TEST REPORT

Report Number. : R15511224-E3

Applicant	:	Ademco Inc 2 Corporate Center Drive Melville, NY, 11749
Models	:	SMCO600NV-AC, SMCO600NV SMCO600NV-A, SMCO600NV-AC-A
FCC ID	:	M7U-BT110T
IC	:	10190A-BT110T
EUT Description	:	Wireless Smart Smoke & Carbon Monoxide Alarm
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 3 ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2025-04-15

Prepared by:
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ACCREDITED
CERT #0751.06

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-01-10	Initial Issue	Noah Bennett
V2	2025-02-20	TCB Feedback 1: -Various typographical updates.	Noah Bennett
V3	2025-03-14	TCB Feedback 2: -Added ISED Model(s)	Noah Bennett
V4	2025-03-17	TCB Feedback 3: -Corrected Typo in section 8.1	Noah Bennett
V5	2025-03-18	Updated Model Differences statement in section 6.1 Updated ANSI reference	Noah Bennett
V6	2025-04-01	Revised Zigbee operational range to 2405-2480MHz in section 6.2	Brian Kiewra
V7	2025-04-15	Added bandedge and power for 2480MHz in sections 8.4, 8.5, and 9.1 Added justification for only including bandedge and power for 2480MHz in section 6.5.	Brian Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Ademco Inc.
2 Corporate Center Drive
Melville, NY, 11749

EUT DESCRIPTION: Wireless Smart Smoke & Carbon Monoxide Alarm

MODELS: SMCO600NV-AC, SMCO600NV
SMCO600NV-A, SMCO600NV-AC-A

SERIAL NUMBER: 565, 643, 5CFCE152F6EE, 5CFCE152F786, 5CFCE152F786, 5CFCE1512B91, 5CFCE15129AB

SAMPLE RECEIPT DATE: 2024-10-11; 2024-11-13

DATE TESTED: 2024-10-15 thru 2025-04-15

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 3	Complies
ISED RSS-GEN Issue 5 + A1 + A2	Complies

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released For
UL LLC. By:

Mike Antola
Staff Engineer
Consumer Technology Division
UL LLC.

Prepared By:

Noah Bennett
Engineer Project Associate
Consumer Technology Division
UL LLC.

2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for correctly integrating customer-provided data with measurements performed by UL LLC. Below is a list of information provided by the customer:

1. EUT supported channels, modes, data-rates, model differences and power settings. (Section 6.1; 6.5)
2. Antenna Gain and Type. (Section 6.3)
3. Firmware and Hardware Version of EUT. (Section 6.4)
4. Operational Duty Cycle (Section 8.1)

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Compliant.	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Compliant.	None.
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Compliant.	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Compliant.	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Compliant.	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Compliant.	None.

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 C63.10-2020+Cor. 1-2023+C63.10a-2024,
- KDB 558074 D01 15.247 Meas Guidance v05r02,
- KDB 414788 D01 Radiated Test Site v01r01,
- RSS-GEN Issue 5 + A1 + A2, and
- RSS-247 Issue 3.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, Certificate Number 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	ULab
Radio Frequency (Spectrum Analyzer)	**141.16 Hz**
Occupied Bandwidth	**1.22%**
Power Spectral Density	**2.47 dB**
RF Power Measurement Direct Method Using Power Meter	**1.3 dB (PK) / 0.45 dB (AV)**
Unwanted Emissions, Conducted	**1.94 dB**
Worst Case Radiated Disturbance, 9kHz to 40 GHz	**6.01 dB**
Time Domain Measurements	**3.39%**
Temperature	**0.57˚C**
Humidity	**3.39%**
DC Supply Voltages	**0.57%**

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 a Wireless Smart Smoke & Carbon Monoxide Alarm. This report covers the full testing of the 2.4GHz Zigbee and BLE portion of Chipset 2 only.

The EUT supports the following wireless technologies and modes of operation:

Wireless technologies	Frequency Band(s)	Operating mode(s)	Additional Config
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)	
	5 GHz[1] UNII-1,2,3	802.11a 802.11n (HT20)	
Bluetooth	2.4 GHz	LE (1Mbps Only)	[3]Max Operational Duty Cycle of 1%
802.15.4	2.4GHz	Zigbee (250Kbps Only)	[3]Max Operational Duty Cycle of 1%

Notes:
1) The EUT operated in a 1x1 SISO mode.
2) The EUT has 2 Antennas for Diversity on both chipsets.
3) Operational Duty Cycles apply to chipset 2 only.

The primary distinction between the two variants is their power source: the SMCO600NV-AC operates on AC power with a DC battery backup, whereas the SMCO600NV relies solely on DC battery power. Beyond this, both variants are identical in terms of electrical and mechanical design.

Model(s) SMCO600NV-A and SMCO600NV-AC-A are ISED variants.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
2405 - 2480	Zigbee	21.44	139.32
2402 - 2480	BLE	21.29	134.59

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Designation in Documentation	Frequency Range (MHz)	Maximum 3D Gain (dBi)
3	CC2674R104T0RGZ	2402-2480MHz	2.87
		2445MHz	2.81
4		2402-2480MHz	2.95
		2445MHz	2.25

6.4. SOFTWARE AND FIRMWARE

EUT FW Version: 1.0

EUT HW Version: 1.0

EUT Control SW Version: TeraTerm v4.106
YAT Terminal v2.7.2

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. All antennas were tested, with the worst-case scenario per mode being reported

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, on both Antenna 3 and Antenna 4. it was determined that X orientation was worst-case orientation for both antennas; therefore, all final radiated testing was performed with the EUT in X orientation.

For radiated testing, the EUT was connected to AC-Lines as worst-case.

This EUT operates on channel 2480MHz for Zigbee at a much lower power. Only conducted and radiated bandedge testing and power were included for this channel as other testing was performed at higher power using 2475MHz as the high channel.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Support Laptop	Lenovo	T14S Gen3	PF4FKVY8	N/A

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	4 Pin PWR	1	AC In	Unshielded	<3m	Connects EUT to AC Lines
2	3 Pin debug	1	UART	Unshielded	<3m	Used to Program EUT.

TEST SETUP

The EUT was connected to a support laptop to program the EUT for testing. The EUT was set to transmit continuously throughout the test. The support laptop and cable 2 were removed from the chamber for testing.

SETUP DIAGRAM

Please refer to R15511224-EP1 for setup diagrams

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
89509	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-05-23	2025-05-23
	Gain-Loss Chains				
207640	Gain-loss string: 1-18GHz	Various	Various	2024-05-22	2025-05-22
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-04-16	2025-04-16
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

Note: All equipment within calibration at time of use.

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Common Equipment					
90410	Spectrum Analyzer	Keysight Technologies	N9030A	2024-06-14	2025-06-14
248881	Environmental Meter	Control Company	06-662-4	2024-04-10	2026-04-10
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
Power Software	Boonton Power Analyzer	Boonton	Version 3.0.13.0	NA	NA
Additional Equipment used					
211055	Real-Time Peak Power Sensor 50MHz to 8GHz	Boonton	RTP5000	2024-07-31	2025-07-31
	Attenuators				
226561	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2024-02-29	2025-02-28
	Cables				
CBL105	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB-197C-0-0160-300300	2024-03-01	2025-03-01

Note: All equipment within calibration at time of use.

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				
135144	Active Loop Antenna	ETS-Lindgren	6502	2024-10-02	2025-10-02
	30-1000 MHz				
159203	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-03-05	2026-03-05
	Gain-Loss Chains				
91975	Gain-loss string: 0.009-30MHz	Various	Various	2024-05-10	2025-05-10
91978	Gain-loss string: 25-1000MHz	Various	Various	2024-05-10	2025-05-10
	Receiver & Software				
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-08-29	2025-08-29
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
200540	Environmental Meter	Fisher Scientific	15-077-963	2023-07-19	2025-07-19

Note: All equipment within calibration at time of use.

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

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
135143	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2024-02-07	2026-02-07
	Gain-Loss Chains				
91979	Gain-loss string: 1-18GHz	Various	Various	2024-05-08	2025-05-08
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-03-05	2025-03-05
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-08-29	2025-08-29
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241205	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05
170112	10dB Pad, DC-18GHz, 5W	Mini-Circuits	BW-N10W5+	2023-11-09	2025-11-09

Note: All equipment within calibration at time of use.

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

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2024-04-04	2025-04-04
179892	Environmental Meter	Fisher Scientific	15-077-963	2024-08-12	2025-08-12
80391	LISN, 50-ohm/50-uH, 250uH 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50/250-25-2-01	2024-08-01	2025-08-01
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2024-08-01	2025-08-01
52859	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2024-04-04	2025-04-04
PS216	AC Power Source	Elgar	CW2501M	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

Note: All equipment within calibration at time of use.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

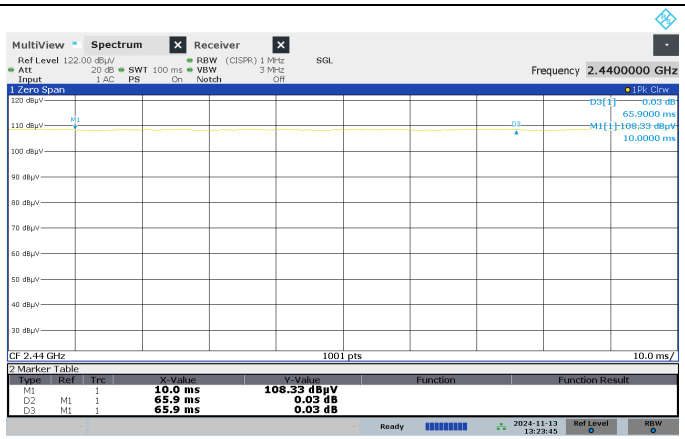
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

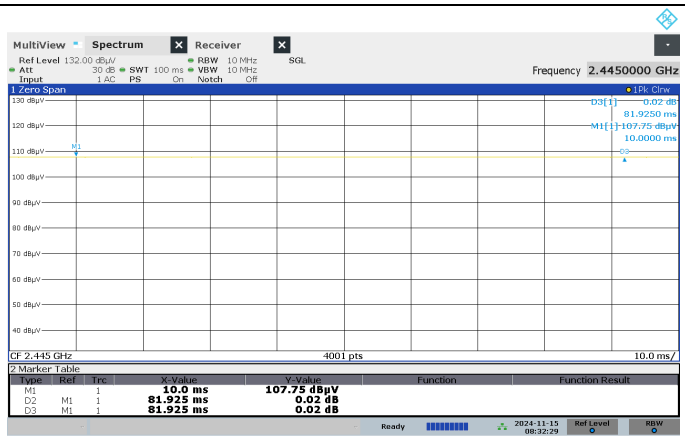
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.15.4 Zigbee	100.000	100.000	1.000	100.00	0.00	0.010
BLE	100.000	100.000	1.000	100.00	0.00	0.010

DUTY CYCLE PLOTS



BLE 1Mbps



Zigbee

Note: The manufacturer declared a worst-case real life duty cycle for BLE and Zigbee on chipset 2 of 1%. Using FCC KDB 558074 D01 15.247 Meas Guidance v05r02 – Section 11 Q3 a), we can apply a duty cycle correction factor to the Peak Measurements to obtain a calculated RMS average value. This correction factor is calculated by 20*Log(1/D), where D = highest Duty Cycle. DCCF (dB) =20*Log(1/1%) = **40dB DCCF.**

During testing, the Zigbee and BLE radios were set to 100% duty cycle.

8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

PROCEDURE

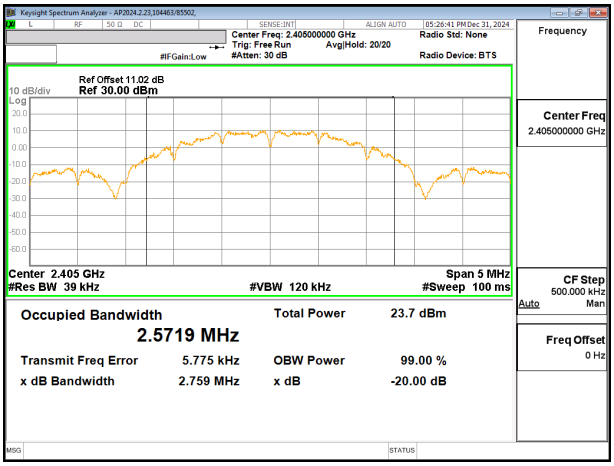
ANSI C63.10-2020 Section 6.9.3

RESULTS

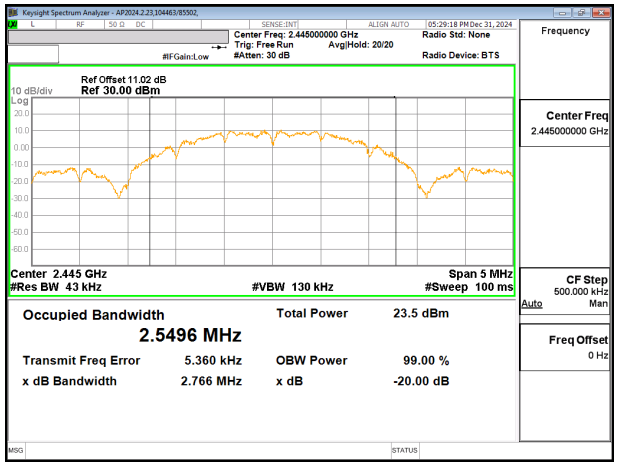
8.2.1. Zigbee (250Kbps)

Antenna 3

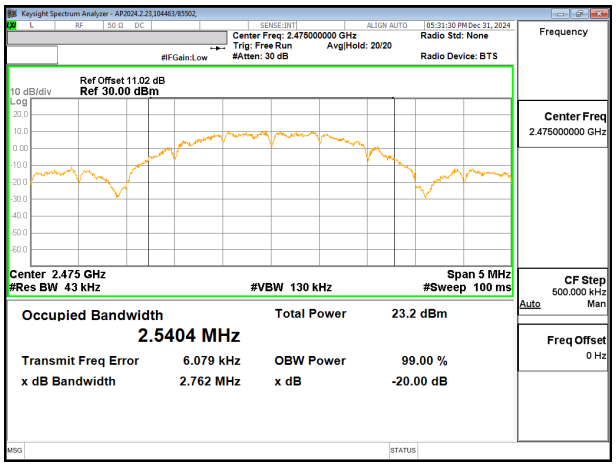
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.5719
Middle	2445	2.5496
High	2475	2.5404



LOW CHANNEL



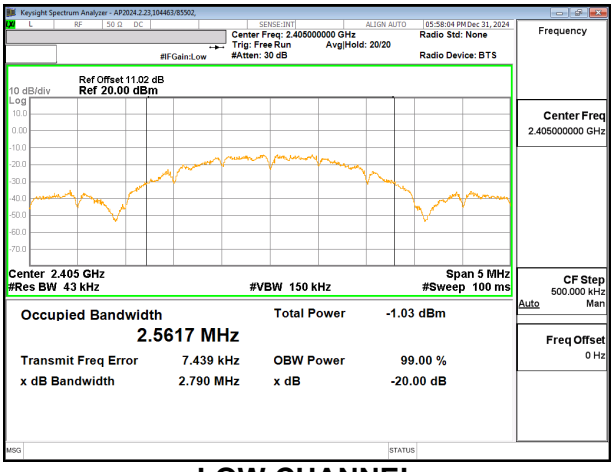
MID CHANNEL



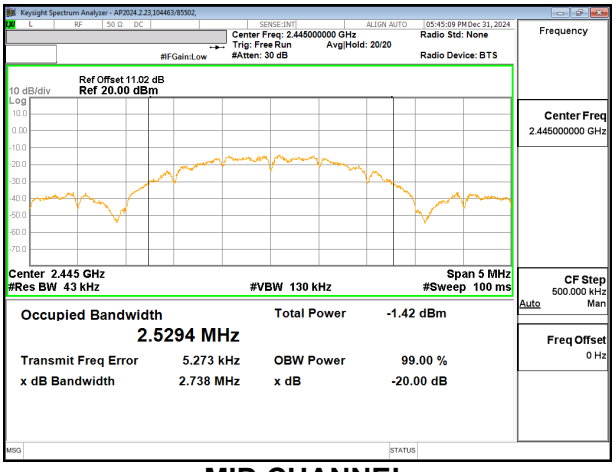
HIGH CHANNEL

Antenna 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.5617
Middle	2445	2.5294
High	2475	2.5432



LOW CHANNEL



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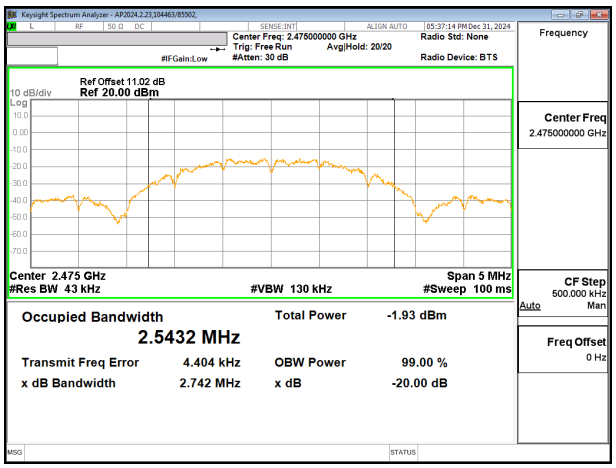
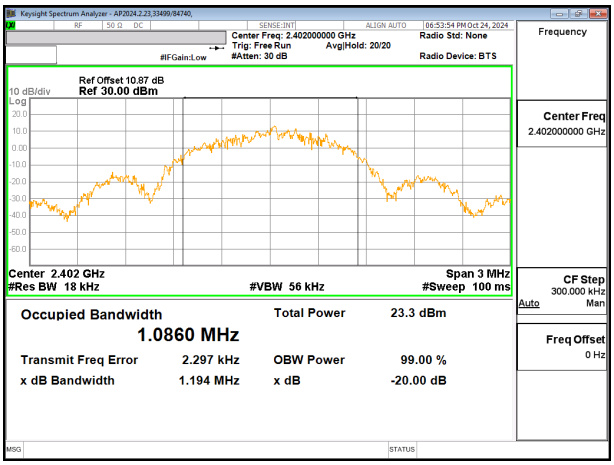


HIGH CHANNEL

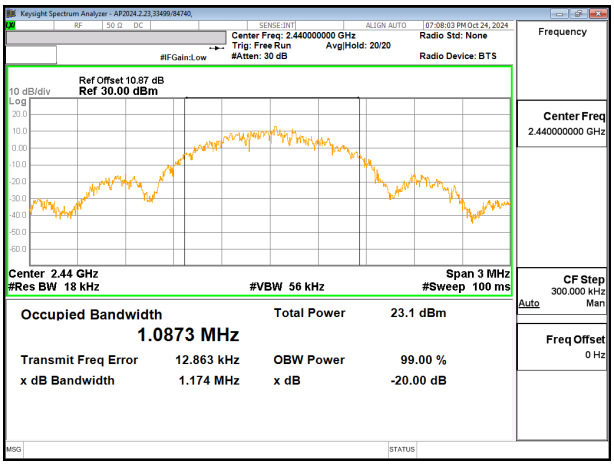
8.2.2. BLE (1Mbps)

Antenna 3

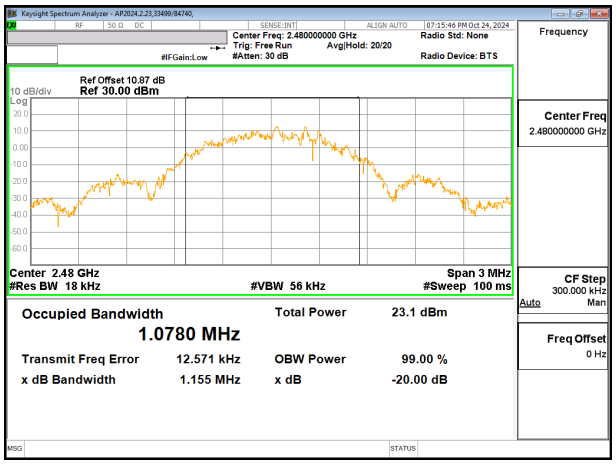
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.086
Mid	2440	1.087
High	2480	1.078



LOW CHANNEL



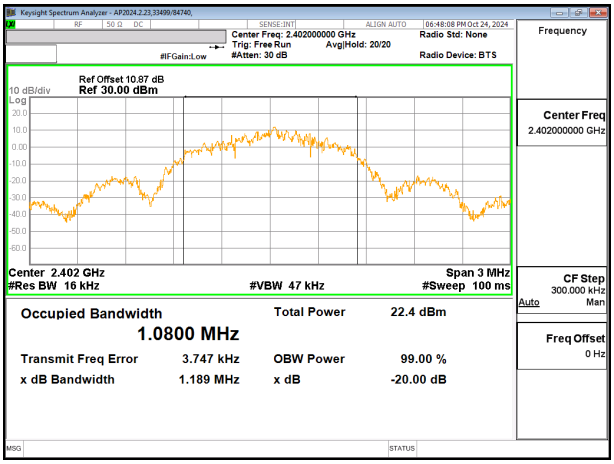
MID CHANNEL



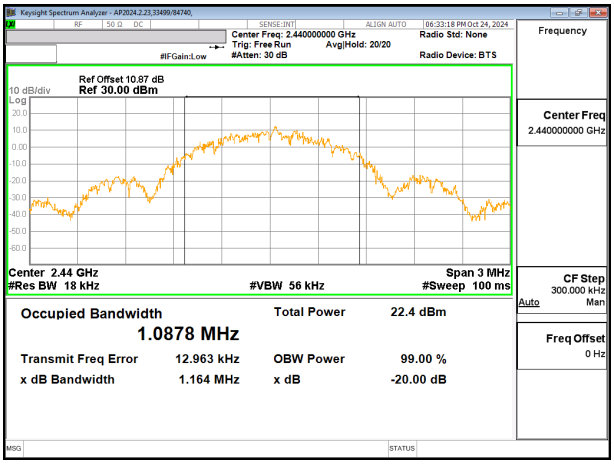
HIGH CHANNEL

Antenna 4

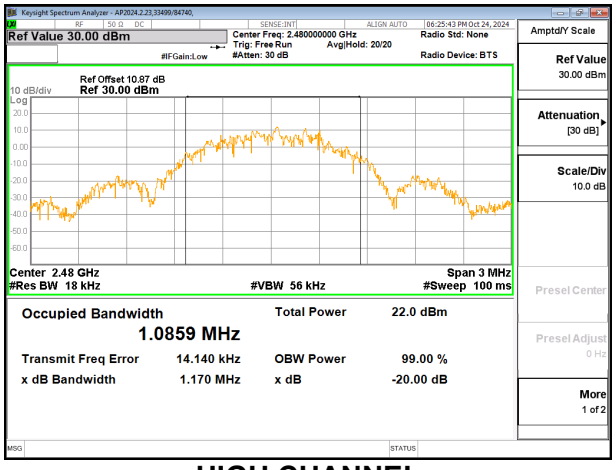
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.080
Mid	2440	1.088
High	2480	1.086



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
RSS-247 5.2 (a)

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

PROCEDURE

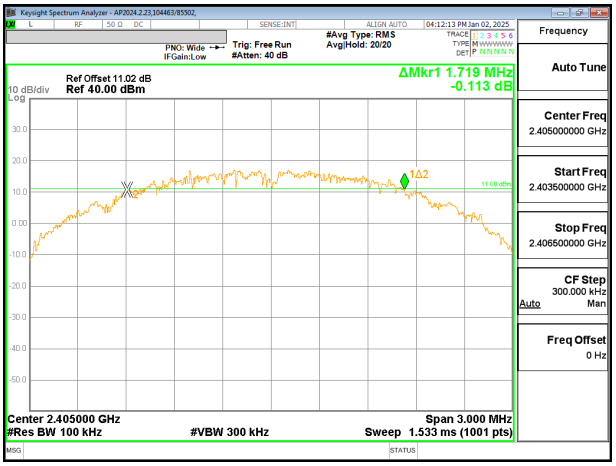
ANSI C63.10 Subclause -11.8.1: RBW ≤ DTS BW

RESULTS

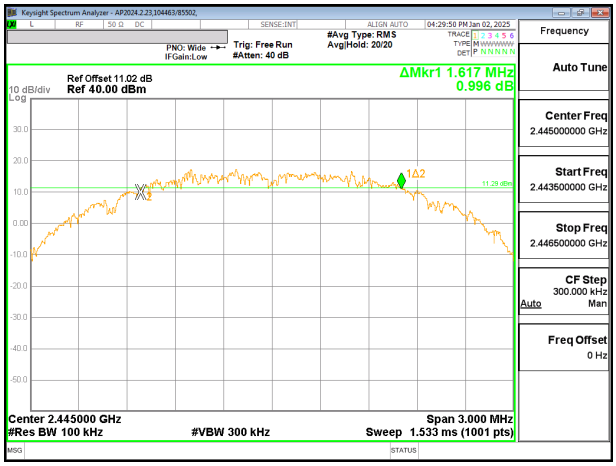
8.3.1. Zigbee (250Kbps)

Antenna 3

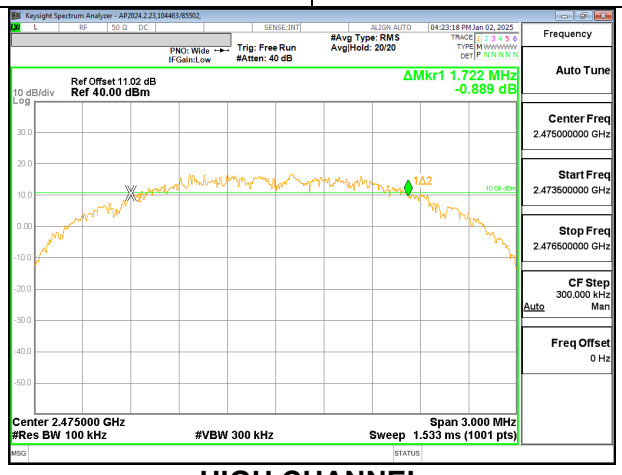
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2405	1.719	0.500
Mid	2445	1.617	0.500
High	2475	1.722	0.500



LOW CHANNEL



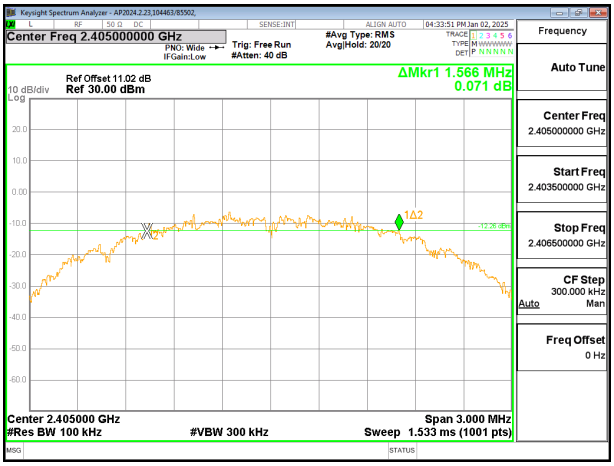
MID CHANNEL



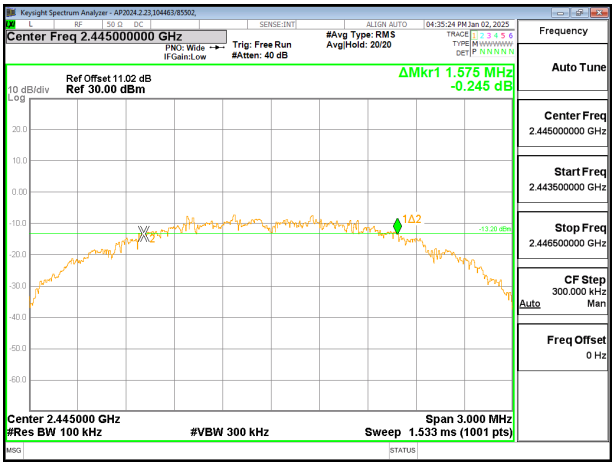
HIGH CHANNEL

Antenna 4

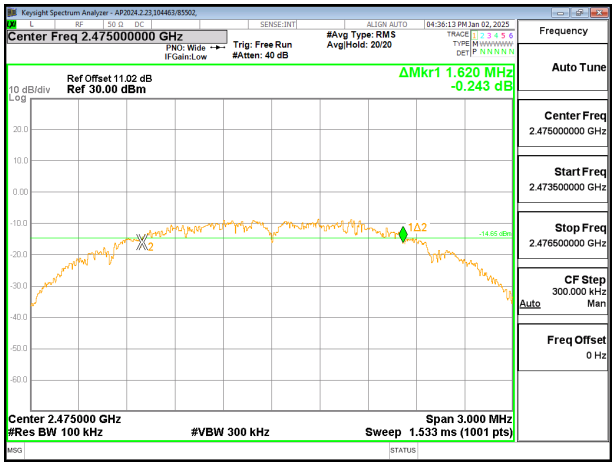
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2405	1.566	0.500
Mid	2445	1.575	0.500
High	2475	1.620	0.500



LOW CHANNEL



MID CHANNEL

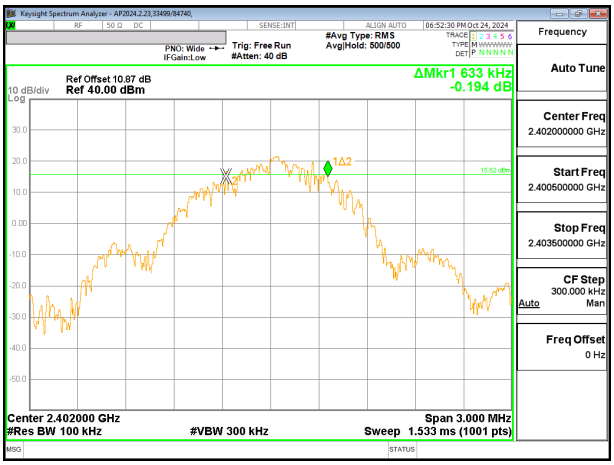


HIGH CHANNEL

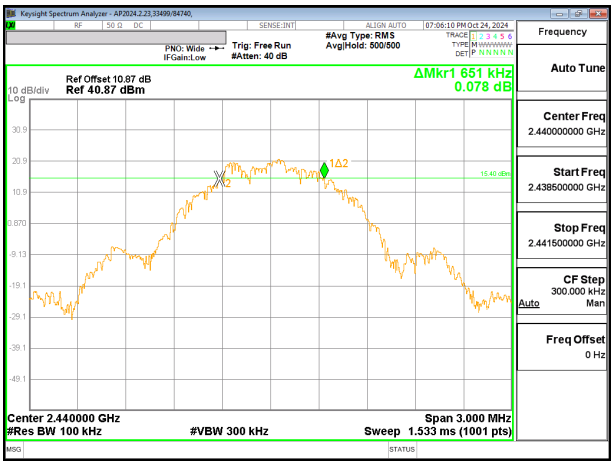
8.3.2. BLE (1Mbps)

Antenna 3

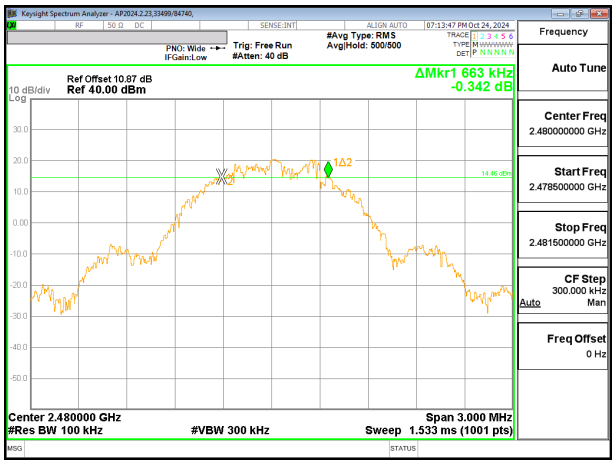
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.633	0.500
Mid	2440	0.651	0.500
High	2480	0.663	0.500



LOW CHANNEL



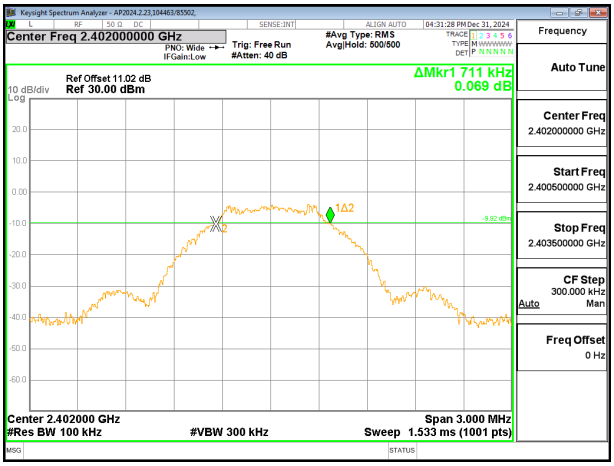
MID CHANNEL



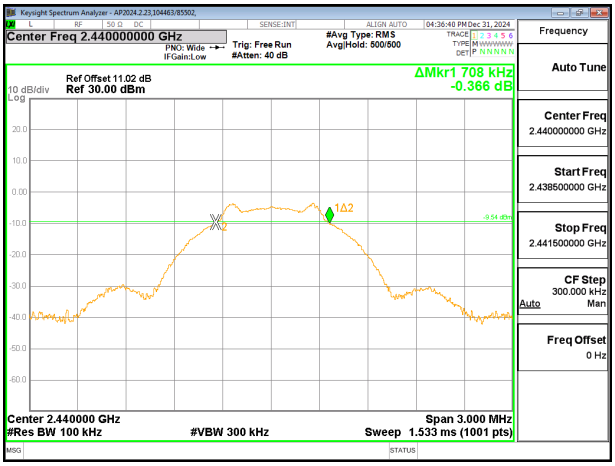
HIGH CHANNEL

Antenna 4

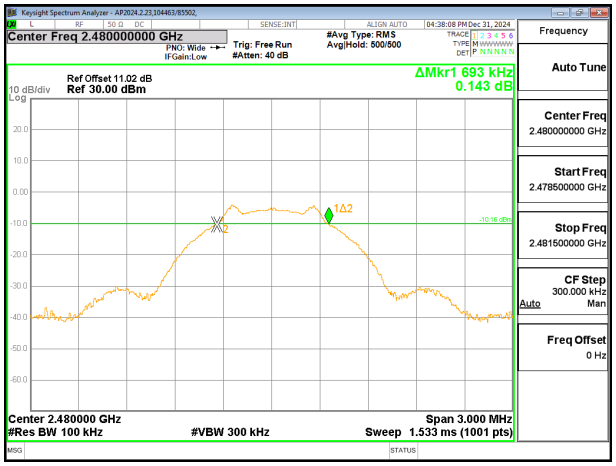
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.711	0.500
Mid	2440	0.708	0.500
High	2480	0.693	0.500



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.4. 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.

PROCEDURE

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

The transmitter output is connected to a power meter.

The cable assembly insertion loss (including 1.45 dB EUT cable) was entered as an offset in the power meter to allow for a peak reading of power. 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.

8.4.1. Zigbee (250Kbps)

Tested By: 105900/84740, 104463
Date Tested: 10/15/2024; 10/25/24, 2024-04-15

Antenna 3

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2405	21.44	30	-8.56
Mid	2445	21.25	30	-8.76
High	2475	20.92	30	-9.08
High	2480	12.52	30	-17.48

Antenna 4

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2405	20.69	30	-9.31
Mid	2445	20.47	30	-9.53
High	2475	20.28	30	-9.72
High	2480	12.30	30	-17.70

RESULTS

8.4.2. BLE (1Mbps)

Tested By: 105900/84740
Date Tested: 10/15/2024; 10/25/24

Antenna 3

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	21.29	30	-8.71
Mid	2440	21.14	30	-8.86
High	2480	20.89	30	-9.11

Antenna 4

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	20.24	30	-9.76
Mid	2440	20.48	30	-9.52
High	2480	20.19	30	-9.81

8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss (including 1.45 dB EUT cable) was entered as an offset in the power meter to allow for a gated average reading of power. Gated average output power was read directly from power meter.

PROCEDURE

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

RESULTS

Tested By: 105900/84740
Date Tested: 10/15/2024; 10/25/24

8.5.1. Zigbee (250Kbps)

Antenna 3

Channel	Frequency (MHz)	Power (dBm)
Low	2405	21.25
Mid	2445	21.03
High	2475	20.72
High	2480	12.29

Antenna 4

Channel	Frequency (MHz)	Power (dBm)
Low	2405	20.45
Mid	2445	20.29
High	2475	20.06
High	2480	12.04

8.5.2. BLE (1Mbps)

Antenna 3

Channel	Frequency (MHz)	Power (dBm)
Low	2402	21.09
Mid	2440	20.95
High	2480	20.65

Antenna 4

Channel	Frequency (MHz)	Power (dBm)
Low	2402	20.47
Mid	2440	20.27
High	2480	19.95

8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)
RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
BLE (1Mbps)

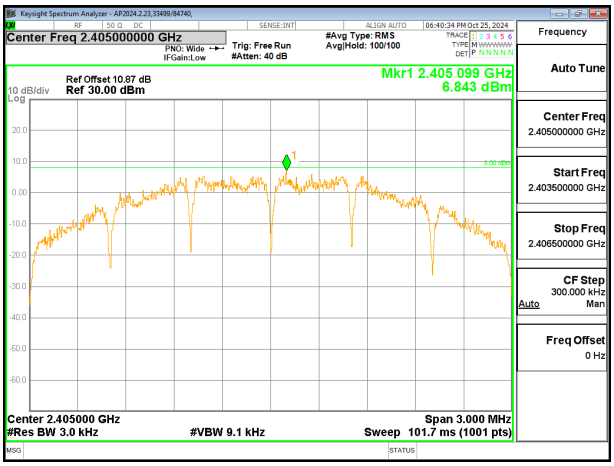
PROCEDURE

ANSI C63.10 Subclause -11.10.2: Method PKPSD (peak PSD)

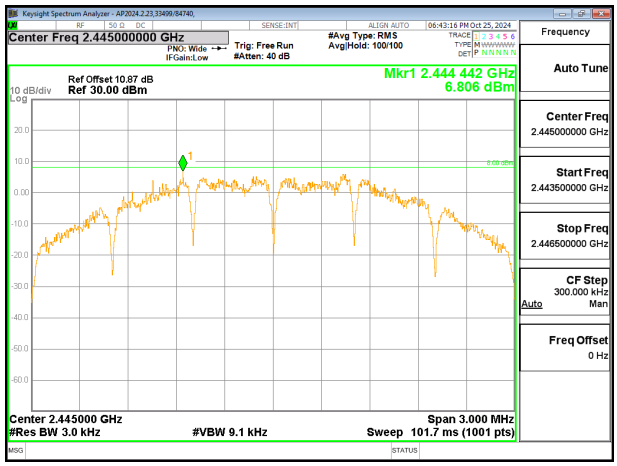
8.6.1. Zigbee (250Kbps)

Antenna 3

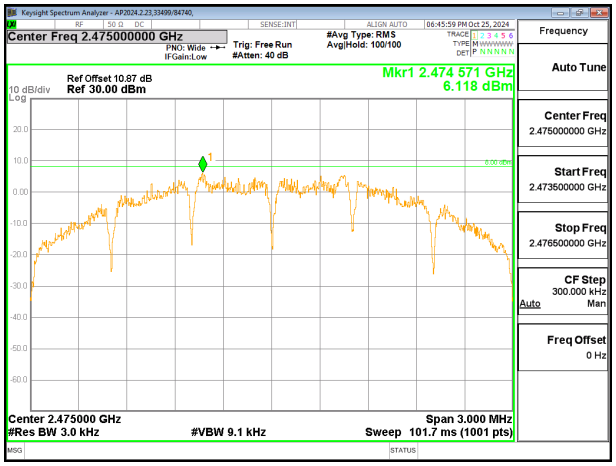
Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2405	6.84	8	-1.16
Mid	2445	6.81	8	-1.19
High	2475	6.12	8	-1.88



LOW CHANNEL



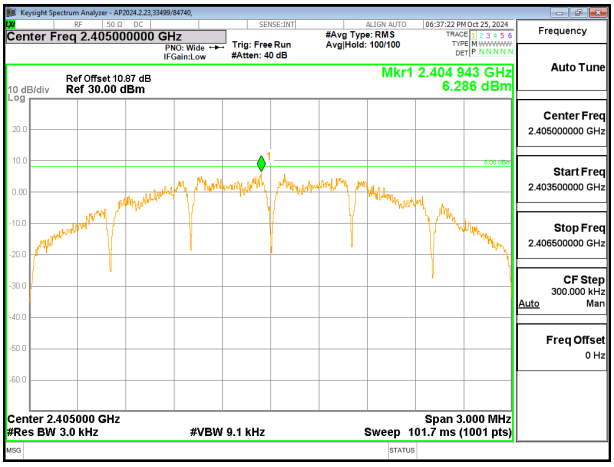
MID CHANNEL



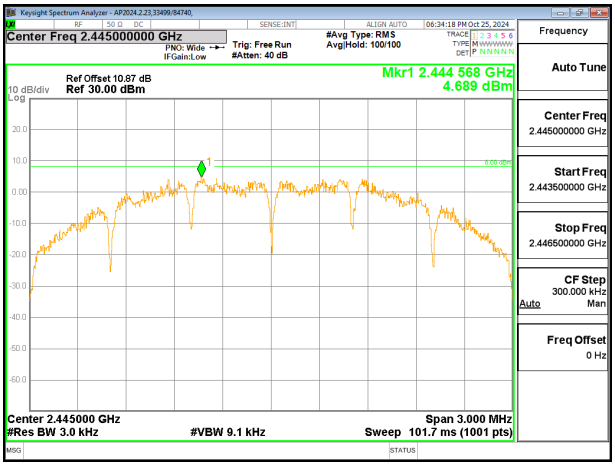
HIGH CHANNEL

Antenna 4

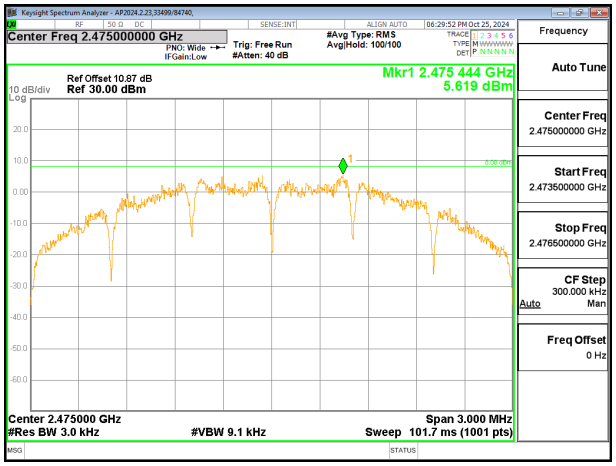
Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2405	6.29	8	-1.71
Mid	2445	4.69	8	-3.31
High	2475	5.62	8	-2.38



LOW CHANNEL



MID CHANNEL

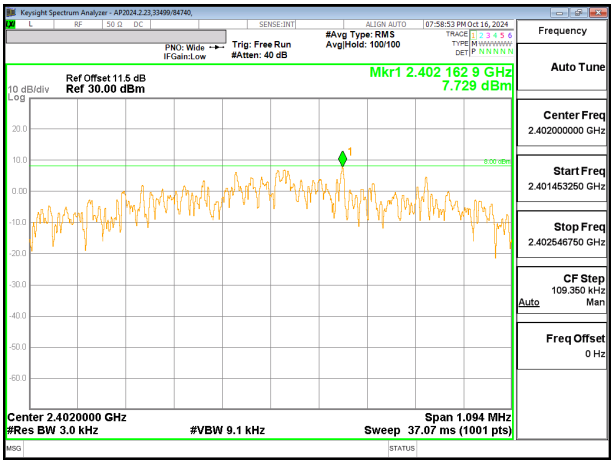


HIGH CHANNEL

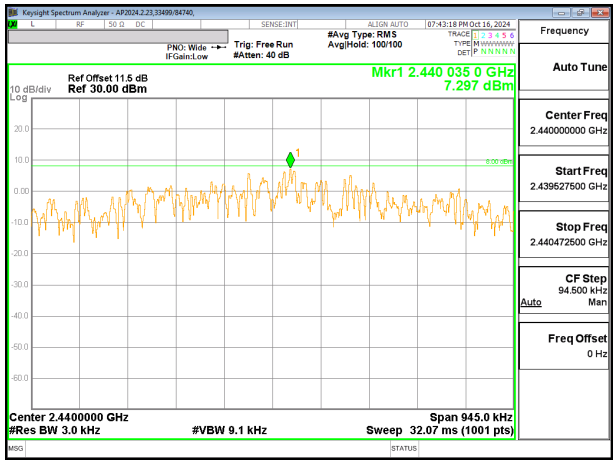
8.6.2. BLE (1Mbps)

Antenna 3

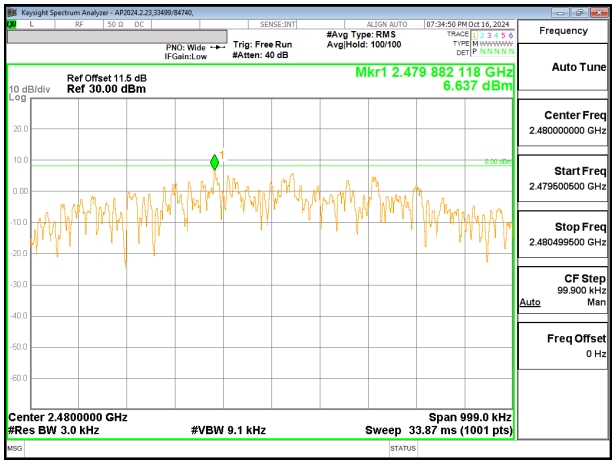
Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.73	8	-0.27
Mid	2440	7.30	8	-0.70
High	2480	6.64	8	-1.36



LOW CHANNEL



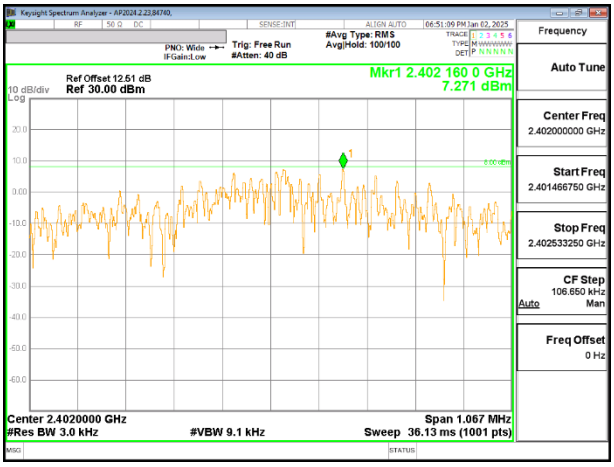
MID CHANNEL



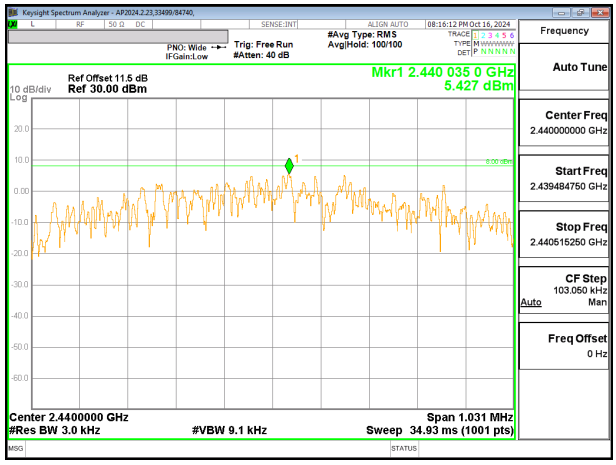
HIGH CHANNEL

Antenna 4

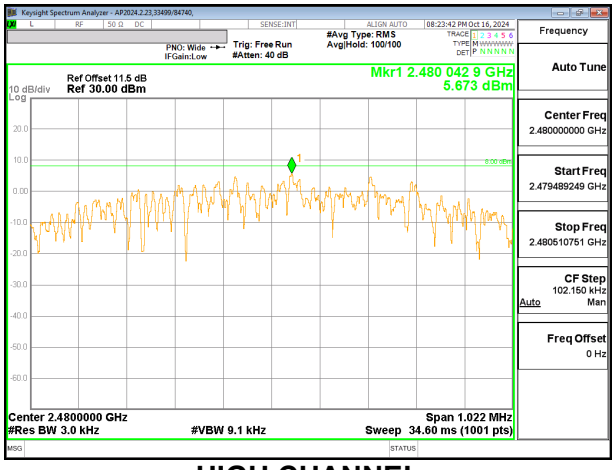
Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.27	8	-0.73
Mid	2440	5.43	8	-2.57
High	2480	5.67	8	-2.33



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)
RSS-247 5.5

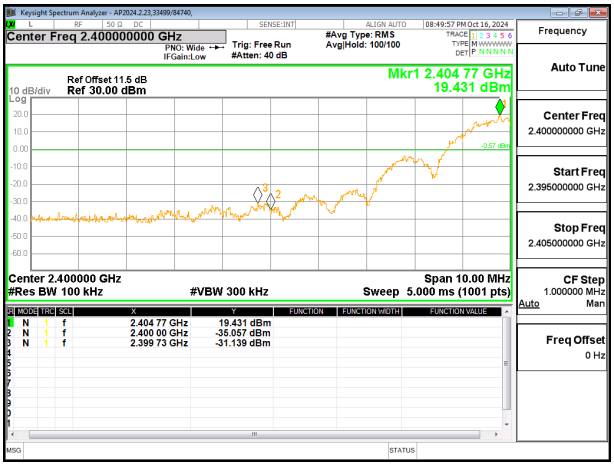
PROCEDURE

Conducted emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11 and 6.10
Output power was measured based on a peak measurement; therefore the required attenuation is -20 dBc.

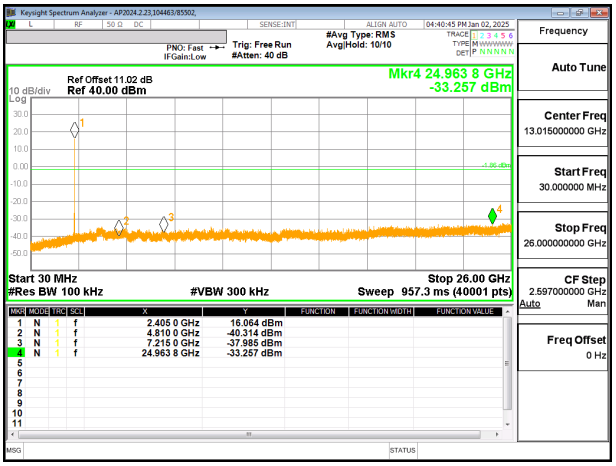
RESULTS

8.7.1. Zigbee (250Kbps)

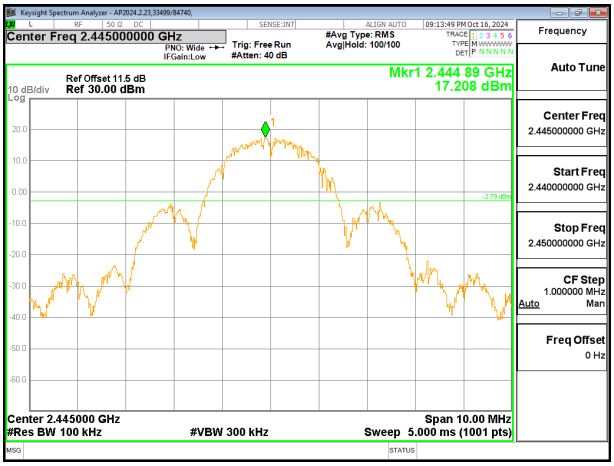
Antenna 3



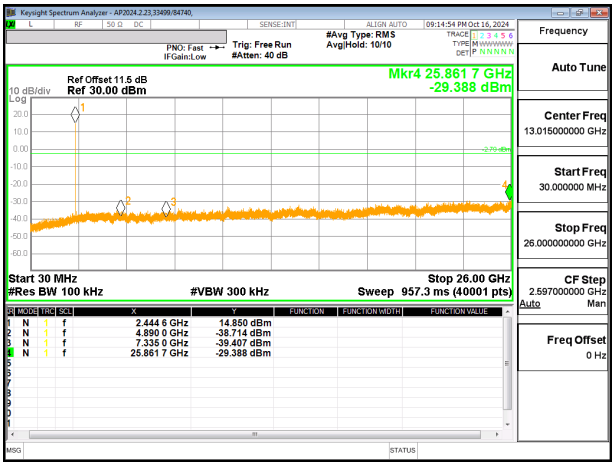
LOW CHANNEL BANDEDGE



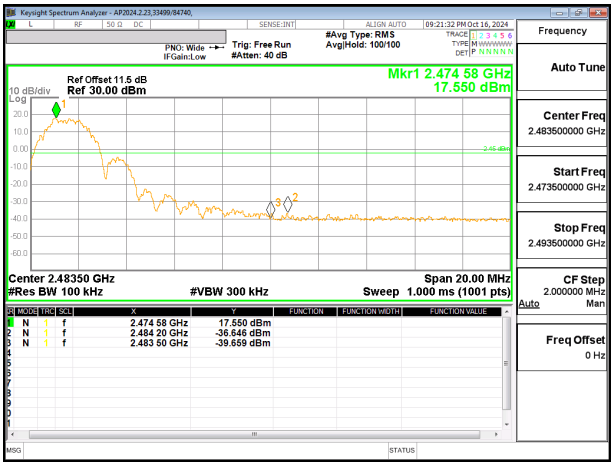
OUT-OF-BAND LOW CHANNEL



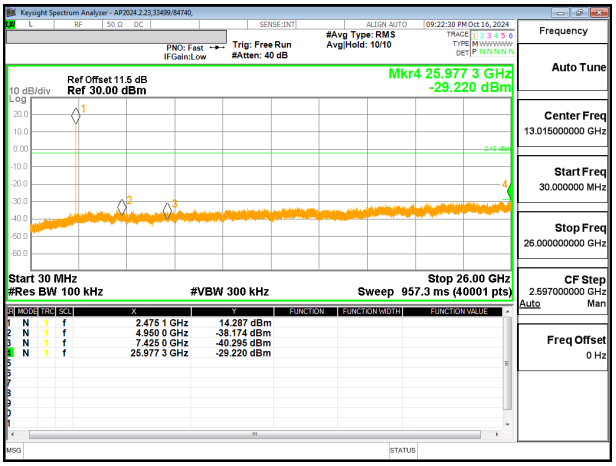
IN-BAND REFERENCE LEVEL



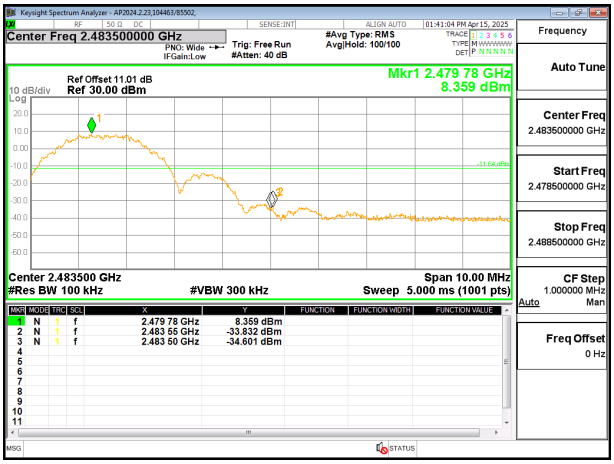
OUT-OF-BAND MID CHANNEL



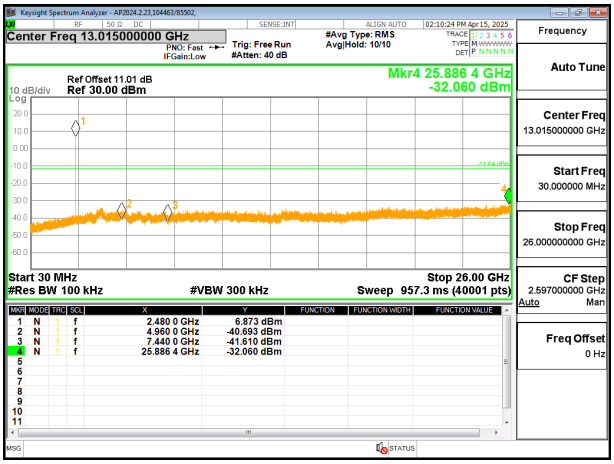
HIGH CHANNEL BANDEDGE 2475MHz



OUT-OF-BAND HIGH CHANNEL 2475MHz

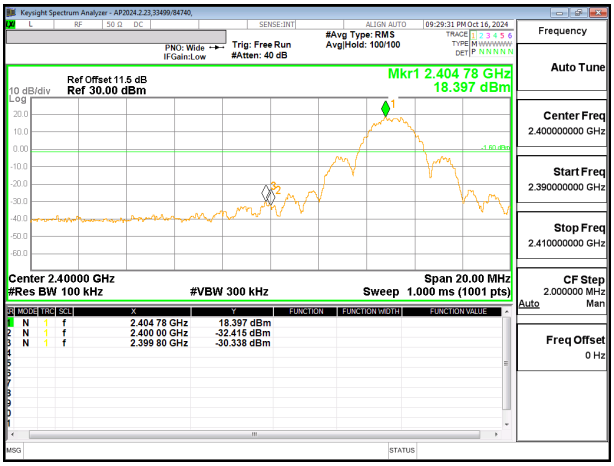


HIGH CHANNEL BANDEDGE 2480MHz

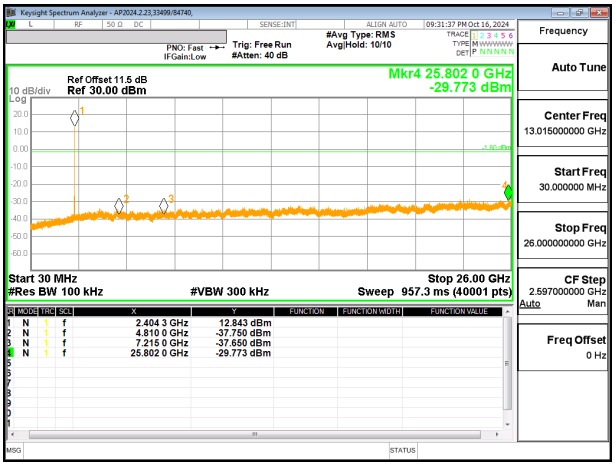


OUT-OF-BAND HIGH CHANNEL 2480MHz

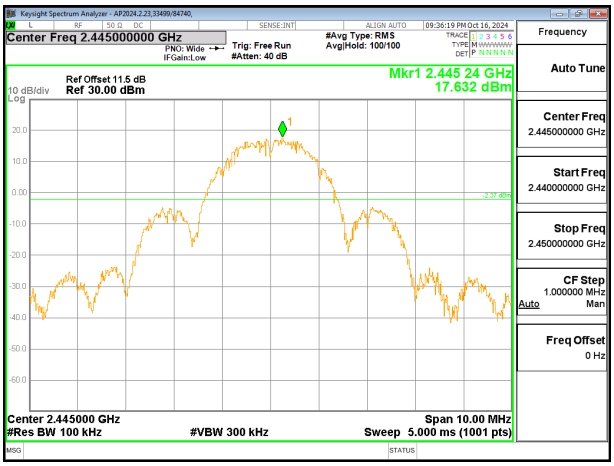
Antenna 4



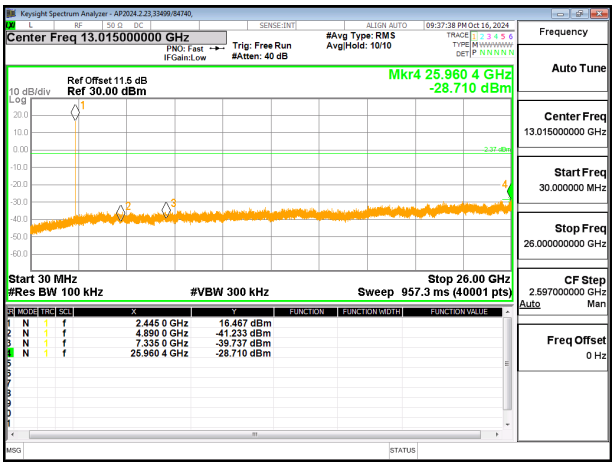
LOW CHANNEL BANDEDGE



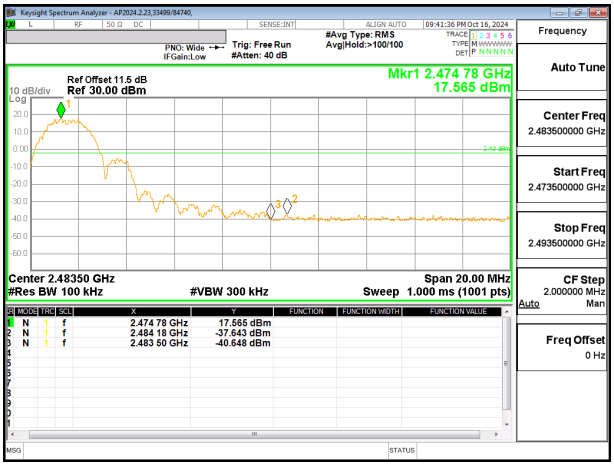
OUT-OF-BAND LOW CHANNEL



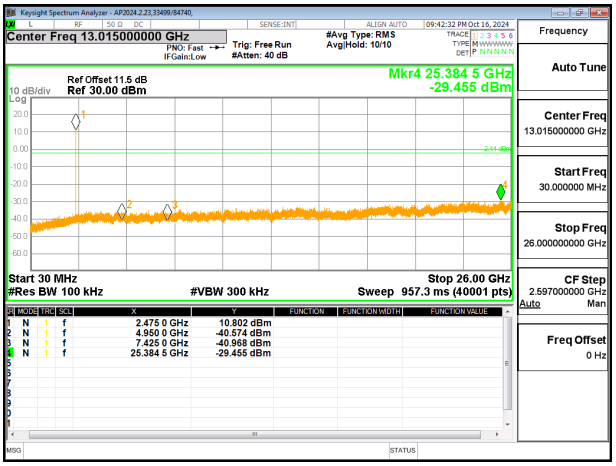
IN-BAND REFERENCE LEVEL



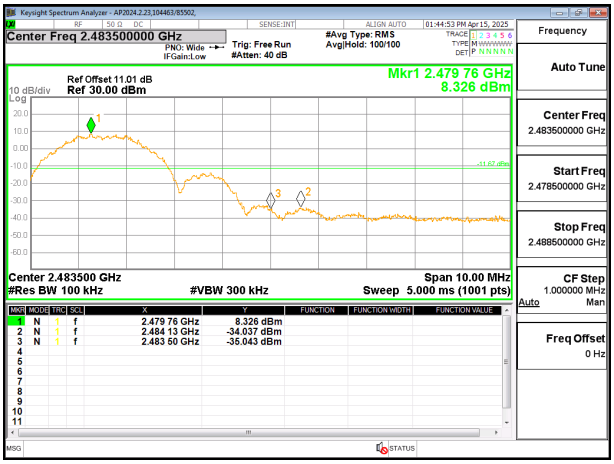
OUT-OF-BAND MID CHANNEL



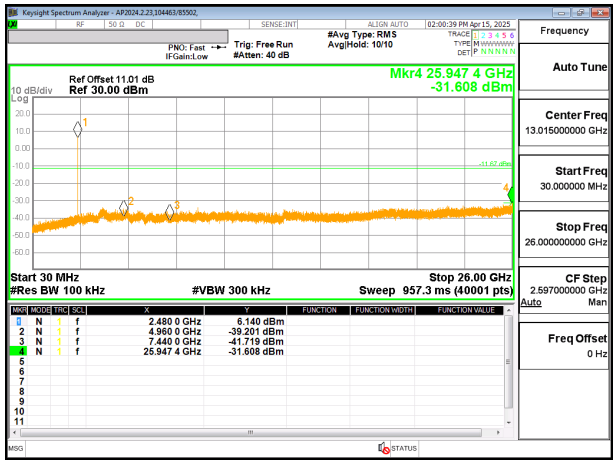
HIGH CHANNEL BANDEDGE 2475MHz



OUT-OF-BAND HIGH CHANNEL 2475MHz



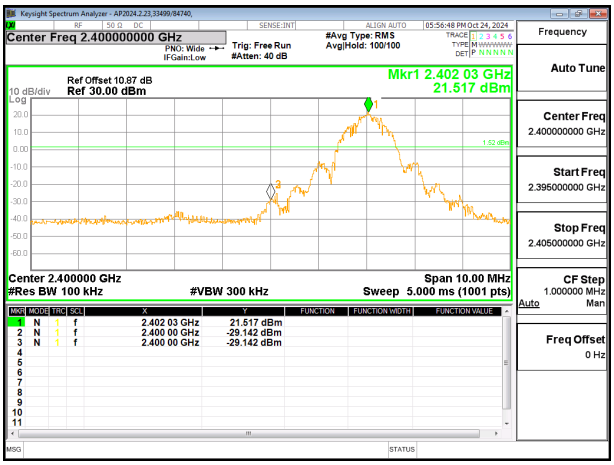
HIGH CHANNEL BANDEDGE 2480MHz



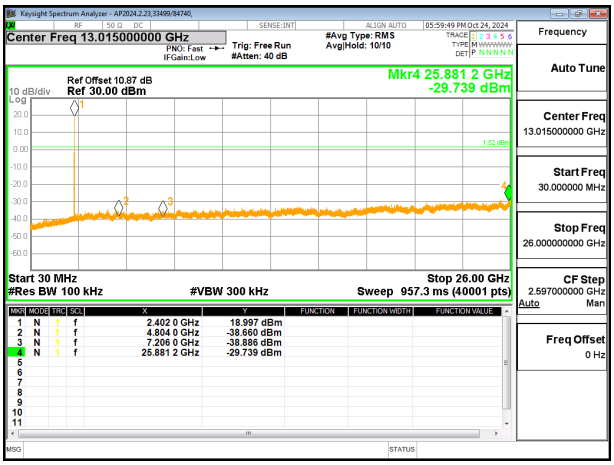
OUT-OF-BAND HIGH CHANNEL 2480MHz

8.7.2. BLE (1Mbps)

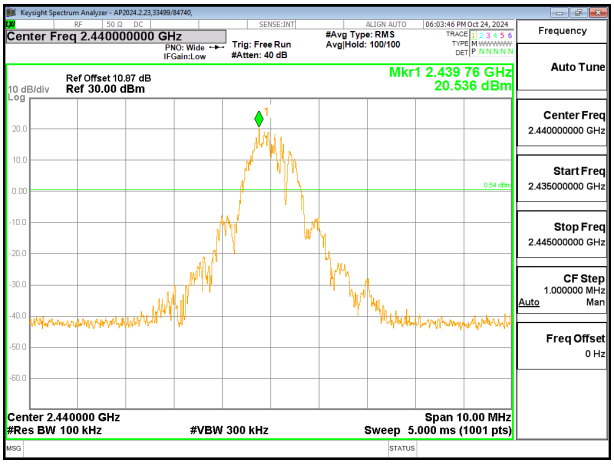
Antenna 3



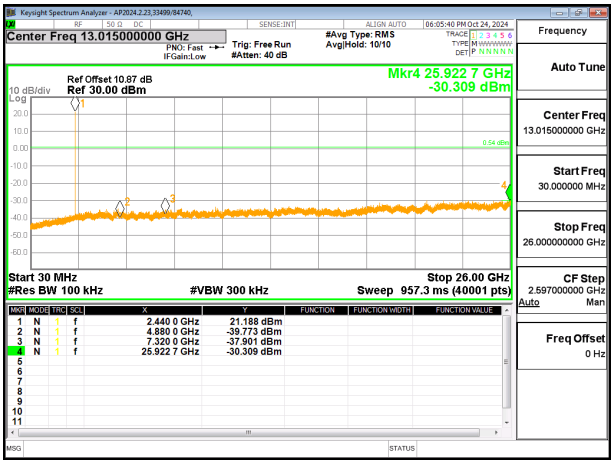
LOW CHANNEL BANDEDGE



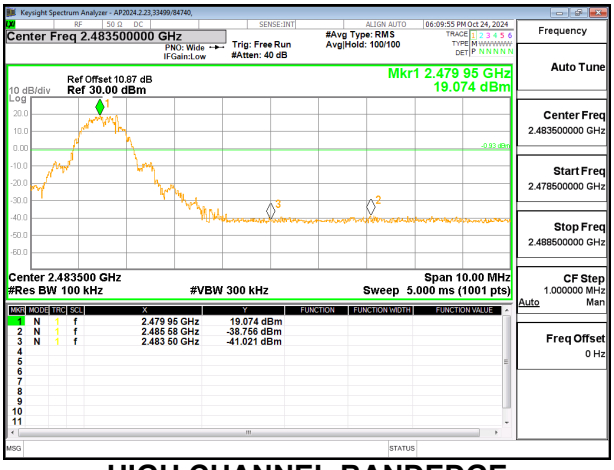
OUT-OF-BAND LOW CHANNEL



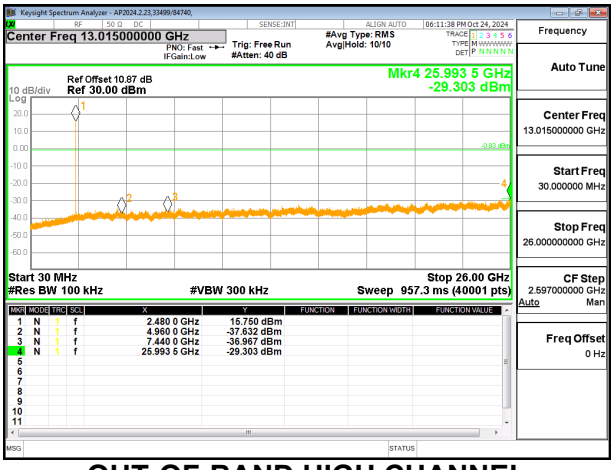
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

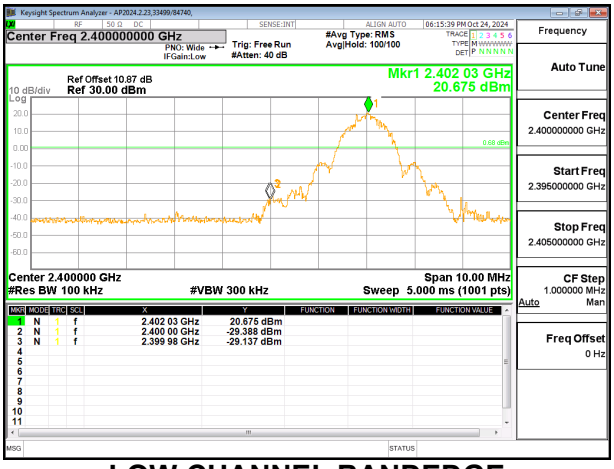


HIGH CHANNEL BANDEDGE

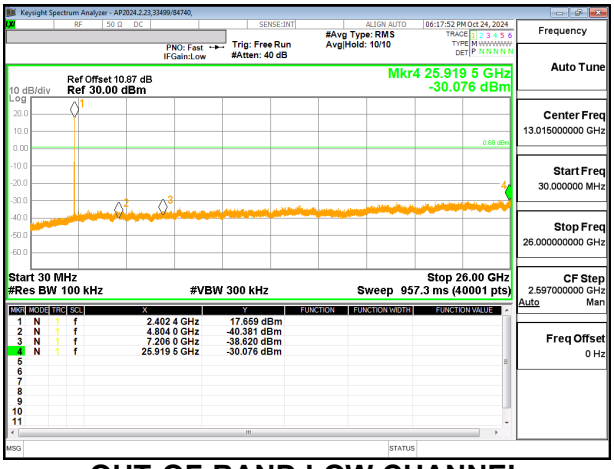


OUT-OF-BAND HIGH CHANNEL

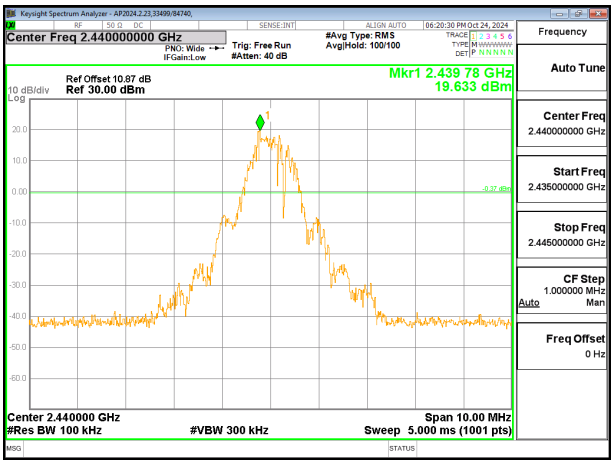
Antenna 4



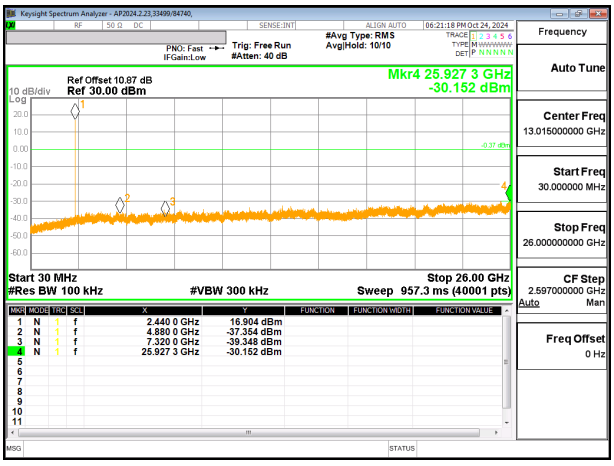
LOW CHANNEL BANDEDGE



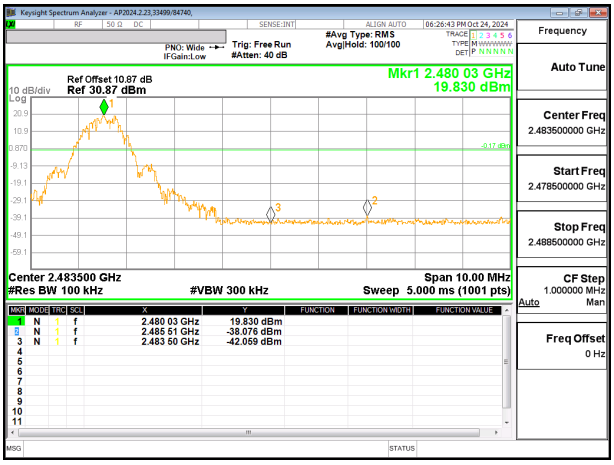
OUT-OF-BAND LOW CHANNEL



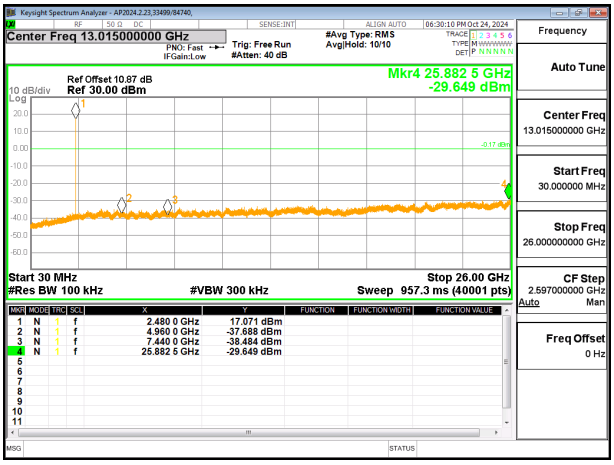
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

9. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209
RSS-GEN, Section 8.9 and 8.10

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54
Frequency Range (kHz)	**Field Strength Limit (uA/m) at 3 m**	**Field Strength Limit (dBuV/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

Radiated emissions in restricted frequency bands: ANSI C63.10 Subclause -11.12.1, 6.3 thru 6.6

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 3MHz 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 average measurements. Linear Voltage Averaging was used.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

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

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.

9.1. TRANSMITTER ABOVE 1 GHz

Note: The manufacturer declared a worst-case real life duty cycle for BLE and Zigbee on chipset 2 of 1%. Using FCC KDB 558074 D01 15.247 Meas Guidance v05r02 – Section 11 Q3 a), we can apply a duty cycle correction factor to the Peak Measurements to obtain a calculated RMS average value. This correction factor is calculated by 20*Log(1/D), where D = highest Duty Cycle. DCCF (dB) =20*Log(1/1%) = **40dB DCCF.**

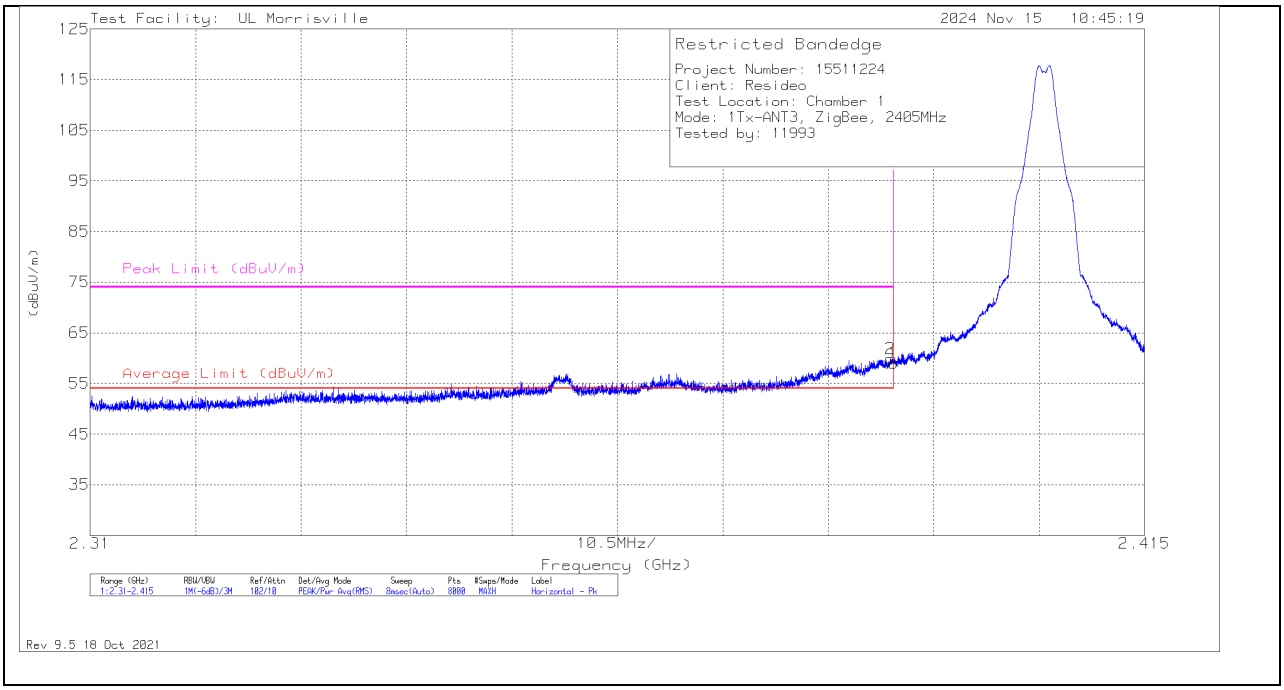
During testing, the Zigbee and BLE radios were set to 100% duty cycle

9.1.1. Zigbee (250Kbps)

Antenna 3

BANDEDGE (LOW CHANNEL)

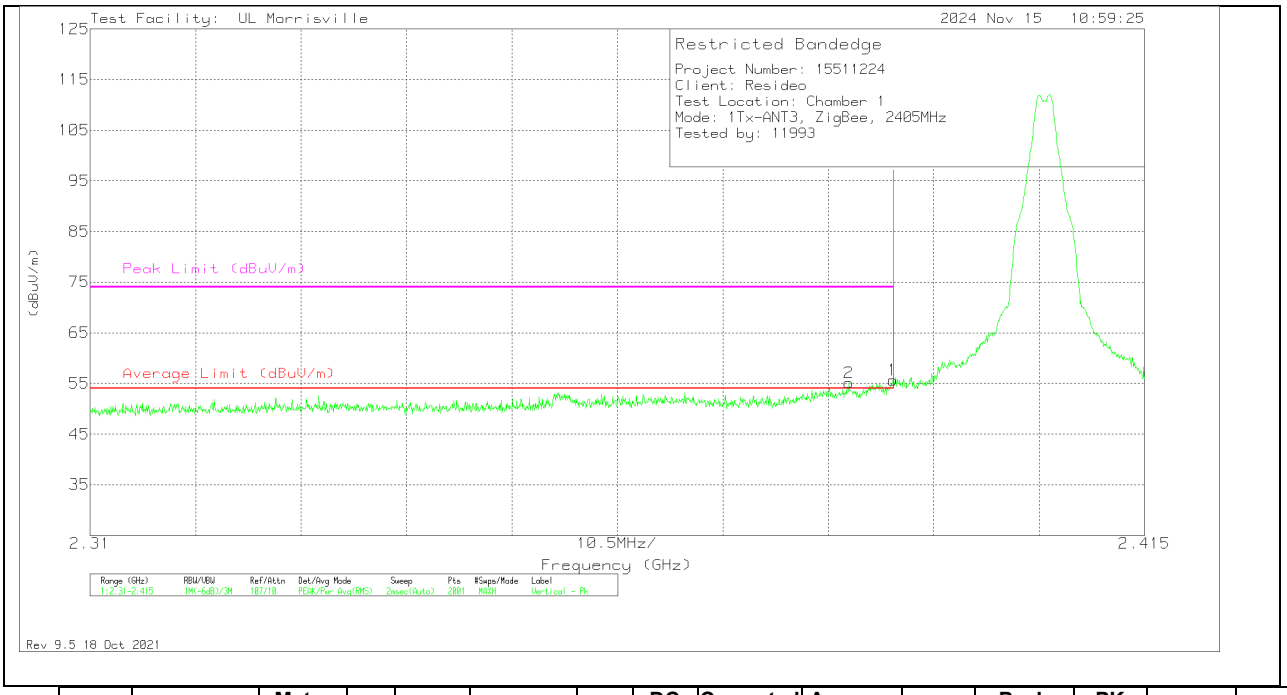
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	41.17	Pk	31.9	-24.1	10	0	58.97	-	-	74	-15.03	81	118	H
	* ** 2.39	41.17	Pk	31.9	-24.1	10	-40	18.97	54	-35.03	-	-	81	118	H
2	* ** 2.38969	41.98	Pk	31.9	-24	10	0	59.88	-	-	74	-14.12	81	118	H
	* ** 2.38969	41.98	Pk	31.9	-24	10	-40	19.88	54	-34.12	-	-	81	118	H

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

VERTICAL RESULT

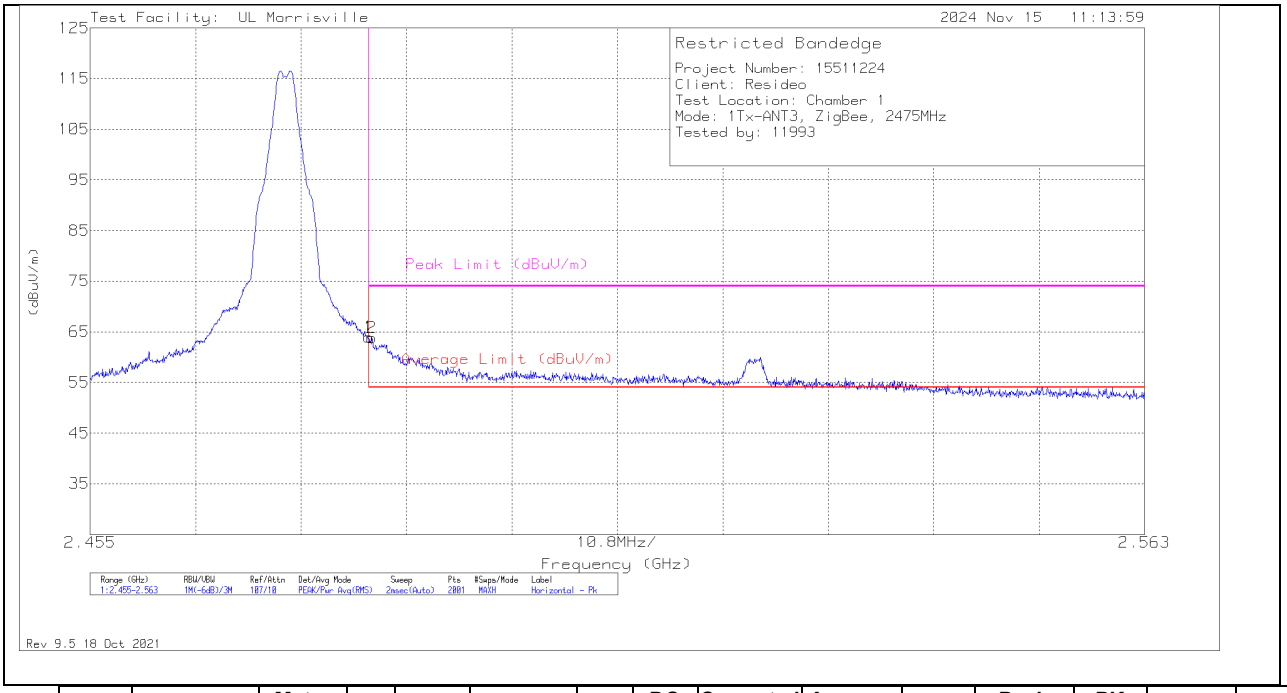


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	37.73	Pk	31.9	-24	10	0	55.63	-	-	74	-18.37	280	113	V
	* ** 2.38996	37.73	Pk	31.9	-24	10	-40	15.63	54	-38.37	-	-	280	113	V
2	* ** 2.38555	37.22	Pk	31.9	-23.9	9.9	0	55.12	-	-	74	-18.88	280	113	V
	* ** 2.38555	37.22	Pk	31.9	-23.9	9.9	-40	15.12	54	-38.88	-	-	280	113	V

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

BANDEDGE (HIGH CHANNEL 2475MHz)

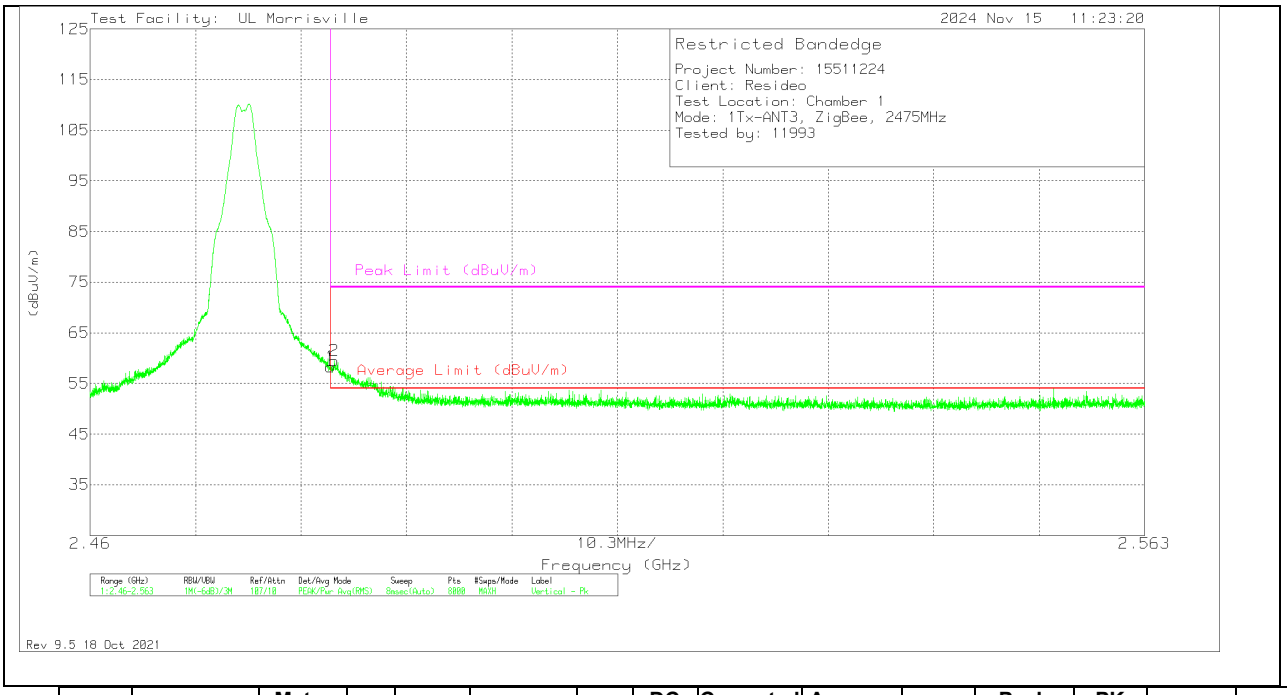
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48351	45.44	Pk	32.2	-23.7	10	0	63.94	-	-	74	-10.06	181	249	H
	* ** 2.48351	45.44	Pk	32.2	-23.7	10	-40	23.94	54	-30.06	-	-	181	249	H
2	* ** 2.48384	45.32	Pk	32.2	-23.7	10	0	63.82	-	-	74	-10.18	181	249	H
	* ** 2.48384	45.32	Pk	32.2	-23.7	10	-40	23.82	54	-30.18	-	-	181	249	H

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

VERTICAL RESULT



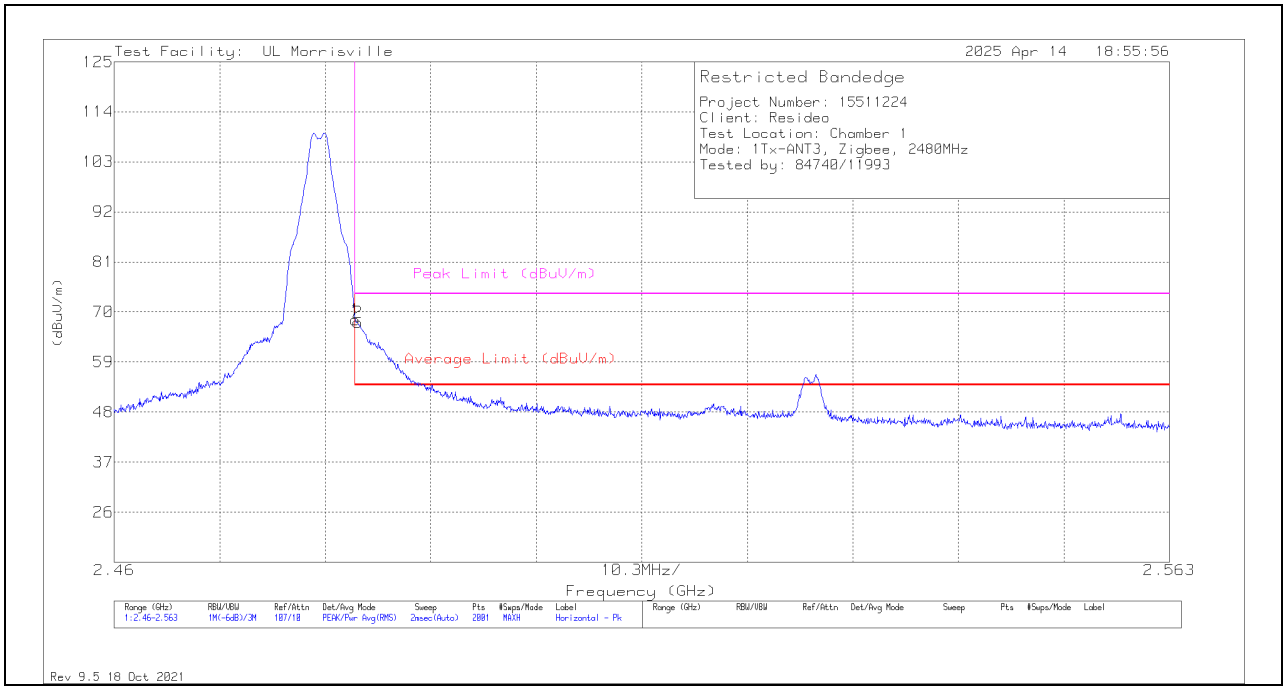
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	39.74	Pk	32.2	-23.7	10	0	58.24	-	-	74	-15.76	185	146	V
	* ** 2.4835	39.74	Pk	32.2	-23.7	10	-40	18.24	54	-35.76	-	-	-	146	V
2	* ** 2.48385	40.99	Pk	32.2	-23.7	10	0	59.49	-	-	74	-14.51	185	146	V
	* ** 2.48385	40.99	Pk	32.2	-23.7	10	-40	19.49	54	-34.51	-	-	185	146	V

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

UL LLC
12 Laboratory Drive, RTP NC 27606; USA TEL:(919) 549-1400

BANDEDGE (HIGH CHANNEL 2480MHz)

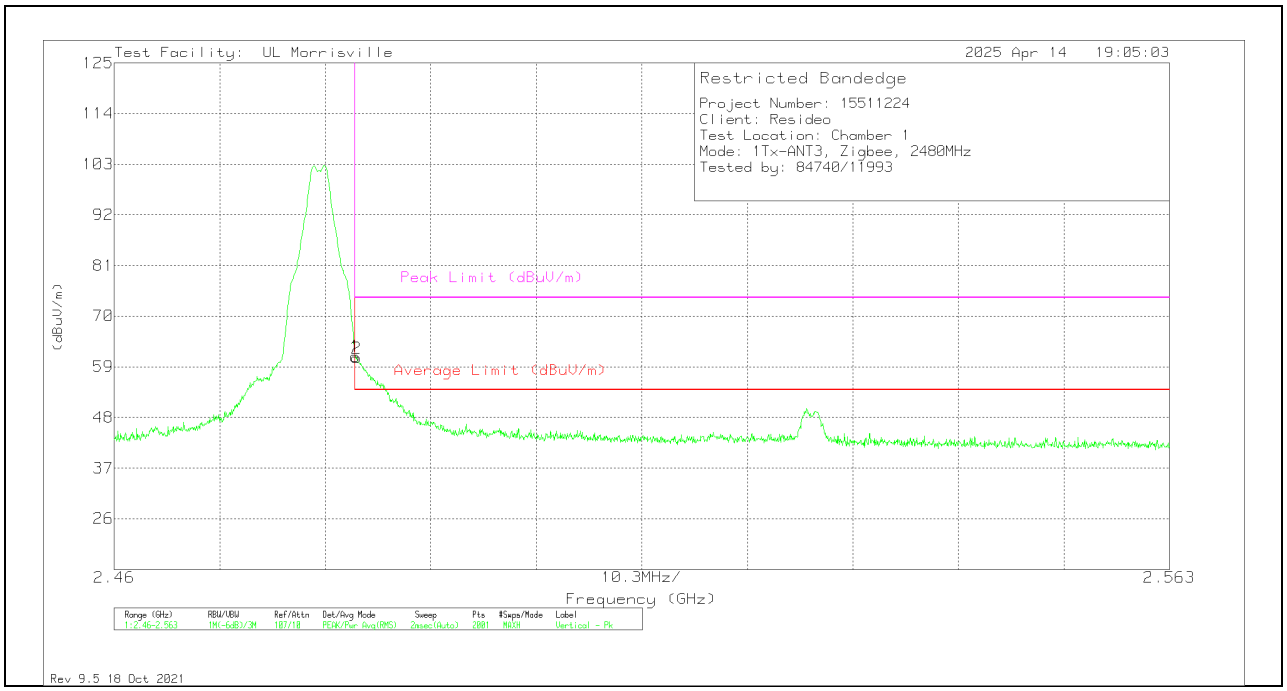
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (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	59.78	Pk	32.2	-23.7	0	68.28	-	-	74	-5.72	347	128	H
	* ** 2.48354	59.78	Pk	32.2	-23.7	-40	28.28	54	-25.72	-	-	347	128	H
2	* ** 2.48379	59.27	Pk	32.2	-23.7	0	62.77	-	-	74	-6.23	347	128	H
	* ** 2.48379	59.27	Pk	32.2	-23.7	-40	22.77	54	-31.23	-	-	347	128	H

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

VERTICAL RESULT

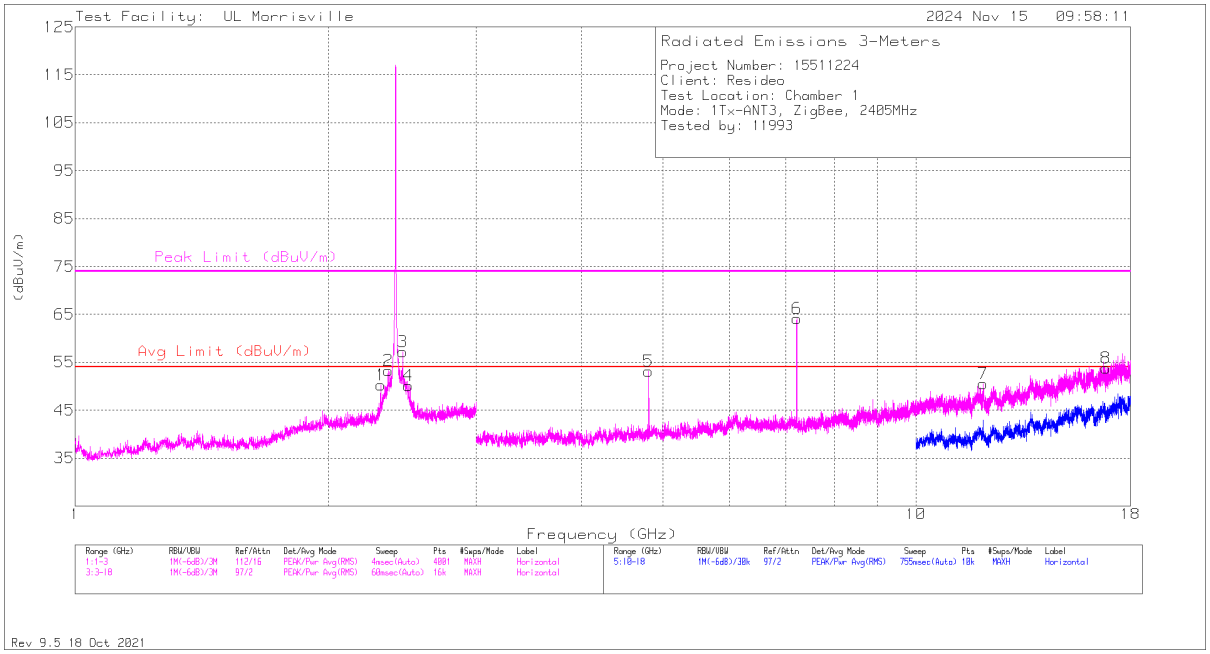


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	52.78	Pk	32.2	-23.7	0	61.28	-	-	74	-12.72	102	103	V
	* ** 2.48354	52.78	Pk	32.2	-23.7	-40	21.28	54	-32.72	-	-	102	103	V
2	* ** 2.48364	52.42	Pk	32.2	-23.7	0	60.92	-	-	74	-13.08	102	103	V
	* ** 2.48364	52.42	Pk	32.2	-23.7	-40	20.92	54	-33.08	-	-	102	103	V

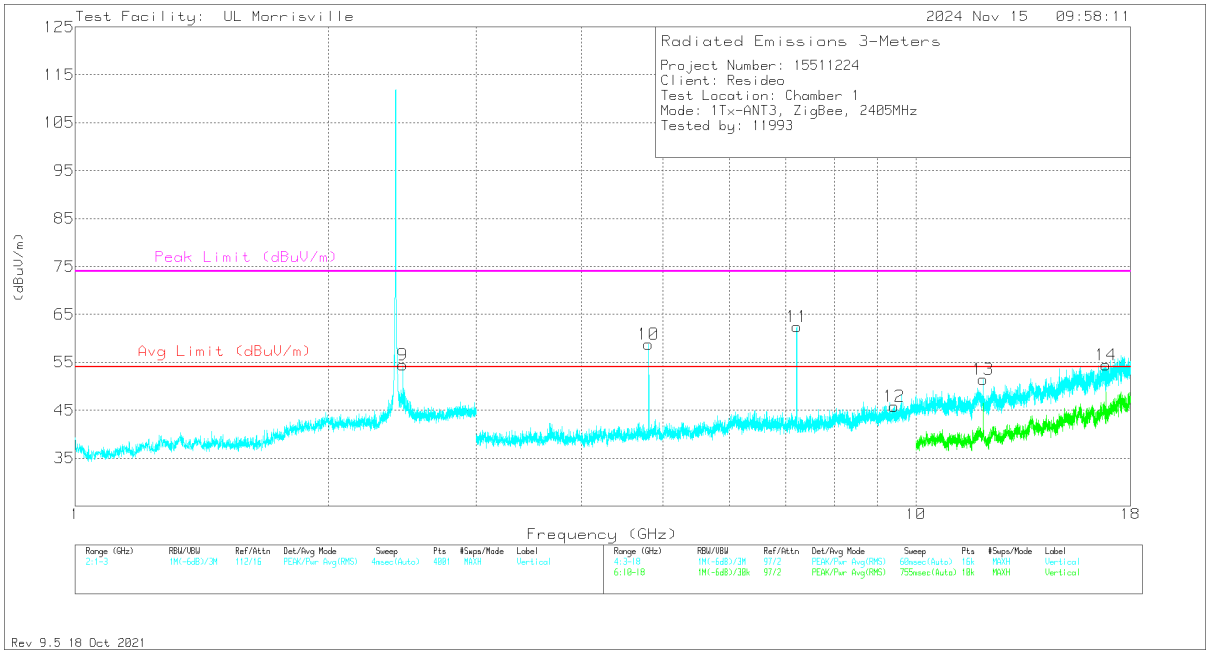
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

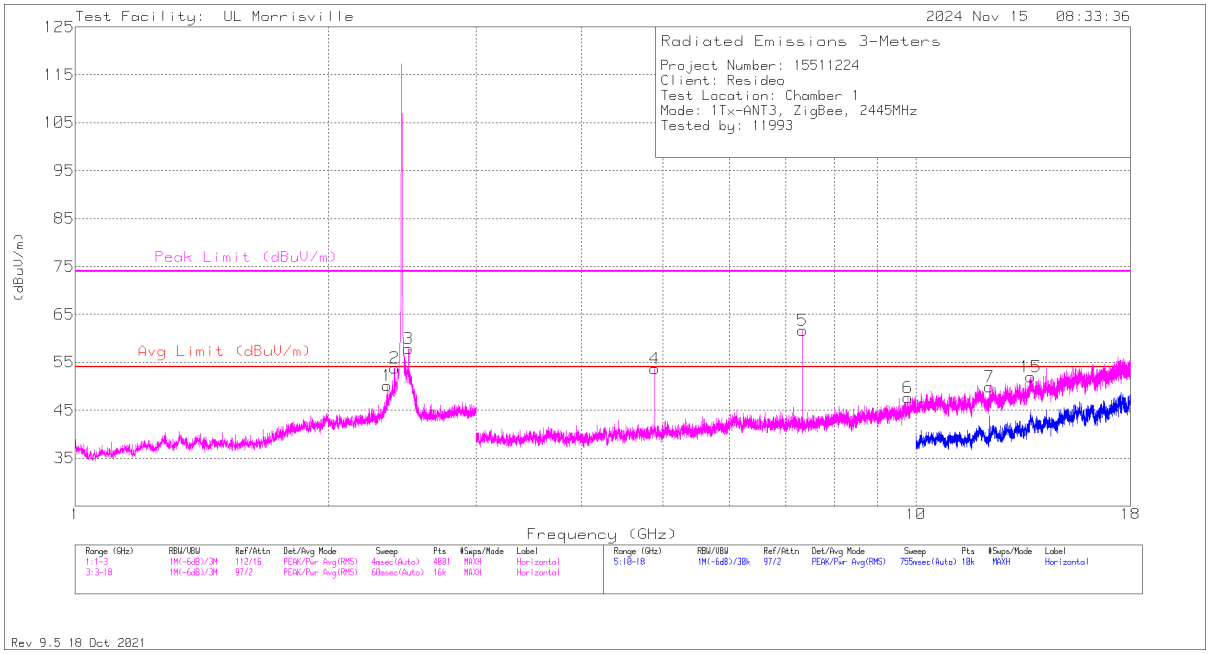
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 2.35745	49.49	PK2	31.8	-24.4	0	56.89	-	-	74	-17.11	175	196	H
	* ** 2.35745	49.49	PK2	31.8	-24.4	-40	16.89	54	-37.11	-	-	175	196	H
4	* ** 2.49162	44.76	PK2	32.3	-24.3	0	52.76	-	-	74	-21.24	164	255	H
	* ** 2.49162	44.76	PK2	32.3	-24.3	-40	12.76	54	-41.24	-	-	164	255	H
5	* ** 4.81099	67.29	PK2	33.9	-45.7	0	55.49	-	-	74	-18.51	164	399	H
	* ** 4.81099	67.29	PK2	33.9	-45.7	-40	15.49	54	-38.51	-	-	164	399	H
7	* ** 12.0275	52.7	PK2	38.7	-37.9	0	53.5	-	-	74	-20.5	164	240	H
	* ** 12.0275	52.7	PK2	38.7	-37.9	-40	13.5	54	-40.5	-	-	164	240	H
10	* ** 4.80893	71.67	PK2	33.9	-45.7	0	59.87	-	-	74	-14.13	239	109	V
	* ** 4.80893	71.67	PK2	33.9	-45.7	-40	19.87	54	-34.13	-	-	239	109	V
12	* ** 9.41813	49.34	Pk	36.3	-39.8	0	45.84	54	-8.16	74	-28.16	0-360	200	V
13	* ** 12.02249	55.27	PK2	38.7	-38	0	55.97	-	-	74	-18.03	57	103	V
	* ** 12.02249	55.27	PK2	38.7	-38	-40	15.97	54	-38.03	-	-	57	103	V
1	2.309	43.05	Pk	31.6	-24.4	0	50.25	-	-	-	-	0-360	200	H
9	2.453	46.58	Pk	32.1	-24.2	0	54.48	-	-	-	-	0-360	101	V
3	2.4535	49.29	Pk	32.1	-24.2	0	57.19	-	-	-	-	0-360	101	H
6	7.21594	70.96	Pk	35.4	-42.2	0	64.16	-	-	-	-	0-360	199	H
11	7.21594	69.2	Pk	35.4	-42.2	0	62.4	-	-	-	-	0-360	101	V
8	16.83375	48.91	Pk	40.9	-36	0	53.81	-	-	-	-	0-360	101	H
14	16.83938	49.46	Pk	40.9	-35.9	0	54.46	-	-	-	-	0-360	101	V

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

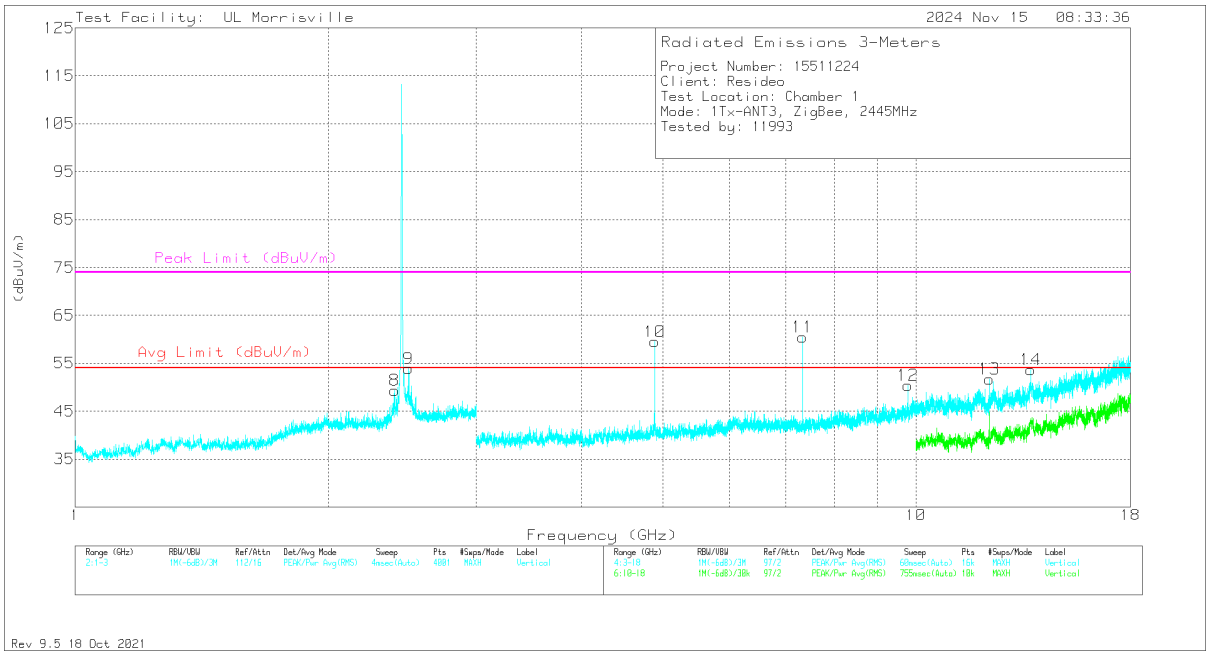
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

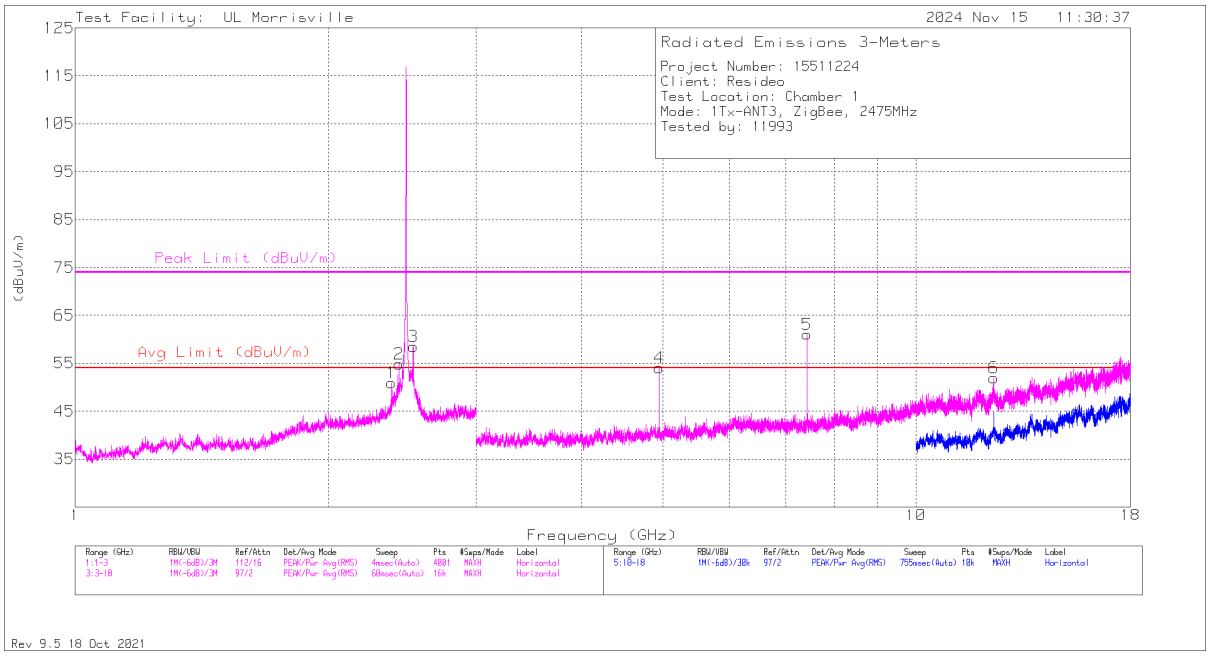
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.34948	46.17	PK2	31.8	-24.6	0	53.37	-	-	74	-20.63	100	218	H
	* ** 2.34948	46.17	PK2	31.8	-24.6	-40	13.37	54	-40.63	-	-	100	218	H
3	* ** 2.49327	53.23	PK2	32.3	-24.4	0	61.13	-	-	74	-12.87	169	260	H
	* ** 2.49327	53.23	PK2	32.3	-24.4	-40	21.13	54	-32.87	-	-	169	260	H
9	* ** 2.49241	48.75	PK2	32.3	-24.3	0	56.75	-	-	74	-17.25	282	101	V
	* ** 2.49241	48.75	PK2	32.3	-24.3	-40	16.75	54	-37.25	-	-	282	101	V
4	* ** 4.88895	66.41	PK2	34	-44.8	0	55.61	-	-	74	-18.39	307	104	H
	* ** 4.88895	66.41	PK2	34	-44.8	-40	15.61	54	-38.39	-	-	307	104	H
5	* ** 7.33651	68.79	PK2	35.4	-42.2	0	61.99	-	-	74	-12.01	153	266	H
	* ** 7.33651	68.79	PK2	35.4	-42.2	-40	21.99	54	-32.01	-	-	153	266	H
7	* ** 12.22764	52.55	PK2	38.7	-38.8	0	52.45	-	-	74	-21.55	171	207	H
	* ** 12.22764	52.55	PK2	38.7	-38.8	-40	12.45	54	-41.55	-	-	171	207	H
10	* ** 4.89105	71.02	PK2	34	-44.8	0	60.22	-	-	74	-13.78	235	102	V
	* ** 4.89105	71.02	PK2	34	-44.8	-40	20.22	54	-33.78	-	-	235	102	V
11	* ** 7.3334	68.94	PK2	35.4	-42.2	0	62.14	-	-	74	-11.86	307	107	V
	* ** 7.3334	68.94	PK2	35.4	-42.2	-40	22.14	54	-31.86	-	-	307	107	V
13	* ** 12.22763	53.7	PK2	38.7	-38.8	0	53.6	-	-	74	-20.4	55	103	V
	* ** 12.22763	53.7	PK2	38.7	-38.8	-40	13.6	54	-40.4	-	-	55	103	V
2	2.397	46.2	Pk	32	-24.4	0	53.8	-	-	-	-	0-360	101	H
8	2.3975	41.88	Pk	32	-24.5	0	49.38	-	-	-	-	0-360	101	V
6	9.78188	50.44	Pk	37.1	-39.9	0	47.64	-	-	-	-	0-360	101	H
12	9.78188	53.16	Pk	37.1	-39.9	0	50.36	-	-	-	-	0-360	101	V
15	13.69313	49.81	Pk	39	-36.9	0	51.91	-	-	-	-	0-360	199	H
14	13.69688	51.39	Pk	39	-36.7	0	53.69	-	-	-	-	0-360	101	V

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

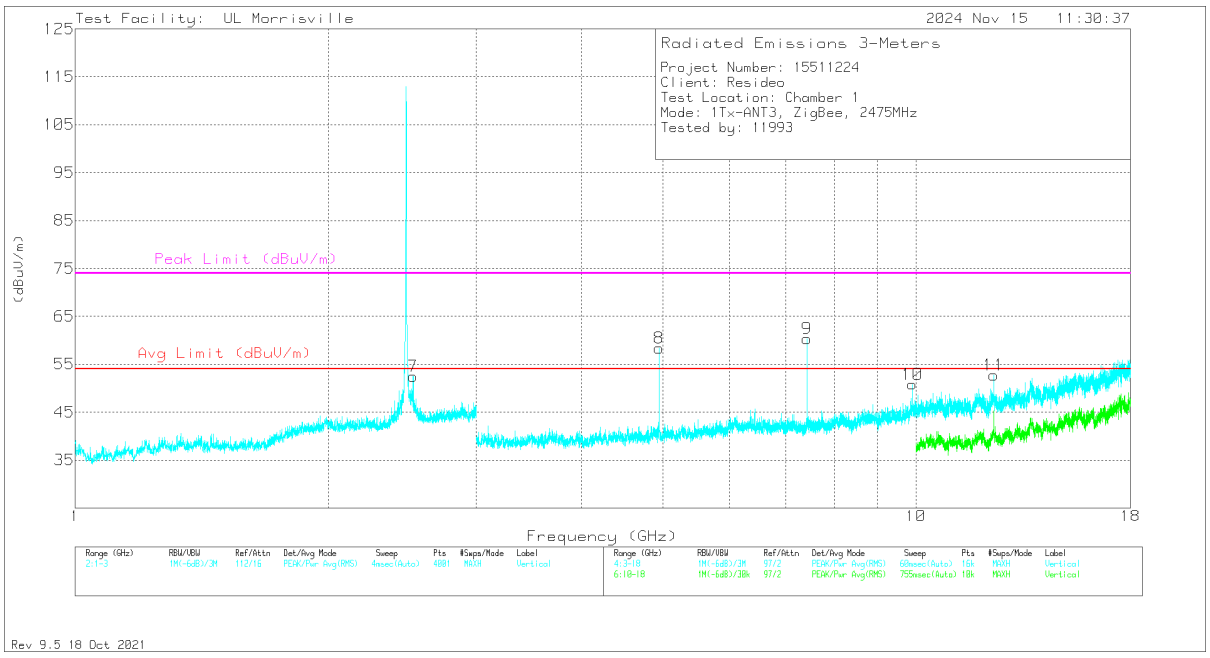
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (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	* ** 2.37942	46.13	PK2	31.9	-24.2	0	53.83	-	-	74	-20.17	175	177	H
	* ** 2.37942	46.13	PK2	31.9	-24.2	-40	13.83	54	-40.17	-	-	175	177	H
3	** 2.524	50.3	Pk	32.3	-24.1	0	58.5	-	-	-	-	0-360	199	H
7	** 2.5235	44.31	Pk	32.3	-24.1	0	52.51	-	-	-	-	0-360	101	V
4	* ** 4.95095	66.98	PK2	34.2	-44.6	0	56.58	-	-	74	-17.42	137	365	H
	* ** 4.95095	66.98	PK2	34.2	-44.6	-40	16.58	54	-37.42	-	-	137	365	H
5	* ** 7.42646	68.25	PK2	35.4	-41.2	0	62.45	-	-	74	-11.55	139	276	H
	* ** 7.42646	68.25	PK2	35.4	-41.2	-40	22.45	54	-31.55	-	-	139	276	H
6	* ** 12.37244	53.32	PK2	38.7	-37.7	0	54.32	-	-	74	-19.68	8	120	H
	* ** 12.37244	53.32	PK2	38.7	-37.7	-40	14.32	54	-39.68	-	-	8	120	H
8	* ** 4.95102	69.85	PK2	34.2	-44.6	0	59.45	-	-	74	-14.55	238	105	V
	* ** 4.95102	69.85	PK2	34.2	-44.6	-40	19.45	54	-34.55	-	-	238	105	V
9	* ** 7.42347	67.16	PK2	35.4	-41.2	0	61.36	-	-	74	-12.64	301	101	V
	* ** 7.42347	67.16	PK2	35.4	-41.2	-40	21.36	54	-32.64	-	-	301	101	V
11	* ** 12.3725	53.56	PK2	38.7	-37.7	0	54.56	-	-	74	-19.44	108	143	V
	* ** 12.3725	53.56	PK2	38.7	-37.7	-40	14.56	54	-39.44	-	-	108	143	V
2	2.4275	47.1	Pk	32	-24.3	0	54.8	-	-	-	-	0-360	199	H
10	9.89813	53.94	Pk	37.4	-40.5	0	50.84	-	-	-	-	0-360	101	V

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

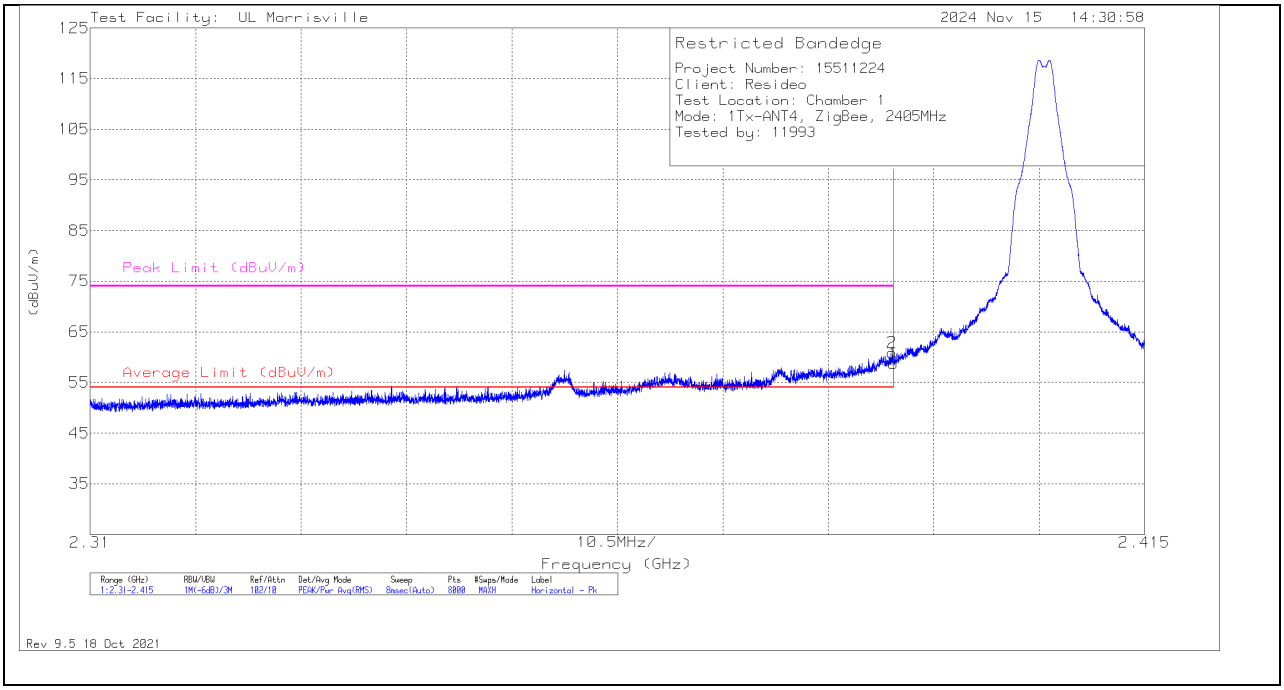
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

Antenna 4

BANDEDGE (LOW CHANNEL)

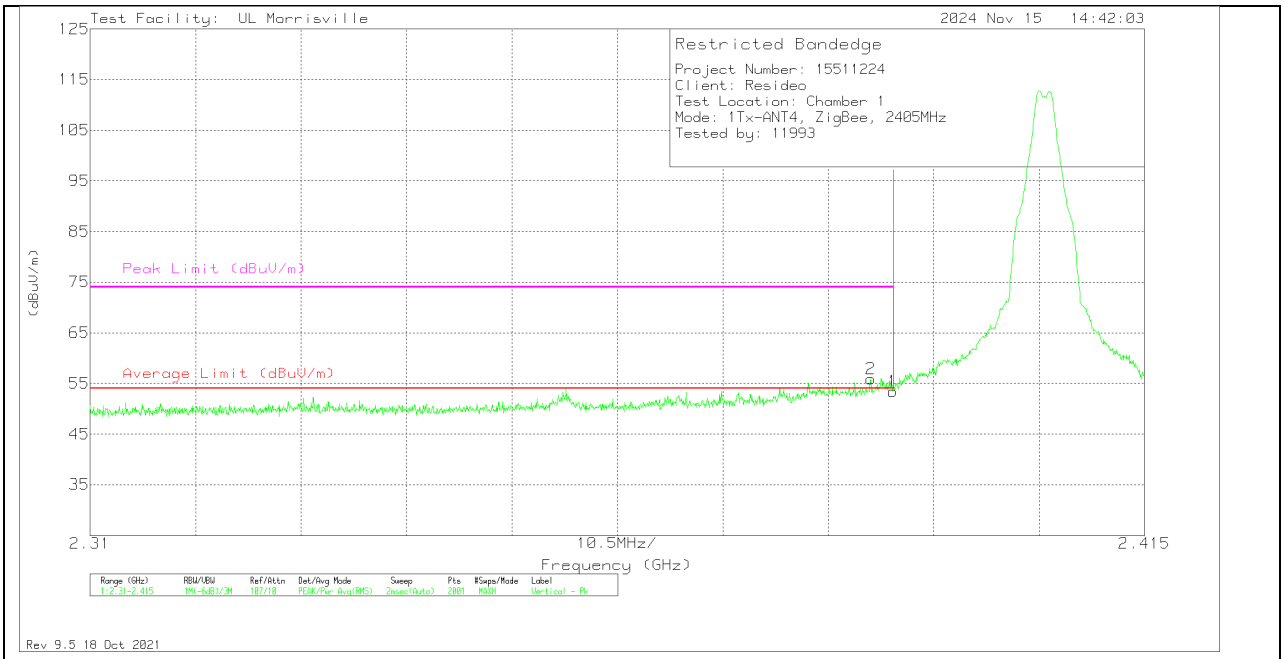
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	40.96	Pk	31.9	-24.1	10	0	58.76	-	-	74	-15.24	118	187	H
	* ** 2.39	40.96	Pk	31.9	-24.1	10	-40	18.76	54	-35.24	-	-	118	187	H
2	* ** 2.38989	42.96	Pk	31.9	-24	10	0	60.86	-	-	74	-13.14	118	187	H
	* ** 2.38989	42.96	Pk	31.9	-24	10	-40	20.86	54	-33.14	-	-	118	187	H

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

VERTICAL RESULT

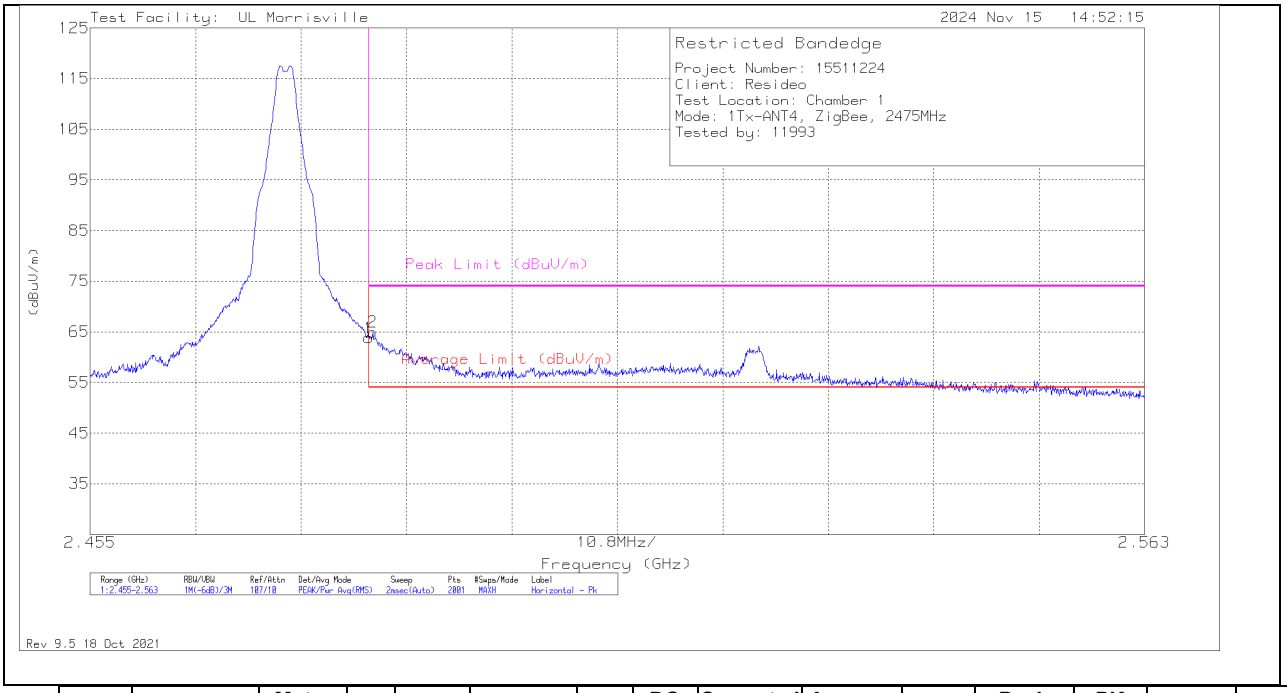


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	35.51	Pk	31.9	-24	10	0	53.41	-	-	74	-20.59	186	358	V
	* ** 2.38996	35.51	Pk	31.9	-24	10	-40	13.41	54	-40.59	-	-	186	358	V
2	* ** 2.38775	37.92	Pk	31.9	-23.9	10	0	55.92	-	-	74	-18.08	186	358	V
	* ** 2.38775	37.92	Pk	31.9	-23.9	10	-40	15.92	54	-38.08	-	-	186	358	V

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

BANDEDGE (HIGH CHANNEL 2475MHz)

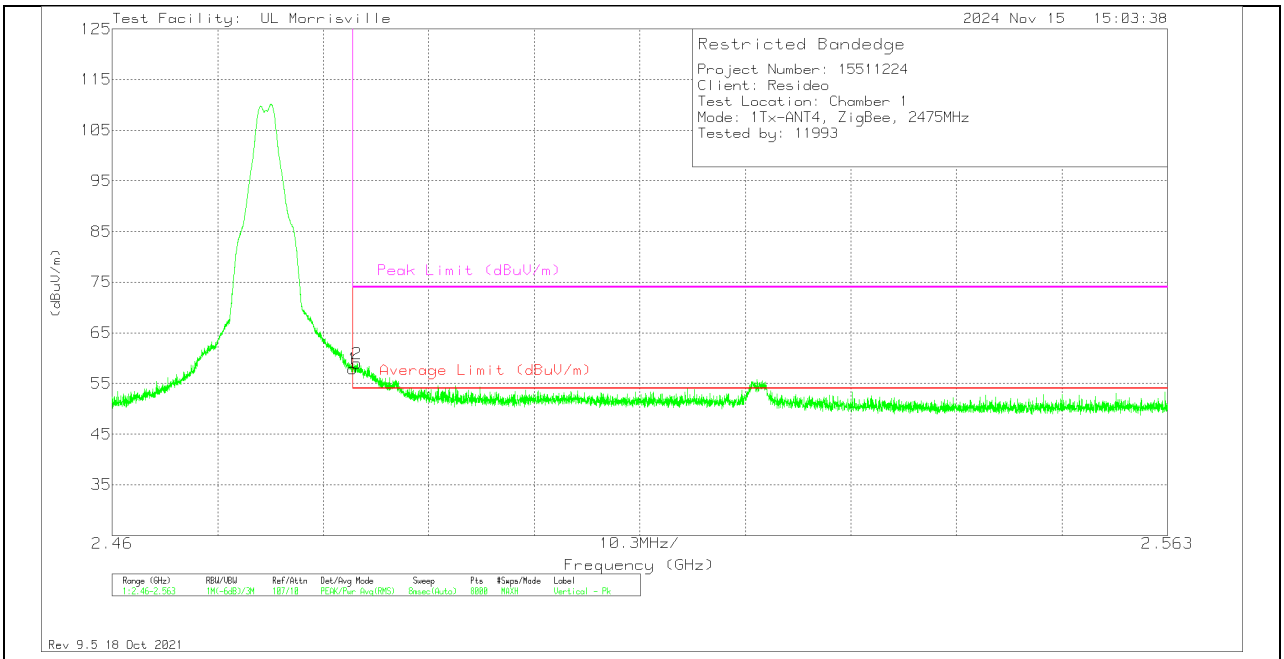
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48351	45.28	Pk	32.2	-23.7	10	0	63.78	-	-	74	-10.22	121	249	H
	* ** 2.48351	45.28	Pk	32.2	-23.7	10	-40	23.78	54	-30.22	-	-	121	249	H
2	* ** 2.48394	46.44	Pk	32.2	-23.7	10	0	64.94	-	-	74	-9.06	121	249	H
	* ** 2.48394	46.44	Pk	32.2	-23.7	10	-40	24.94	54	-29.06	-	-	121	249	H

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

VERTICAL RESULT

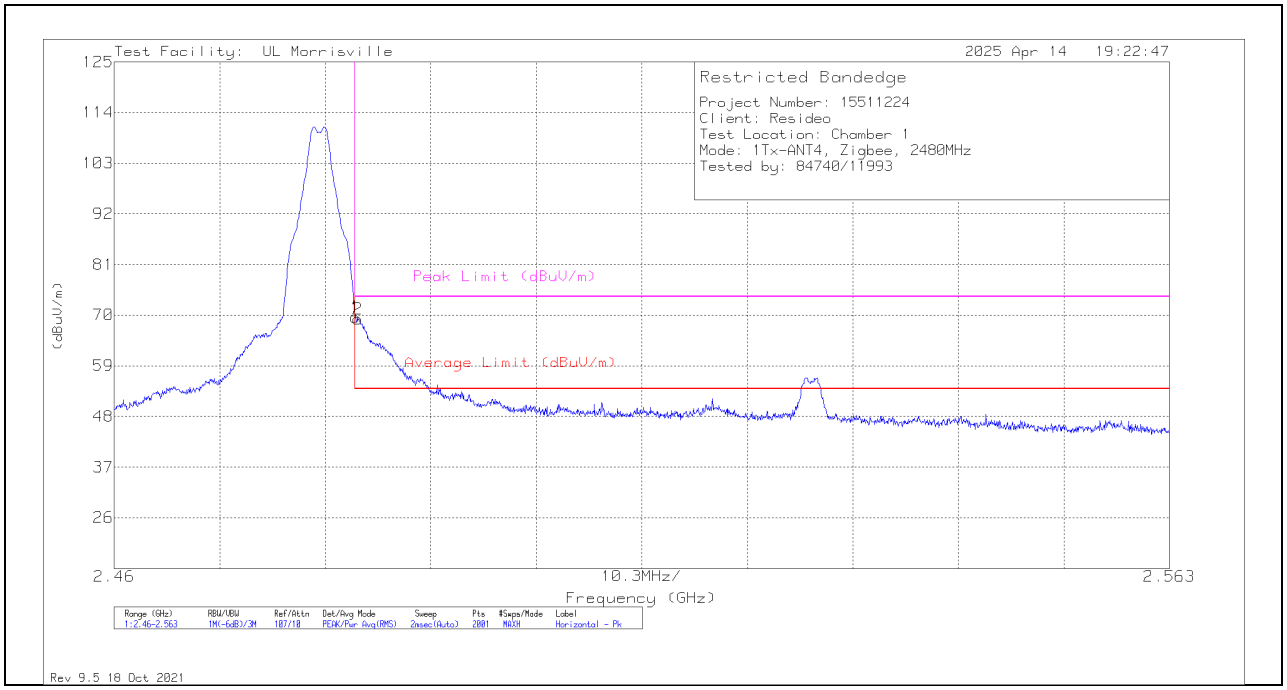


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	39.35	Pk	32.2	-23.7	10	0	57.85	-	-	74	-16.15	85	318	V
	* ** 2.4835	39.35	Pk	32.2	-23.7	10	-40	17.85	54	-36.15	-	-	85	318	V
2	* ** 2.48391	40.45	Pk	32.2	-23.7	10	0	58.95	-	-	74	-15.05	85	318	V
	* ** 2.48391	40.45	Pk	32.2	-23.7	10	-40	18.95	54	-35.05	-	-	85	318	V

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

BANDEDGE (HIGH CHANNEL 2480MHz)

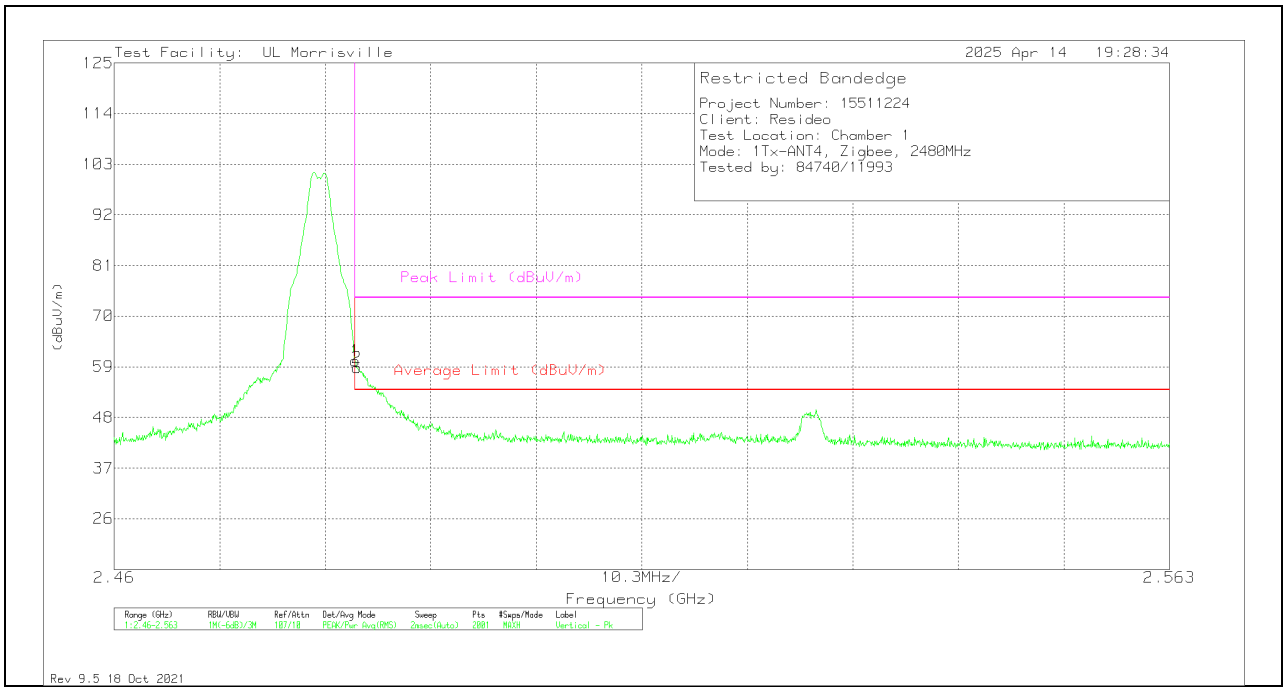
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (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	61.1	Pk	32.2	-23.7	0	69.6	-	-	74	-4.4	17	141	H
	* ** 2.48354	61.1	Pk	32.2	-23.7	-40	29.6	54	-24.4	-	-	17	141	H
2	* ** 2.48379	60.66	Pk	32.2	-23.7	0	69.16	-	-	74	-4.84	17	141	H
	* ** 2.48379	60.66	Pk	32.2	-23.7	-40	29.16	54	-24.84	-	-	17	141	H

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

VERTICAL RESULT



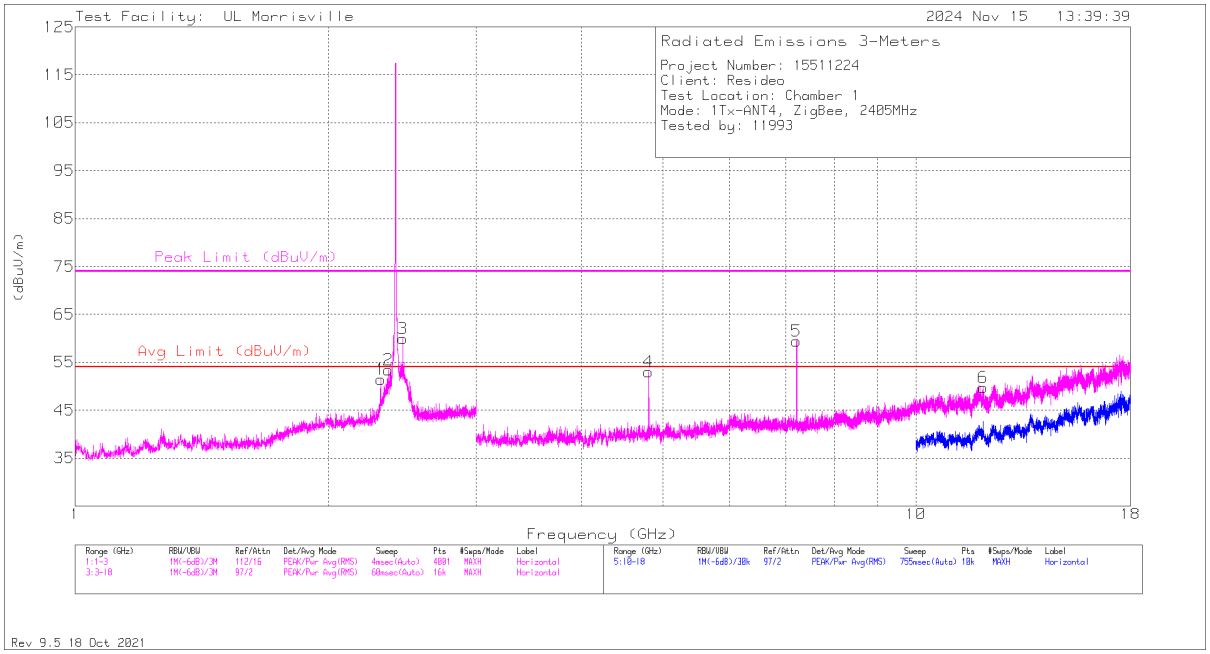
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	51.8	Pk	32.2	-23.7	0	60.3	-	-	74	-13.7	268	122	V
	* ** 2.48354	51.8	Pk	32.2	-23.7	-40	20.3	54	-33.7	-	-	268	122	V
2	* ** 2.48369	50.34	Pk	32.2	-23.7	0	58.84	-	-	74	-15.16	268	122	V
	* ** 2.48369	50.34	Pk	32.2	-23.7	-40	18.84	54	-35.16	-	-	268	122	V

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

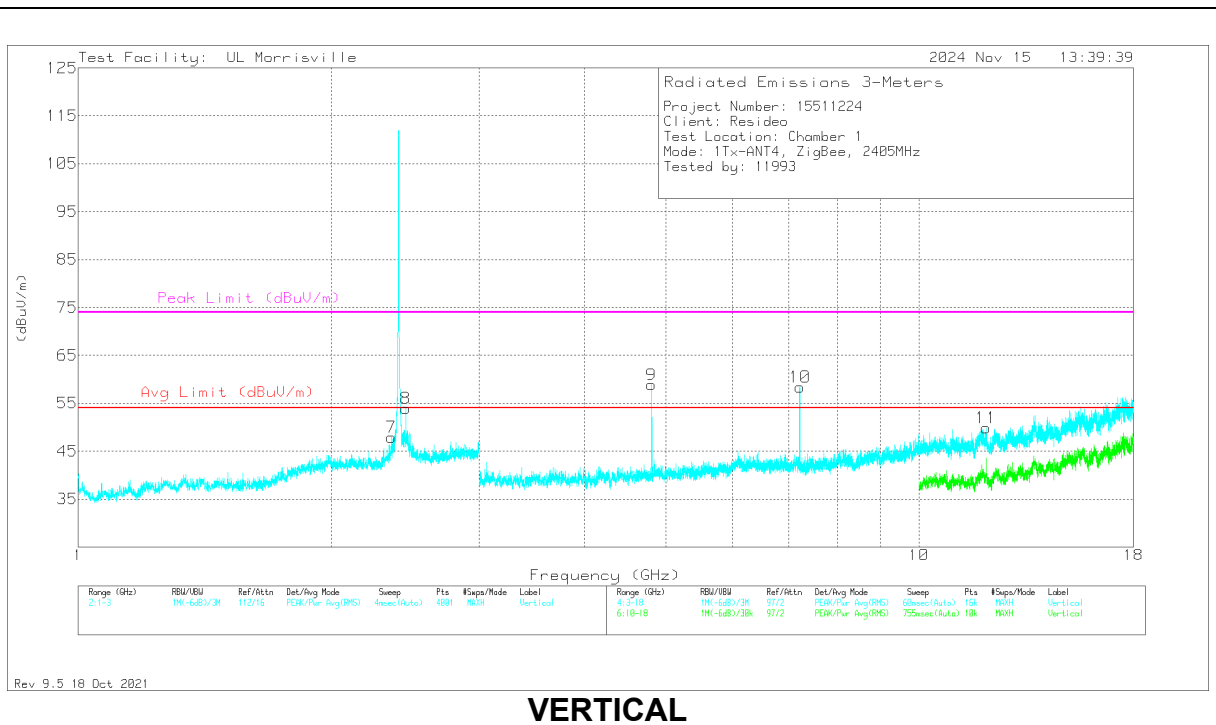
UL LLC
12 Laboratory Drive, RTP NC 27606; USA TEL:(919) 549-1400

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

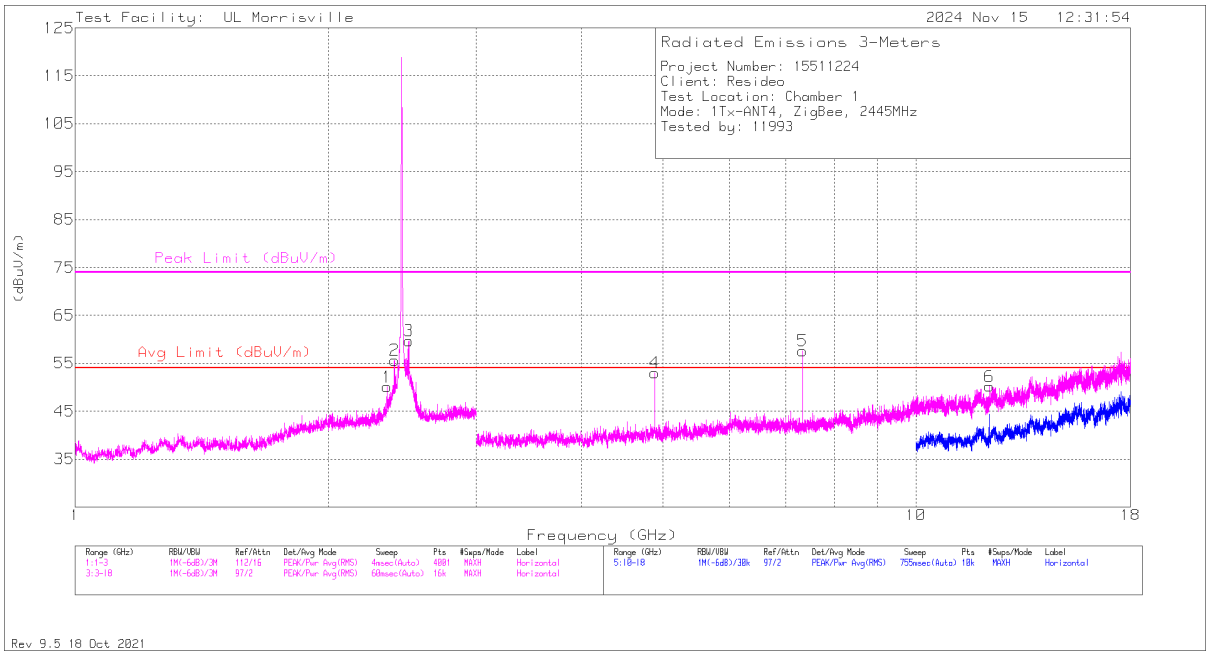
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 2.35746	50	PK2	31.8	-24.4	0	57.4	-	-	74	-16.6	117	223	H
	* ** 2.35746	50	PK2	31.8	-24.4	-40	17.4	54	-36.6	-	-	117	223	H
7	* ** 2.3575	40.41	Pk	31.9	-24.4	0	47.91	54	-6.09	74	-26.09	0-360	101	V
4	* ** 4.80899	66.1	PK2	33.9	-45.7	0	54.3	-	-	74	-19.7	2	101	H
	* ** 4.80899	66.1	PK2	33.9	-45.7	-40	14.3	54	-39.7	-	-	2	101	H
6	* ** 12.02739	51.05	PK2	38.7	-37.9	0	51.85	-	-	74	-22.15	152	217	H
	* ** 12.02739	51.05	PK2	38.7	-37.9	-40	11.85	54	-42.15	-	-	152	217	H
9	* ** 4.81101	71.82	PK2	33.9	-45.7	0	60.02	-	-	74	-13.98	233	101	V
	* ** 4.81101	71.82	PK2	33.9	-45.7	-40	20.02	54	-33.98	-	-	233	101	V
11	* ** 12.02231	52.25	PK2	38.7	-38	0	52.95	-	-	74	-21.05	57	106	V
	* ** 12.02231	52.25	PK2	38.7	-38	-40	12.95	54	-41.05	-	-	57	106	V
1	2.3095	44.23	Pk	31.6	-24.4	0	51.43	-	-	-	-	0-360	200	H
3	2.4525	52.09	Pk	32.1	-24.2	0	59.99	-	-	-	-	0-360	200	H
8	2.4535	46.03	Pk	32.1	-24.2	0	53.93	-	-	-	-	0-360	101	V
5	7.21313	66.41	Pk	35.4	-42.4	0	59.41	-	-	-	-	0-360	101	H
10	7.21641	65.06	Pk	35.4	-42.1	0	58.36	-	-	-	-	0-360	101	V

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

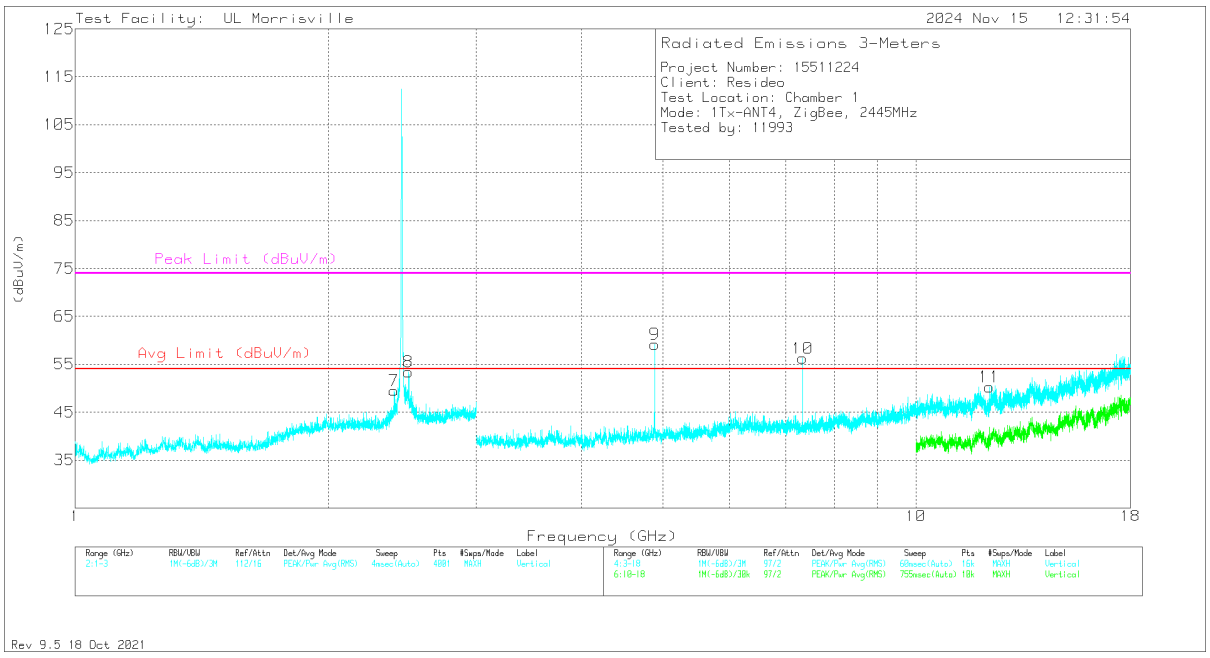
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

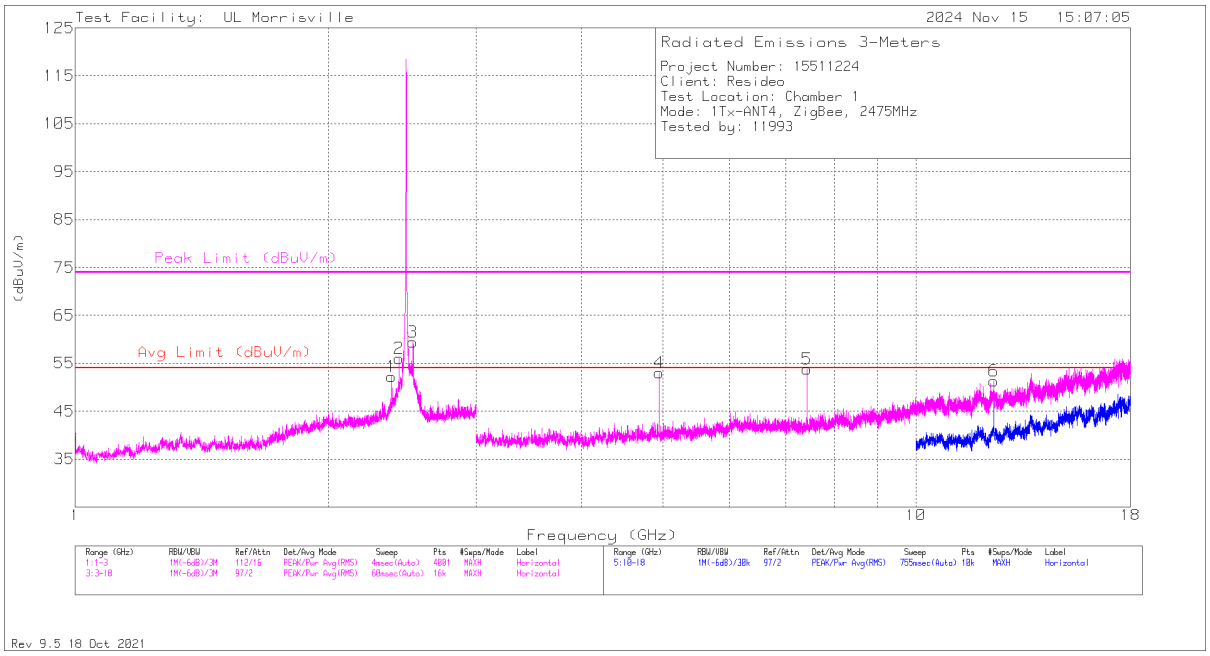
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.34893	46.59	PK2	31.8	-24.6	0	53.79	-	-	74	-20.21	114	221	H
	* ** 2.34893	46.59	PK2	31.8	-24.6	-40	13.79	54	-40.21	-	-	114	221	H
3	* ** 2.49351	54.26	PK2	32.3	-24.4	0	62.16	-	-	74	-11.84	123	226	H
	* ** 2.49351	54.26	PK2	32.3	-24.4	-40	22.16	54	-31.84	-	-	123	226	H
8	* ** 2.4925	47.32	PK2	32.3	-24.3	0	55.32	-	-	74	-18.68	6	101	V
	* ** 2.4925	47.32	PK2	32.3	-24.3	-40	15.32	54	-38.68	-	-	6	101	V
4	* ** 4.88897	65.94	PK2	34	-44.8	0	55.14	-	-	74	-18.86	305	104	H
	* ** 4.88897	65.94	PK2	34	-44.8	-40	15.14	54	-38.86	-	-	305	104	H
5	* ** 7.33656	65.37	PK2	35.4	-42.2	0	58.57	-	-	74	-15.43	75	151	H
	* ** 7.33656	65.37	PK2	35.4	-42.2	-40	18.57	54	-35.43	-	-	75	151	H
6	* ** 12.22748	52.44	PK2	38.7	-38.8	0	52.34	-	-	74	-21.66	29	107	H
	* ** 12.22748	52.44	PK2	38.7	-38.8	-40	12.34	54	-41.66	-	-	29	107	H
9	* ** 4.88898	71.03	PK2	34	-44.8	0	60.23	-	-	74	-13.77	235	101	V
	* ** 4.88898	71.03	PK2	34	-44.8	-40	20.23	54	-33.77	-	-	235	101	V
10	* ** 7.33652	64.72	PK2	35.4	-42.2	0	57.92	-	-	74	-16.08	48	103	V
	* ** 7.33652	64.72	PK2	35.4	-42.2	-40	17.92	54	-36.08	-	-	48	103	V
11	* ** 12.22237	53.06	PK2	38.8	-38.7	0	53.16	-	-	74	-20.84	57	108	V
	* ** 12.22237	53.06	PK2	38.8	-38.7	-40	13.16	54	-40.84	-	-	57	108	V
7	2.3965	41.93	Pk	32	-24.4	0	49.53	-	-	-	-	0-360	101	V
2	2.397	48.06	Pk	32	-24.4	0	55.66	-	-	-	-	0-360	101	H

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

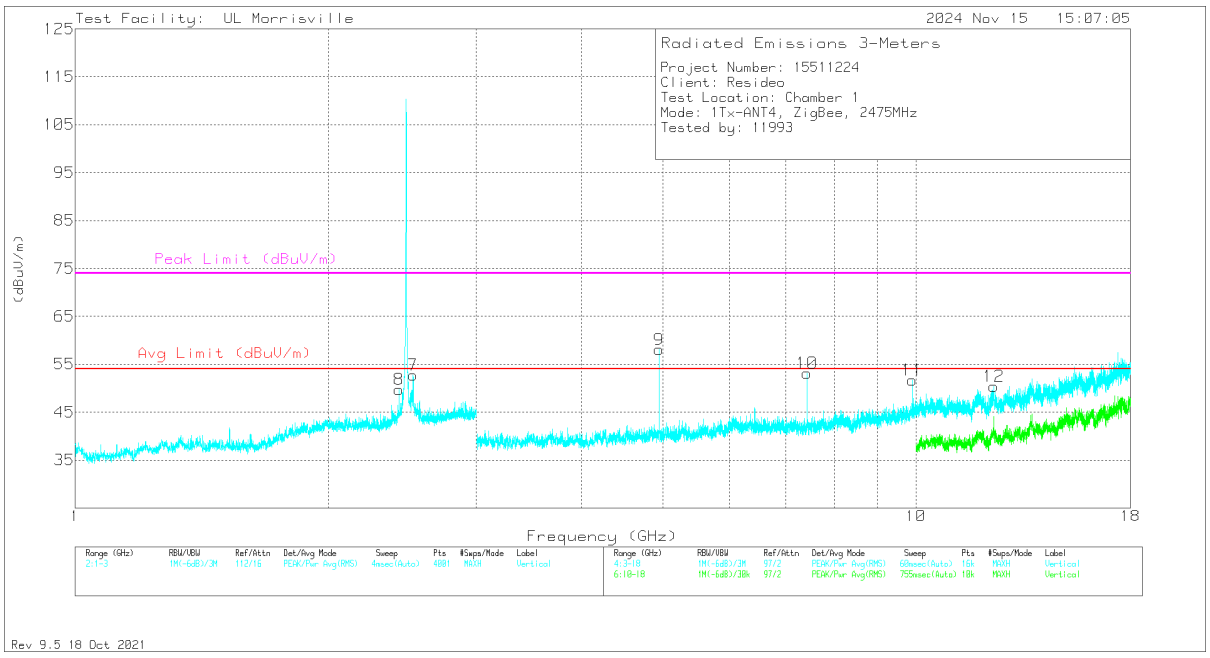
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (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	* ** 2.37856	47.88	PK2	31.9	-24.2	0	55.58	-	-	74	-18.42	111	216	H
	* ** 2.37856	47.88	PK2	31.9	-24.2	-40	15.58	54	-38.42	-	-	111	216	H
3	** 2.523	51.23	Pk	32.3	-24.1	0	59.43	-	-	-	-	0-360	199	H
7	** 2.5235	44.52	Pk	32.3	-24.1	0	52.72	-	-	-	-	0-360	101	V
4	* ** 4.95095	65.49	PK2	34.2	-44.6	0	55.09	-	-	74	-18.91	302	110	H
	* ** 4.95095	65.49	PK2	34.2	-44.6	-40	15.09	54	-38.91	-	-	302	110	H
5	* ** 7.42337	62.24	PK2	35.4	-41.2	0	56.44	-	-	74	-17.56	71	233	H
	* ** 7.42337	62.24	PK2	35.4	-41.2	-40	16.44	54	-37.56	-	-	71	233	H
6	* ** 12.37752	52.42	PK2	38.7	-37.9	0	53.22	-	-	74	-20.78	137	235	H
	* ** 12.37752	52.42	PK2	38.7	-37.9	-40	13.22	54	-40.78	-	-	137	235	H
9	* ** 4.95099	70.13	PK2	34.2	-44.6	0	59.73	-	-	74	-14.27	233	104	V
	* ** 4.95099	70.13	PK2	34.2	-44.6	-40	19.73	54	-34.27	-	-	233	104	V
10	* ** 7.42658	61.26	PK2	35.4	-41.2	0	55.46	-	-	74	-18.54	53	106	V
	* ** 7.42658	61.26	PK2	35.4	-41.2	-40	15.46	54	-38.54	-	-	53	106	V
12	* ** 12.3723	53.26	PK2	38.7	-37.6	0	54.36	-	-	74	-19.64	170	157	V
	* ** 12.3723	53.26	PK2	38.7	-37.6	-40	14.36	54	-39.64	-	-	170	157	V
8	2.4265	41.97	Pk	32	-24.2	0	49.77	-	-	-	-	0-360	101	V
2	2.427	48.28	Pk	32	-24.3	0	55.98	-	-	-	-	0-360	100	H
11	9.90188	54.55	Pk	37.4	-40.3	0	51.65	-	-	-	-	0-360	101	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

9.1.2. BLE (1Mbps)

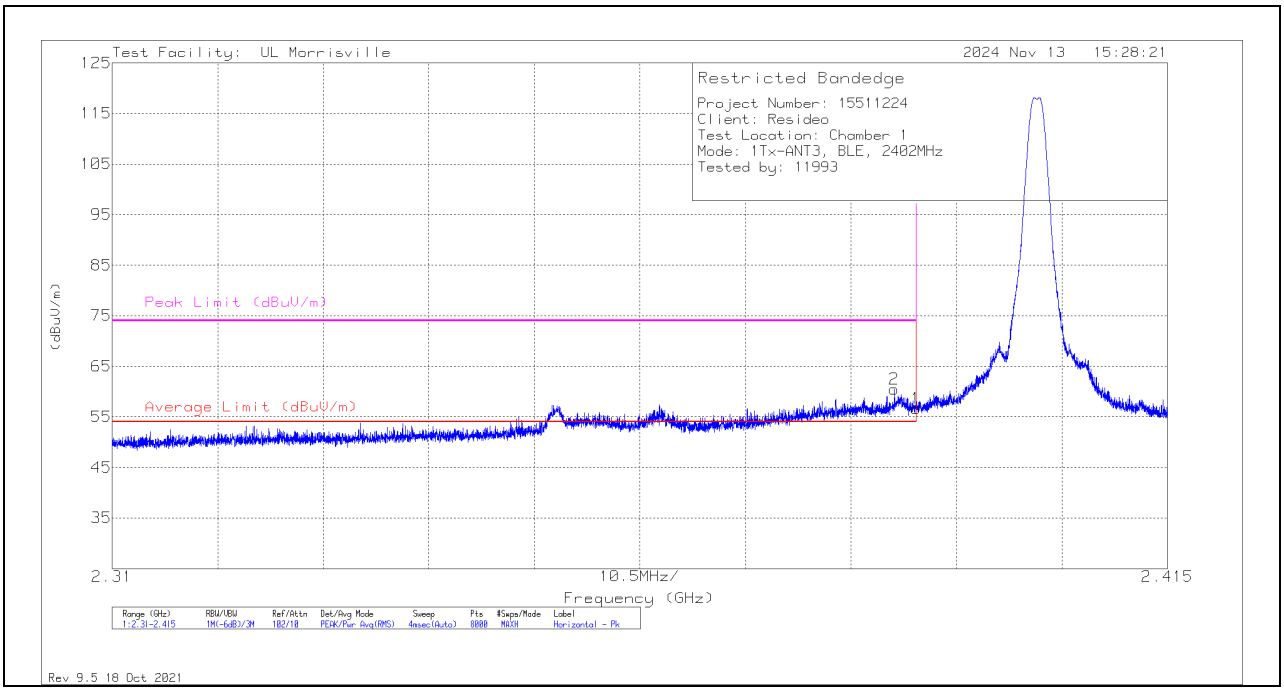
Note: The manufacturer declared a worst-case real life duty cycle for BLE and Zigbee on chipset 2 of 1%. Using FCC KDB 558074 D01 15.247 Meas Guidance v05r02 – Section 11 Q3 a), we can apply a duty cycle correction factor to the Peak Measurements to obtain a calculated RMS average value. This correction factor is calculated by 20*Log(1/D), where D = highest Duty Cycle. DCCF (dB) =20*Log(1/1%) = **40dB DCCF.**

During testing, the Zigbee and BLE radios were set to 100% duty cycle

Antenna 3

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



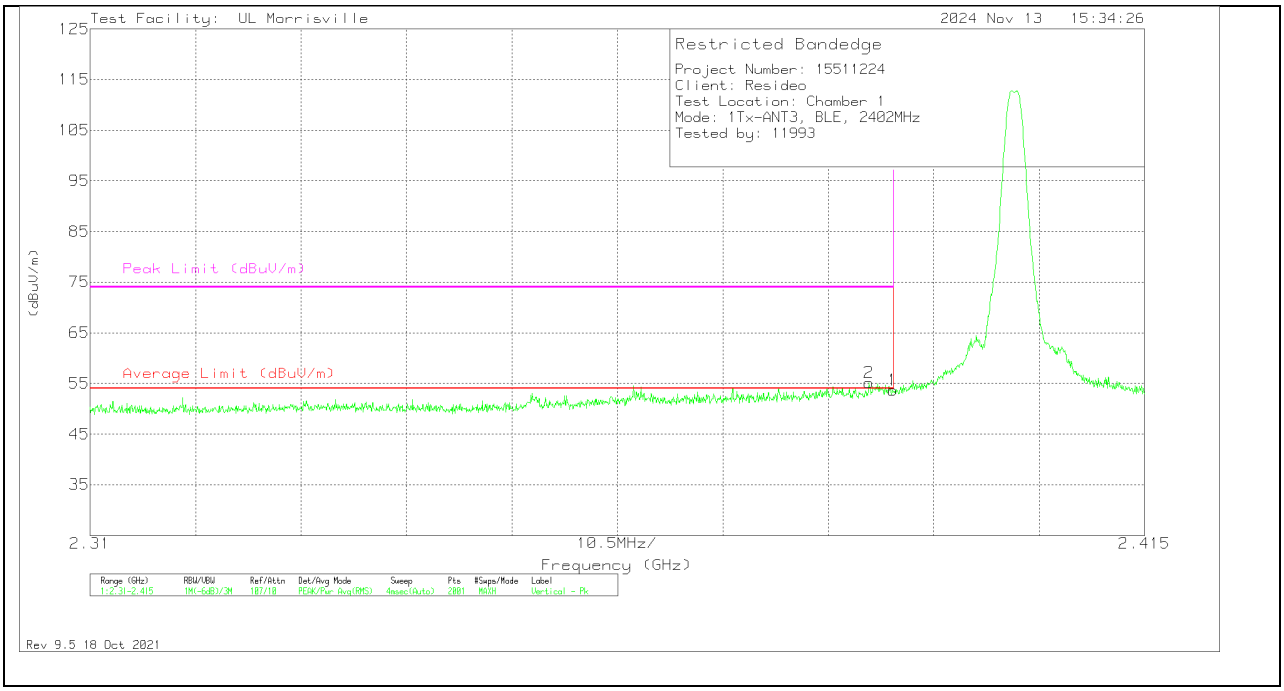
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	38.85	Pk	31.9	-24.1	10	0	56.65	-	-	74	-17.35	81	137	H
	* ** 2.39	38.85	Pk	31.9	-24.1	10	-40	16.65	54	-37.35	-	-	81	137	H
2	* ** 2.38779	42.53	Pk	31.9	-23.9	10	0	60.53	-	-	74	-13.47	81	137	H
	* ** 2.38779	42.53	Pk	31.9	-23.9	10	-40	20.53	54	-33.47	-	-	81	137	H

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	35.81	Pk	31.9	-24	10	0	53.71	-	-	74	-20.29	267	112	V
	* ** 2.38996	35.81	Pk	31.9	-24	10	-40	13.71	54	-40.29	-	-	267	112	V
2	* ** 2.38754	37.17	Pk	31.9	-23.9	10	0	55.17	-	-	74	-18.83	267	112	V
	* ** 2.38754	37.17	Pk	31.9	-23.9	10	-40	15.17	54	-38.83	-	-	267	112	V

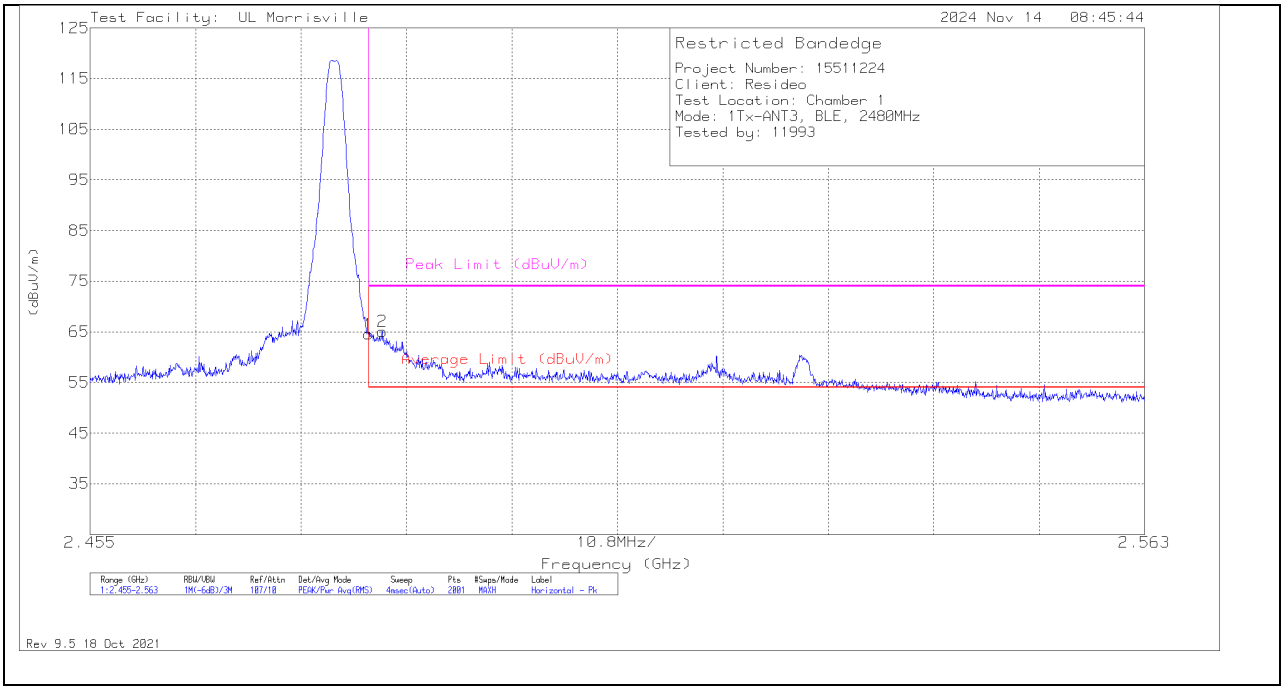
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



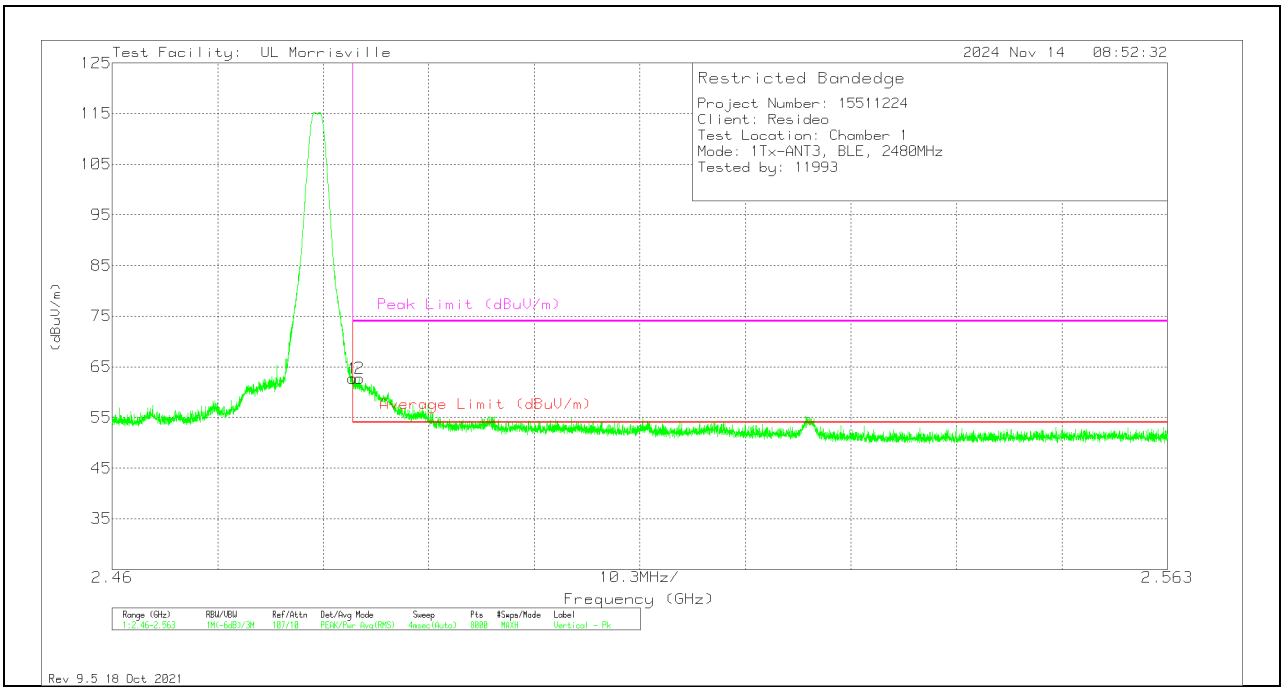
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48351	46.02	Pk	32.2	-23.7	10	0	64.52	-	-	74	-9.48	174	263	H
1	* ** 2.48351	46.02	Pk	32.2	-23.7	10	-40	24.52	54	-29.48	-	-	174	263	H
2	* ** 2.48492	46.72	Pk	32.2	-23.8	10	0	65.12	-	-	74	-8.88	174	263	H
2	* ** 2.48492	46.72	Pk	32.2	-23.8	10	-40	25.12	54	-28.88	-	-	174	263	H

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

VERTICAL RESULT



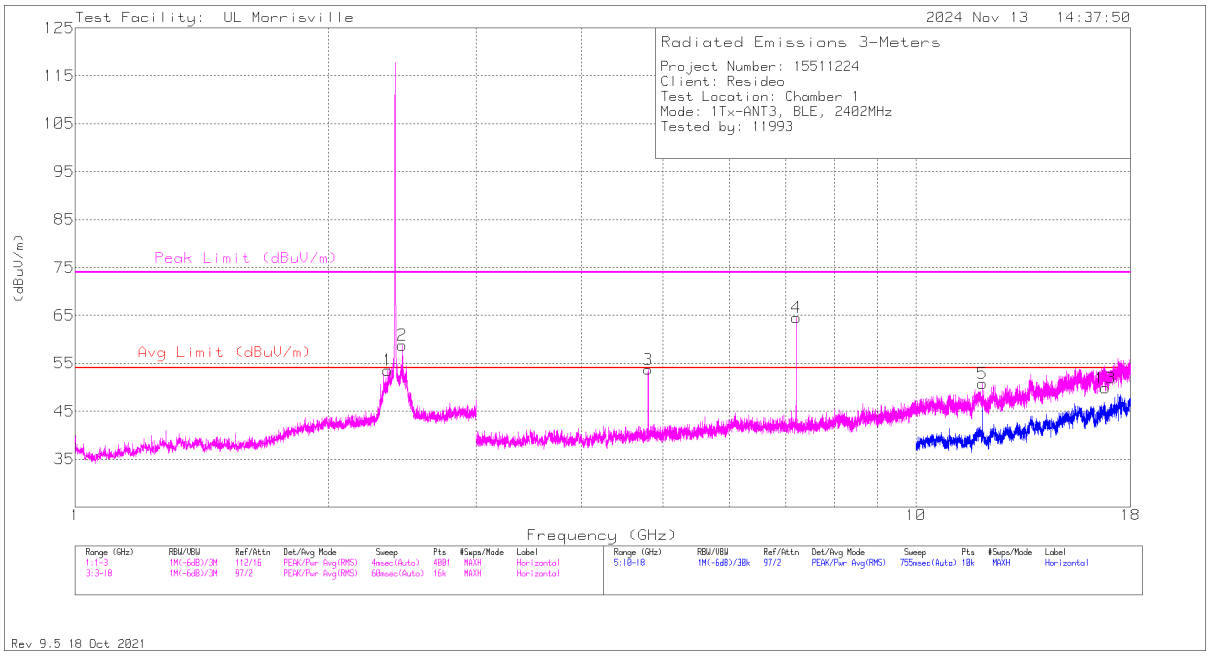
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	44.17	Pk	32.2	-23.7	10	0	62.67	-	-	74	-11.33	276	384	V
	* ** 2.4835	44.17	Pk	32.2	-23.7	10	-40	22.67	54	-31.33	-	-	276	384	V
2	* ** 2.48412	44.32	Pk	32.2	-23.8	10	0	62.72	-	-	74	-11.28	276	384	V
	* ** 2.48412	44.32	Pk	32.2	-23.8	10	-40	22.72	54	-31.28	-	-	276	384	V

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

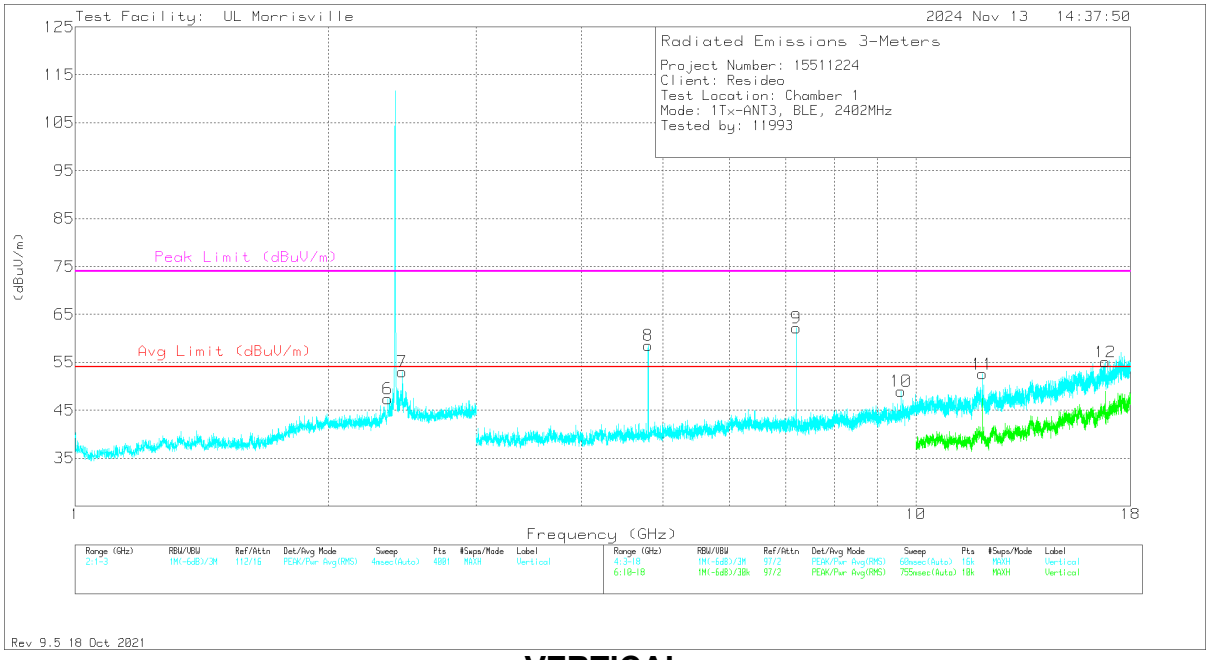
UL LLC
12 Laboratory Drive, RTP NC 27606; USA TEL:(919) 549-1400

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

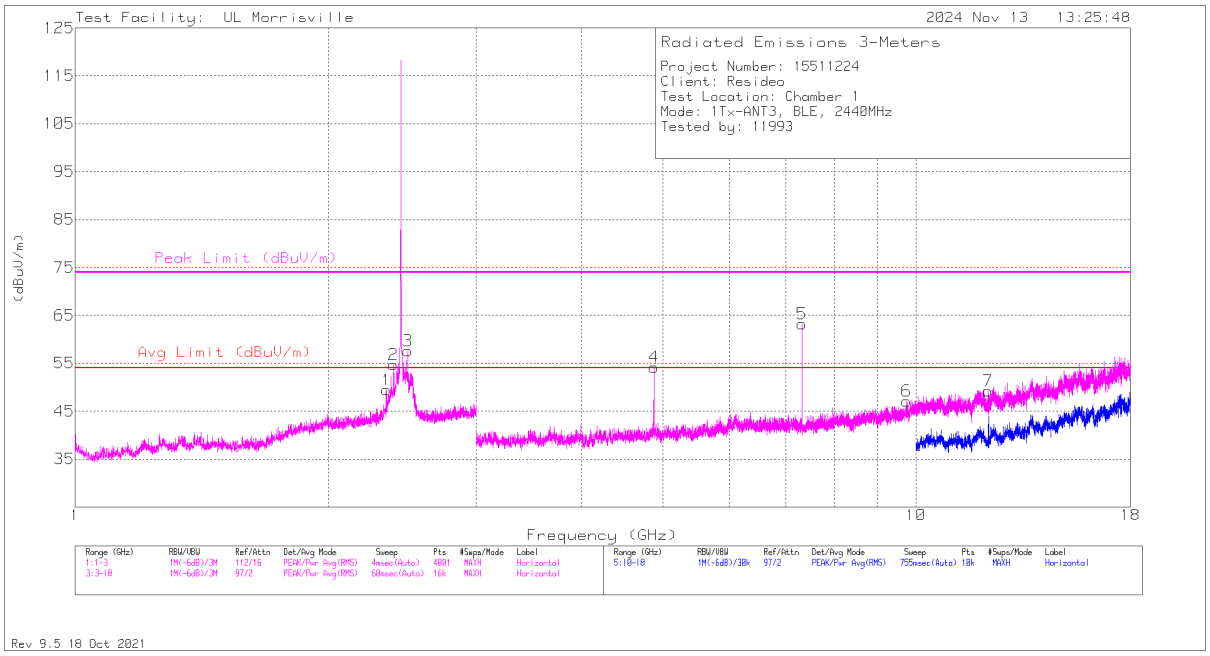
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.35376	50.39	PK2	31.8	-24.5	0	57.69	-	-	74	-16.31	92	188	H
	* ** 2.35376	50.39	PK2	31.8	-24.5	-40	17.69	54	-36.31	-	-	92	188	H
6	* ** 2.3545	40.11	Pk	31.8	-24.5	0	47.41	54	-6.59	74	-26.59	0-360	101	V
3	* ** 4.80351	67	PK2	33.9	-45.6	0	55.3	-	-	74	-18.7	163	241	H
	* ** 4.80351	67	PK2	33.9	-45.6	-40	15.3	54	-38.7	-	-	163	241	H
5	* ** 12.00861	53.03	PK2	38.7	-38.4	0	53.33	-	-	74	-20.67	238	106	H
	* ** 12.00861	53.03	PK2	38.7	-38.4	-40	13.33	54	-40.67	-	-	238	106	H
8	* ** 4.8035	71.04	PK2	33.9	-45.6	0	59.34	-	-	74	-14.66	235	105	V
	* ** 4.8035	71.04	PK2	33.9	-45.6	-40	19.34	54	-34.66	-	-	235	105	V
11	* ** 12.00869	55.09	PK2	38.7	-38.4	0	55.39	-	-	74	-18.61	58	112	V
	* ** 12.00869	55.09	PK2	38.7	-38.4	-40	15.39	54	-38.61	-	-	58	112	V
2	2.45	50.83	Pk	32.1	-24.2	0	58.73	-	-	-	-	0-360	101	H
7	2.45	45.09	Pk	32.1	-24.2	0	52.99	-	-	-	-	0-360	101	V
4	7.20469	71.26	Pk	35.4	-42.1	0	64.56	-	-	-	-	0-360	199	H
9	7.20563	68.95	Pk	35.4	-42.2	0	62.15	-	-	-	-	0-360	101	V
10	9.60844	53.05	Pk	36.6	-40.7	0	48.95	-	-	-	-	0-360	101	V
12	16.81313	50.94	Pk	40.9	-36.8	0	55.04	-	-	-	-	0-360	101	V
13	16.81406	45.81	Pk	40.9	-36.9	0	49.81	-	-	-	-	0-360	199	H

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

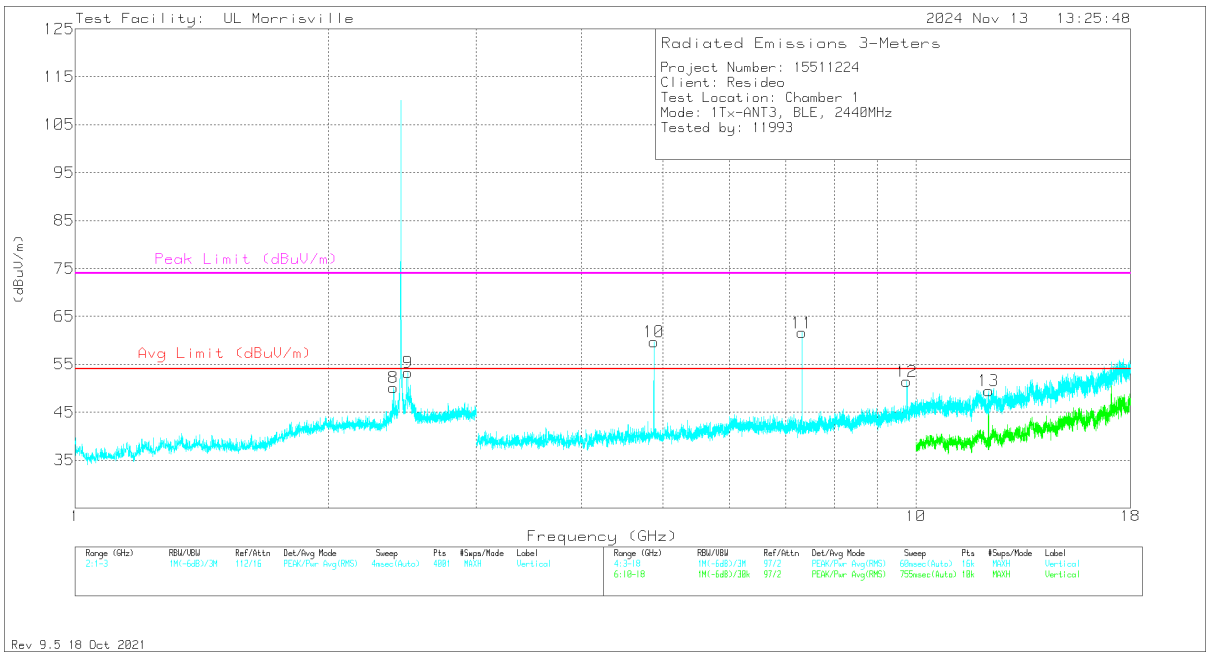
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

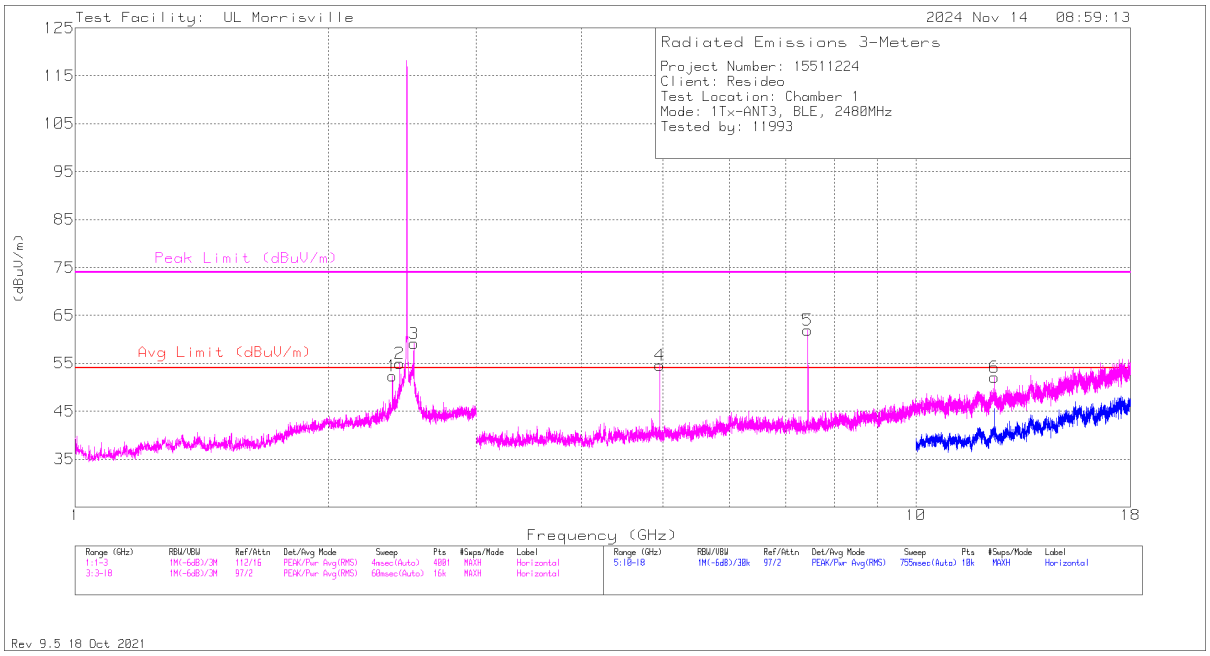
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.3437	46.52	PK2	31.8	-24.7	0	53.62	-	-	74	-20.38	181	143	H
	* ** 2.3437	46.52	PK2	31.8	-24.7	-40	13.62	54	-40.38	-	-	181	143	H
3	* ** 2.48817	50.85	PK2	32.2	-24	0	59.05	-	-	74	-14.95	154	172	H
	* ** 2.48817	50.85	PK2	32.2	-24	-40	19.05	54	-34.95	-	-	154	172	H
9	* ** 2.48831	49.26	PK2	32.2	-24.1	0	57.36	-	-	74	-16.64	4	334	V
	* ** 2.48831	49.26	PK2	32.2	-24.1	-40	17.36	54	-36.64	-	-	4	334	V
4	* ** 4.88044	66.96	PK2	34	-44.7	0	56.26	-	-	74	-17.74	241	111	H
	* ** 4.88044	66.96	PK2	34	-44.7	-40	16.26	54	-37.74	-	-	241	111	H
5	* ** 7.31921	70.44	PK2	35.4	-41.6	0	64.24	-	-	74	-9.76	233	101	H
	* ** 7.31921	70.44	PK2	35.4	-41.6	-40	24.24	54	-29.76	-	-	233	101	H
7	* ** 12.19874	52.38	PK2	38.8	-39.7	0	51.48	-	-	74	-22.52	261	106	H
	* ** 12.19874	52.38	PK2	38.8	-39.7	-40	14.48	54	-39.52	-	-	261	106	H
10	* ** 4.8805	71.47	PK2	34	-44.7	0	60.77	-	-	74	-13.23	309	109	V
	* ** 4.8805	71.47	PK2	34	-44.7	-40	20.77	54	-33.23	-	-	309	109	V
11	* ** 7.32071	68.87	PK2	35.4	-41.8	0	62.47	-	-	74	-11.53	32	101	V
	* ** 7.32071	68.87	PK2	35.4	-41.8	-40	22.47	54	-31.53	-	-	32	101	V
13	* ** 12.20106	52.12	PK2	38.8	-39.7	0	51.22	-	-	74	-22.78	188	113	V
	* ** 12.20106	52.12	PK2	38.8	-39.7	-40	11.22	54	-42.78	-	-	188	113	V
2	2.3925	46.98	Pk	31.9	-24.2	0	54.68	-	-	-	-	0-360	101	H
8	2.3925	42.45	Pk	31.9	-24.2	0	50.15	-	-	-	-	0-360	101	V
6	9.75844	49.91	Pk	37.1	-39.9	0	47.11	-	-	-	-	0-360	101	H
12	9.75938	54.08	Pk	37.1	-39.8	0	51.38	-	-	-	-	0-360	101	V

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

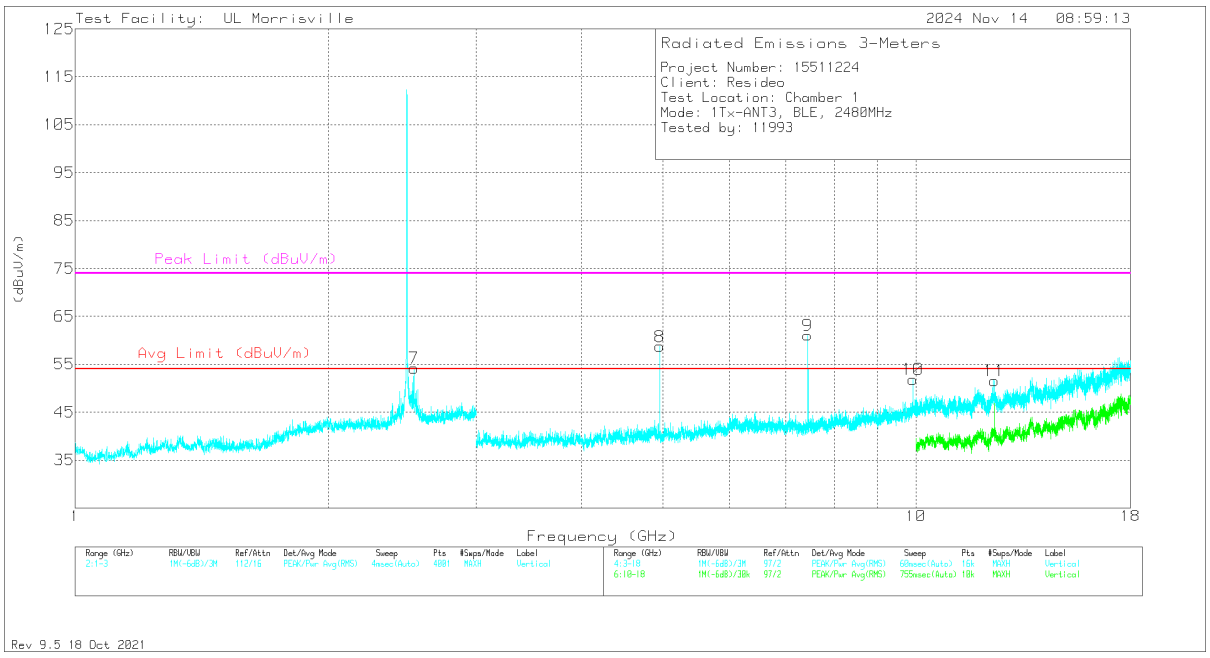
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (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	* ** 2.3842	47.27	PK2	31.9	-24	0	55.17	-	-	74	-18.83	88	214	H
	* ** 2.3842	47.27	PK2	31.9	-24	-40	15.17	54	-38.83	-	-	88	214	H
3	** 2.528	50.9	Pk	32.3	-24.1	0	59.1	-	-	-	-	0-360	200	H
7	** 2.5285	46.04	Pk	32.3	-24.2	0	54.14	-	-	-	-	0-360	101	V
4	* ** 4.95955	66.63	PK2	34.2	-44.8	0	56.03	-	-	74	-17.97	140	211	H
	* ** 4.95955	66.63	PK2	34.2	-44.8	-40	16.03	54	-37.97	-	-	140	211	H
5	* ** 7.44072	68.06	PK2	35.4	-41.1	0	62.36	-	-	74	-11.64	141	288	H
	* ** 7.44072	68.06	PK2	35.4	-41.1	-40	22.36	54	-31.64	-	-	141	288	H
6	* ** 12.4011	54.57	PK2	38.7	-38.8	-0	54.47	-	-	74	-19.53	162	193	H
	* ** 12.4011	54.57	PK2	38.7	-38.8	-40	14.47	54	-39.53	-	-	162	193	H
8	* ** 4.95947	69.84	PK2	34.2	-44.8	0	59.24	-	-	74	-14.76	237	101	V
	* ** 4.95947	69.84	PK2	34.2	-44.8	-40	19.24	54	-34.76	-	-	237	101	V
9	* ** 7.44072	68.13	PK2	35.4	-41.1	0	62.43	-	-	74	-11.57	301	109	V
	* ** 7.44072	68.13	PK2	35.4	-41.1	-40	22.43	54	-31.57	-	-	301	109	V
11	* ** 12.40129	54.93	PK2	38.7	-38.8	0	54.83	-	-	74	-19.17	24	113	V
	* ** 12.40129	54.93	PK2	38.7	-38.8	-40	14.83	54	-39.17	-	-	24	113	V
2	2.432	47.3	Pk	32.1	-24.4		55	-	-	-	-	0-360	100	H
10	9.92156	54.86	Pk	37.5	-40.5		51.86	-	-	-	-	0-360	101	V

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

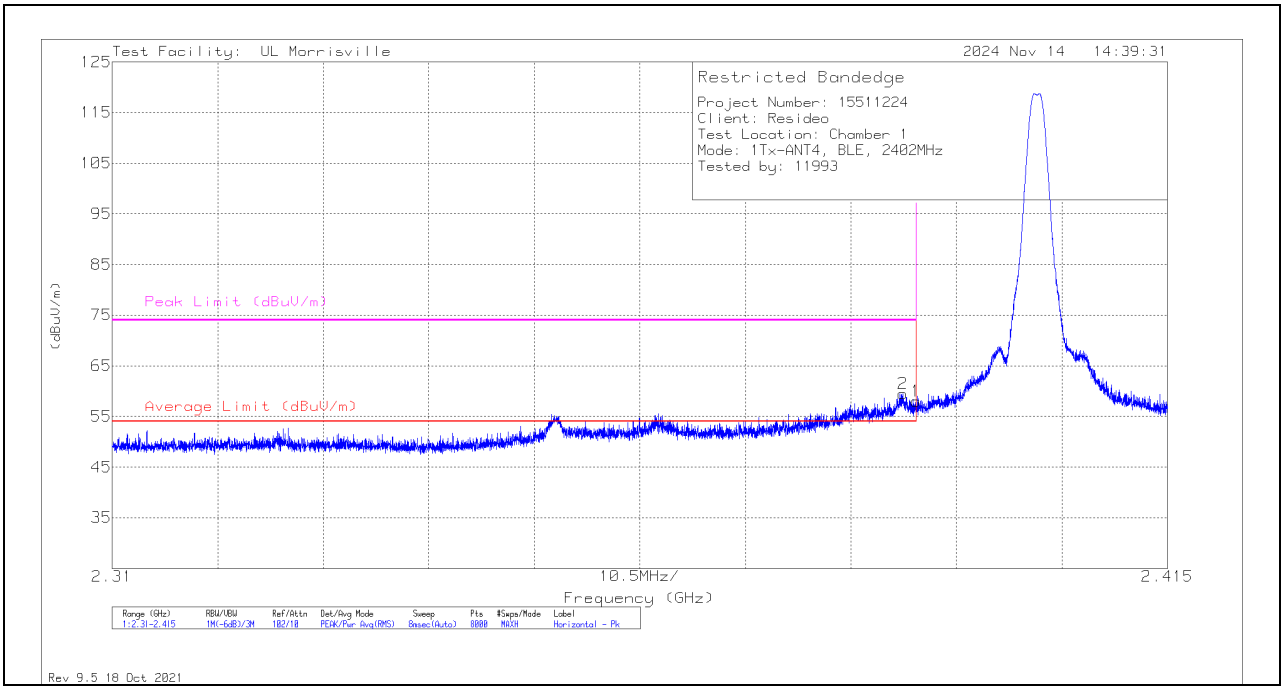
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

Antenna 4

BANDEDGE (LOW CHANNEL)

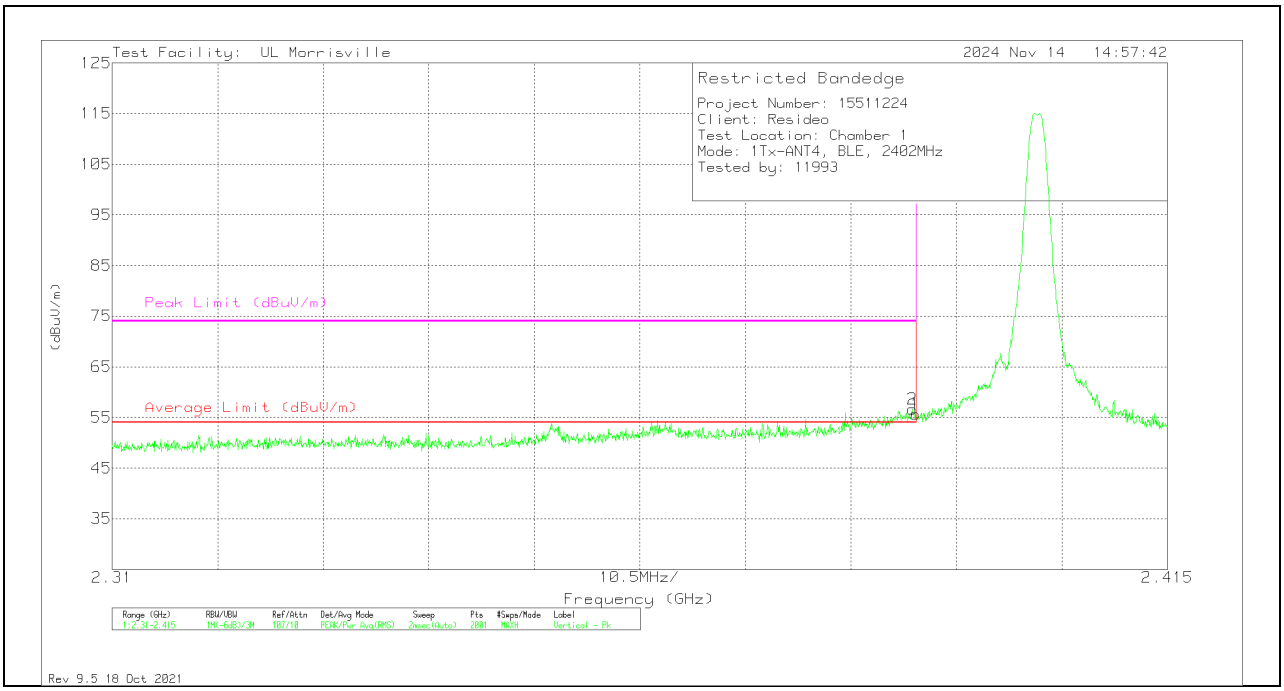
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	40.21	Pk	31.9	-24.1	10	0	58.01	-	-	74	-15.99	126	273	H
	* ** 2.39	40.21	Pk	31.9	-24.1	10	-40	18.01	54	-35.99	-	-	126	273	H
2	* ** 2.38867	41.61	Pk	31.9	-24	10	0	59.51	-	-	74	-14.49	126	273	H
	* ** 2.38867	41.61	Pk	31.9	-24	10	-40	19.51	54	-34.49	-	-	126	273	H

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

VERTICAL RESULT

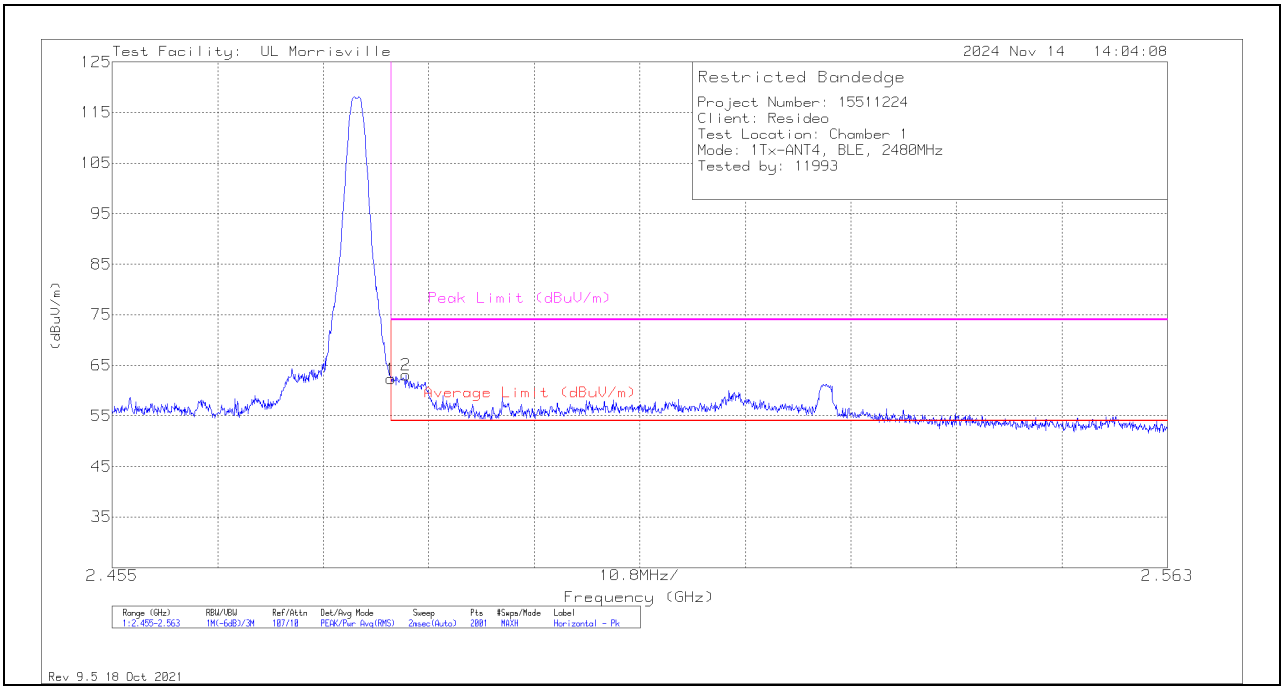


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	37.78	Pk	31.9	-24	10	0	55.68	-	-	74	-18.32	159	362	V
	* ** 2.38996	37.78	Pk	31.9	-24	10	-40	15.68	54	-38.32	-	-	159	362	V
2	* ** 2.38959	38.78	Pk	31.9	-24	10	0	56.68	-	-	74	-17.32	159	362	V
	* ** 2.38959	38.78	Pk	31.9	-24	10	-40	16.68	54	-37.32	-	-	159	362	V

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

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



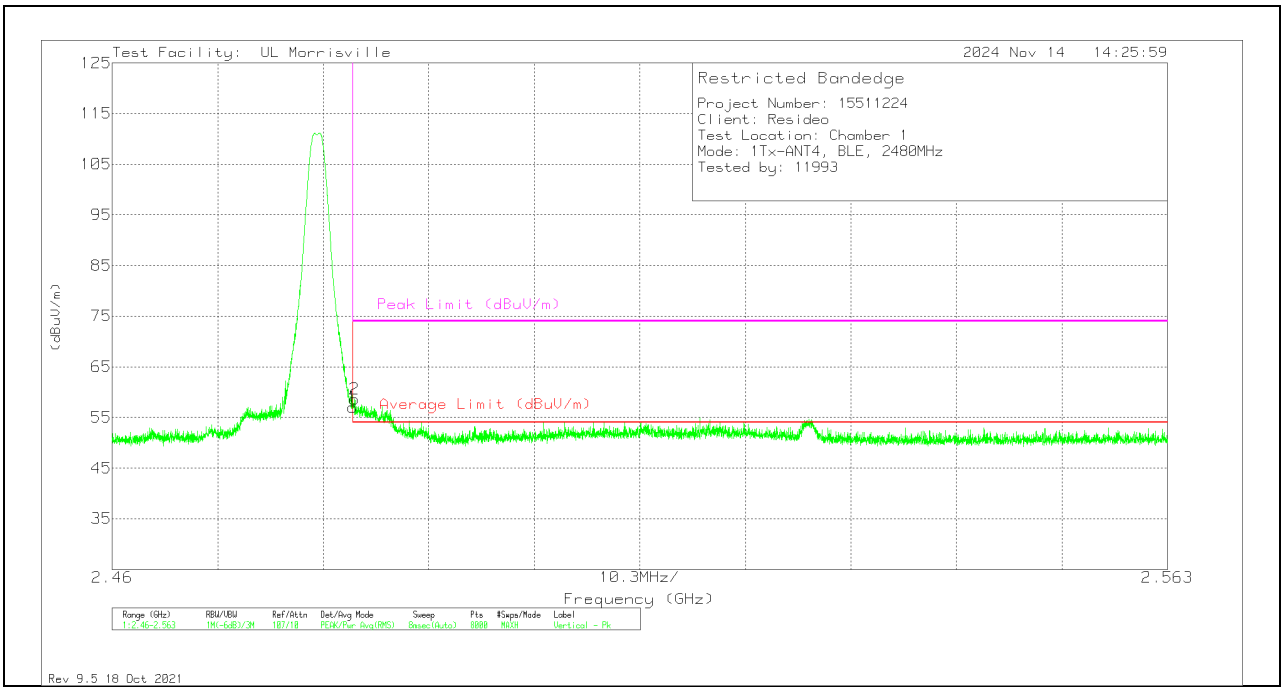
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48351	43.79	Pk	32.2	-23.7	10	0	62.29	-	-	74	-11.71	117	250	H
	* ** 2.48351	43.79	Pk	32.2	-23.7	10	-40	22.29	54	-31.71	-	-	117	250	H
2	* ** 2.48508	44.73	Pk	32.2	-23.8	10	0	63.13	-	-	74	-10.87	117	250	H
	* ** 2.48508	44.73	Pk	32.2	-23.8	10	-40	23.13	54	-30.87	-	-	117	250	H

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	38.49	Pk	32.2	-23.7	10	0	56.99	-	-	74	-17.01	129	328	V
	* ** 2.4835	38.49	Pk	32.2	-23.7	10	-40	16.99	54	-37.01	-	-	129	328	V
2	* ** 2.48363	40.15	Pk	32.2	-23.7	10	0	58.65	-	-	74	-15.35	129	328	V
	* ** 2.48363	40.15	Pk	32.2	-23.7	10	-40	18.65	54	-24.35	-	-	129	328	V

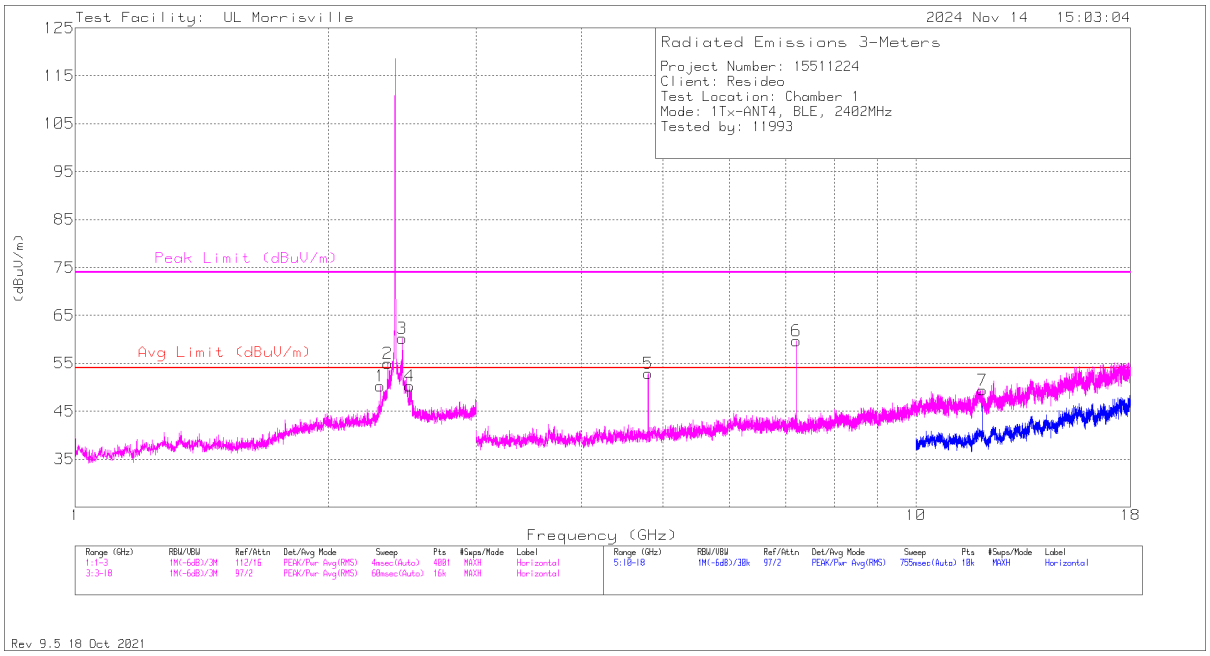
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

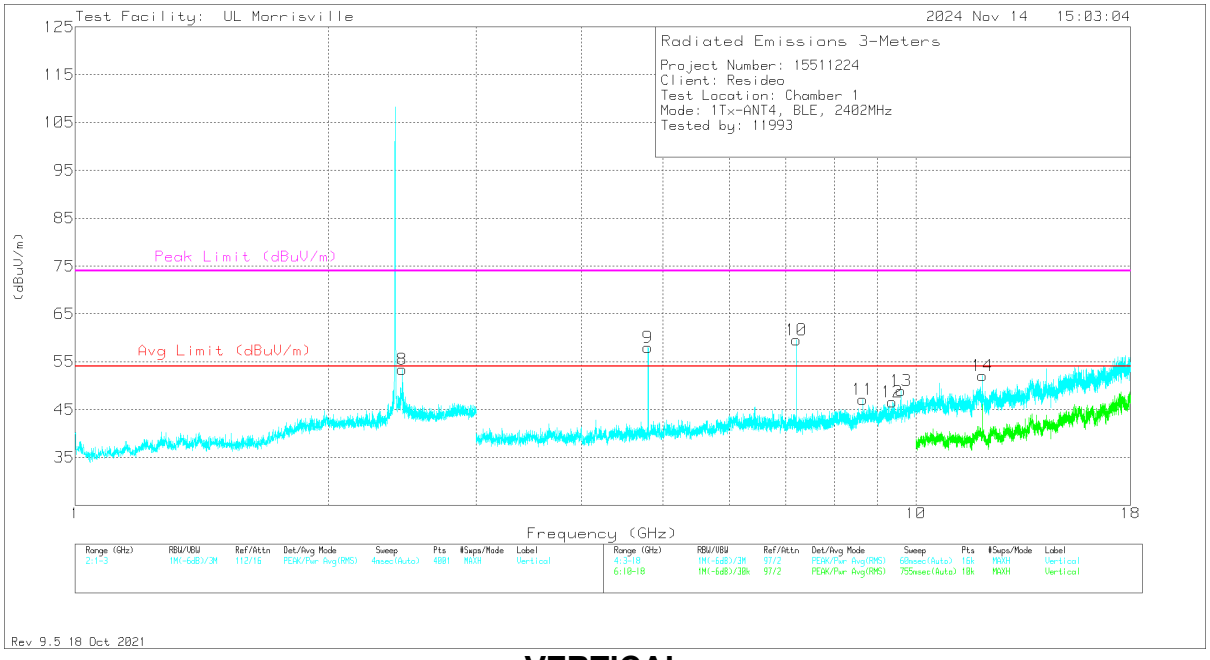
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



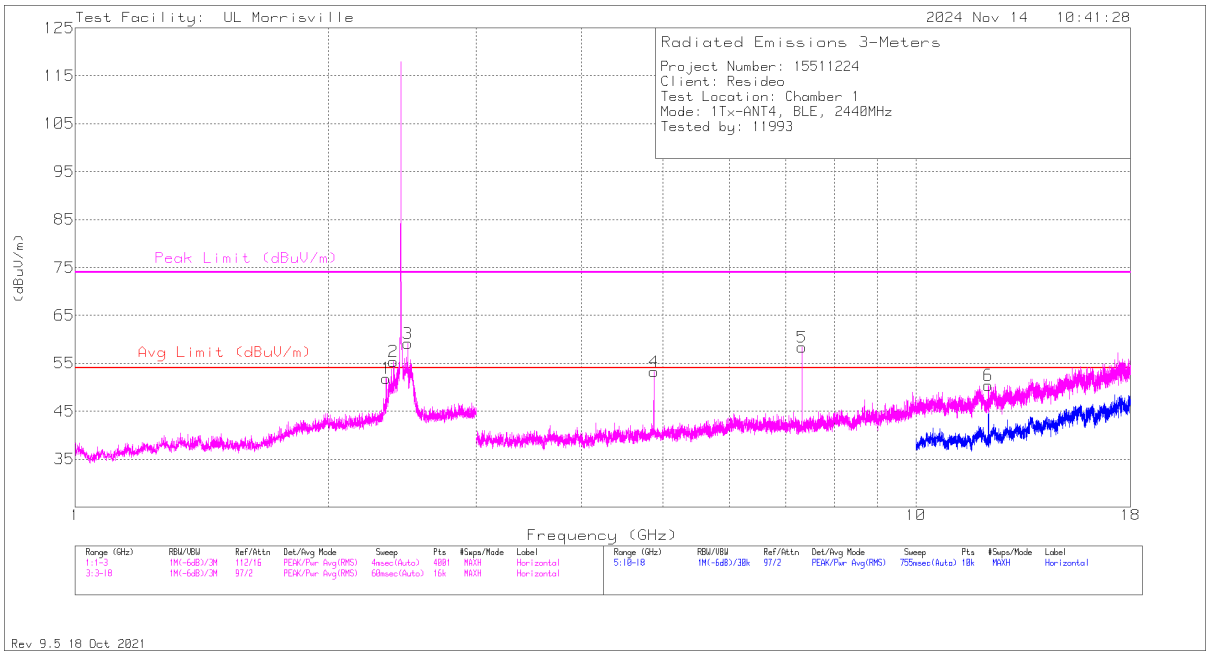
VERTICAL

RADIATED EMISSIONS

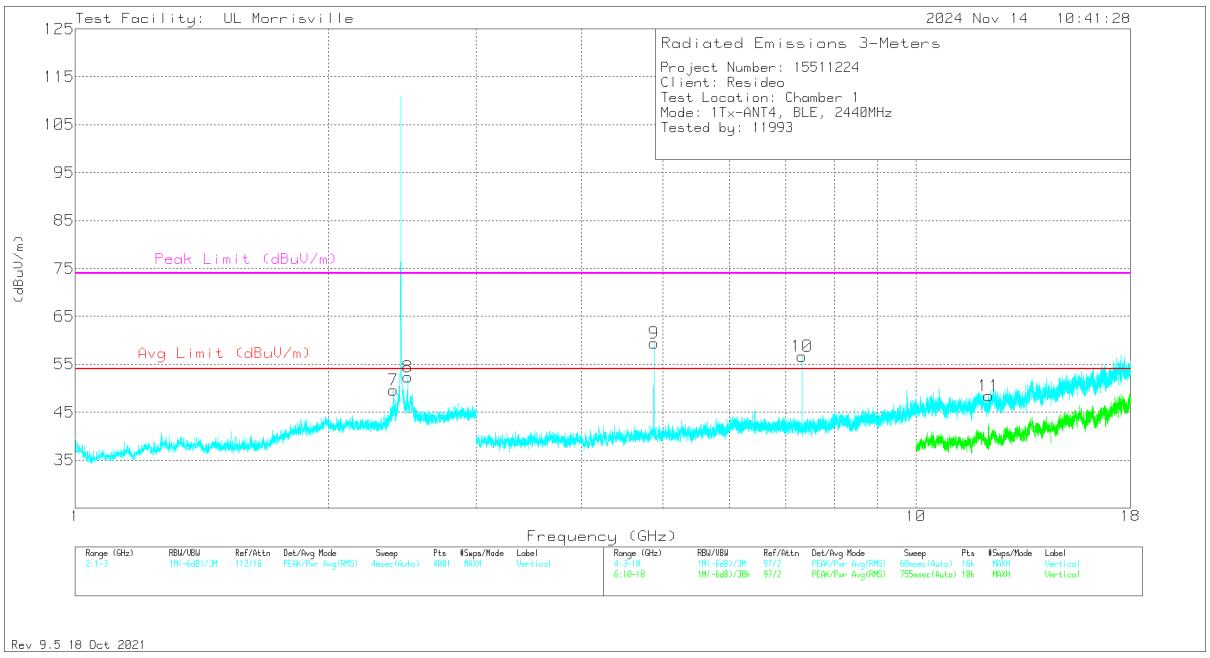
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 2.35389	49.11	PK2	31.8	-24.5	0	56.41	-	-	74	-17.59	124	109	H
	* ** 2.35389	49.11	PK2	31.8	-24.5	-40	16.41	54	-37.59	-	-	124	109	H
4	* ** 2.49785	45.1	PK2	32.3	-24.2	0	53.2	-	-	74	-20.8	118	201	H
	* ** 2.49785	45.1	PK2	32.3	-24.2	-40	13.2	54	-40.8	-	-	118	201	H
5	* ** 4.80353	66.25	PK2	33.9	-45.6	0	54.55	-	-	74	-19.45	356	113	H
	* ** 4.80353	66.25	PK2	33.9	-45.6	-40	14.55	54	-39.45	-	-	356	113	H
7	* ** 12.01102	53.32	PK2	38.7	-38.3	0	53.72	-	-	74	-20.28	27	120	H
	* ** 12.01102	53.32	PK2	38.7	-38.3	-40	13.72	54	-40.28	-	-	27	120	H
9	* ** 4.80445	70.57	PK2	33.9	-45.6	0	58.87	-	-	74	-15.13	216	113	V
	* ** 4.80445	70.57	PK2	33.9	-45.6	-40	18.87	54	-35.13	-	-	216	113	V
12	* ** 9.37313	50.62	Pk	36.2	-40.2	0	46.62	54	-7.38	74	-27.38	0-360	200	V
14	* ** 12.01116	53.95	PK2	38.7	-38.3	0	54.35	-	-	74	-19.65	57	108	V
	* ** 12.01116	53.95	PK2	38.7	-38.3	-40	14.35	54	-39.65	-	-	57	108	V
1	2.3065	43.08	Pk	31.6	-24.4	0	50.28	-	-	-	-	0-360	199	H
3	2.45	52.33	Pk	32.1	-24.2	0	60.23	-	-	-	-	0-360	100	H
8	2.45	45.55	Pk	32.1	-24.2	0	53.45	-	-	-	-	0-360	101	V
6	7.20469	66.35	Pk	35.4	-42.1	0	59.65	-	-	-	-	0-360	101	H
10	7.20469	66.25	Pk	35.4	-42.1	0	59.55	-	-	-	-	0-360	101	V
11	8.65313	51.35	Pk	35.7	-39.9	0	47.15	-	-	-	-	0-360	200	V
13	9.60656	52.92	Pk	36.6	-40.6	0	48.92	-	-	-	-	0-360	101	V

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

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

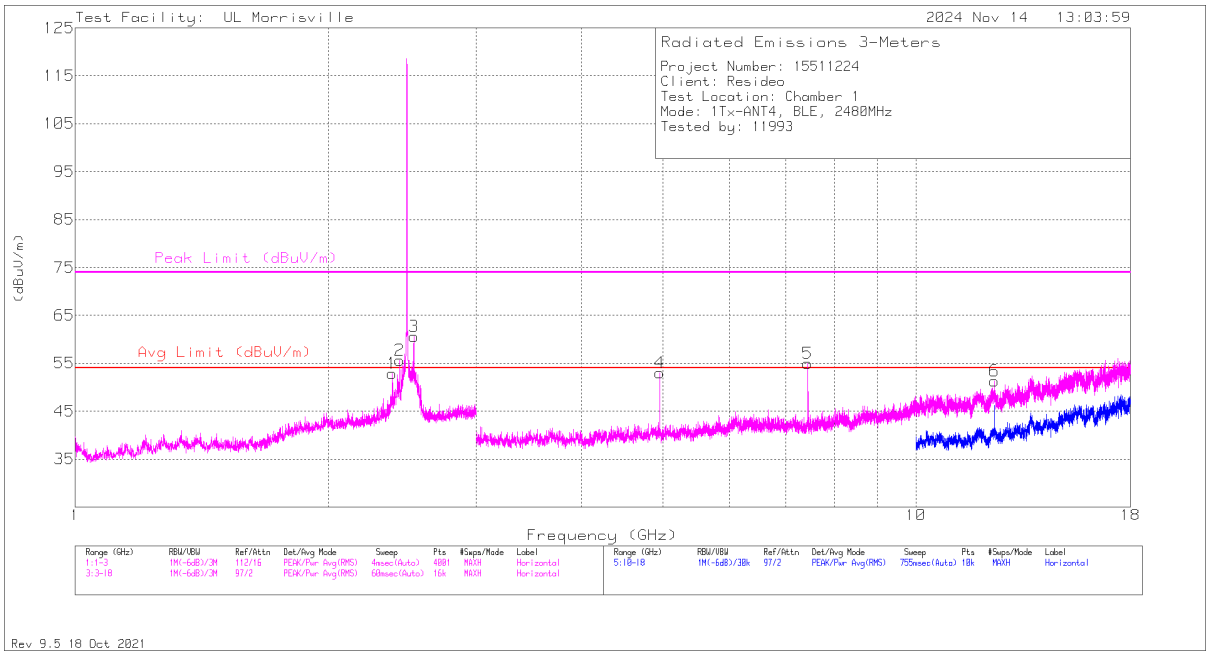
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.34419	46.32	PK2	31.8	-24.7	0	53.42	-	-	74	-20.58	108	132	H
	* ** 2.34419	46.32	PK2	31.8	-24.7	-40	13.42	54	-40.58	-	-	108	132	H
3	* ** 2.48834	54.61	PK2	32.2	-24.1	0	62.71	-	-	74	-11.29	113	173	H
	* ** 2.48834	54.61	PK2	32.2	-24.1	-40	22.78	54	-31.22	-	-	113	173	H
8	* ** 2.48828	48.96	PK2	32.2	-24.1	0	57.06	-	-	74	-16.94	170	375	V
	* ** 2.48828	48.96	PK2	32.2	-24.1	-40	17.06	54	-36.94	-	-	170	375	V
4	* ** 4.88046	62.73	PK2	34	-44.7	0	52.03	-	-	74	-21.97	170	101	H
	* ** 4.88046	62.73	PK2	34	-44.7	-40	12.03	54	-41.97	-	-	170	101	H
5	* ** 7.32069	66.09	PK2	35.4	-41.7	0	59.79	-	-	74	-14.21	65	108	H
	* ** 7.32069	66.09	PK2	35.4	-41.7	-40	19.79	54	-34.21	-	-	65	108	H
6	* ** 12.20125	53.37	PK2	38.8	-39.7	0	52.47	-	-	74	-21.53	35	115	H
	* ** 12.20125	53.37	PK2	38.8	-39.7	-40	12.47	54	-41.53	-	-	35	115	H
9	* ** 4.87949	70.71	PK2	34	-44.7	0	60.01	-	-	74	-13.99	235	107	V
	* ** 4.87949	70.71	PK2	34	-44.7	-40	20.01	54	-33.99	-	-	235	107	V
10	* ** 7.32069	65.27	PK2	35.4	-41.7	0	58.97	-	-	74	-15.03	38	104	V
	* ** 7.32069	65.27	PK2	35.4	-41.7	-40	18.97	54	-35.03	-	-	38	104	V
11	* ** 12.2014	52.7	PK2	38.8	-39.7	0	51.8	-	-	74	-22.2	57	118	V
	* ** 12.2014	52.7	PK2	38.8	-39.7	-40	11.8	54	-42.2	-	-	57	118	V
2	2.392	47.66	Pk	31.9	-24.2	0	55.36	-	-	-	-	0-360	101	H
7	2.392	41.93	Pk	31.9	-24.2	0	49.63	-	-	-	-	0-360	101	V

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

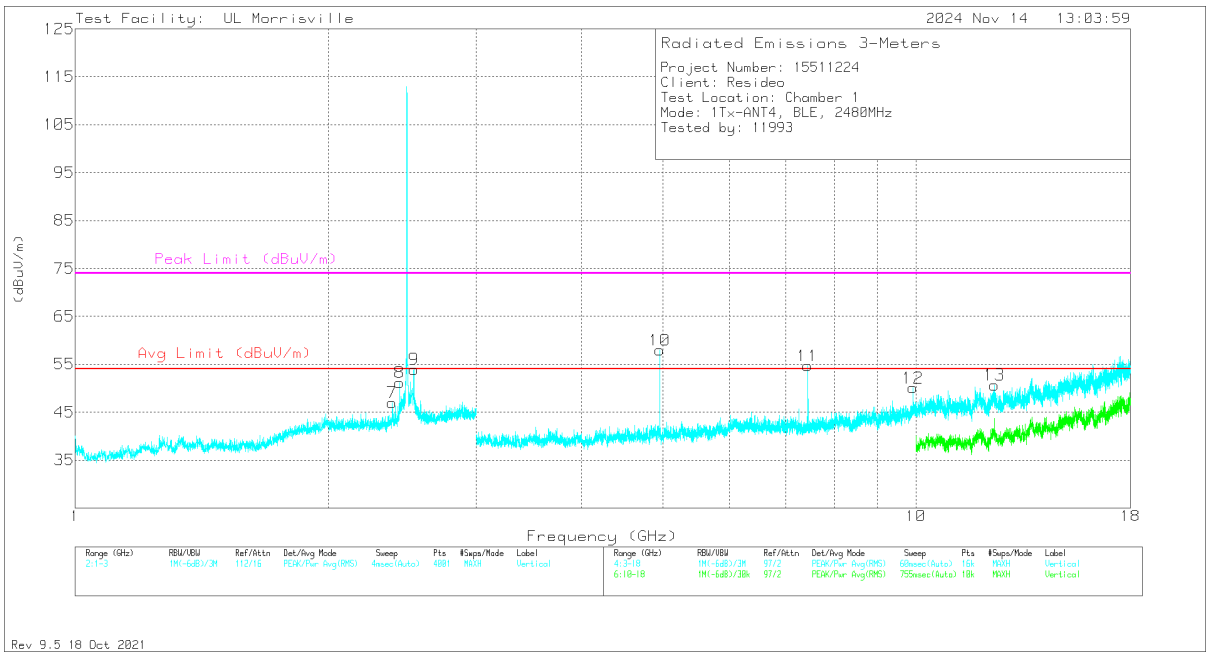
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (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	* ** 2.38408	46.15	PK2	31.9	-24	0	54.05	-	-	74	-19.95	104	107	H
	* ** 2.38408	46.15	PK2	31.9	-24	-40	14.05	54	-39.95	-	-	104	107	H
3	** 2.528	52.43	Pk	32.3	-24.1	0	60.63	-	-	-	-	0-360	200	H
7	* ** 2.384	39.11	Pk	31.9	-24	0	47.01	54	-6.99	74	-26.99	0-360	101	V
9	** 2.5285	45.87	Pk	32.3	-24.2	0	53.97	-	-	-	-	0-360	101	V
4	* ** 4.95948	65.66	PK2	34.2	-44.8	0	55.06	-	-	74	-18.94	305	374	H
	* ** 4.95948	65.66	PK2	34.2	-44.8	-40	15.06	54	-38.94	-	-	305	374	H
5	* ** 7.44084	62.59	PK2	35.4	-41.1	0	56.89	-	-	74	-17.11	78	285	H
	* ** 7.44084	62.59	PK2	35.4	-41.1	-40	16.89	54	-37.11	-	-	78	285	H
6	* ** 12.40102	55.01	PK2	38.7	-38.8	0	54.91	-	-	74	-19.09	33	107	H
	* ** 12.40102	55.01	PK2	38.7	-38.8	-40	14.91	54	-39.09	-	-	33	107	H
10	* ** 4.96047	69.96	PK2	34.2	-44.8	0	59.36	-	-	74	-14.64	234	101	V
	* ** 4.96047	69.96	PK2	34.2	-44.8	-40	19.36	54	-34.64	-	-	234	101	V
11	* ** 7.43927	61.89	PK2	35.4	-41	0	56.29	-	-	74	-17.71	53	103	V
	* ** 7.43927	61.89	PK2	35.4	-41	-40	16.29	54	-37.71	-	-	53	103	V
13	* ** 12.40127	53.52	PK2	38.7	-38.8	0	53.42	-	-	74	-20.58	169	185	V
	* ** 12.40127	53.52	PK2	38.7	-38.8	-40	13.42	54	-40.58	-	-	169	185	V
2	2.4325	47.91	Pk	32.1	-24.4	0	55.61	-	-	-	-	0-360	200	H
8	2.4325	43.5	Pk	32.1	-24.4	0	51.2	-	-	-	-	0-360	101	V
12	9.91875	53.16	Pk	37.4	-40.5	0	50.06	-	-	-	-	0-360	101	V

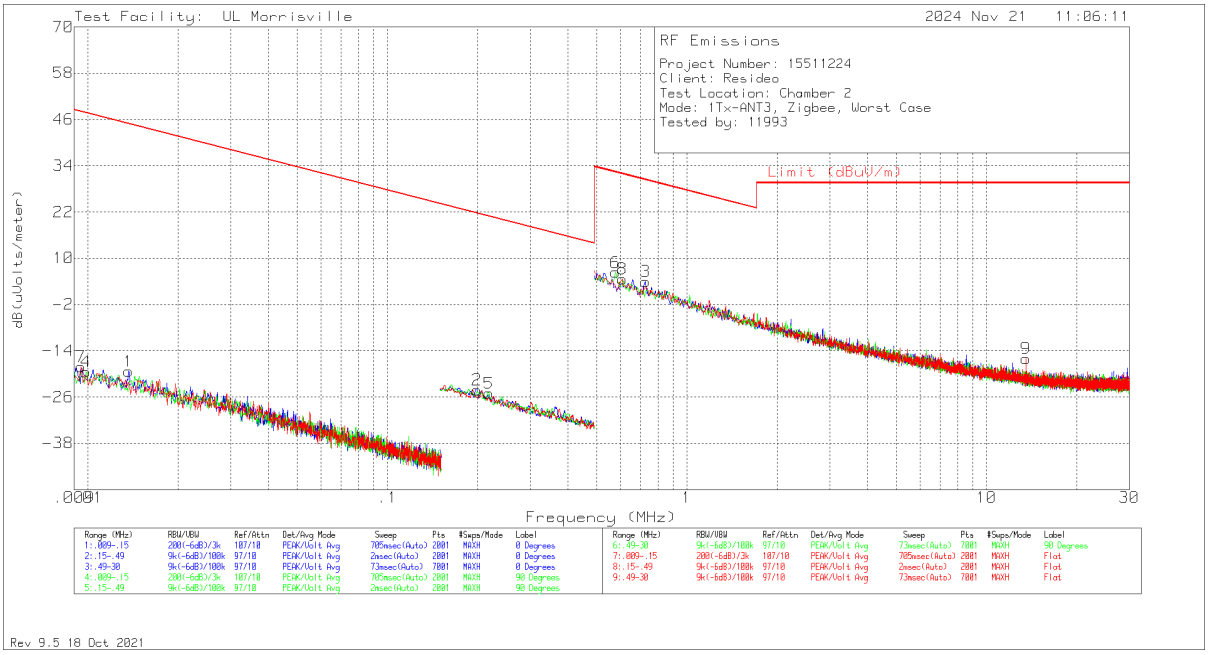
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

9.2. WORST CASE BELOW 30MHZ

9.2.1. SPURIOUS EMISSIONS BELOW 30 MHz (Zigbee WORST-CASE CONFIGURATION)



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)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
7	.0095	43.01	Pk	18.7	.1	-80	-18.19	48.05	68.05	-66.24	0-360	Flat
4	.00985	42.13	Pk	18.3	.1	-80	-19.47	47.73	67.73	-67.2	0-360	90 degs
1	.01369	43.92	Pk	16.6	.1	-80	-19.38	44.88	64.88	-64.26	0-360	0 degs
2	.1993	44.75	Pk	11	.1	-80	-24.15	21.61	41.61	-45.76	0-360	0 degs
5	.21834	43.93	Pk	10.9	.1	-80	-25.07	20.82	40.82	-45.89	0-360	90 degs
6	.57854	35.22	Pk	11	.1	-40	6.32	32.36	-	-26.04	0-360	90 degs
8	.60805	33.53	Pk	11	.1	-40	4.63	31.93	-	-27.3	0-360	Flat
3	.7261	32.85	Pk	11	.1	-40	3.95	30.38	-	-26.43	0-360	0 degs
9	13.5596	13.49	Pk	9.8	.6	-40	-16.11	29.54	-	-45.65	0-360	Flat

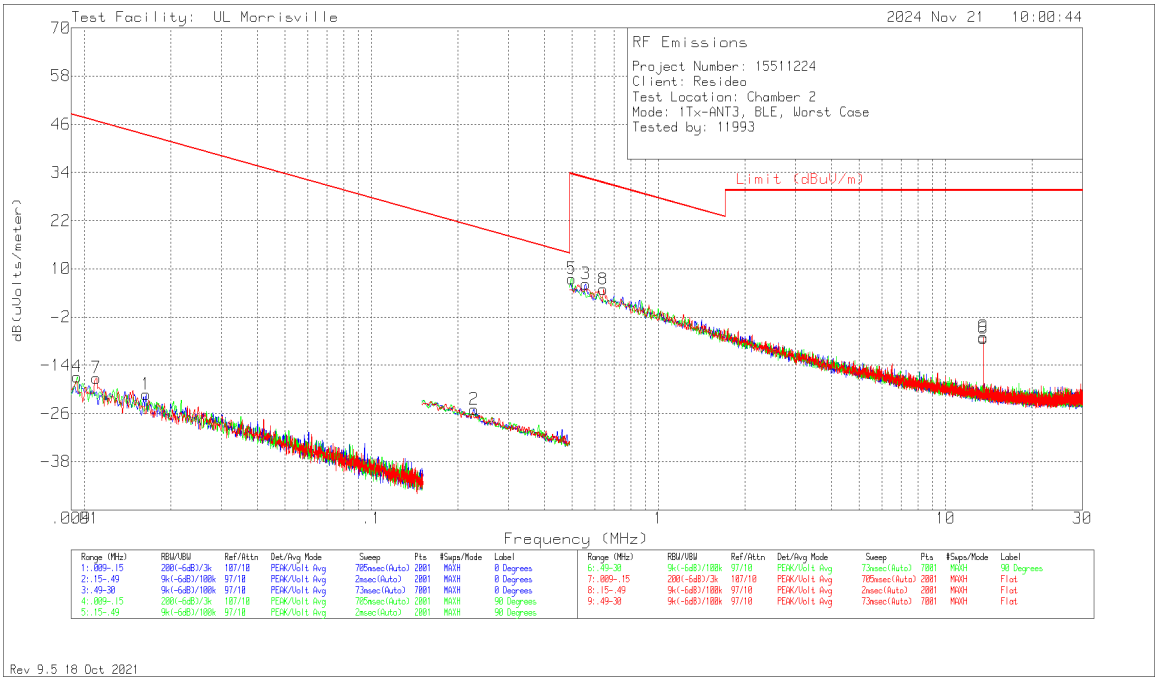
PK- Peak Detector

H-FIELD Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuA)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	QP/AV Limit (dBuA/m)	PK Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
7	.0095	43.01	Pk	-32.8	.1	-80	-69.69	-3.45	16.55	-66.24	0-360	Flat
4	.00985	42.13	Pk	-33.2	.1	-80	-70.97	-3.77	16.23	-67.2	0-360	90 degs
1	.01369	43.92	Pk	-34.9	.1	-80	-70.88	-6.62	13.38	-64.26	0-360	0 degs
2	.1993	44.75	Pk	-40.5	.1	-80	-75.65	-29.89	-9.89	-45.76	0-360	0 degs
5	.21834	43.93	Pk	-40.6	.1	-80	-76.57	-30.68	-10.68	-45.89	0-360	90 degs
6	.57854	35.22	Pk	-40.5	.1	-40	-45.18	-19.14	-	-26.04	0-360	90 degs
8	.60805	33.53	Pk	-40.5	.1	-40	-46.87	-19.57	-	-27.3	0-360	Flat
3	.7261	32.85	Pk	-40.5	.1	-40	-47.55	-21.12	-	-26.43	0-360	0 degs
9	13.5596	13.49	Pk	-41.7	.6	-40	-67.61	-21.96	-	-45.65	0-360	Flat

PK- Peak Detector

9.2.2. SPURIOUS EMISSIONS BELOW 30 MHz (BLE WORST-CASE CONFIGURATION)



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)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
4	.00943	44.38	Pk	18.7	.1	-80	-16.82	48.12	68.12	-64.94	0-360	90 degs
7	.01099	44.9	Pk	17.8	.1	-80	-17.2	46.79	66.79	-63.99	0-360	Flat
1	.01638	43.11	Pk	15.5	.1	-80	-21.29	43.32	63.32	-64.61	0-360	0 degs
2	.22744	43.96	Pk	10.9	.1	-80	-25.04	20.47	40.47	-45.51	0-360	0 degs
5	.49843	36.41	Pk	11	.1	-40	7.51	33.65	-	-26.14	0-360	90 degs
3	.55746	35.16	Pk	11	.1	-40	6.26	32.68	-	-26.42	0-360	0 degs
8	.64178	33.77	Pk	11	.1	-40	4.87	31.46	-	-26.59	0-360	Flat
6	13.5596	22.27	Pk	9.8	.6	-40	-7.33	29.54	-	-36.87	0-360	90 degs
9	13.5596	22.67	Pk	9.8	.6	-40	-6.93	29.54	-	-36.47	0-360	Flat

PK- Peak Detector

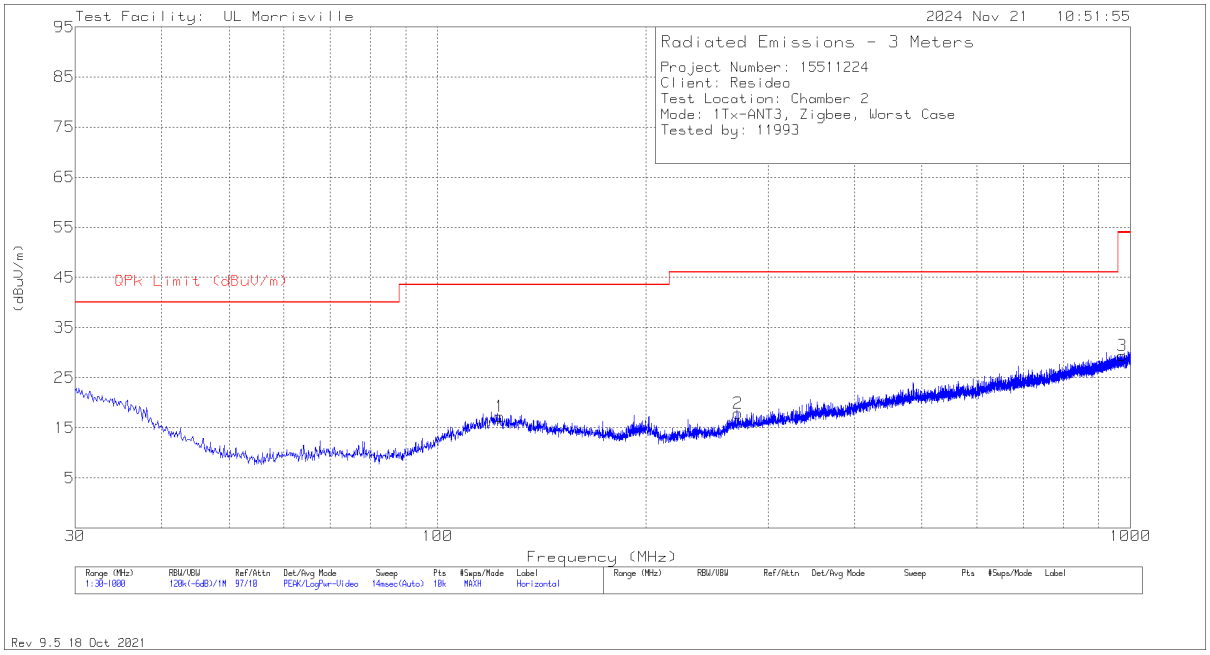
H-FIELD Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	QP/AV Limit (dBuA/m)	Pk Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
4	.00943	44.38	Pk	-32.8	.1	-80	-68.32	-3.38	16.62	-64.94	0-360	90 degs
7	.01099	44.9	Pk	-33.7	.1	-80	-68.7	-4.71	15.29	-63.99	0-360	Flat
1	.01638	43.11	Pk	-36	.1	-80	-72.79	-8.18	11.82	-64.61	0-360	0 degs
2	.22744	43.96	Pk	-40.6	.1	-80	-76.54	-31.03	-11.03	-45.51	0-360	0 degs
5	.49843	36.41	Pk	-40.5	.1	-40	-43.99	-17.85	-	-26.14	0-360	90 degs
3	.55746	35.16	Pk	-40.5	.1	-40	-45.24	-18.82	-	-26.42	0-360	0 degs
8	.64178	33.77	Pk	-40.5	.1	-40	-46.63	-20.04	-	-26.59	0-360	Flat
6	13.5596	22.27	Pk	-41.7	.6	-40	-58.83	-21.96	-	-36.87	0-360	90 degs
9	13.5596	22.67	Pk	-41.7	.6	-40	-58.43	-21.96	-	-36.47	0-360	Flat

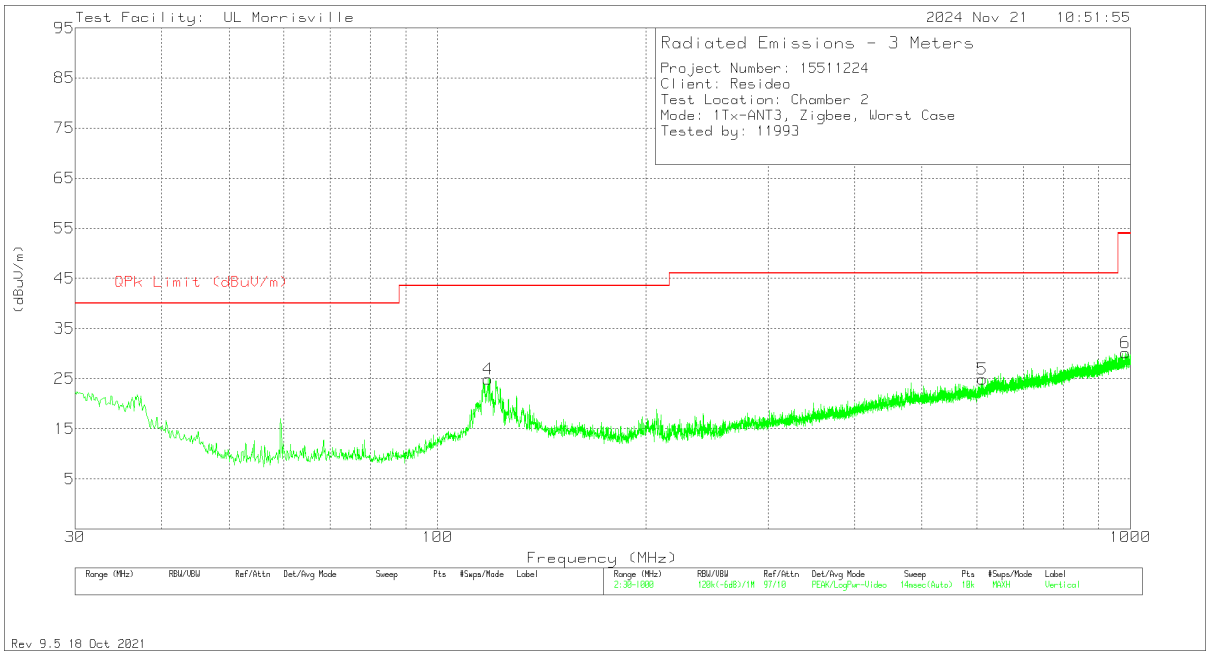
PK- Peak Detector

9.3. WORST CASE BELOW 1 GHZ

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



HORIZONTAL



VERTICAL

Below 1GHz Data

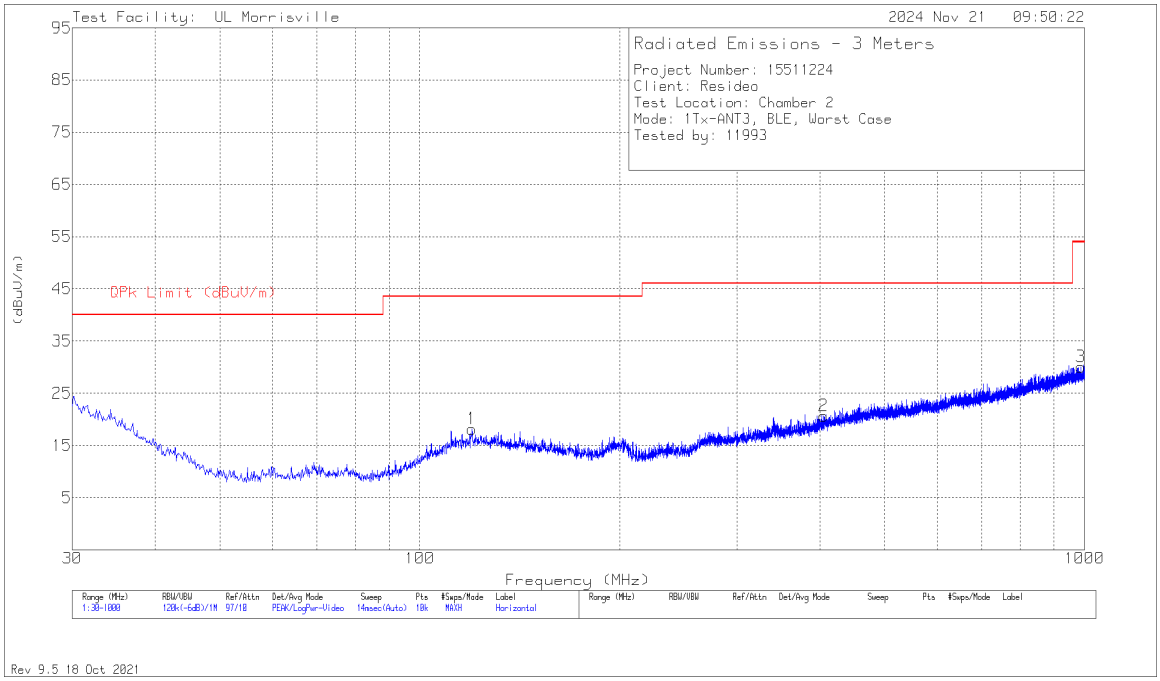
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	159203 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 123.12	27.56	Pk	20.3	-30.6	17.26	43.52	-26.26	0-360	199	H
2	* ** 271.724	27.65	Pk	19.8	-29.6	17.85	46.02	-28.17	0-360	199	H
3	* ** 973.616	24.85	Pk	29.8	-25.2	29.45	53.97	-24.52	0-360	399	H
4	* ** 118.367	35.5	Pk	20	-30.6	24.9	43.52	-18.62	0-360	101	V
5	* ** 611.806	27.47	Pk	25.5	-28.1	24.87	46.02	-21.15	0-360	199	V
6	* ** 983.801	25.47	Pk	29.8	-25.1	30.17	53.97	-23.8	0-360	101	V

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

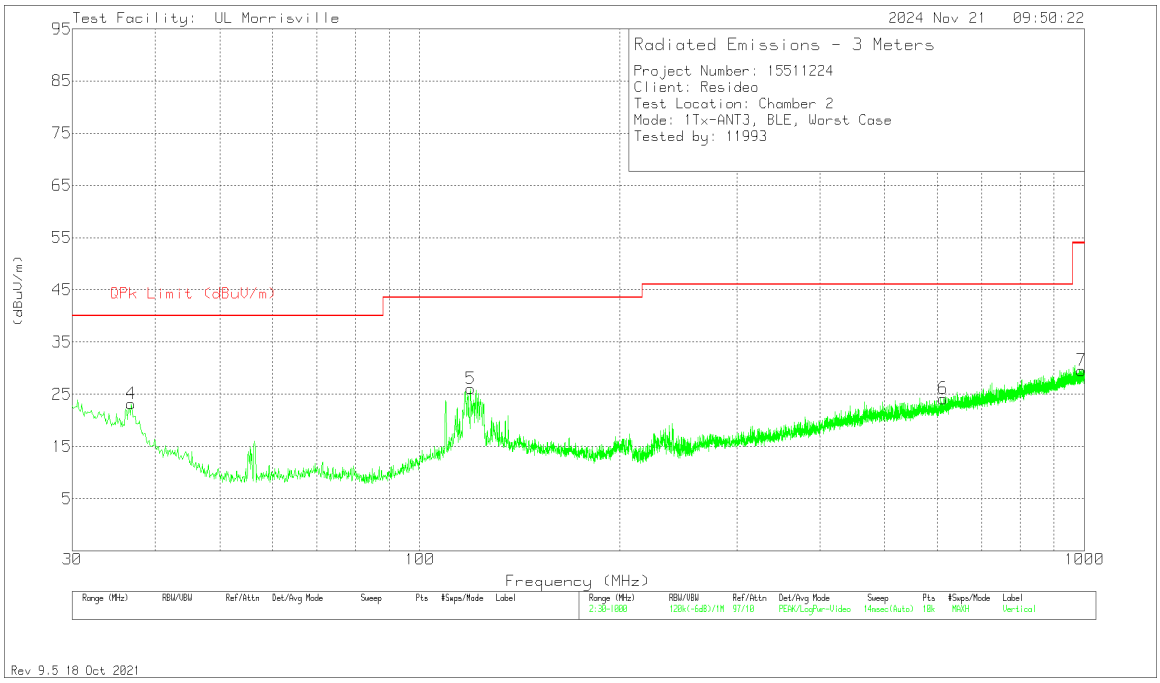
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

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



HORIZONTAL



VERTICAL

Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	159203 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 119.822	28.6	Pk	20.2	-30.7	18.1	43.52	-25.42	0-360	101	H
2	* ** 404.614	27.28	Pk	22.3	-28.9	20.68	46.02	-25.34	0-360	299	H
3	* ** 987.002	25.27	Pk	29.9	-25.1	30.07	53.97	-23.9	0-360	299	H
5	* ** 119.24	36.69	Pk	20.1	-30.7	26.09	43.52	-17.43	0-360	101	V
6	* ** 613.455	26.58	Pk	25.6	-28	24.18	46.02	-21.84	0-360	299	V
7	* ** 989.233	24.74	Pk	29.9	-25.1	29.54	53.97	-24.43	0-360	199	V
4	36.79	32.21	Pk	22.7	-31.7	23.21	40	-16.79	0-360	101	V

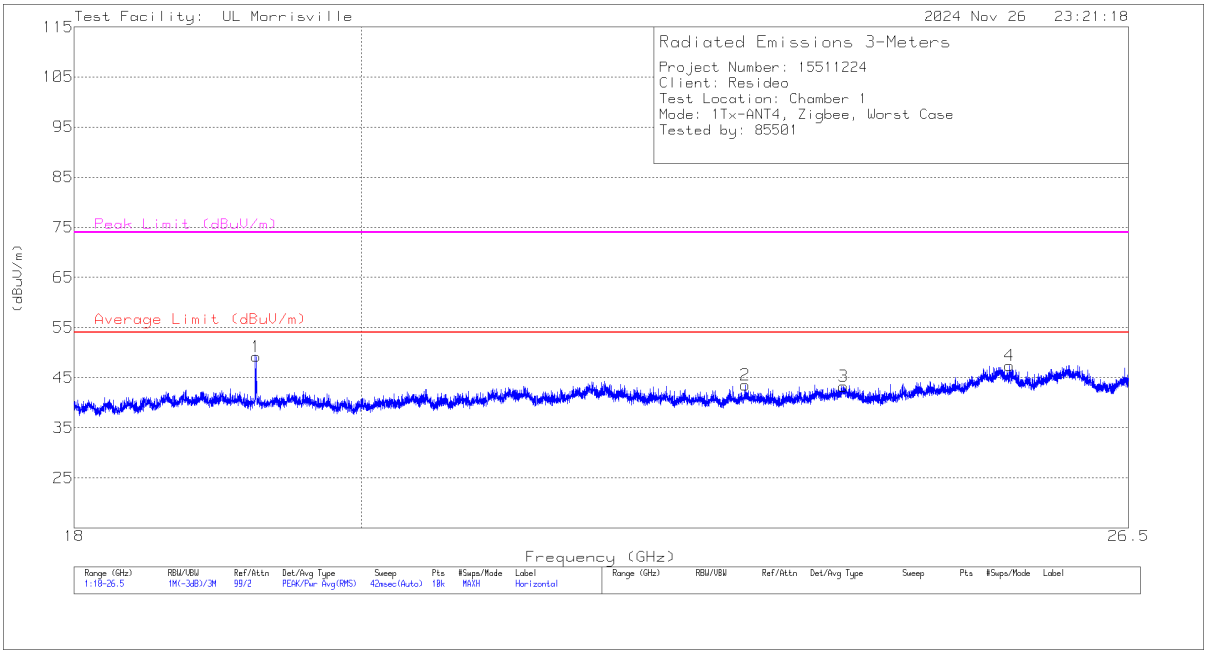
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

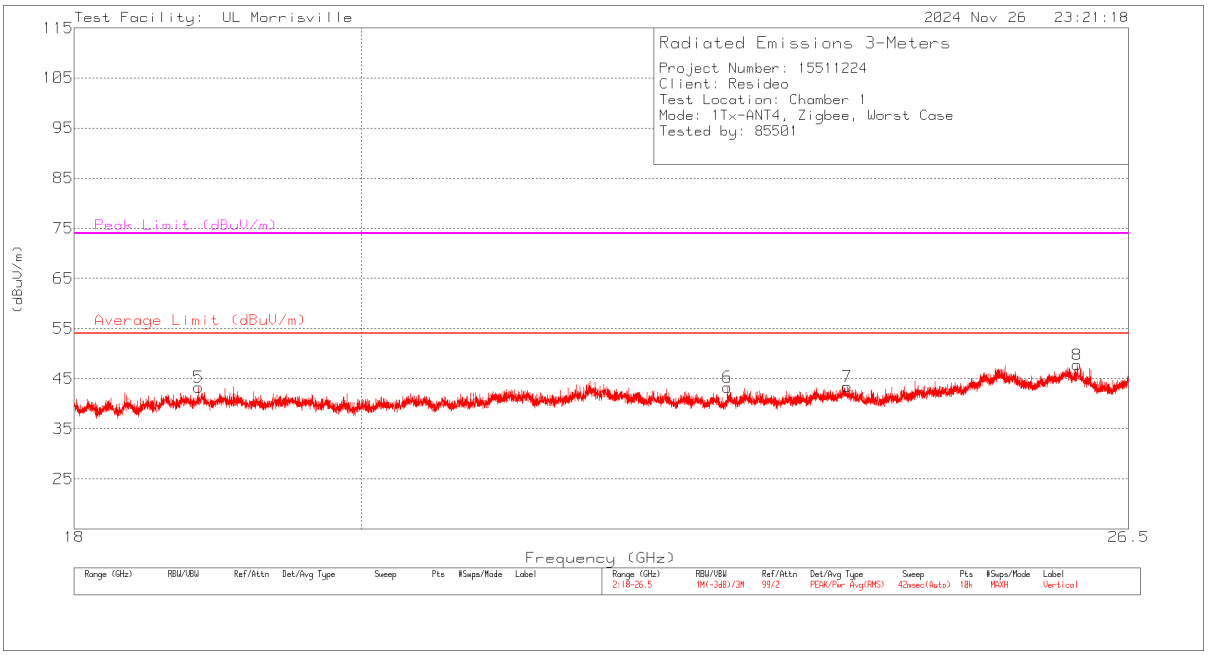
Pk - Peak detector

9.4. WORST CASE 18-26 GHZ

9.4.1. SPURIOUS EMISSIONS 18-26 GHz (Zigbee WORST-CASE CONFIGURATION)



HORIZONTAL



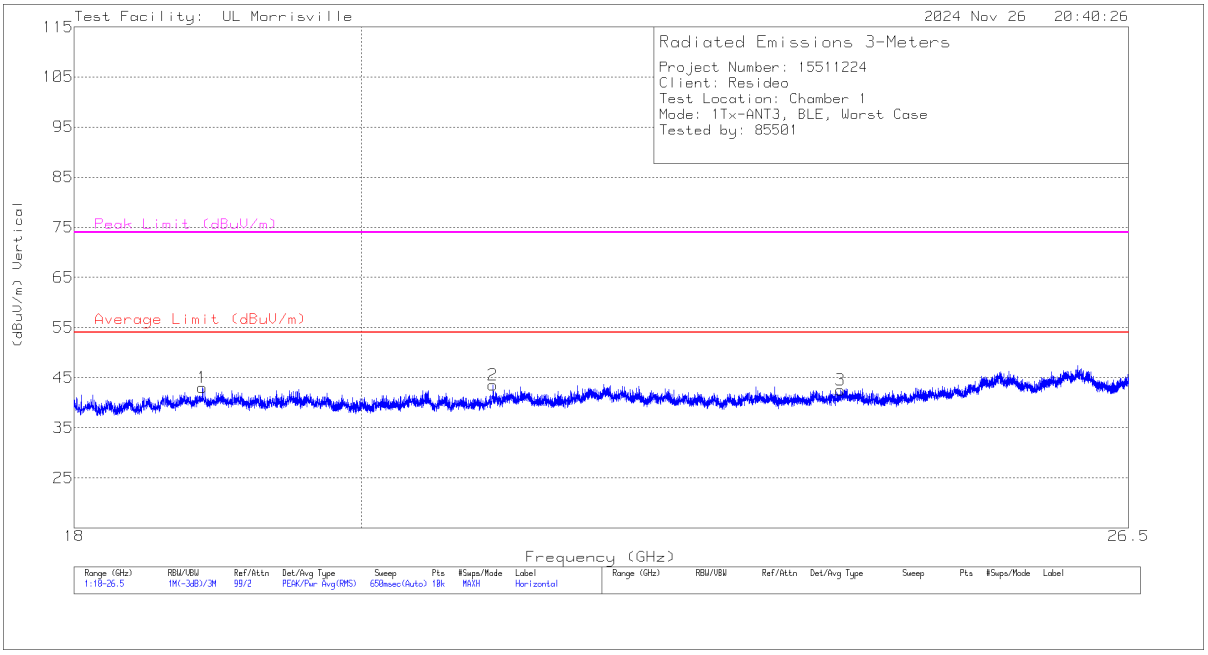
VERTICAL

18 – 26GHz Data

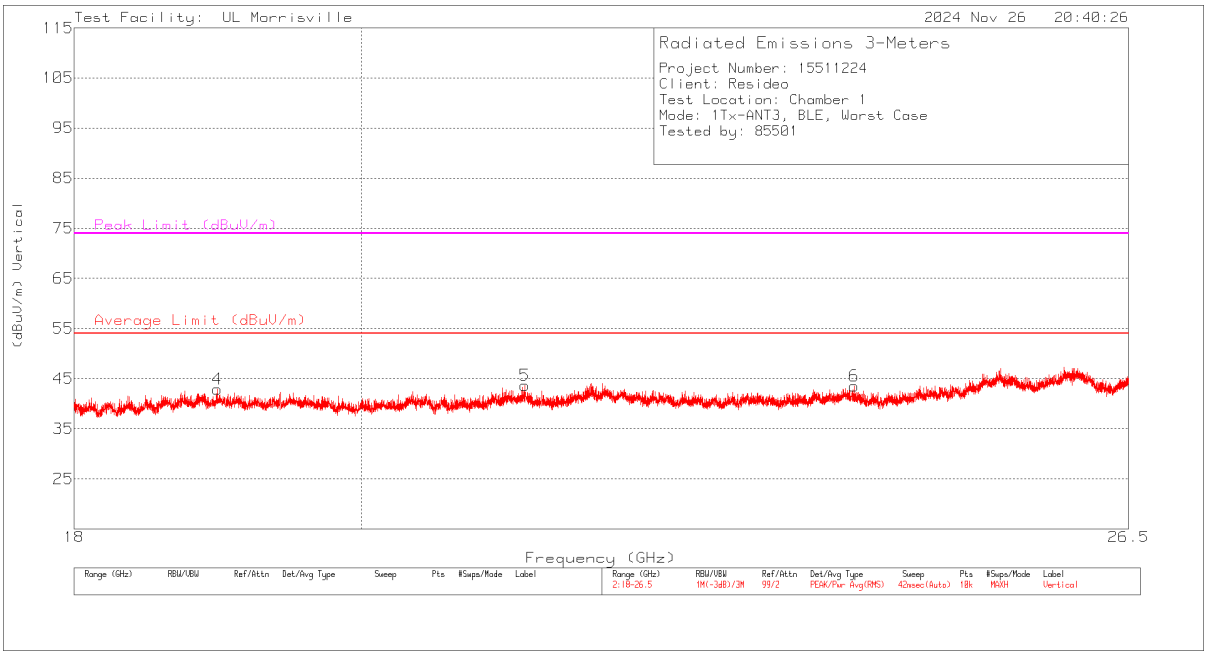
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	204704 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 19.24516	49.97	PK2	33.4	-40.1	0	43.27	-	-	74	-30.73	114	188	H
	* ** 19.24516	49.97	PK2	33.4	-40.1	-40	3.27	54	-50.73	-	-	114	188	H
2	* ** 23.023	49.74	Pk	34	-40.2	0	43.54	54	-10.46	74	-30.46	0-360	249	H
3	* ** 23.87036	48.81	Pk	34.4	-39.9	0	43.31	54	-10.69	74	-30.69	0-360	149	H
5	* ** 18.84142	49.96	Pk	33.4	-40.1	0	43.26	54	-10.74	74	-30.74	0-360	300	V
6	* ** 22.87426	49.34	Pk	34.1	-40.2	0	43.24	54	-10.76	74	-30.76	0-360	200	V
7	* ** 23.90181	48.93	Pk	34.4	-39.9	0	43.43	54	-10.57	74	-30.57	0-360	300	V
4	25.36876	50.86	Pk	35.6	-39	0	47.46	-	-	-	-	0-360	200	H
8	26.00705	51.03	Pk	35.3	-38.6	0	47.73	-	-	-	-	0-360	150	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

9.4.2. SPURIOUS EMISSIONS 18-26 GHz (BLE 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	* ** 18.86861	49.65	Pk	33.5	-40.1	43.05	54	-10.95	74	-30.95	0-360	150	H
2	* ** 20.99085	49.94	Pk	33.6	-40	43.54	54	-10.46	74	-30.46	0-360	249	H
3	* ** 23.84147	48.02	Pk	34.4	-39.9	42.52	54	-11.48	74	-31.48	0-360	101	H
4	* ** 18.96975	49.41	Pk	33.6	-40.1	42.91	54	-11.09	74	-31.09	0-360	101	V
5	* ** 21.23393	50.19	Pk	33.5	-40	43.69	54	-10.31	74	-30.31	0-360	101	V
6	* ** 23.9647	48.85	Pk	34.5	-39.8	43.55	54	-10.45	74	-30.45	0-360	250	V

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

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

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

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

AC Power Line Conducted Emissions: ANSI C63.10-2020, Section 6.2.

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

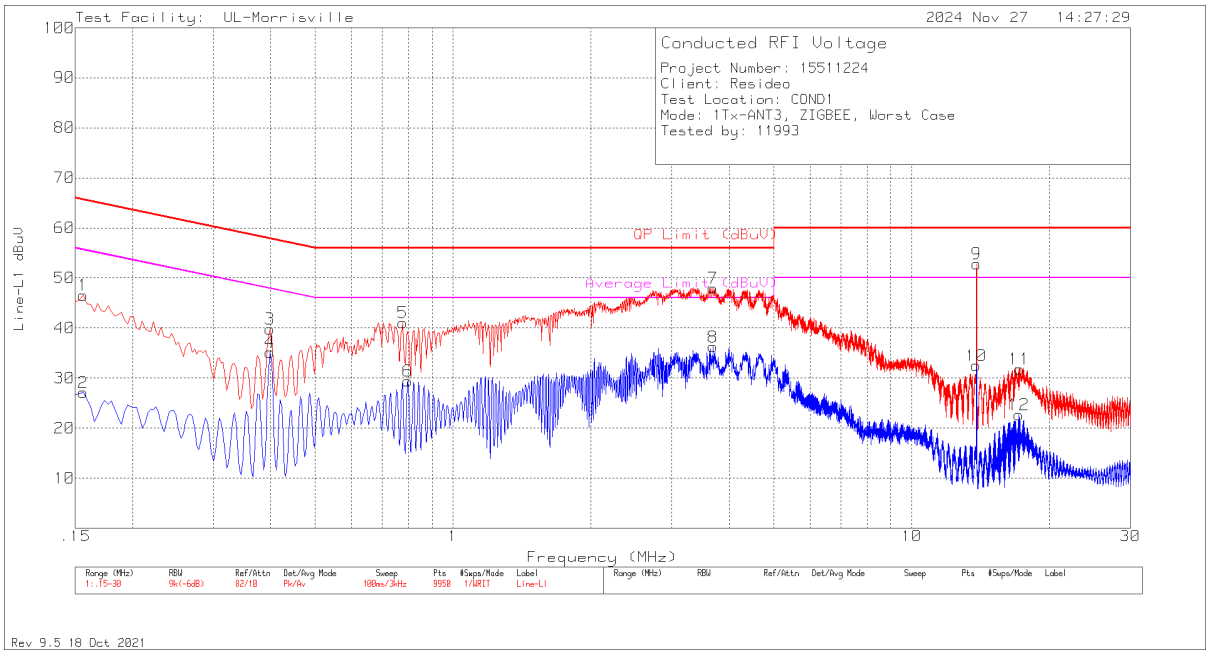
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

10.1.1. AC Power Line Norm - Zigbee

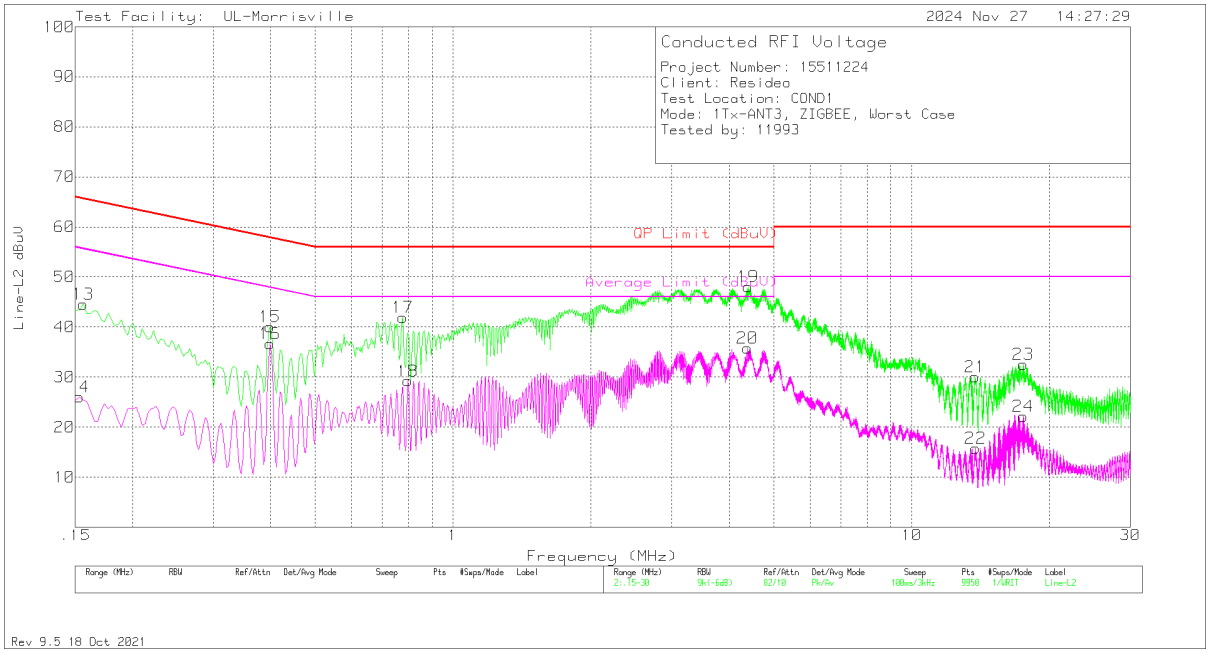
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.156	36.51	Pk	.2	9.8	46.51	65.67	-19.16	-	-
2	.156	17.1	Av	.2	9.8	27.1	-	-	55.67	-28.57
3	.399	29.87	Pk	.1	9.8	39.77	57.87	-18.1	-	-
4	.399	25.29	Av	.1	9.8	35.19	-	-	47.87	-12.68
5	.777	31.2	Pk	0	9.8	41	56	-15	-	-
6	.798	19.6	Av	0	9.8	29.4	-	-	46	-16.6
7	3.687	38.09	Pk	0	9.9	47.99	56	-8.01	-	-
8	3.69	26.33	Av	0	9.9	36.23	-	-	46	-9.77
10	13.851	22.38	Av	.1	10	32.48	-	-	50	-17.52
9	13.854	42.68	Pk	.1	10	52.78	60	-7.22	-	-
12	17.151	12.33	Av	.2	10.1	22.63	-	-	50	-27.37
11	17.169	21.45	Pk	.2	10.1	31.75	60	-28.25	-	-

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS

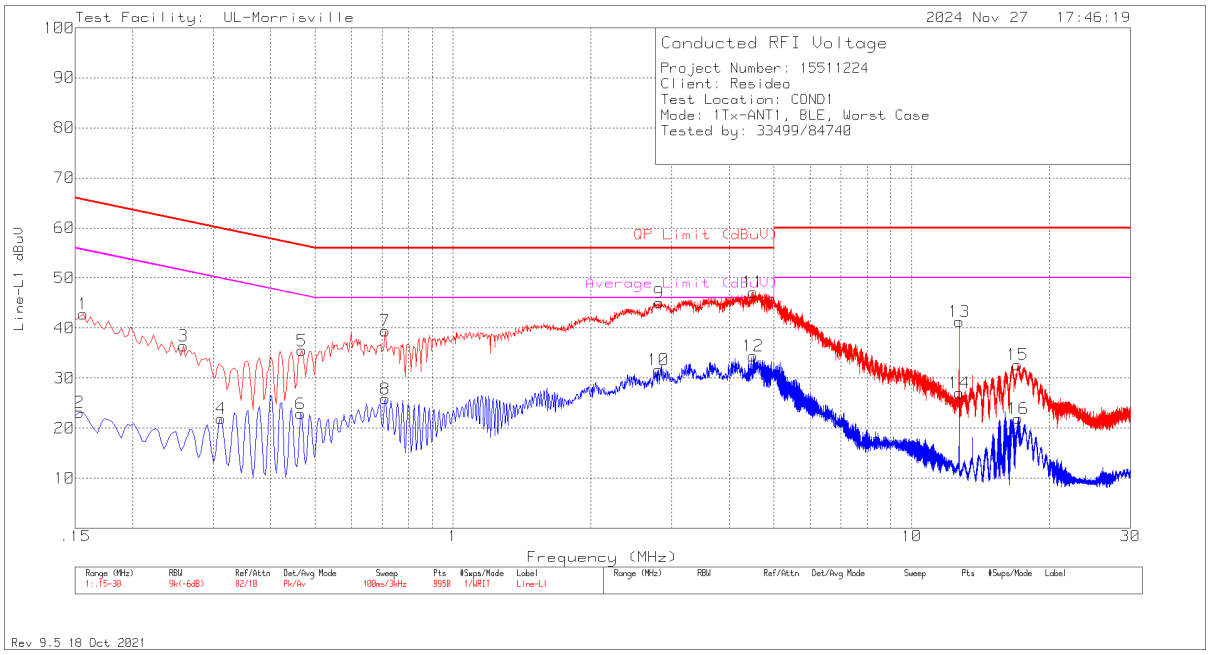


Range 2: Line-L2 .15 - 30MHz										
Marker	**Frequency (MHz)**	**Meter Reading (dBuV)**	**Det**	**LISN VDF (dB)**	**Cbl/Limiter (dB)**	**Corrected Reading dBuV**	**QP Limit (dBuV)**	**Margin (dB)**	**Average Limit (dBuV)**	**Margin (dB)**
14	.153	16.02	Av	.2	9.8	26.02	-	-	55.84	-29.82
13	.156	34.53	Pk	.2	9.8	44.53	65.67	-21.14	-	-
15	.399	30.2	Pk	.1	9.8	40.1	57.87	-17.77	-	-
16	.399	26.73	Av	.1	9.8	36.63	-	-	47.87	-11.24
17	.777	32.17	Pk	0	9.8	41.97	56	-14.03	-	-
18	.798	19.42	Av	0	9.8	29.22	-	-	46	-16.78
20	4.383	25.82	Av	.1	9.9	35.82	-	-	46	-10.18
19	4.404	38.04	Pk	.1	9.9	48.04	56	-7.96	-	-
21	13.764	19.94	Pk	.1	10	30.04	60	-29.96	-	-
22	13.803	5.7	Av	.1	10	15.8	-	-	50	-34.2
23	17.526	22.25	Pk	.2	10.1	32.55	60	-27.45	-	-
24	17.529	11.85	Av	.2	10.1	22.15	-	-	50	-27.85

Pk - Peak detector
Av - Average detection

10.1.2. AC Power Line Host - BLE

LINE 1 RESULTS

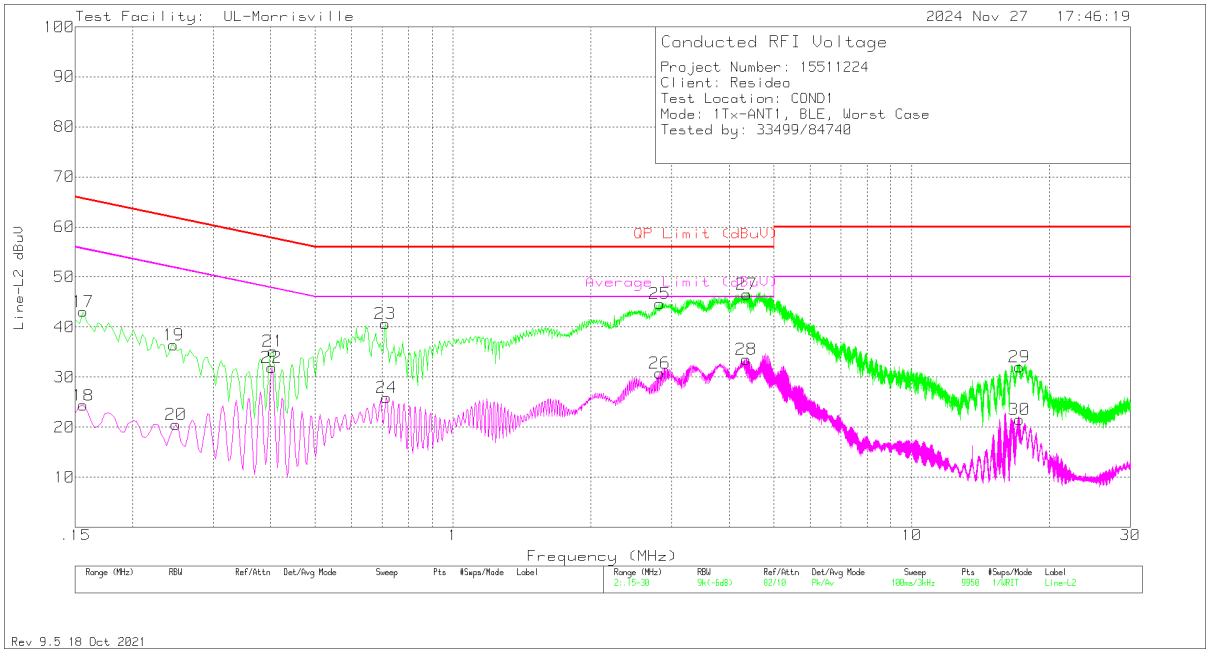


Note: ANT1 above = ANT3

Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.156	32.78	Pk	.2	9.8	42.78	65.67	-22.89	-	-
2	.153	13.18	Av	.2	9.8	23.18	-	-	55.84	-32.66
3	.258	26.52	Pk	.1	9.8	36.42	61.5	-25.08	-	-
4	.312	12	Av	.1	9.8	21.9	-	-	49.92	-28.02
5	.468	25.68	Pk	0	9.8	35.48	56.55	-21.07	-	-
6	.465	13.04	Av	0	9.8	22.84	-	-	46.6	-23.76
7	.711	29.67	Pk	0	9.8	39.47	56	-16.53	-	-
8	.711	16.04	Av	0	9.8	25.84	-	-	46	-20.16
9	2.811	35.24	Pk	0	9.8	45.04	56	-10.96	-	-
10	2.802	21.88	Av	0	9.8	31.68	-	-	46	-14.32
11	4.518	37.18	Pk	.1	9.9	47.18	56	-8.82	-	-
12	4.518	24.45	Av	.1	9.9	34.45	-	-	46	-11.55
13	12.693	31.19	Pk	.1	10	41.29	60	-18.71	-	-
14	12.693	16.89	Av	.1	10	26.99	-	-	50	-23.01
15	17.037	22.4	Pk	.2	10.1	32.7	60	-27.3	-	-
16	17.07	11.57	Av	.2	10.1	21.87	-	-	50	-28.13

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
17	.156	33.11	Pk	.2	9.8	43.11	65.67	-22.56	-	-
18	.156	14.34	Av	.2	9.8	24.34	-	-	55.67	-31.33
19	.246	26.56	Pk	.1	9.8	36.46	61.89	-25.43	-	-
20	.249	10.62	Av	.1	9.8	20.52	-	-	51.79	-31.27
21	.405	25.27	Pk	.1	9.8	35.17	57.75	-22.58	-	-
22	.402	22.05	Av	.1	9.8	31.95	-	-	47.81	-15.86
23	.711	30.85	Pk	0	9.8	40.65	56	-15.35	-	-
24	.717	16.11	Av	0	9.8	25.91	-	-	46	-20.09
25	2.826	34.87	Pk	0	9.8	44.67	56	-11.33	-	-
26	2.826	21.01	Av	0	9.8	30.81	-	-	46	-15.19
27	4.374	36.6	Pk	.1	9.9	46.6	56	-9.4	-	-
28	4.356	23.51	Av	.1	9.9	33.51	-	-	46	-12.49
29	17.184	21.75	Pk	.2	10.1	32.05	60	-27.95	-	-
30	17.175	11.21	Av	.2	10.1	21.51	-	-	50	-28.49

Pk - Peak detector
Av - Average detection

11. SETUP PHOTOS

Please refer to R15511224-EP1 for setup photos

END OF TEST REPORT

UL LLC
12 Laboratory Drive, RTP NC 27606; USA TEL:(919) 549-1400