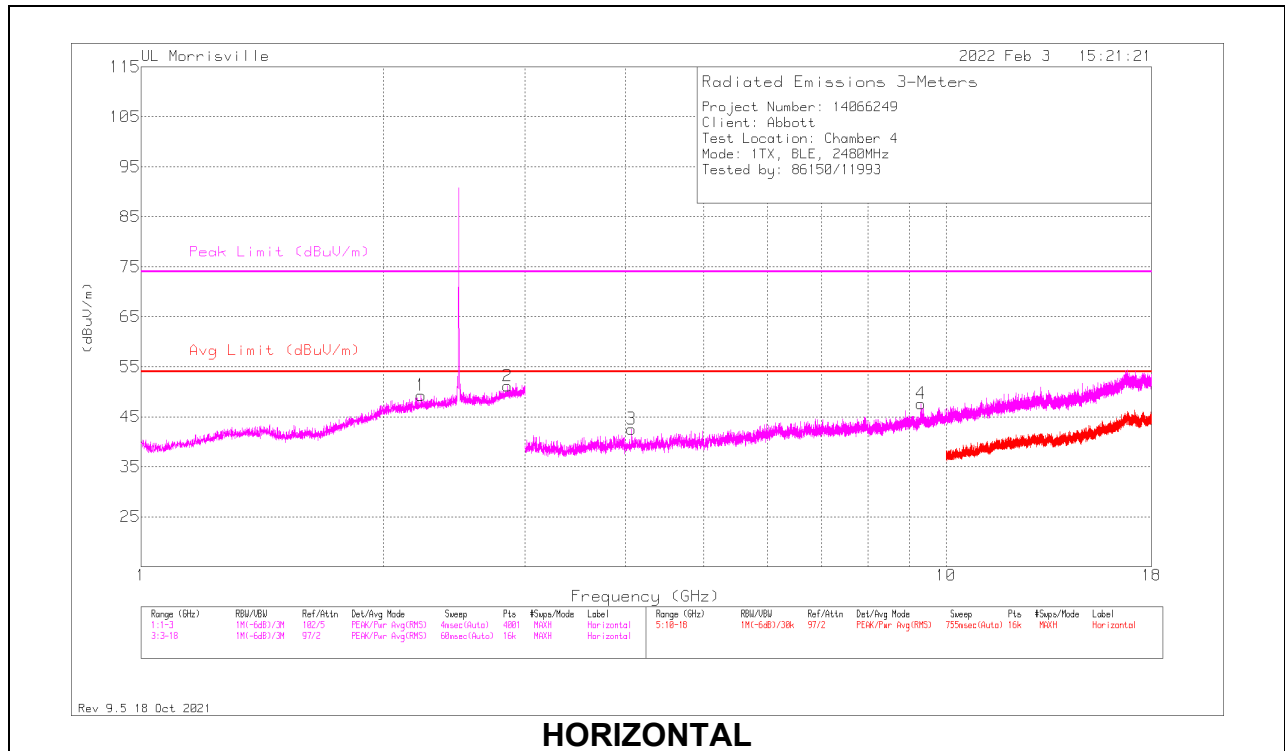
VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 1.57	31.14	Pk	27.9	-15	44.04	54	-9.96	74	-29.96	0-360	100	H
2	*** 2.88026	31.99	PK2	32.5	-12.8	51.69	54	-2.31	74	-22.31	135	395	H
5	*** 1.6675	31.68	Pk	27.9	-14.9	44.68	54	-9.32	74	-29.32	0-360	200	V
6	** 2.12604	31.57	PK2	31.5	-14.2	48.87	54	-5.13	74	-25.13	353	393	V
3	*** 3.56438	43.09	Pk	33	-34.5	41.59	54	-12.41	74	-32.41	0-360	100	H
4	*** 9.06563	35.83	Pk	36	-25.5	46.33	54	-7.67	74	-27.67	0-360	100	H
7	*** 3.76125	41.67	Pk	33.3	-33.4	41.57	54	-12.43	74	-32.43	0-360	200	V
8	*** 7.35	38.17	Pk	35.6	-28.9	44.87	54	-9.13	74	-29.13	0-360	200	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 PK2 - Maximum Peak

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.22738	31.67	PK2	31.6	-14.1	49.17	54	-4.83	74	-24.83	298	400	H
2	*** 2.85261	32.69	PK2	32.4	-12.9	52.19	54	-1.81	74	-21.81	18	391	H
5	** 1.171	30.73	Pk	27.6	-15.7	42.63	54	-11.37	74	-31.37	0-360	200	V
3	*** 4.06875	42.22	Pk	33.4	-33.1	42.52	54	-11.48	74	-31.48	0-360	100	H
4	*** 9.31219	37.33	Pk	36.4	-26.1	47.63	54	-6.37	74	-26.37	0-360	100	H
6	*** 4.15875	40.58	Pk	33.3	-32.5	41.38	54	-12.62	74	-32.62	0-360	200	V
7	*** 8.31469	36.45	Pk	35.7	-27.8	44.35	54	-9.65	74	-29.65	0-360	200	V
8	*** 9.32906	36.45	Pk	36.4	-25.8	47.05	54	-6.95	74	-26.95	0-360	200	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

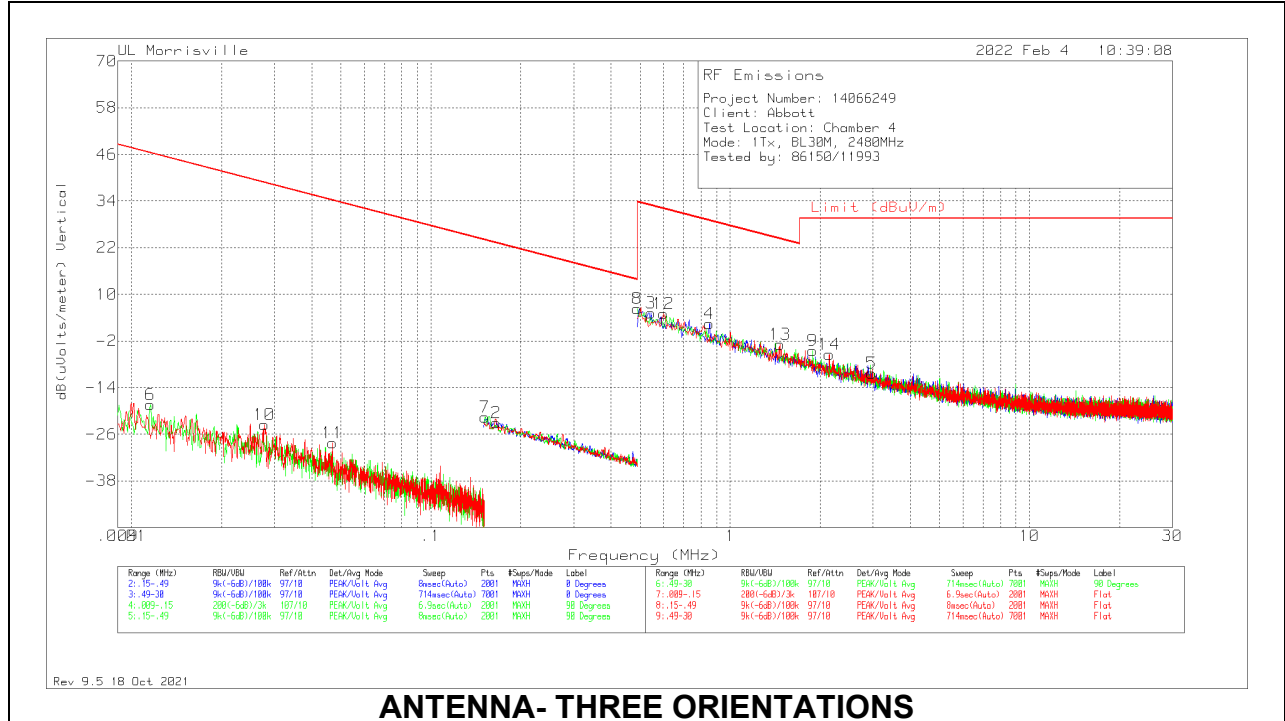
Pk - Peak detector

PK2 - Maximum Peak

10.3. WORST CASE BELOW 30MHZ

Note for below 30 MHz scans: 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 $40 \cdot \log(\text{test distance} / \text{specification distance})$.

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION E FIELD)



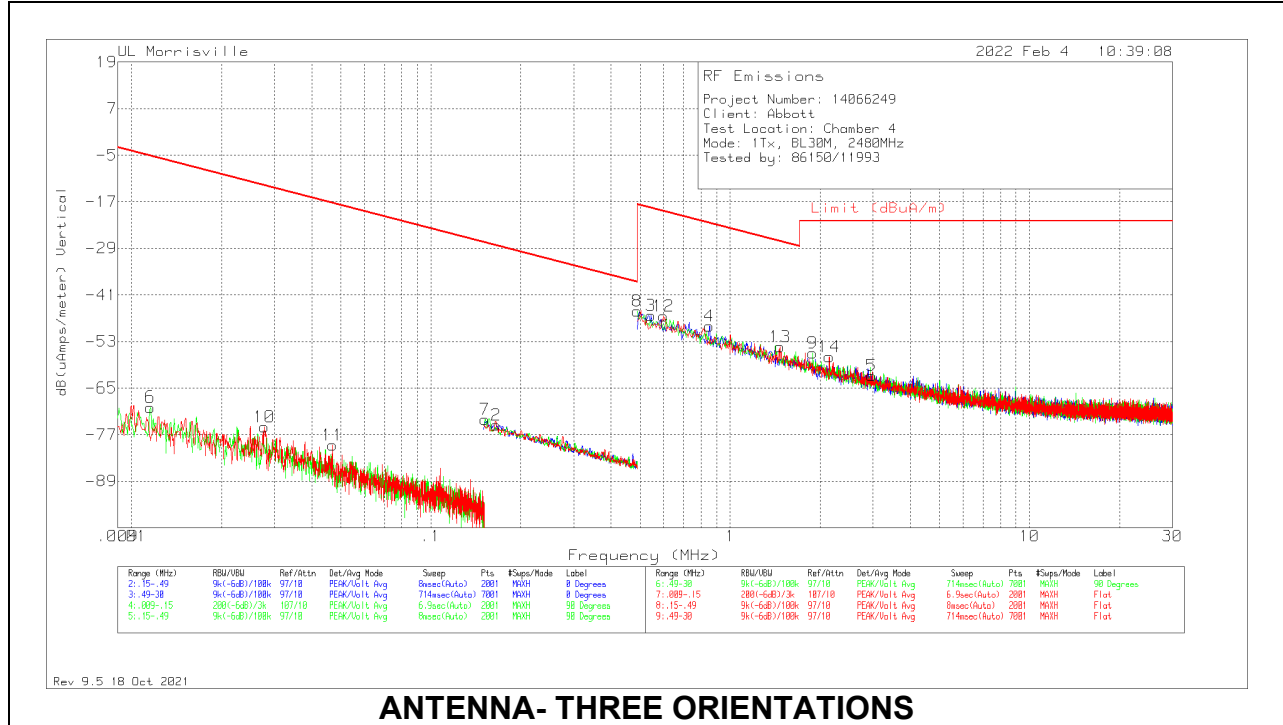
ANTENNA- THREE ORIENTATIONS

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (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)	Height (cm)	Loop Angle
6	.01156	43.76	Pk	17.7	.1	-80	-18.44	46.35	66.35	-64.79	0-360	400	90 degs
1	.01362	44.5	Pk	16.8	.1	-80	-18.6	44.92	64.92	-63.52	0-360	400	0 degs
10	.02774	42.86	Pk	13.5	.1	-80	-23.54	38.74	58.74	-62.28	0-360	400	Flat
11	.04699	39.69	Pk	12	.1	-80	-28.21	34.17	54.17	-62.38	0-360	400	Flat
7	.1517	47.08	Pk	11.2	.1	-80	-21.62	23.98	43.98	-45.6	0-360	400	90 degs
2	.16556	45.61	Pk	11.2	.1	-80	-23.09	23.23	43.23	-46.32	0-360	400	0 degs
8	.49	34.89	Pk	11.2	.2	-40	6.29	13.8	33.8	-7.51	0-360	400	90 degs
3	.54481	33.78	Pk	11.2	.2	-40	5.18	32.88	-	-27.7	0-360	400	0 degs
12	.59962	33.64	Pk	11.2	.2	-40	5.04	32.05	-	-27.01	0-360	400	Flat
4	.85258	31.01	Pk	11.3	.2	-40	2.51	28.99	-	-26.48	0-360	400	0 degs
13	1.46811	25.52	Pk	11.3	.3	-40	-2.88	24.27	-	-27.15	0-360	400	Flat
9	1.88971	23.83	Pk	11.4	.3	-40	-4.47	29.54	-	-34.01	0-360	400	90 degs
14	2.14267	22.89	Pk	11.4	.3	-40	-5.41	29.54	-	-34.95	0-360	400	Flat
5	2.96058	17.91	Pk	11.4	.4	-40	-10.29	29.54	-	-39.83	0-360	400	0 degs

Pk - Peak detector

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION H FIELD)



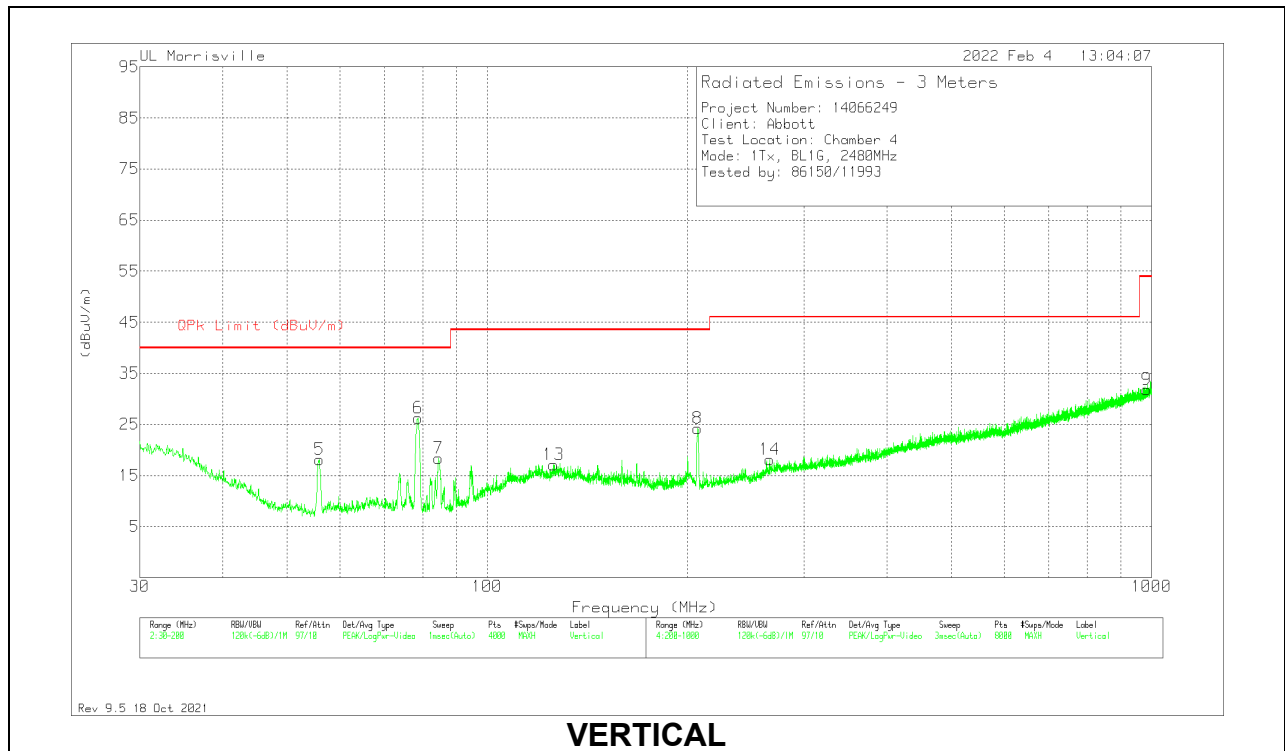
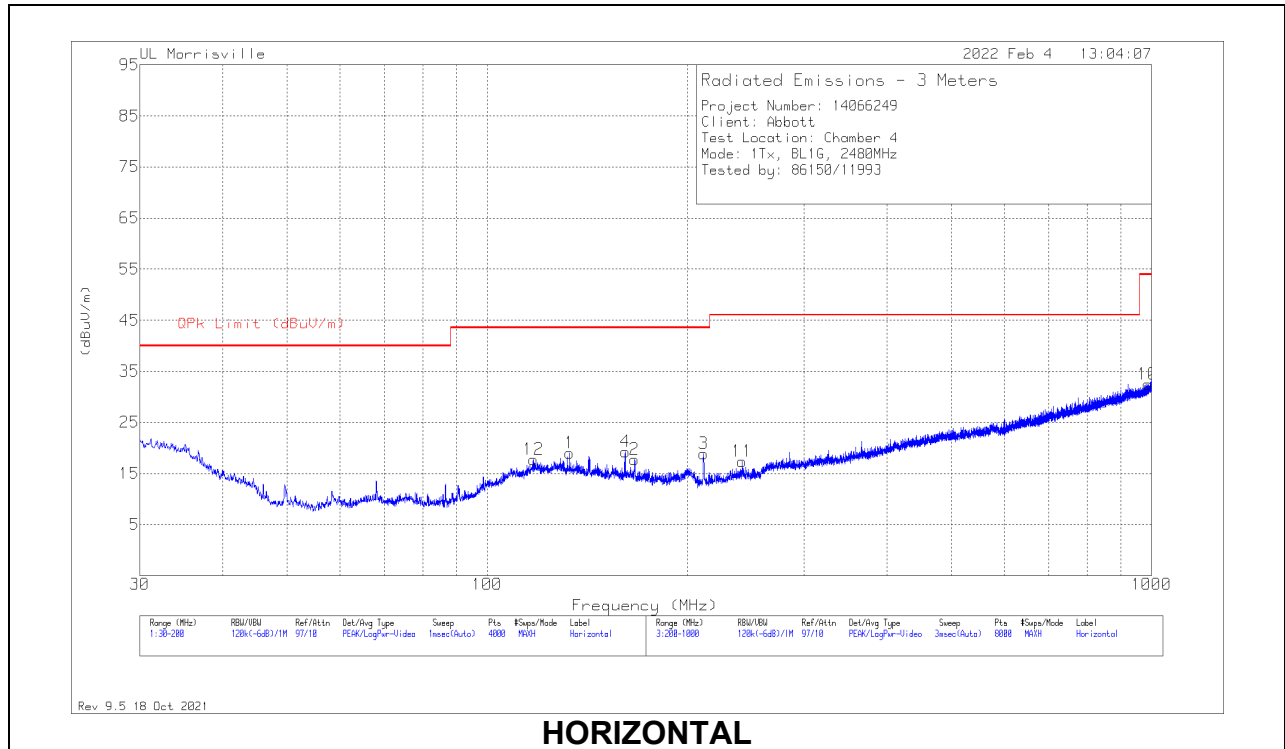
Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	RSS-GEN Qp/Av Limit (dBuA/m)	RSS-GEN Pk Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
6	.01156	43.76	Pk	-33.8	.1	-80	-69.94	-5.15	14.85	-64.79	0-360	400	90 degs
1	.01362	44.5	Pk	-34.7	.1	-80	-70.1	-6.58	13.42	-63.52	0-360	400	0 degs
10	.02774	42.86	Pk	-38	.1	-80	-75.04	-12.76	7.24	-62.28	0-360	400	Flat
11	.04699	39.69	Pk	-39.5	.1	-80	-79.71	-17.33	2.77	-62.38	0-360	400	Flat
7	.1517	47.08	Pk	-40.3	.1	-80	-73.12	-27.52	-7.52	-45.6	0-360	400	90 degs
2	.16556	45.61	Pk	-40.3	.1	-80	-74.59	-28.27	-8.27	-46.32	0-360	400	0 degs
8	.49	34.89	Pk	-40.3	.2	-40	-45.21	-37.7	-17.7	-7.51	0-360	400	90 degs
3	.54481	33.78	Pk	-40.3	.2	-40	-46.32	-18.62	-	-27.7	0-360	400	0 degs
12	.59962	33.64	Pk	-40.3	.2	-40	-46.46	-19.45	-	-27.01	0-360	400	Flat
4	.85258	31.01	Pk	-40.2	.2	-40	-48.99	-22.51	-	-26.48	0-360	400	0 degs
13	1.46811	25.52	Pk	-40.2	.3	-40	-54.38	-27.23	-	-27.15	0-360	400	Flat
9	1.88971	23.83	Pk	-40.1	.3	-40	-55.97	-21.96	-	-34.01	0-360	400	90 degs
14	2.14267	22.89	Pk	-40.1	.3	-40	-56.91	-21.96	-	-34.95	0-360	400	Flat
5	2.96058	17.91	Pk	-40.1	.4	-40	-61.79	-21.96	-	-39.83	0-360	400	0 degs

Pk - Peak detector

10.4. WORST CASE BELOW 1 GHZ

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



Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	206210 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 133.0042	31.1	Pk	17.6	-29.7	19	43.52	-24.52	0-360	100	H
2	* ** 166.6304	31.12	Pk	16	-29.4	17.72	43.52	-25.8	0-360	100	H
12	* ** 117.3176	30.03	Pk	17.6	-29.9	17.73	43.52	-25.79	0-360	100	H
13	* ** 125.9048	28.98	Pk	17.9	-29.8	17.08	43.52	-26.44	0-360	100	V
10	* ** 987.6024	27.62	Pk	27.3	-22.5	32.42	53.97	-21.55	0-360	100	H
11	* ** 242.1055	30.4	Pk	15.7	-28.7	17.4	46.02	-28.62	0-360	300	H
9	* ** 983.8019	27.09	Pk	27.2	-22.5	31.79	53.97	-22.18	0-360	200	V
14	* ** 266.1086	29.6	Pk	17	-28.5	18.1	46.02	-27.92	0-360	100	V
5	55.8892	37.79	Pk	11.2	-30.9	18.09	-	-	0-360	100	V
6	78.6751	44.98	Pk	11.7	-30.5	26.18	-	-	0-360	100	V
7	84.4991	37.25	Pk	11.4	-30.3	18.35	-	-	0-360	100	V
4	161.4015	32.34	Pk	16.3	-29.4	19.24	-	-	0-360	100	H
8	207.501	38.73	Pk	14.5	-29	24.23	-	-	0-360	100	V
3	211.8015	33.28	Pk	14.5	-28.9	18.88	-	-	0-360	100	H

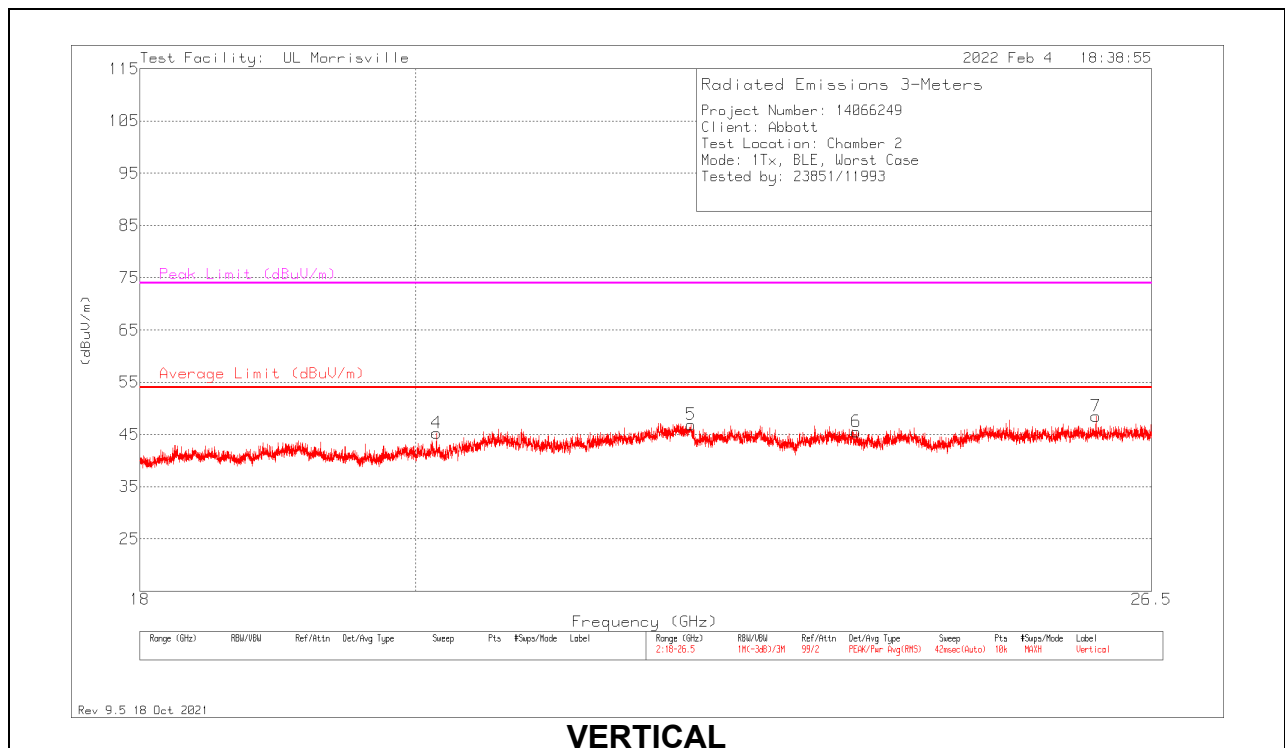
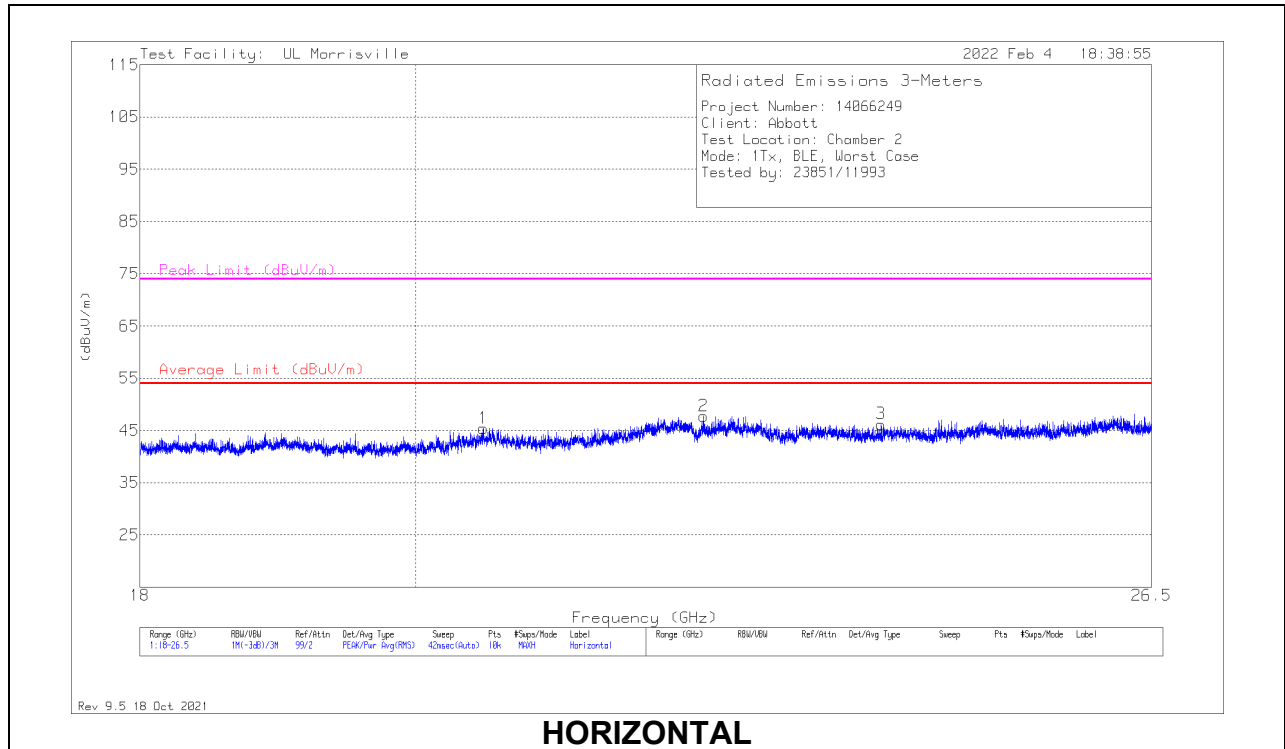
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.5. WORST CASE 18-26 GHZ

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



18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0063 (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	* ** 20.52595	49.16	Pk	33.9	-37.7	45.36	54	-8.64	74	-28.64	0-360	249	H
2	* ** 22.32777	48.8	Pk	36.6	-37.7	47.7	54	-6.3	74	-26.3	0-360	101	H
3	* ** 23.89416	48.79	Pk	34.9	-37.5	46.19	54	-7.81	74	-27.81	0-360	149	H
4	* ** 20.16133	49.14	Pk	33.6	-37.5	45.24	54	-8.76	74	-28.76	0-360	300	V
5	* ** 22.22238	47.81	Pk	36.8	-37.7	46.91	54	-7.09	74	-27.09	0-360	101	V
6	* ** 23.67148	47.93	Pk	34.9	-37.3	45.53	54	-8.47	74	-28.47	0-360	150	V
7	25.94246	49.34	Pk	35.4	-36.3	48.44	-	-	74	-25.56	0-360	250	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

11. SETUP PHOTOS

Please refer to R14066249-EP1 for setup photos

END OF TEST REPORT