FCC Radio Test Report

FCC ID	:	**G95BGW620**
Equipment	:	**Wi-Fi 7 XGS-PON Gateway**
Brand Name	:	**ARRIS**
Model Name	:	**BGW620-700**
Applicant	:	**Vantiva USA LLC** **4855 Peachtree Industrial Blvd. Suite 200, Norcross, Georgia, 30092 United States**
Manufacturer	:	**Vantiva** **887 N Douglas street, El Segundo CA 90245**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on May 09, 2024, and testing was started from May 15, 2024 and completed on Jul. 23, 2024. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.

Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR450601AZ	01	Initial issue of report	Aug. 08, 2024

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and explanations:
None

Reviewed by: Barry Hsiao

Report Producer: Ann Hou

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std.	Ch. Frequency (MHz)	Channel Number
2400-2483.5	802.15.4	2405-2480	11-26 [16]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	Zigbee	5	1TX

Note:.
- Zigbee uses a O-QPSK (250kbps) modulation for DSSS.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Support
1	Galtronics	DB1	PCB	I-Pex	2.4G+5G
2	Galtronics	DB2	PCB	I-Pex	2.4G+5G
3	Galtronics	DB3	PCB	I-Pex	2.4G+5G
4	Galtronics	DB4	PCB	I-Pex	2.4G+5G
5	Galtronics	6G1	PCB	I-Pex	6G
6	Galtronics	6G2	PCB	I-Pex	6G
7	Galtronics	6G3	PCB	I-Pex	6G
8	Galtronics	6G4	PCB	I-Pex	6G
9	Galtronics	IoT1-DFS	PCB	I-Pex	5G/BT/802.15.4
10	Galtronics	IoT2	PCB	I-Pex	BT/802.15.4
11	Galtronics	GNSS	PCB	I-Pex	GPS

Ant.	Port	Gain (dBi)											
		2.4G	UNII-1	UNII-2A	UNII-2C	UNII-3	UNII-5	UNII-6	UNII-7	UNII-8	DFS-RX	BT+802.15.4	GPS
1	1	3.54	4.9	4.94	5.12	5.02	-	-	-	-	-	-	-
2	2	4.79	3.47	3.79	3.58	2.66	-	-	-	-	-	-	-
3	3	3.46	2.48	2.72	4.85	4.02	-	-	-	-	-	-	-
4	4	3.75	4.41	3.05	3.46	3.78	-	-	-	-	-	-	-
5	1	-	-	-	-	-	4	4.85	4.11	4.22	-	-	-
6	2	-	-	-	-	-	3.64	4.26	3.26	4.19	-	-	-

Ant.	Port	Gain (dBi)											
		2.4G	UNII-1	UNII-2A	UNII-2C	UNII-3	UNII-5	UNII-6	UNII-7	UNII-8	DFS-RX	BT+802.15.4	GPS
7	3	-	-	-	-	-	5.5	5.4	4.77	5.07	-	-	-
8	4	-	-	-	-	-	5.11	5.04	4.96	5.17	-	-	-
9	1	-	-	-	-	-	-	-	-	-	5.647	4.716	-
10	2	-	-	-	-	-	-	-	-	-	-	3.765	-
11	1	-	-	-	-	-	-	-	-	-	-	-	4.219

Composite Gain (dBi)									
Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G	6.175G	6.475G	6.695G	6.995G
DG [1SS] (dBi)	5.03	5.25	5.58	6.35	6.17	5.66	5.88	5.63	5.82
DG [2SS] (dBi)	4.79	4.9	4.94	5.12	5.02	5.5	5.4	4.96	5.17
DG [4SS] (dBi)	4.79	4.9	4.94	5.12	5.02	5.5	5.4	4.96	5.17

Note 1: The EUT has eleven antennas.

Note 2: The composite gain is derived as KDB 662911 D03 v01 which was used as directional gain. For more detail information, please refer to the Antenna Pattern Report AP450601.

For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax/be mode (4TX/4RX)

Ant. 1 (port 1), Ant. 2 (port 2), Ant. 3 (port 3) and Ant. 4 (port 4) could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax/be mode (4TX/5RX)

Ant. 1 (port 1), Ant. 2 (port 2), Ant. 3 (port 3) and Ant. 4 (port 4) could transmit simultaneously.

Ant. 1 (port 1), Ant. 2 (port 2), Ant. 3 (port 3), Ant. 4 (port 4) and Ant. 9 (port 1) could receive simultaneously.

For 6GHz function:

For IEEE 802.11 ax/be mode (4TX/4RX)

Ant. 5 (port 1), Ant. 6 (port 2), Ant. 7 (port 3) and Ant. 8 (port 4) could transmit/receive simultaneously.

For BT function:

For IEEE 802.15.1 Bluetooth mode (1TX/1RX)

Ant. 9 (port 1) or Ant. 10 (port 2) could transmit/receive.

Support diversity function and pre-tested on each single chain, the worst case was Ant. 10(port 2) and it was record in this test report.

For 802.15.4 function:

For IEEE 802.15.4 mode (1TX/1RX)

Ant. 9 (port 1) or Ant. 10 (port 2) could transmit/receive.

Support diversity function and pre-tested on each single chain, the worst case was Ant. 10(port 2) and it was record in this test report.

For GPS function:

For GNSS mode (1TX/1RX)

Ant. 11 (port 1) could transmit/receive.

1.1.3 EUT Information

Operational Condition					
EUT Power Type	From AC Adapter				
EUT Function	☒	Point-to-multipoint	☐	Point-to-point	
Type of EUT					
☒	Stand-alone				
☐	Combined (EUT where the radio part is fully integrated within another device)				
	Combined Equipment - Brand Name / Model No.:	…			
☐	Plug-in radio (EUT intended for a variety of host systems)				
	Host System - Brand Name / Model No.:	…			
☐	Other:				

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF (dB)	T (s)	VBW (Hz)_1/T
Zigbee	0.51	2.92	755.625u	3k

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- KDB 558074 D01 v05r02
- KDB 414788 D01 v01r01

1.3 Testing Location Information

Test Lab.：Sporton International Inc. Hsinhua Laboratory				
☒ Hsinhua **(TAF:** 3785**)**	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		**FAX:** 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
AC Conduction	CO04-HY	Wayne Chiu	23.4~23.7°C / 53~55%	05/Jun/2024
RF Conducted	TH07-HY	Yuna Lin	21.8~23.7°C / 52~61%	15/May/2024~23/Jul/2024
☒ Wenhua 3rd. **(TAF:** 3785**)**	**ADD:** No. 58, Aly. 75, Ln. 564, Wenhua 3rd Rd., Guishan Dist. Taoyuan City 333, Taiwan (R.O.C.)			
	TEL: 886-3-327-0868			
Test site Designation No. TW0036 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
Radiated	03CH25-HY	Simon Cheng	22.3~23.1°C / 52~54%	15/May/2024~23/Jul/2024
Radiated (Co-location)	03CH25-HY	Lego Lin	22.2~23.4°C / 50~52%	01/Jun/2024

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	**Uncertainty**	**Remark**
AC Power-line Conducted Emissions	4.53 dB	Confidence levels of 95%
Bandwidth	3 MHz	Confidence levels of 95%
Maximum Conducted Output Power	2 dB	Confidence levels of 95%
Power Spectral Density	2 dB	Confidence levels of 95%
Emissions in Non-restricted Frequency Bands	0.14 dB	Confidence levels of 95%
Emissions in Restricted Frequency Bands	4.8 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Test Software Version	Dos6.1

Mode	Power Setting
Zigbee	-
2405MHz	20
2440MHz	20
2475MHz	20
2480MHz	5

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	CTX
1	Adapter mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	Adapter mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT		V	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	CTX
1	WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Bluetooth
2	WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + 802.15.4
Refer to Sporton Test Report No.: FA450601 for Co-location RF Exposure Evaluation and Appendix G for Radiated Emission Co-location.	

2.3 Accessories

Accessories				
AC Adapter (US Plug)	Brand Name	Vantiva	Model Name	EPS72R0-16
	SN	DD72A2343A0551		
	Power Rating	I/P: 120Vac, 1.8A, O/P: 12Vdc, 6A		
	Power Cord	3.6 meter, non-shielded cable, w/o ferrite core		

Reminder: Regarding to more detail and other information, please refer to user manual.

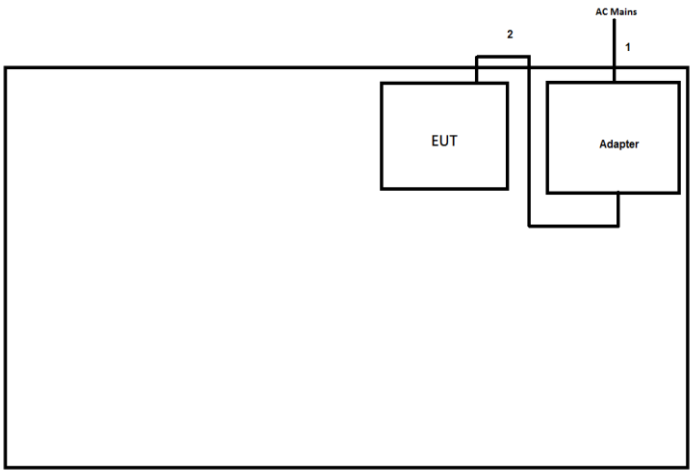
2.4 Support Equipment

Support Equipment – Conducted					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-

Support Equipment – Radiated					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	RJ45 cable	Power sync	CAT-6E-10	-	-
2	NB	HP	HSTNN-142C	-	Remote
3	Adapter for NB	HP	HSTNN-CA40	-	Remote
4	Client	AT&T	BGW620-700	-	Remote Provided by Customer

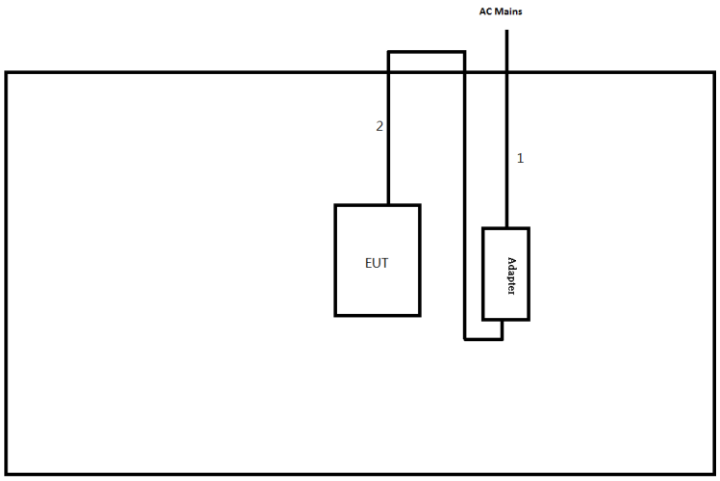
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)
1	AC power cable	No	1.8
2	DC power cable	No	1.8

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)
1	AC Power cable	No	1.8
2	DC Power cable	No	1.8

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

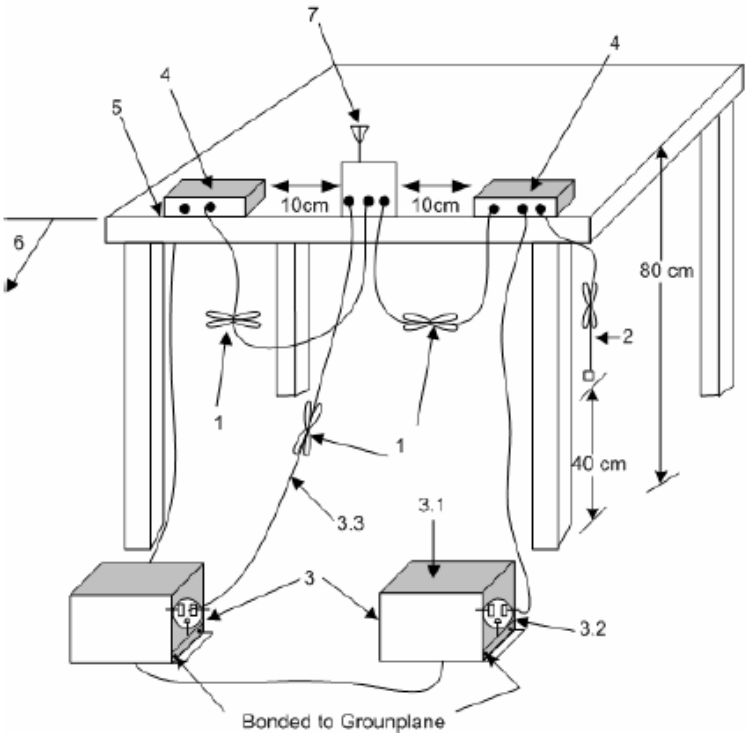
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Raw(Read Level) +LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

3.1.5 Test Setup

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
▪ 6 dB bandwidth ≥ 500 kHz.

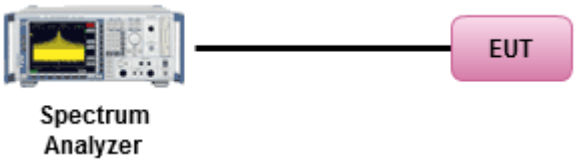
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
	☐ Refer as RSS-Gen, clause 6.7 for for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)	
	▪ Point-to-multipoint systems (P2M): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) dBm	
	▪ Point-to-point systems (P2P): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm	
	▪ Smart antenna system (SAS):	
		- Single beam: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm
		- Overlap beam: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm
		- Aggregate power on all beams: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 + 8dB dBm
e.i.r.p. Power Limit:		
▪ 2400-2483.5 MHz Band		
	▪ Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W)	
	▪ Point-to-point systems (P2P): P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX}]) dBm	
	▪ Smart antenna system (SAS)	
		- Single beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
		- Overlap beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
		- Aggregate power on all beams: P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX} + 8]) dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi.		

3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
	☐ Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
	☐ Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
▪ Maximum Average Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
	☒ Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)


3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
▪ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

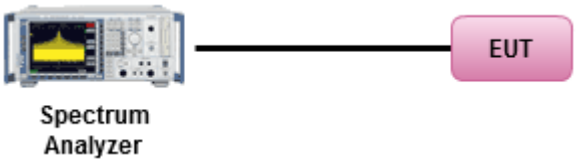
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Max. PSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		▪ Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.4.4 Test Setup

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average level.	

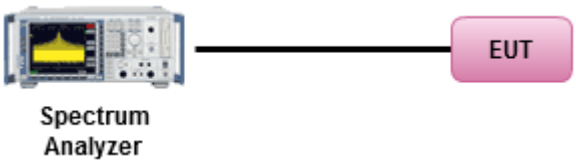
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
▪ Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands


3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

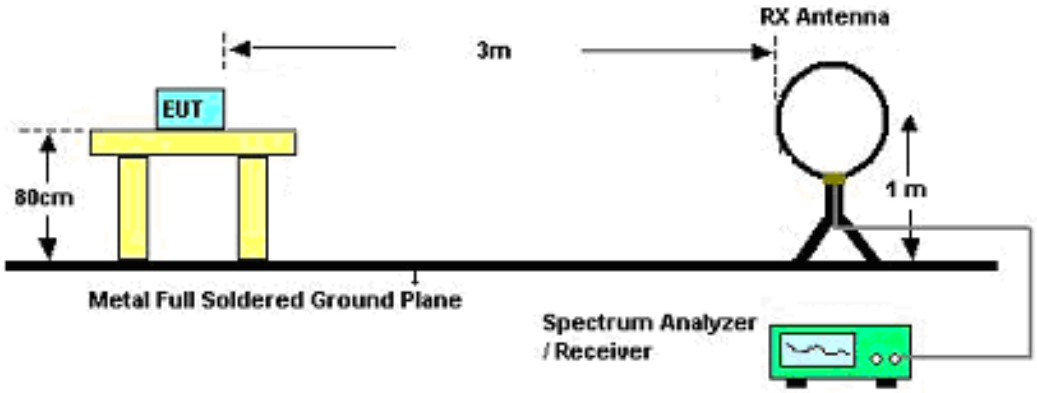
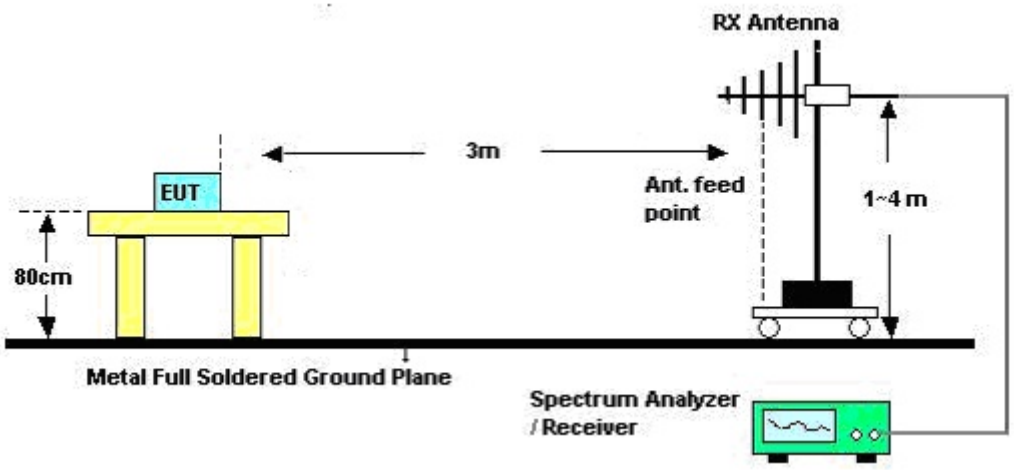
3.6.3 Test Procedures

Test Method	
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
▪ For the transmitter unwanted emissions shall be measured using following options below:	
	▪ Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
▪ For the transmitter band-edge emissions shall be measured using following options below:	
	▪ Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	▪ Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	▪ Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
▪ Use the following spectrum analyzer settings:	
	▪ Set RBW=100 kHz for f < 1 GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	▪ Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4.
▪ KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.	
	▪ Based on FCC 15.31(f)(2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
	▪ Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

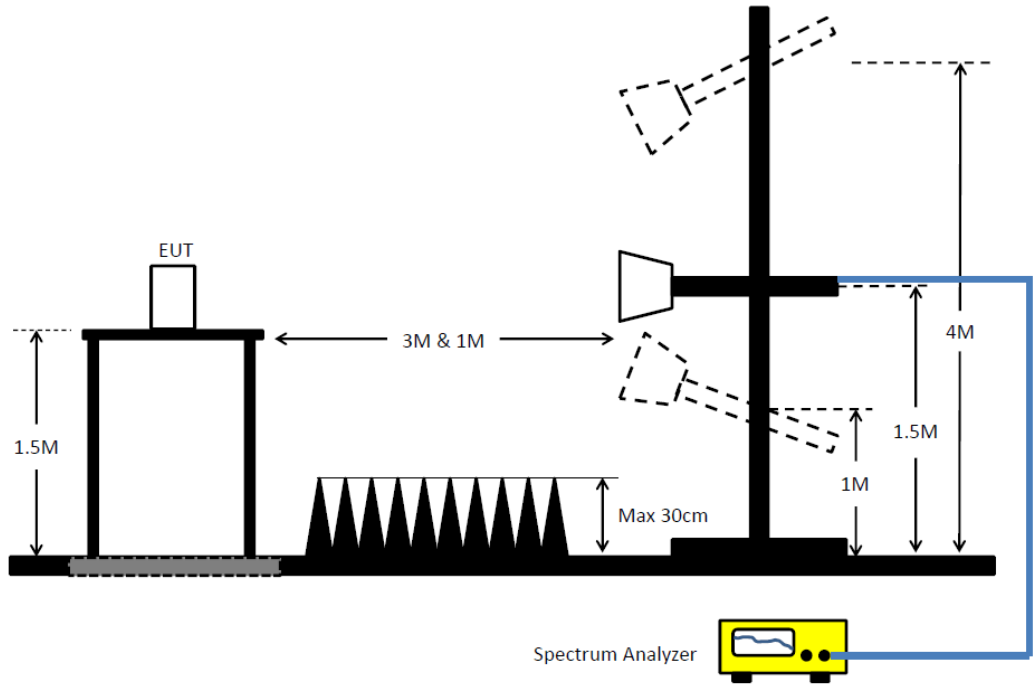
3.6.4 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

3.6.5 Test Setup

Emissions in Restricted Frequency Bands
9kHz ~30MHz

30MHz~1GHz


Above 1GHz



3.6.6 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	ROHDE & SCHWARZ	ESR3	102051	9kHz ~ 3.6GHz	17/May/2024	16/May/2025
LISN(Artificial Mains Network)	SCHWARZBECK	NSLK 8127	8127477	9kHz ~ 30MHz	12/Apr/2024	11/Apr/2025
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	27/Feb/2024	26/Feb/2025
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	18/Oct/2023	17/Oct/2024
Software	Sporton	SENSE-EMI	V5.11.3	-	NCR	NCR

NCR: No Calibration Required

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101515	9kHz~40GHz	02/Feb/2024	01/Feb/2025
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	20/Oct/2023	19/Oct/2024
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	15/Dec/2023	14/Dec/2024
Pulse Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	15/Dec/2023	14/Dec/2024
SENSE-15247_DTS	Sporton	V5.11.18	N/A	N/A	N/A	N/A

Instrument for Radiated Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH25-HY	30MHz~1GHz 3m	03/Aug/2023	02/Aug/2024
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH25-HY	1GHz~18GHz 3m	09/Aug/2023	08/Aug/2024
EMI Test Receiver	ROHDE & SCHWARZ	ESR	102318	9kHz~3.6GHz	27/Dec/2023	26/Dec/2024
Signal Analyzer	ROHDE&SCHWARZ	FSV3044	101410	10Hz~44GHz	17/Nov/2023	16/Nov/2024
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	19/Mar/2024	18/Mar/2025
Bilog Antenna & 6dB Attenuator	TESEQ & VGT	CBL 6111D & VFA 04002-06	63537/001	30MHz~1GHz	31/May/2023	30/May/2024
Bilog Antenna & 6dB Attenuator	TESEQ & VGT	CBL 6111D & VFA 04002-06	63537/001	30MHz~1GHz	30/May/2024	29/May/2025
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02876	1GHz~18GHz	12/Jul/2023	11/Jul/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02876	1GHz~18GHz	11/Jul/2023	10/Jul/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	01248	18GHz~40GHz	21/Aug/2023	20/Aug/2024
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	9kHz~1GHz	24/Apr/2024	23/Apr/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	1GHz~40GHz	23/Apr/2024	22/Apr/2025
Preamplifier	SGH	PRAMP 903	20230515-1	25MHz~3GHz	25/May/2023	24/May/2024
Preamplifier	SGH	PRAMP 903	20230515-1	25MHz~3GHz	24/May/2023	23/May/2025
Preamplifier	SGH	PRAMP 118-H	20230515-3	1GHz ~18GHz	25/May/2023	24/May/2024
Preamplifier	SGH	PRAMP 118-H	20230515-3	1GHz ~18GHz	24/May/2023	23/May/2025
Amplifier	EM	EM18G40GA	060874	18GHz ~ 40GHz	15/Apr/2024	14/Apr/2025
SENSE-15247-DTS	Sporton	V5.11.18	NA	NA	NA	NA

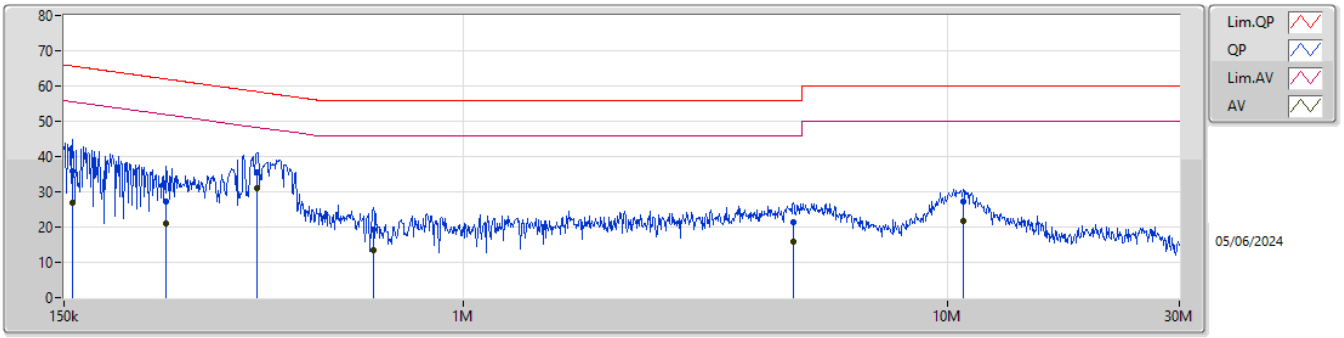
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	375.703k	31.16	48.37	-17.21	Line

Result

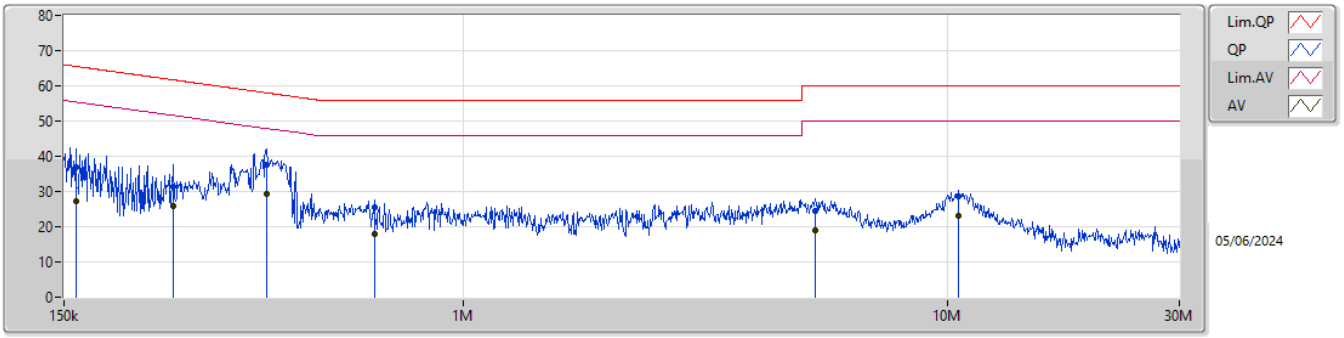
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	156.109k	35.96	65.67	-29.71	Line	-
Mode 1	Pass	AV	156.109k	26.86	55.67	-28.81	Line	-
Mode 1	Pass	QP	244.12k	27.40	61.95	-34.55	Line	-
Mode 1	Pass	AV	244.12k	20.93	51.95	-31.02	Line	-
Mode 1	Pass	QP	375.703k	35.68	58.37	-22.69	Line	-
Mode 1	Pass	AV	375.703k	31.16	48.37	-17.21	Line	-
Mode 1	Pass	QP	651.775k	19.32	56.00	-36.68	Line	-
Mode 1	Pass	AV	651.775k	13.38	46.00	-32.62	Line	-
Mode 1	Pass	QP	4.797M	21.29	56.00	-34.71	Line	-
Mode 1	Pass	AV	4.797M	16.01	46.00	-29.99	Line	-
Mode 1	Pass	QP	10.744M	27.10	60.00	-32.90	Line	-
Mode 1	Pass	AV	10.744M	21.64	50.00	-28.36	Line	-
Mode 1	Pass	QP	158.622k	36.78	65.54	-28.76	Neutral	-
Mode 1	Pass	AV	158.622k	27.24	55.54	-28.30	Neutral	-
Mode 1	Pass	QP	252.043k	31.33	61.70	-30.37	Neutral	-
Mode 1	Pass	AV	252.043k	25.77	51.70	-25.93	Neutral	-
Mode 1	Pass	QP	392.569k	37.59	58.01	-20.42	Neutral	-
Mode 1	Pass	AV	392.569k	29.34	48.01	-18.67	Neutral	-
Mode 1	Pass	QP	654.382k	25.55	56.00	-30.45	Neutral	-
Mode 1	Pass	AV	654.382k	17.86	46.00	-28.14	Neutral	-
Mode 1	Pass	QP	5.321M	24.56	60.00	-35.44	Neutral	-
Mode 1	Pass	AV	5.321M	18.87	50.00	-31.13	Neutral	-
Mode 1	Pass	QP	10.49M	28.46	60.00	-31.54	Neutral	-
Mode 1	Pass	AV	10.49M	23.24	50.00	-26.76	Neutral	-

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	156.109k	35.96	65.67	-29.71	9.86	Line	-	26.10	0.04	0.07	9.75
AV	156.109k	26.86	55.67	-28.81	9.86	Line	-	17.00	0.04	0.07	9.75
QP	244.12k	27.40	61.95	-34.55	9.84	Line	-	17.56	0.04	0.10	9.70
AV	244.12k	20.93	51.95	-31.02	9.84	Line	-	11.09	0.04	0.10	9.70
QP	375.703k	35.68	58.37	-22.69	9.92	Line	-	25.76	0.05	0.12	9.75
AV	375.703k	31.16	48.37	-17.21	9.92	Line	-	21.24	0.05	0.12	9.75
QP	651.775k	19.32	56.00	-36.68	9.94	Line	-	9.38	0.06	0.10	9.78
AV	651.775k	13.38	46.00	-32.62	9.94	Line	-	3.44	0.06	0.10	9.78
QP	4.797M	21.29	56.00	-34.71	9.98	Line	-	11.31	0.12	0.07	9.79
AV	4.797M	16.01	46.00	-29.99	9.98	Line	-	6.03	0.12	0.07	9.79
QP	10.744M	27.10	60.00	-32.90	10.08	Line	-	17.02	0.22	0.06	9.80
AV	10.744M	21.64	50.00	-28.36	10.08	Line	-	11.56	0.22	0.06	9.80

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	158.622k	36.78	65.54	-28.76	9.87	Neutral	-	26.91	0.06	0.07	9.74
AV	158.622k	27.24	55.54	-28.30	9.87	Neutral	-	17.37	0.06	0.07	9.74
QP	252.043k	31.33	61.70	-30.37	9.87	Neutral	-	21.46	0.06	0.10	9.71
AV	252.043k	25.77	51.70	-25.93	9.87	Neutral	-	15.90	0.06	0.10	9.71
QP	392.569k	37.59	58.01	-20.42	9.95	Neutral	-	27.64	0.07	0.12	9.76
AV	392.569k	29.34	48.01	-18.67	9.95	Neutral	-	19.39	0.07	0.12	9.76
QP	654.382k	25.55	56.00	-30.45	9.96	Neutral	-	15.59	0.08	0.10	9.78
AV	654.382k	17.86	46.00	-28.14	9.96	Neutral	-	7.90	0.08	0.10	9.78
QP	5.321M	24.56	60.00	-35.44	10.02	Neutral	-	14.54	0.17	0.06	9.79
AV	5.321M	18.87	50.00	-31.13	10.02	Neutral	-	8.85	0.17	0.06	9.79
QP	10.49M	28.46	60.00	-31.54	10.11	Neutral	-	18.35	0.27	0.05	9.79
AV	10.49M	23.24	50.00	-26.76	10.11	Neutral	-	13.13	0.27	0.05	9.79

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Zigbee	1.588M	2.206M	2M21G1D	1.263M	2.174M

Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

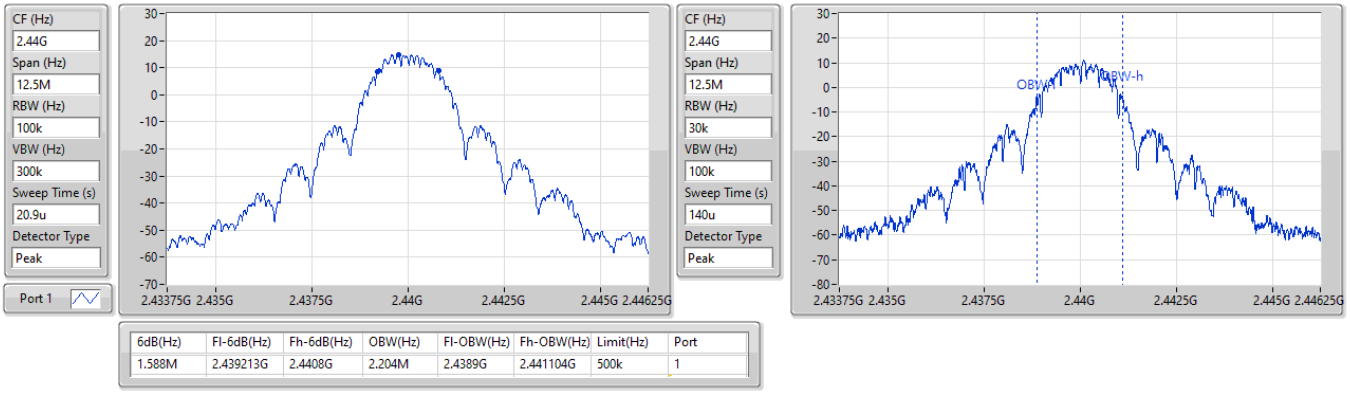
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Zigbee	-	-	-	-
2405MHz	Pass	500k	1.331M	2.202M
2440MHz	Pass	500k	1.588M	2.204M
2475MHz	Pass	500k	1.263M	2.206M
2480MHz	Pass	500k	1.55M	2.174M

Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_Zigbee **EBW**

2440MHz

15/05/2024



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.588M	2.439213G	2.4408G	2.204M	2.4389G	2.441104G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	18.88	0.07727

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-
2405MHz	Pass	3.765	18.82	18.82	30.00
2440MHz	Pass	3.765	18.88	18.88	30.00
2475MHz	Pass	3.765	17.15	17.15	30.00
2480MHz	Pass	3.765	3.94	3.94	30.00

DG = Directional Gain; Port X = Port X output power;
Inf = There's no restriction for the limit.

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Zigbee	3.44

RBW = 3kHz;

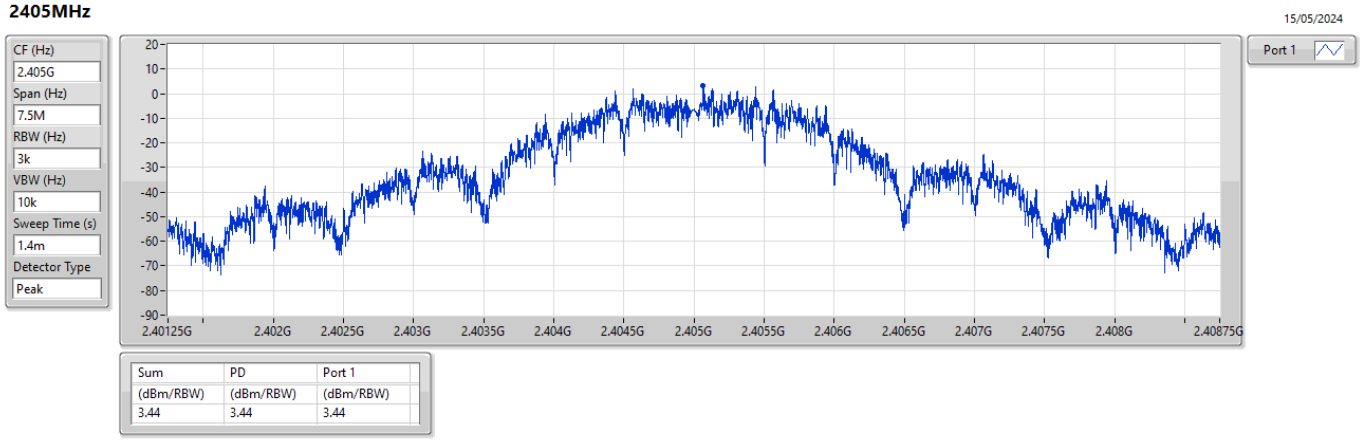
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-
2405MHz	Pass	3.765	3.44	3.44	8.00
2440MHz	Pass	3.765	3.00	3.00	8.00
2475MHz	Pass	3.765	1.80	1.80	8.00
2480MHz	Pass	3.765	-11.34	-11.34	8.00

DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;
Inf = There's no restriction for the limit.

2.4-2.4835GHz_Zigbee **PSD**

2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
3.44	3.44	3.44

Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	2.43991G	19.15	-10.85	1.9946G	-54.21	2.39688G	-42.88	2.4G	-46.06	2.5031G	-53.16	7.2137G	-42.19	1

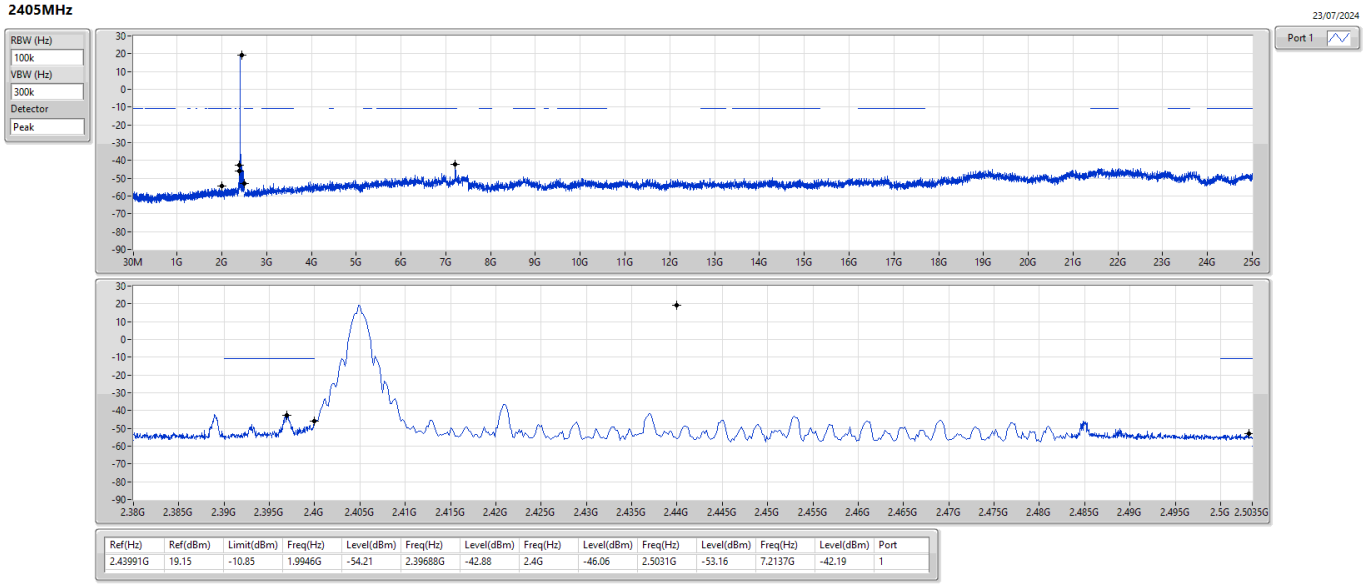
Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.43991G	19.15	-10.85	1.9946G	-54.21	2.39688G	-42.88	2.4G	-46.06	2.5031G	-53.16	7.2137G	-42.19	1
2440MHz	Pass	2.43991G	19.15	-10.85	1.9382G	-54.86	2.4G	-45.13	2.4G	-46.08	2.50106G	-52.86	21.63396G	-44.48	1
2475MHz	Pass	2.43991G	19.15	-10.85	2.03455G	-54.76	2.39904G	-48.18	2.4G	-55.47	2.50278G	-52.68	21.50461G	-43.77	1
2480MHz	Pass	2.43991G	19.15	-10.85	743.23M	-55.83	2.39156G	-53.25	2.4G	-55.47	2.50098G	-53.08	24.61756G	-41.55	1

2.4-2.4835GHz_Zigbee

CSENdB

2405MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43991G	19.15	-10.85	1.9946G	-54.21	2.39688G	-42.88	2.4G	-46.06	2.5031G	-53.16	7.2137G	-42.19	1

Summary

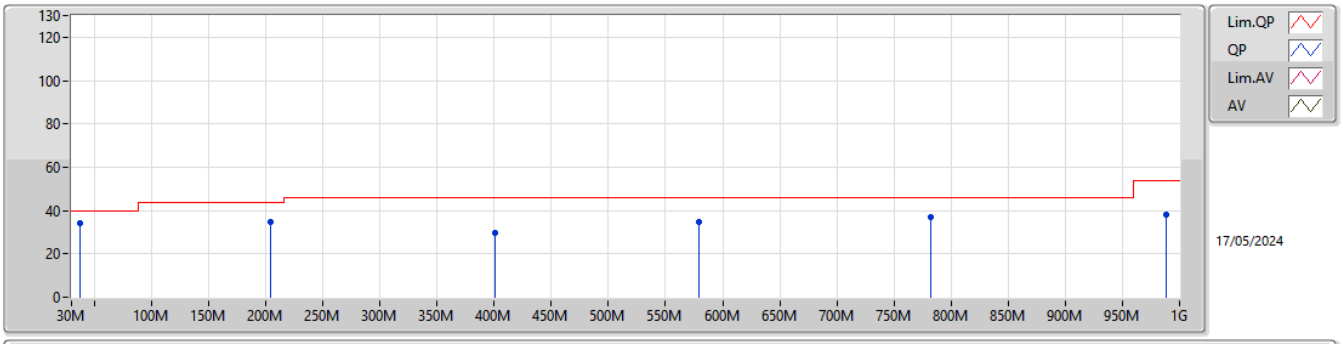
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	PK	37.76M	33.93	40.00	-6.07	3	Vertical	0	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Zigbee	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	37.76M	33.93	40.00	-6.07	3	Vertical	0	1.00
2440MHz	Pass	PK	204.6M	34.55	43.50	-8.95	3	Vertical	0	1.00
2440MHz	Pass	PK	400.54M	29.80	46.00	-16.20	3	Vertical	0	1.00
2440MHz	Pass	PK	579.02M	34.52	46.00	-11.48	3	Vertical	0	1.00
2440MHz	Pass	PK	782.72M	36.89	46.00	-9.11	3	Vertical	0	1.00
2440MHz	Pass	PK	988.36M	38.30	54.00	-15.70	3	Vertical	0	1.00
2440MHz	Pass	PK	30M	31.24	40.00	-8.76	3	Horizontal	360	1.00
2440MHz	Pass	PK	204.6M	33.06	43.50	-10.44	3	Horizontal	360	1.00
2440MHz	Pass	PK	468.44M	31.30	46.00	-14.70	3	Horizontal	360	1.00
2440MHz	Pass	PK	676.02M	35.93	46.00	-10.07	3	Horizontal	360	1.00
2440MHz	Pass	PK	846.74M	37.95	46.00	-8.05	3	Horizontal	360	1.00
2440MHz	Pass	PK	988.36M	38.18	54.00	-15.82	3	Horizontal	360	1.00

2.4-2.4835GHz_Zigbee

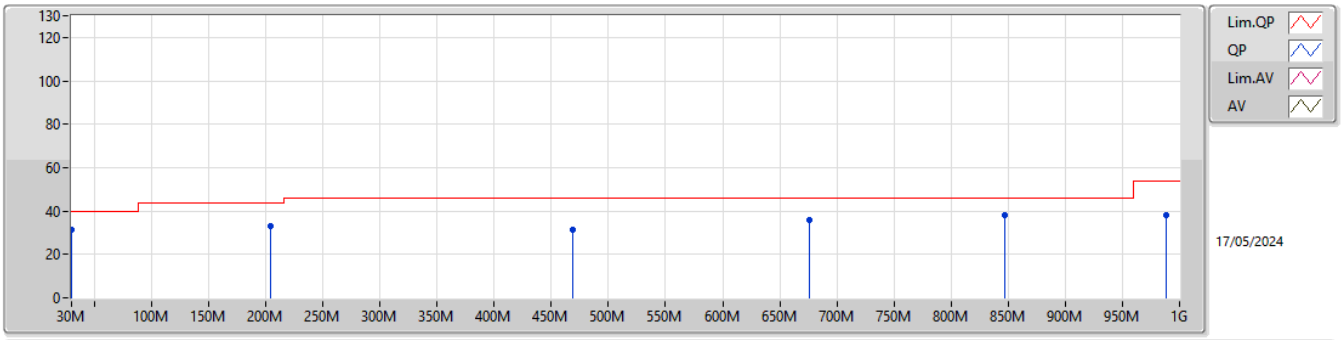
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
PK	37.76M	33.93	40.00	-6.07	-22.29	3	Vertical	0	1.00	56.22	21.57	0.44	44.30
PK	204.6M	34.55	43.50	-8.95	-27.78	3	Vertical	0	1.00	62.33	15.35	1.12	44.25
PK	400.54M	29.80	46.00	-16.20	-20.26	3	Vertical	0	1.00	50.06	22.22	1.45	43.93
PK	579.02M	34.52	46.00	-11.48	-16.01	3	Vertical	0	1.00	50.53	26.02	1.68	43.71
PK	782.72M	36.89	46.00	-9.11	-13.02	3	Vertical	0	1.00	49.91	28.35	2.07	43.44
PK	988.36M	38.30	54.00	-15.70	-10.48	3	Vertical	0	1.00	48.78	30.63	2.26	43.37

2.4-2.4835GHz_Zigbee

2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
PK	30M	31.24	40.00	-8.76	-18.66	3	Horizontal	360	1.00	49.90	25.10	0.45	44.21
PK	204.6M	33.06	43.50	-10.44	-27.78	3	Horizontal	360	1.00	60.84	15.35	1.12	44.25
PK	468.44M	31.30	46.00	-14.70	-18.76	3	Horizontal	360	1.00	50.06	23.53	1.56	43.85
PK	676.02M	35.93	46.00	-10.07	-14.93	3	Horizontal	360	1.00	50.86	26.78	1.86	43.57
PK	846.74M	37.95	46.00	-8.05	-11.61	3	Horizontal	360	1.00	49.56	29.70	2.09	43.40
PK	988.36M	38.18	54.00	-15.82	-10.48	3	Horizontal	360	1.00	48.66	30.63	2.26	43.37

Summary

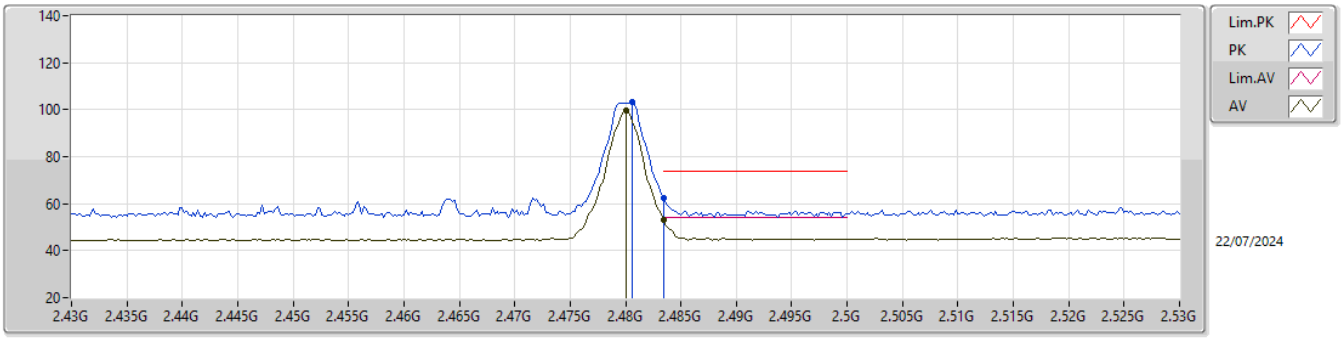
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	2.4835G	53.33	54.00	-0.67	3	Vertical	94	1.05

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Zigbee	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	AV	2.389G	44.56	54.00	-9.44	3	Vertical	65	1.36
2405MHz	Pass	AV	2.405G	114.37	Inf	-Inf	3	Vertical	65	1.36
2405MHz	Pass	PK	2.3888G	67.02	74.00	-6.98	3	Vertical	65	1.36
2405MHz	Pass	PK	2.4054G	117.57	Inf	-Inf	3	Vertical	65	1.36
2405MHz	Pass	AV	2.3882G	44.74	54.00	-9.26	3	Horizontal	149	1.87
2405MHz	Pass	AV	2.405G	106.17	Inf	-Inf	3	Horizontal	149	1.87
2405MHz	Pass	PK	2.389G	60.94	74.00	-13.06	3	Horizontal	149	1.87
2405MHz	Pass	PK	2.4044G	109.31	Inf	-Inf	3	Horizontal	149	1.87
2405MHz	Pass	AV	4.81102G	37.86	54.00	-16.14	3	Vertical	310	2.96
2405MHz	Pass	PK	4.81111G	47.18	74.00	-26.82	3	Vertical	310	2.96
2405MHz	Pass	AV	4.81091G	33.74	54.00	-20.26	3	Horizontal	108	3.00
2405MHz	Pass	PK	4.80926G	44.21	74.00	-29.79	3	Horizontal	108	3.00
2440MHz	Pass	AV	2.35G	44.52	54.00	-9.48	3	Vertical	113	2.45
2440MHz	Pass	AV	2.44G	114.58	Inf	-Inf	3	Vertical	113	2.45
2440MHz	Pass	AV	2.4944G	45.23	54.00	-8.77	3	Vertical	113	2.45
2440MHz	Pass	PK	2.3876G	57.99	74.00	-16.01	3	Vertical	113	2.45
2440MHz	Pass	PK	2.4396G	117.78	Inf	-Inf	3	Vertical	113	2.45
2440MHz	Pass	PK	2.488G	64.71	74.00	-9.29	3	Vertical	113	2.45
2440MHz	Pass	AV	2.3844G	44.43	54.00	-9.57	3	Horizontal	145	2.37
2440MHz	Pass	AV	2.44G	105.71	Inf	-Inf	3	Horizontal	145	2.37
2440MHz	Pass	AV	2.4972G	45.11	54.00	-8.89	3	Horizontal	145	2.37
2440MHz	Pass	PK	2.3516G	56.49	74.00	-17.51	3	Horizontal	145	2.37
2440MHz	Pass	PK	2.4404G	108.93	Inf	-Inf	3	Horizontal	145	2.37
2440MHz	Pass	PK	2.488G	57.17	74.00	-16.83	3	Horizontal	145	2.37
2440MHz	Pass	AV	4.88098G	35.68	54.00	-18.32	3	Vertical	263	2.64
2440MHz	Pass	PK	4.87888G	46.12	74.00	-27.88	3	Vertical	263	2.64
2440MHz	Pass	AV	4.88109G	33.14	54.00	-20.86	3	Horizontal	107	1.50
2440MHz	Pass	PK	4.88G	44.50	74.00	-29.50	3	Horizontal	107	1.50
2475MHz	Pass	AV	2.4752G	112.66	Inf	-Inf	3	Vertical	91	1.15
2475MHz	Pass	AV	2.484G	45.76	54.00	-8.24	3	Vertical	91	1.15
2475MHz	Pass	PK	2.4746G	115.86	Inf	-Inf	3	Vertical	91	1.15
2475MHz	Pass	PK	2.4908G	65.84	74.00	-8.16	3	Vertical	91	1.15
2475MHz	Pass	AV	2.475G	103.81	Inf	-Inf	3	Horizontal	152	2.70
2475MHz	Pass	AV	2.4836G	45.57	54.00	-8.43	3	Horizontal	152	2.70
2475MHz	Pass	PK	2.4746G	107.10	Inf	-Inf	3	Horizontal	152	2.70
2475MHz	Pass	PK	2.4906G	58.77	74.00	-15.23	3	Horizontal	152	2.70
2475MHz	Pass	AV	4.95114G	32.27	54.00	-21.73	3	Vertical	57	1.50
2475MHz	Pass	PK	4.95091G	43.96	74.00	-30.04	3	Vertical	57	1.50
2475MHz	Pass	AV	4.9509G	31.83	54.00	-22.17	3	Horizontal	238	1.41
2475MHz	Pass	PK	4.94927G	42.29	74.00	-31.71	3	Horizontal	238	1.41
2480MHz	Pass	AV	2.48G	99.76	Inf	-Inf	3	Vertical	94	1.05
2480MHz	Pass	AV	2.4835G	53.33	54.00	-0.67	3	Vertical	94	1.05
2480MHz	Pass	PK	2.4806G	103.02	Inf	-Inf	3	Vertical	94	1.05
2480MHz	Pass	PK	2.4835G	62.33	74.00	-11.67	3	Vertical	94	1.05
2480MHz	Pass	AV	2.48G	91.46	Inf	-Inf	3	Horizontal	168	1.18
2480MHz	Pass	AV	2.4835G	47.79	54.00	-6.21	3	Horizontal	168	1.18
2480MHz	Pass	PK	2.4796G	94.75	Inf	-Inf	3	Horizontal	168	1.18
2480MHz	Pass	PK	2.4835G	58.11	74.00	-15.89	3	Horizontal	168	1.18
2480MHz	Pass	AV	4.96122G	30.04	54.00	-23.96	3	Vertical	51	1.50
2480MHz	Pass	PK	4.96095G	42.33	74.00	-31.67	3	Vertical	51	1.50
2480MHz	Pass	AV	4.96164G	29.96	54.00	-24.04	3	Horizontal	116	1.50
2480MHz	Pass	PK	4.96134G	43.75	74.00	-30.25	3	Horizontal	116	1.50

2.4-2.4835GHz_Zigbee

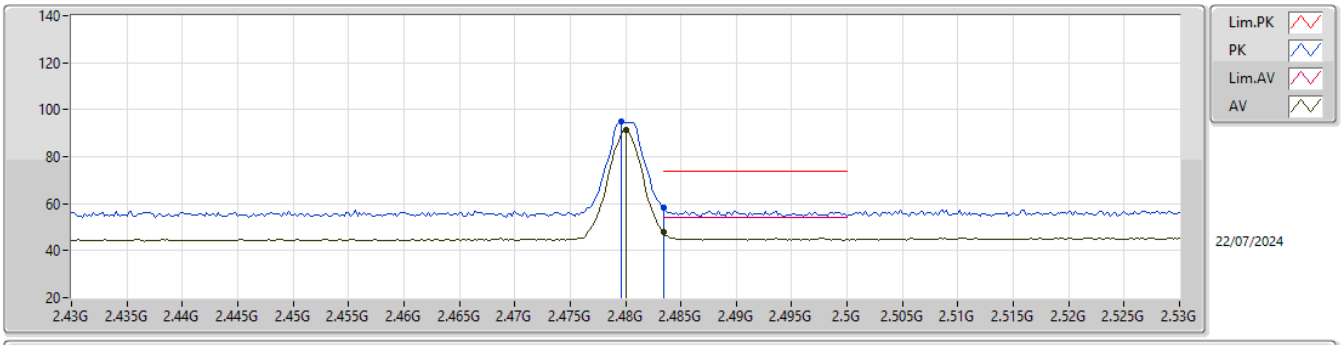
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	99.76	Inf	-Inf	31.10	3	Vertical	94	1.05	68.66	27.90	3.20	-
AV	2.4835G	53.33	54.00	-0.67	31.15	3	Vertical	94	1.05	22.18	27.94	3.21	-
PK	2.4806G	103.02	Inf	-Inf	31.11	3	Vertical	94	1.05	71.91	27.91	3.20	-
PK	2.4835G	62.33	74.00	-11.67	31.15	3	Vertical	94	1.05	31.18	27.94	3.21	-

2.4-2.4835GHz_Zigbee

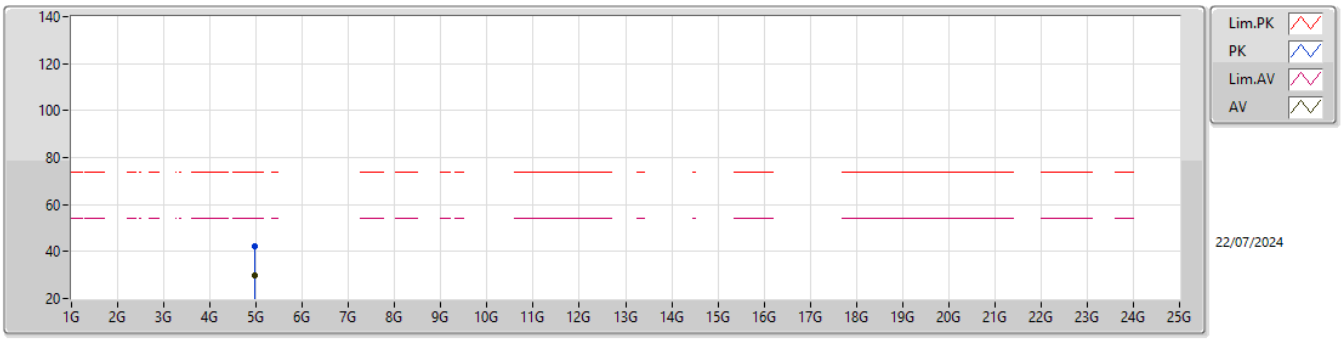
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	91.46	Inf	-Inf	31.10	3	Horizontal	168	1.18	60.36	27.90	3.20	-
AV	2.4835G	47.79	54.00	-6.21	31.15	3	Horizontal	168	1.18	16.64	27.94	3.21	-
PK	2.4796G	94.75	Inf	-Inf	31.10	3	Horizontal	168	1.18	63.65	27.90	3.20	-
PK	2.4835G	58.11	74.00	-15.89	31.15	3	Horizontal	168	1.18	26.96	27.94	3.21	-

2.4-2.4835GHz_Zigbee

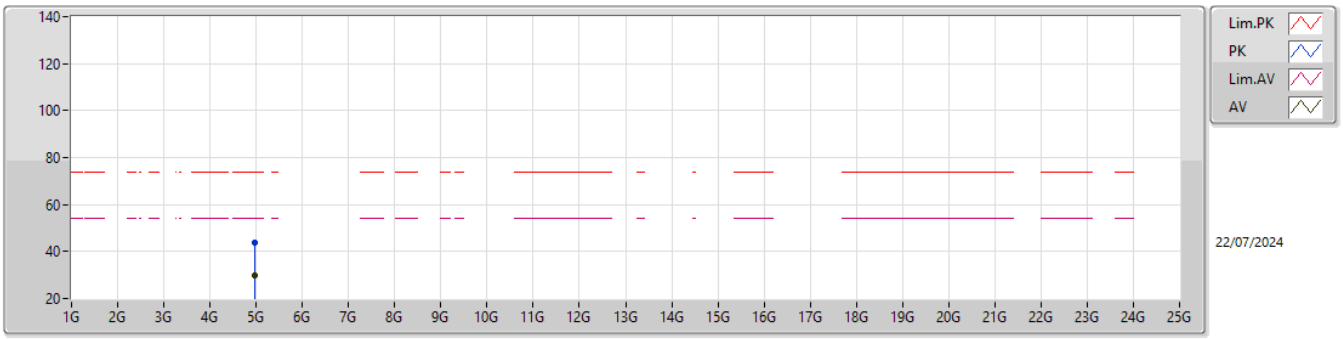
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.96122G	30.04	54.00	-23.96	-6.04	3	Vertical	51	1.50	36.08	33.31	4.70	44.05
PK	4.96095G	42.33	74.00	-31.67	-6.04	3	Vertical	51	1.50	48.37	33.31	4.70	44.05

2.4-2.4835GHz_Zigbee

2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.96164G	29.96	54.00	-24.04	-6.03	3	Horizontal	116	1.50	35.99	33.32	4.70	44.05
PK	4.96134G	43.75	74.00	-30.25	-6.04	3	Horizontal	116	1.50	49.79	33.31	4.70	44.05

Summary

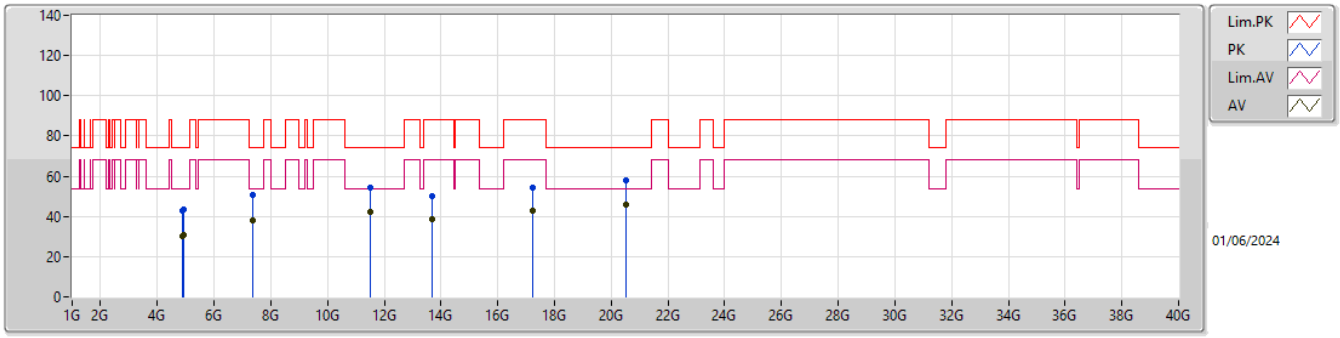
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	20.54466G	50.58	54.00	-3.42	Horizontal
Mode 2	Pass	AV	20.53628G	50.48	54.00	-3.52	Horizontal

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Mode 1	Pass	AV	4.87993G	29.92	54.00	-24.08	3	Vertical	176	1.44
Mode 1	Pass	AV	4.9197G	31.01	54.00	-22.99	3	Vertical	85	1.53
Mode 1	Pass	AV	7.37644G	38.19	54.00	-15.81	3	Vertical	2	1.50
Mode 1	Pass	AV	11.49226G	42.11	54.00	-11.89	3	Vertical	290	1.74
Mode 1	Pass	AV	13.6918G	38.87	68.20	-29.33	3	Vertical	104	1.31
Mode 1	Pass	AV	17.23794G	42.55	68.20	-25.65	3	Vertical	290	1.50
Mode 1	Pass	AV	20.53165G	46.06	54.00	-7.94	3	Vertical	23	1.16
Mode 1	Pass	PK	4.87854G	42.75	74.00	-31.25	3	Vertical	176	1.44
Mode 1	Pass	PK	4.9221G	43.30	74.00	-30.70	3	Vertical	85	1.53
Mode 1	Pass	PK	7.3639G	50.65	74.00	-23.35	3	Vertical	2	1.50
Mode 1	Pass	PK	11.49268G	54.01	74.00	-19.99	3	Vertical	290	1.74
Mode 1	Pass	PK	13.694G	50.10	88.20	-38.10	3	Vertical	104	1.31
Mode 1	Pass	PK	17.22838G	54.45	88.20	-33.75	3	Vertical	290	1.50
Mode 1	Pass	PK	20.53169G	57.65	74.00	-16.35	3	Vertical	314	2.16
Mode 1	Pass	AV	4.8801G	29.90	54.00	-24.10	3	Horizontal	247	1.35
Mode 1	Pass	AV	4.92348G	30.84	54.00	-23.16	3	Horizontal	335	2.71
Mode 1	Pass	AV	7.36614G	45.95	54.00	-8.05	3	Horizontal	295	1.93
Mode 1	Pass	AV	11.4927G	43.70	54.00	-10.30	3	Horizontal	267	2.52
Mode 1	Pass	AV	13.69792G	38.76	68.20	-29.44	3	Horizontal	352	1.00
Mode 1	Pass	AV	17.23356G	48.78	68.20	-19.42	3	Horizontal	318	1.50
Mode 1	Pass	AV	20.54466G	50.58	54.00	-3.42	3	Horizontal	312	1.18
Mode 1	Pass	PK	4.87988G	43.68	74.00	-30.32	3	Horizontal	247	1.35
Mode 1	Pass	PK	4.92174G	42.90	74.00	-31.10	3	Horizontal	335	2.71
Mode 1	Pass	PK	7.36442G	60.63	74.00	-13.37	3	Horizontal	295	1.93
Mode 1	Pass	PK	11.4875G	54.63	74.00	-19.37	3	Horizontal	267	2.52
Mode 1	Pass	PK	13.68982G	49.89	88.20	-38.31	3	Horizontal	352	1.00
Mode 1	Pass	PK	17.23836G	60.41	88.20	-27.79	3	Horizontal	318	1.50
Mode 1	Pass	PK	20.54464G	62.28	74.00	-11.72	3	Horizontal	36	1.53
Mode 2	Pass	AV	4.88G	29.77	54.00	-24.23	3	Vertical	331	2.88
Mode 2	Pass	AV	4.92074G	30.99	54.00	-23.01	3	Vertical	19	1.69
Mode 2	Pass	AV	7.3755G	37.98	54.00	-16.02	3	Vertical	2	1.50
Mode 2	Pass	AV	11.49198G	42.07	54.00	-11.93	3	Vertical	290	1.74
Mode 2	Pass	AV	13.69666G	38.89	68.20	-29.31	3	Vertical	264	1.68
Mode 2	Pass	AV	17.2329G	42.48	68.20	-25.72	3	Vertical	290	1.50
Mode 2	Pass	AV	20.53167G	45.96	54.00	-8.04	3	Vertical	209	1.38
Mode 2	Pass	PK	4.87982G	42.12	74.00	-31.88	3	Vertical	331	2.88
Mode 2	Pass	PK	4.92002G	43.27	74.00	-30.73	3	Vertical	19	1.69
Mode 2	Pass	PK	7.37552G	50.85	74.00	-23.15	3	Vertical	2	1.50
Mode 2	Pass	PK	11.48354G	54.54	74.00	-19.46	3	Vertical	290	1.74
Mode 2	Pass	PK	13.699G	50.72	88.20	-37.48	3	Vertical	264	1.68
Mode 2	Pass	PK	17.2324G	54.28	88.20	-33.92	3	Vertical	290	1.50
Mode 2	Pass	PK	20.53175G	57.59	74.00	-16.41	3	Vertical	174	1.18
Mode 2	Pass	AV	4.88007G	29.82	54.00	-24.18	3	Horizontal	302	1.86
Mode 2	Pass	AV	4.92372G	30.85	54.00	-23.15	3	Horizontal	208	1.38
Mode 2	Pass	AV	7.36496G	46.08	54.00	-7.92	3	Horizontal	295	1.93
Mode 2	Pass	AV	11.49318G	43.90	54.00	-10.10	3	Horizontal	267	2.52
Mode 2	Pass	AV	13.69478G	38.68	68.20	-29.52	3	Horizontal	209	1.24
Mode 2	Pass	AV	17.23354G	49.01	68.20	-19.19	3	Horizontal	318	1.50
Mode 2	Pass	AV	20.53628G	50.48	54.00	-3.52	3	Horizontal	180	1.40
Mode 2	Pass	PK	4.87933G	42.52	74.00	-31.48	3	Horizontal	302	1.86

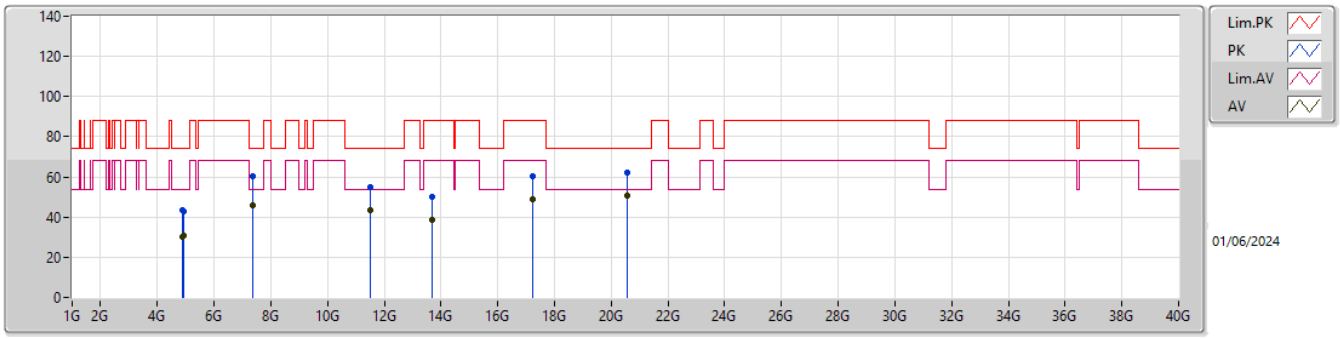
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Mode 2	Pass	PK	4.92266G	42.87	74.00	-31.13	3	Horizontal	208	1.38
Mode 2	Pass	PK	7.36518G	59.58	74.00	-14.42	3	Horizontal	295	1.93
Mode 2	Pass	PK	11.48754G	54.89	74.00	-19.11	3	Horizontal	267	2.52
Mode 2	Pass	PK	13.69756G	51.14	88.20	-37.06	3	Horizontal	209	1.24
Mode 2	Pass	PK	17.22888G	59.90	88.20	-28.30	3	Horizontal	318	1.50
Mode 2	Pass	PK	20.54471G	62.33	74.00	-11.67	3	Horizontal	306	2.06

Radiated Emissions above 1GHz_Mode 1



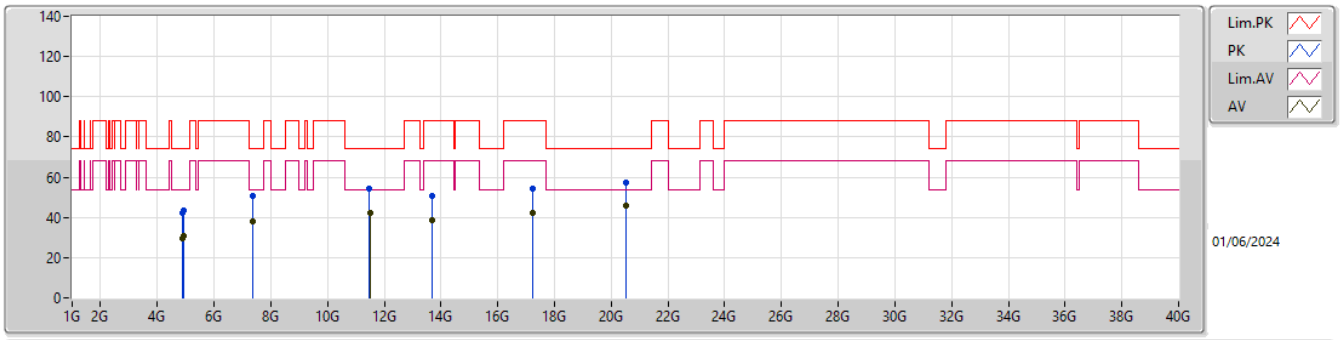
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	4.87993G	29.92	54.00	-24.08	-6.50	3	Vertical	176	1.44	36.42	32.92	4.63	44.05
AV	4.9197G	31.01	54.00	-22.99	-6.30	3	Vertical	85	1.53	37.31	33.08	4.66	44.04
AV	7.37644G	38.19	54.00	-15.81	-0.75	3	Vertical	2	1.50	38.94	36.84	6.07	43.66
AV	11.49226G	42.11	54.00	-11.89	5.08	3	Vertical	290	1.74	37.03	39.10	7.78	41.80
AV	13.6918G	38.87	68.20	-29.33	6.18	3	Vertical	104	1.31	32.69	39.92	8.90	42.64
AV	17.23794G	42.55	68.20	-25.65	4.72	3	Vertical	290	1.50	37.83	37.58	10.40	43.26
AV	20.53165G	46.06	54.00	-7.94	-24.09	3	Vertical	23	1.16	70.15	38.10	11.21	63.86
PK	4.87854G	42.75	74.00	-31.25	-6.51	3	Vertical	176	1.44	49.26	32.91	4.63	44.05
PK	4.9221G	43.30	74.00	-30.70	-6.29	3	Vertical	85	1.53	49.59	33.09	4.66	44.04
PK	7.3639G	50.65	74.00	-23.35	-0.70	3	Vertical	2	1.50	51.35	36.92	6.05	43.67
PK	11.49268G	54.01	74.00	-19.99	5.08	3	Vertical	290	1.74	48.93	39.10	7.78	41.80
PK	13.694G	50.10	88.20	-38.10	6.16	3	Vertical	104	1.31	43.94	39.91	8.90	42.65
PK	17.22838G	54.45	88.20	-33.75	4.69	3	Vertical	290	1.50	49.76	37.56	10.39	43.26
PK	20.53169G	57.65	74.00	-16.35	-24.09	3	Vertical	314	2.16	81.74	38.10	11.21	63.86

Radiated Emissions above 1GHz_Mode 1



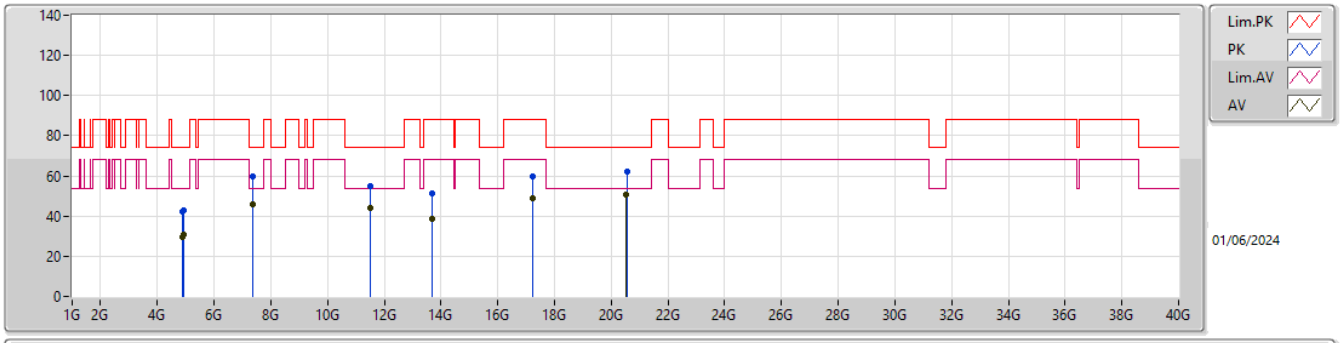
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	4.8801G	29.90	54.00	-24.10	-6.50	3	Horizontal	247	1.35	36.40	32.92	4.63	44.05
AV	4.92348G	30.84	54.00	-23.16	-6.29	3	Horizontal	335	2.71	37.13	33.09	4.66	44.04
AV	7.36614G	45.95	54.00	-8.05	-0.71	3	Horizontal	295	1.93	46.66	36.90	6.06	43.67
AV	11.4927G	43.70	54.00	-10.30	5.08	3	Horizontal	267	2.52	38.62	39.10	7.78	41.80
AV	13.69792G	38.76	68.20	-29.44	6.16	3	Horizontal	352	1.00	32.60	39.90	8.91	42.65
AV	17.23356G	48.78	68.20	-19.42	4.70	3	Horizontal	318	1.50	44.08	37.57	10.39	43.26
AV	20.54466G	50.58	54.00	-3.42	-24.08	3	Horizontal	312	1.18	74.66	38.10	11.21	63.85
PK	4.87988G	43.68	74.00	-30.32	-6.50	3	Horizontal	247	1.35	50.18	32.92	4.63	44.05
PK	4.92174G	42.90	74.00	-31.10	-6.29	3	Horizontal	335	2.71	49.19	33.09	4.66	44.04
PK	7.36442G	60.63	74.00	-13.37	-0.71	3	Horizontal	295	1.93	61.34	36.91	6.05	43.67
PK	11.4875G	54.63	74.00	-19.37	5.07	3	Horizontal	267	2.52	49.56	39.10	7.77	41.80
PK	13.68982G	49.89	88.20	-38.31	6.18	3	Horizontal	352	1.00	43.71	39.92	8.90	42.64
PK	17.23836G	60.41	88.20	-27.79	4.72	3	Horizontal	318	1.50	55.69	37.58	10.40	43.26
PK	20.54464G	62.28	74.00	-11.72	-24.08	3	Horizontal	36	1.53	86.36	38.10	11.21	63.85

Radiated Emissions above 1GHz_Mode 2



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	4.88G	29.77	54.00	-24.23	-6.50	3	Vertical	331	2.88	36.27	32.92	4.63	44.05
AV	4.92074G	30.99	54.00	-23.01	-6.30	3	Vertical	19	1.69	37.29	33.08	4.66	44.04
AV	7.3755G	37.98	54.00	-16.02	-0.74	3	Vertical	2	1.50	38.72	36.85	6.07	43.66
AV	11.49198G	42.07	54.00	-11.93	5.08	3	Vertical	290	1.74	36.99	39.10	7.78	41.80
AV	13.69666G	38.89	68.20	-29.31	6.17	3	Vertical	264	1.68	32.72	39.91	8.91	42.65
AV	17.2329G	42.48	68.20	-25.72	4.70	3	Vertical	290	1.50	37.78	37.57	10.39	43.26
AV	20.53167G	45.96	54.00	-8.04	-24.09	3	Vertical	209	1.38	70.05	38.10	11.21	63.86
PK	4.87982G	42.12	74.00	-31.88	-6.50	3	Vertical	331	2.88	48.62	32.92	4.63	44.05
PK	4.92002G	43.27	74.00	-30.73	-6.30	3	Vertical	19	1.69	49.57	33.08	4.66	44.04
PK	7.37552G	50.85	74.00	-23.15	-0.74	3	Vertical	2	1.50	51.59	36.85	6.07	43.66
PK	11.48354G	54.54	74.00	-19.46	5.06	3	Vertical	290	1.74	49.48	39.10	7.77	41.81
PK	13.699G	50.72	88.20	-37.48	6.16	3	Vertical	264	1.68	44.56	39.90	8.91	42.65
PK	17.2324G	54.28	88.20	-33.92	4.69	3	Vertical	290	1.50	49.59	37.56	10.39	43.26
PK	20.53175G	57.59	74.00	-16.41	-24.09	3	Vertical	174	1.18	81.68	38.10	11.21	63.86

Radiated Emissions above 1GHz_Mode 2



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	4.88007G	29.82	54.00	-24.18	-6.50	3	Horizontal	302	1.86	36.32	32.92	4.63	44.05
AV	4.92372G	30.85	54.00	-23.15	-6.28	3	Horizontal	208	1.38	37.13	33.09	4.67	44.04
AV	7.36496G	46.08	54.00	-7.92	-0.71	3	Horizontal	295	1.93	46.79	36.91	6.05	43.67
AV	11.49318G	43.90	54.00	-10.10	5.08	3	Horizontal	267	2.52	38.82	39.10	7.78	41.80
AV	13.69478G	38.68	68.20	-29.52	6.17	3	Horizontal	209	1.24	32.51	39.91	8.91	42.65
AV	17.23354G	49.01	68.20	-19.19	4.70	3	Horizontal	318	1.50	44.31	37.57	10.39	43.26
AV	20.53628G	50.48	54.00	-3.52	-24.09	3	Horizontal	180	1.40	74.57	38.10	11.21	63.86
PK	4.87933G	42.52	74.00	-31.48	-6.50	3	Horizontal	302	1.86	49.02	32.92	4.63	44.05
PK	4.92266G	42.87	74.00	-31.13	-6.29	3	Horizontal	208	1.38	49.16	33.09	4.66	44.04
PK	7.36518G	59.58	74.00	-14.42	-0.71	3	Horizontal	295	1.93	60.29	36.91	6.05	43.67
PK	11.48754G	54.89	74.00	-19.11	5.07	3	Horizontal	267	2.52	49.82	39.10	7.77	41.80
PK	13.69756G	51.14	88.20	-37.06	6.16	3	Horizontal	209	1.24	44.98	39.90	8.91	42.65
PK	17.22888G	59.90	88.20	-28.30	4.69	3	Horizontal	318	1.50	55.21	37.56	10.39	43.26
PK	20.54471G	62.33	74.00	-11.67	-24.08	3	Horizontal	306	2.06	86.41	38.10	11.21	63.85