TEST REPORT

Report Number: R14311587-E2

Applicant	:	Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0075, Japan
FCC ID	:	PY7-53752E
EUT Description	:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C AND E

Date Of Issue:

2022-08-23

Prepared by:
UL LLC
12 Laboratory Dr.
Research Triangle Park, NC 27709 U.S.A.
TEL: (919) 549-1400

ACCREDITED
CERT #0751.06

REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2022-08-02	Initial Issue	Charles Moody
V2	2022-08-10	Updated sections 7.3, 7.4 and added units to Corrected EIRP column	Charles Moody
V3	2022-08-12	Updated with DFS spot check data	Charles Moody
V4	2022-08-15	Updated support and measurement equipment used for DFS testing	Charles Moody
V5	2022-08-17	Updated note in section 7.4	Charles Moody
V6	2022-08-23	Updated section 7.2 to reflect device differences and updated 7.4 spot check verification table	Charles Moody

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Sony Corporation
1-7-1 Konan Minato-ku
Tokyo, 108-0075, Japan

EUT DESCRIPTION: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC

SERIAL NUMBER: QV770027D8, QV7700ETD8

SAMPLE RECEIPT DATE: 2022-07-05

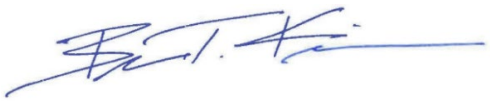
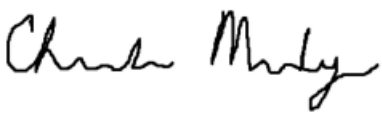
DATE TESTED: 2022-07-26 to 2022-07-29

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C and E	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. 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:	Reviewed By:	Prepared By:
		
Mike Antola Staff Engineer Consumer Technology Division UL LLC	Brian Kiewra Project Engineer Consumer Technology Division UL LLC	Charles Moody Electrical Engineer Consumer Technology Division UL LLC

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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.

FCC Clause	Requirement	Result	Comment
See Comment	Duty Cycle	Not performed	Radiated spot checks performed to justify data reuse.
See Comment	20/26dB BW		
15.247 (a) (2) 15.407 (e)	6dB BW		
15.247 (a)(1)	Hopping Frequency Separation		
15.247 (a)(1)(iii)	Number of Hopping Channels		
15.247 (a)(1)(iii)	Average Time of Occupancy		
See Comment	Average Power		
15.247 (d)	Conducted Spurious Emissions		
15.247 (b) (1,3) 15.407(a)(1-3)(h)(1)	Output Power		
15.247 (e) 15.407 (a) (1-3)	PSD		
15.207	AC Mains Conducted Emissions		
15.209, 15.205, 15.225 (d), 15.407(b)	Radiated Emissions	See Comment	Radiated spot checks performed on worst-case channels only to justify data reuse.

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 and KDB 484596 D01 Referencing Test Data v01.

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: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
☒	Building: 2800 Perimeter Park Dr. Suite B 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}
All emissions, radiated	6.01 dB

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

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6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE PHONE with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC.

6.2. WORST-CASE CONFIGURATION AND MODE

Band edge and radiated emissions between 1GHz and 18 GHz were performed with the EUT set to transmit at the worst-case channels and data rates based on the reports of an electrically identical model (see section 7 for data reuse information).

The antenna of the EUT was investigated in three orthogonal orientations X/Y/Z. See the table below for WC Orientations.

Technology	Orientation
2.4 WLAN	X
5.0 WLAN	Y
BLE Chain 0	X
BLE Chain 1	X
BT	Z
WPT	X

The Worst-Case scenarios for 1-18GHz are as follows:

Technology	Test Type	Frequency (MHz)	Mode	Data Rate	Chain
2.4 WLAN (DTS)	Band Edge	2462	HE20 242T/RU61	MCS0	MIMO
	RSE	2437	HE20 242T/RU61	MCS0	MIMO
5 WLAN (UNII)	5.2 Band Edge	5210	11ac80	MCS0	MIMO
	5.3 Band Edge	5290	11ac80	MCS0	MIMO
	5.6 Band Edge	5530	11ac80	MCS0	MIMO
	5.8 Band Edge	5775	11ac80	MCS0	MIMO
	RSE	5260	11a	6 Mbps	MIMO
BLE	Band Edge	2480	BLE (GFSK)	2 Mbps	0
	RSE	2440	BLE (GFSK)	2 Mbps	1
BT	Band Edge	2480	GFSK/DH-5	1 Mbps	0
	RSE	2441	GFSK/DH-5	1 Mbps	0

The worst-case scenario for WPT is as follows:

The EUT emissions should be measured from 9kHZ to 30MHz in its X orientation. The two devices shall be oriented perpendicularly, with coils aligned, and no separation distance between the two devices. Additionally, the device serving as the supply, shall have a battery greater than 70%. The device that is being charged should also have a battery of 50%.

6.3. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Sony	XQZ-UC11-010-236-21	1821W34209742	NA
Laptop	Asus	X515J	M8N0CX14J687338	N/A
Access Point	ASUS	GT-AXE11000	M9IG0X400839JKM	N/A
AP Power Supply	AcBel	ADD011	17AG213403440A	N/A
Controller Laptop	Lenovo	T450s	RTP0416PCOBHFNX	N/A
Laptop Power Supply	Lenovo	ADLX90NLC2A	11S45N0247Z1ZS9B51A0Z7	N/A

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB	1	USB-C	Non-Shielded	<3m	Connected to Power Supply
2	3.5mm	1	3.5mm Audio	Non-Shielded	<1m	Connected to headphones

7. REUSE OF TEST DATA

7.1. INTRODUCTION

According to the manufacturer, FCC ID: PY7-58692W and FCC ID: PY7-53752E unlicensed radios (WLAN/BT/BLE/WPT) are electrically identical. The FCC ID: PY7-58692W test data shall remain representative of FCC ID: PY7-53752E so, FCC ID: PY7-53752E leverages test data from FCC ID: PY7-58692W.

Manufacturer has also declared that DFS mechanism and software is identical to the lead device (PY7-58692W) and is to be reused.

The applicant takes full responsibility that the test data as referenced in this section represents compliance for this FCC ID.

7.2. DEVICES DIFFERENCES

Difference between PY7-58692W and PY7-53752E:

Sony Corporation hereby declares that the hardware of WLAN 2.4GHz , WLAN 5GHz, Bluetooth, GPS and WPT is identical among PY7-58692W and PY7-53752E. The change is related to the cellular and NFC radio. Therefore the following report/data of PY7-58692W may represent for PY7-53752E.

7.3. REFERENCE DETAIL

Equipment Class	Reference FCC ID	Report Title/Section
DSS (BT)	PY7-58692W	1M2207200079-05.PY7 PY7-58692W RF Bluetooth Test Report / All sections
DTS (BLE)	PY7-58692W	1M2207200079-06.PY7 PY7-58692W RF BT LE Test Report / All sections
DTS (WLAN)	PY7-58692W	1M2207200079-08.PY7 PY7-58692W RF WLAN Test Report / All sections 1M2207200079-09.PY7 PY7-58692W RF WLAN (OFDMA) Test Report / All sections
NII (WLAN)	PY7-58692W	1M2207200079-10.PY7 PY7-58692W RF UNII Test Report / All sections 1M2207200079-11.PY7 PY7-58692W RF UNII (OFDMA) Test Report / All sections
NII (DFS)	PY7-58692W	1M2207200079-12.PY7 PY7-58692W RF DFS Test Report / All sections
DCD (WPT)	PY7-58692W	1M2207200079-15.PY7 PY7-58692W RF 15C Wireless Charging Test Report / All sections

7.4. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device PY7-53752E for radiated spurious. The data from the application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary.

PY7-53752E SPOT CHECK RESULTS									
Technology	Test Item	Channel	Measured Frequency (MHz)	PY7-58692W		PY7-53752E		Delta (dB) <+3dB	
				PK Reading (dBuV/m)	AV Reading (dBuV/m)	PK Reading (dBuV/m)	AV Reading (dBuV/m)	PK	AV
BT (GFSK)	RBE	78	2483	61.04	35.16	47.84	32.01	-13.20	-3.15
	RSE	39	12205	54.12	42.30	51.10	36.97	-3.02	-5.33
BLE (GFSK)	RBE	39	2483	63.42	46.41	46.12	36.08	-17.3	-10.34
	RSE	19	12200	51.86	39.91	51.00	43.05	-0.86	3.21**
			**Note: This measurement included no emissions and is entirely noise floor						
2.4GHz WLAN (HE20)	RBE	11	2483	62.76	47.27	57.27	43.27	-5.49	-4.00
	RSE	6	12185	56.49	46.09	50.77	38.52	-5.72	-7.57
5GHz WLAN (11ac80)	RBE	42	5149	59.15	46.58	53.55	40.07	-5.60	-6.51
	RBE	58	5350	58.73	46.17	53.37	39.7	-5.36	-6.47
	RBE	106	5460	61.78	47.02	49.10	36.79	-12.68	-10.23
	RBE	155	5944	58.58	-	48.28	-	-10.3	-
			Note: No AV limit for above scan, therefore no AV measurements just PK.						
	RSE	52	15780	59.99	48.50	53.38	40.77	-6.61	-7.73
WPT	RSE	148 kHz	0.592	11.08	-	4.27	-	-6.81	-

Technology / Mode	Test Item	PY7-58692W		PY7-53752E		PY7-58692W representative of PV7-53752E
		Move time	Close time	Move time	Close time	
DFS	Channel move time and channel closing transmissions time	0.8700s	5.0ms	0.7704s	5.6ms	Yes

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8. TEST AND MEASUREMENT EQUIPMENT

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

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
	1-18 GHz				
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-03-21	2023-03-21
	Gain-Loss Chains				
C2-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2022-05-10	2023-05-10
C2-SAC03	Gain-loss string: 1-18GHz	Various	Various	2022-05-10	2023-05-10
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-03-08	2023-03-08
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
200540	Environmental Meter	Fisher Scientific	15-077-963	2021-09-27	2022-09-27

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 1)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-05-11	2023-05-11
	Gain-Loss Chains				
C1-SAC03	Gain-loss string: 1-18GHz	Various	Various	2022-05-05	2023-05-05
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-04-14	2023-04-14
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
s/n 181474341	Environmental Meter	Fisher Scientific	15-077-963	2021-09-27	2022-09-27

Test Equipment Used – DFS Equipment (Chamber 5)

Description	Manufacturer	Model Number	Equipment ID	Next Cal.	Last Cal.
DFS Chamber					
Spectrum Analyzer, PXA, 3Hz to 8.4GHz	Keysight	N9030A	SA0021	2023-07-14	2022-07-14
Signal Generator, MXG, 9kHz to 6GHz	Agilent	N5182B	SIG003	2023-05-19	2022-05-19
Additional Equipment used					
Environmental meter	Fisher Scientific	14-650-118-15557603	HI0096	2022-09-21	2021-09-21

9. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4 WLAN DTS						
802.11ax HE20	2.3826	2.4123	0.988	98.77%	0.00	0.010
5 WLAN UNII						
802.11ac 80MHz	5.3850	5.4650	0.985	98.54%	0.00	0.010
802.11a 6Mbps	2.0952	2.113	0.991	99.15%	0.00	0.010
BLE						
GFSK 2Mbps	1.0550	1.8775	0.562	56.19%	5.01	0.948
BT						
GFSK (DH-5) 1Mbps	2.870	3.760	0.763	76.33%	2.35	0.348

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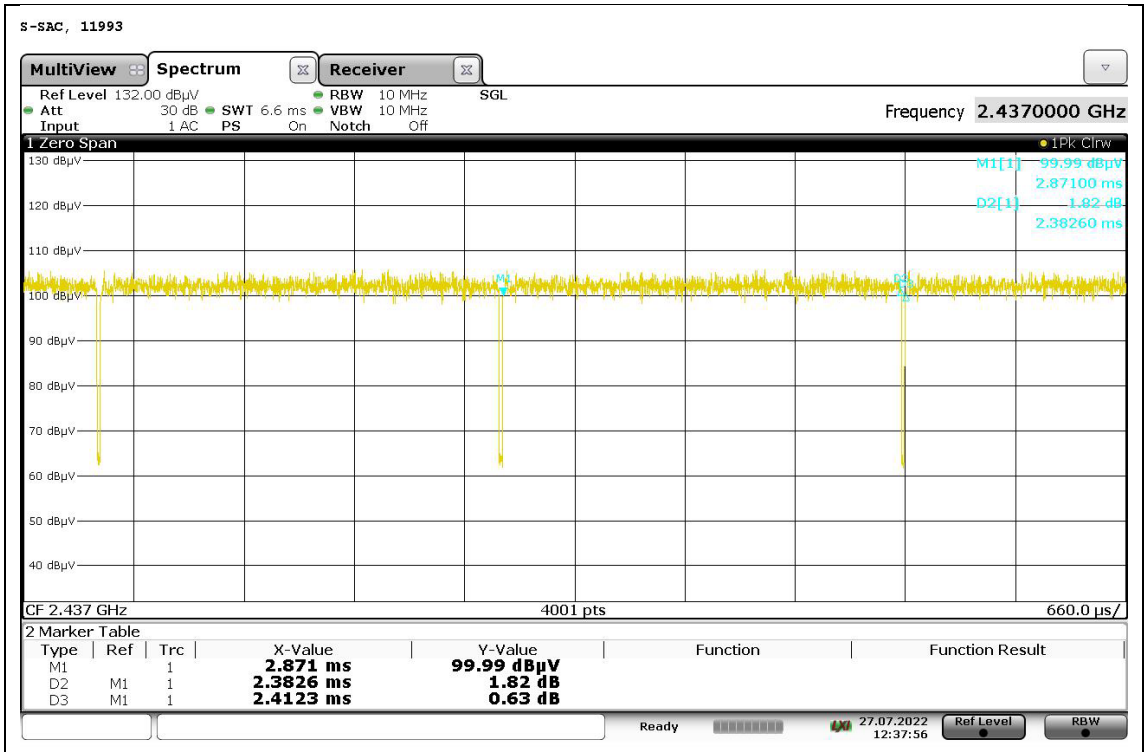
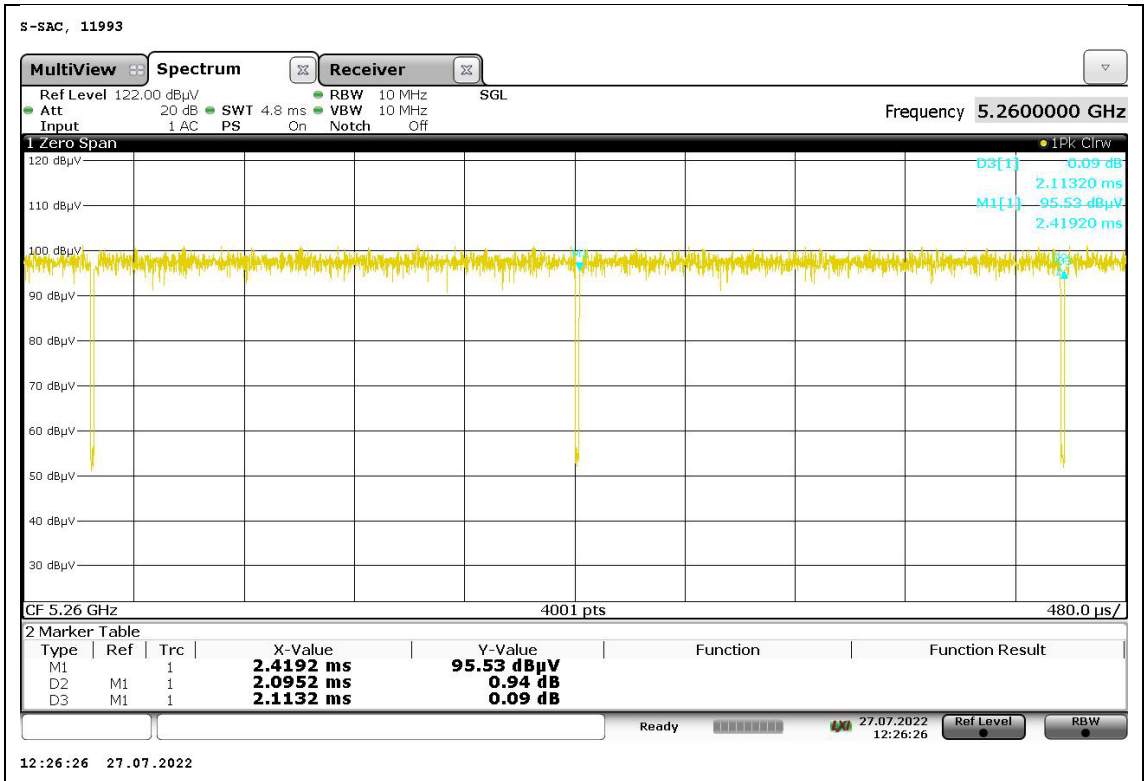
DUTY CYCLE PLOTS

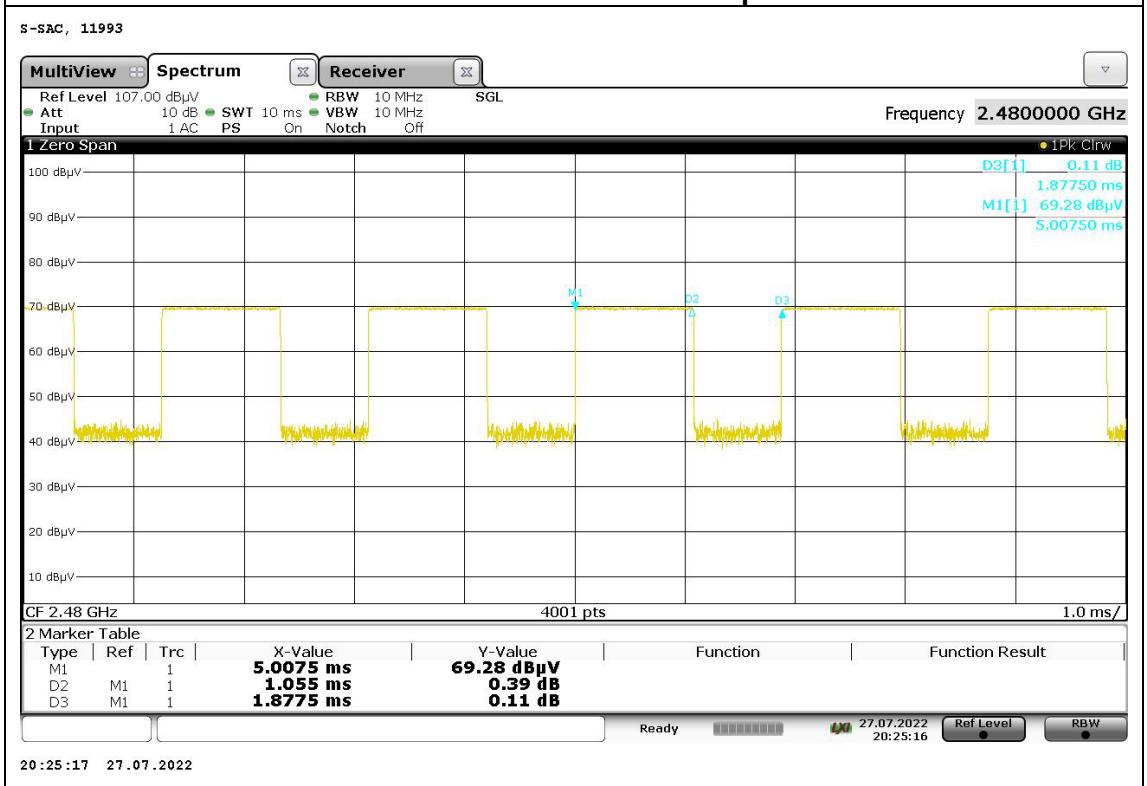


DUTY CYCLE 802.11ax HE20

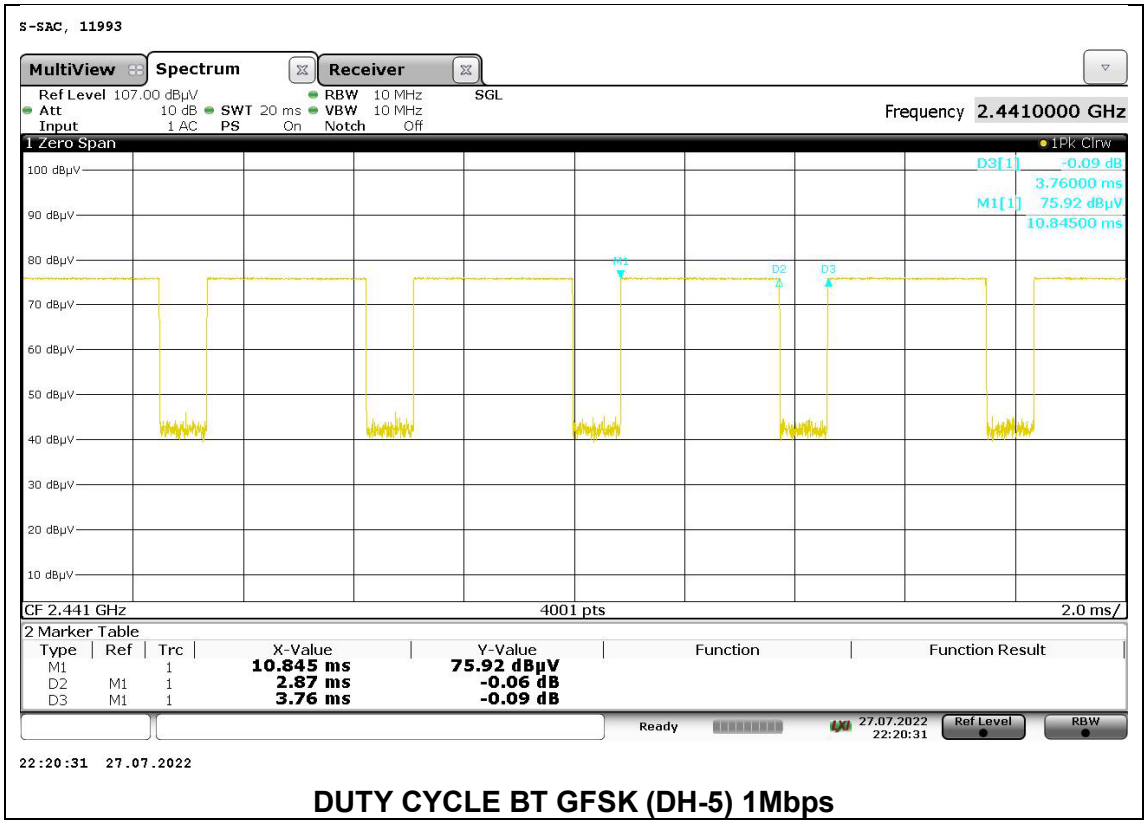
DUTY CYCLE 802.11ac 80 MHz



DUTY CYCLE 802.11a 6Mbps



DUTY CYCLE BLE GFSK 2Mbps



DUTY CYCLE BT GFSK (DH-5) 1Mbps

10. SPOT CHECK DATA

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 1.5 m above the ground plane for measurement above 1GHz and at 80 cm above the ground plane for measurements below 1 GHz. 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 above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with a minimum of 1/T video bandwidth with peak detector for BT average measurements, linear averaging for BLE measurements, and linear voltage detection for WLAN measurements.

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

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to worst case mode.

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.

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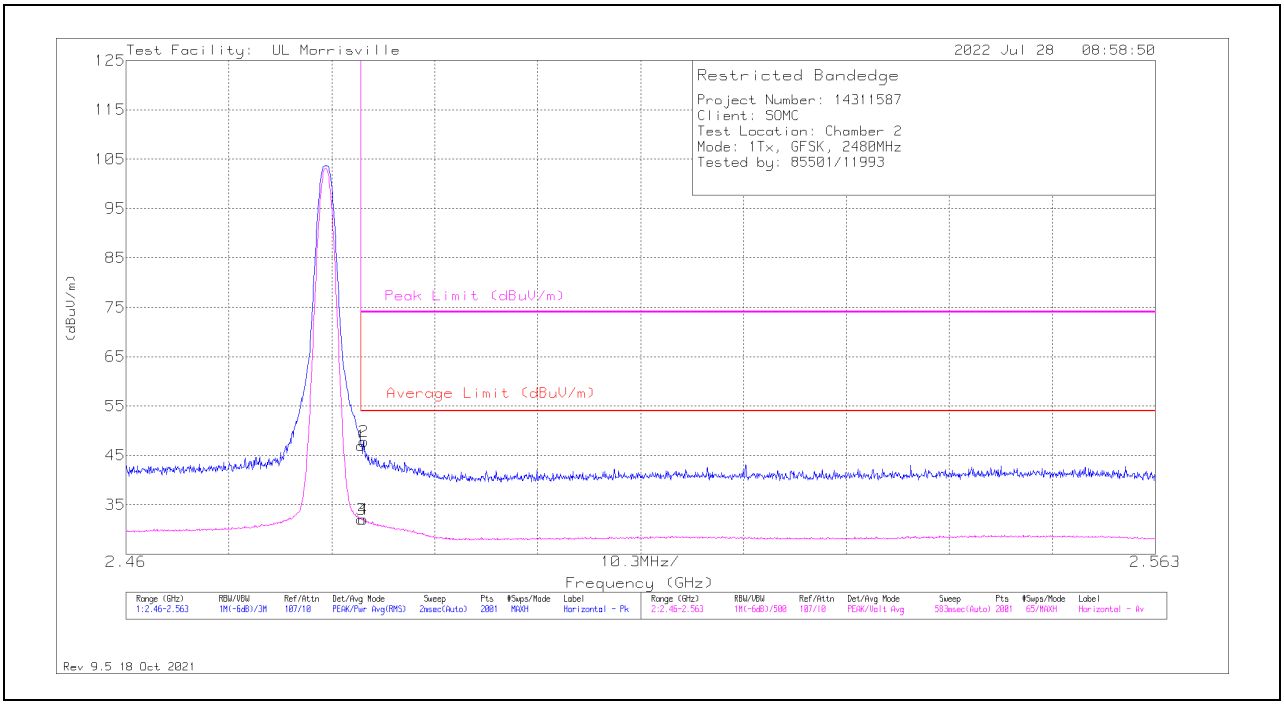
10.1. BLUETOOTH

BANDEDGE (HIGH CHANNEL - CHAIN 0, GFSK)

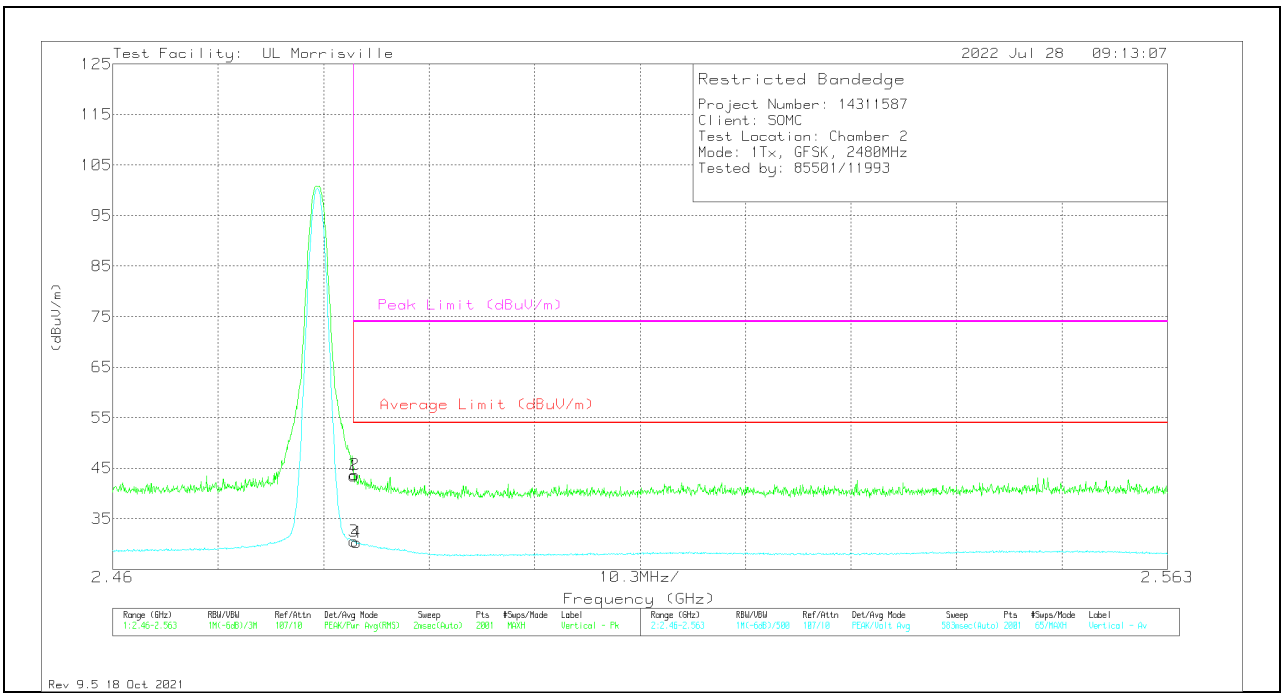
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	38.93	Pk	32.3	-24.3	46.93	-	-	74	-27.07	79	378	H
2	* ** 2.48379	39.94	Pk	32.3	-24.4	47.84	-	-	74	-26.16	79	378	H
3	* ** 2.48354	24	V1TV	32.3	-24.3	32	54	-22	-	-	79	378	H
4	* ** 2.48374	24.01	V1TV	32.3	-24.3	32.01	54	-21.99	-	-	79	378	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	35.48	Pk	32.3	-24.3	43.48	-	-	74	-30.52	296	261	V
2	* ** 2.48364	35.72	Pk	32.3	-24.3	43.72	-	-	74	-30.28	296	261	V
3	* ** 2.48354	22.58	V1TV	32.3	-24.3	30.58	54	-23.42	-	-	296	261	V
4	* ** 2.48379	22.37	V1TV	32.3	-24.4	30.27	54	-23.73	-	-	296	261	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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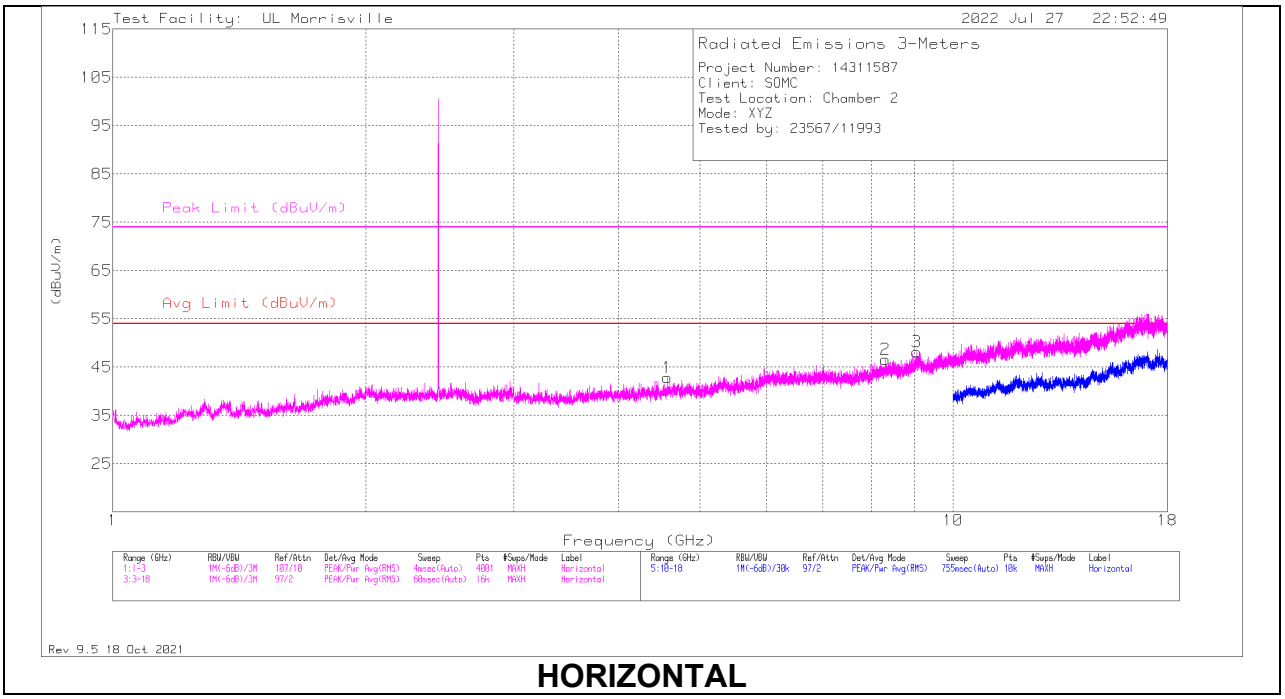
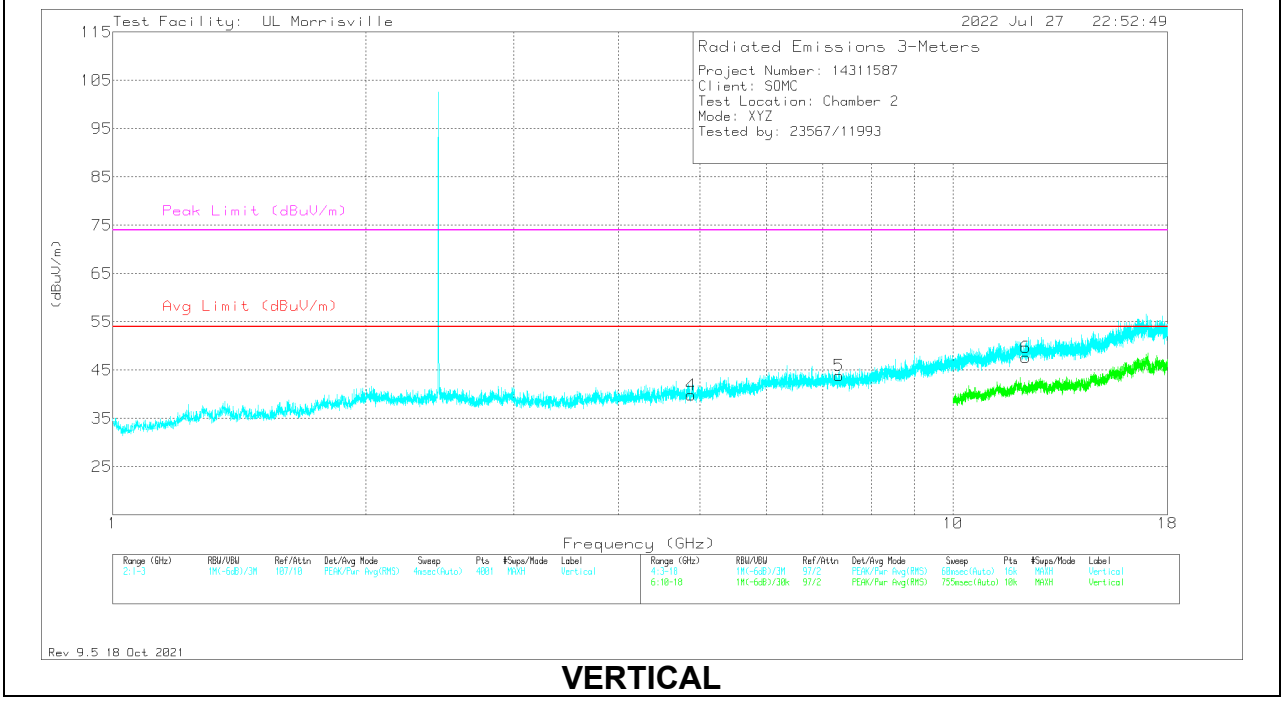
HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL – CHAIN 0, GFSK



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

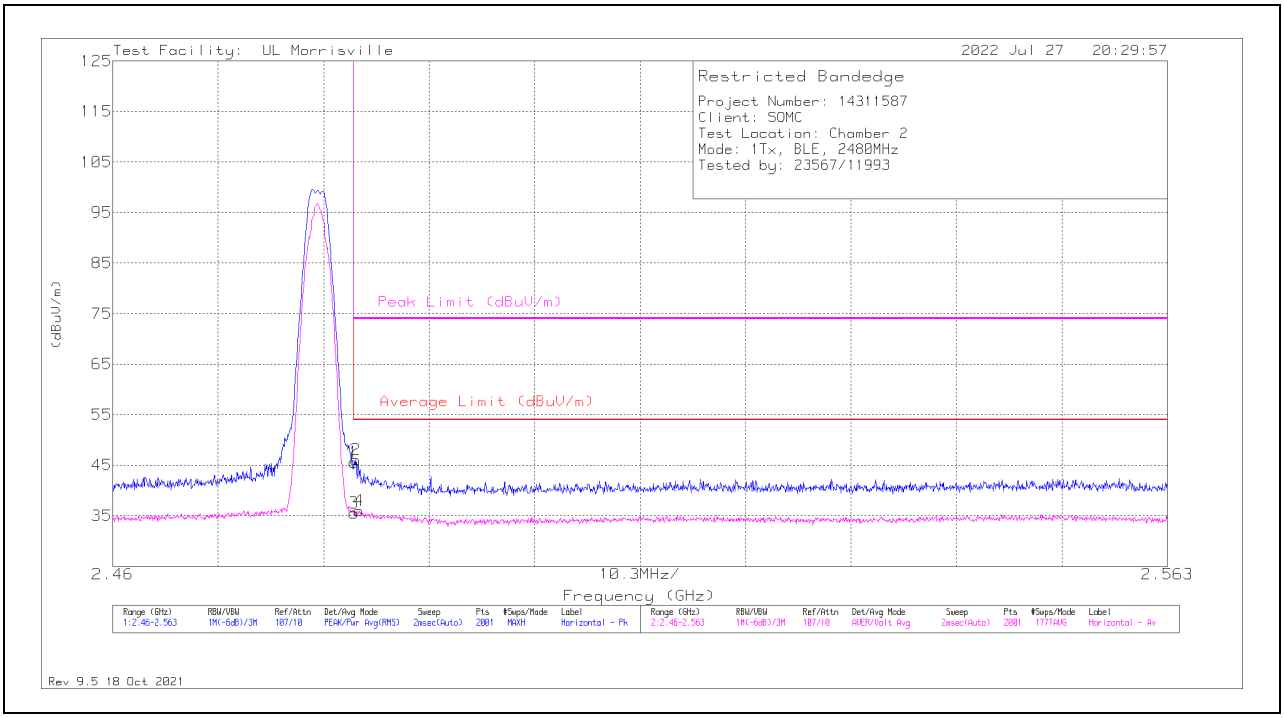
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* ** 9.04571	38.28	PK2	36	-25.6	48.68	-	-	74	-25.32	78	147	H
	* ** 9.04584	23.83	V1TV	36	-25.6	34.23	54	-19.77	-	-	78	147	H
4	* ** 4.88225	39.68	PK2	33.9	-30.7	42.88	-	-	74	-31.12	234	217	V
	* ** 4.88325	25.57	V1TV	33.9	-30.7	28.77	54	-25.23	-	-	234	217	V
5	* ** 7.3238	37.22	PK2	35.6	-26.9	45.92	-	-	74	-28.08	167	328	V
	* ** 7.32387	22.91	V1TV	35.6	-26.9	31.61	54	-22.39	-	-	167	328	V
6	* ** 12.20788	36.2	PK2	38.8	-23.9	51.1	-	-	74	-22.9	296	317	V
	* ** 12.2078	22.07	V1TV	38.8	-23.9	36.97	54	-17.03	-	-	296	317	V
1	* ** 4.57125	39.58	Pk	34.2	-30.9	42.88	54	-11.12	74	-31.12	0-360	199	H
2	* ** 8.31094	37.05	Pk	35.8	-26.3	46.55	54	-7.45	74	-27.45	0-360	199	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

10.2. BLE

BANDEDGE (HIGH CHANNEL – CHAIN 0, 2Mbps)

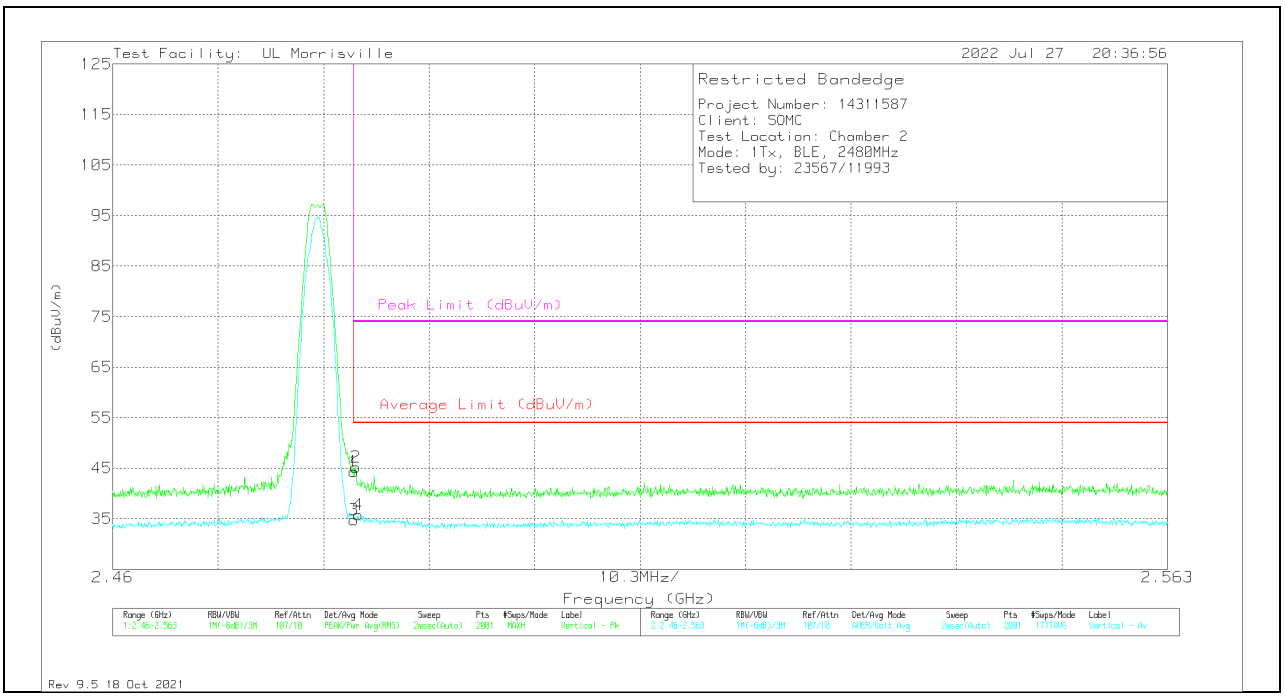
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (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	37.58	Pk	32.3	-24.3	0	45.58	-	-	74	-28.42	84	357	H
2	* ** 2.48374	38.12	Pk	32.3	-24.3	0	46.12	-	-	74	-27.88	84	357	H
3	* ** 2.48354	22.53	ADV	32.3	-24.3	5.01	35.54	54	-18.47	-	-	84	357	H
4	* ** 2.48405	23.17	ADV	32.3	-24.4	5.01	36.08	54	-17.93	-	-	84	357	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

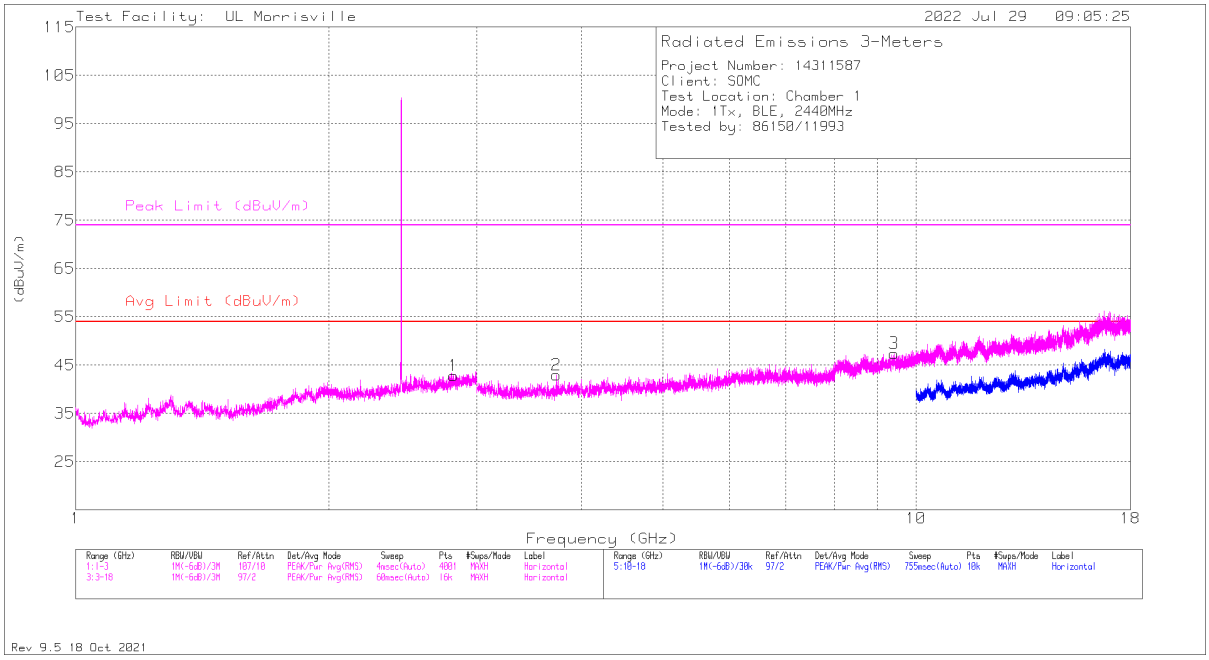


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	36.36	Pk	32.3	-24.3	0	44.36	-	-	74	-29.64	353	368	V
2	* ** 2.48374	37.22	Pk	32.3	-24.3	0	45.22	-	-	74	-28.78	353	368	V
3	* ** 2.48354	21.8	ADV	32.3	-24.3	5.01	34.81	54	-19.2	-	-	353	368	V
4	* ** 2.484	22.83	ADV	32.3	-24.4	5.01	35.74	54	-18.27	-	-	353	368	V

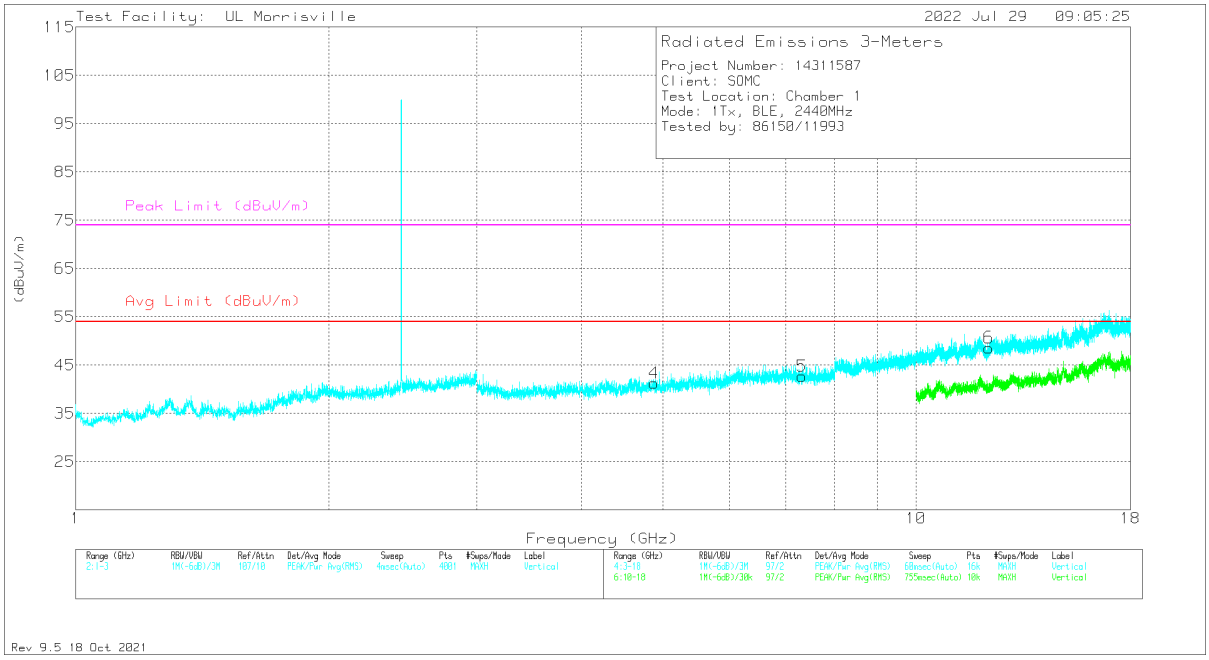
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL – CHAIN 1, 2Mbps



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.8175	34.1	Pk	32.6	-23.9	0	42.8	54	-11.2	74	-31.2	0-360	101	H
2	* ** 3.73219	42.57	Pk	33.2	-32.8	0	42.97	54	-11.03	74	-31.03	0-360	101	H
3	* ** 9.41906	39.05	Pk	36.6	-28.2	0	47.38	54	-6.55	74	-26.55	0-360	101	H
4	* ** 4.87853	41.72	PK2	34	-31.4	0	44.32	-	-	74	-29.68	299	357	V
	* ** 4.87888	28.87	ADV	34	-31.3	5.01	36.65	54	-17.35	-	-	299	357	V
5	* ** 7.3217	39.24	PK2	35.6	-29.4	0	45.44	-	-	74	-28.56	216	152	V
	* ** 7.32139	26.5	ADV	35.6	-29.5	5.01	37.61	54	-16.32	-	-	216	152	V
6	* ** 12.20148	38.7	PK2	38.9	-26.6	0	51	-	-	74	-23	285	238	V
	* ** 12.199	25.64	ADV	38.9	-26.5	5.01	43.05	54	-10.88	-	-	285	238	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

UL LLC
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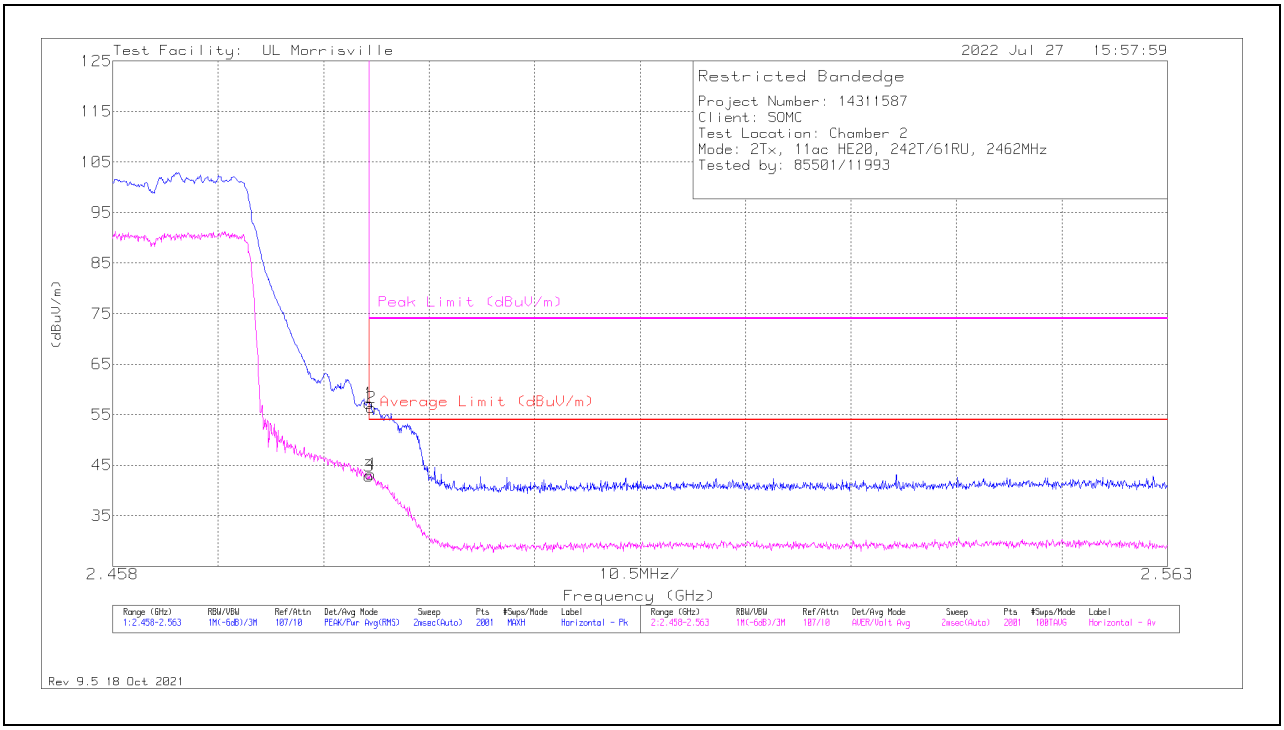
10.3. 2.4GHz WLAN

BANDEDGE (HIGH CHANNEL – 2TX, 802.11ax HE20 242T/RU61)

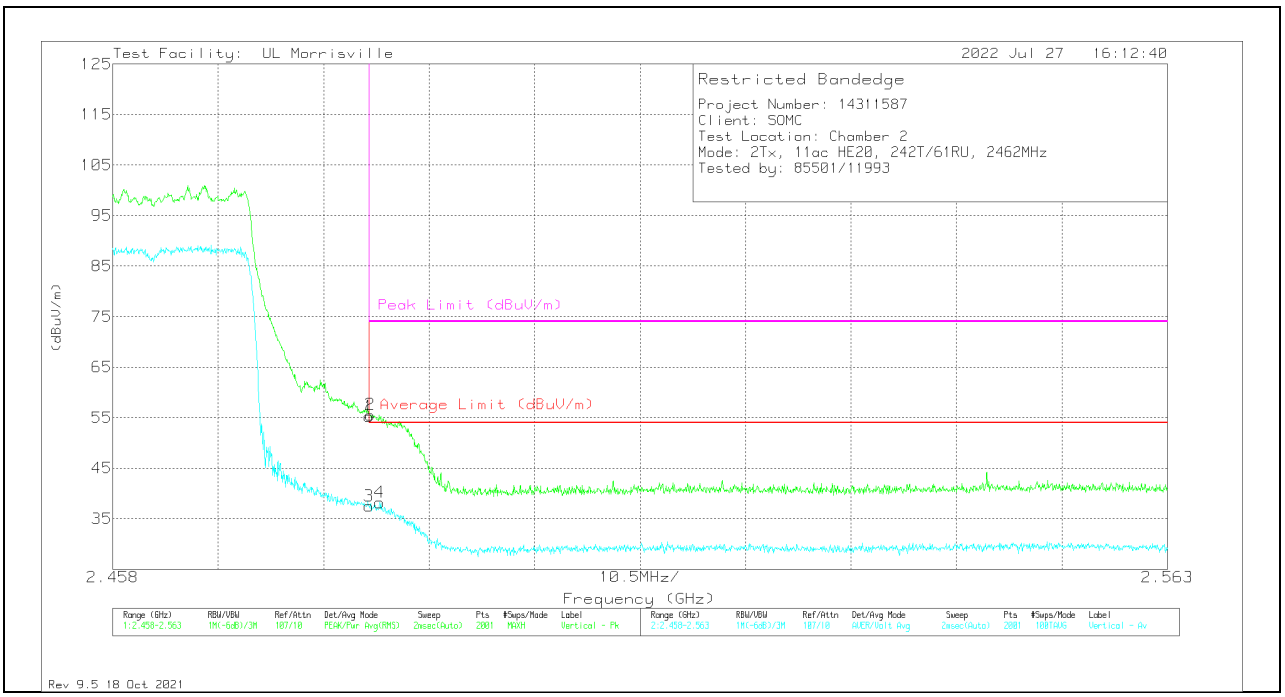
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 2.48352	49.27	Pk	32.3	-24.3	57.27	-	-	74	-16.73	108	173	H
2	* ** 2.48378	48.4	Pk	32.3	-24.3	56.4	-	-	74	-17.6	108	173	H
3	* ** 2.48352	34.89	ADV	32.3	-24.3	42.89	54	-11.11	-	-	108	173	H
4	* ** 2.48373	35.27	ADV	32.3	-24.3	43.27	54	-10.73	-	-	108	173	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

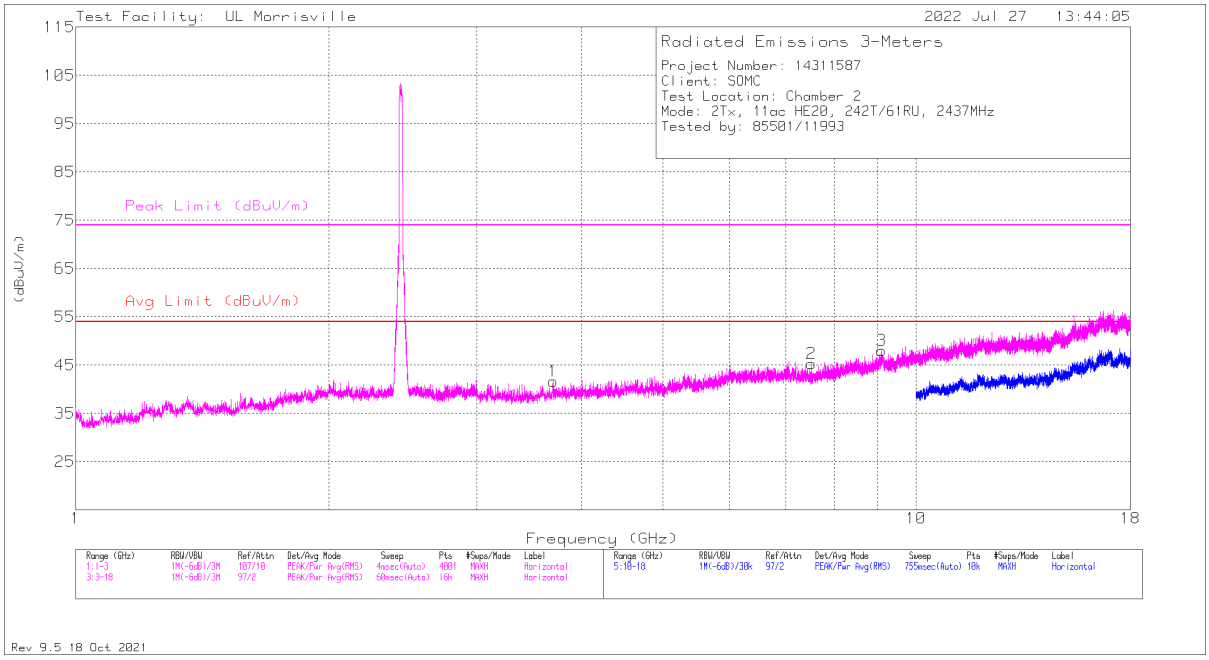


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48352	47.24	Pk	32.3	-24.3	55.24	-	-	74	-18.76	202	207	V
2	* ** 2.48362	47.57	Pk	32.3	-24.3	55.57	-	-	74	-18.43	202	207	V
3	* ** 2.48352	29.5	ADV	32.3	-24.3	37.5	54	-16.5	-	-	202	207	V
4	* ** 2.48457	30.29	ADV	32.3	-24.4	38.19	54	-15.81	-	-	202	207	V

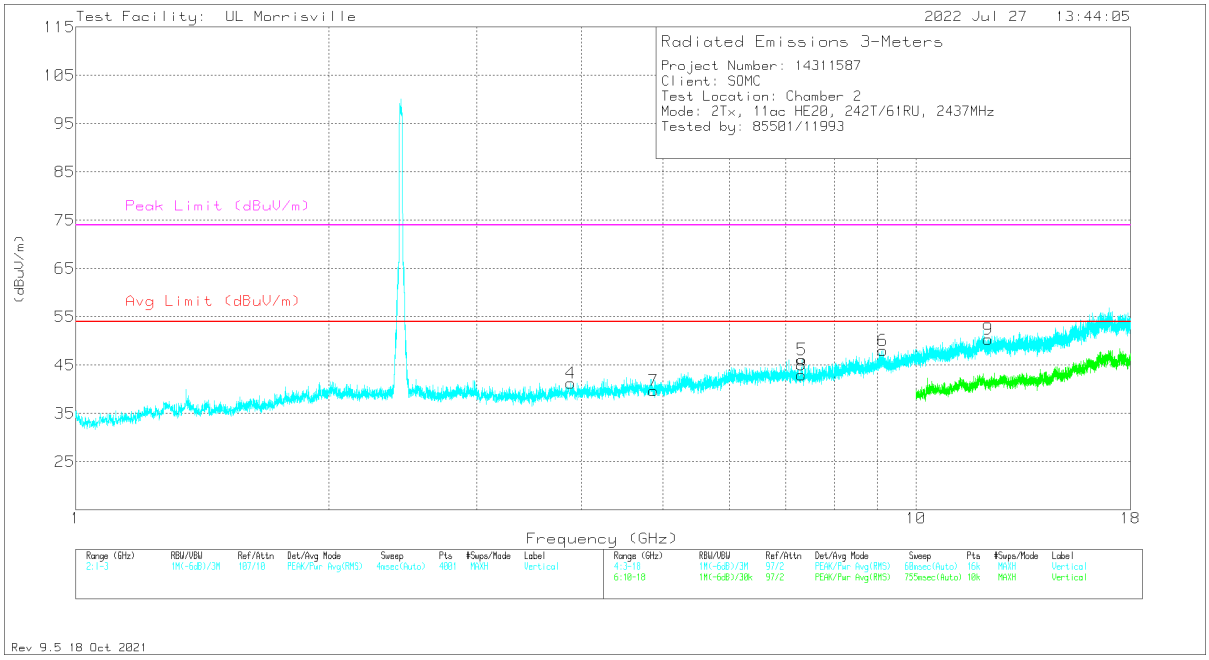
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL 2TX, 802.11ax HE20 242T/RU61



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 3.70313	40.46	Pk	33.2	-32	41.66	54	-12.34	74	-32.34	0-360	101	H
2	* ** 7.50375	37.1	Pk	35.7	-27.5	45.3	54	-8.7	74	-28.7	0-360	101	H
3	* ** 9.10158	37.59	PK2	36.2	-25.4	48.39	-	-	74	-25.61	282	310	H
	* ** 9.10181	25.4	ADV	36.2	-25.4	36.2	54	-17.8	-	-	282	310	H
4	* ** 3.88313	39.43	Pk	33.4	-31.5	41.33	54	-12.67	74	-32.67	0-360	101	V
5	* ** 7.3125	37.55	Pk	35.6	-27	46.15	54	-7.85	74	-27.85	0-360	200	V
6	* ** 9.13974	37.7	PK2	36.2	-25	48.9	-	-	74	-25.1	332	314	V
	* ** 9.13779	25.35	ADV	36.2	-24.9	36.65	54	-17.35	-	-	332	314	V
7	* ** 4.87298	39.74	PK2	33.9	-30.8	42.84	-	-	74	-31.16	320	178	V
	* ** 4.87471	26.98	ADV	33.9	-30.8	30.08	54	-23.92	-	-	320	178	V
8	* ** 7.30992	56.87	PK2	35.6	-27.2	65.27	-	-	74	-8.73	358	114	V
	* ** 7.31096	25.01	ADV	35.6	-27.1	33.51	54	-20.49	-	-	358	114	V
9	* ** 12.18553	36.07	PK2	38.8	-24.1	50.77	-	-	74	-23.23	56	172	V
	* ** 12.18691	23.72	ADV	38.8	-24	38.52	54	-15.48	-	-	56	172	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

UL LLC
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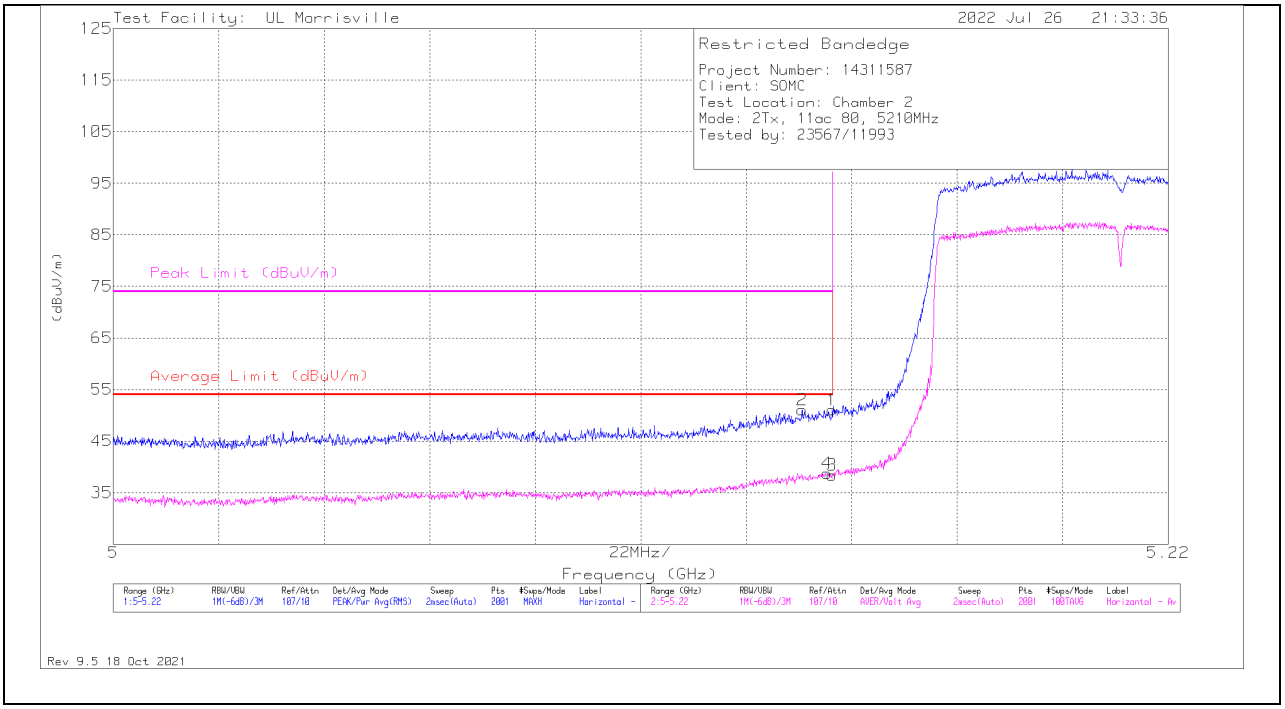
10.4. 5GHz WLAN

BANDEDGE (5.2 BAND LOW CHANNEL – 2TX, 802.11ac 80MHz)

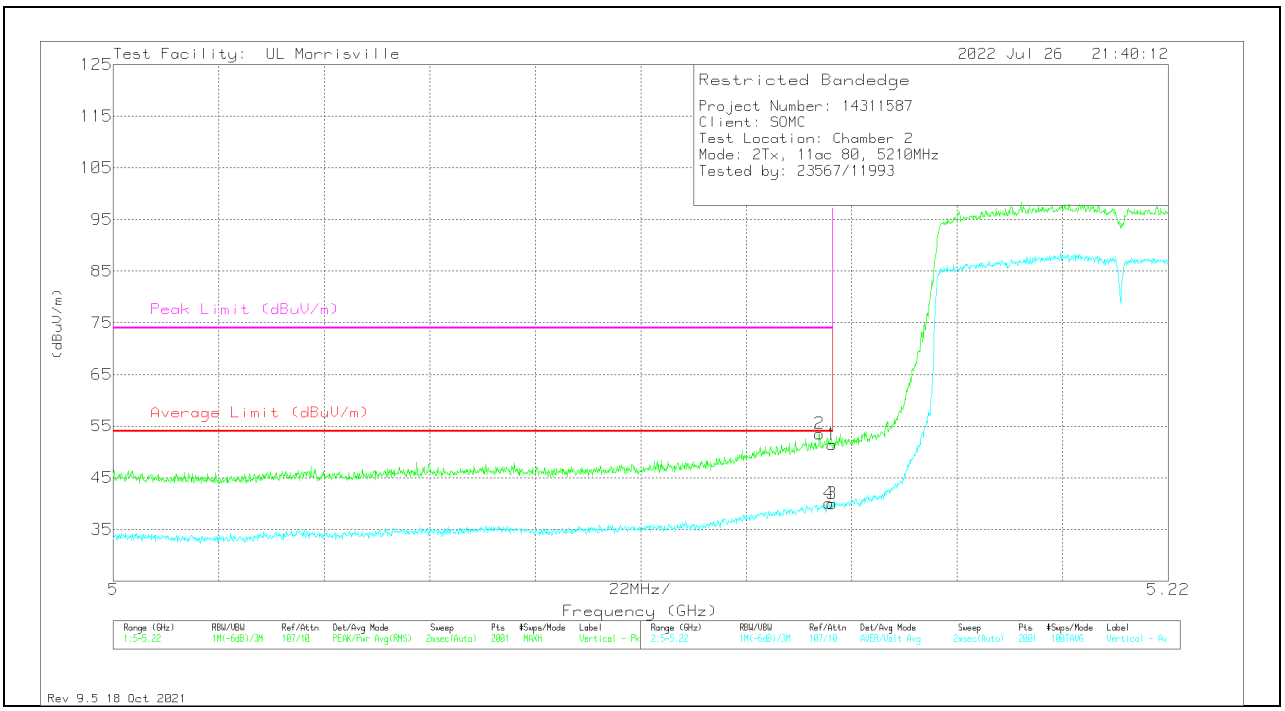
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 5.14993	39.42	Pk	34.2	-22.6	51.02	-	-	74	-22.98	335	131	H
2	* ** 5.14366	39.34	Pk	34.2	-22.5	51.04	-	-	74	-22.96	335	131	H
3	* ** 5.14993	26.8	ADV	34.2	-22.6	38.4	54	-15.6	-	-	335	131	H
4	* ** 5.14883	27.12	ADV	34.2	-22.6	38.72	54	-15.28	-	-	335	131	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



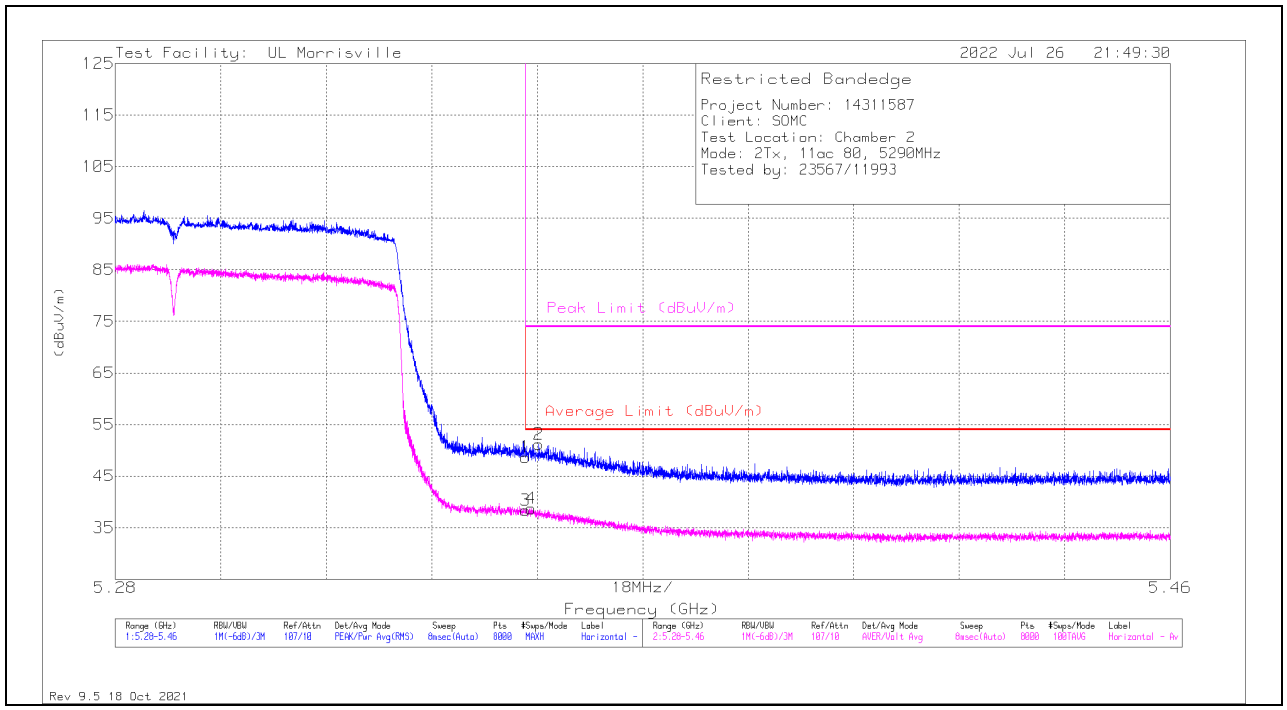
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 5.14993	39.83	Pk	34.2	-22.6	51.43	-	-	74	-22.57	305	119	V
2	* ** 5.14729	41.95	Pk	34.2	-22.6	53.55	-	-	74	-20.45	305	119	V
3	* ** 5.14993	28.41	ADV	34.2	-22.6	40.01	54	-13.99	-	-	305	119	V
4	* ** 5.14927	28.47	ADV	34.2	-22.6	40.07	54	-13.93	-	-	305	119	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

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

BANDEDGE (5.3 BAND HIGH CHANNEL – 2TX, 802.11ac 80MHz)

HORIZONTAL RESULT

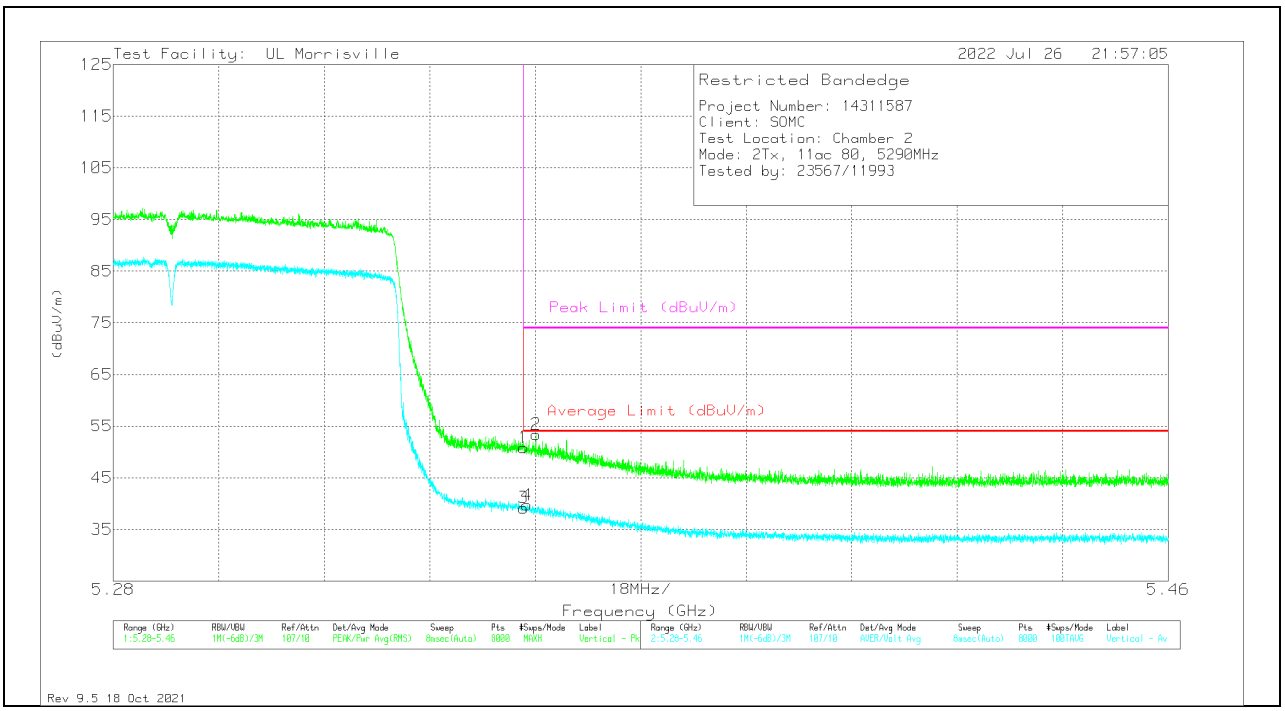


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 5.35001	36.73	Pk	34.6	-22.7	48.63	-	-	74	-25.37	339	101	H
2	* ** 5.35228	39.29	Pk	34.6	-22.7	51.19	-	-	74	-22.81	339	101	H
3	* ** 5.35001	26.47	ADV	34.6	-22.7	38.37	54	-15.63	-	-	339	101	H
4	* ** 5.35095	26.8	ADV	34.6	-22.7	38.7	54	-15.3	-	-	339	101	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

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

VERTICAL RESULT

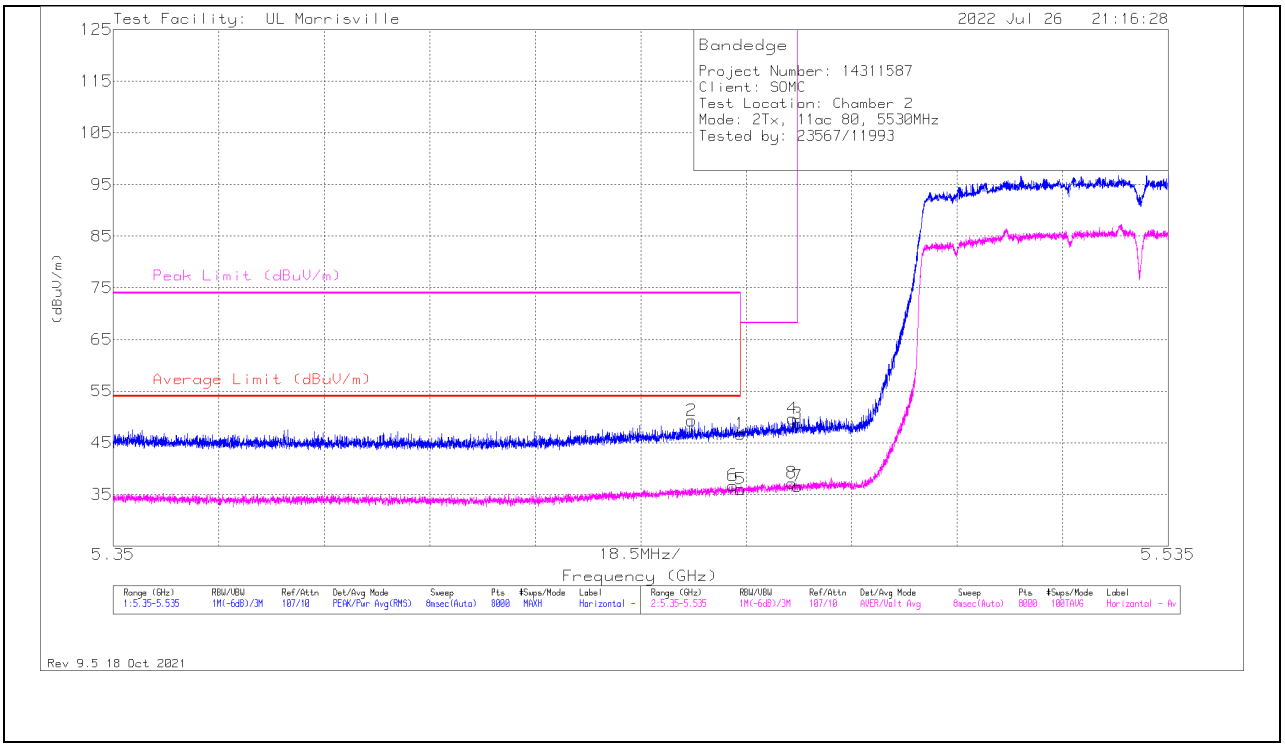


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 5.35001	38.95	Pk	34.6	-22.7	50.85	-	-	74	-23.15	312	112	V
2	* ** 5.3521	41.47	Pk	34.6	-22.7	53.37	-	-	74	-20.63	312	112	V
3	* ** 5.35001	27.28	ADV	34.6	-22.7	39.18	54	-14.82	-	-	312	112	V
4	* ** 5.35059	27.8	ADV	34.6	-22.7	39.7	54	-14.3	-	-	312	112	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 (5.6 BAND LOW CHANNEL – 2TX, 802.11ac 80MHz)

HORIZONTAL RESULT

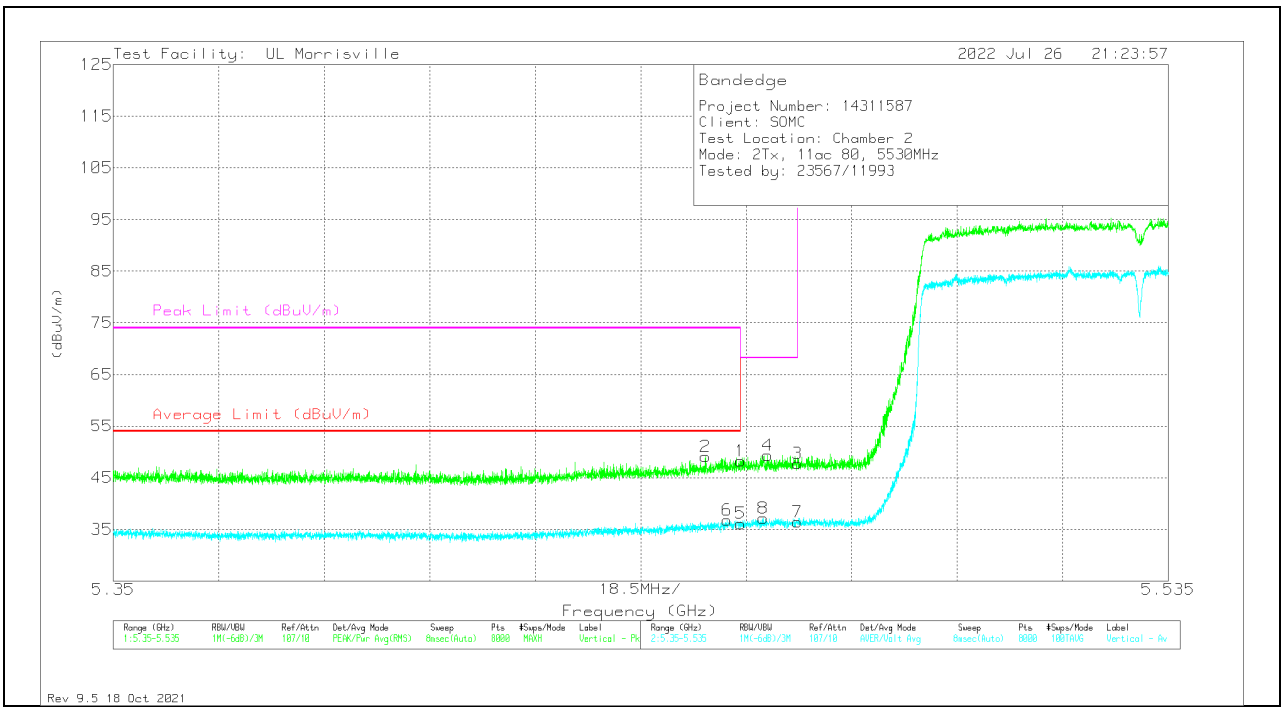


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 5.46	35.65	Pk	34.4	-23.3	46.75	-	-	74	-27.25	338	108	H
2	* ** 5.45142	38.21	Pk	34.4	-23.3	49.31	-	-	74	-24.69	338	108	H
5	* ** 5.46	24.92	ADV	34.4	-23.3	36.02	54	-17.98	-	-	338	108	H
6	* ** 5.45868	25.62	ADV	34.4	-23.3	36.72	54	-17.28	-	-	338	108	H
8	5.46897	26.41	ADV	34.4	-23.6	37.21	-	-	-	-	338	108	H
4	5.46906	38.86	Pk	34.4	-23.6	49.66	-	-	68.2	-18.54	338	108	H
3	5.46999	37.89	Pk	34.4	-23.6	48.69	-	-	68.2	-19.51	338	108	H
7	5.46999	25.78	ADV	34.4	-23.6	36.58	-	-	-	-	338	108	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

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

VERTICAL RESULT



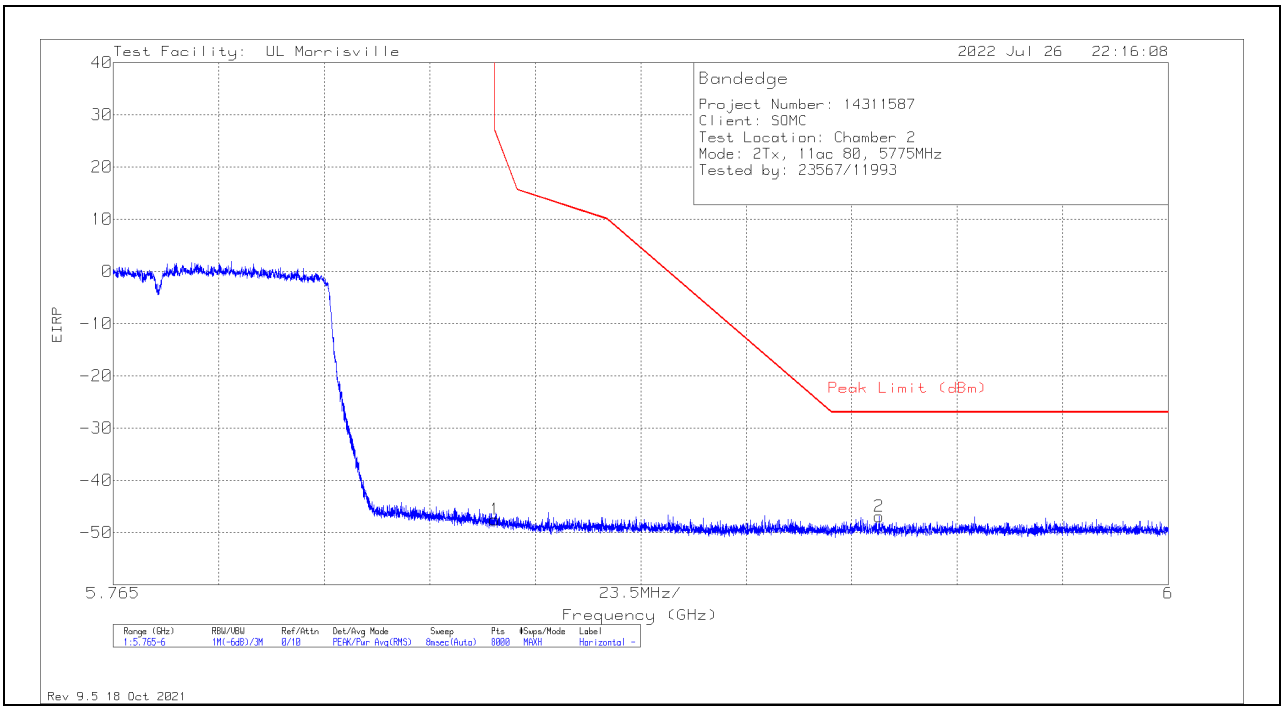
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 5.46	37.12	Pk	34.4	-23.3	48.22	-	-	74	-25.78	333	103	V
2	* ** 5.45384	38	Pk	34.4	-23.3	49.1	-	-	74	-24.9	333	103	V
5	* ** 5.46	25.03	ADV	34.4	-23.3	36.13	54	-17.87	-	-	333	103	V
6	* ** 5.45764	25.69	ADV	34.4	-23.3	36.79	54	-17.21	-	-	333	103	V
8	5.46397	26.16	ADV	34.4	-23.4	37.16	-	-	-	-	333	103	V
4	5.46474	38.33	Pk	34.4	-23.4	49.33	-	-	68.2	-18.87	333	103	V
3	5.46999	36.95	Pk	34.4	-23.6	47.75	-	-	68.2	-20.45	333	103	V
7	5.46999	25.61	ADV	34.4	-23.6	36.41	-	-	-	-	333	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

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

BANDEDGE (5.8 BAND HIGH CHANNEL – 2TX, 802.11ac 80 MHz)

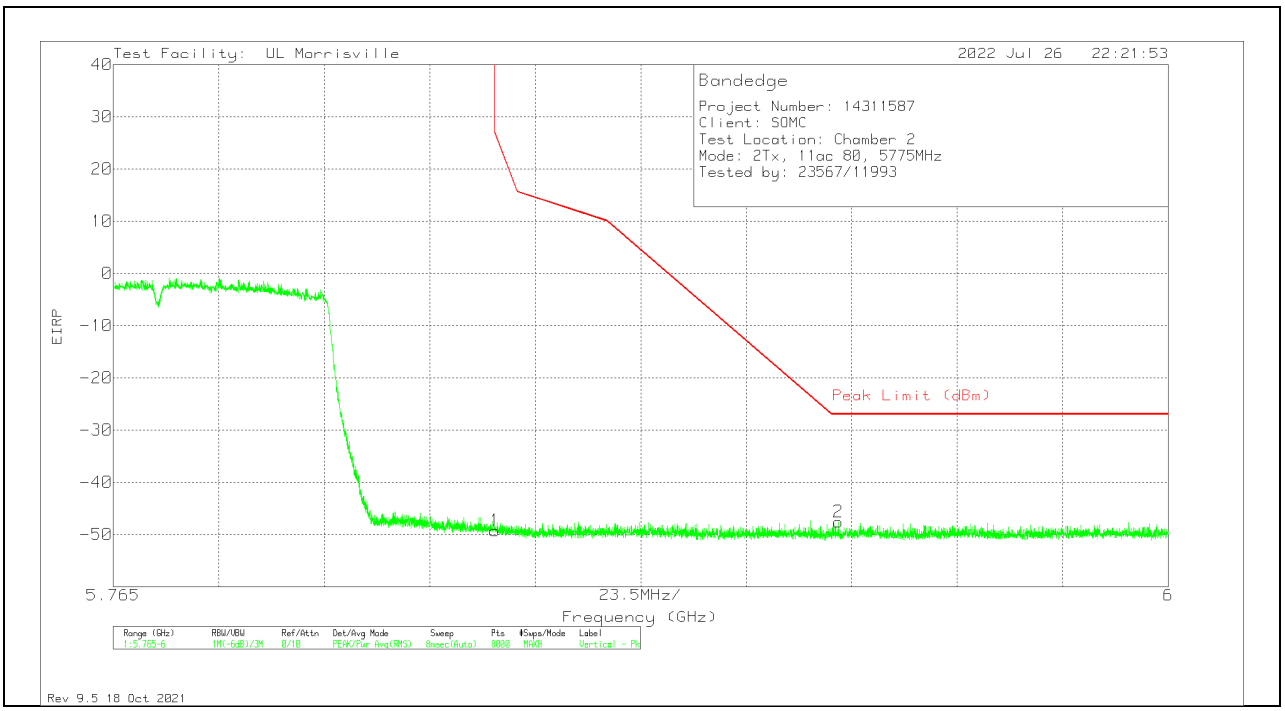
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	Conversion Factor (dB)	Corrected Reading EIRP (dBm)	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85002	-71.34	Pk	34.9	-22.9	11.8	-47.54	26.95	-74.49	64	102	H
2	5.9356	-71.02	Pk	35.1	-22.8	11.8	-46.92	-27	-19.92	64	102	H

Pk - Peak detector

VERTICAL RESULT

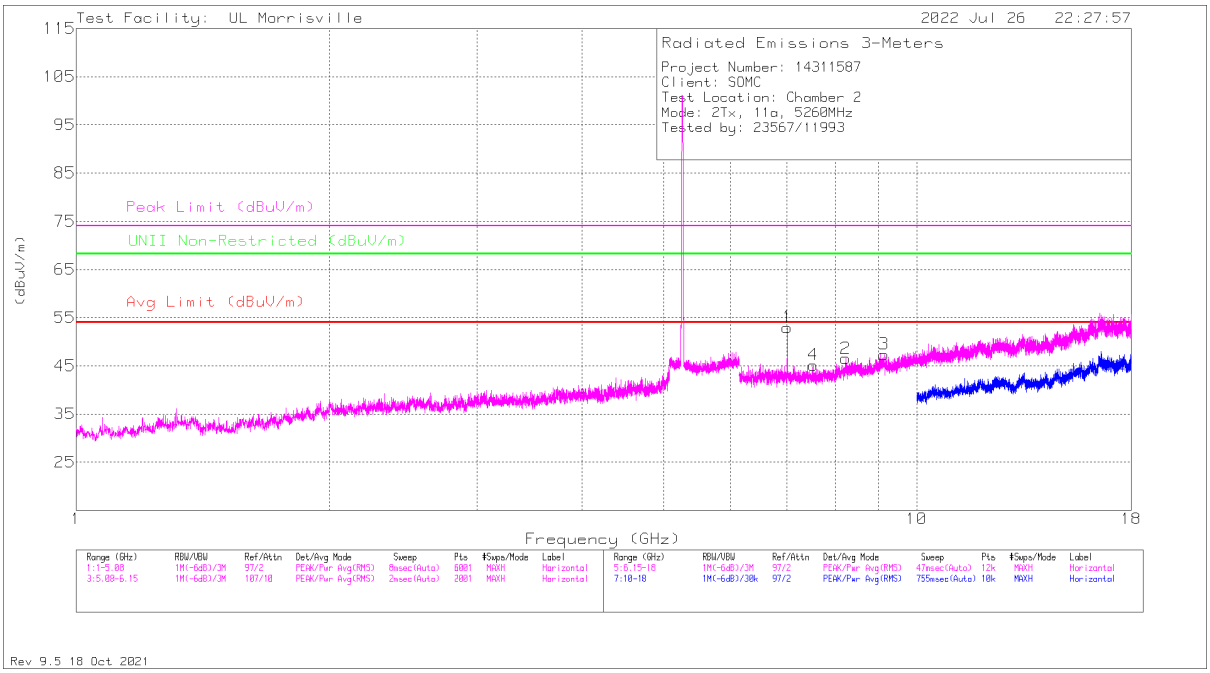


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	Conversion Factor (dB)	Corrected Reading EIRP (dBm)	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85002	-73.06	Pk	34.9	-22.9	11.8	-49.26	26.95	-76.21	96	106	V
2	5.9265	-71.48	Pk	35.1	-23	11.8	-47.58	-27	-20.58	96	106	V

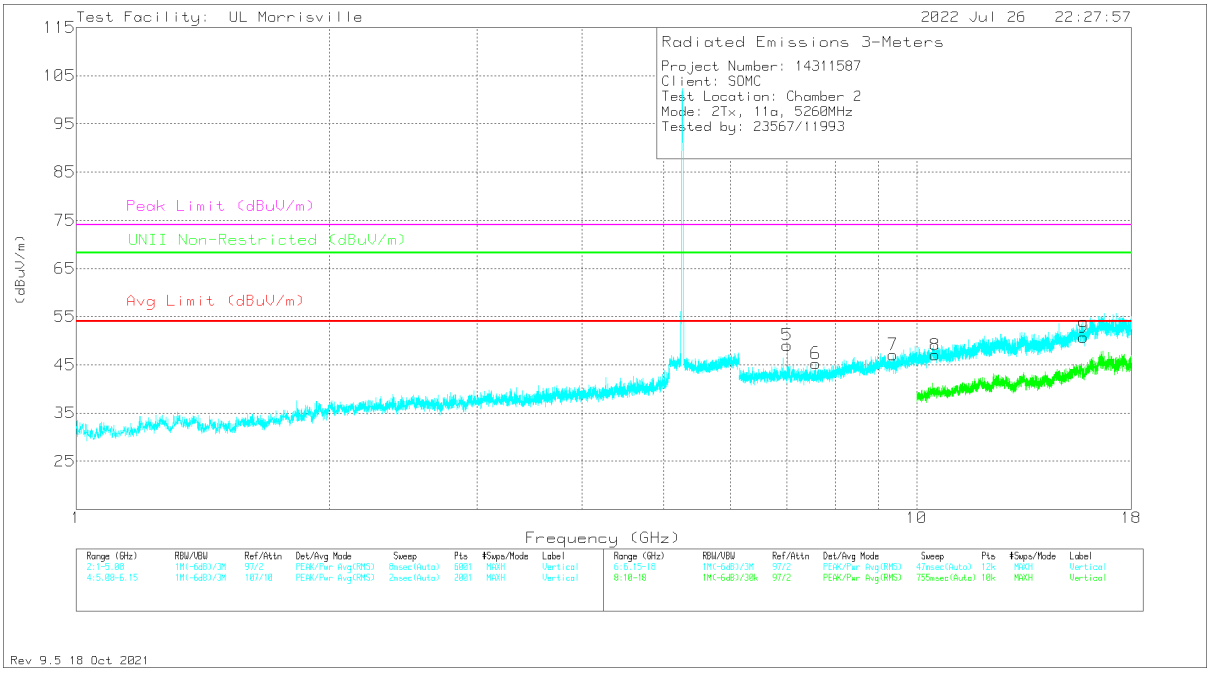
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

5.3 BAND LOW CHANNEL 2TX, 802.11a 6Mbps



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 8.23066	37.95	Pk	35.7	-27.1	46.55	54	-7.45	74	-27.45	-	-	0-360	199	H
3	* ** 9.14114	36.99	Pk	36.2	-25.8	47.39	54	-6.61	74	-26.61	-	-	0-360	101	H
4	* ** 7.53546	36.87	Pk	35.7	-27.4	45.17	54	-8.83	74	-28.83	-	-	0-360	101	H
6	* ** 7.58089	37.25	Pk	35.7	-27.7	45.25	54	-8.75	74	-28.75	-	-	0-360	199	V
7	* ** 9.37616	36.58	Pk	36.5	-26	47.08	54	-6.92	74	-26.92	-	-	0-360	199	V
9	* ** 15.77906	35.88	PK-U	40.5	-23	53.38	-	-	74	-20.62	-	-	321	216	V
	* ** 15.77817	23.27	ADV	40.5	-23	40.77	54	-13.23	-	-	-	-	321	216	V
5	7.01323	44.68	PK-U	35.6	-27.9	52.38	-	-	-	-	68.2	-15.82	19	115	V
1	7.01329	46.43	PK-U	35.6	-27.9	54.13	-	-	-	-	68.2	-14.07	52	101	H
8	10.52017	37.18	PK-U	37.5	-24.8	49.88	-	-	-	-	68.2	-18.32	50	305	V
	10.52	24.79	ADV	37.5	-24.8	37.49	-	-	-	-	-	-	50	305	V

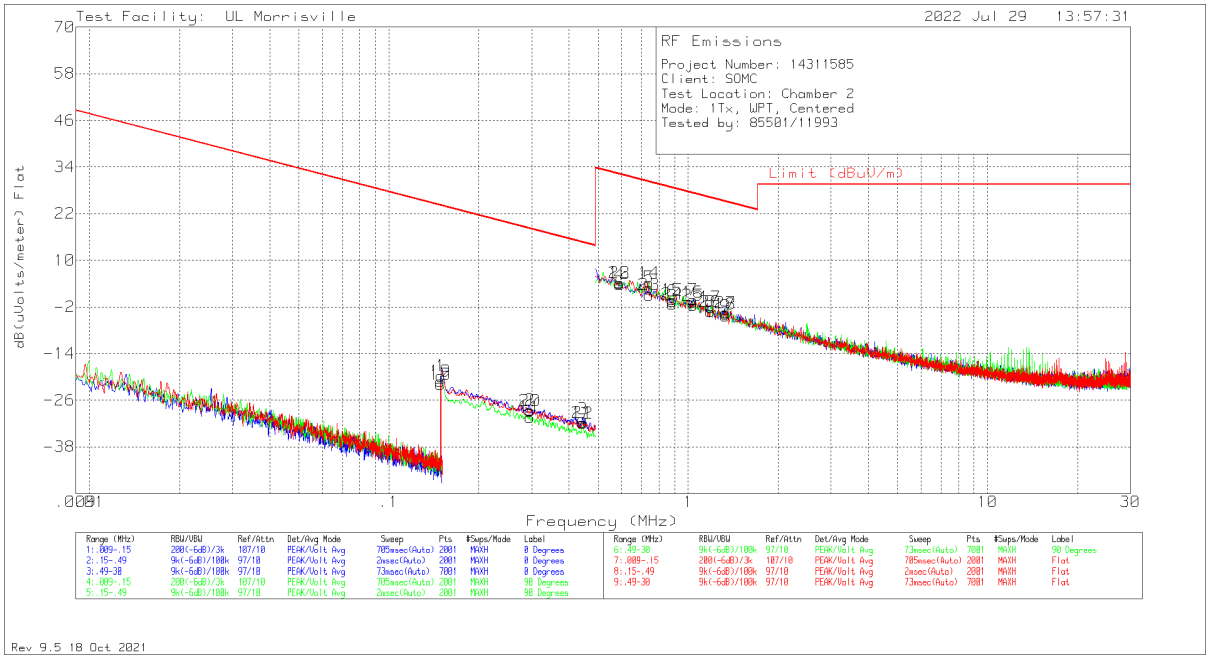
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK-U - Maximum Peak
ADV - Linear Voltage Average
Pk - Peak detector

10.5. WPT

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).

HARMONICS AND SPURIOUS EMISSIONS – CONFIG 1

0.009 to 30MHz



RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
10	.14811	46.88	Av	11.2	.1	-80	-21.82	24.19	44.19	-46.01	360	90 degs
19	.14806	48.16	Av	11.2	.1	-80	-20.54	24.2	44.20	-44.74	267	Flat
1	.14808	49.55	Av	11.2	.1	-80	-19.15	24.19	44.19	-43.34	268	0 degs
2	.29654	40.21	Pk	11.2	.1	-80	-28.49	18.16	38.16	-46.65	0-360	0 degs
11	.29654	38.15	Pk	11.2	.1	-80	-30.55	18.16	38.16	-48.71	0-360	90 degs
20	.29654	39.93	Pk	11.2	.1	-80	-28.77	18.16	38.16	-46.93	0-360	Flat
12	.44393	36.7	Pk	11.2	.1	-80	-32	14.66	34.66	-46.66	0-360	90 degs
21	.44393	36.88	Pk	11.2	.1	-80	-31.82	14.66	34.66	-46.48	0-360	Flat
3	.4441	37.97	Pk	11.2	.1	-80	-30.73	14.65	34.66	-45.38	0-360	0 degs
4	.59118	32.31	Pk	11.2	.2	-40	3.71	32.17	-	-28.46	0-360	0 degs
13	.59118	32.73	Pk	11.2	.2	-40	4.13	32.17	-	-28.04	0-360	90 degs
22	.59118	32.87	Pk	11.2	.2	-40	4.27	32.17	-	-27.9	0-360	Flat
5	.73874	31.5	Pk	11.3	.2	-40	3	30.23	-	-27.23	0-360	0 degs
14	.73874	32.65	Pk	11.3	.2	-40	4.15	30.23	-	-26.08	0-360	90 degs
23	.73874	29.57	Pk	11.3	.2	-40	1.07	30.23	-	-29.16	0-360	Flat
6	.8863	27.96	Pk	11.3	.2	-40	-.54	28.65	-	-29.19	0-360	0 degs
15	.8863	28.4	Pk	11.3	.2	-40	-.1	28.65	-	-28.75	0-360	90 degs
24	.8863	27.3	Pk	11.3	.2	-40	-1.2	28.65	-	-29.85	0-360	Flat
7	1.03808	28.32	Pk	11.3	.2	-40	-.18	27.28	-	-27.46	0-360	0 degs
16	1.03808	27.7	Pk	11.3	.2	-40	-.8	27.28	-	-28.08	0-360	90 degs
25	1.03808	26.86	Pk	11.3	.2	-40	-1.64	27.28	-	-28.92	0-360	Flat
8	1.18564	25.31	Pk	11.3	.2	-40	-3.19	26.13	-	-29.32	0-360	0 degs
17	1.18564	26.46	Pk	11.3	.2	-40	-2.04	26.13	-	-28.17	0-360	90 degs
26	1.18564	25.32	Pk	11.3	.2	-40	-3.18	26.13	-	-29.31	0-360	Flat
9	1.3332	24.18	Pk	11.3	.2	-40	-4.32	25.11	-	-29.43	0-360	0 degs
18	1.3332	24.61	Pk	11.3	.2	-40	-3.89	25.11	-	-29	0-360	90 degs
27	1.3332	24.96	Pk	11.3	.2	-40	-3.54	25.11	-	-28.65	0-360	Flat

Pk - Peak detector
Av - Average detection

11. SETUP PHOTOS

Refer to R14311587-EP2 for setup photos.

END OF REPORT