TEST REPORT

Report Number. : R15093706-E1

Applicant	:	Physio-Control Inc 11811 Willows Road NE Redmond, WA 98052-2003, USA
Model	:	LIFEPAK CR2
Contains FCC ID	:	CZO23LPCR2T
Contains IC	:	1449A-23LPCR2T
EUT Description	:	Defibrillator
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C: 2023 ISED RSS-247 ISSUE 3: 2023 ISED RSS-GEN ISSUE 5: 2018+A1: 2019+A2:2021

Date Of Issue:
2024-01-03

Prepared by:
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ACCREDITED
CERT #0751.06

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-01-03	Initial Issue	Noah Bennett

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Physio-Control Inc
11811 Willows Road NE
Redmond, WA 98052-2003, USA

EUT DESCRIPTION: Defibrillator

MODEL: LIFEPAK CR2

SERIAL NUMBER: 50628715(EUT), PC24910003(battery), PC24911616(battery)

SAMPLE RECEIPT DATE: 2023-12-08

DATE TESTED: 2023-12-08 to 2023-12-18

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
47 CFR Part 15 Subpart C: 2023	Refer to Section 2
ISED RSS-247 Issue 3: 2023	Refer to Section 2
ISED RSS-GEN Issue 5 + A1 + A2: 2021	Refer to Section 2

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.

Approved & Released
For UL LLC By:

Jeff Moser
Operations Manager
Consumer Technology Division
UL LLC

Prepared By:

Noah Bennett
Engineering Project Associate
Consumer Technology Division
UL LLC

2. TEST RESULTS SUMMARY

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. The following is information provided by the client:

1. Antenna Gain and Type (see section 6.3)
2. Worst-Case Data rates (see section 6.5)

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	20dB BW/99% OBW	Compliant	See Note 1.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW		
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power		See Note 2.
See Comment		Average power		
15.247 (e)	RSS-247 5.2 (b)	PSD		See Note 1.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions		
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions		
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Not Performed	EUT is Battery Power only.

Note 1: All Testing for these requirements was performed at mid channel power settings, or the highest power setting programmed on the EUT.

Note 2: For output power, power was reduced from the original module certification due to radiated test failures. Therefore, full antenna port testing is included in this report.

3. 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 3.

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
☒	Building 2800 Suite Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

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:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

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

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is the LIFEPAK CR2 defibrillator, which is an automated external defibrillator (AED) with a 2.4GHz WLAN Radio and WWAN Radio. This report covers the testing of the 2.4GHz WLAN Radio.

6.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
2412 - 2462	802.11b	14.54	28.44
2412 - 2462	802.11g	25.53	357.27
2412 - 2462	802.11n HT20	24.78	300.61

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

Chain	Designation in Documentation	Type	Frequency Range (MHz)	Maximum Gain (dBi)
0	WLAN DUAL BAND ANTENNA PCB	External PCB	2412 – 2462	1.5

6.4. SOFTWARE AND FIRMWARE

HW version: 3315185-004
SW/FW Version: 3319936-003
EUT Control Software: AmebaD_mptool_2V2

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.

Power was reduced from the original module certification due to radiated test failures. Therefore, full antenna port testing is included in this report. Radiated Band edge, Power and PSD were done at the certification power settings.

Conducted BW, CSE, CBE, and Radiated spurious emissions tests were performed at mid channel power settings, or the highest power setting programmed on the EUT to represent worst-case.

The EUT is meant to be battery powered only and will not operate while charging. Therefore, AC Mains was not tested, and the EUT was set up on battery power for all tests.

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

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

802.11b mode: CCK_1 Mbps
802.11g mode: OFDM_6 Mbps
802.11n HT20mode: MCS0

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Support Laptop	Asus	X515J	M8N0CX14J687338	PD99461NG
Support Laptop charger	Asus	W19-045N3A	N/A	N/A

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	UART	1	USB	Shielded	<1m	Used to program UART on EUT. Removed for testing.
2	Micro-USB	1	Micro-USB	Shielded	<1m	Port Population.
3	Barrel DC	1	Charging	Shielded	<3m	Used to Connect Support Laptop to AC Mains to maintain battery.

TEST SETUP

The EUT is configured as tabletop equipment. Support laptops were connected to configure and program the EUT to transmit continuously during the entire test.

SETUP DIAGRAM

Please refer to R14593706-EP1 for setup diagrams

7. MEASUREMENT METHOD

6 dB BW: ANSI C63.10 Subclause -11.8.1

99% OBW: ANSI C63.10-2013 Subclause – 6.9.3

Output Power: ANSI C63.10 Subclause -11.9.1.3 PKPM1 Peak power meter method

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)

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

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

General Radiated Spurious Emissions: ANSI C63.10-2013 Section 6.3 to 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 - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	COND1				
238710	Environmental Meter	Fisher Scientific	15-077-963	2023-06-27	2024-06-27
179892	Environmental Meter	Fisher Scientific	15-077-963	2023-07-26	2024-06-31
Power Software	Boonton Power Analyzer	Boonton	Version 3.0.13.0	NA	NA
90411	Spectrum Analyzer	Keysight Technologies	N9030A	2023-08-02	2024-08-02
211055	Real-Time Peak Power Sensor 50MHz to 8GHz	Boonton	RTP5000	2023-08-01	2024-08-01
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
	Attenuators				
ATTEN-X	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-20	2023-02-16	2024-02-16

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				
135144	Active Loop Antenna	ETS-Lindgren	6502	2023-01-17	2024-01-17
	30-1000 MHz				
90629	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2023-01-06	2024-01-06
	1-18 GHz				
89509	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-05-23	2025-05-23
	18-40 GHz				
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-826	2023-07-20	2025-07-20
	Gain-Loss Chains				
207638	Gain-loss string: 0.009-30MHz	Various	Various	2023-09-18	2024-09-18
207639	Gain-loss string: 25-1000MHz	Various	Various	2023-09-18	2024-09-18
207640	Gain-loss string: 1-18GHz	Various	Various	2023-05-17	2024-05-17
225795	Gain-loss string: 18-40GHz	Various	Various	2023-05-17	2024-05-17
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-04-10	2024-04-10
81018	Spectrum Analyzer	Agilent	E4446A	2023-08-01	2024-08-01
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241204	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

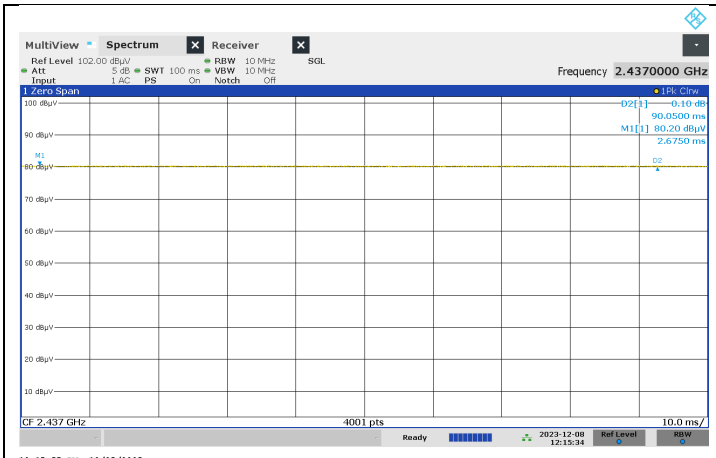
PROCEDURE

ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

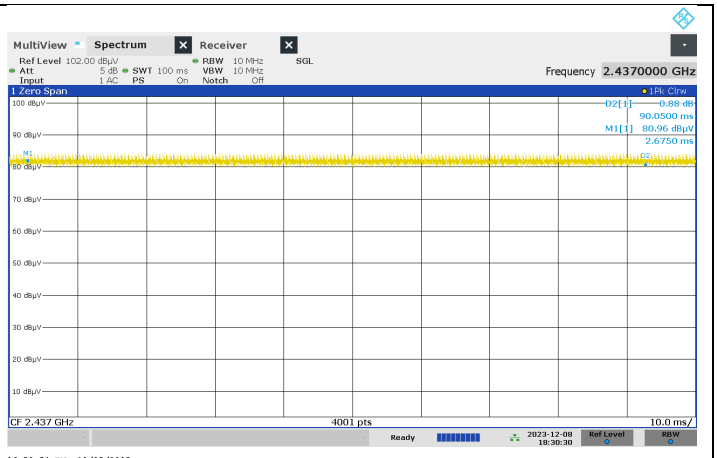
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
Chain 0						
802.11b - 1Mbps	100.000	100.000	1.000	100.00	0.00	0.010
802.11g - 6Mbps	100.000	100.000	1.000	100.00	0.00	0.010
802.11n HT20 - MCS0	100.000	100.000	1.000	100.00	0.00	0.010

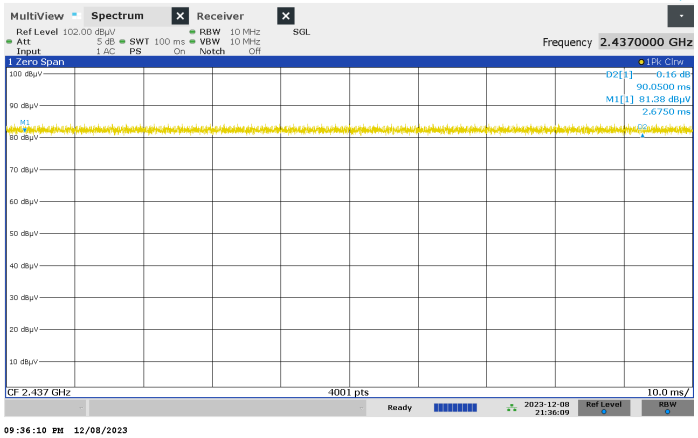
PLOTS



DUTY CYCLE 802.11b – 1Mbps CHAIN 0



DUTY CYCLE 802.11g – 6Mbps CHAIN 0



DUTY CYCLE 802.11n HT20 – MCS0 CHAIN 0

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9.2. 99% BANDWIDTH

LIMITS

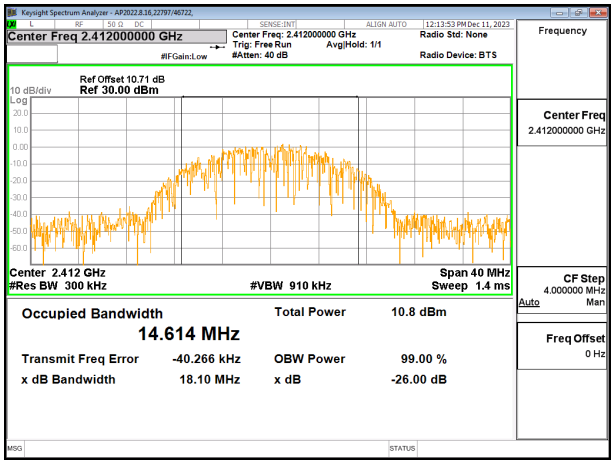
None; for reporting purposes only.

RESULTS

9.2.1. 802.11b MODE

1TX Antenna 1 MODE

Channel	Frequency (MHz)	99% OBW (MHz)
Low 1	2412	14.614
Mid 6	2437	14.623
High 11	2462	14.776



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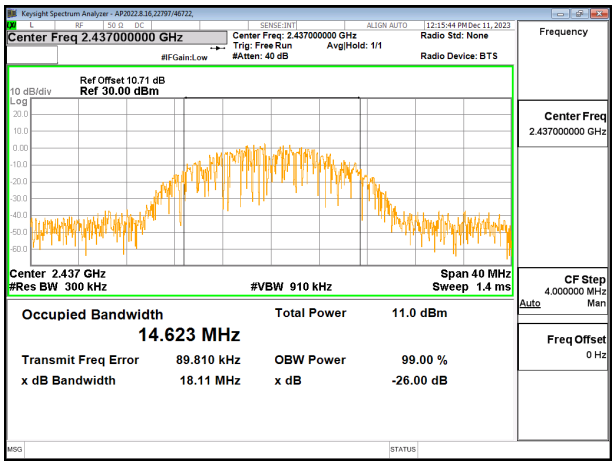
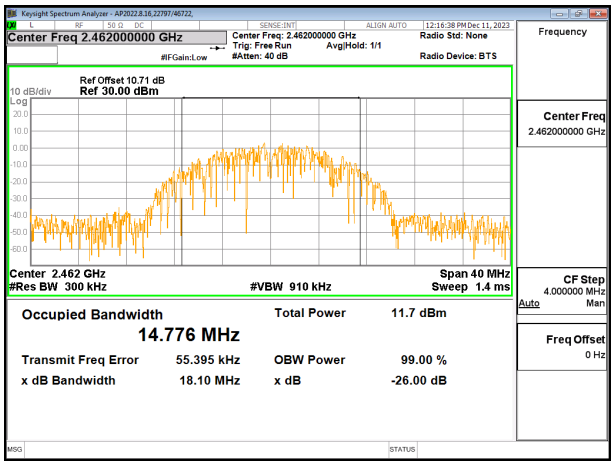


MID CHANNEL 6



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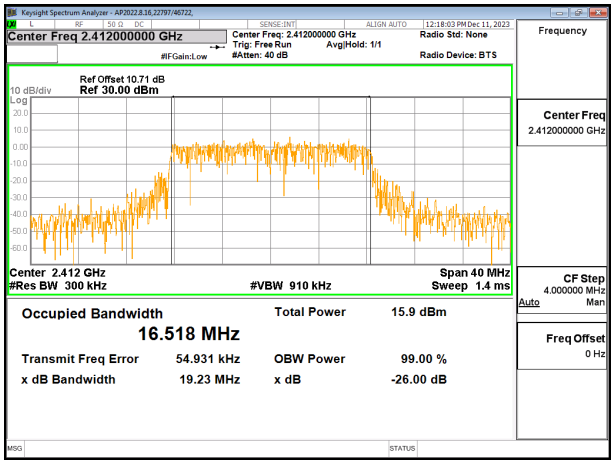
9.2.2. 802.11g MODE

1TX Antenna 1 MODE

Channel	Frequency (MHz)	99% OBW (MHz)
Low 1	2412	16.518
Mid 6	2437	16.423
High 11	2462	16.462



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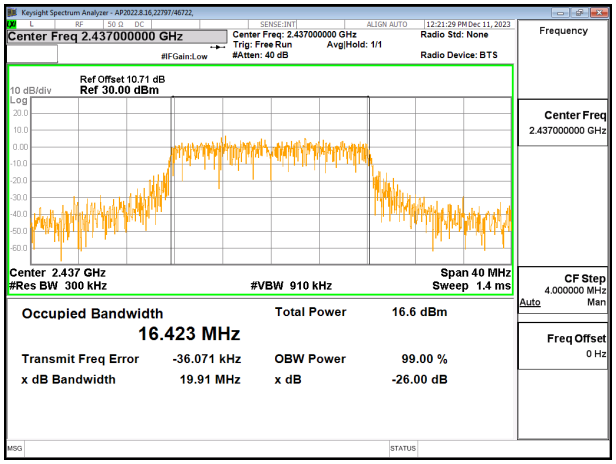

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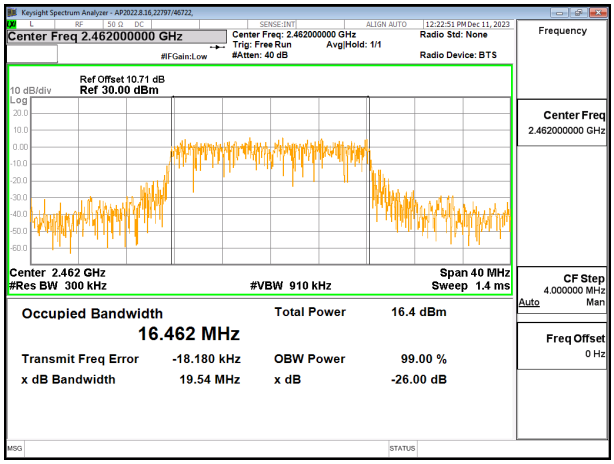

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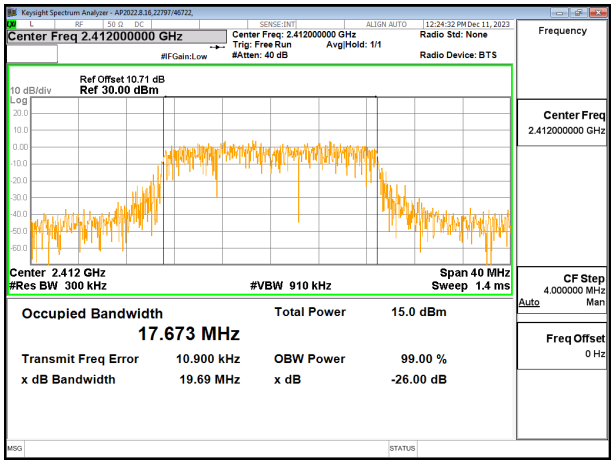
9.2.3. 802.11n HT20 MODE

1TX Antenna 1 MODE

Channel	Frequency (MHz)	99% OBW (MHz)
Low 1	2412	17.673
Mid 6	2437	17.676
High 11	2462	17.706



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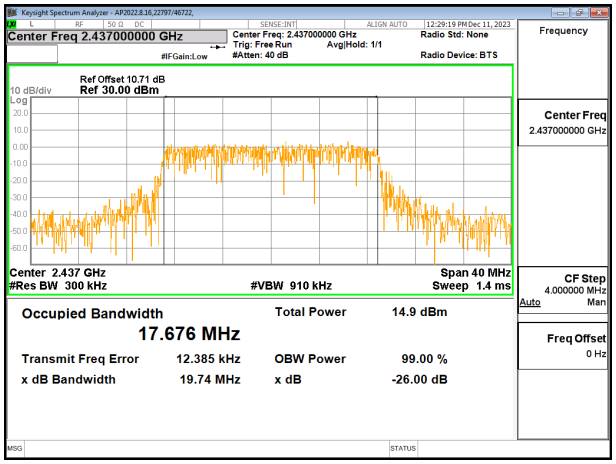

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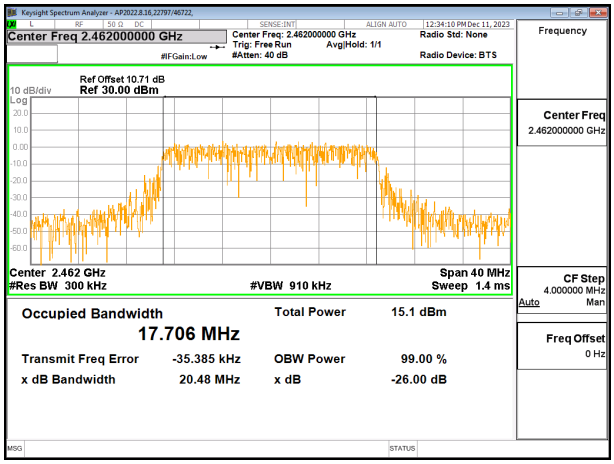

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9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
RSS-247 5.2 (a)

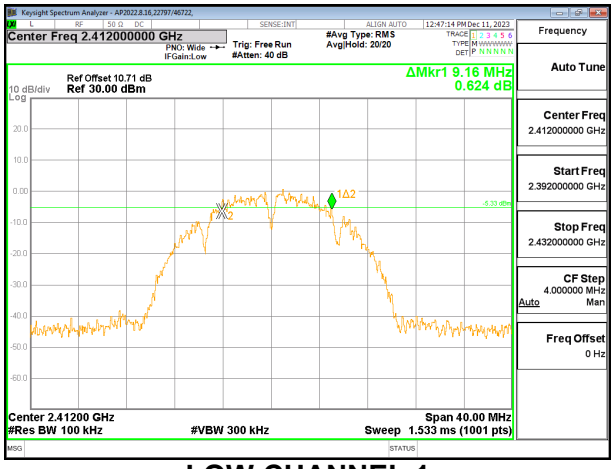
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

9.3.1. 802.11b MODE

1TX Antenna 1 MODE

Channel	Frequency (MHz)	6dB BW (MHz)	Limit (MHz)
Low 1	2412	9.16	0.5
Mid 6	2437	9.84	0.5
High 11	2462	9.64	0.5



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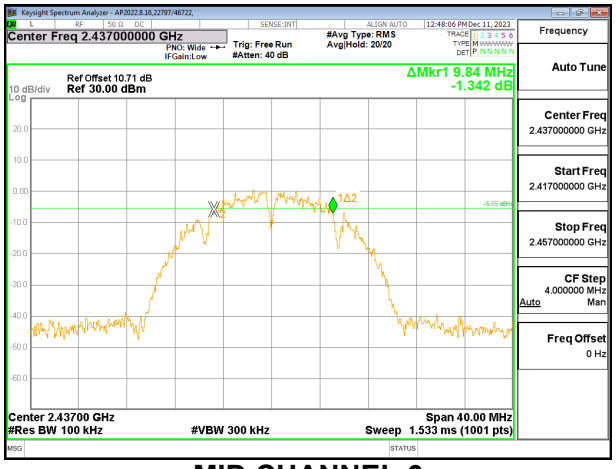

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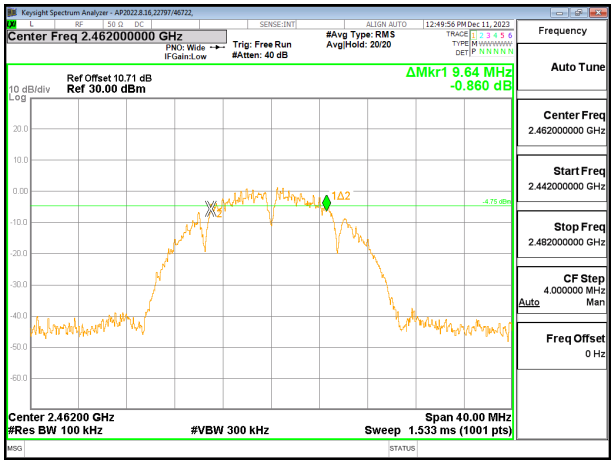

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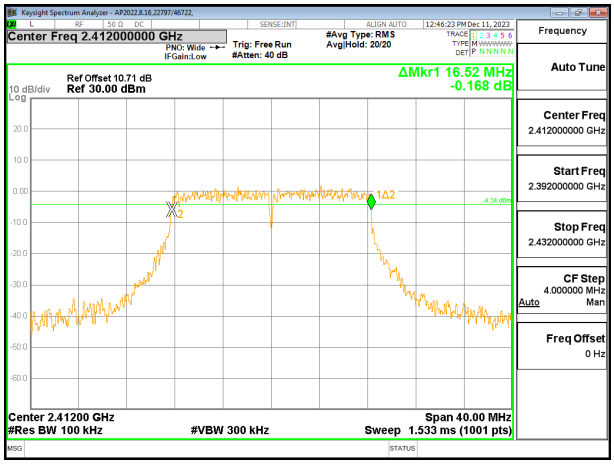
9.3.2. 802.11g MODE

1TX Antenna 1 MODE

Channel	Frequency (MHz)	6dB BW (MHz)	Limit (MHz)
Low 1	2412	16.52	0.5
Mid 6	2437	16.48	0.5
High 11	2462	16.56	0.5



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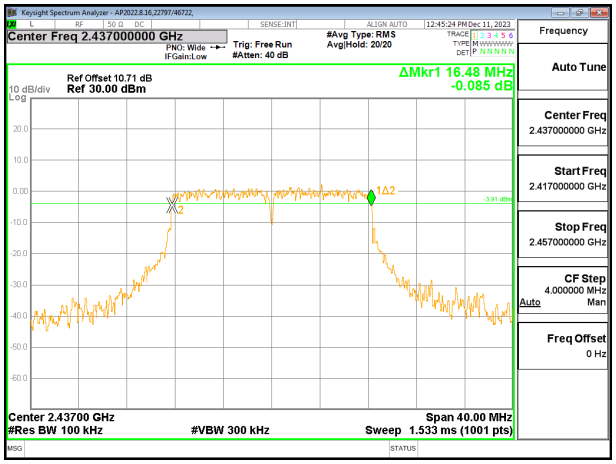

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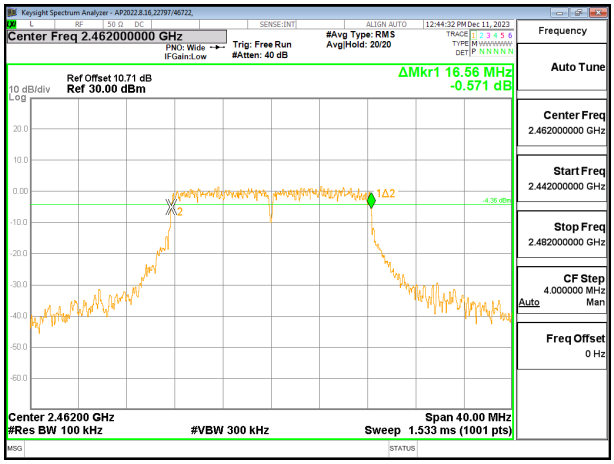

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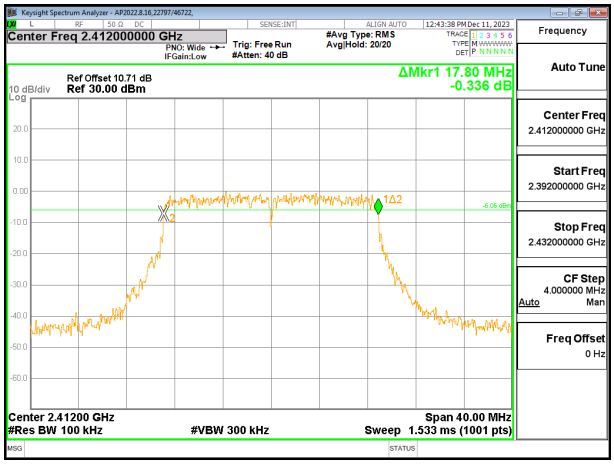
9.3.3. 802.11n HT20 MODE

1TX Antenna 1 MODE

Channel	Frequency (MHz)	6dB BW (MHz)	Limit (MHz)
Low 1	2412	17.80	0.5
Mid 6	2437	17.76	0.5
High 11	2462	17.76	0.5



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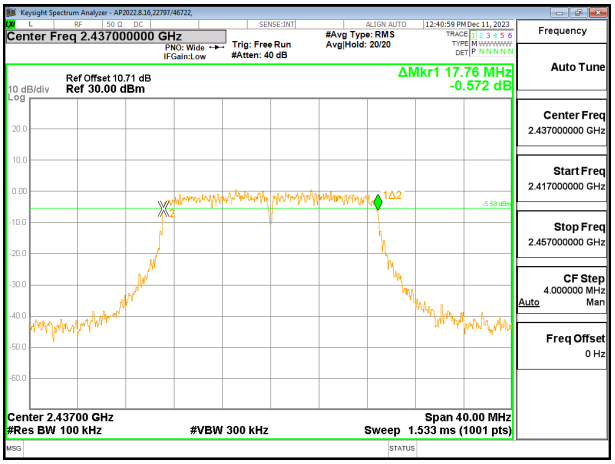

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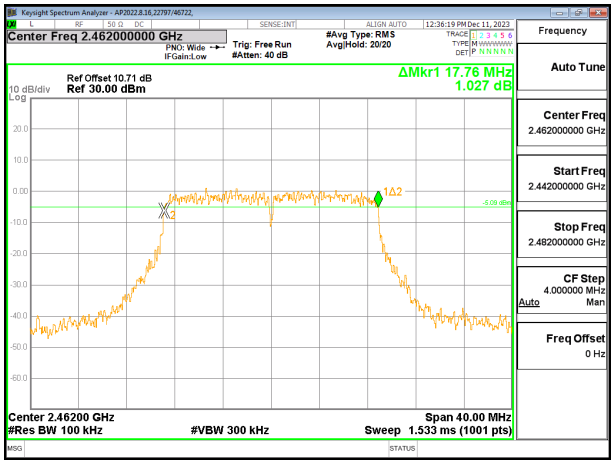

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9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)
RSS-247 5.4 (d)

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

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 0.84 dB from the EUT cable loss was entered as an offset in the power meter to allow for a peak reading of power.

The power output was measured on the EUT antenna port using the U.FL to SMA EUT cable connected to a power meter via wideband power sensor. Peak output power was read directly from power meter.

DIRECTIONAL ANTENNA GAIN

For 1 TX:
There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

9.4.1. 802.11b MODE

1TX Antenna 1 MODE

Test Engineer:	22797/44389
Test Date:	2023-12-8 2023-12-11

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	1.50	30.00	30	36	30.00
Mid 6	2437	1.50	30.00	30	36	30.00
High 11	2462	1.50	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	14.18	14.18	30.00	-15.82
Mid 6	2437	14.24	14.24	30.00	-15.76
High 11	2462	14.54	14.54	30.00	-15.46

9.4.2. 802.11g MODE

1TX Antenna 1 MODE

Test Engineer:	22797/44389
Test Date:	2023-12-8 2023-12-11

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	1.50	30.00	30	36	30.00
Mid 6	2437	1.50	30.00	30	36	30.00
High 11	2462	1.50	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	21.86	21.86	30.00	-8.14
Mid 6	2437	25.53	25.53	30.00	-4.47
High 11	2462	22.04	22.04	30.00	-7.96

9.4.3. 802.11n HT20 MODE

1TX Antenna 1 MODE

Test Engineer:	22797/44389
Test Date:	2023-12-8 2023-12-11

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	1.50	30.00	30	36	30.00
Mid 6	2437	1.50	30.00	30	36	30.00
High 11	2462	1.50	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	21.18	21.18	30.00	-8.82
Mid 6	2437	24.19	24.19	30.00	-5.81
High 11	2462	21.55	21.55	30.00	-8.45

9.5. 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 0.84 dB from the EUT cable loss was entered as an offset in the power meter to allow for a gated average reading of power.

The power output was measured on the EUT antenna port using the U.FL to SMA EUT cable connected to a power meter via wideband power sensor. Gated average output power was read directly from power meter.

RESULTS

9.5.1. 802.11b MODE

1TX Antenna 1 MODE

Test Engineer:	22797/44389
Test Date:	2023-12-8 2023-12-11

Channel	Frequency (MHz)	Avg Power (dBm)
Low 1	2412	11.42
Mid 6	2437	11.48
High 11	2462	11.78

9.5.2. 802.11g MODE

1TX Antenna 1 MODE

Test Engineer:	22797/44389
Test Date:	2023-12-8 2023-12-11

Channel	Frequency (MHz)	Avg Power (dBm)
Low 1	2412	11.90
Low 2	2417	13.91
Mid 6	2437	16.21
High 10	2457	13.85
High 11	2462	12.01

9.5.3. 802.11n HT20 MODE

1TX Antenna 1 MODE

Test Engineer:	22797/44389
Test Date:	2023-12-8 2023-12-11

Channel	Frequency (MHz)	Avg Power (dBm)
Low 1	2412	11.34
Low 2	2417	13.50
Mid 6	2437	15.27
High 10	2457	13.62
High 11	2462	11.93

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

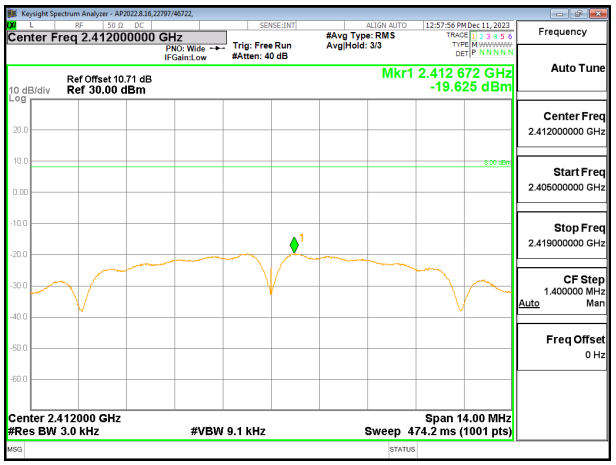
9.6.1. 802.11b MODE

1TX Antenna 1 MODE

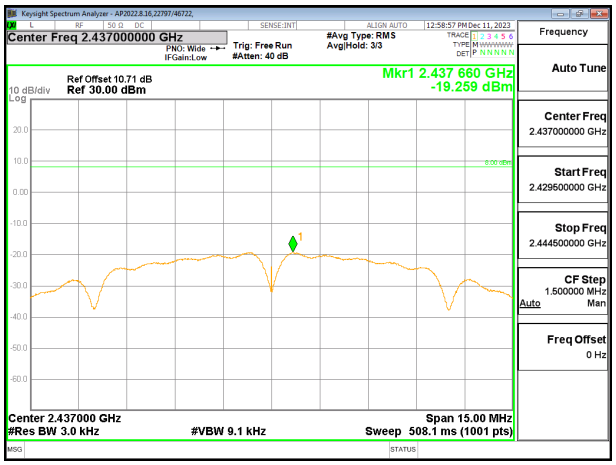
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

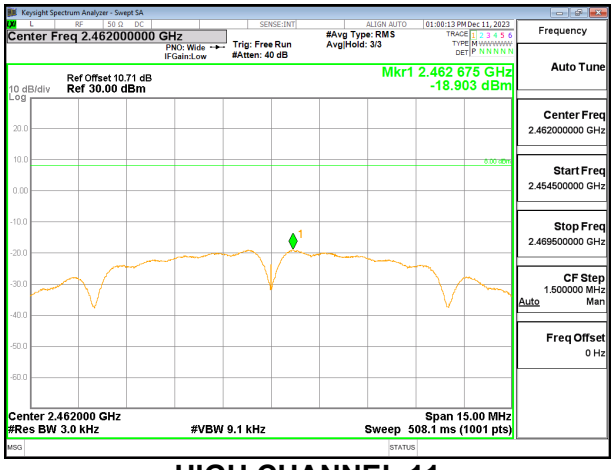
Channel	Frequency (MHz)	Chain 0 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-19.625	-19.625	8.000	-27.625
Mid 6	2437	-19.259	-19.259	8.000	-27.259
High 11	2462	-18.903	-18.903	8.000	-26.903



LOW CHANNEL 1



MID CHANNEL 6



HIGH CHANNEL 11

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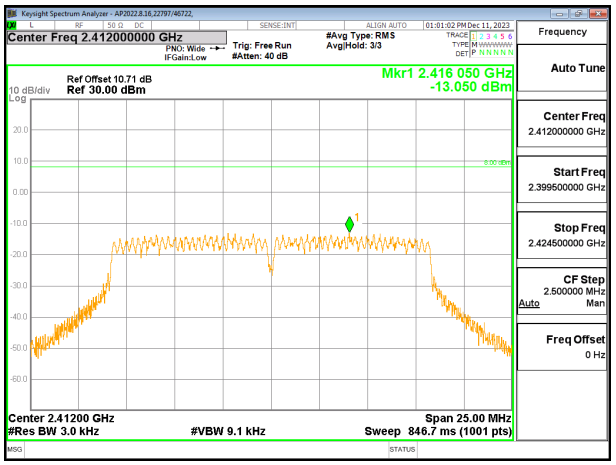
9.6.2. 802.11g MODE

1TX Antenna 1 MODE

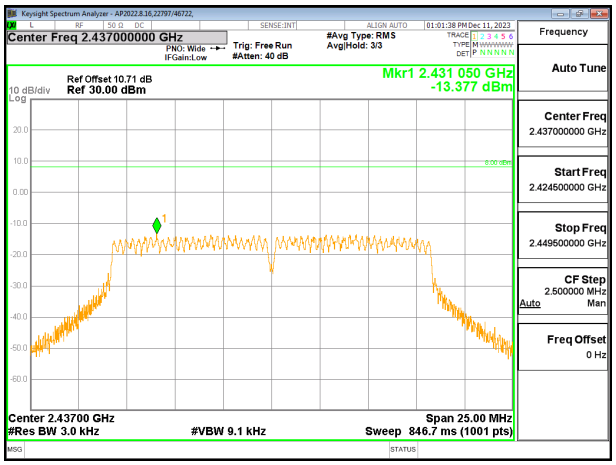
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

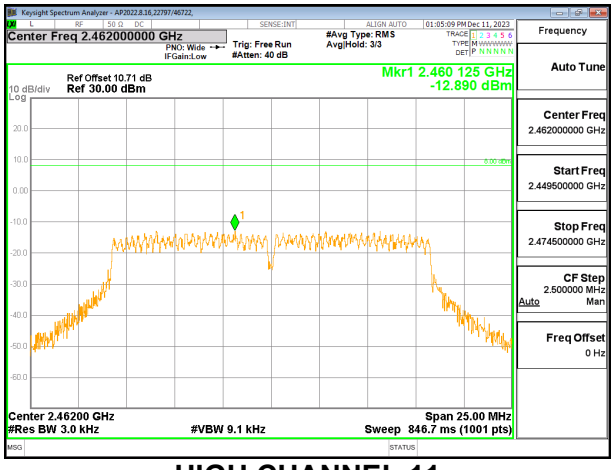
Channel	Frequency (MHz)	Chain 0 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-13.050	-13.050	8.000	-21.050
Mid 6	2437	-13.377	-13.377	8.000	-21.377
High 11	2462	-12.890	-12.890	8.000	-20.890



LOW CHANNEL 1



MID CHANNEL 6



HIGH CHANNEL 11

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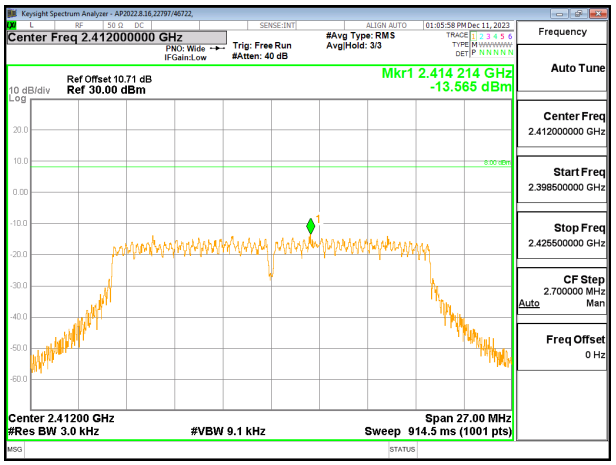
9.6.3. 802.11n HT20 MODE

1TX Antenna 1 MODE

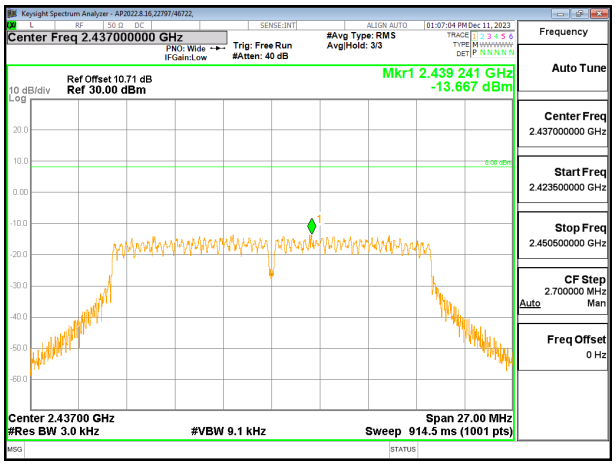
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

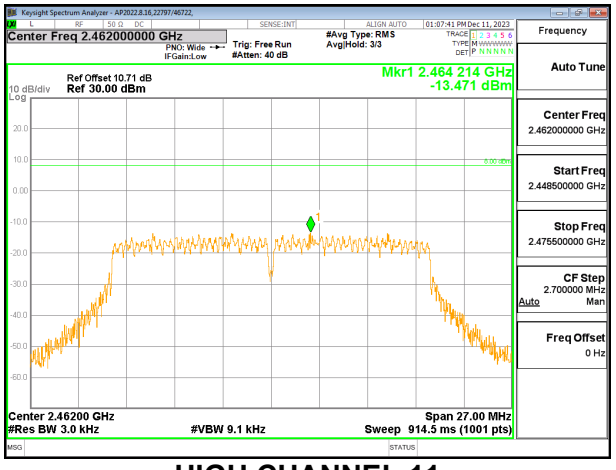
Channel	Frequency (MHz)	Chain 0 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-13.565	-13.565	8.000	-21.565
Mid 6	2437	-13.667	-13.667	8.000	-21.667
High 11	2462	-13.471	-13.471	8.000	-21.471



LOW CHANNEL 1



MID CHANNEL 6



HIGH CHANNEL 11

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9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

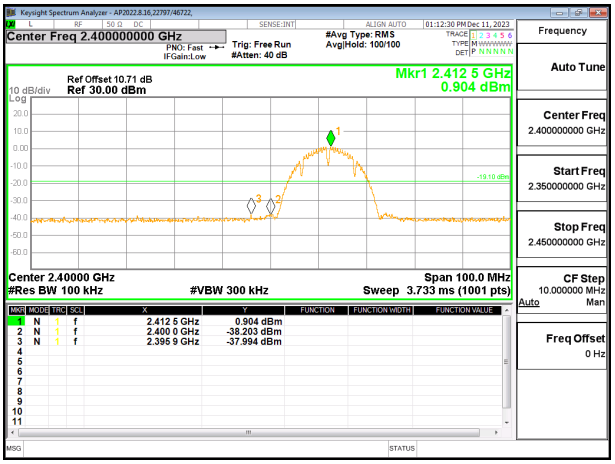
FCC §15.247 (d)
RSS-247 5.5

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

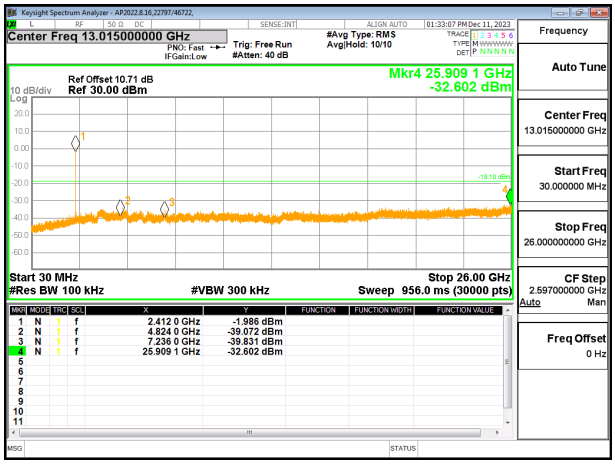
RESULTS

9.7.1. 802.11b MODE

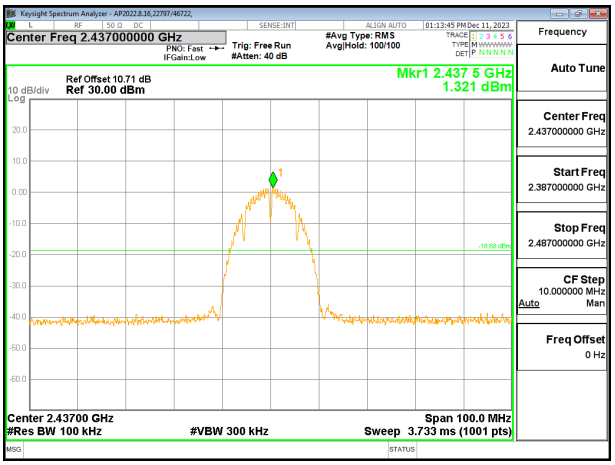
1TX Antenna 1 MODE



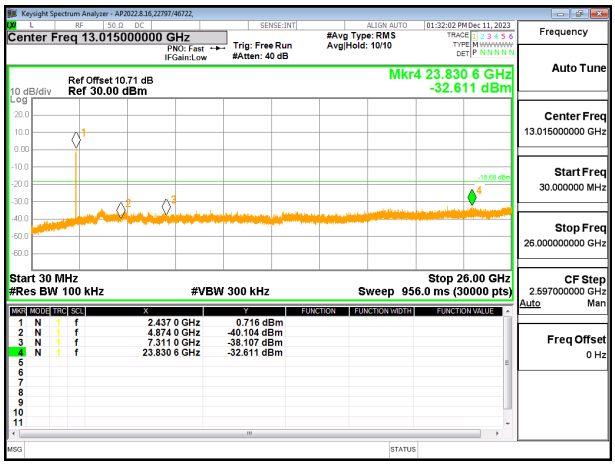
LOW CHANNEL 1 BANDEDGE



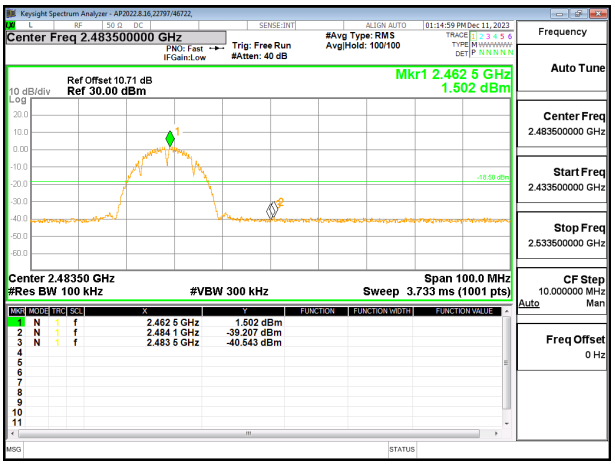
OUT-OF-BAND LOW CHANNEL 1



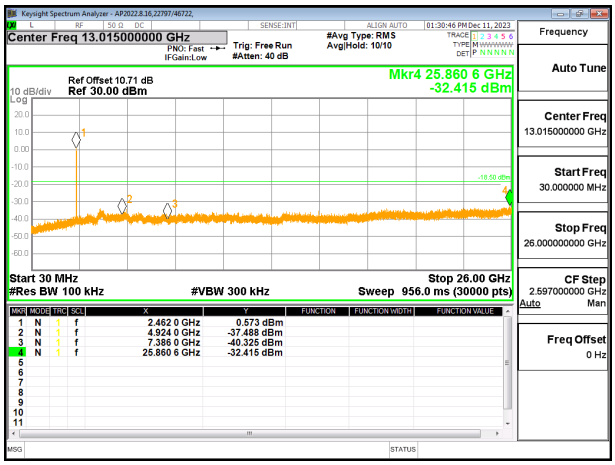
IN-BAND REFERNCE LEVEL



OUT-OF-BAND MID CHANNEL



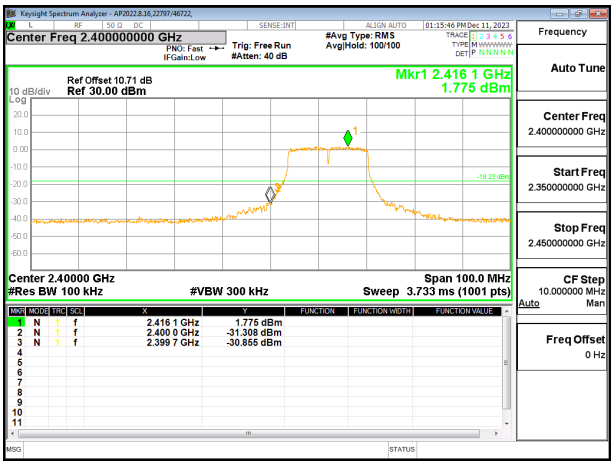
HIGH CHANNEL 11 BANDEDGE



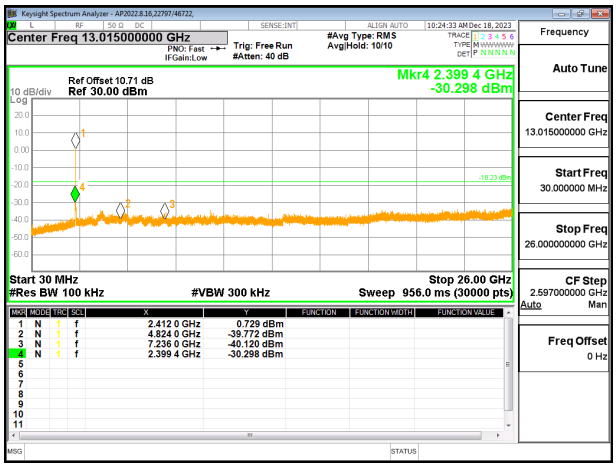
OUT-OF-BAND HIGH CHANNEL 11

9.7.2. 802.11g MODE

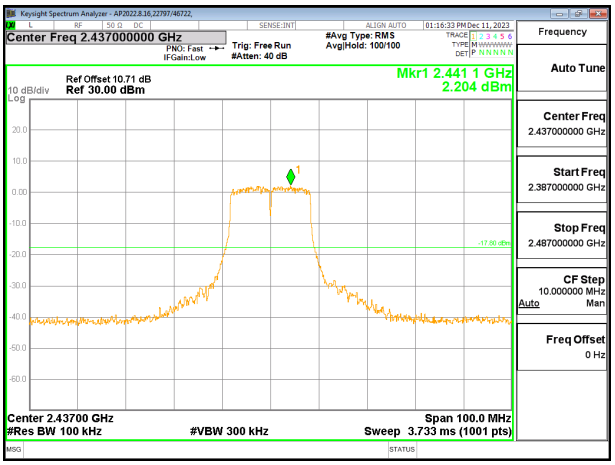
1TX Antenna 1 MODE



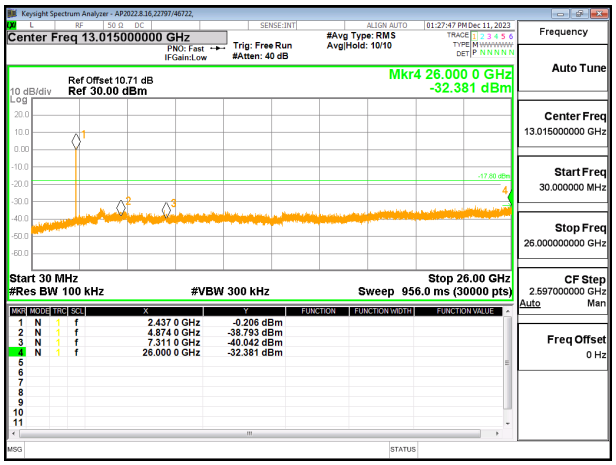
LOW CHANNEL 1 BANDEDGE



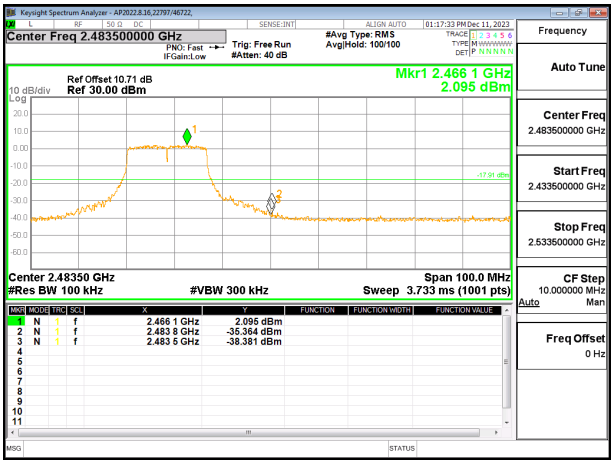
OUT-OF-BAND LOW CHANNEL 1



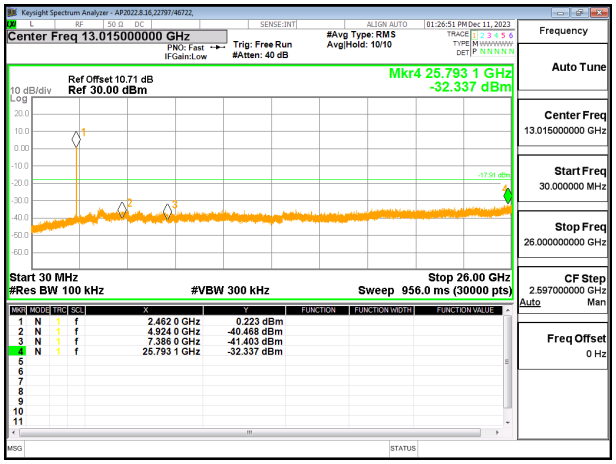
IN-BAND REFERNCE LEVEL



OUT-OF-BAND MID CHANNEL



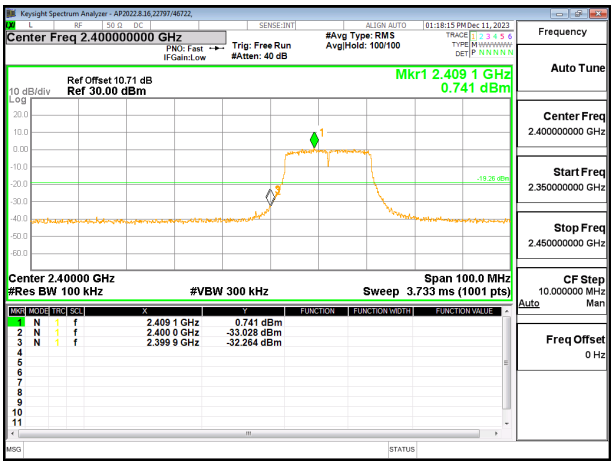
HIGH CHANNEL 11 BANDEDGE



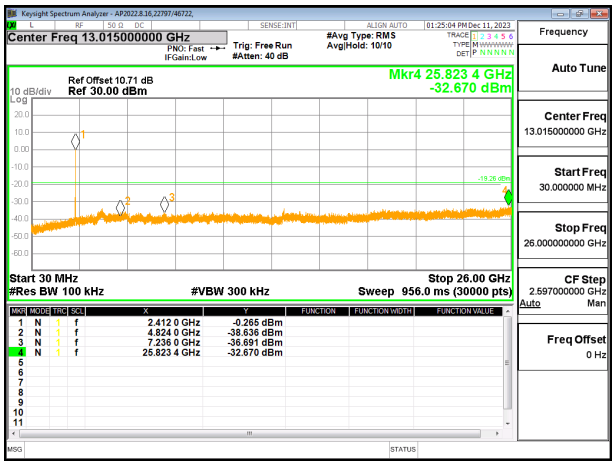
OUT-OF-BAND HIGH CHANNEL 11

9.7.3. 802.11n HT20 MODE

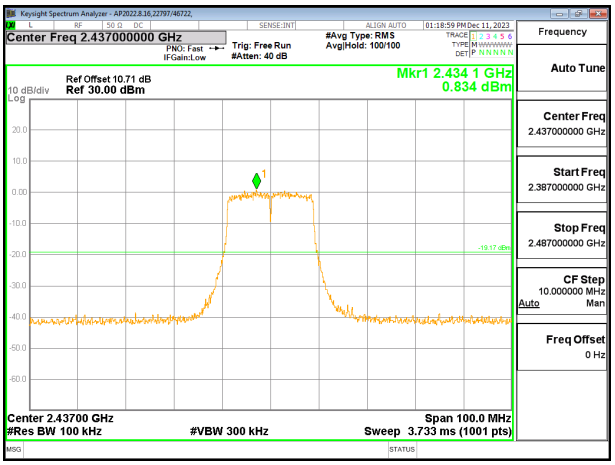
1TX Antenna 1 MODE



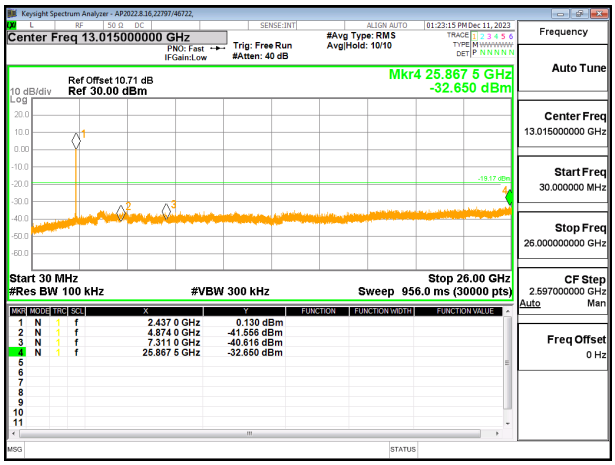
LOW CHANNEL 1 BANDEDGE



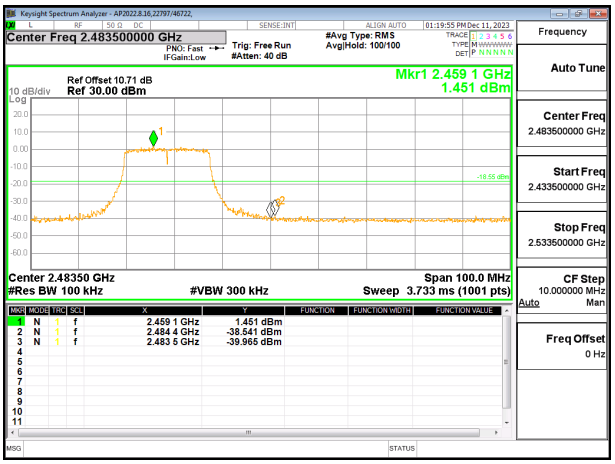
OUT-OF-BAND LOW CHANNEL 1



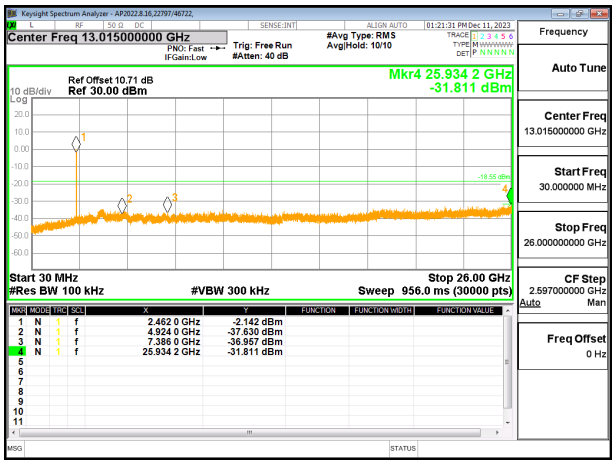
IN-BAND REFERNCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL 11 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 11

10. RADIATED TEST RESULTS

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 linear 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 average 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).

Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

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.

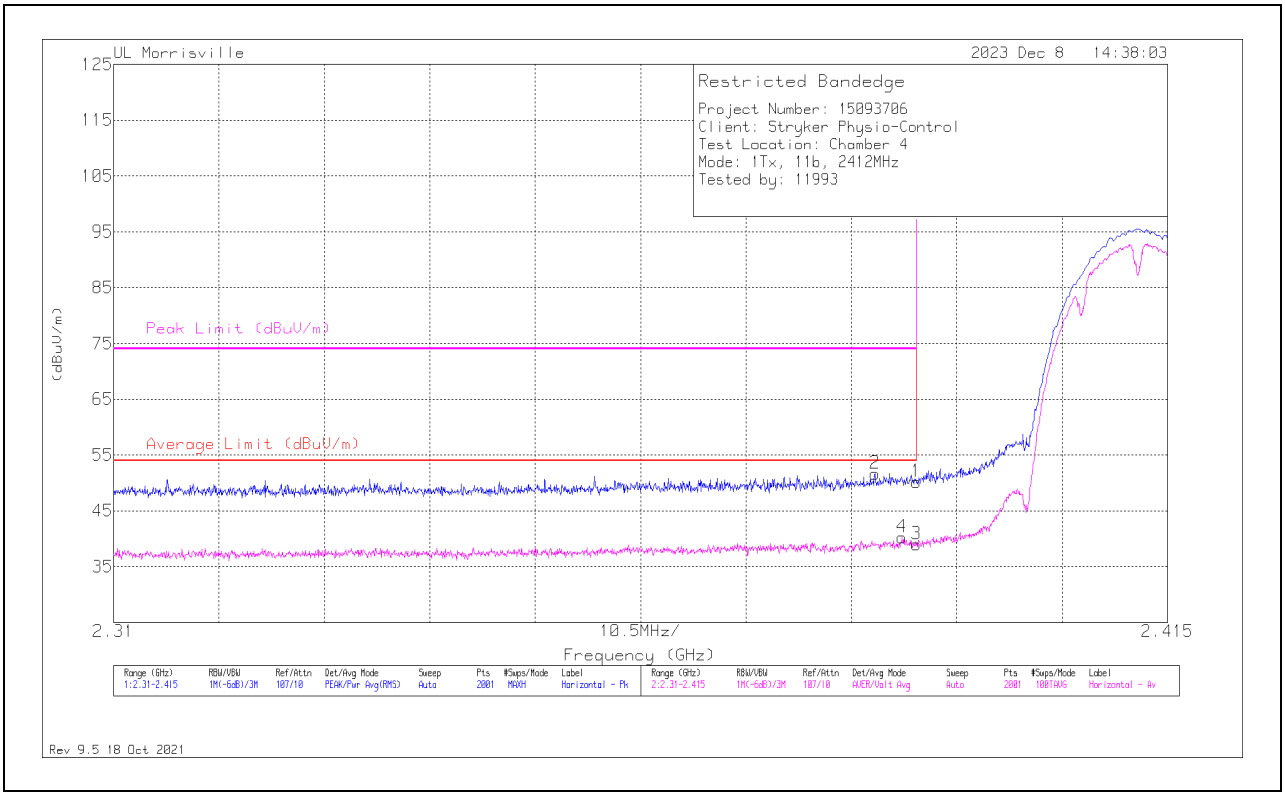
10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (LOW CHANNEL, CH 1)

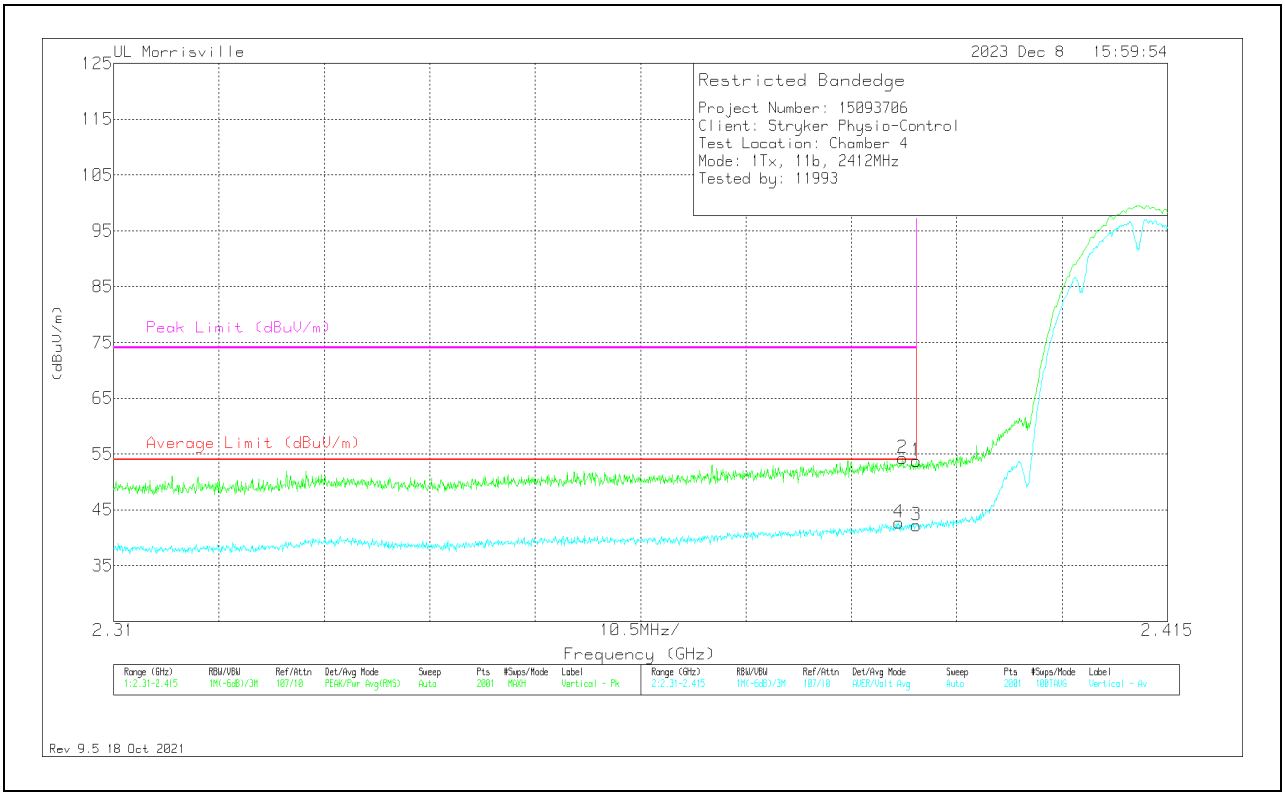
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (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	31.41	Pk	32	-13.2	50.21	-	-	74	-23.79	231	100	H
2	* ** 2.38586	32.86	Pk	32	-13.2	51.66	-	-	74	-22.34	231	100	H
3	* ** 2.38996	20.2	ADV	32	-13.2	39	54	-15	-	-	231	100	H
4	* ** 2.38854	21.48	ADV	32	-13.2	40.28	54	-13.72	-	-	231	100	H

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

VERTICAL RESULT

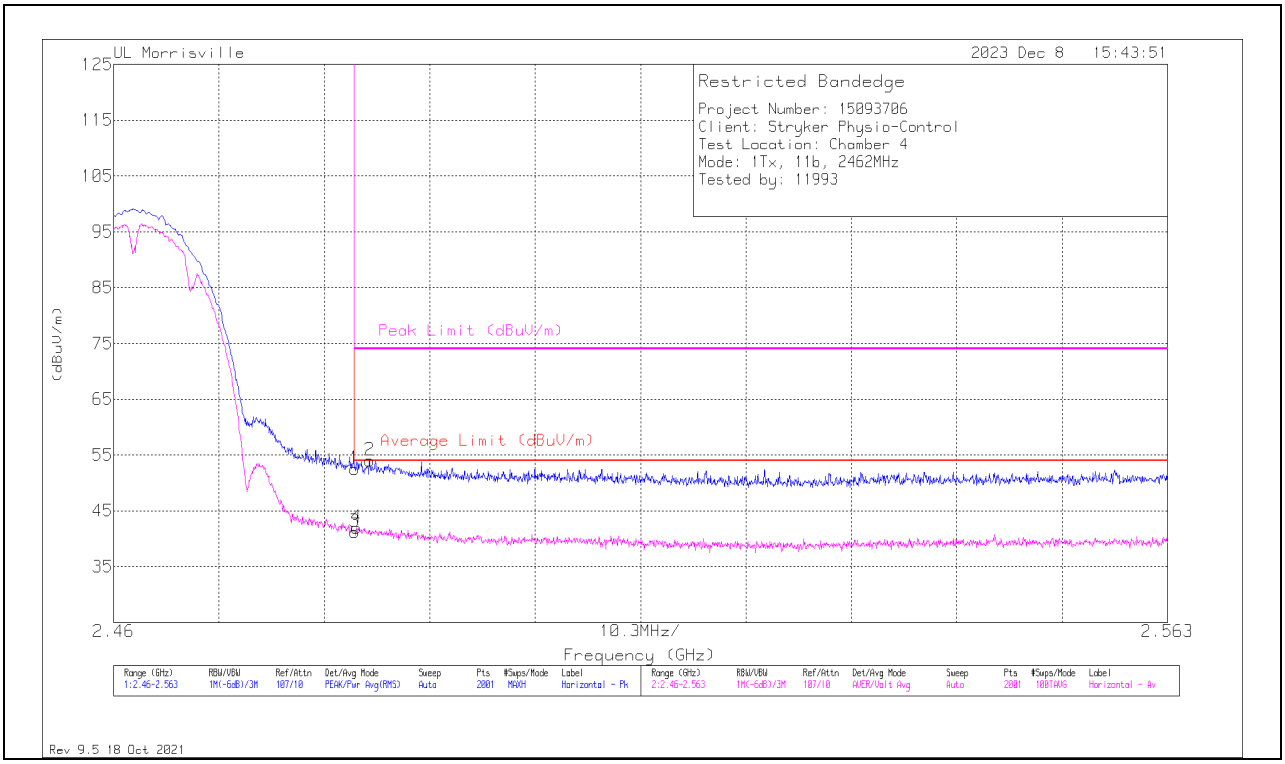


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	34.92	Pk	32	-13.2	53.72	-	-	74	-20.28	217	190	V
2	* ** 2.38859	35.45	Pk	32	-13.2	54.25	-	-	74	-19.75	217	190	V
3	* ** 2.38996	23.47	ADV	32	-13.2	42.27	54	-11.73	-	-	217	190	V
4	* ** 2.38823	23.87	ADV	32	-13.2	42.67	54	-11.33	-	-	217	190	V

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

BANDEDGE (HIGH CHANNEL, CH 11)

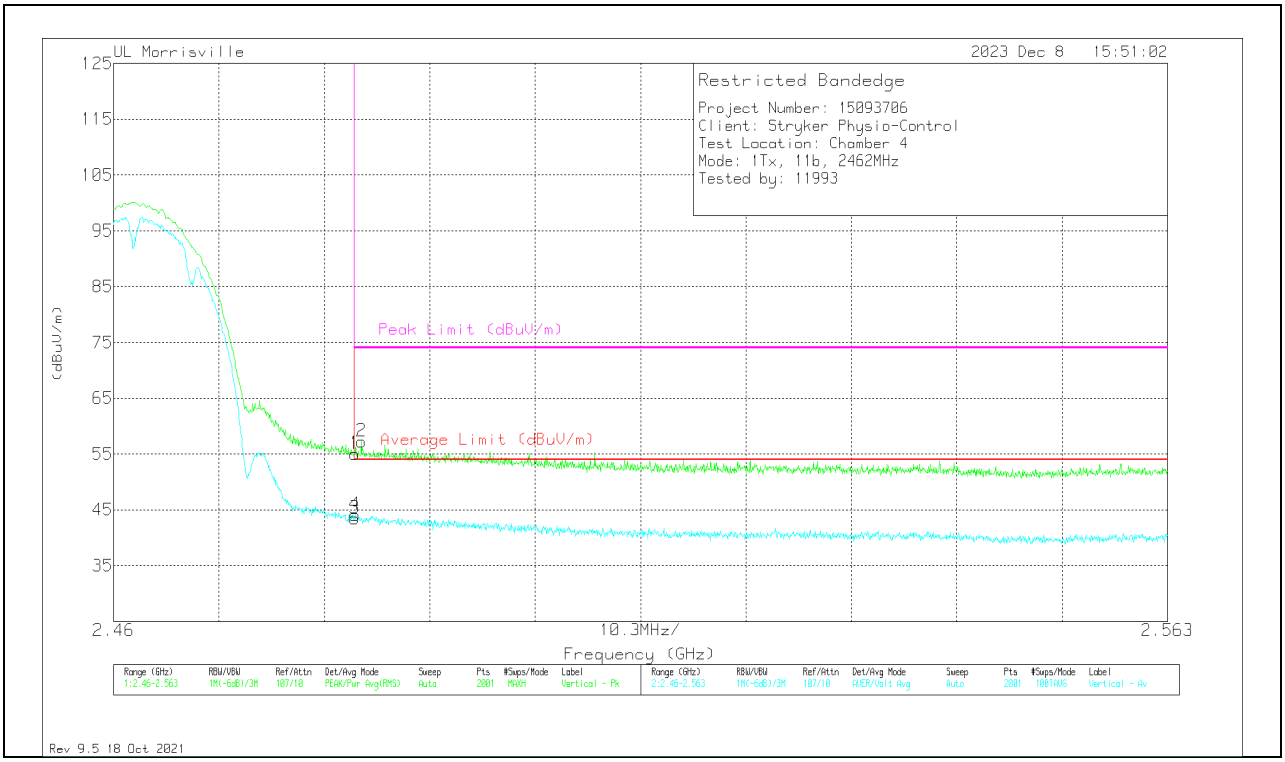
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (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	33.11	Pk	32.3	-12.9	52.51	-	-	74	-21.49	100	285	H
2	* ** 2.48503	34.61	Pk	32.3	-12.9	54.01	-	-	74	-19.99	100	285	H
3	* ** 2.48354	21.82	ADV	32.3	-12.9	41.22	54	-12.78	-	-	100	285	H
4	* ** 2.48374	22.54	ADV	32.3	-12.9	41.94	54	-12.06	-	-	100	285	H

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

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (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	35.64	Pk	32.3	-12.9	55.04	-	-	74	-18.96	240	202	V
2	* ** 2.48421	37.88	Pk	32.3	-12.9	57.28	-	-	74	-16.72	240	202	V
3	* ** 2.48354	24.06	ADV	32.3	-12.9	43.46	54	-10.54	-	-	240	202	V
4	* ** 2.48359	24.67	ADV	32.3	-12.9	44.07	54	-9.93	-	-	240	202	V

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

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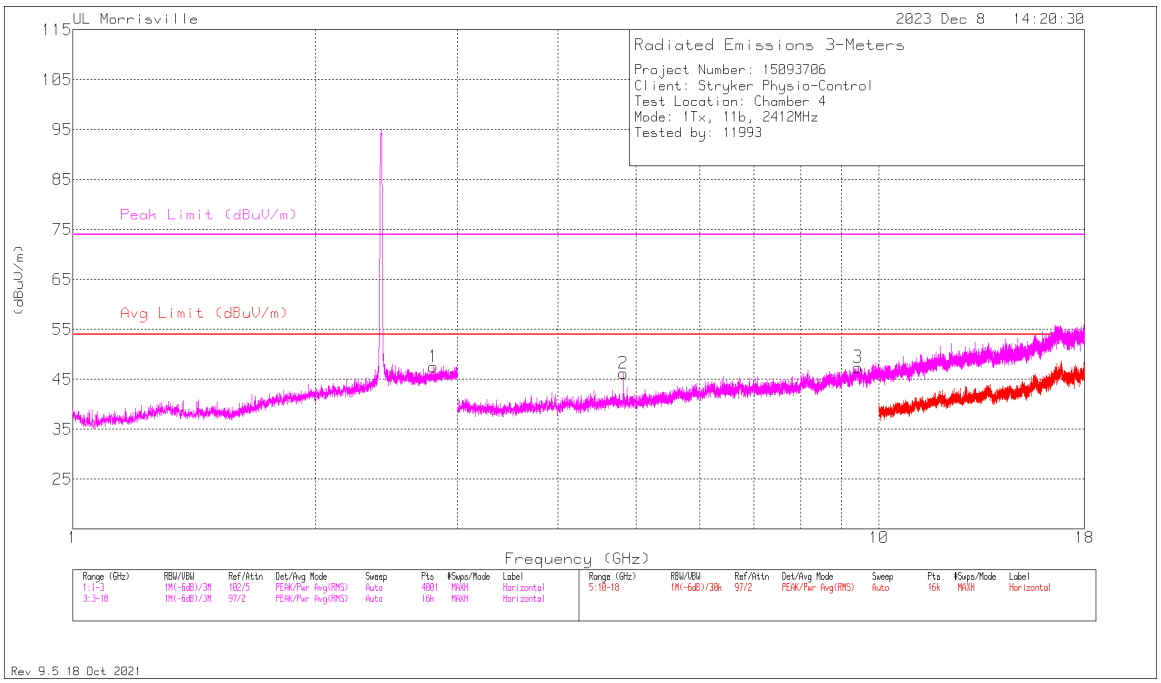
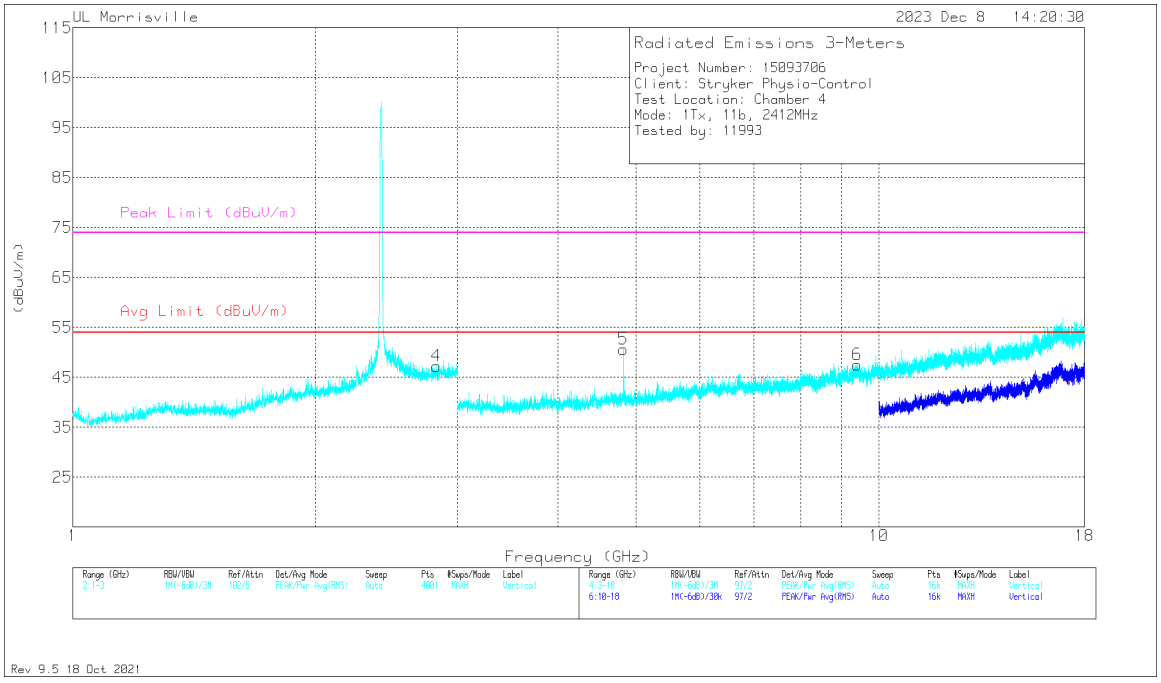
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL, CH 1 RESULTS



HORIZONTAL



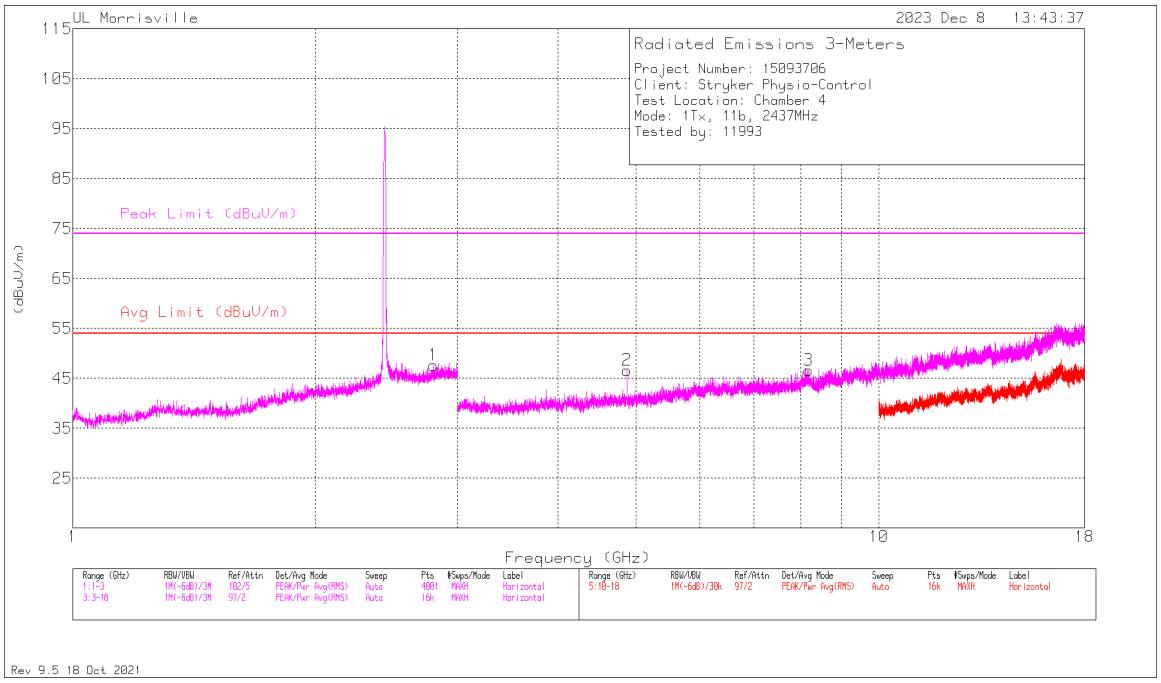
VERTICAL

RADIATED EMISSIONS

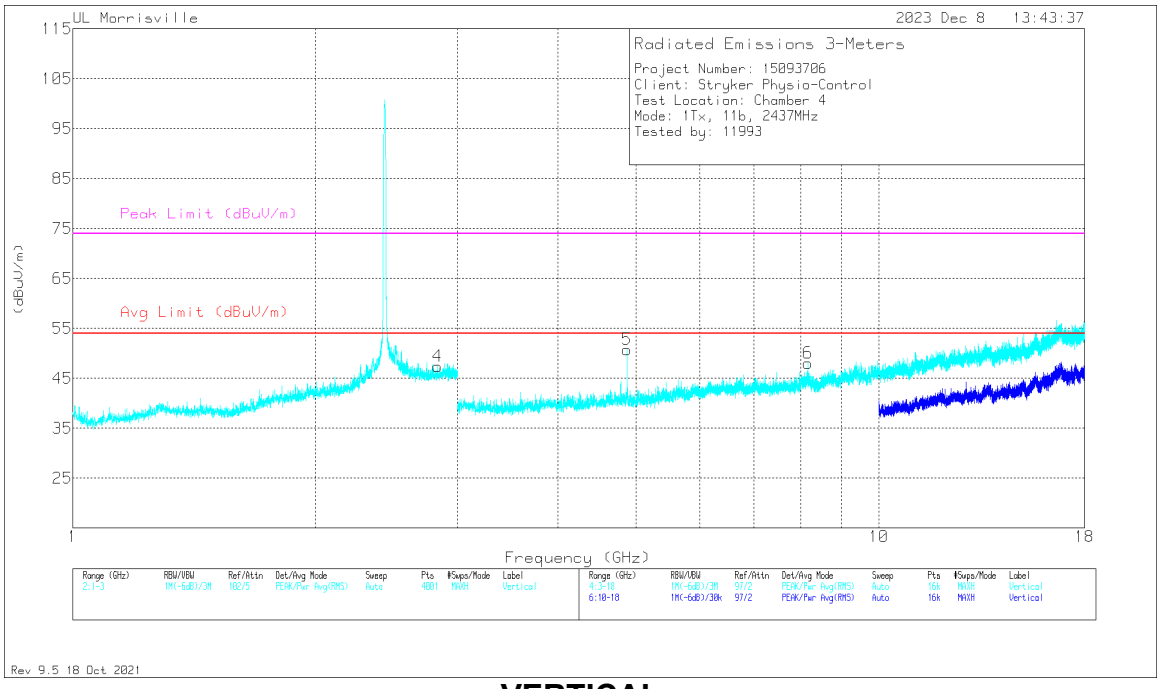
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.8035	27.18	Pk	32.6	-12.3	47.48	54	-6.52	74	-26.52	0-360	100	H
4	* ** 2.825	27.03	Pk	32.4	-12.2	47.23	54	-6.77	74	-26.77	0-360	200	V
2	* ** 4.82344	43.66	Pk	34.1	-31.5	46.26	54	-7.74	74	-27.74	0-360	100	H
3	* ** 9.42656	36.35	Pk	36.7	-25.6	47.45	54	-6.55	74	-26.55	0-360	100	H
5	* ** 4.82395	50.36	PK2	34.1	-31.5	52.96	-	-	74	-21.04	264	103	V
	* ** 4.82401	47.23	ADV	34.1	-31.5	49.83	54	-4.17	-	-	264	103	V
6	* ** 9.40875	36.66	Pk	36.6	-25.8	47.46	54	-6.54	74	-26.54	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
ADV - Linear Voltage Average

MID CHANNEL, CH 6 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.802	27.39	Pk	32.6	-12.3	47.69	54	-6.31	74	-26.31	0-360	100	H
4	* ** 2.8335	27.32	Pk	32.4	-12.3	47.42	54	-6.58	74	-26.58	0-360	200	V
2	* ** 4.87406	43.96	Pk	34.1	-31.5	46.56	54	-7.44	74	-27.44	0-360	200	H
3	* ** 8.18156	37.64	Pk	35.8	-26.8	46.64	54	-7.36	74	-27.36	0-360	200	H
5	* ** 4.87393	50.94	PK2	34.1	-31.5	53.54	-	-	74	-20.46	264	102	V
	* ** 4.87399	47.65	ADV	34.1	-31.5	50.25	54	-3.75	-	-	264	102	V
6	* ** 8.17125	39.29	Pk	35.8	-27.1	47.99	54	-6.01	74	-26.01	0-360	100	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
ADV - Linear Voltage Average

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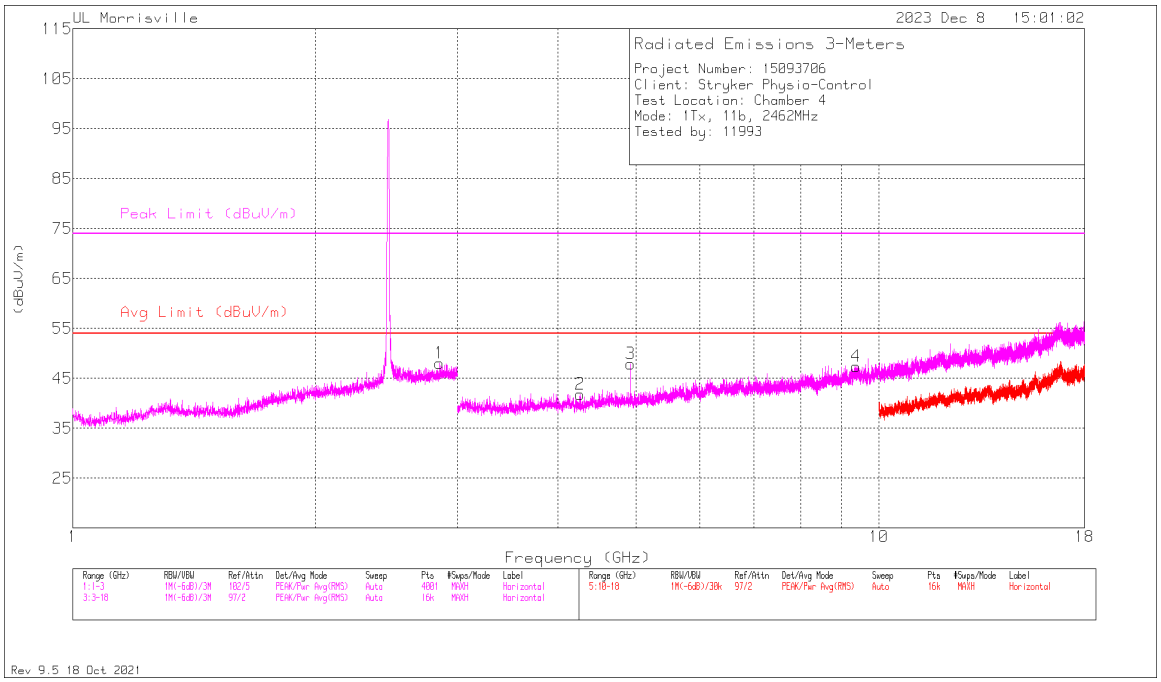
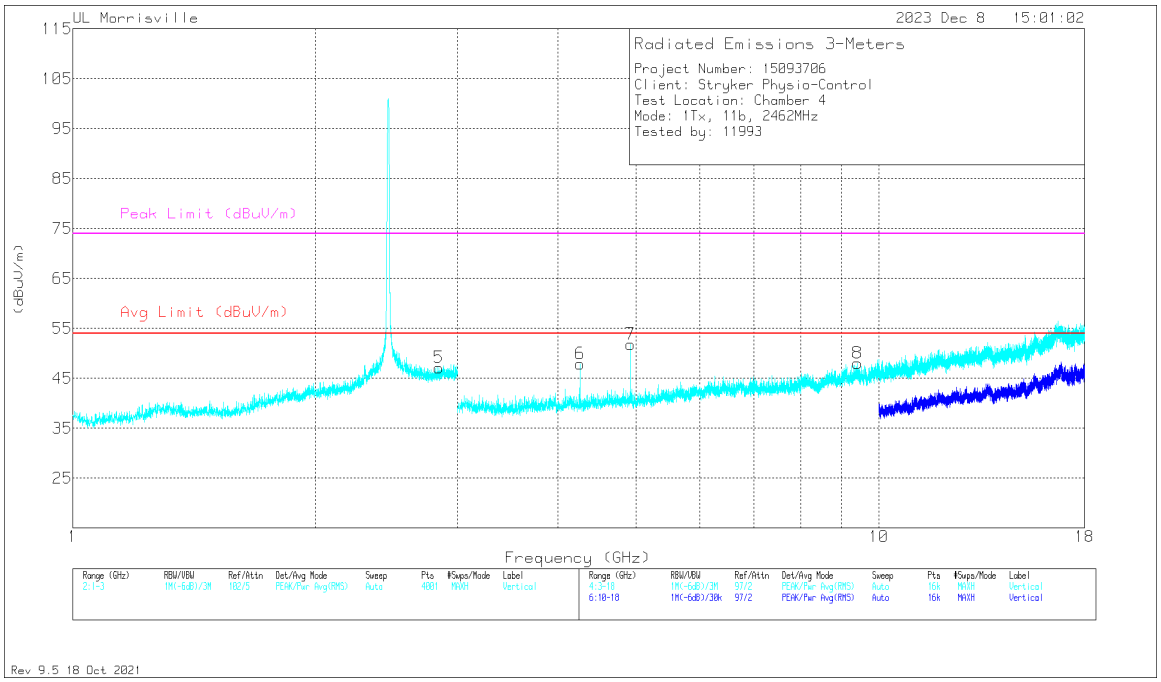
HIGH CHANNEL, CH 11 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.85086	28.31	PK2	32.4	-12.4	48.31	-	-	74	-25.69	225	103	H
	* ** 2.84936	15.72	ADV	32.4	-12.3	35.82	54	-18.18	-	-	225	103	H
5	* ** 2.8465	26.93	Pk	32.4	-12.2	47.13	54	-6.87	74	-26.87	0-360	200	V
2	* ** 4.25813	40.06	Pk	33.4	-31.7	41.76	54	-12.24	74	-32.24	0-360	100	H
3	* ** 4.92375	45.28	Pk	34	-31.4	47.88	54	-6.12	74	-26.12	0-360	100	H
4	* ** 9.37875	35.75	Pk	36.6	-25	47.35	54	-6.65	74	-26.65	0-360	100	H
6	* ** 4.26	46.05	Pk	33.4	-31.5	47.95	54	-6.05	74	-26.05	0-360	200	V
7	* ** 4.92396	50.59	PK2	34	-31.4	53.19	-	-	74	-20.81	266	102	V
	* ** 4.92399	47.62	ADV	34	-31.4	50.22	54	-3.78	-	-	266	102	V
8	* ** 9.41218	37.16	PK2	36.6	-25.6	48.16	-	-	74	-25.84	357	390	V
	* ** 9.41348	25.21	ADV	36.6	-25.5	36.31	54	-17.69	-	-	357	390	V

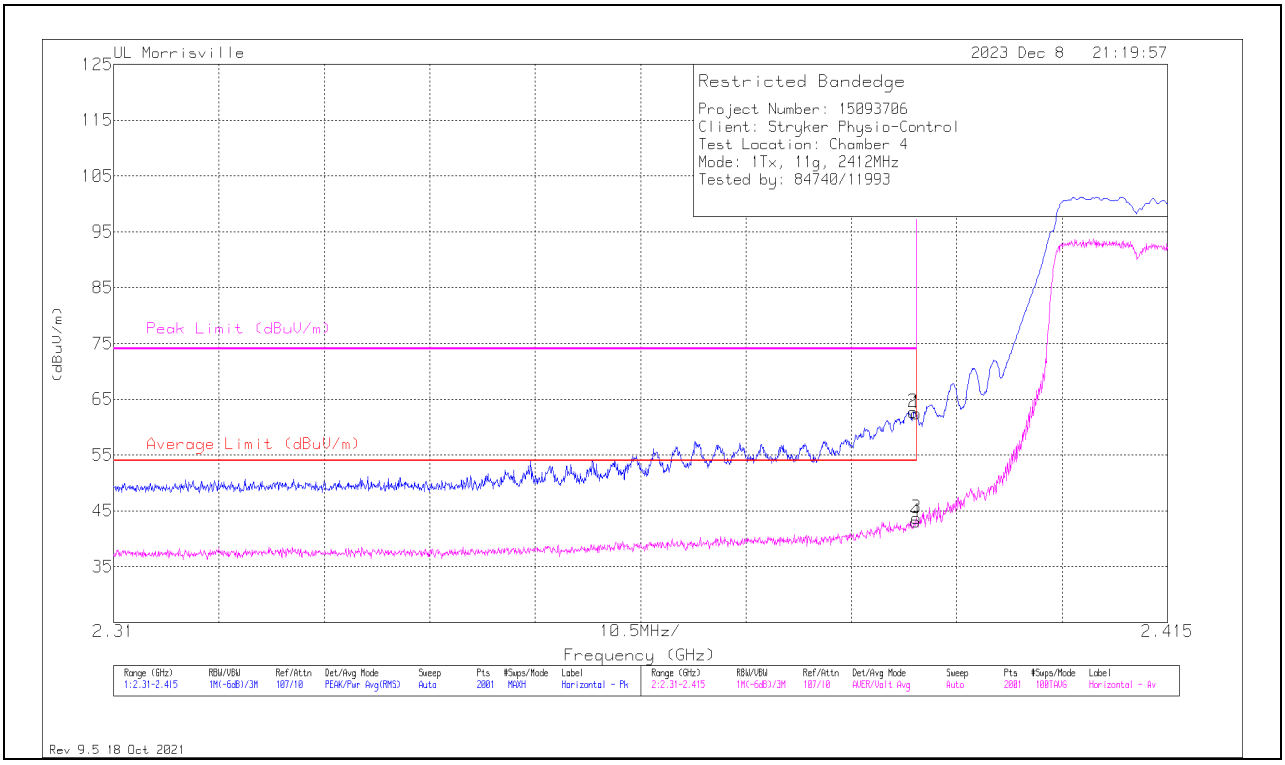
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
ADV - Linear Voltage Average

10.1.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (LOW CHANNEL, CH 1)

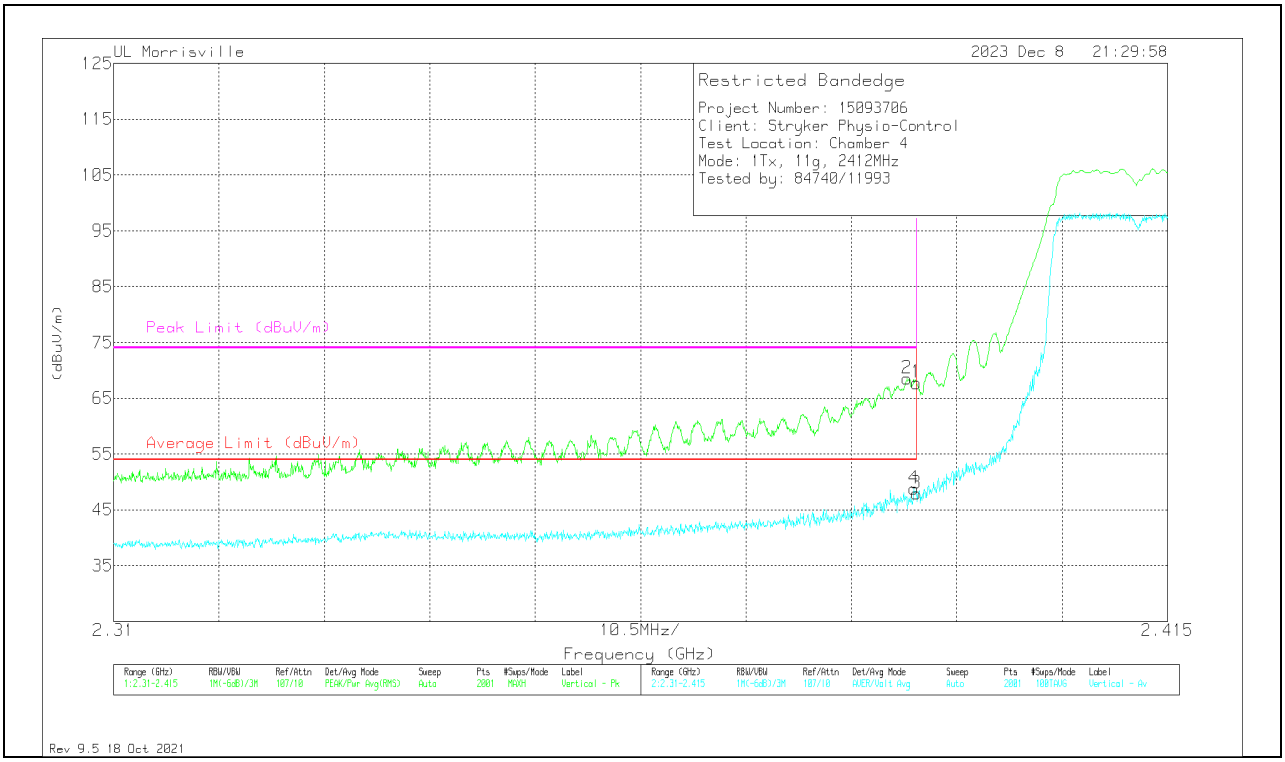
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (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	43.69	Pk	32	-13.2	62.49	-	-	74	-11.51	233	106	H
2	* ** 2.3897	43.89	Pk	32	-13.2	62.69	-	-	74	-11.31	233	106	H
3	* ** 2.38996	24.87	ADV	32	-13.2	43.67	54	-10.33	-	-	233	106	H
4	* ** 2.38991	24.27	ADV	32	-13.2	43.07	54	-10.93	-	-	233	106	H

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

VERTICAL RESULT

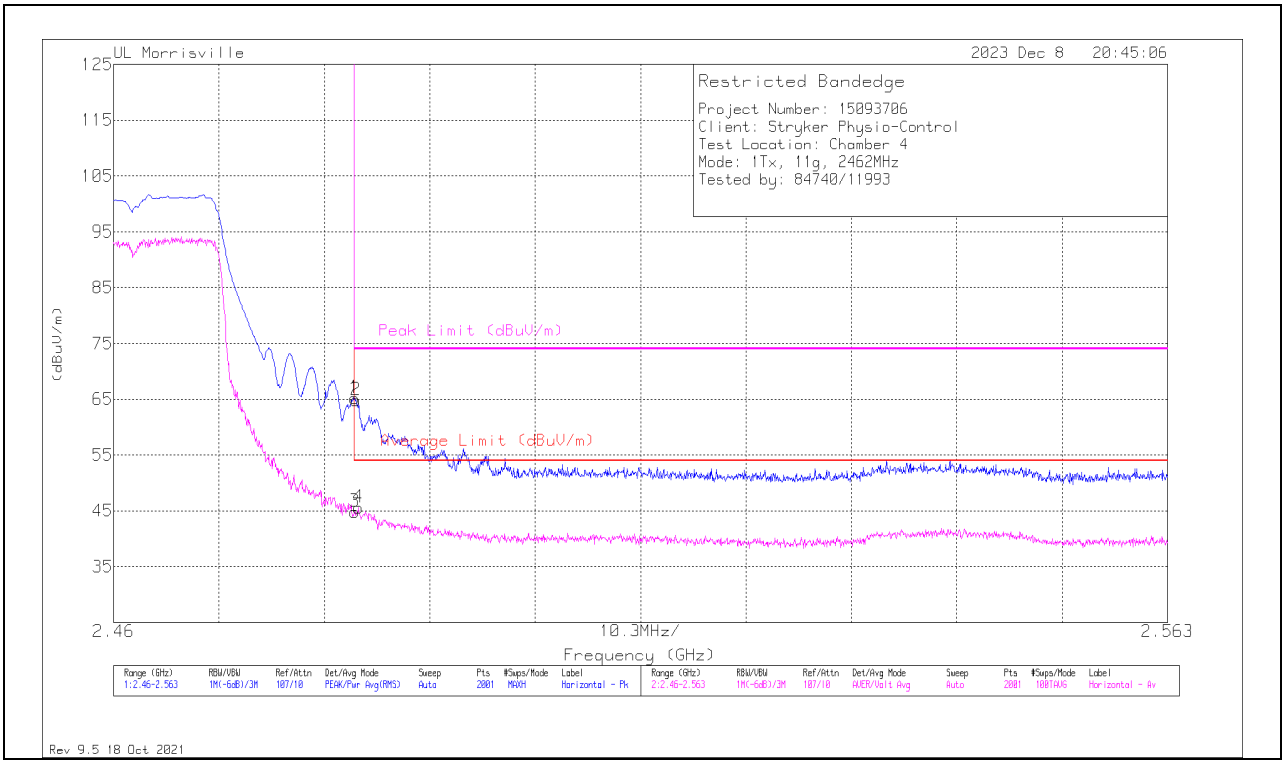


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	48.94	Pk	32	-13.2	67.74	-	-	74	-6.26	61	115	V
2	* ** 2.38907	49.71	Pk	32	-13.2	68.51	-	-	74	-5.49	61	115	V
3	* ** 2.38996	29.11	ADV	32	-13.2	47.91	54	-6.09	-	-	61	115	V
4	* ** 2.38975	30.01	ADV	32	-13.2	48.81	54	-5.19	-	-	61	115	V

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

BANDEDGE (HIGH CHANNEL, CH 11)

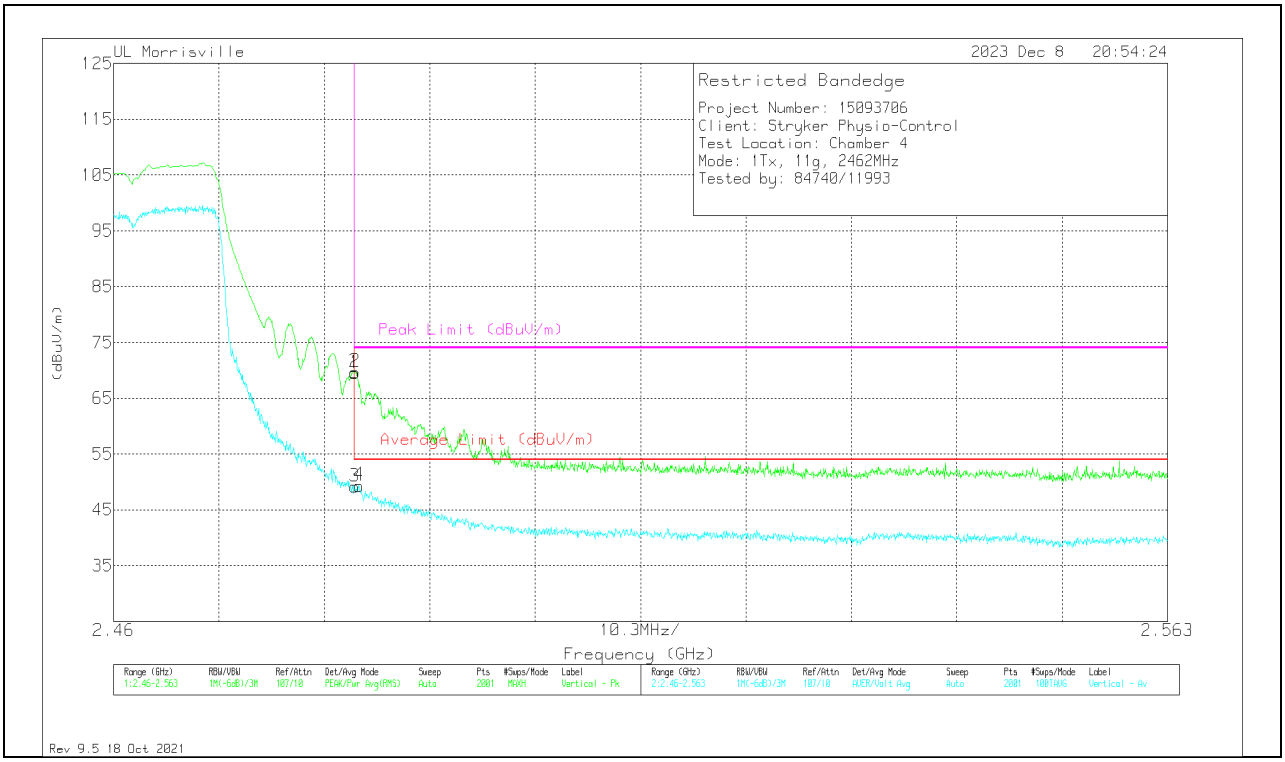
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (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	45.82	Pk	32.3	-12.9	65.22	-	-	74	-8.78	223	122	H
2	* ** 2.48369	45.38	Pk	32.3	-12.9	64.78	-	-	74	-9.22	223	122	H
3	* ** 2.48354	25.44	ADV	32.3	-12.9	44.84	54	-9.16	-	-	223	122	H
4	* ** 2.4839	26.2	ADV	32.3	-12.9	45.6	54	-8.4	-	-	223	122	H

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

VERTICAL RESULT

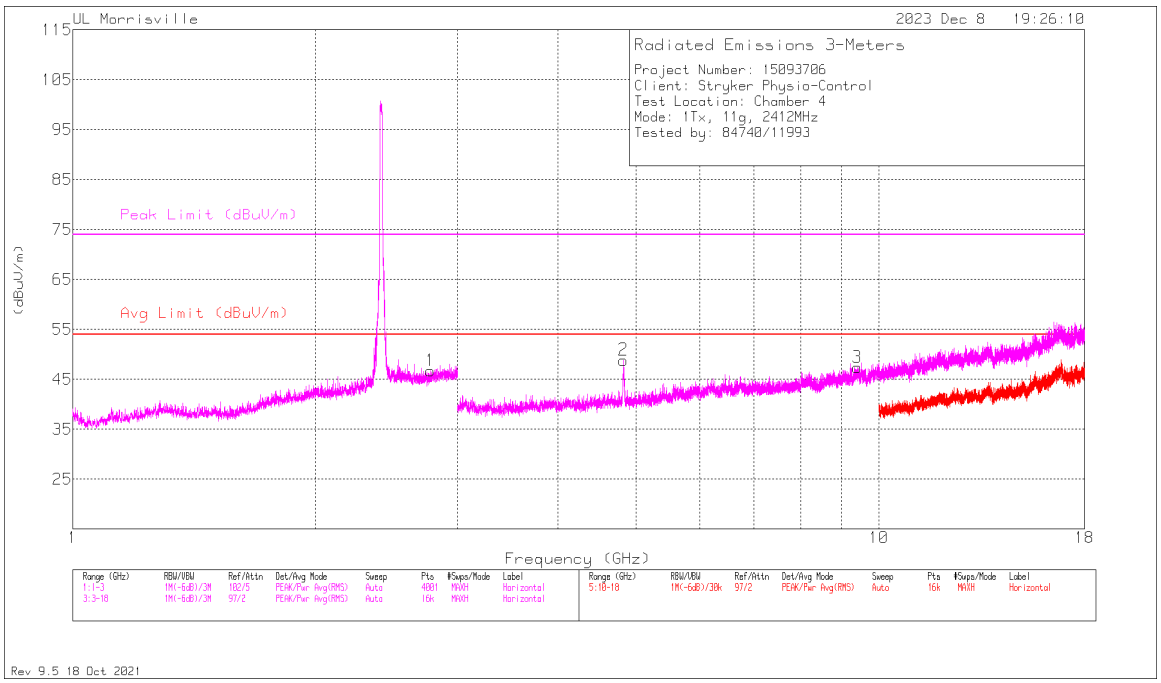


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	50.16	Pk	32.3	-12.9	69.56	-	-	74	-4.44	313	120	V
2	* ** 2.48359	50.32	Pk	32.3	-12.9	69.72	-	-	74	-4.28	313	120	V
3	* ** 2.48354	29.82	ADV	32.3	-12.9	49.22	54	-4.78	-	-	313	120	V
4	* ** 2.484	29.96	ADV	32.3	-12.9	49.36	54	-4.64	-	-	313	120	V

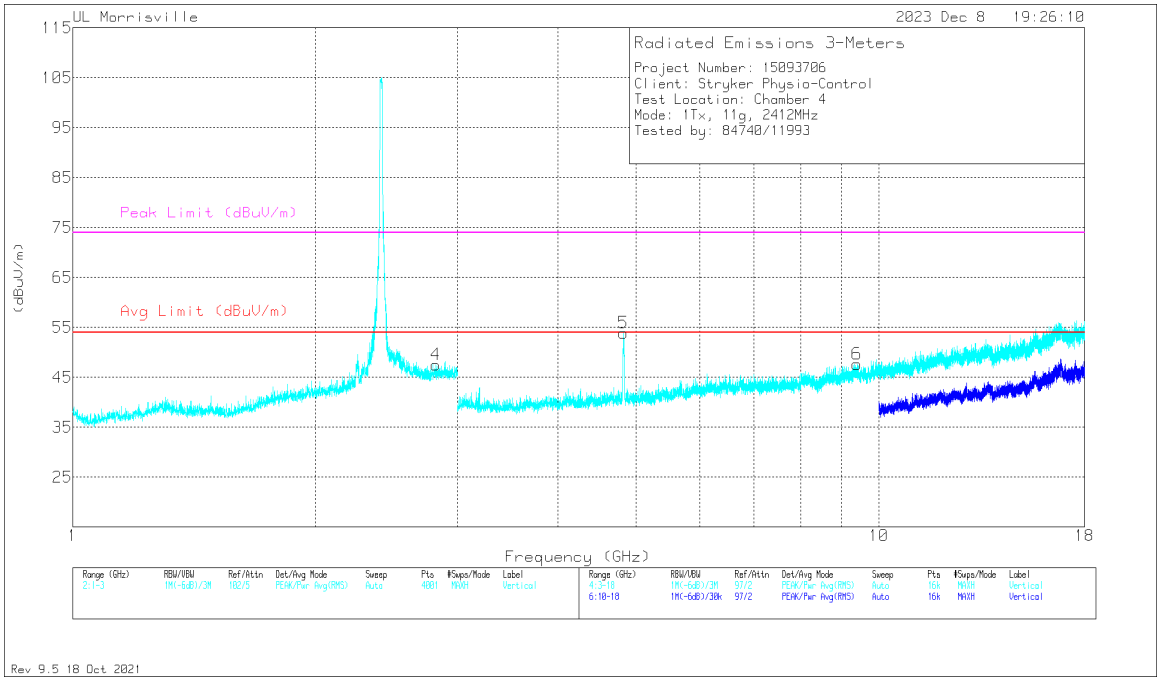
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL, CH 1 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.776	26.53	Pk	32.6	-12.4	46.73	54	-7.27	74	-27.27	0-360	100	H
4	* ** 2.8195	27.37	Pk	32.4	-12.3	47.47	54	-6.53	74	-26.53	0-360	200	V
2	* ** 4.82025	50.37	PK2	34.1	-31.6	52.87	-	-	74	-21.13	285	104	H
	* ** 4.82163	37.68	ADV	34.1	-31.6	40.18	54	-13.82	-	-	285	104	H
3	* ** 9.40875	36.59	Pk	36.6	-25.8	47.39	54	-6.61	74	-26.61	0-360	100	H
5	* ** 4.82468	55.36	PK2	34.1	-31.5	57.96	-	-	74	-16.04	265	103	V
	* ** 4.82407	43.91	ADV	34.1	-31.5	46.51	54	-7.49	-	-	265	103	V
6	* ** 9.39563	36.6	Pk	36.6	-25.5	47.7	54	-6.3	74	-26.3	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
ADV - Linear Voltage Average

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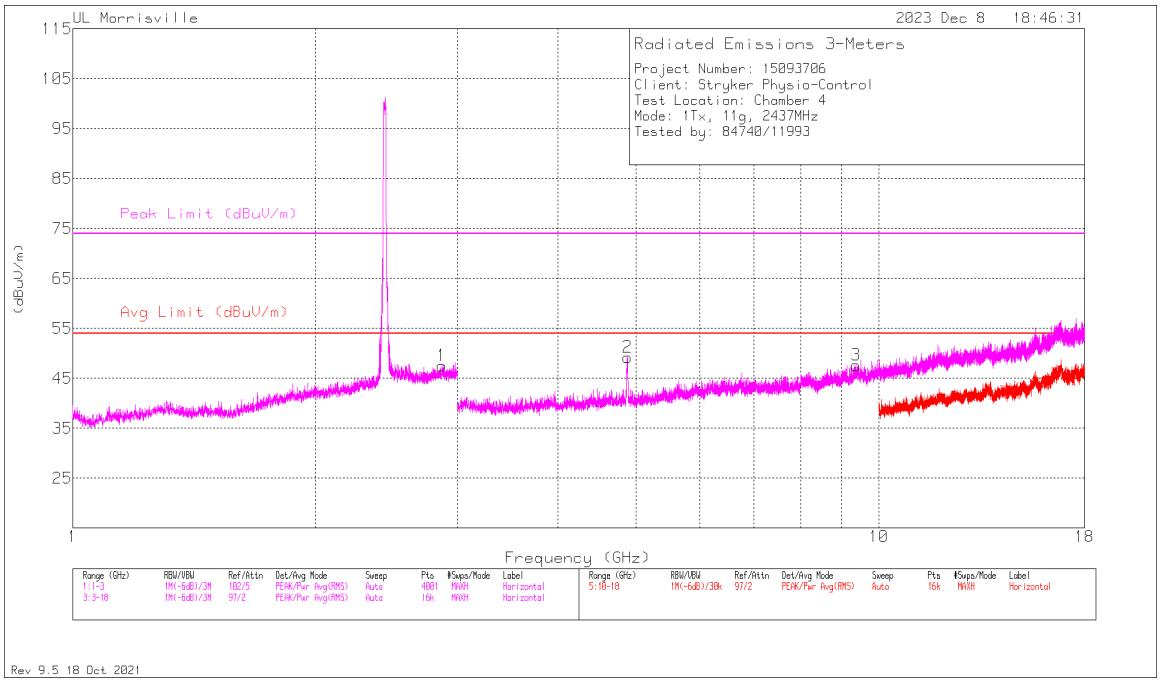
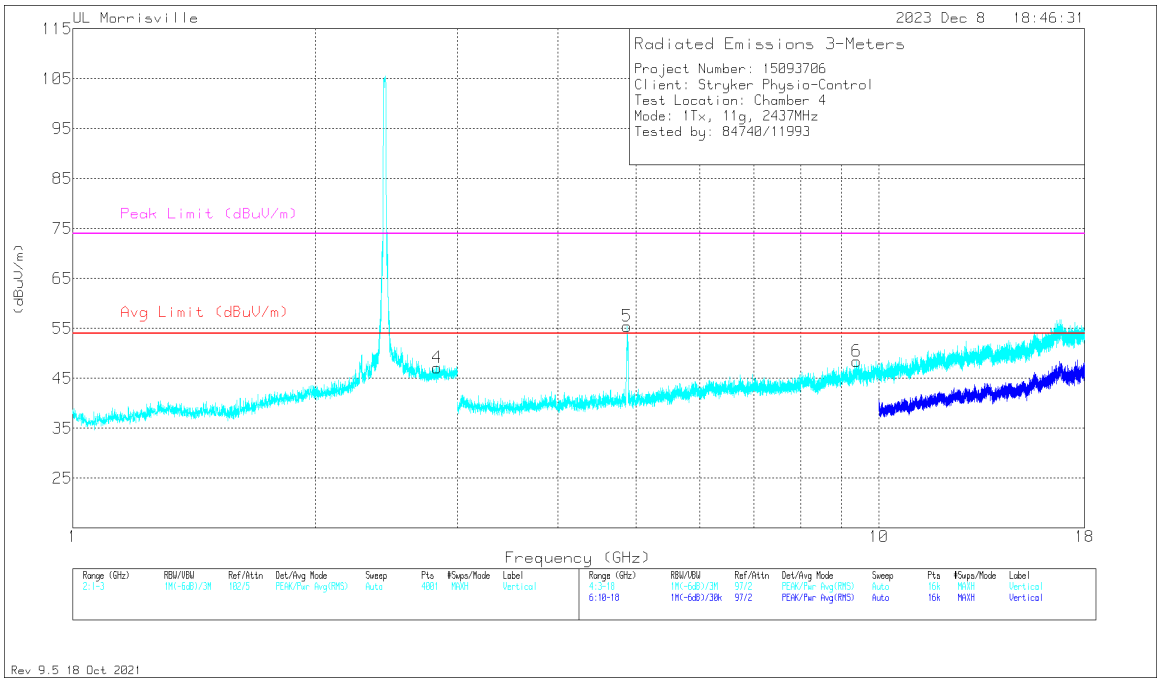
MID CHANNEL, CH 6 RESULTS



HORIZONTAL



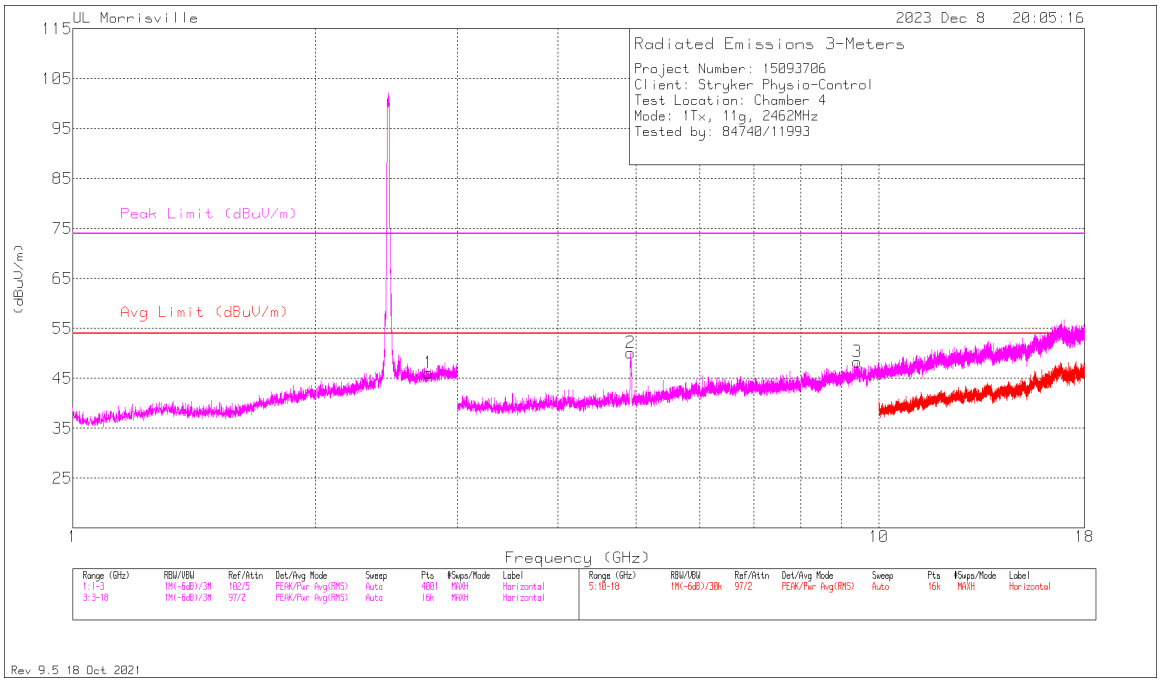
VERTICAL

RADIATED EMISSIONS

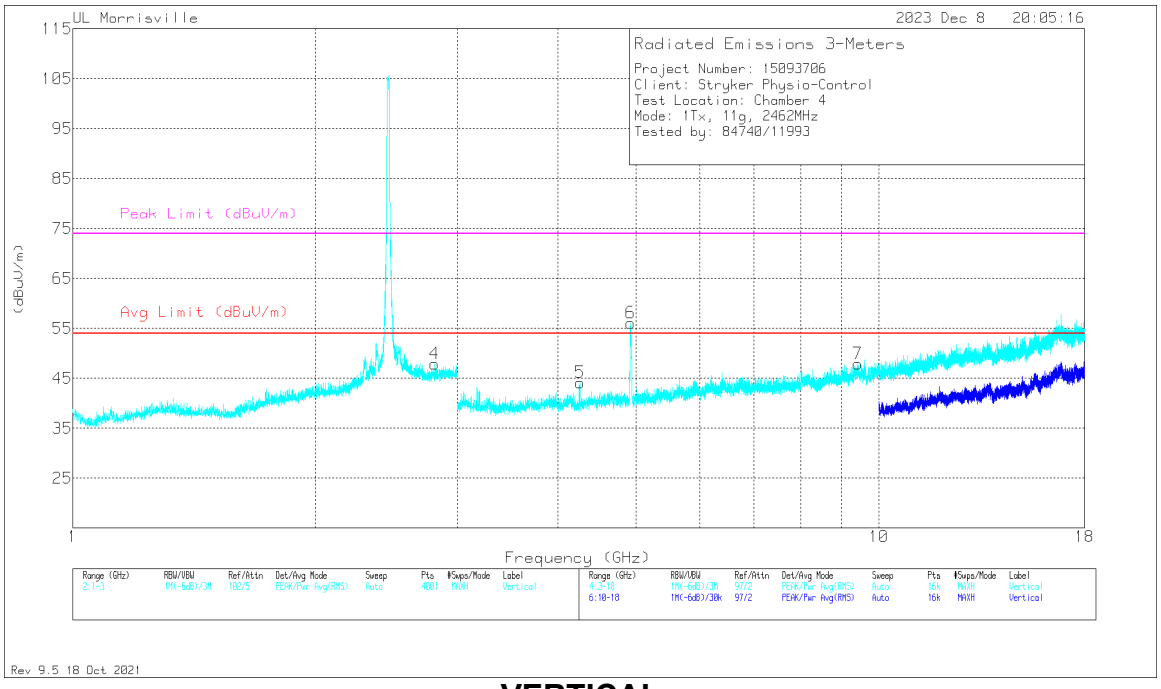
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.8685	27.27	Pk	32.4	-12.1	47.57	54	-6.43	74	-26.43	0-360	100	H
4	* ** 2.8315	27.04	Pk	32.4	-12.3	47.14	54	-6.86	74	-26.86	0-360	200	V
2	* ** 4.87466	51.9	PK2	34.1	-31.4	54.6	-	-	74	-19.4	302	102	H
	* ** 4.87398	39.67	ADV	34.1	-31.5	42.27	54	-11.73	-	-	302	102	H
3	* ** 9.37875	36.05	Pk	36.6	-25	47.65	54	-6.35	74	-26.35	0-360	100	H
5	* ** 4.87474	55.58	PK2	34.1	-31.4	58.28	-	-	74	-15.72	263	102	V
	* ** 4.8742	44.16	ADV	34.1	-31.5	46.76	54	-7.24	-	-	263	102	V
6	* ** 9.38259	37.3	PK2	36.6	-24.9	49	-	-	74	-25	342	130	V
	* ** 9.38308	24.74	ADV	36.6	-24.9	36.44	54	-17.56	-	-	342	130	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
ADV - Linear Voltage Average

HIGH CHANNEL, CH 11 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.7655	26.12	Pk	32.5	-12.5	46.12	54	-7.88	74	-27.88	0-360	100	H
4	* ** 2.8105	27.82	Pk	32.5	-12.4	47.92	54	-6.08	74	-26.08	0-360	200	V
2	* ** 4.92026	51.43	PK2	34	-31.2	54.23	-	-	74	-19.77	300	110	H
	* ** 4.92029	38.91	ADV	34	-31.2	41.71	54	-12.29	-	-	300	110	H
3	* ** 9.4026	37.7	PK2	36.6	-25.6	48.7	-	-	74	-25.3	331	260	H
	* ** 9.4036	25.07	ADV	36.6	-25.6	36.07	54	-17.93	-	-	331	260	H
5	* ** 4.26	42.22	Pk	33.4	-31.5	44.12	54	-9.88	74	-29.88	0-360	200	V
6	* ** 4.92471	56.64	PK2	34	-31.4	59.24	-	-	74	-14.76	263	101	V
	* ** 4.92397	44.78	ADV	34	-31.4	47.38	54	-6.62	-	-	263	101	V
7	* ** 9.4125	36.93	Pk	36.6	-25.6	47.93	54	-6.07	74	-26.07	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
ADV - Linear Voltage Average

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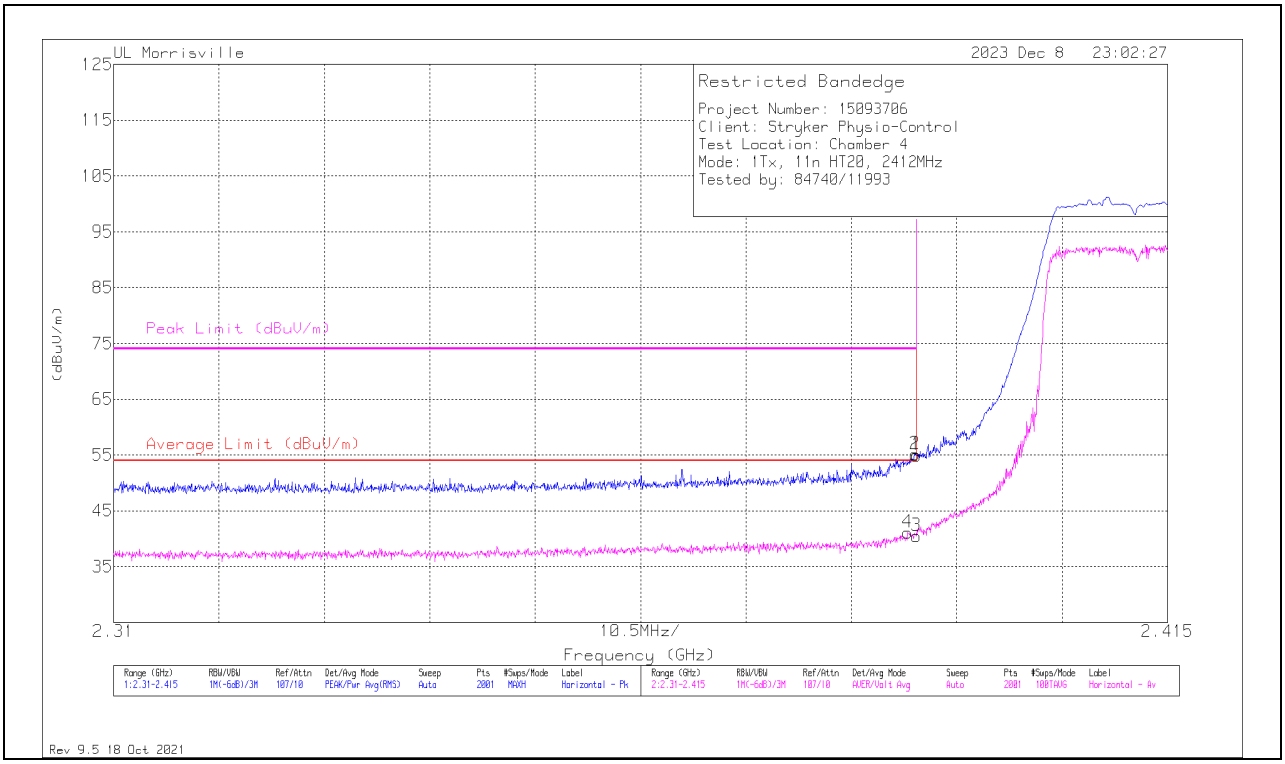
10.1.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (LOW CHANNEL, CH 1)

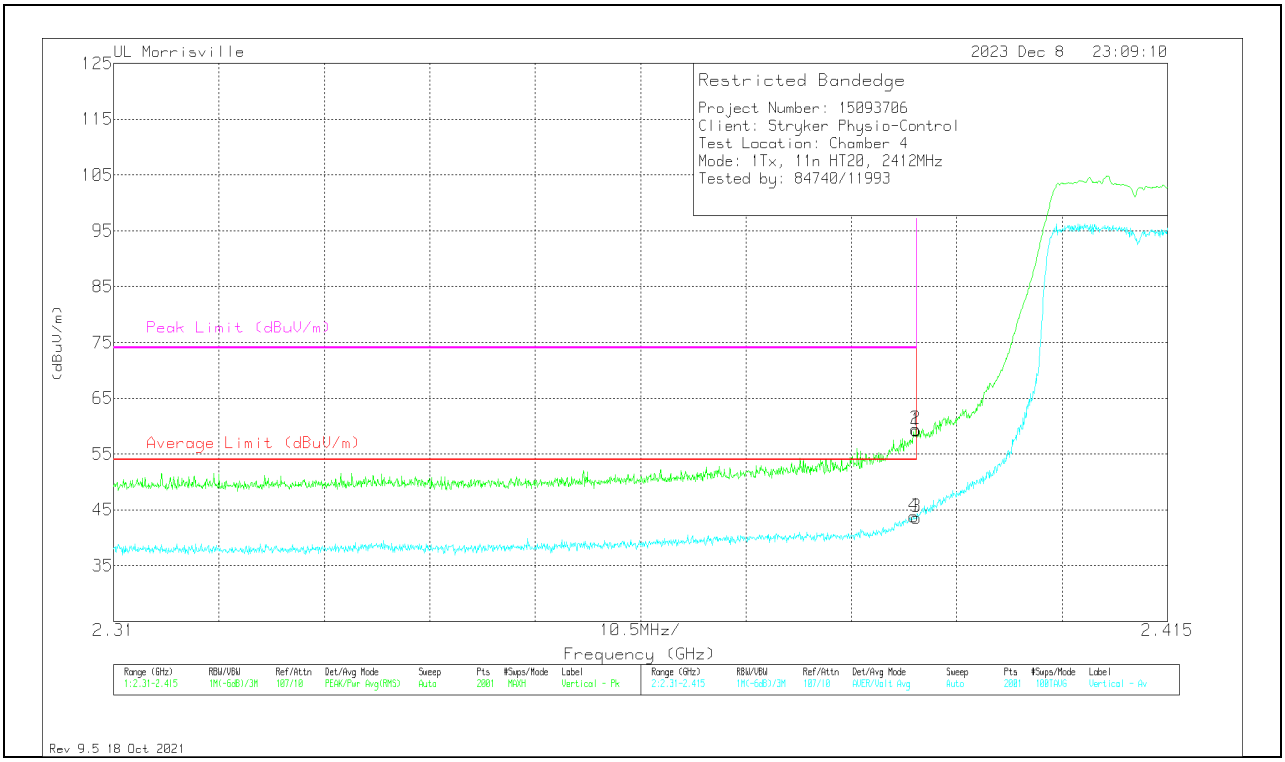
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (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	36.15	Pk	32	-13.2	54.95	-	-	74	-19.05	231	103	H
2	* ** 2.38985	36.38	Pk	32	-13.2	55.18	-	-	74	-18.82	231	103	H
3	* ** 2.38996	21.73	ADV	32	-13.2	40.53	54	-13.47	-	-	231	103	H
4	* ** 2.38912	22.33	ADV	32	-13.2	41.13	54	-12.87	-	-	231	103	H

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

VERTICAL RESULT

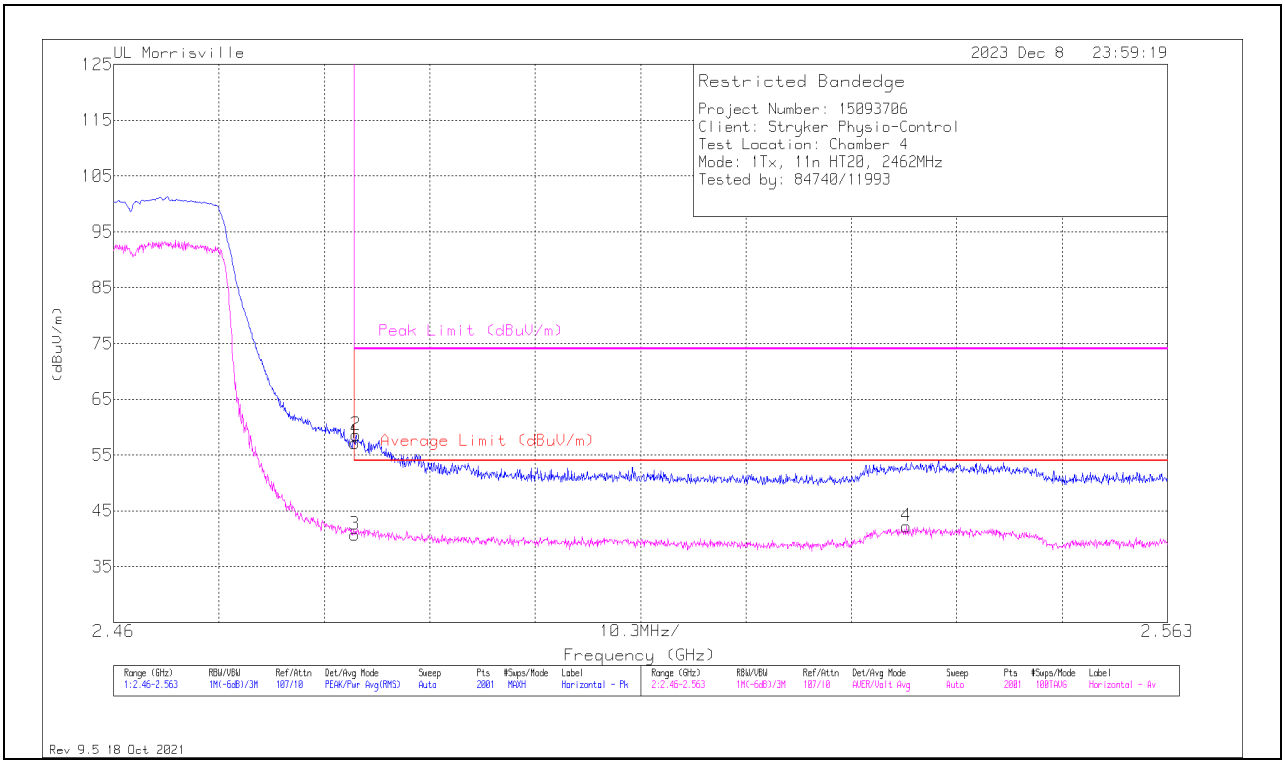


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	40.46	Pk	32	-13.2	59.26	-	-	74	-14.74	260	103	V
2	* ** 2.38991	40.62	Pk	32	-13.2	59.42	-	-	74	-14.58	260	103	V
3	* ** 2.38996	24.85	ADV	32	-13.2	43.65	54	-10.35	-	-	260	103	V
4	* ** 2.38975	25.01	ADV	32	-13.2	43.81	54	-10.19	-	-	260	103	V

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

BANDEDGE (HIGH CHANNEL, CH 11)

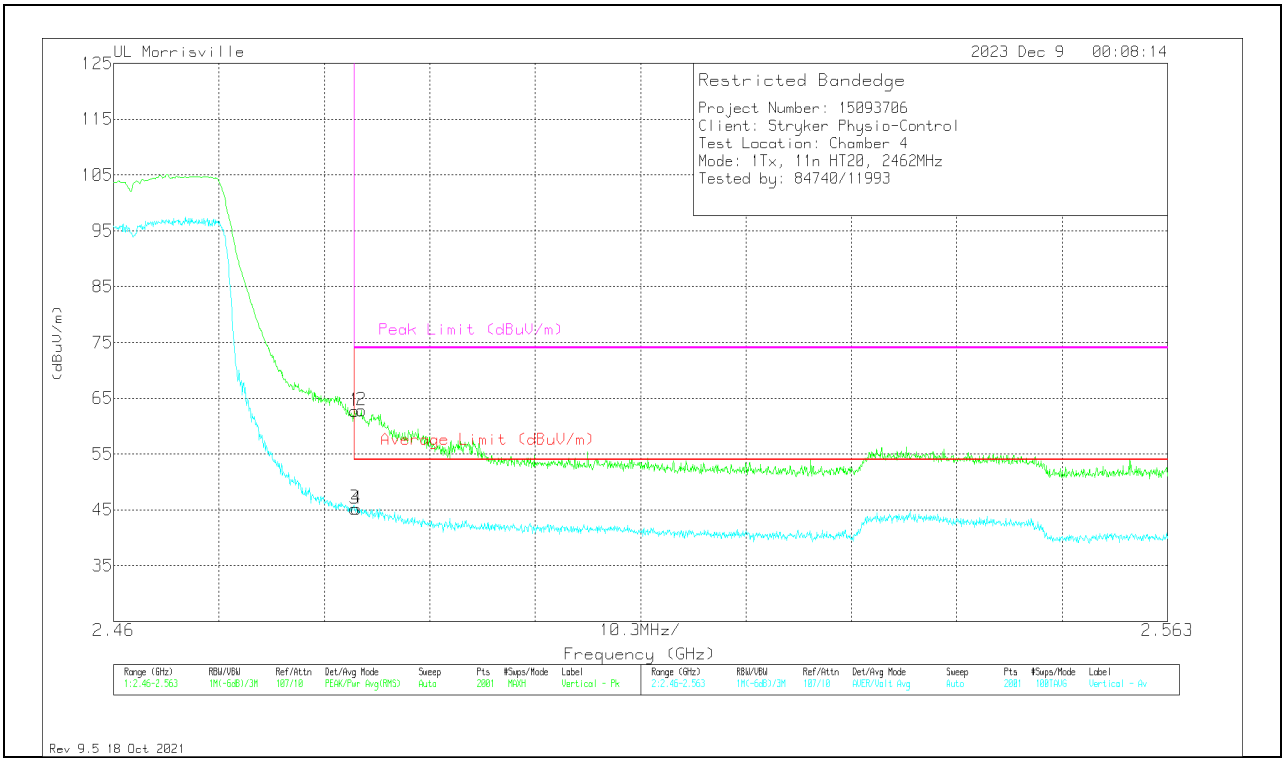
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (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	37.69	Pk	32.3	-12.9	57.09	-	-	74	-16.91	222	103	H
2	* ** 2.48369	39.16	Pk	32.3	-12.9	58.56	-	-	74	-15.44	222	103	H
3	* ** 2.48354	21.28	ADV	32.3	-12.9	40.68	54	-13.32	-	-	222	103	H
4	** 2.53746	22.65	ADV	32.5	-12.9	42.25	54	-11.75	-	-	222	103	H

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

VERTICAL RESULT

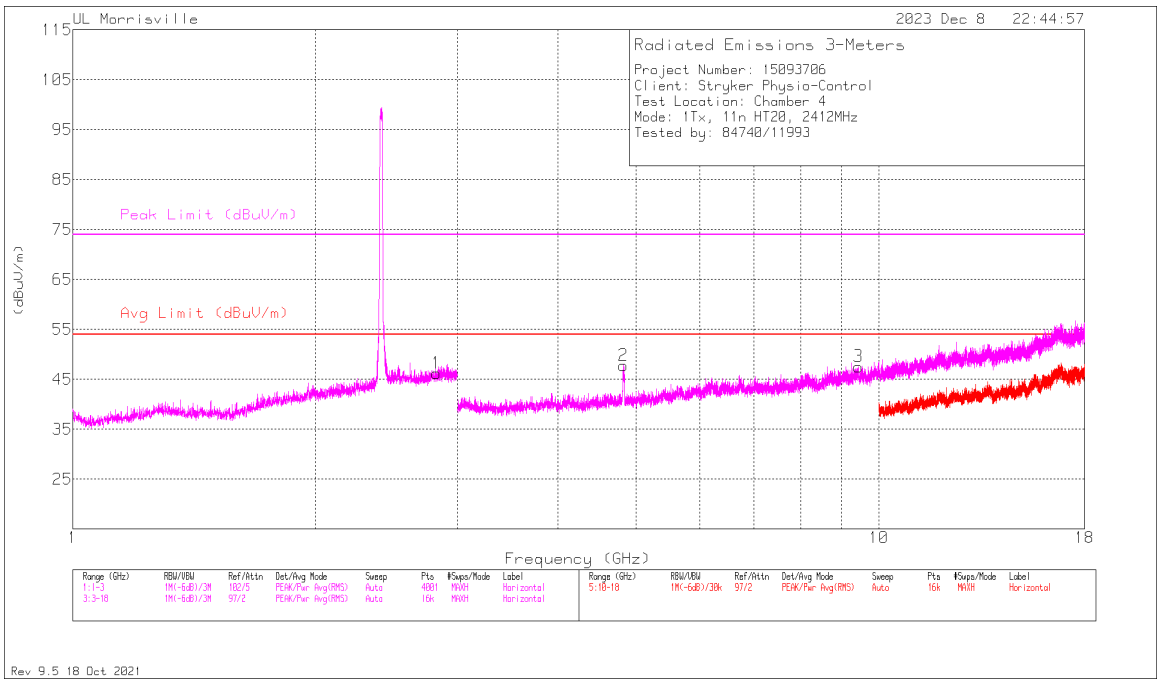


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	43.28	Pk	32.3	-12.9	62.68	-	-	74	-11.32	63	102	V
2	* ** 2.48421	43.44	Pk	32.3	-12.9	62.84	-	-	74	-11.16	63	102	V
3	* ** 2.48354	25.86	ADV	32.3	-12.9	45.26	54	-8.74	-	-	63	102	V
4	* ** 2.48374	25.83	ADV	32.3	-12.9	45.23	54	-8.77	-	-	63	102	V

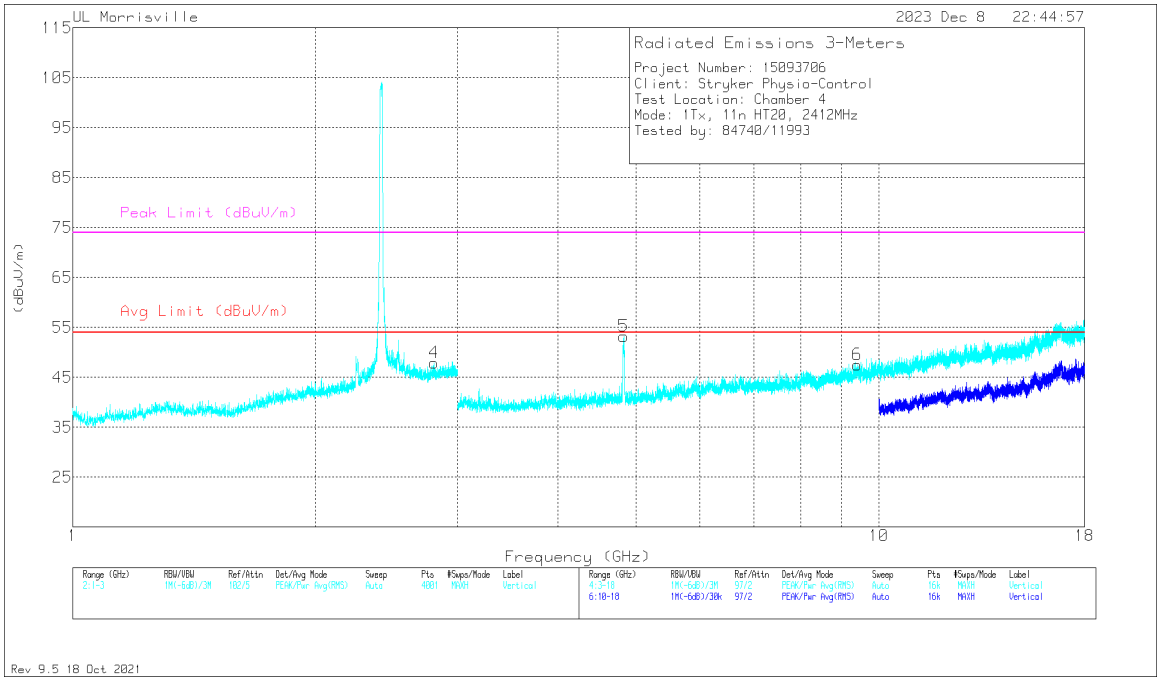
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL, CH 1 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.826	25.97	Pk	32.4	-12.2	46.17	54	-7.83	74	-27.83	0-360	100	H
4	* ** 2.8045	27.56	Pk	32.6	-12.3	47.86	54	-6.14	74	-26.14	0-360	200	V
2	* ** 4.82438	45.19	Pk	34.1	-31.5	47.79	54	-6.21	74	-26.21	0-360	100	H
3	* ** 9.43969	36.28	Pk	36.7	-25.4	47.58	54	-6.42	74	-26.42	0-360	100	H
5	* ** 4.82417	54.23	PK2	34.1	-31.5	56.83	-	-	74	-17.17	266	121	V
	* ** 4.82411	42.1	ADV	34.1	-31.5	44.7	54	-9.3	-	-	266	121	V
6	* ** 9.41063	36.66	Pk	36.6	-25.7	47.56	54	-6.44	74	-26.44	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
ADV - Linear Voltage Average

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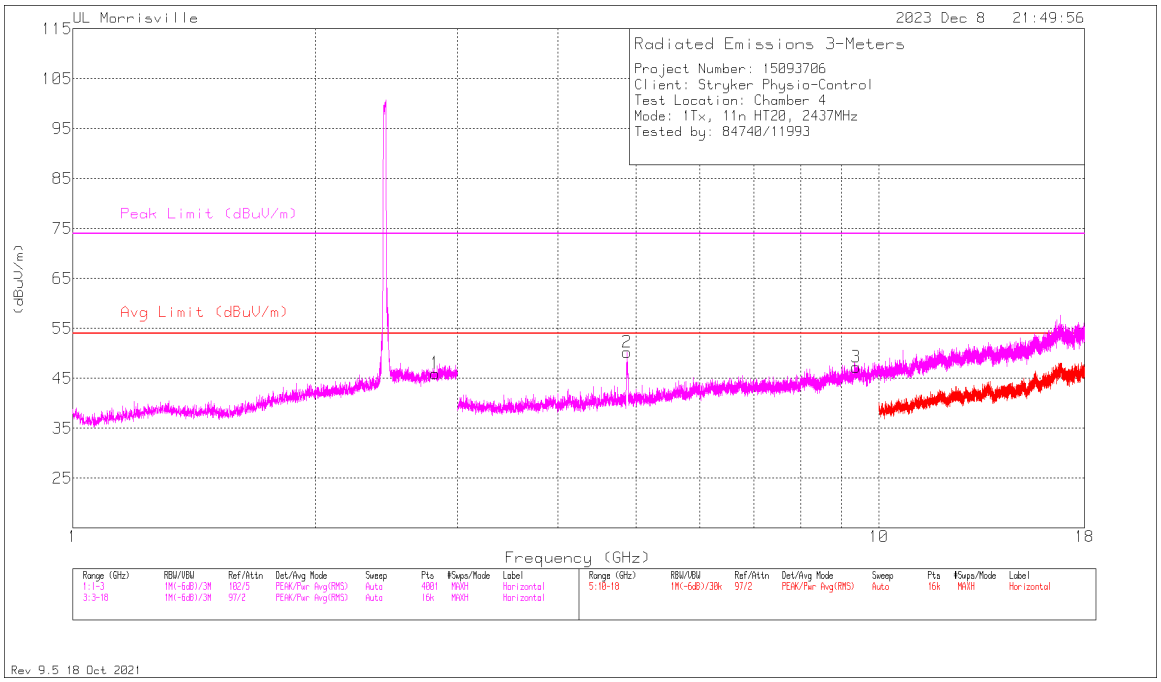
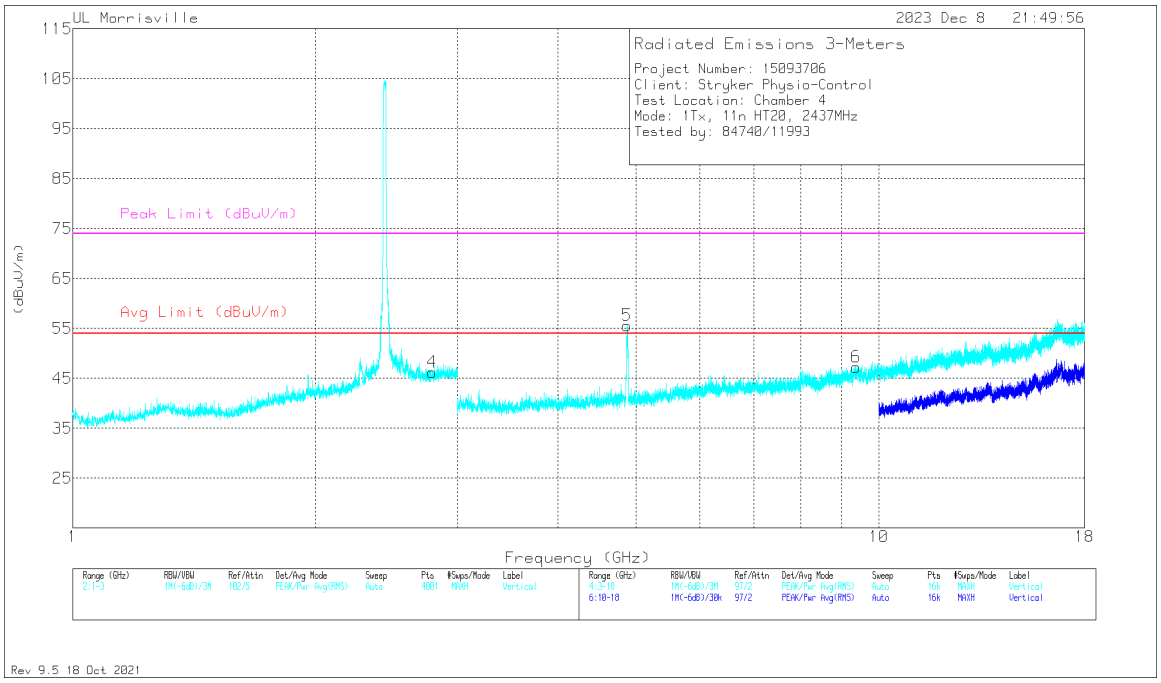
MID CHANNEL, CH 6 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.817	25.82	Pk	32.4	-12.2	46.02	54	-7.98	74	-27.98	0-360	100	H
4	* ** 2.791	25.98	Pk	32.6	-12.4	46.18	54	-7.82	74	-27.82	0-360	200	V
2	* ** 4.8732	52.52	PK2	34.1	-31.5	55.12	-	-	74	-18.88	301	331	H
	* ** 4.87428	39.54	ADV	34.1	-31.4	42.24	54	-11.76	-	-	301	331	H
3	* ** 9.37781	35.63	Pk	36.6	-25	47.23	54	-6.77	74	-26.77	0-360	100	H
5	* ** 4.87202	56.2	PK2	34.1	-31.6	58.7	-	-	74	-15.3	262	102	V
	* ** 4.8712	42.81	ADV	34.1	-31.7	45.21	54	-8.79	-	-	262	102	V
6	* ** 9.37594	35.65	Pk	36.6	-25	47.25	54	-6.75	74	-26.75	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
ADV - Linear Voltage Average

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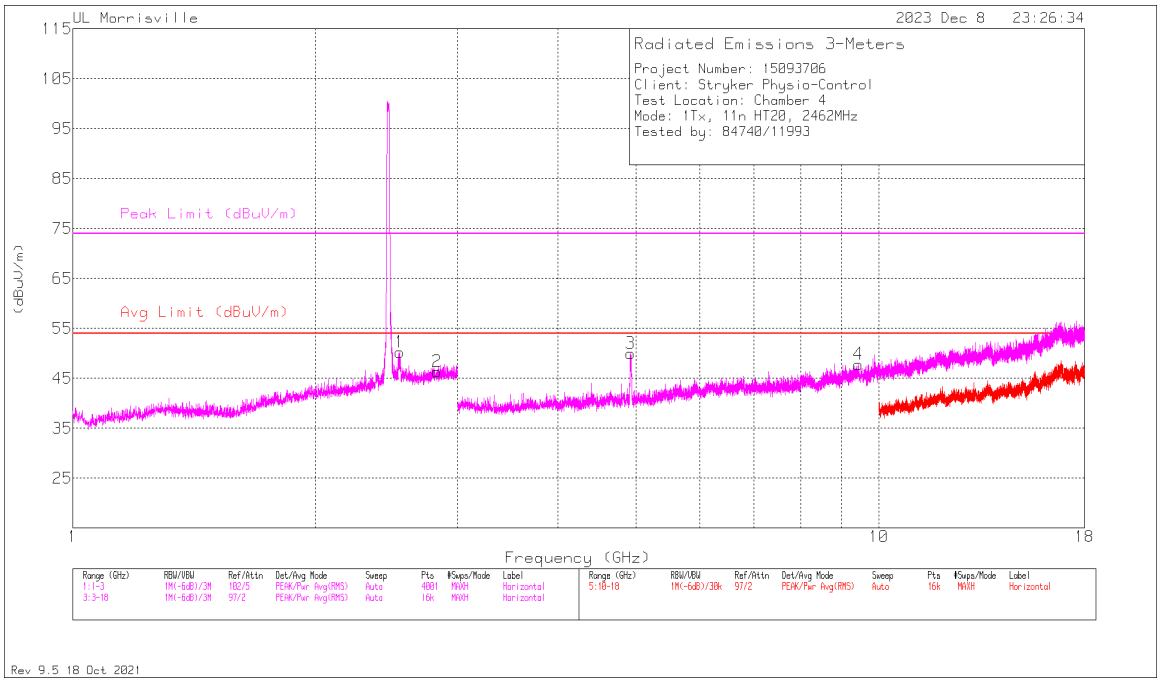
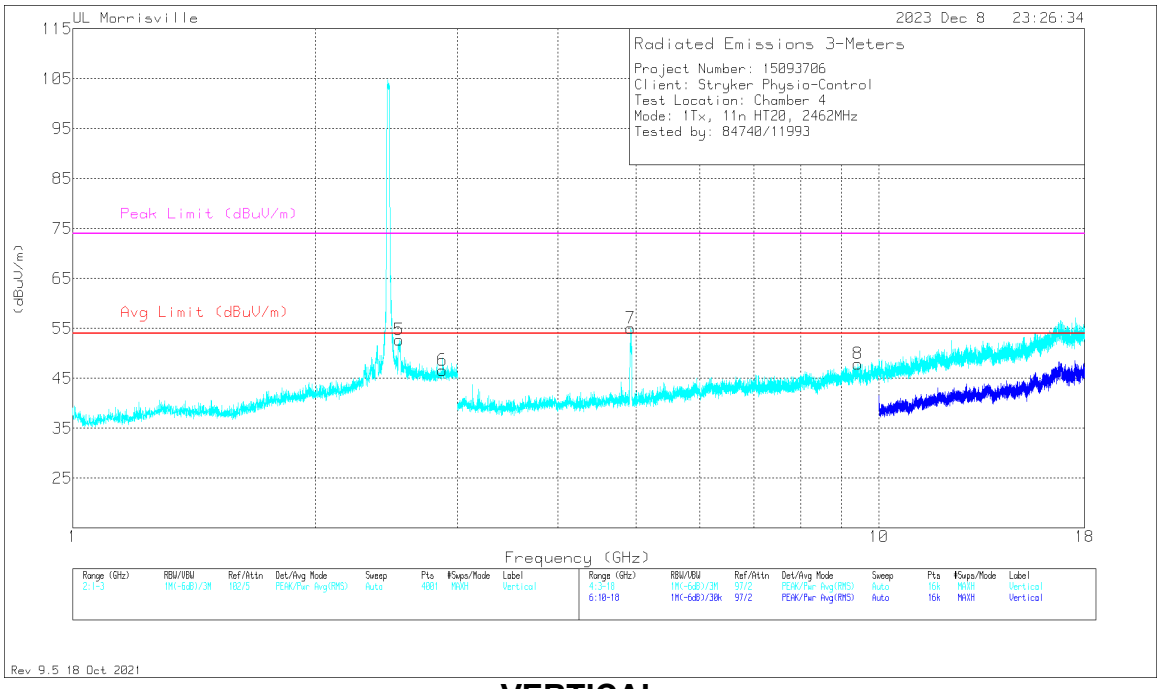
HIGH CHANNEL, CH 11 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	** 2.54153	33.45	PK2	32.5	-12.9	53.05	-	-	74	-20.95	225	101	H
	** 2.54266	21.58	ADV	32.5	-13	41.08	54	-12.92	-	-	225	101	H
2	* ** 2.8315	26.3	Pk	32.4	-12.3	46.4	54	-7.6	74	-27.6	0-360	100	H
5	** 2.53744	35.47	PK2	32.5	-12.9	55.07	-	-	74	-18.93	214	190	V
	** 2.53837	23.75	ADV	32.5	-12.9	43.35	54	-10.65	-	-	214	190	V
6	* ** 2.874	26.25	Pk	32.4	-12.1	46.55	54	-7.45	74	-27.45	0-360	200	V
3	* ** 4.92313	52.3	PK2	34	-31.4	54.9	-	-	74	-19.1	298	371	H
	* ** 4.92298	39.31	ADV	34	-31.4	41.91	54	-12.09	-	-	298	371	H
4	* ** 9.43219	36.94	Pk	36.7	-25.8	47.84	54	-6.16	74	-26.16	0-360	100	H
7	* ** 4.92203	56.46	PK2	34	-31.3	59.16	-	-	74	-14.84	266	101	V
	* ** 4.92422	43.54	ADV	34	-31.4	46.14	54	-7.86	-	-	266	101	V
8	* ** 9.42281	36.86	Pk	36.6	-25.6	47.86	54	-6.14	74	-26.14	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
ADV - Linear Voltage Average

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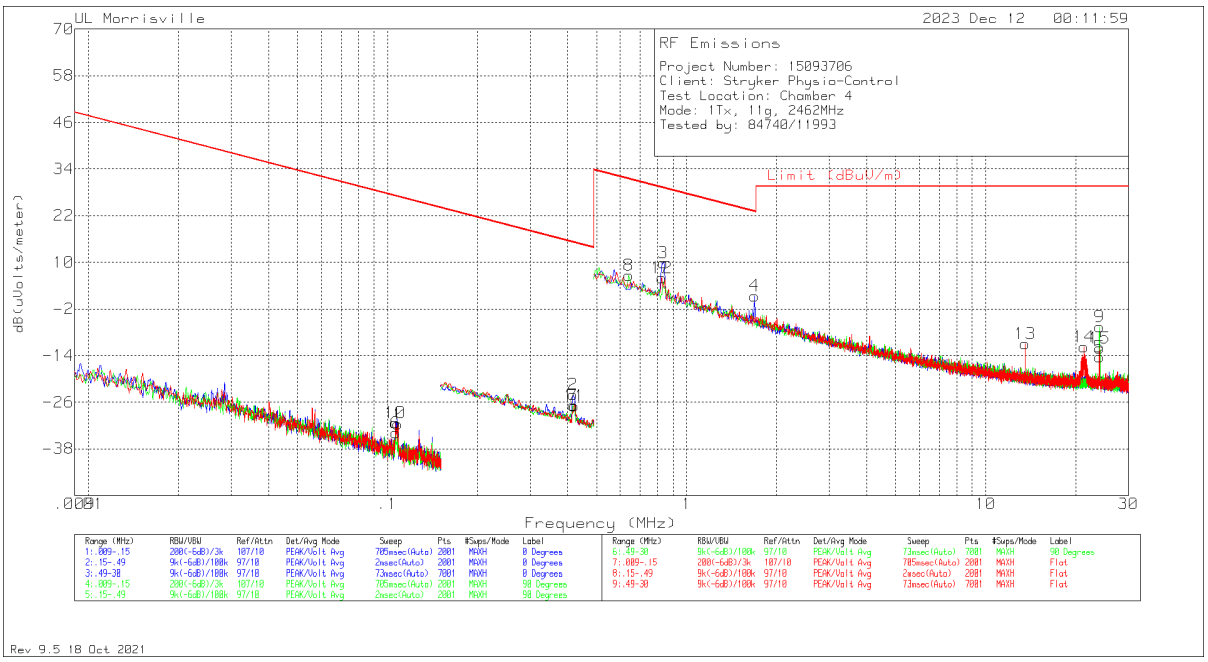
10.2. WORST CASE RADIATED EMISSIONS

10.2.1. WORST CASE BELOW 30MHZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

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

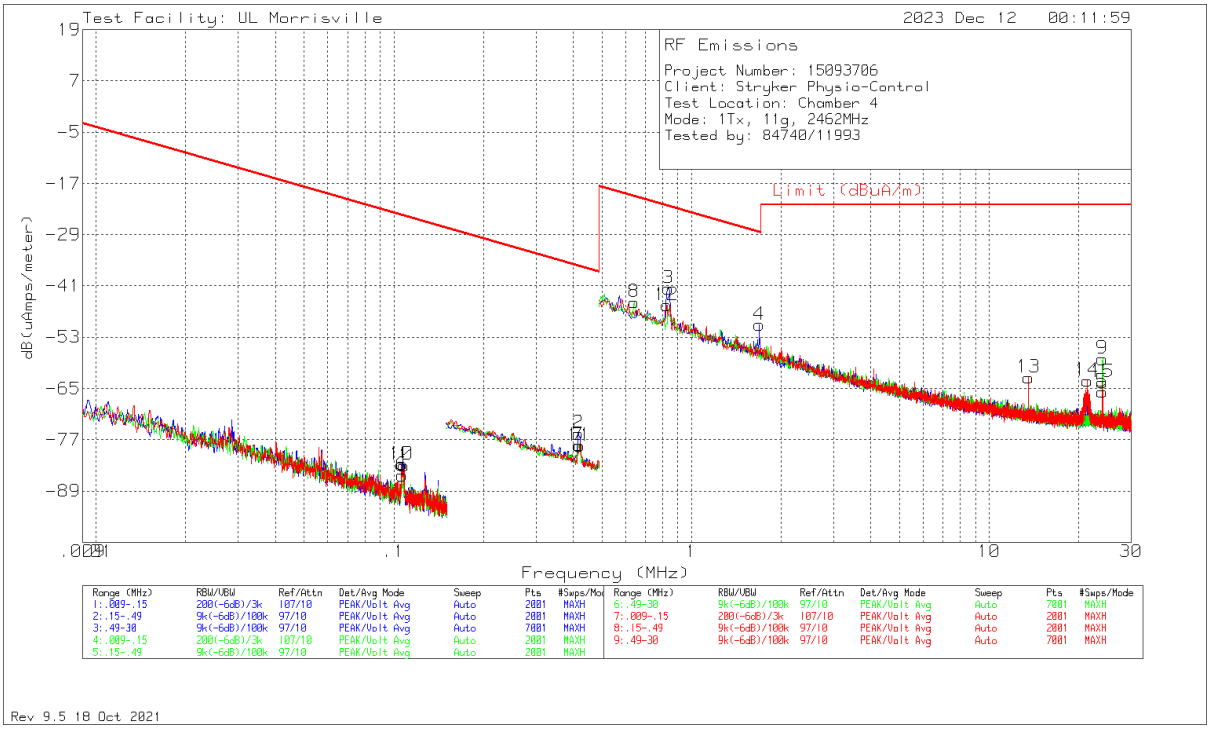


ANTENNA- THREE ORIENTATIONS E-FIELD

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
1	.10812	36.21	Pk	12.2	0	-80	-31.59	26.93	-58.52	0-360	400	0 degs
2	.41707	43.64	Pk	12.2	.1	-80	-24.06	15.2	-39.26	0-360	400	0 degs
3	.83571	37.63	Pk	12.2	.1	-40	9.93	29.16	-19.23	0-360	400	0 degs
4	1.68734	28.99	Pk	12.3	.1	-40	1.39	23.06	-21.67	0-360	400	0 degs
5	24.03214	15.99	Pk	9.1	.6	-40	-14.31	29.54	-43.85	0-360	400	0 degs
6	.10663	34	Pk	12.2	0	-80	-33.8	27.05	-60.85	0-360	400	90 degs
7	.41699	40.89	Pk	12.2	.1	-80	-26.81	15.2	-42.01	0-360	400	90 degs
8	.64178	34.36	Pk	12.2	.1	-40	6.66	31.46	-24.8	0-360	400	90 degs
9	24.04058	23.71	Pk	9.1	.6	-40	-6.59	29.54	-36.13	0-360	400	90 degs
10	.10606	36.52	Pk	12.2	0	-80	-31.28	27.09	-58.37	0-360	400	Flat
11	.42064	40.78	Pk	12.2	.1	-80	-26.92	15.13	-42.05	0-360	400	Flat
12	.82517	33.67	Pk	12.2	.1	-40	5.97	29.27	-23.3	0-360	400	Flat
13	13.5596	18.02	Pk	10.6	.4	-40	-10.98	29.54	-40.52	0-360	400	Flat
14	21.34234	18.07	Pk	9.6	.6	-40	-11.73	29.54	-41.27	0-360	400	Flat
15	24.00263	18.21	Pk	9.1	.6	-40	-12.09	29.54	-41.63	0-360	400	Flat

Pk - Peak detector



ANTENNA- THREE ORIENTATIONS H-FIELD

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
10	.10606	36.52	Pk	-39.3	0	-80	-82.78	-24.41	-58.37	0-360	400	Flat
6	.10663	34	Pk	-39.3	0	-80	-85.3	-24.45	-60.85	0-360	400	90 degs
1	.10812	36.21	Pk	-39.3	0	-80	-83.09	-24.57	-58.52	0-360	400	0 degs
7	.41699	40.89	Pk	-39.3	.1	-80	-78.31	-36.3	-42.01	0-360	400	90 degs
2	.41707	43.64	Pk	-39.3	.1	-80	-75.56	-36.3	-39.26	0-360	400	0 degs
11	.42064	40.78	Pk	-39.3	.1	-80	-78.42	-36.37	-42.05	0-360	400	Flat
8	.64178	34.36	Pk	-39.3	.1	-40	-44.84	-20.04	-24.8	0-360	400	90 degs
12	.82517	33.67	Pk	-39.3	.1	-40	-45.53	-22.23	-23.3	0-360	400	Flat
3	.83571	37.63	Pk	-39.3	.1	-40	-41.57	-22.34	-19.23	0-360	400	0 degs
4	1.68734	28.99	Pk	-39.2	.1	-40	-50.11	-28.44	-21.67	0-360	400	0 degs
13	13.5596	18.02	Pk	-40.9	.4	-40	-62.48	-21.96	-40.52	0-360	400	Flat
14	21.34234	18.07	Pk	-41.9	.6	-40	-63.23	-21.96	-41.27	0-360	400	Flat
15	24.00263	18.21	Pk	-42.4	.6	-40	-63.59	-21.96	-41.63	0-360	400	Flat
5	24.03214	15.99	Pk	-42.4	.6	-40	-65.81	-21.96	-43.85	0-360	400	0 degs
9	24.04058	23.71	Pk	-42.4	.6	-40	-58.09	-21.96	-36.13	0-360	400	90 degs

Pk - Peak detector

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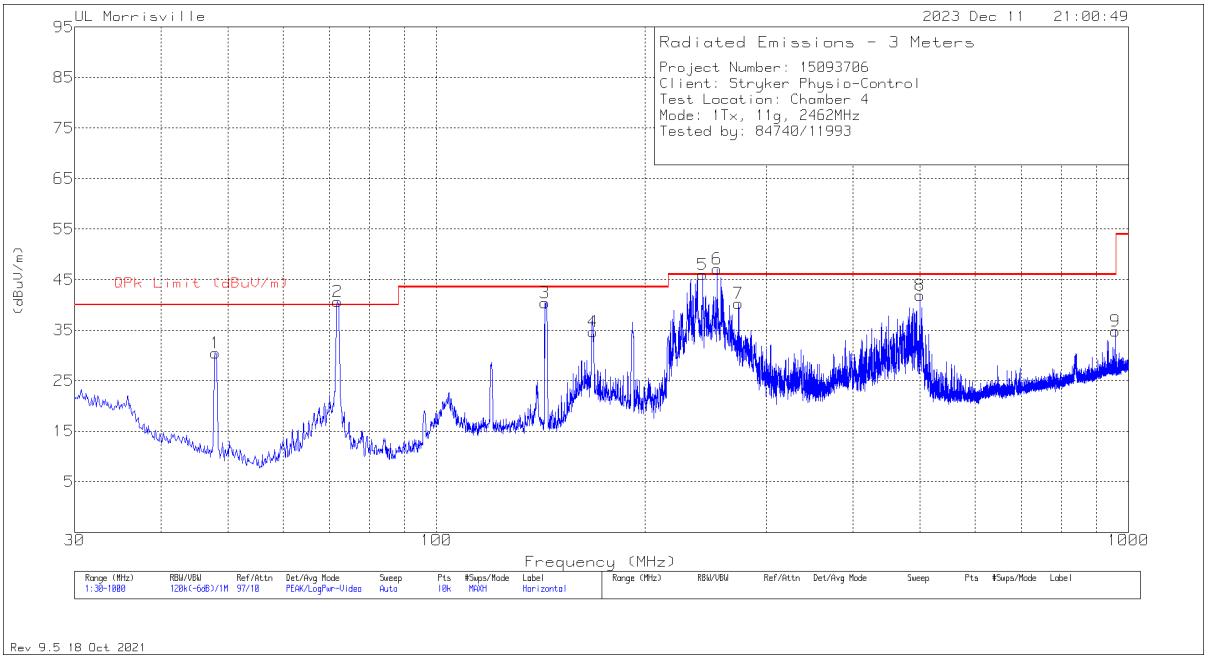
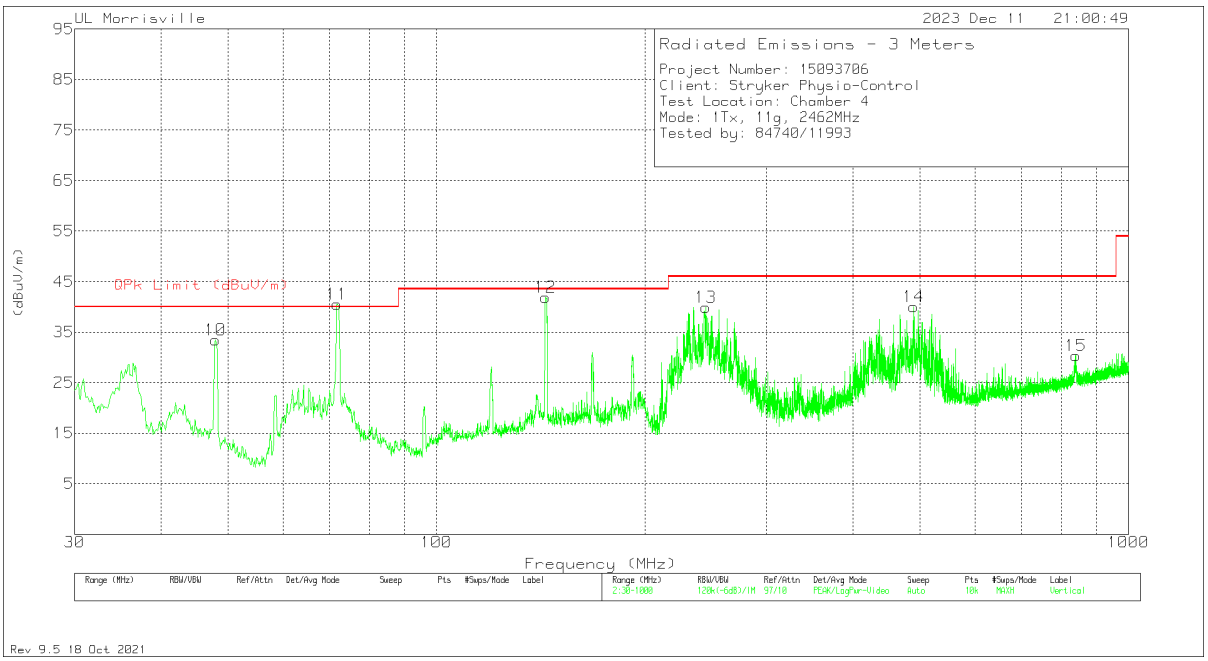
10.2.2. WORST CASE BELOW 1 GHZ

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



HORIZONTAL



VERTICAL

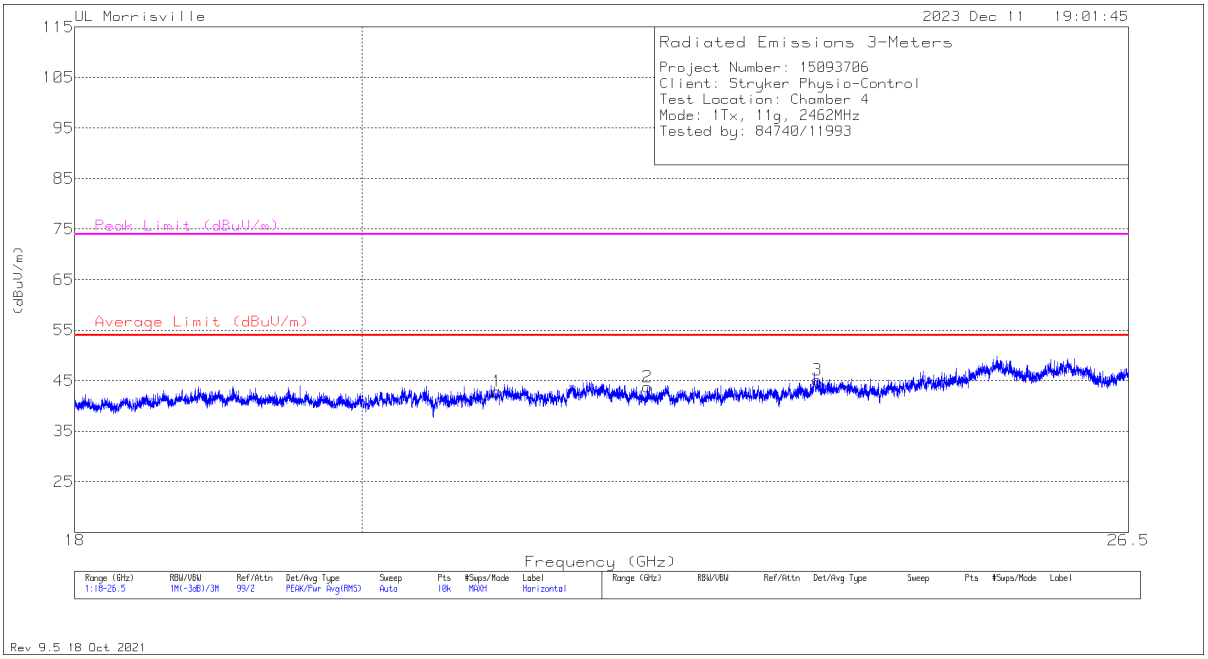
Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90629 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	47.945	47.71	Pk	14.8	-32	30.51	40	-9.49	0-360	300	H
10	47.945	50.67	Pk	14.8	-32	33.47	40	-6.53	0-360	100	V
11	71.85639	56.96	Qp	14.4	-31.7	39.66	40	-.34	1	109	V
2	71.9166	56.8	Qp	14.4	-31.7	39.5	40	-.5	123	229	H
3	143.49539	50.72	Qp	18.9	-31.2	38.42	43.52	-5.1	242	215	H
12	143.74794	53.07	Qp	18.8	-31.2	40.67	43.52	-2.85	284	102	V
4	168.516	47.65	Pk	18	-31	34.65	43.52	-8.87	0-360	100	H
5	242.39783	49.29	Qp	17.7	-30.6	36.39	46.02	-9.63	34	127	H
13	244.952	52.85	Pk	17.7	-30.6	39.95	46.02	-6.07	0-360	100	V
6	254.27189	48.98	Qp	17.5	-30.5	35.98	46.02	-10.04	41	117	H
7	273.31306	42.29	Qp	19.3	-30.4	31.19	46.02	-14.83	52	109	H
14	488.88662	32.08	Qp	23.8	-29.6	26.28	46.02	-19.74	320	107	V
8	499.30298	33.21	Qp	23.8	-29.6	27.41	46.02	-18.61	54	128	H
15	838.592	30.48	Pk	27.9	-28	30.38	46.02	-15.64	0-360	100	V
9	957.32	32.51	Pk	28.9	-26.6	34.81	46.02	-11.21	0-360	100	H

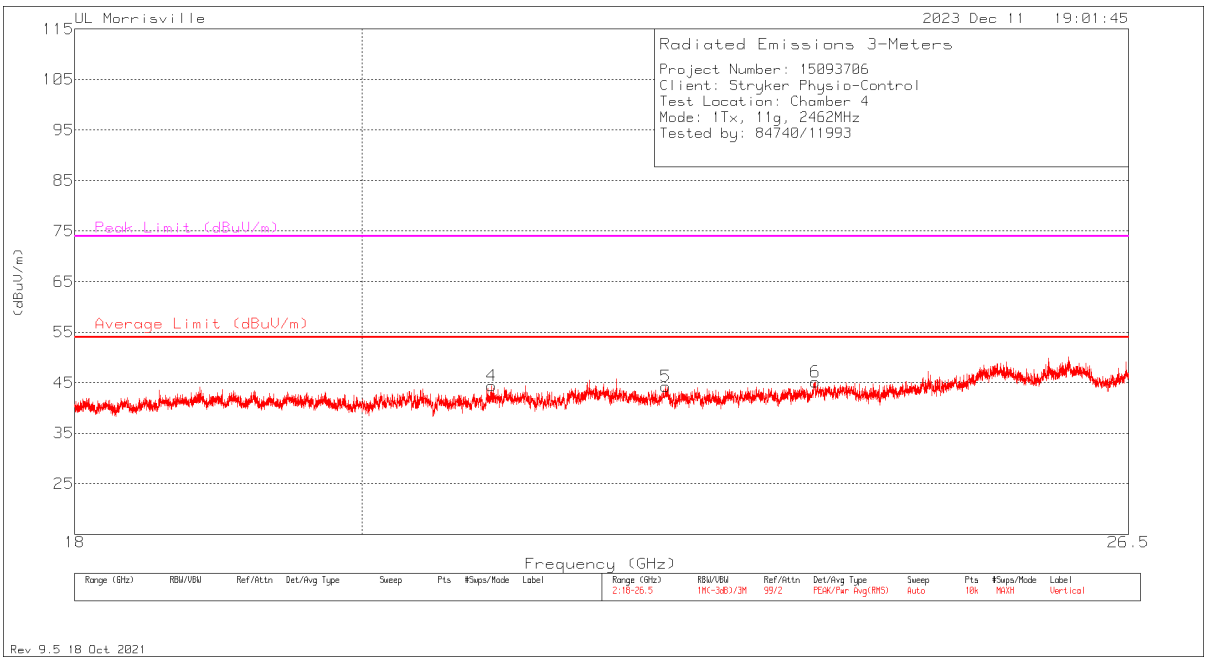
Pk - Peak detector
Qp - Quasi-Peak detector

10.2.3. WORST CASE 18-26 GHZ

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



HORIZONTAL



VERTICAL

18 – 26GHz Data

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	204704 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 21.01975	48.78	Pk	33.6	-39.5	42.88	54	-11.12	74	-31.12	0-360	100	H
2	* ** 22.20963	49.04	Pk	34.3	-39.6	43.74	54	-10.26	74	-30.26	0-360	100	H
3	* ** 23.63834	47.64	Pk	34.6	-37.1	45.14	54	-8.86	74	-28.86	0-360	100	H
4	* ** 20.97725	50.01	Pk	33.6	-39.2	44.41	54	-9.59	74	-29.59	0-360	250	V
5	* ** 22.36006	48.62	Pk	34.1	-38.5	44.22	54	-9.78	74	-29.78	0-360	250	V
6	* ** 23.62049	47.48	Pk	34.6	-36.9	45.18	54	-8.82	74	-28.82	0-360	300	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 R14593706-EP1 for setup photos.

END OF TEST REPORT