Testing Laboratory 3787

RADIO TEST REPORT

FCC ID	:	2AXXQHNRM30
Equipment	:	Wi-Fi7 Tri-band AP Router
Brand Name	:	HUMAX NETWORKS
Model Name	:	HNRM30
Applicant	:	Humax Networks, INC 216, Hwangsaeul-ro, Bundang-gu, Seongnam-si, South Korea 13595
Manufacturer	:	Humax Networks, INC 216, Hwangsaeul-ro, Bundang-gu, Seongnam-si, South Korea 13595
Standard	:	47 CFR FCC Part 15.247

The product was received on Aug. 06, 2024, and testing was started from Aug. 09, 2024 and completed on Feb. 13, 2025. We, Sporton International Inc. Hsinchu 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR470906AE	01	Initial issue of report	Feb. 26, 2025

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	-

Conformity Assessment Condition:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account. 2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".
Disclaimer:
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen
Report Producer: Cathy Chiu

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	3	1TX

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

1.1.2 Antenna Information

Ant.	Port				Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth /Zigbee					
1	4	1	-	-	Galtronics	60-3693-03-2	PCB	I-PEX	Note 1
2	3	2	-	-	Galtronics	60-3693-03-2	PCB	I-PEX	
3	2	3	-	-	Galtronics	60-3693-03-1	PCB	I-PEX	
4	1	4	-	-	Galtronics	60-3693-03-1	PCB	I-PEX	
5	-	-	3	-	Galtronics	60-3695-03-2	PCB	I-PEX	
6	-	-	2	-	Galtronics	60-3610-03	PCB	I-PEX	
7	-	-	1	-	Galtronics	60-3695-03-2	PCB	I-PEX	
8	-	-	4	-	Galtronics	60-3610-03	PCB	I-PEX	
9	-	-	-	1	Galtronics	AT6901	Printed	N/A	

Note 1:

Ant.	Antenna Gain (dBi)										
	WLAN 2.4GHz	WLAN 5GHz				WLAN 6GHz				Bluetooth/ Zigbee	GPS
		UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 5	UNII 6	UNII 7	UNII 8		
1	3.68	3.73	3.25	3.77	3.16	-	-	-	-	-	-
2	2.53	3.43	3.21	3.82	3.85	-	-	-	-	-	-
3	3.76	5.24	5.15	5.05	4.94	-	-	-	-	-	-
4	4.06	4.80	4.41	3.96	3.87	-	-	-	-	-	-
5	-	-	-	-	-	4.67	4.16	4.37	4.01	-	-
6	-	-	-	-	-	3.76	3.24	4.42	4.17	-	-
7	-	-	-	-	-	4.63	5.06	4.31	4.58	-	-
8	-	-	-	-	-	3.75	3.58	3.93	4.38	-	-
9	-	-	-	-	-	-	-	-	-	3.83	-

Item	Directional Gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz			
		UNII 1	UNII 2A	UNII 2C	UNII 3
4T1S	4.75	5.35	5.86	5.30	5.17
4T2S	4.06	5.24	5.15	5.05	4.94
4T4S	4.06	5.24	5.15	5.05	4.94

Note 2: The above information (except gain of Ant. 1~4 and directional gain) was declared by the manufacturer.

Note 3: For 2.4GHz/5GHz, the antenna gain and directional gain are measured which follow the procedure of KDB 662911 D03.

For 2.4GHz function:
For IEEE 802.11 b/g/n/VHT/ax/be (4TX/4RX):
Port 1~4 can be used as transmitting/receiving antenna.
Port 1~4 could transmit/receive simultaneously.
For 5GHz function:
For IEEE 802.11 a/n/ac/ax/be (4TX/4RX):
Port 1~4 can be used as transmitting/receiving antenna.
Port 1~4 could transmit/receive simultaneously.
For 6GHz function:
For IEEE 802.11 ax/be (4TX/4RX):
Port 1~4 can be used as transmitting/receiving antenna.
Port 1~4 could transmit/receive simultaneously.
For Bluetooth function (1TX/1RX):
Only Port 1 can be used as transmitting/receiving antenna.
For Zigbee function (1TX/1RX):
Only Port 1 can be used as transmitting/receiving antenna.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF (dB)	T (s)	VBW (Hz)_1/T
Zigbee_Nss 1	1	0	n/a (DC>=0.98)	n/a (DC>=0.98)

Note:
- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	accessMtool 3.3.0.8			

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT Support Function

Function
AP
Mesh
Bridge

Note: The above information was declared by manufacturer.

1.2 Applicable Standards

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

- 47 CFR FCC Part 15.247
- ANSI C63.10-2013

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

- FCC KDB 558074 D01 v05r02
- FCC KDB 662911 D01 v02r01
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location Information	
Test Lab.：Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) TEL: 886-3-656-9065 FAX: 886-3-656-9085 Test site Designation No. TW3787 with FCC. Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH01-CB	Serway Lee	22.5~23.7 / 63~64	Aug. 20, 2024~Oct. 21, 2024
Radiated (Below 1GHz)	03CH04-CB	Ederson Huang	22.7-23.8 / 56-59	Jan. 21, 2025~Feb. 12, 2025
	03CH05-CB	Ederson Huang	21.6-22.7 / 56-59	Jan. 21, 2025~Feb. 12, 2025
Radiated (Above 1GHz)	03CH01-CB	Ederson Huang	22-23 / 55-58	Aug. 09, 2024~Oct. 14, 2024
AC Conduction	CO02-CB	Gray Lee	21~23 / 49~50	Feb. 13, 2025

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
Conducted Emission (150kHz ~ 30MHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	4.1 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.0 dB	Confidence levels of 95%
Conducted Emission	3.1 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.1 dB	Confidence levels of 95%
Bandwidth Measurement	2.1 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode
Zigbee
2405MHz
2440MHz
2475MHz
2480MHz

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	EUT + WLAN 2.4GHz
2	EUT + WLAN 5GHz
3	EUT + WLAN 6GHz
4	EUT + Bluetooth
5	EUT + Zigbee
For operating mode 1 is the worst case and it was record in this test report.	

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
After evaluating, and the worst case was found at Y-axis, so it was selected to perform test and its test result was written in the report.	
1	EUT in Y-axis + WLAN 2.4GHz
2	EUT in Y-axis + WLAN 5GHz
3	EUT in Y-axis + WLAN 6GHz
4	EUT in Y-axis + Bluetooth
5	EUT in Y-axis + Zigbee
For operating mode 1 is the worst case and it was record in this test report.	

Operating Mode > 1GHz	CTX
After evaluating, and the worst case was found at Y-axis, so it was selected to perform test and its test result was written in the report.	
1	EUT in Y-axis

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Bluetooth
2	WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Zigbee
Refer to Sporton Test Report No.: FA470906 for Co-location RF Exposure Evaluation.	

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

Accessories			
Equipment Name	**Brand Name**	**Model Name**	**Rating**
Adapter	NetBit	NBS42D120333VU	INPUT: 100-120V~, 50/60Hz, 1.0A OUTPUT: 12.0V, 3.33A
Others			
RJ-45 cable*1, non-shielded, 1.53m			

2.5 Support Equipment

For AC Conduction:

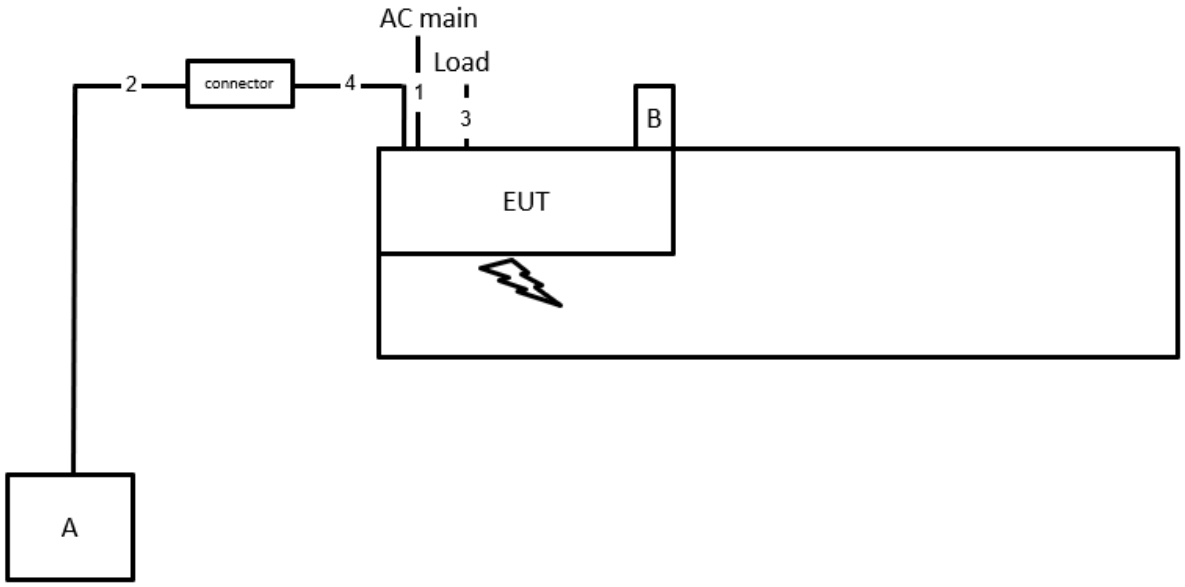
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	LAN NB	DELL	E6430	N/A
B	Flash disk3.0	Transcend	JetFlash-700	N/A

For Radiated and RF Conducted:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Notebook	DELL	E4300	N/A

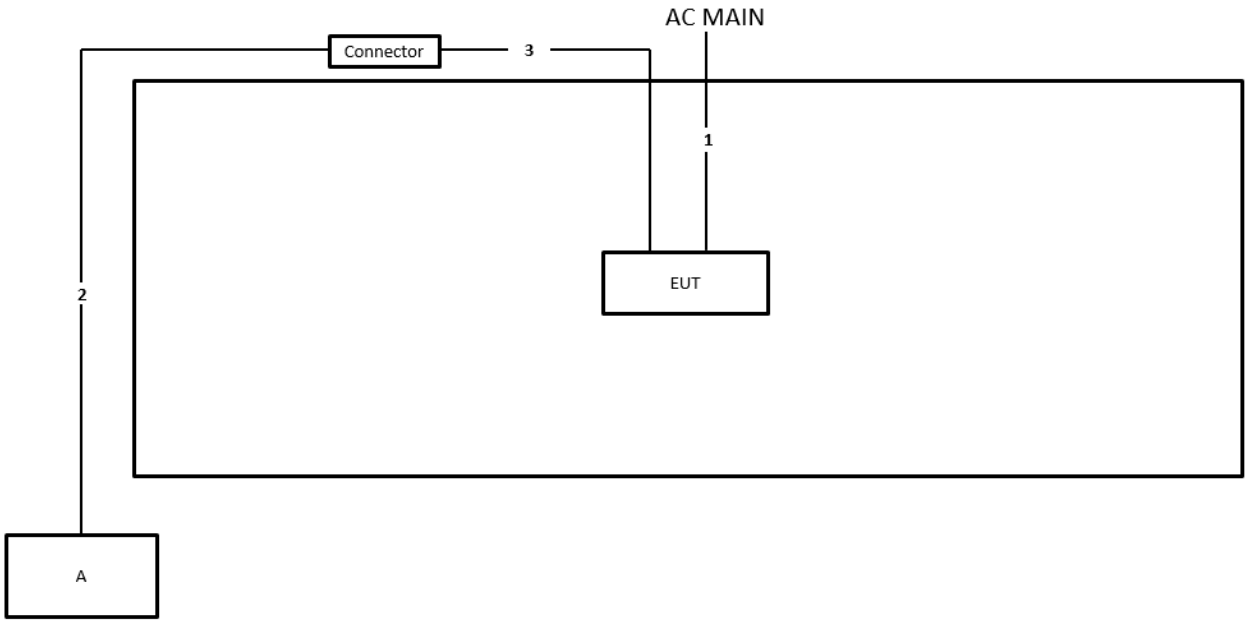
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable*4	No	1m
4	RJ-45 cable	No	1.53m

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1.53m

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

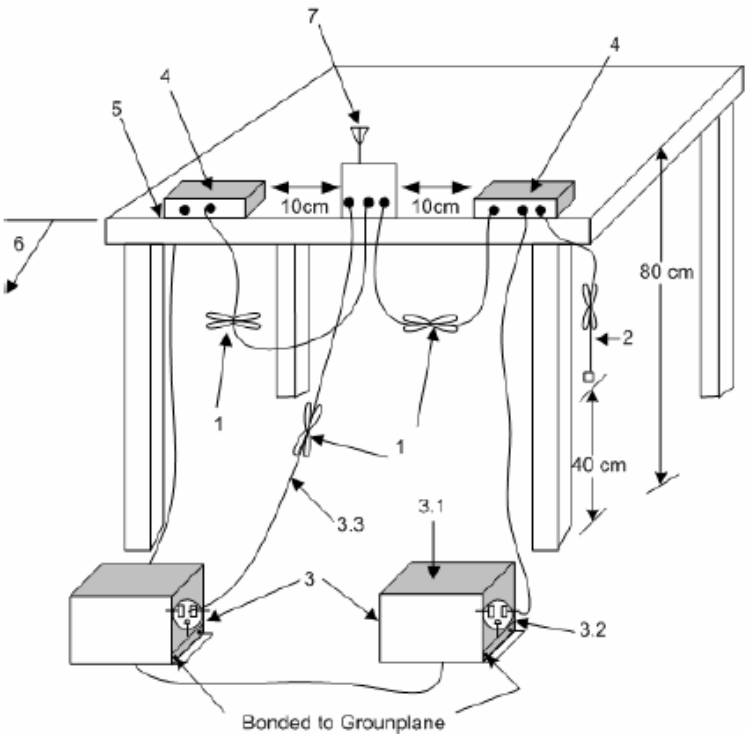
Refer a test equipment and calibration data table in this test report.

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 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 50 Ω 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.

3.1.5 Measurement Results Calculation

The measured Level is calculated using:

a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level

b. Margin = -Limit + Level

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.

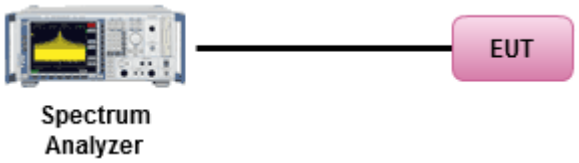
3.2.2 Measuring Instruments

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 FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
	☐ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
	☐ Refer as ANSI C63.10, clause 6.9.1 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 $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ 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 $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB 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 FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	☐ Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
▪ Maximum Conducted Output Power	
	[duty cycle ≥ 98% or external video / power trigger]
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
	Measurement using a power meter (PM)
	☐ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
	☒ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC 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

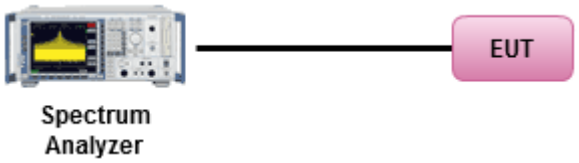
3.4.2 Measuring Instruments

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 FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		☐ Option 1: Measure and sum the spectra across the outputs. Refer as FCC 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.
		☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,
		☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

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 (dBc)**
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 PSD 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 PSD level.

3.5.2 Measuring Instruments

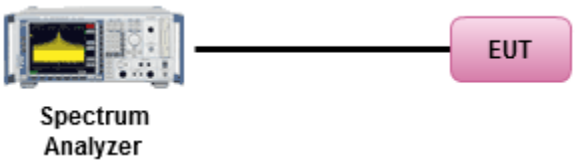
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
▪ Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted 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.

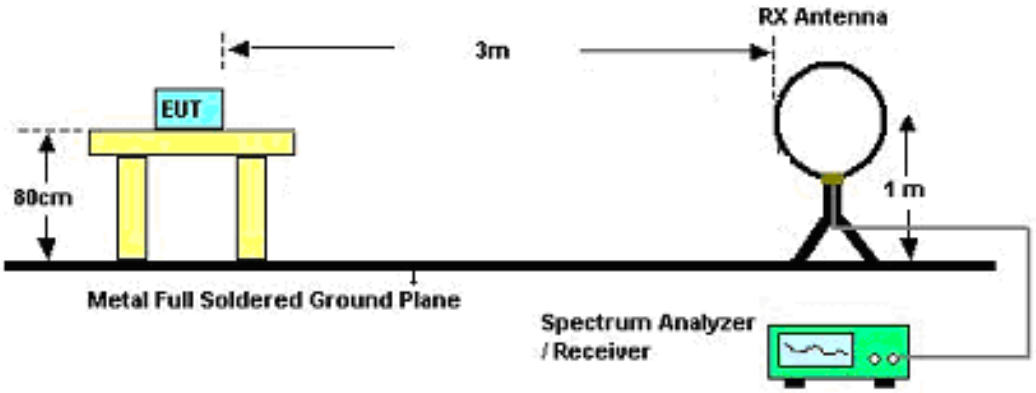
3.6.3 Test Procedures

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 FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.		
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).
		☐	Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐	Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:			
	▪ Refer as FCC KDB 558074 clause 8.7 & c63.10 clause 11.13.1, 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 FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.		
	▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).		
	▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB		
	▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.		

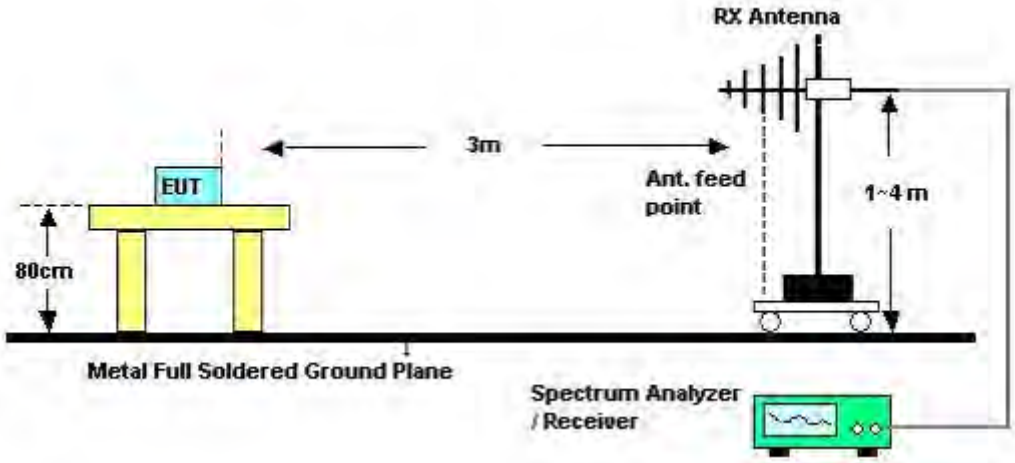
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

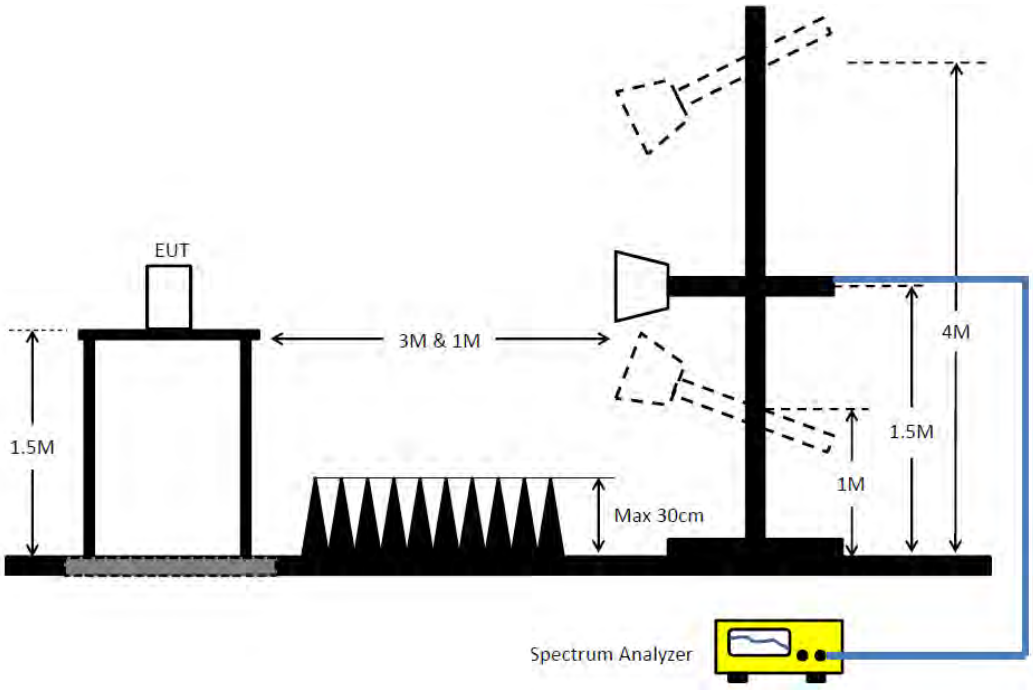
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Apr. 15, 2024	Apr. 14, 2025	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Apr. 24, 2024	Apr. 23, 2025	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	May 15, 2024	May 14, 2025	Conduction (CO02-CB)
COND Cable	Woken	Cable	02	0.15MHz ~ 30MHz	Oct. 16, 2024	Oct. 15, 2025	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Oct. 16, 2024	Oct. 15, 2025	Conduction (CO02-CB)
Test Software	SPORTON	SENSE-EMI	V5.11	150kHz-30MHz	N.C.R.	N.C.R.	Conduction (CO02-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH01-CB	1GHz ~18GHz 3m	May 04, 2024	May 03, 2025	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1370	1GHz~18GHz	Jul.11, 2024	Jul. 10, 2025	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jul. 09, 2024	Jul. 08, 2025	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02121	1GHz ~ 26.5GHz	May 17, 2024	May 16, 2025	Radiation (03CH01-CB)
Signal Analyzer	R&S	FSV3044	101437	10kHz ~ 44GHz	Nov. 28, 2023	Nov. 27, 2024	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Nov. 06, 2023	Nov. 05, 2024	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Nov. 06, 2023	Nov. 05, 2024	Radiation (03CH01-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40 GHz	Jan. 11, 2024	Jan. 10, 2025	Radiation (03CH01-CB)
Test Software	SPORTON	SENSE-15247 _DTS	V5.11.18	2.4GHz-2.4835GHz	N.C.R.	N.C.R.	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30 MHz	Oct. 16, 2024	Oct. 15, 2025	Radiation (03CH04-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH04-CB	30 MHz ~ 1 GHz	Jul. 31, 2024	Jul. 30, 2025	Radiation (03CH04-CB)
BILOG ANTENNA with 6 dB attenuator	Schaffner & EMCI	CBL6112B & N-6-06	22021&AT-N0 607	30MHz ~ 1GHz	Oct. 05, 2024	Oct. 04, 2025	Radiation (03CH04-CB)
Pre-Amplifier	EMCI	EMC330N	980391	20MHz ~ 3GHz	May 22, 2024	May 21, 2025	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 19, 2024	Mar. 18, 2025	Radiation (03CH04-CB

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Test Receiver	R&S	ESR7	102171	9kHz ~ 7GHz	Aug. 02, 2024	Aug. 01, 2025	Radiation (03CH04-CB)
RF Cable-low	Woken	RG402	Low Cable-03+67	30MHz – 1GHz	Oct. 01, 2024	Sep. 30, 2025	Radiation (03CH04-CB)
Test Software	SPORTON	SENSE-EMI	V5.11.8	30MHz-40GHz	N.C.R.	N.C.R.	Radiation (03CH04-CB)
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30 MHz	Oct. 16, 2024	Oct. 15, 2025	Radiation (03CH05-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 01, 2024	Jul. 31, 2025	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 23, 2024	Mar. 22, 2025	Radiation (03CH05-CB)
Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 02, 2024	May 01, 2025	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Apr. 17, 2024	Apr. 16, 2025	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESR7	102171	9kHz ~ 7GHz	Aug. 02, 2024	Aug. 01, 2025	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Jul. 27, 2024	Jul. 26, 2025	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE-EMI	V5.11.8	30MHz-40GHz	N.C.R.	N.C.R.	Radiation (03CH05-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	May 27, 2024	May 26, 2025	Conducted (TH01-CB)
Switch	SPTCB	SP-SWI	SWI-01	1~26.5 GHz	Oct. 03, 2023	Oct. 02, 2024	Conducted (TH01-CB)
Switch	SPTCB	SP-SWI	SWI-01	1~18 GHz	Oct. 02, 2024	Oct. 01, 2025	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz – 18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz – 18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz – 18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH01-CB)

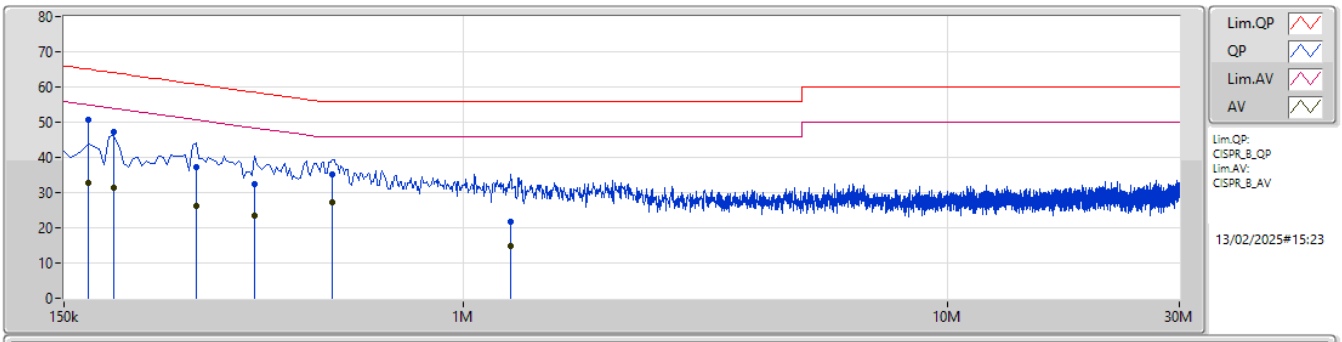
Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-30	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
Cable 9k-18G	Woken	RG402	Cable-95	9 kHz –18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Mar. 01, 2024	Feb. 28, 2025	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	MY45100745	50MHz~18GHz	Jul. 12, 2024	Jul. 11, 2025	Conducted (TH01-CB)
Test Software	SPORTON	SENSE-15247 _DTS	V5.11.18	2.4GHz-2.4835GHz	N.C.R.	N.C.R.	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.
NCR means Non-Calibration required.

Summary

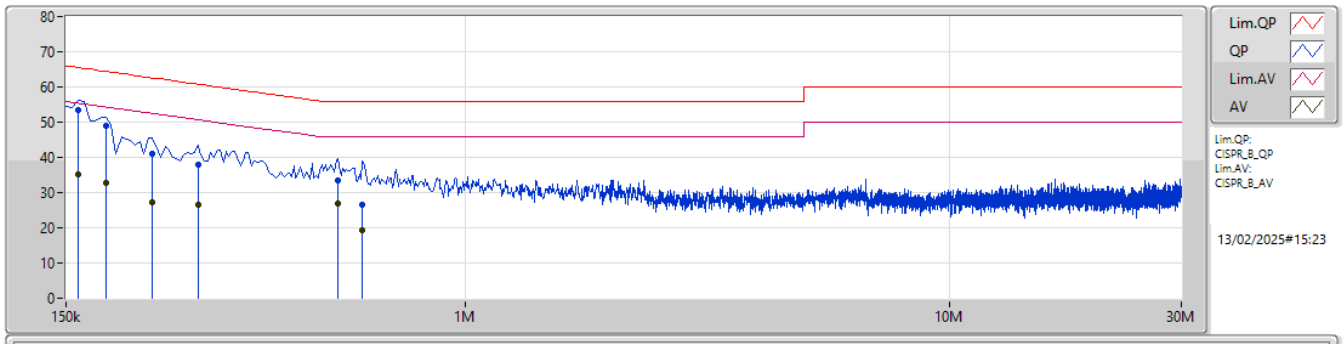
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	159k	53.29	65.52	-12.23	Neutral

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	168k	50.59	65.06	-14.47	10.15	Line	"Worst"	40.44	0.05	0.08	10.02
AV	168k	32.93	55.06	-22.13	10.15	Line	-	22.78	0.05	0.08	10.02
QP	190.5k	47.26	64.01	-16.75	10.14	Line	-	37.12	0.05	0.07	10.02
AV	190.5k	31.39	54.01	-22.62	10.14	Line	-	21.25	0.05	0.07	10.02
QP	280.5k	37.11	60.80	-23.69	10.15	Line	-	26.96	0.05	0.08	10.02
AV	280.5k	26.07	50.80	-24.73	10.15	Line	-	15.92	0.05	0.08	10.02
QP	370.5k	32.42	58.49	-26.07	10.18	Line	-	22.24	0.05	0.10	10.03
AV	370.5k	23.31	48.49	-25.18	10.18	Line	-	13.13	0.05	0.10	10.03
QP	537k	35.31	56.00	-20.69	10.19	Line	-	25.12	0.06	0.10	10.03
AV	537k	27.26	46.00	-18.74	10.19	Line	-	17.07	0.06	0.10	10.03
QP	1.253M	21.82	56.00	-34.18	10.21	Line	-	11.61	0.08	0.11	10.02
AV	1.253M	14.94	46.00	-31.06	10.21	Line	-	4.73	0.08	0.11	10.02

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	159k	53.29	65.52	-12.23	10.15	Neutral	"Worst"	43.14	0.05	0.08	10.02
AV	159k	35.22	55.52	-20.30	10.15	Neutral	-	25.07	0.05	0.08	10.02
QP	181.5k	49.13	64.41	-15.28	10.14	Neutral	-	38.99	0.05	0.07	10.02
AV	181.5k	32.77	54.41	-21.64	10.14	Neutral	-	22.63	0.05	0.07	10.02
QP	226.5k	41.10	62.58	-21.48	10.15	Neutral	-	30.95	0.05	0.08	10.02
AV	226.5k	27.20	52.58	-25.38	10.15	Neutral	-	17.05	0.05	0.08	10.02
QP	280.5k	37.98	60.80	-22.82	10.15	Neutral	-	27.83	0.05	0.08	10.02
AV	280.5k	26.45	50.80	-24.35	10.15	Neutral	-	16.30	0.05	0.08	10.02
QP	546k	33.57	56.00	-22.43	10.18	Neutral	-	23.39	0.05	0.10	10.03
AV	546k	26.74	46.00	-19.26	10.18	Neutral	-	16.56	0.05	0.10	10.03
QP	613.5k	26.49	56.00	-29.51	10.18	Neutral	-	16.31	0.05	0.10	10.03
AV	613.5k	19.22	46.00	-26.78	10.18	Neutral	-	9.04	0.05	0.10	10.03

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Zigbee	1.575M	2.224M	2M22G1D	1.519M	2.18M

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

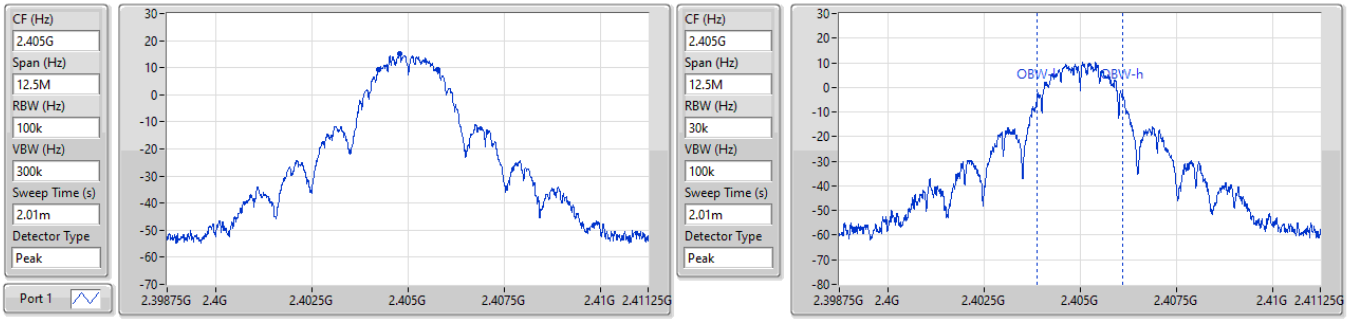
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Zigbee	-	-	-	-
2405MHz	Pass	500k	1.538M	2.224M
2440MHz	Pass	500k	1.538M	2.18M
2475MHz	Pass	500k	1.575M	2.186M
2480MHz	Pass	500k	1.519M	2.193M

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

2.4-2.4835GHz_Zigbee **EBW**

2405MHz

22/08/2024

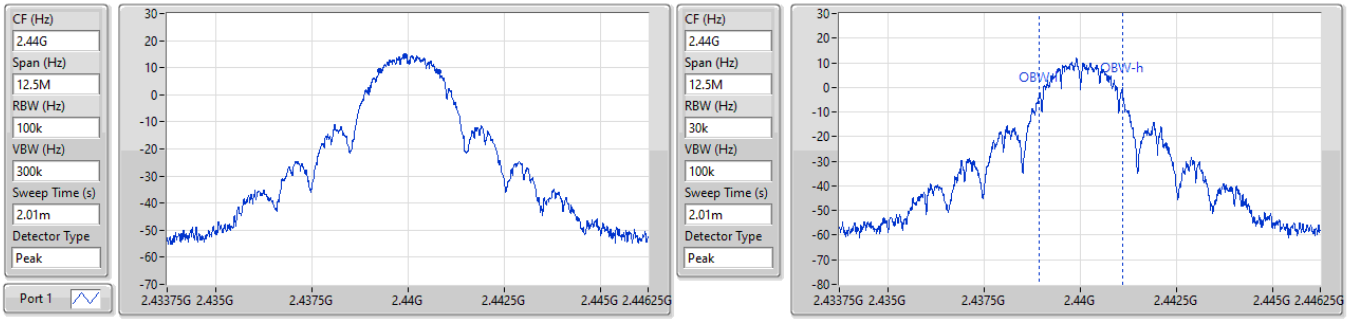


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.538M	2.404244G	2.405781G	2.224M	2.403901G	2.406124G	500k	1

2.4-2.4835GHz_Zigbee **EBW**

2440MHz

22/08/2024

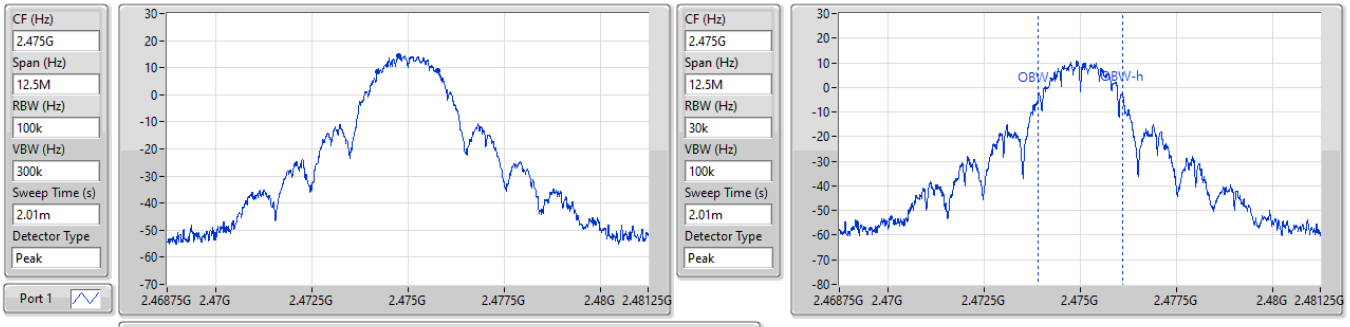


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.538M	2.439263G	2.4408G	2.18M	2.438932G	2.441112G	500k	1

2.4-2.4835GHz_Zigbee **EBW**

2475MHz

22/08/2024

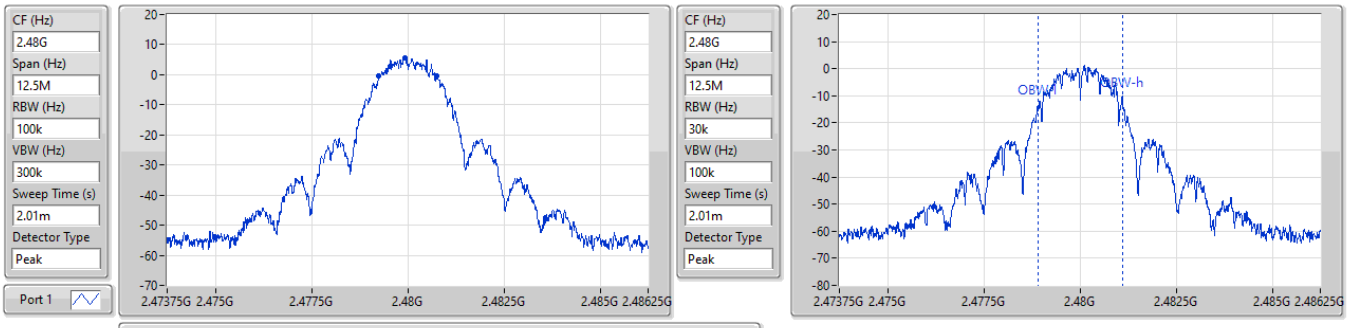


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.575M	2.474219G	2.475794G	2.186M	2.473919G	2.476106G	500k	1

2.4-2.4835GHz_Zigbee **EBW**

2480MHz

22/08/2024



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.519M	2.47925G	2.480769G	2.193M	2.478926G	2.481118G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	19.36	0.08630

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-
2405MHz	Pass	3.83	19.24	19.24	30.00
2440MHz	Pass	3.83	19.36	19.36	30.00
2475MHz	Pass	3.83	19.15	19.15	30.00
2480MHz	Pass	3.83	9.52	9.52	30.00

DG = Directional Gain; Port X = Port X output power

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Zigbee	4.47

RBW = 3kHz;

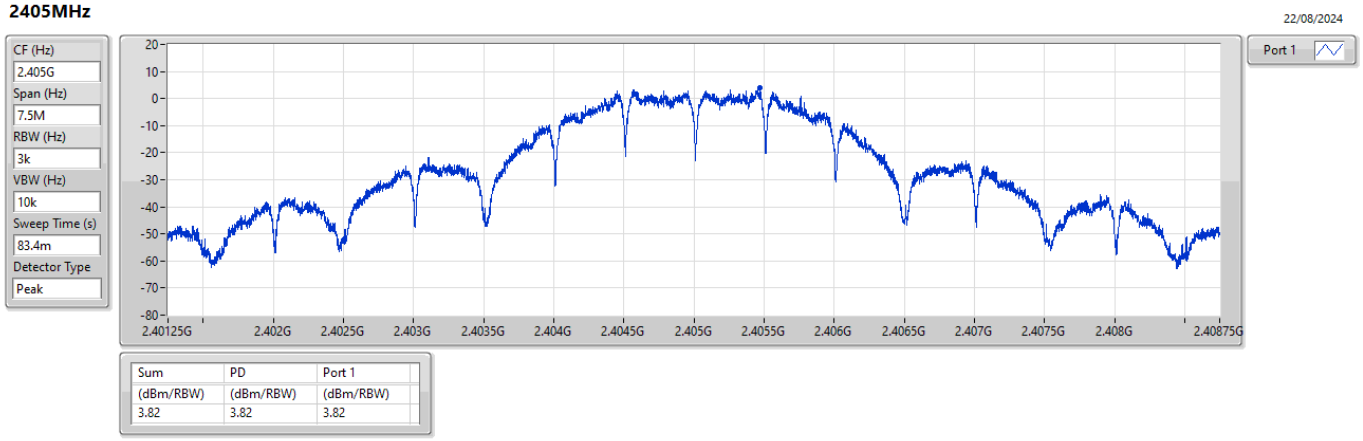
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-
2405MHz	Pass	3.83	3.82	3.82	8.00
2440MHz	Pass	3.83	4.47	4.47	8.00
2475MHz	Pass	3.83	3.69	3.69	8.00
2480MHz	Pass	3.83	-4.56	-4.56	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;

2.4-2.4835GHz_Zigbee **PSD**

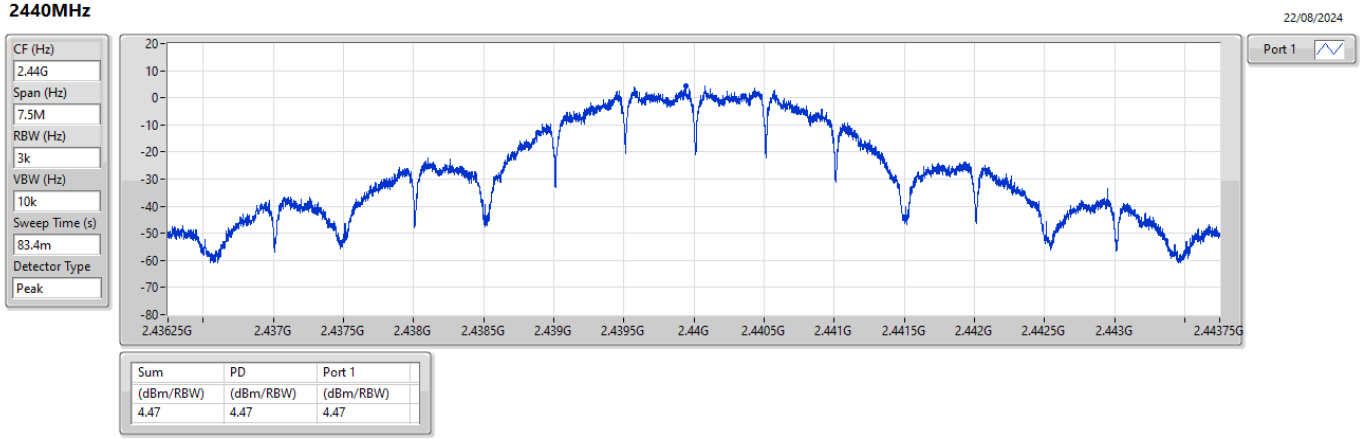
2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
3.82	3.82	3.82

2.4-2.4835GHz_Zigbee **PSD**

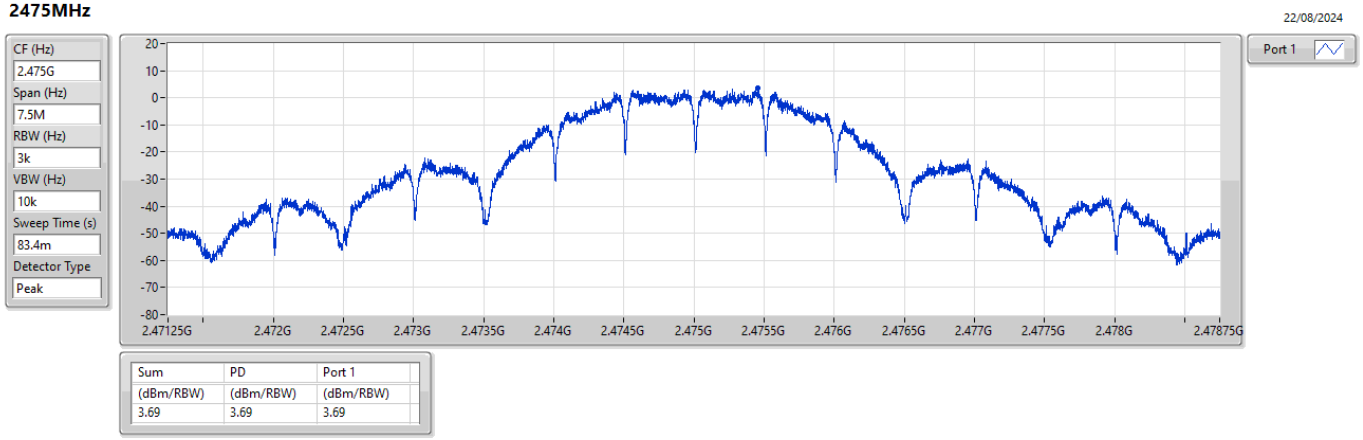
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.47	4.47	4.47

2.4-2.4835GHz_Zigbee **PSD**

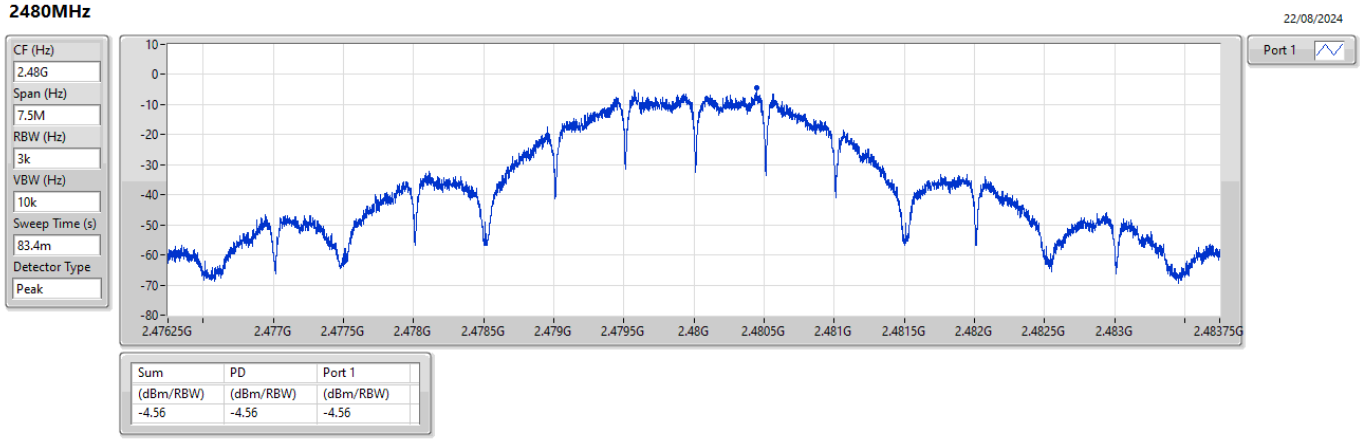
2475MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
3.69	3.69	3.69

2.4-2.4835GHz_Zigbee **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-4.56	-4.56	-4.56

Summary

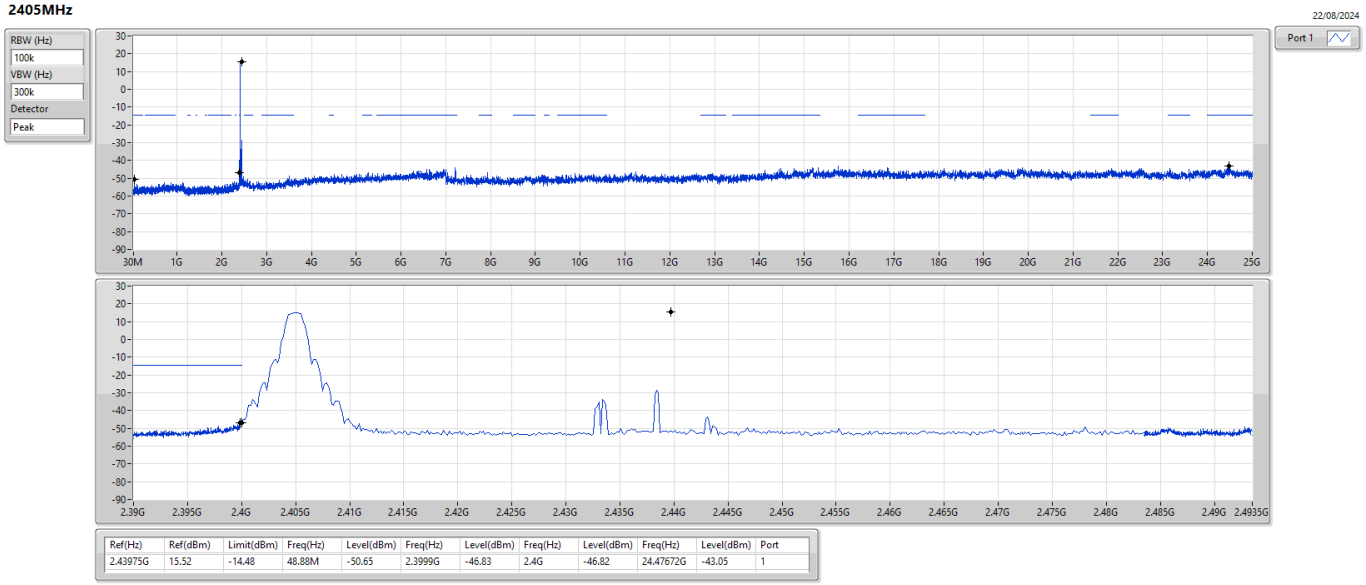
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	2.43975G	15.52	-14.48	48.88M	-50.83	2.39708G	-51.26	2.4G	-52.38	21.91098G	-41.88	1

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)	Port
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.43975G	15.52	-14.48	48.88M	-50.65	2.3999G	-46.83	2.4G	-46.82	24.47672G	-43.05	1
2440MHz	Pass	2.43975G	15.52	-14.48	48.88M	-50.83	2.39708G	-51.26	2.4G	-52.38	21.91098G	-41.88	1
2475MHz	Pass	2.43975G	15.52	-14.48	48.88M	-50.27	2.39428G	-49.91	2.4G	-53.82	15.19842G	-43.64	1
2480MHz	Pass	2.43975G	15.52	-14.48	48.88M	-51.46	2.39514G	-51.57	2.4G	-54.55	15.19561G	-44.28	1

2.4-2.4835GHz_Zigbee CSENdB

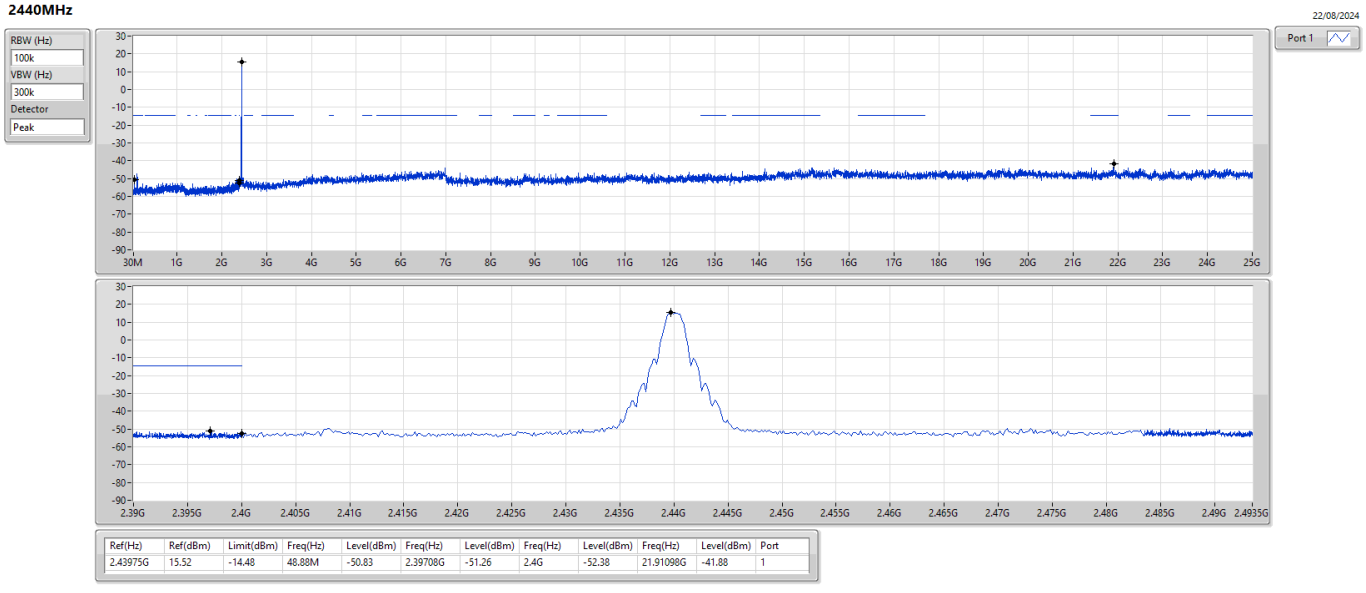
2405MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	15.52	-14.48	48.88M	-50.65	2.3999G	-46.83	2.4G	-46.82	24.47672G	-43.05	1

2.4-2.4835GHz_Zigbee CSENdB

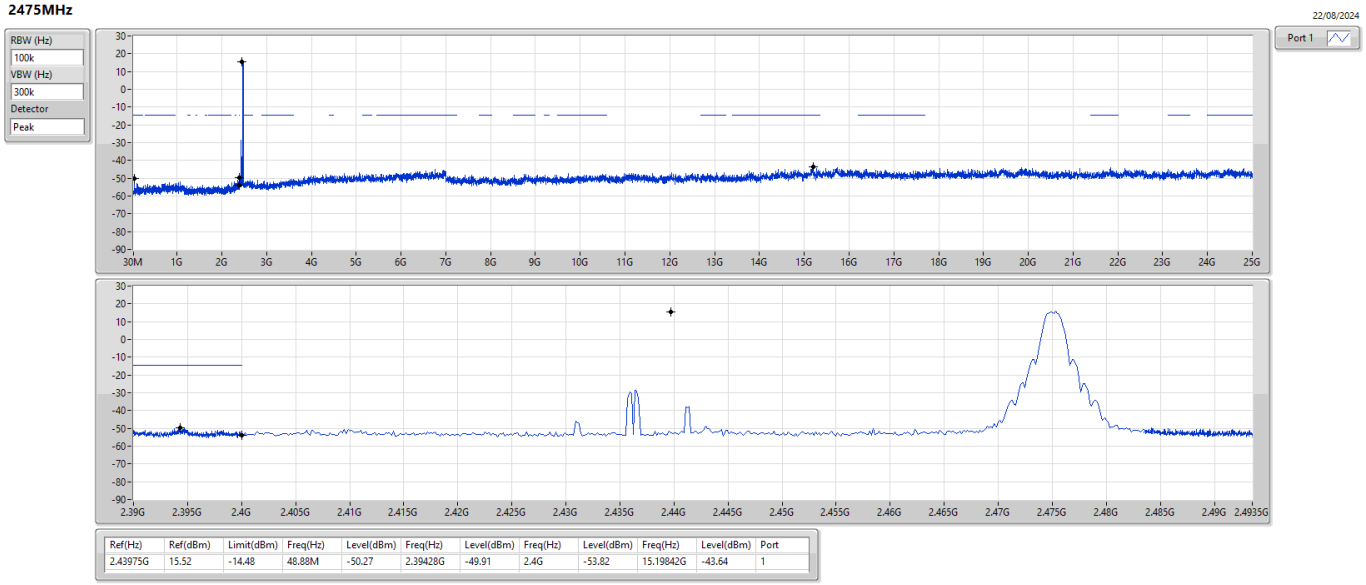
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	15.52	-14.48	48.88M	-50.83	2.39708G	-51.26	2.4G	-52.38	21.91098G	-41.88	1

2.4-2.4835GHz_Zigbee CSENdB

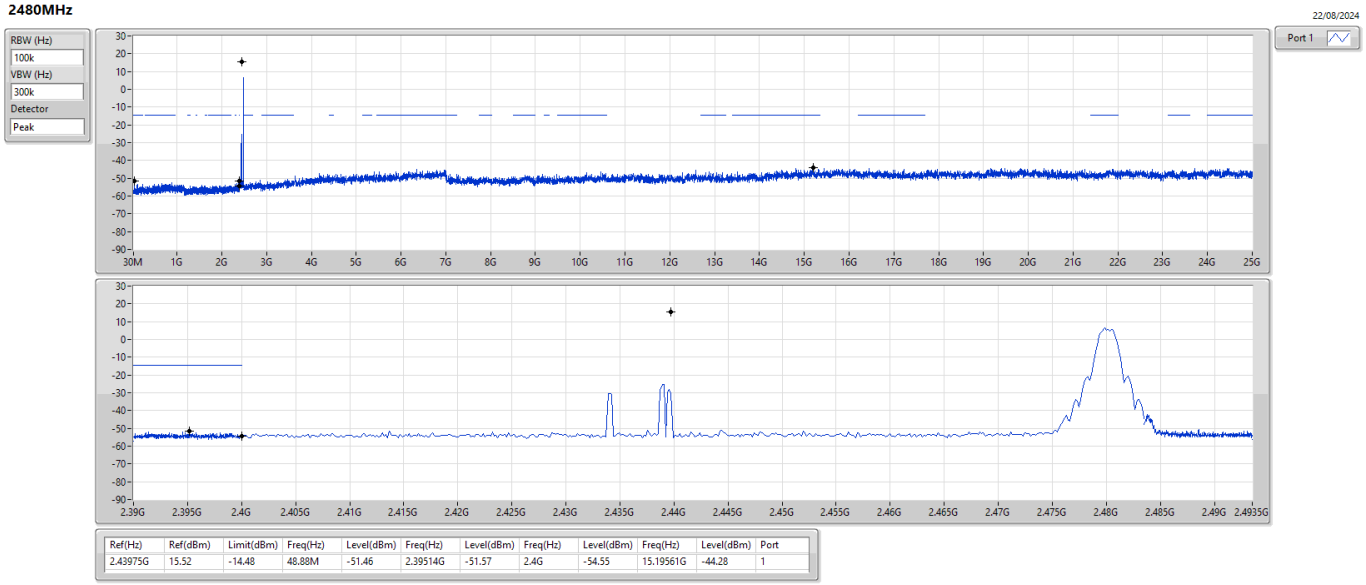
2475MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	15.52	-14.48	48.88M	-50.27	2.39428G	-49.91	2.4G	-53.82	15.19842G	-43.64	1

2.4-2.4835GHz_Zigbee CSENdB

2480MHz

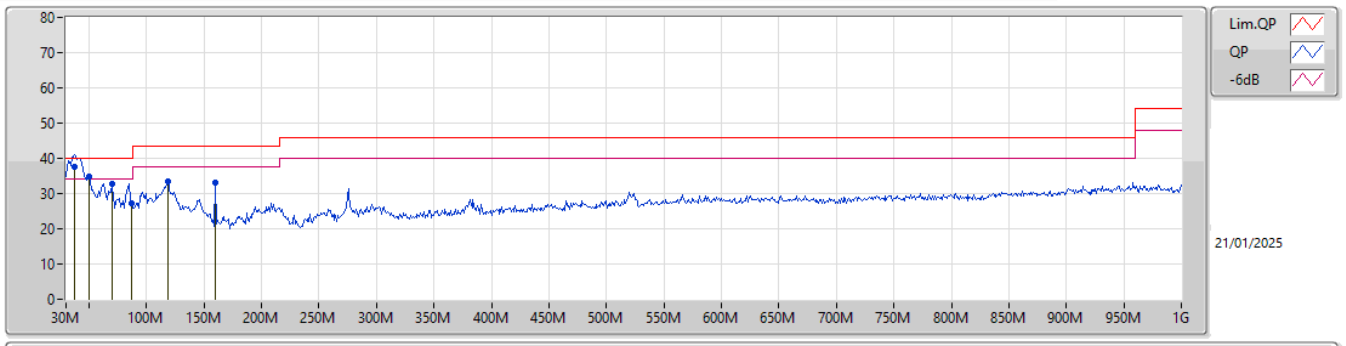


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	15.52	-14.48	48.88M	-51.46	2.39514G	-51.57	2.4G	-54.55	15.19561G	-44.28	1

Summary

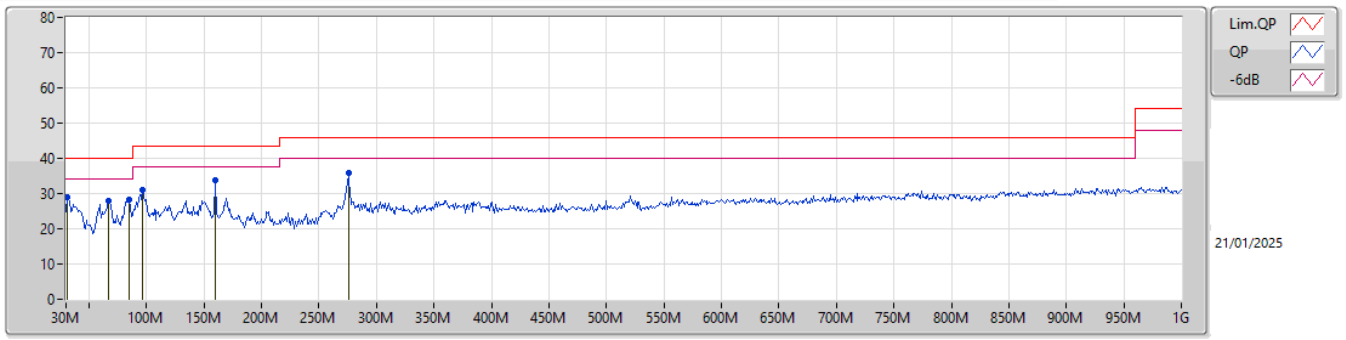
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	QP	37.76M	37.46	40.00	-2.54	Vertical

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
QP	37.76M	37.46	40.00	-2.54	-10.04	3	Vertical	145	1.00	"Worst"	47.50	20.27	1.21	31.52
PK	50.37M	34.78	40.00	-5.22	-16.04	3	Vertical	360	3.00	-	50.82	14.25	1.34	31.63
PK	69.77M	32.87	40.00	-7.13	-17.57	3	Vertical	25	1.50	-	50.44	12.57	1.56	31.70
PK	87.23M	27.38	40.00	-12.62	-15.72	3	Vertical	155	1.25	-	43.10	14.43	1.58	31.73
PK	118.27M	33.31	43.50	-10.19	-11.67	3	Vertical	183	1.00	-	44.98	18.09	1.99	31.75
PK	159.98M	32.94	43.50	-10.56	-13.41	3	Vertical	360	1.50	-	46.35	16.05	2.30	31.76

Mode 1



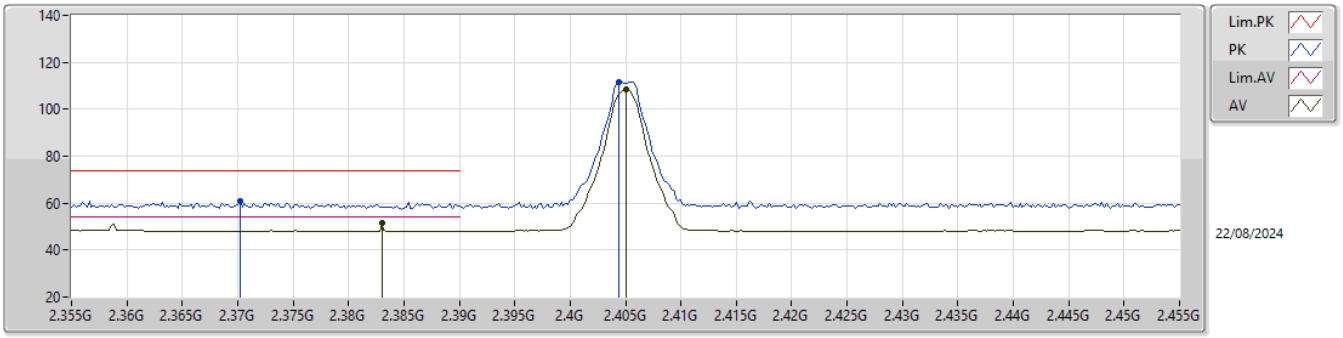
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)
PK	30.97M	28.82	40.00	-11.18	-6.22	3	Horizontal	18	1.00	-	35.04	24.03	1.15	31.40
PK	66.86M	27.82	40.00	-12.18	-17.65	3	Horizontal	77	3.00	-	45.47	12.49	1.55	31.69
PK	85.29M	28.35	40.00	-11.65	-16.16	3	Horizontal	250	2.00	-	44.51	13.98	1.59	31.73
PK	96.93M	31.16	43.50	-12.34	-13.77	3	Horizontal	84	2.00	-	44.93	16.27	1.71	31.75
PK	159.98M	33.80	43.50	-9.70	-13.41	3	Horizontal	278	1.50	"Worst"	47.21	16.05	2.30	31.76
PK	275.41M	35.83	46.00	-10.17	-10.12	3	Horizontal	233	1.00	-	45.95	18.73	2.98	31.83

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	2.4835G	53.77	54.00	-0.23	3	Vertical	18	1.80	-

2.4-2.4835GHz_Zigbee

2405MHz_TX

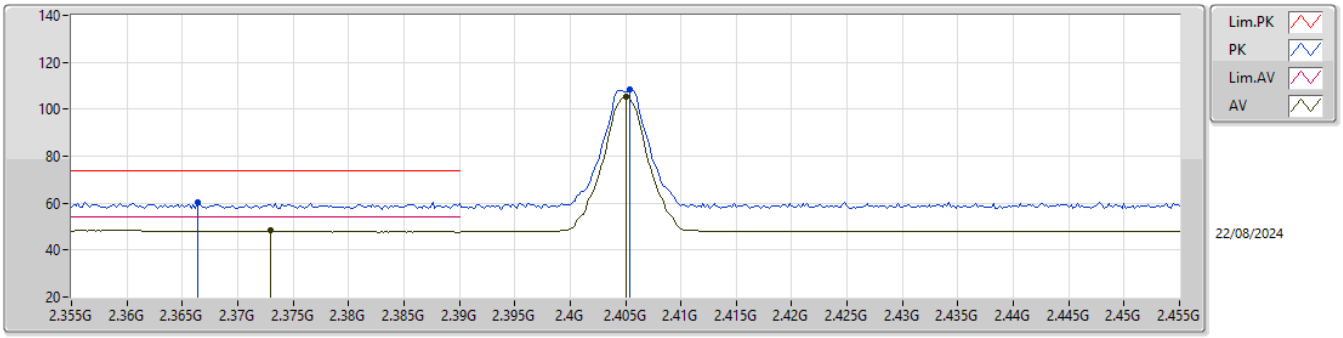


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3702G	60.94	74.00	-13.06	28.51	3	Vertical	76	2.49	-	27.80	4.63	-
AV	2.383G	51.57	54.00	-2.43	19.22	3	Vertical	76	2.49	-	27.70	4.65	-
PK	2.4044G	111.78	Inf	-Inf	79.45	3	Vertical	76	2.49	-	27.66	4.67	-
AV	2.405G	108.67	Inf	-Inf	76.35	3	Vertical	76	2.49	-	27.65	4.67	-

2.4-2.4835GHz_Zigbee

2405MHz_TX

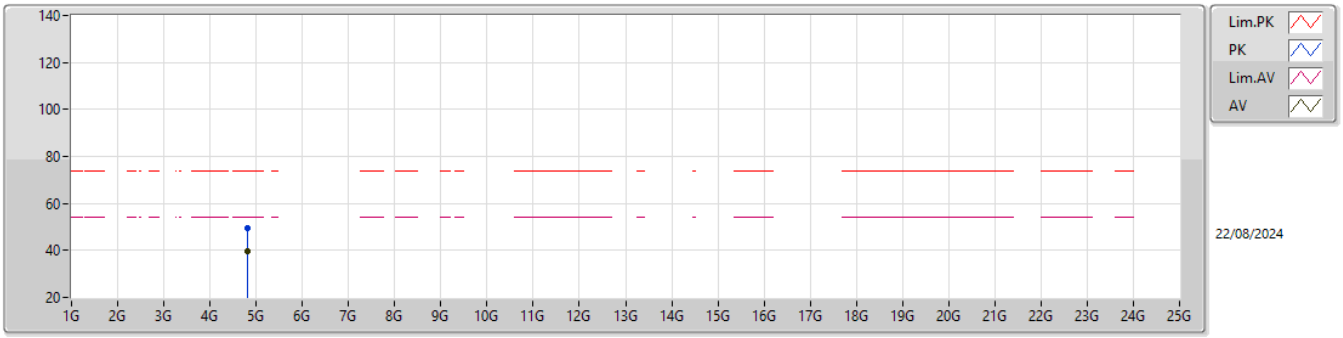


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3664G	60.50	74.00	-13.50	28.04	3	Horizontal	256	2.59	-	27.84	4.62	-
AV	2.373G	48.33	54.00	-5.67	15.93	3	Horizontal	256	2.59	-	27.77	4.63	-
PK	2.4054G	108.28	Inf	-Inf	75.96	3	Horizontal	256	2.59	-	27.65	4.67	-
AV	2.405G	105.15	Inf	-Inf	72.83	3	Horizontal	256	2.59	-	27.65	4.67	-

2.4-2.4835GHz_Zigbee

2405MHz_TX

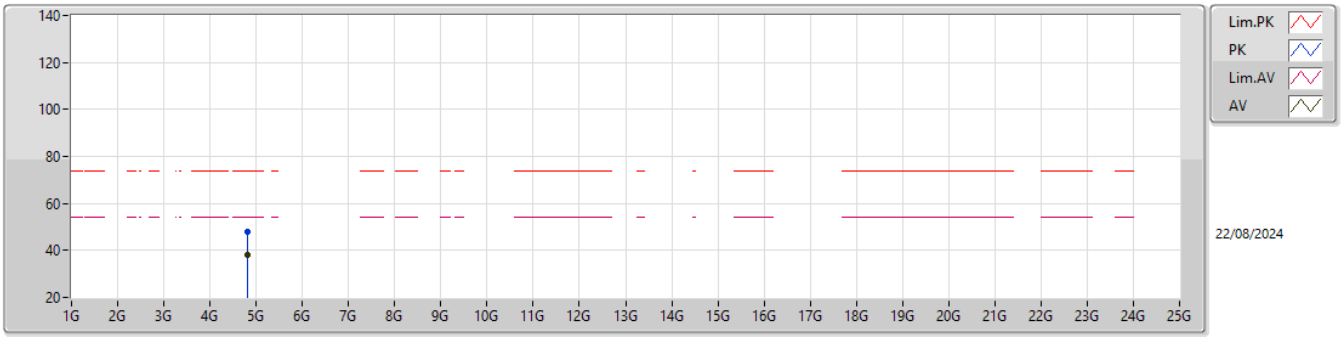


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.81108G	49.73	74.00	-24.27	44.08	3	Vertical	91	2.57	-	31.30	6.92	32.57
AV	4.80904G	39.52	54.00	-14.48	33.87	3	Vertical	91	2.57	-	31.30	6.92	32.57

2.4-2.4835GHz_Zigbee

2405MHz_TX

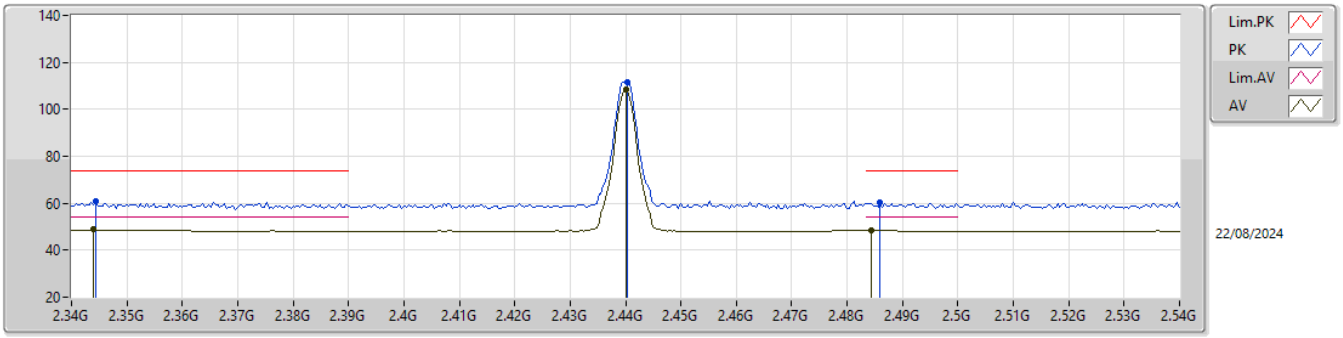


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.80904G	48.09	74.00	-25.91	42.44	3	Horizontal	40	1.00	-	31.30	6.92	32.57
AV	4.80904G	37.92	54.00	-16.08	32.27	3	Horizontal	40	1.00	-	31.30	6.92	32.57

2.4-2.4835GHz_Zigbee

2440MHz_TX

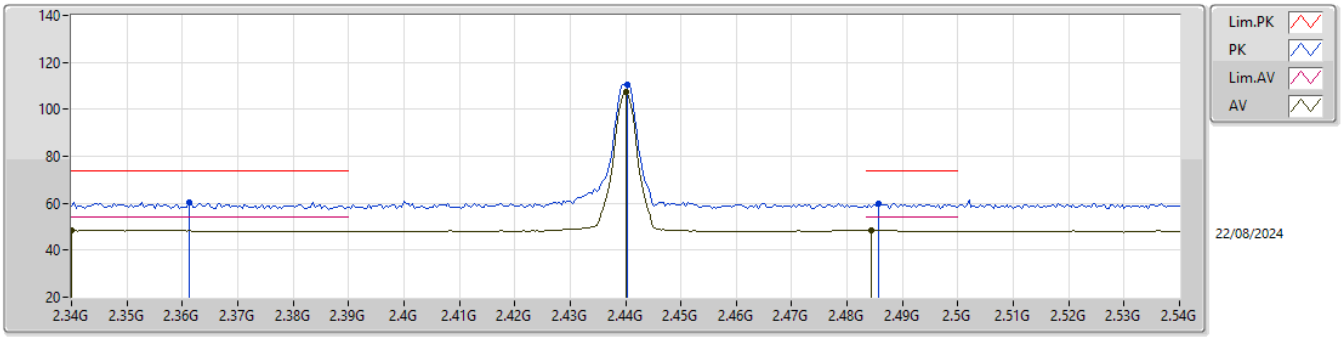


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3444G	60.81	74.00	-13.19	28.22	3	Vertical	49	1.80	-	28.00	4.59	-
AV	2.344G	48.95	54.00	-5.05	16.36	3	Vertical	49	1.80	-	28.00	4.59	-
PK	2.4404G	111.36	Inf	-Inf	79.22	3	Vertical	49	1.80	-	27.50	4.64	-
AV	2.44G	108.27	Inf	-Inf	76.13	3	Vertical	49	1.80	-	27.50	4.64	-
PK	2.486G	60.21	74.00	-13.79	28.11	3	Vertical	49	1.80	-	27.50	4.60	-
AV	2.4844G	48.22	54.00	-5.78	16.12	3	Vertical	49	1.80	-	27.50	4.60	-

2.4-2.4835GHz_Zigbee

2440MHz_TX

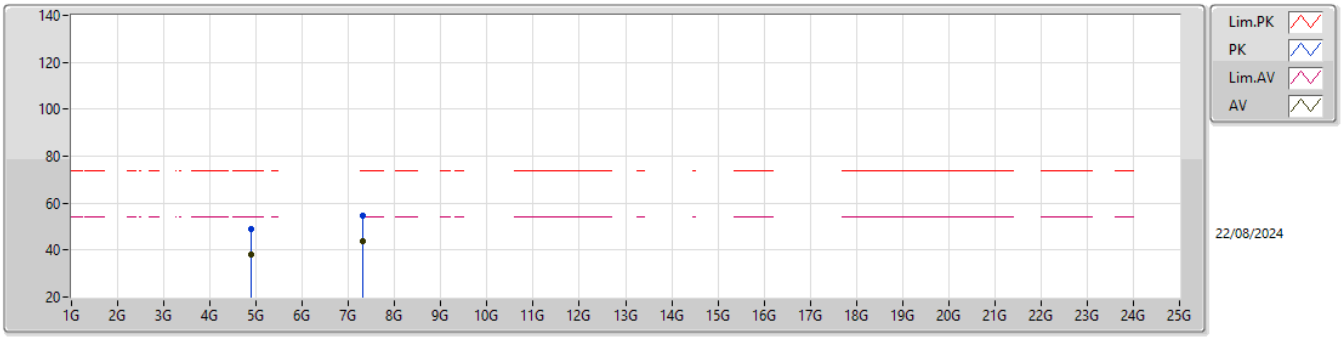


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3612G	60.56	74.00	-13.44	28.06	3	Horizontal	307	2.35	-	27.89	4.61	-
AV	2.34G	48.39	54.00	-5.61	15.81	3	Horizontal	307	2.35	-	28.00	4.58	-
PK	2.4404G	110.58	Inf	-Inf	78.44	3	Horizontal	307	2.35	-	27.50	4.64	-
AV	2.44G	107.35	Inf	-Inf	75.21	3	Horizontal	307	2.35	-	27.50	4.64	-
PK	2.4856G	59.68	74.00	-14.32	27.58	3	Horizontal	307	2.35	-	27.50	4.60	-
AV	2.4844G	48.22	54.00	-5.78	16.12	3	Horizontal	307	2.35	-	27.50	4.60	-

2.4-2.4835GHz_Zigbee

2440MHz_TX

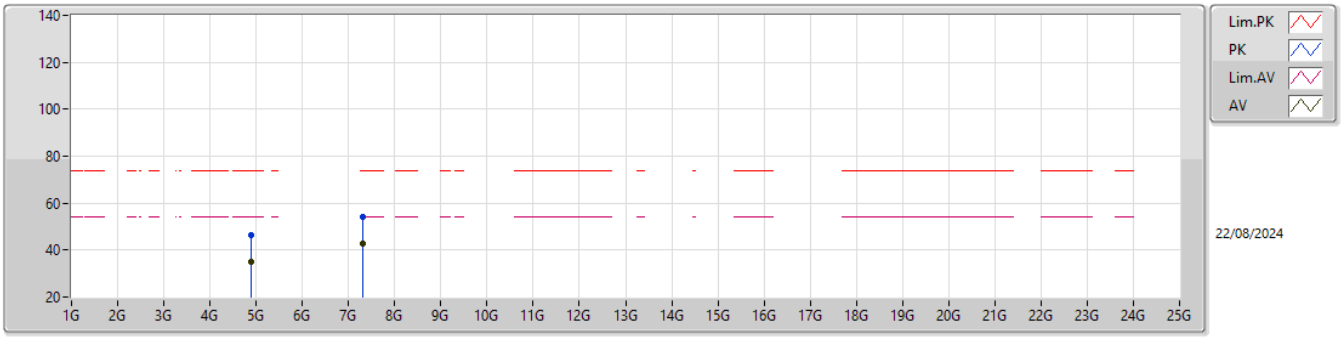


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87904G	48.92	74.00	-25.08	43.21	3	Vertical	94	2.66	-	31.30	6.99	32.58
AV	4.87898G	38.14	54.00	-15.86	32.43	3	Vertical	94	2.66	-	31.30	6.99	32.58
PK	7.32114G	54.74	74.00	-19.26	42.51	3	Vertical	118	1.80	-	36.22	8.64	32.63
AV	7.32132G	43.86	54.00	-10.14	31.64	3	Vertical	118	1.80	-	36.21	8.64	32.63

2.4-2.4835GHz_Zigbee

2440MHz_TX

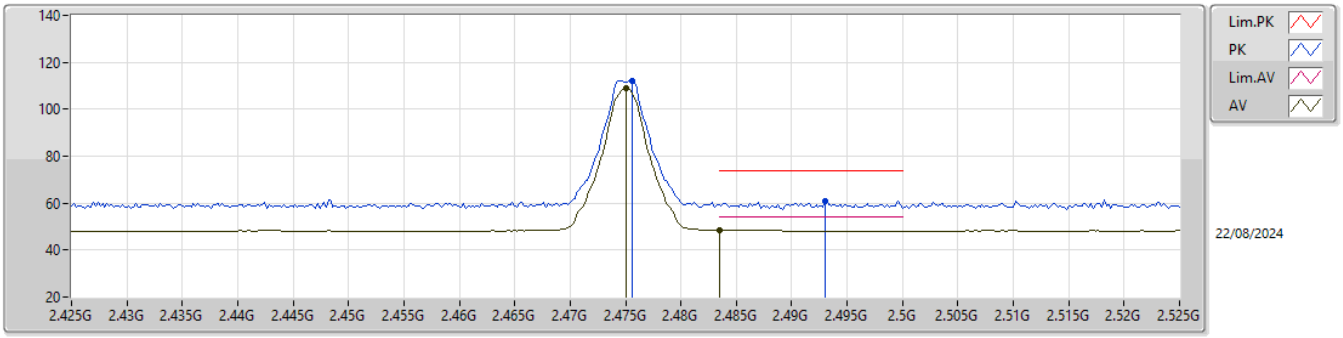


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.881866G	46.13	74.00	-27.87	40.42	3	Horizontal	53	1.80	-	31.30	6.99	32.58
AV	4.88096G	35.07	54.00	-18.93	29.36	3	Horizontal	53	1.80	-	31.30	6.99	32.58
PK	7.32114G	54.22	74.00	-19.78	41.99	3	Horizontal	150	1.80	-	36.22	8.64	32.63
AV	7.32132G	42.97	54.00	-11.03	30.75	3	Horizontal	150	1.80	-	36.21	8.64	32.63

2.4-2.4835GHz_Zigbee

2475MHz_TX

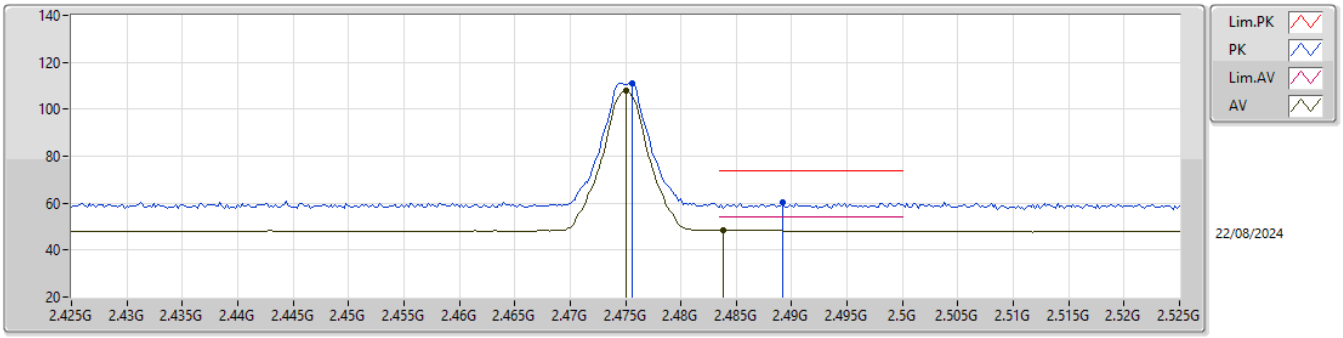


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4756G	112.26	Inf	-Inf	80.19	3	Vertical	17	1.60	-	27.46	4.61	-
AV	2.475G	109.14	Inf	-Inf	77.08	3	Vertical	17	1.60	-	27.45	4.61	-
PK	2.493G	60.89	74.00	-13.11	28.80	3	Vertical	17	1.60	-	27.50	4.59	-
AV	2.4835G	48.51	54.00	-5.49	16.41	3	Vertical	17	1.60	-	27.50	4.60	-

2.4-2.4835GHz_Zigbee

2475MHz_TX

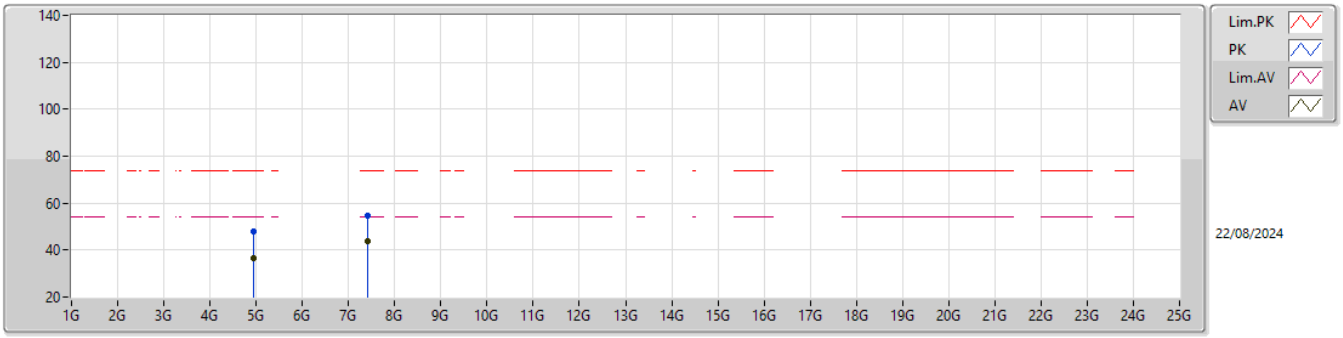


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4756G	111.02	Inf	-Inf	78.95	3	Horizontal	303	2.58	-	27.46	4.61	-
AV	2.475G	107.94	Inf	-Inf	75.88	3	Horizontal	303	2.58	-	27.45	4.61	-
PK	2.4892G	60.56	74.00	-13.44	28.47	3	Horizontal	303	2.58	-	27.50	4.59	-
AV	2.4838G	48.51	54.00	-5.49	16.41	3	Horizontal	303	2.58	-	27.50	4.60	-

2.4-2.4835GHz_Zigbee

2475MHz_TX

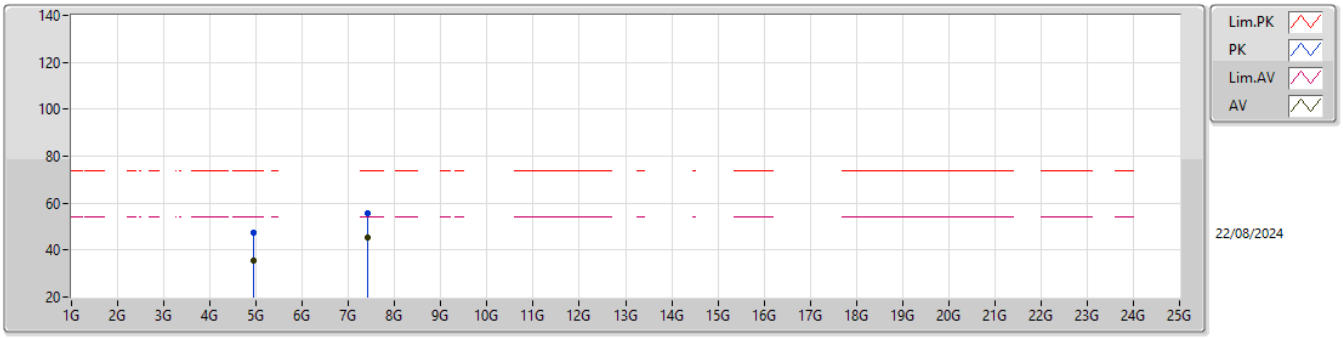


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.95132G	47.71	74.00	-26.29	41.72	3	Vertical	94	2.57	-	31.51	7.06	32.58
AV	4.95096G	36.80	54.00	-17.20	30.82	3	Vertical	94	2.57	-	31.50	7.06	32.58
PK	7.4265G	54.81	74.00	-19.19	42.41	3	Vertical	118	1.80	-	36.26	8.73	32.59
AV	7.42638G	43.76	54.00	-10.24	31.36	3	Vertical	118	1.80	-	36.26	8.73	32.59

2.4-2.4835GHz_Zigbee

2475MHz_TX

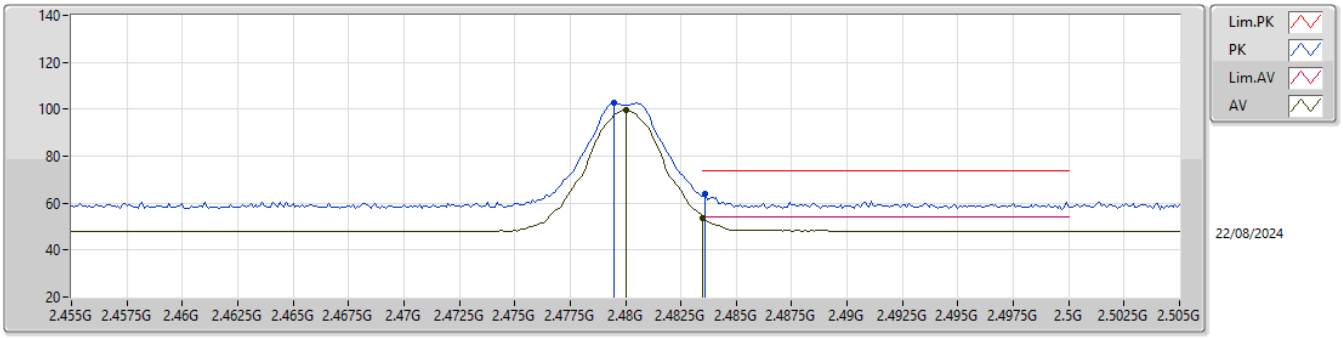


EUT Y_1TX
Setting 20
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.95084G	47.17	74.00	-26.83	41.19	3	Horizontal	41	1.00	-	31.50	7.06	32.58
AV	4.94904G	35.33	54.00	-18.67	29.35	3	Horizontal	41	1.00	-	31.50	7.06	32.58
PK	7.4265G	55.87	74.00	-18.13	43.47	3	Horizontal	23	3.00	-	36.26	8.73	32.59
AV	7.42368G	45.17	54.00	-8.83	32.79	3	Horizontal	23	3.00	-	36.24	8.73	32.59

2.4-2.4835GHz_Zigbee

2480MHz_TX

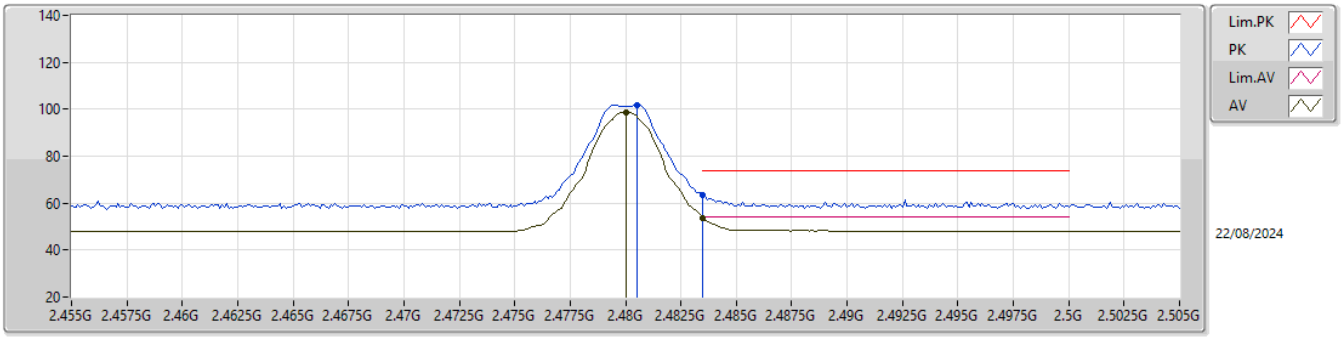


EUT Y_1TX
Setting 10
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4795G	102.54	Inf	-Inf	70.45	3	Vertical	18	1.80	-	27.49	4.60	-
AV	2.48G	99.46	Inf	-Inf	67.36	3	Vertical	18	1.80	-	27.50	4.60	-
PK	2.4836G	63.74	74.00	-10.26	31.64	3	Vertical	18	1.80	-	27.50	4.60	-
AV	2.4835G	53.77	54.00	-0.23	21.67	3	Vertical	18	1.80	-	27.50	4.60	-

2.4-2.4835GHz_Zigbee

2480MHz_TX

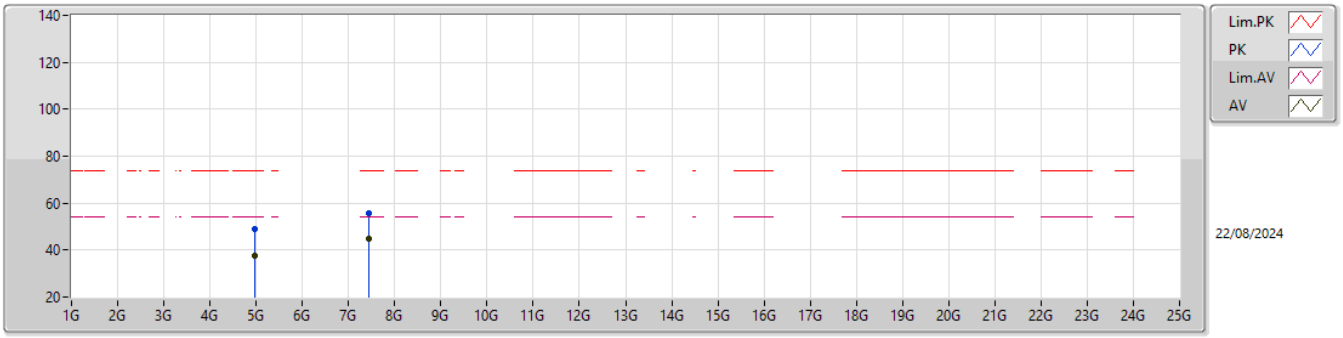


EUT Y_1TX
Setting 10
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4805G	101.94	Inf	-Inf	69.84	3	Horizontal	304	2.82	-	27.50	4.60	-
AV	2.48G	98.79	Inf	-Inf	66.69	3	Horizontal	304	2.82	-	27.50	4.60	-
PK	2.4835G	63.28	74.00	-10.72	31.18	3	Horizontal	304	2.82	-	27.50	4.60	-
AV	2.4835G	53.61	54.00	-0.39	21.51	3	Horizontal	304	2.82	-	27.50	4.60	-

2.4-2.4835GHz_Zigbee

2480MHz_TX

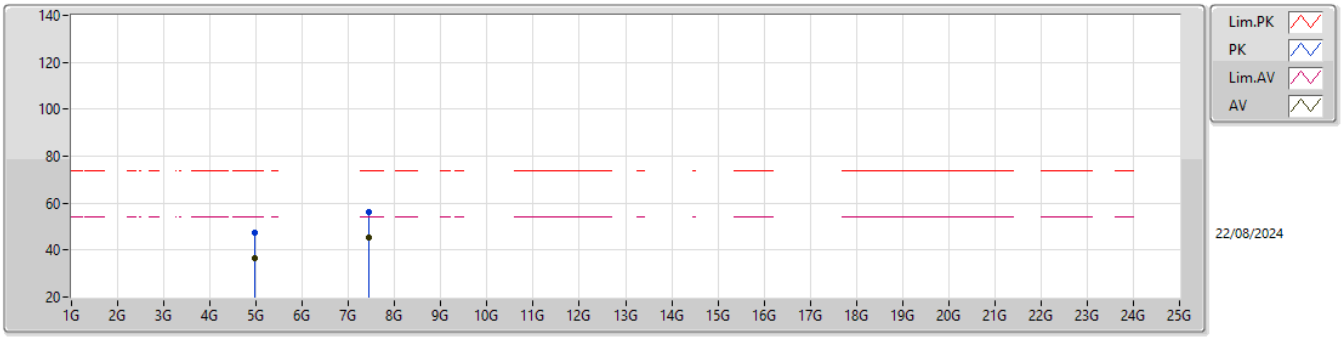


EUT Y_1TX
Setting 10
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.96054G	49.15	74.00	-24.85	43.12	3	Vertical	105	3.00	-	31.54	7.07	32.58
AV	4.9609G	37.70	54.00	-16.30	31.67	3	Vertical	105	3.00	-	31.54	7.07	32.58
PK	7.43826G	55.58	74.00	-18.42	43.10	3	Vertical	121	1.80	-	36.33	8.73	32.58
AV	7.44144G	44.68	54.00	-9.32	32.18	3	Vertical	121	1.80	-	36.35	8.73	32.58

2.4-2.4835GHz_Zigbee

2480MHz_TX



EUT Y_1TX
Setting 10
01-I-E-2

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.96102G	47.62	74.00	-26.38	41.59	3	Horizontal	44	1.00	-	31.54	7.07	32.58
AV	4.9609G	36.46	54.00	-17.54	30.43	3	Horizontal	44	1.00	-	31.54	7.07	32.58
PK	7.43862G	56.28	74.00	-17.72	43.80	3	Horizontal	16	3.00	-	36.33	8.73	32.58
AV	7.44144G	45.21	54.00	-8.79	32.71	3	Horizontal	16	3.00	-	36.35	8.73	32.58