FCC Radio Test Report

FCC ID	:	**R33C4CA1V2**
Equipment	:	**CONTROL AND AUTOMATION CONTROLLER C4-CA1-V2**
Brand Name	:	**Control4**
Model Name	:	**C4-CA1-V2**
Applicant	:	**Snap One,LLC** **1800 Continental Blvd Charlotte, NC 28273 USA**
Manufacturer	:	**Lite-On Network Communication (Dongguan) Limited** **No.30 QingXi-Keji Road, QingXi Town, DongGuan City, Guangdong Province, P.R. China**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Mar. 30, 2022, and testing was started from May 06, 2022 and completed on Jun. 01, 2022. 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.)

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR780502-06AZ	01	Initial issue of report	Sep. 26, 2022

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: Ryan 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	2405-2475	11-25 [15]

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	Gain (dBi)
1	MDLINK	MBMC01551682G	Dipole	Reverse SMA	2

Note 1: The EUT has one antenna.

For Zigbee function:

For Zigbee mode (1TX/1RX)

Ant. 1 (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	1	0	n/a (DC>=0.98)	n/a (DC>=0.98)

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	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
(TAF: 3785**)**	**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	Jack	22.6~23.4°C / 58~62%	01/Jun/2022
RF Conducted	TH06-HY	Barry	20.1~26.9°C / 50~60%	06/May/2022
	TH01-HY	Johnny	20.1~26.9°C / 50~60%	31/May/2022
Radiated (Above 1G)	03CH02-HY	Jack	21.6~22.1°C / 56~61%	27/May/2022~30/May/2022
☒ Wen 33rd.St.	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
(TAF: 3785**)**	**TEL:** 886-3-318-0787		**FAX:** 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
Radiated (Below 1G)	03CH09-HY	Daniel	23.7~24.4°C / 66~68%	06/May/2022

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)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 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	Putty Release 0.62

Mode	Power Setting
Zigbee	-
2405MHz	-4
2440MHz	-8
2475MHz	-11

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	

2.3 Accessories

Accessories				
AC Adapter	Brand Name	PHIHONG	Model Name	PSC15R-050
	Power Rating	I/P: 100-240Vac, 0.5A, O/P: 5Vdc, 3A		
	Power Cord	1.5 meter, non-shielded cable, w/o ferrite core		

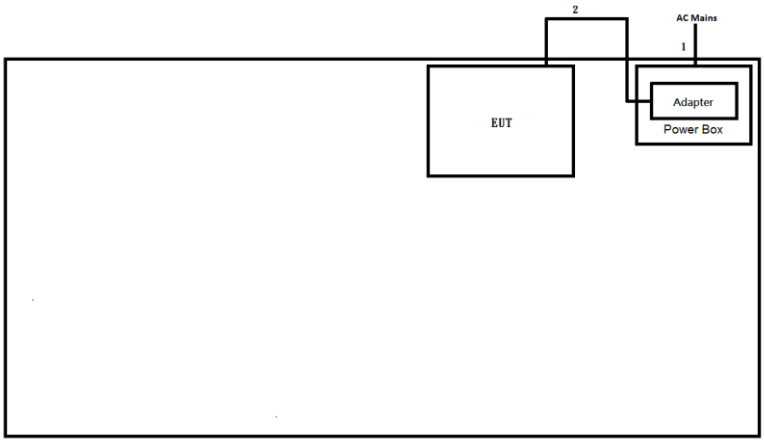
Reminder: Regarding to more detail and other information, please refer to user manual.

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	-	-

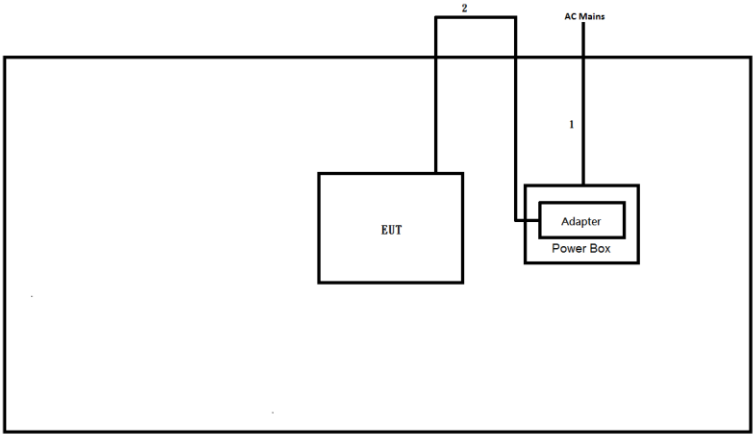
2.5 Test Setup Diagram

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	1.5

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length (m)
1	AC Power cable	No	1.8
2	DC Power cable	No	1.5

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

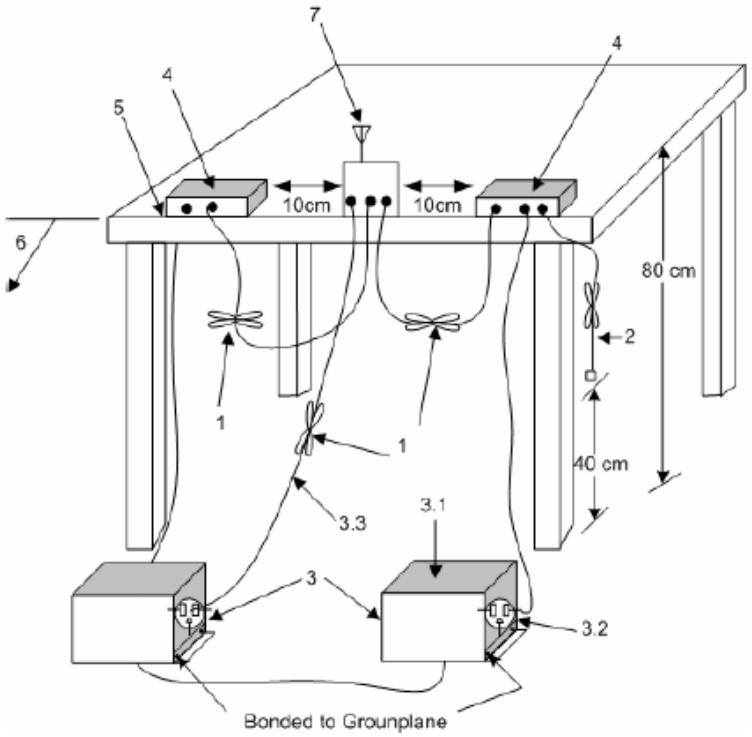
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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.

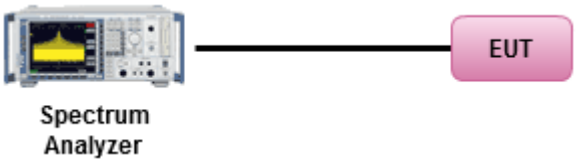
3.2.2 Measuring Instruments

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

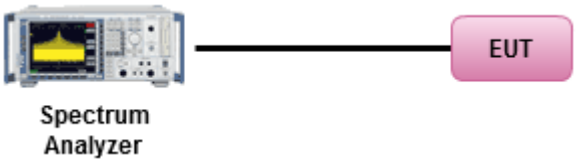
3.4.2 Measuring Instruments

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.	

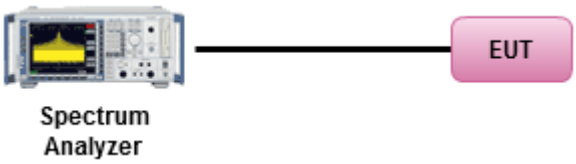
3.5.2 Measuring Instruments

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.

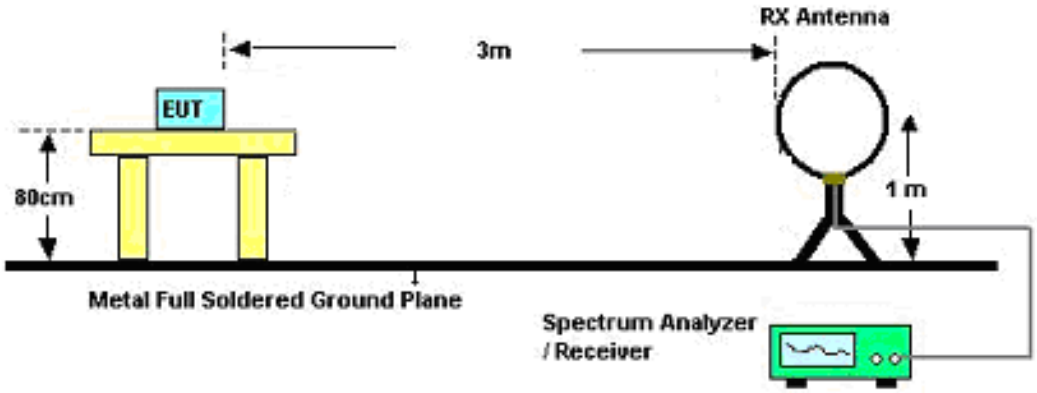
3.6.4 Measurement Results Calculation

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

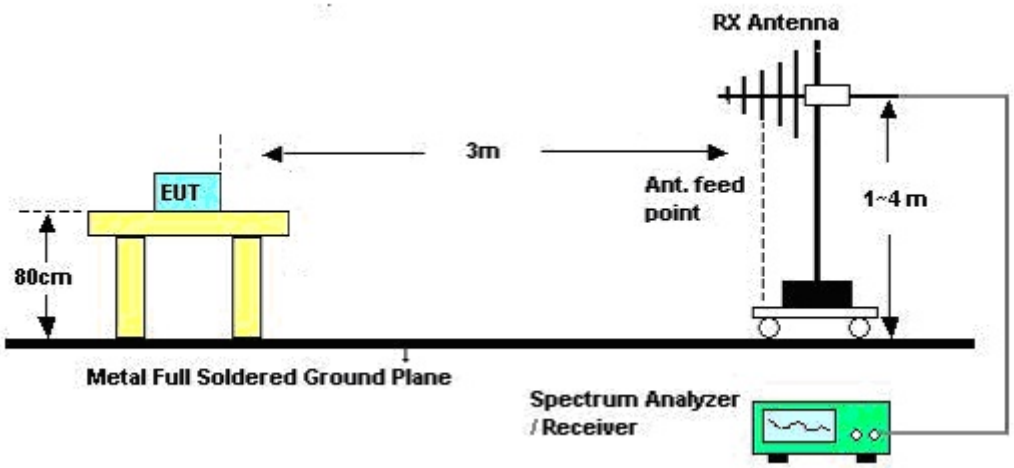
3.6.5 Test Setup

Emissions in Restricted Frequency Bands

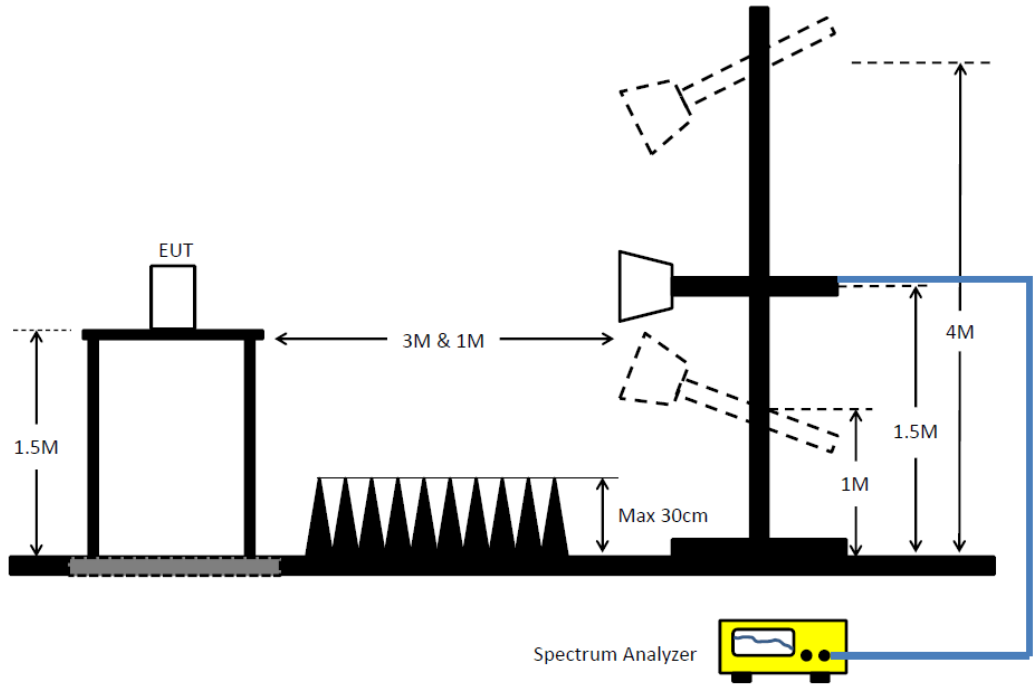
9kHz ~30MHz



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	R&S	ESR	102051	9kHz ~ 3.6GHz	13/May/2022	12/May/2023
Two-Line V-Network	R&S	ENV 216	100003	9kHz ~ 30MHz	18/Feb/2022	17/Feb/2023
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	01/Mar/2022	28/Feb/2023
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	26/Oct/2021	25/Oct/2022
Software	Sporton	SENSE-EMI	V5.10.14	-	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	101029	10Hz~40GHz	20/Oct/2021	19/Oct/2022
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	21/Oct/2021	20/Oct/2022
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz~40GHz	25/Mar/2022	24/Mar/2023
Power Meter	Anritsu	ML2495A	1124009	300MHz~40GHz	25/Mar/2022	24/Mar/2023
SENSE-15247_DTS	SPORTON	v5.10.7.17	NA	NA	NA	NA

Instrument for Radiated Test (Below 1G)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz~1GHz 3m	25/Mar/2022	24/Mar/2023
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	13/Aug/2021	12/Aug/2022
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	08/Apr/2022	07/Apr/2023
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MT J6102-05	35418 & 3	30MHz~1GHz	04/Sep/2021	03/Sep/2022
RF Cable-low	Jye Bao	RG142	CB031+324530/4	9kHz~30MHz	30/Aug/2021	29/Aug/2022
RF Cable-low	Jye Bao	RG142	CB031+324530/4	30MHz~1GHz	07/Feb/2022	06/Feb/2023
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	18/Mar/2022	17/Mar/2023
EMI Test Receiver	R&S	ESR3	102051	9kHz~3.6GHz	21/May/2021	20/May/2022
SENSE-15247_DTS	Sporton	V5.10.7.17	N/A	N/A	N/A	N/A

Instrument for Radiated Test (Above 1G)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3m	01/Aug/2021	31/Jul/2022
Signal Analyzer	R&S	FSP40	100593	9kHz~40GHz	08/Apr/2022	07/Apr/2023
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~26.5GHz	03/Nov/2021	02/Nov/2022
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02268	1GHz ~18GHz	14/Sep/2021	13/Sep/2022
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX104	805193/4+805192/4	1GHz~40GHz	01/Apr/2022	31/Mar/2023
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz~40GHz	18/Mar/2022	17/Mar/2023
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz~40GHz	08/Mar/2022	07/Mar/2023
SENSE-15247_DTS	Sporton	V5.10.7.18	N/A	N/A	N/A	N/A

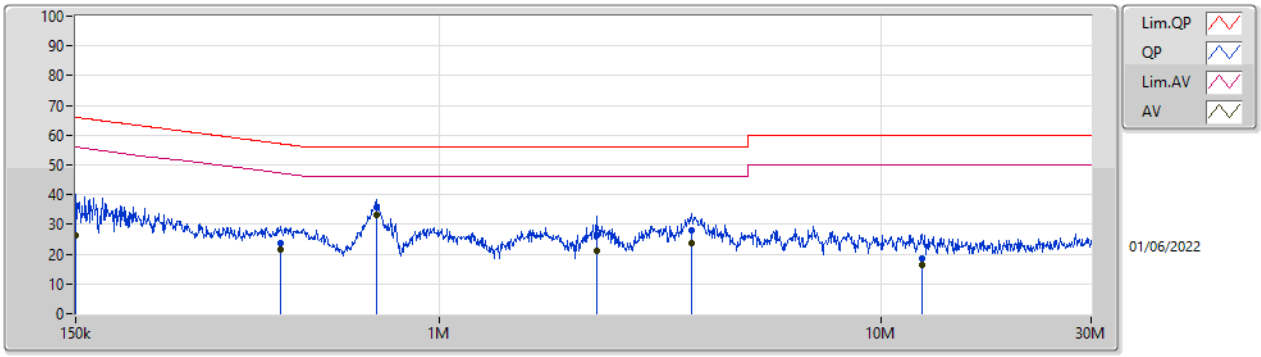
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	720.179k	33.05	46.00	-12.95	Line

Mode Configure

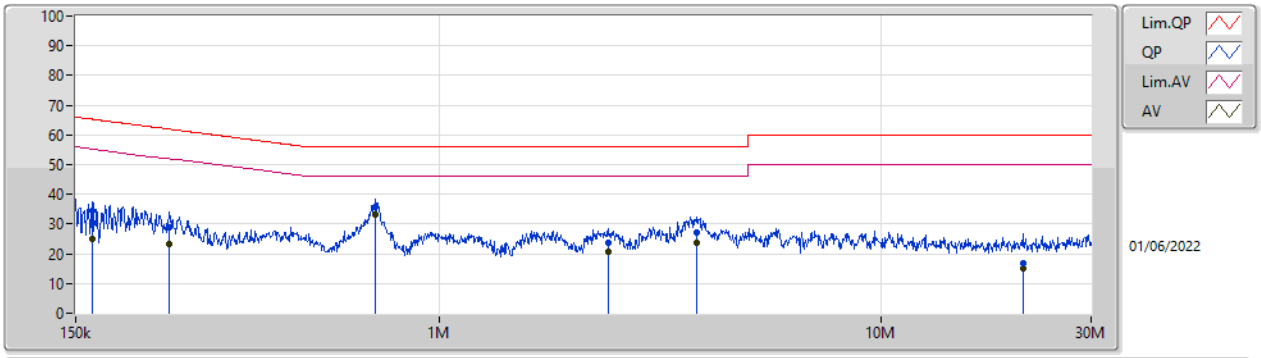
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	150k	36.01	66.00	-29.99	Line	-
Mode 1	Pass	AV	150k	26.25	56.00	-29.75	Line	-
Mode 1	Pass	QP	437.246k	23.91	57.11	-33.20	Line	-
Mode 1	Pass	AV	437.246k	21.38	47.11	-25.73	Line	-
Mode 1	Pass	QP	720.179k	35.98	56.00	-20.02	Line	-
Mode 1	Pass	AV	720.179k	33.05	46.00	-12.95	Line	-
Mode 1	Pass	QP	2.274M	26.19	56.00	-29.81	Line	-
Mode 1	Pass	AV	2.274M	21.12	46.00	-24.88	Line	-
Mode 1	Pass	QP	3.73M	27.82	56.00	-28.18	Line	-
Mode 1	Pass	AV	3.73M	23.53	46.00	-22.47	Line	-
Mode 1	Pass	QP	12.404M	18.71	60.00	-41.29	Line	-
Mode 1	Pass	AV	12.404M	16.57	50.00	-33.43	Line	-
Mode 1	Pass	QP	163.117k	34.44	65.31	-30.87	Neutral	-
Mode 1	Pass	AV	163.117k	24.90	55.31	-30.41	Neutral	-
Mode 1	Pass	QP	245.097k	28.70	61.93	-33.23	Neutral	-
Mode 1	Pass	AV	245.097k	23.18	51.93	-28.75	Neutral	-
Mode 1	Pass	QP	717.31k	35.81	56.00	-20.19	Neutral	-
Mode 1	Pass	AV	717.31k	33.00	46.00	-13.00	Neutral	-
Mode 1	Pass	QP	2.424M	23.67	56.00	-32.33	Neutral	-
Mode 1	Pass	AV	2.424M	20.65	46.00	-25.35	Neutral	-
Mode 1	Pass	QP	3.836M	27.10	56.00	-28.90	Neutral	-
Mode 1	Pass	AV	3.836M	23.52	46.00	-22.48	Neutral	-
Mode 1	Pass	QP	21.01M	16.94	60.00	-43.06	Neutral	-
Mode 1	Pass	AV	21.01M	15.04	50.00	-34.96	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	150k	36.01	66.00	-29.99	19.63	Line	-	16.38	9.69	0.03	9.91
AV	150k	26.25	56.00	-29.75	19.63	Line	-	6.62	9.69	0.03	9.91
QP	437.246k	23.91	57.11	-33.20	19.63	Line	-	4.28	9.68	0.04	9.91
AV	437.246k	21.38	47.11	-25.73	19.63	Line	-	1.75	9.68	0.04	9.91
QP	720.179k	35.98	56.00	-20.02	19.65	Line	-	16.33	9.68	0.05	9.92
AV	720.179k	33.05	46.00	-12.95	19.65	Line	-	13.40	9.68	0.05	9.92
QP	2.274M	26.19	56.00	-29.81	19.71	Line	-	6.48	9.70	0.09	9.92
AV	2.274M	21.12	46.00	-24.88	19.71	Line	-	1.41	9.70	0.09	9.92
QP	3.73M	27.82	56.00	-28.18	19.76	Line	-	8.06	9.71	0.13	9.92
AV	3.73M	23.53	46.00	-22.47	19.76	Line	-	3.77	9.71	0.13	9.92
QP	12.404M	18.71	60.00	-41.29	19.94	Line	-	-1.23	9.80	0.21	9.93
AV	12.404M	16.57	50.00	-33.43	19.94	Line	-	-3.37	9.80	0.21	9.93

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	163.117k	34.44	65.31	-30.87	19.67	Neutral	-	14.77	9.73	0.03	9.91
AV	163.117k	24.90	55.31	-30.41	19.67	Neutral	-	5.23	9.73	0.03	9.91
QP	245.097k	28.70	61.93	-33.23	19.66	Neutral	-	9.04	9.72	0.03	9.91
AV	245.097k	23.18	51.93	-28.75	19.66	Neutral	-	3.52	9.72	0.03	9.91
QP	717.31k	35.81	56.00	-20.19	19.70	Neutral	-	16.11	9.73	0.05	9.92
AV	717.31k	33.00	46.00	-13.00	19.70	Neutral	-	13.30	9.73	0.05	9.92
QP	2.424M	23.67	56.00	-32.33	19.76	Neutral	-	3.91	9.75	0.09	9.92
AV	2.424M	20.65	46.00	-25.35	19.76	Neutral	-	0.89	9.75	0.09	9.92
QP	3.836M	27.10	56.00	-28.90	19.81	Neutral	-	7.29	9.76	0.13	9.92
AV	3.836M	23.52	46.00	-22.48	19.81	Neutral	-	3.71	9.76	0.13	9.92
QP	21.01M	16.94	60.00	-43.06	20.22	Neutral	-	-3.28	10.01	0.28	9.93
AV	21.01M	15.04	50.00	-34.96	20.22	Neutral	-	-5.18	10.01	0.28	9.93

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Zigbee	1.606M	2.48M	2M48G1D	1.575M	2.468M

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

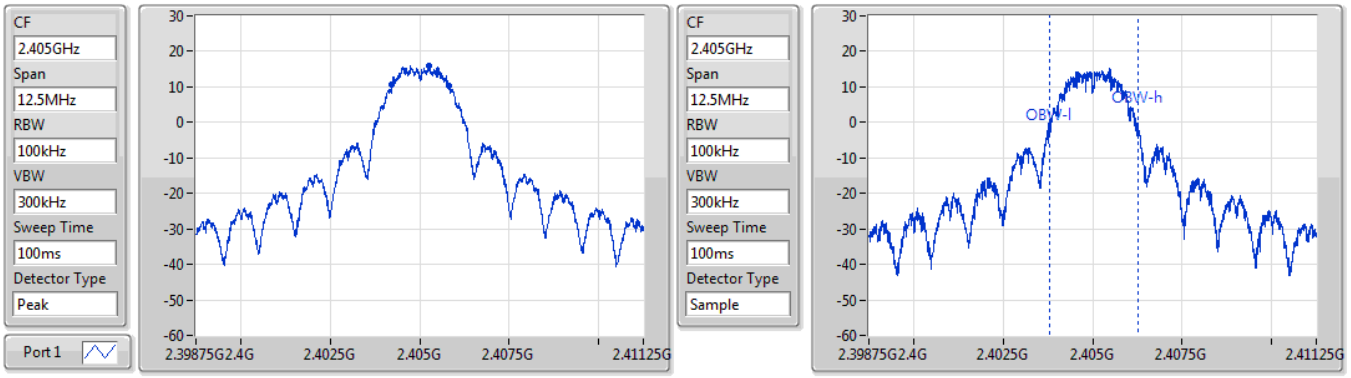
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Zigbee	-	-	-	-
2405MHz	Pass	500k	1.588M	2.48M
2440MHz	Pass	500k	1.606M	2.468M
2475MHz	Pass	500k	1.575M	2.474M

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

Zigbee EBW

2405MHz

06/05/2022

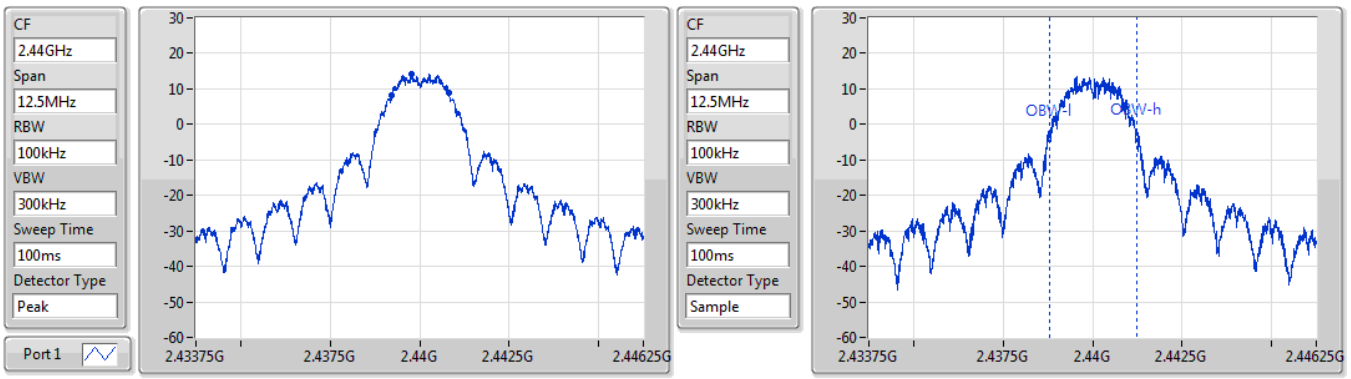


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.588M	2.404225G	2.405813G	2.48M	2.403782G	2.406262G	500k	1

Zigbee EBW

2440MHz

06/05/2022

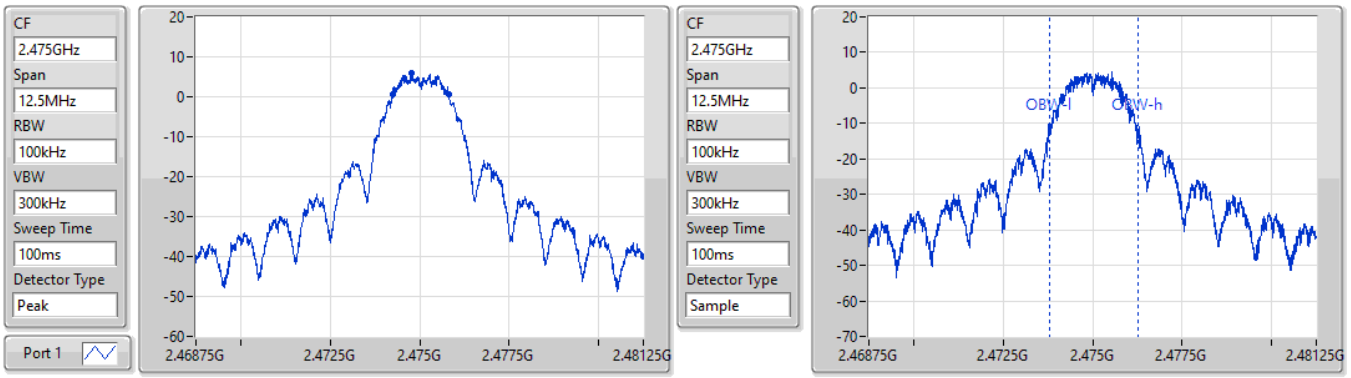


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.606M	2.439219G	2.440825G	2.468M	2.438782G	2.441249G	500k	1

Zigbee **EBW**

2475MHz

31/05/2022



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.575M	2.47425G	2.475825G	2.474M	2.473788G	2.476262G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	19.85	0.09661

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-
2405MHz	Pass	2.00	19.85	19.85	30.00
2440MHz	Pass	2.00	17.96	17.96	30.00
2475MHz	Pass	2.00	9.75	9.75	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Zigbee	2.36

RBW = 3kHz;

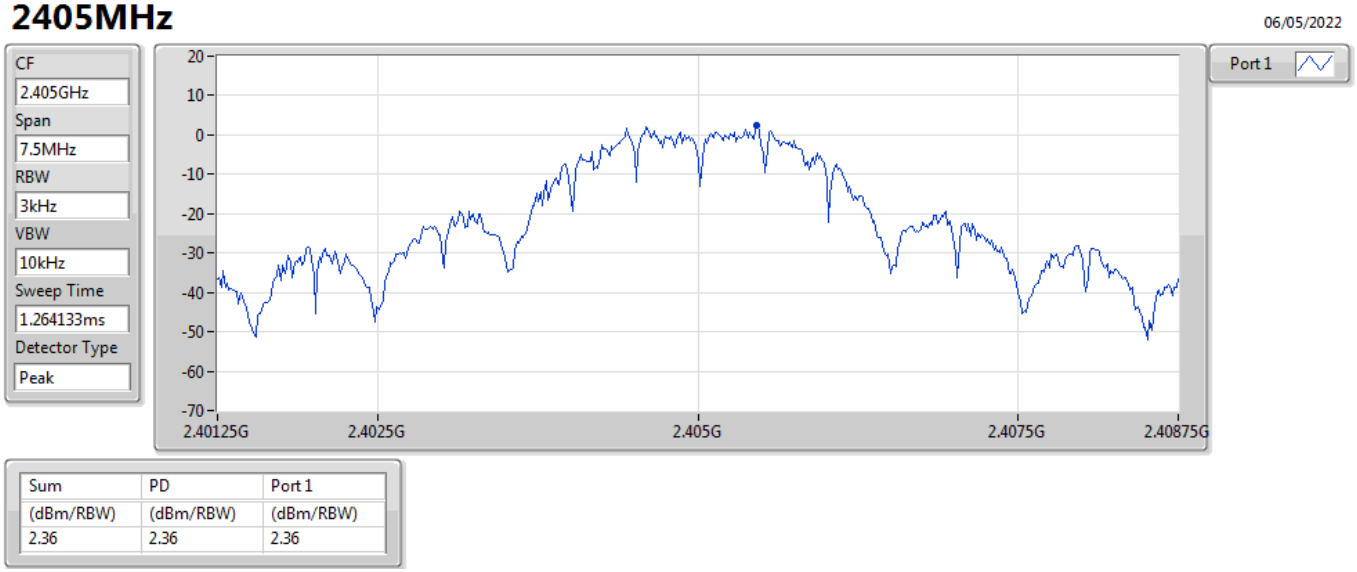
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-
2405MHz	Pass	2.00	2.36	2.36	8.00
2440MHz	Pass	2.00	1.25	1.25	8.00
2475MHz	Pass	2.00	-7.21	-7.21	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;

Zigbee PSD

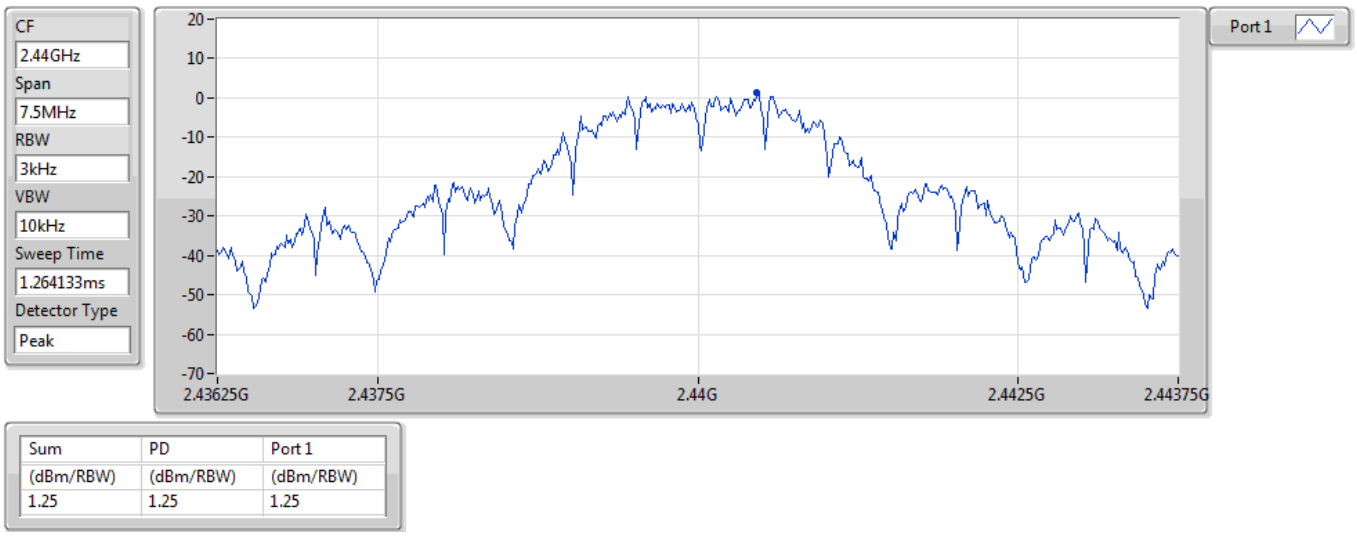
2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
2.36	2.36	2.36

Zigbee PSD

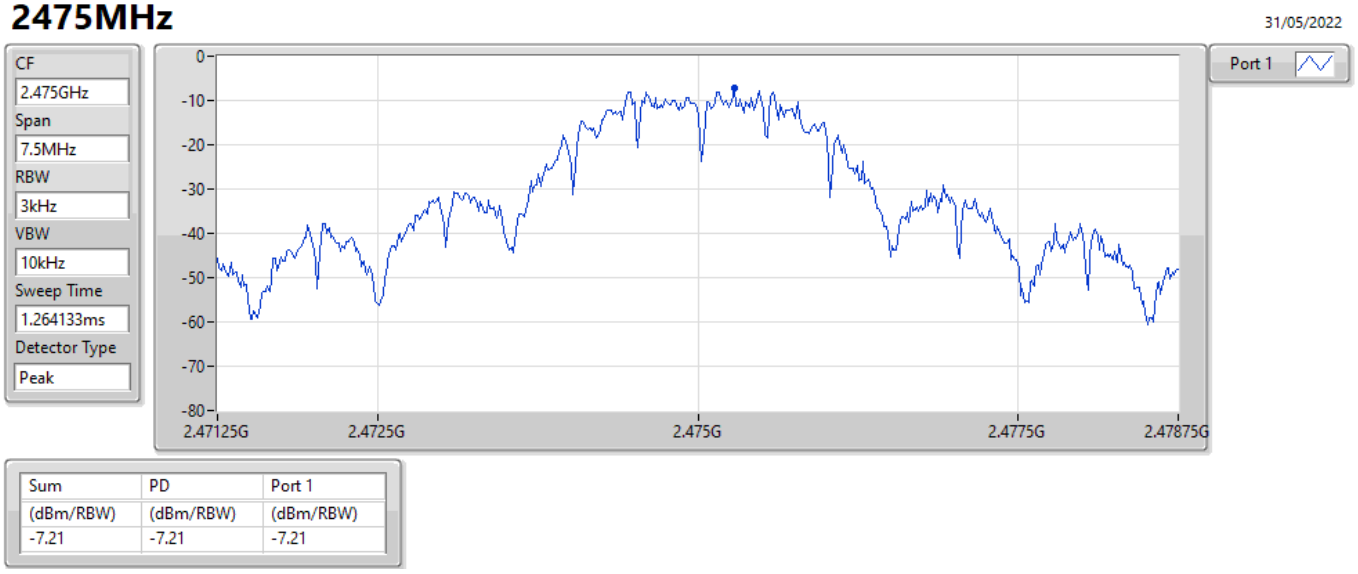
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
1.25	1.25	1.25

Zigbee **PSD**

2475MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.21	-7.21	-7.21

Summary

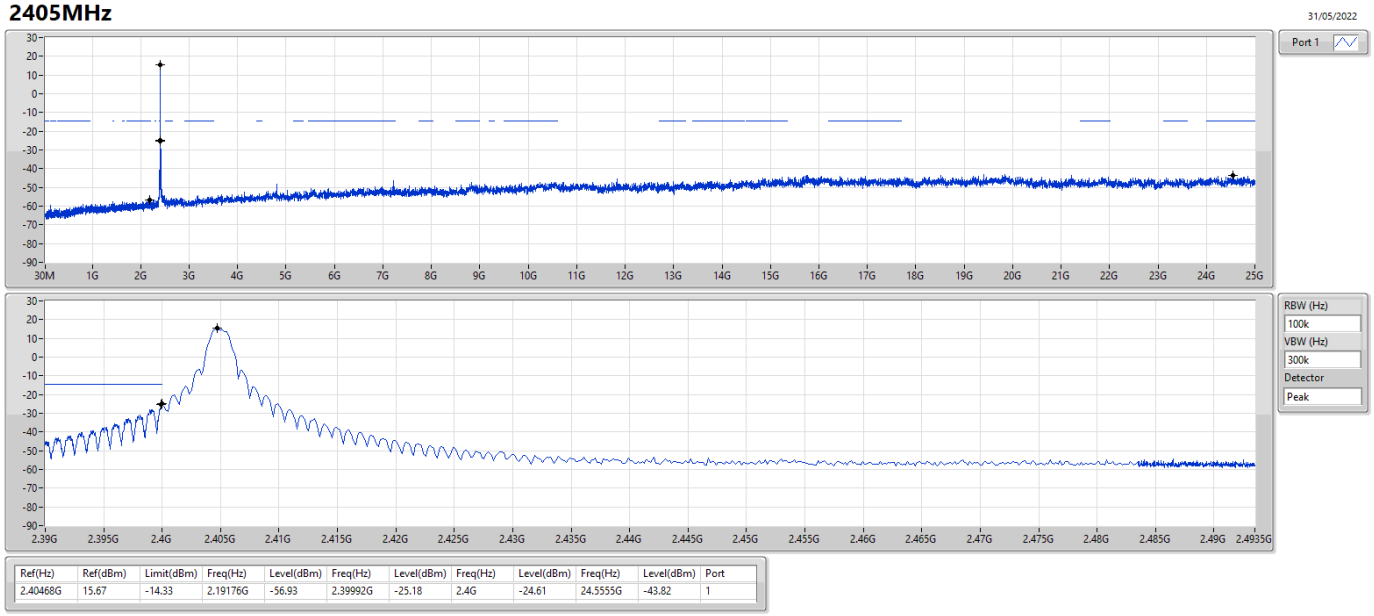
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	2.40468G	15.67	-14.33	2.19176G	-56.93	2.39992G	-25.18	2.4G	-24.61	24.5555G	-43.82	1

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	2.40468G	15.67	-14.33	2.19176G	-56.93	2.39992G	-25.18	2.4G	-24.61	24.5555G	-43.82	1
2440MHz	Pass	2.40468G	15.67	-14.33	2.30504G	-56.01	2.39924G	-54.65	2.4G	-56.33	24.72992G	-43.93	1
2475MHz	Pass	2.40468G	15.67	-14.33	2.14338G	-57.11	2.39782G	-55.48	2.4G	-56.26	15.17873G	-43.39	1

Zigbee **CSENdB**

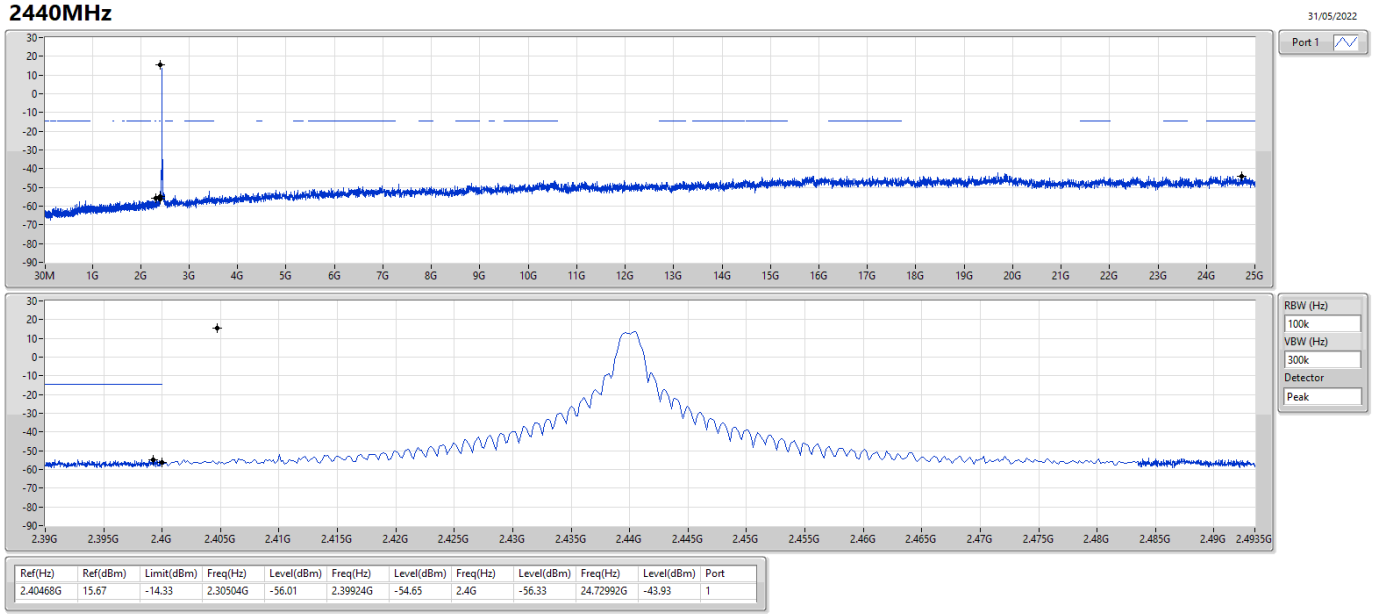
2405MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40468G	15.67	-14.33	2.19176G	-56.93	2.39992G	-25.18	2.4G	-24.61	24.5555G	-43.82	1

Zigbee **CSENdB**

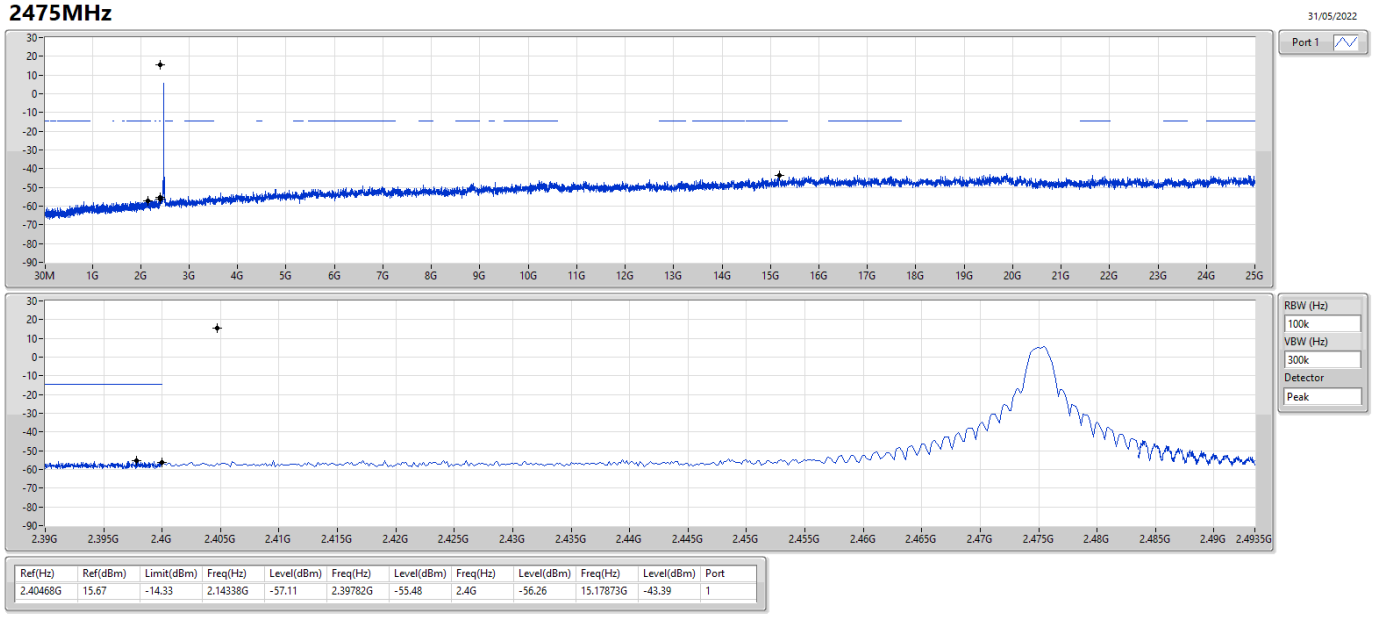
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40468G	15.67	-14.33	2.30504G	-56.01	2.39924G	-54.65	2.4G	-56.33	24.72992G	-43.93	1

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
2.40468G	15.67	-14.33	2.14338G	-57.11	2.39782G	-55.48	2.4G	-56.26	15.17873G	-43.39	1

Summary

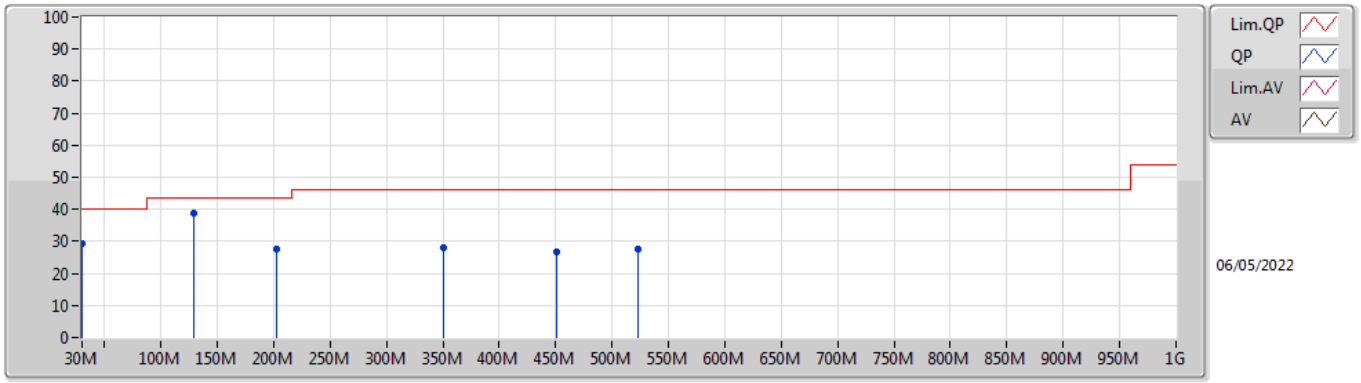
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	PK	128.94M	38.67	43.50	-4.83	3	Vertical	0	1.00	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
Zigbee	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	29.26	40.00	-10.74	3	Vertical	0	1.00	-
2440MHz	Pass	PK	128.94M	38.67	43.50	-4.83	3	Vertical	0	1.00	-
2440MHz	Pass	PK	202.66M	27.39	43.50	-16.11	3	Vertical	0	1.00	-
2440MHz	Pass	PK	350.1M	27.97	46.00	-18.03	3	Vertical	0	1.00	-
2440MHz	Pass	PK	450.98M	26.65	46.00	-19.35	3	Vertical	0	1.00	-
2440MHz	Pass	PK	522.76M	27.55	46.00	-18.45	3	Vertical	0	1.00	-
2440MHz	Pass	PK	30M	23.35	40.00	-16.65	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	130.88M	38.44	43.50	-5.06	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	198.78M	30.07	43.50	-13.43	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	299.66M	30.27	46.00	-15.73	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	350.1M	29.42	46.00	-16.58	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	491.72M	25.31	46.00	-20.69	3	Horizontal	360	1.00	-

Zigbee

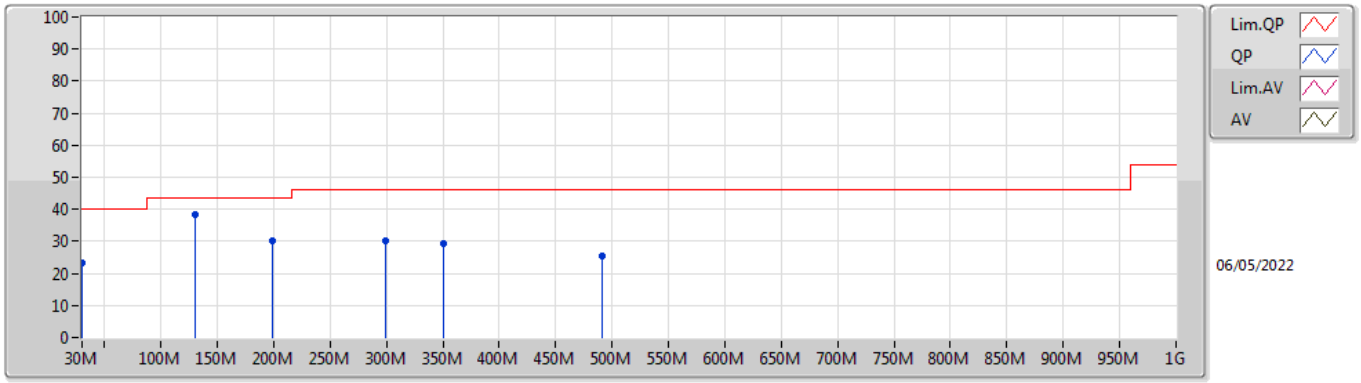
2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	30M	29.26	40.00	-10.74	-12.99	3	Vertical	0	1.00	-	42.25	23.73	0.48	37.20
PK	128.94M	38.67	43.50	-4.83	-18.48	3	Vertical	0	1.00	-	57.15	16.85	1.21	36.54
PK	202.66M	27.39	43.50	-16.11	-20.61	3	Vertical	0	1.00	-	48.00	14.27	1.40	36.28
PK	350.1M	27.97	46.00	-18.03	-15.06	3	Vertical	0	1.00	-	43.03	19.59	1.88	36.53
PK	450.98M	26.65	46.00	-19.35	-12.17	3	Vertical	0	1.00	-	38.82	22.31	2.18	36.66
PK	522.76M	27.55	46.00	-18.45	-11.56	3	Vertical	0	1.00	-	39.11	23.06	2.43	37.05

Zigbee

2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	30M	23.35	40.00	-16.65	-12.99	3	Horizontal	360	1.00	-	36.34	23.73	0.48	37.20
PK	130.88M	38.44	43.50	-5.06	-18.46	3	Horizontal	360	1.00	-	56.90	16.84	1.23	36.53
PK	198.78M	30.07	43.50	-13.43	-20.62	3	Horizontal	360	1.00	-	50.69	14.27	1.39	36.28
PK	299.66M	30.27	46.00	-15.73	-16.32	3	Horizontal	360	1.00	-	46.59	18.38	1.71	36.41
PK	350.1M	29.42	46.00	-16.58	-15.06	3	Horizontal	360	1.00	-	44.48	19.59	1.88	36.53
PK	491.72M	25.31	46.00	-20.69	-11.60	3	Horizontal	360	1.00	-	36.91	23.02	2.31	36.93

Summary

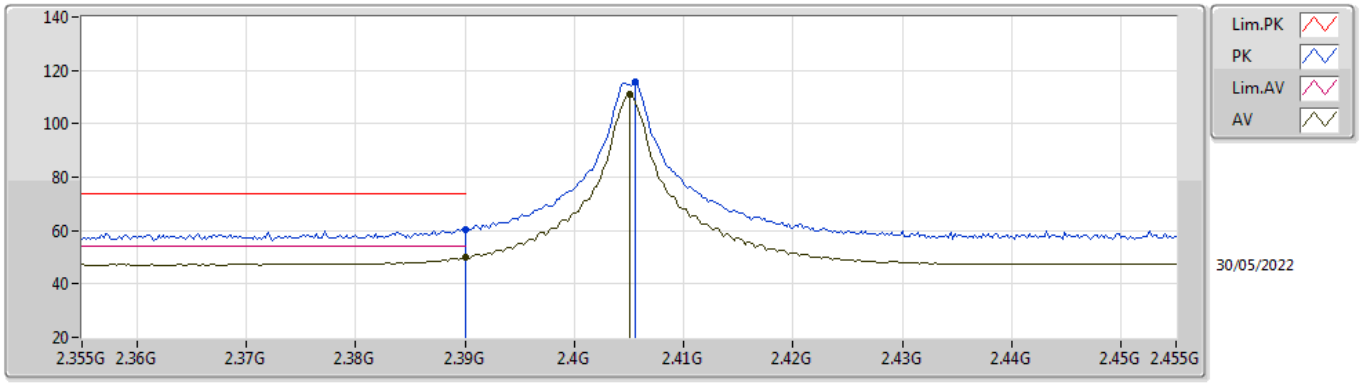
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	2.4835G	53.70	54.00	-0.30	3	Vertical	56	2.16	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
Zigbee	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	AV	2.39G	49.81	54.00	-4.19	3	Vertical	9	2.07	-
2405MHz	Pass	AV	2.405G	110.87	Inf	-Inf	3	Vertical	9	2.07	-
2405MHz	Pass	PK	2.39G	60.58	74.00	-13.42	3	Vertical	9	2.07	-
2405MHz	Pass	PK	2.4056G	115.53	Inf	-Inf	3	Vertical	9	2.07	-
2405MHz	Pass	AV	4.81102G	42.99	54.00	-11.01	3	Vertical	3	1.82	-
2405MHz	Pass	AV	12.02262G	42.88	54.00	-11.12	3	Vertical	360	1.38	-
2405MHz	Pass	PK	4.81108G	52.68	74.00	-21.32	3	Vertical	3	1.82	-
2405MHz	Pass	PK	12.02252G	55.68	74.00	-18.32	3	Vertical	360	1.38	-
2405MHz	Pass	AV	4.81106G	37.53	54.00	-16.47	3	Horizontal	338	1.40	-
2405MHz	Pass	AV	12.02252G	48.47	54.00	-5.53	3	Horizontal	352	1.23	-
2405MHz	Pass	PK	4.81126G	48.41	74.00	-25.59	3	Horizontal	338	1.40	-
2405MHz	Pass	PK	12.0228G	59.95	74.00	-14.05	3	Horizontal	352	1.23	-
2440MHz	Pass	AV	2.3432G	47.20	54.00	-6.80	3	Vertical	164	2.45	-
2440MHz	Pass	AV	2.44G	110.63	Inf	-Inf	3	Vertical	164	2.45	-
2440MHz	Pass	AV	2.4996G	47.73	54.00	-6.27	3	Vertical	164	2.45	-
2440MHz	Pass	PK	2.3732G	58.58	74.00	-15.42	3	Vertical	164	2.45	-
2440MHz	Pass	PK	2.4396G	115.20	Inf	-Inf	3	Vertical	164	2.45	-
2440MHz	Pass	PK	2.4964G	59.54	74.00	-14.46	3	Vertical	164	2.45	-
2440MHz	Pass	AV	4.87906G	46.39	54.00	-7.61	3	Vertical	0	1.70	-
2440MHz	Pass	AV	7.32162G	50.93	54.00	-3.07	3	Vertical	0	2.98	-
2440MHz	Pass	AV	12.19946G	40.85	54.00	-13.15	3	Vertical	67	2.38	-
2440MHz	Pass	PK	4.87912G	55.70	74.00	-18.30	3	Vertical	0	1.70	-
2440MHz	Pass	PK	7.32158G	61.03	74.00	-12.97	3	Vertical	0	2.98	-
2440MHz	Pass	PK	12.20436G	55.30	74.00	-18.70	3	Vertical	67	2.38	-
2440MHz	Pass	AV	4.88102G	40.65	54.00	-13.35	3	Horizontal	330	1.48	-
2440MHz	Pass	AV	7.32142G	48.65	54.00	-5.35	3	Horizontal	221	1.50	-
2440MHz	Pass	AV	12.20302G	41.06	54.00	-12.94	3	Horizontal	354	1.49	-
2440MHz	Pass	PK	4.88108G	51.29	74.00	-22.71	3	Horizontal	330	1.48	-
2440MHz	Pass	PK	7.32164G	59.38	74.00	-14.62	3	Horizontal	221	1.50	-
2440MHz	Pass	PK	12.19746G	54.78	74.00	-19.22	3	Horizontal	354	1.49	-
2475MHz	Pass	AV	2.475G	105.22	Inf	-Inf	3	Vertical	56	2.16	-
2475MHz	Pass	AV	2.4835G	53.70	54.00	-0.30	3	Vertical	56	2.16	-
2475MHz	Pass	PK	2.4744G	109.79	Inf	-Inf	3	Vertical	56	2.16	-
2475MHz	Pass	PK	2.4835G	63.90	74.00	-10.10	3	Vertical	56	2.16	-
2475MHz	Pass	AV	4.9511G	39.23	54.00	-14.77	3	Vertical	1	1.50	-
2475MHz	Pass	AV	7.42664G	40.56	54.00	-13.44	3	Vertical	0	2.55	-
2475MHz	Pass	AV	12.37074G	40.93	54.00	-13.07	3	Vertical	238	2.56	-
2475MHz	Pass	PK	4.95118G	49.87	74.00	-24.13	3	Vertical	1	1.50	-
2475MHz	Pass	PK	7.4265G	52.91	74.00	-21.09	3	Vertical	0	2.55	-
2475MHz	Pass	PK	12.37422G	55.17	74.00	-18.83	3	Vertical	238	2.56	-
2475MHz	Pass	AV	4.94904G	34.42	54.00	-19.58	3	Horizontal	265	1.50	-
2475MHz	Pass	AV	7.42662G	38.07	54.00	-15.93	3	Horizontal	0	1.00	-
2475MHz	Pass	AV	12.3701G	40.98	54.00	-13.02	3	Horizontal	144	1.00	-
2475MHz	Pass	PK	4.94954G	46.96	74.00	-27.04	3	Horizontal	265	1.50	-
2475MHz	Pass	PK	7.42686G	51.53	74.00	-22.47	3	Horizontal	0	1.00	-
2475MHz	Pass	PK	12.37832G	54.99	74.00	-19.01	3	Horizontal	144	1.00	-

Zigbee

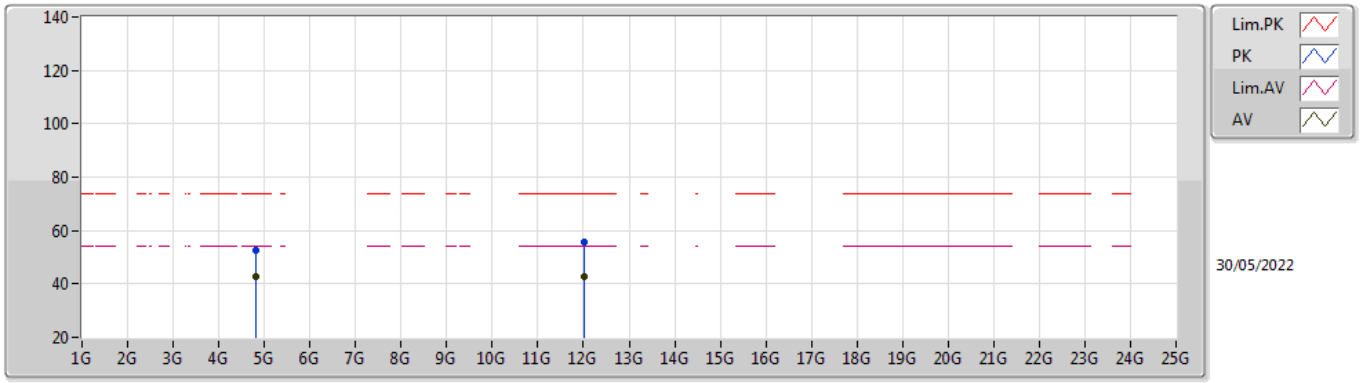
2405MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.39G	49.81	54.00	-4.19	35.56	3	Vertical	9	2.07	-	14.25	27.28	8.28	-
AV	2.405G	110.87	Inf	-Inf	35.61	3	Vertical	9	2.07	-	75.26	27.32	8.29	-
PK	2.39G	60.58	74.00	-13.42	35.56	3	Vertical	9	2.07	-	25.02	27.28	8.28	-
PK	2.4056G	115.53	Inf	-Inf	35.61	3	Vertical	9	2.07	-	79.92	27.32	8.29	-

Zigbee

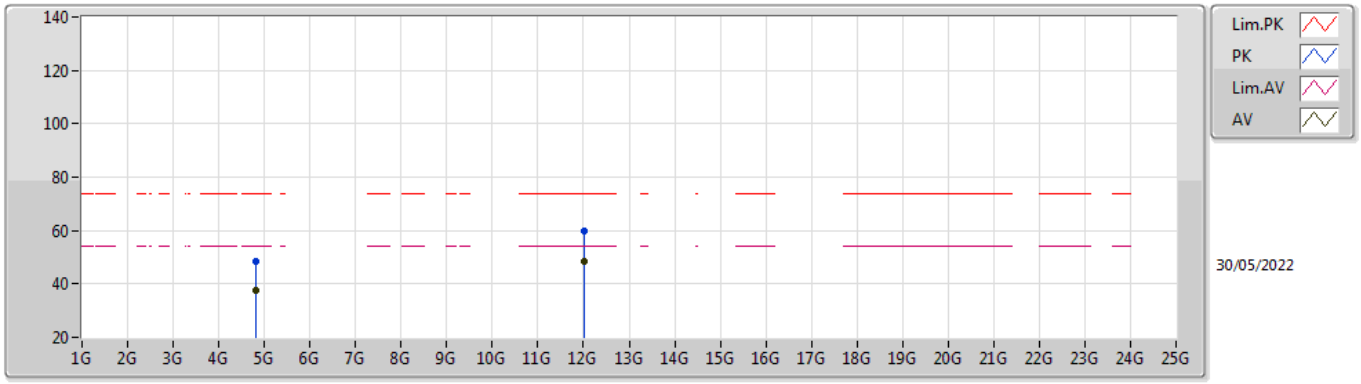
2405MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.81102G	42.99	54.00	-11.01	8.00	3	Vertical	3	1.82	-	34.99	32.52	9.67	34.19
AV	12.02262G	42.88	54.00	-11.12	17.87	3	Vertical	360	1.38	-	25.01	38.87	13.32	34.32
PK	4.81108G	52.68	74.00	-21.32	8.00	3	Vertical	3	1.82	-	44.68	32.52	9.67	34.19
PK	12.02252G	55.68	74.00	-18.32	17.87	3	Vertical	360	1.38	-	37.81	38.87	13.32	34.32

Zigbee

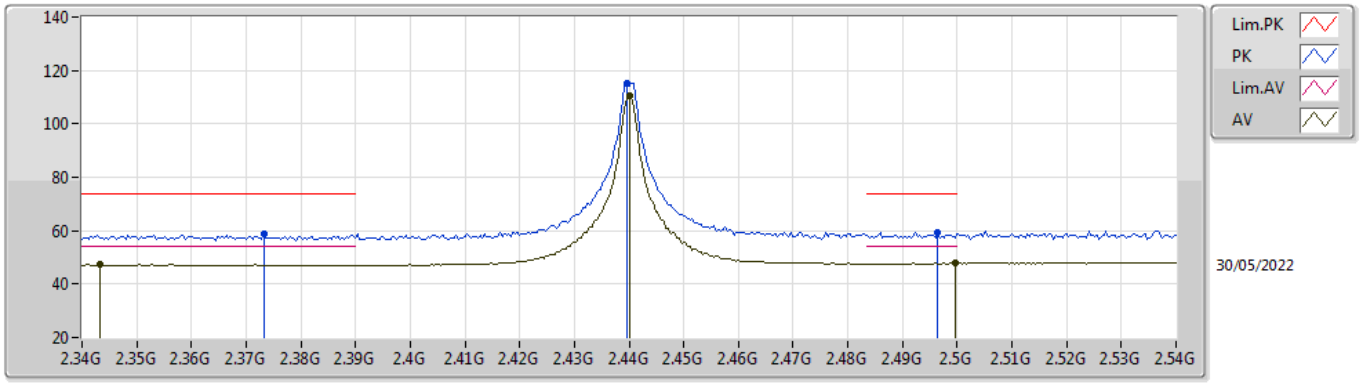
2405MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.81106G	37.53	54.00	-16.47	8.00	3	Horizontal	338	1.40	-	29.53	32.52	9.67	34.19
AV	12.02252G	48.47	54.00	-5.53	17.87	3	Horizontal	352	1.23	-	30.60	38.87	13.32	34.32
PK	4.81126G	48.41	74.00	-25.59	8.00	3	Horizontal	338	1.40	-	40.41	32.52	9.67	34.19
PK	12.0228G	59.95	74.00	-14.05	17.87	3	Horizontal	352	1.23	-	42.08	38.87	13.32	34.32

Zigbee

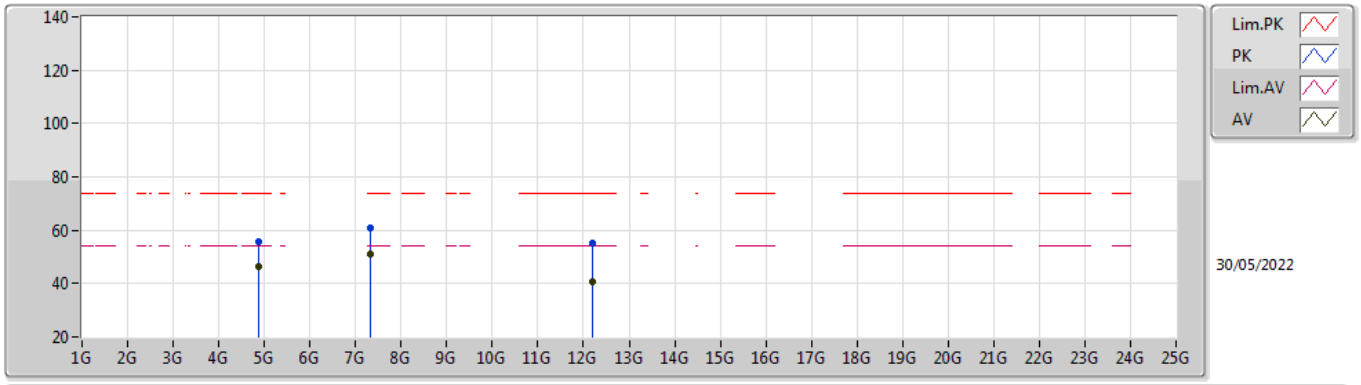
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3432G	47.20	54.00	-6.80	35.42	3	Vertical	164	2.45	-	11.78	27.17	8.25	-
AV	2.44G	110.63	Inf	-Inf	35.78	3	Vertical	164	2.45	-	74.85	27.46	8.32	-
AV	2.4996G	47.73	54.00	-6.27	36.15	3	Vertical	164	2.45	-	11.58	27.80	8.35	-
PK	2.3732G	58.58	74.00	-15.42	35.52	3	Vertical	164	2.45	-	23.06	27.25	8.27	-
PK	2.4396G	115.20	Inf	-Inf	35.78	3	Vertical	164	2.45	-	79.42	27.46	8.32	-
PK	2.4964G	59.54	74.00	-14.46	36.13	3	Vertical	164	2.45	-	23.41	27.78	8.35	-

Zigbee

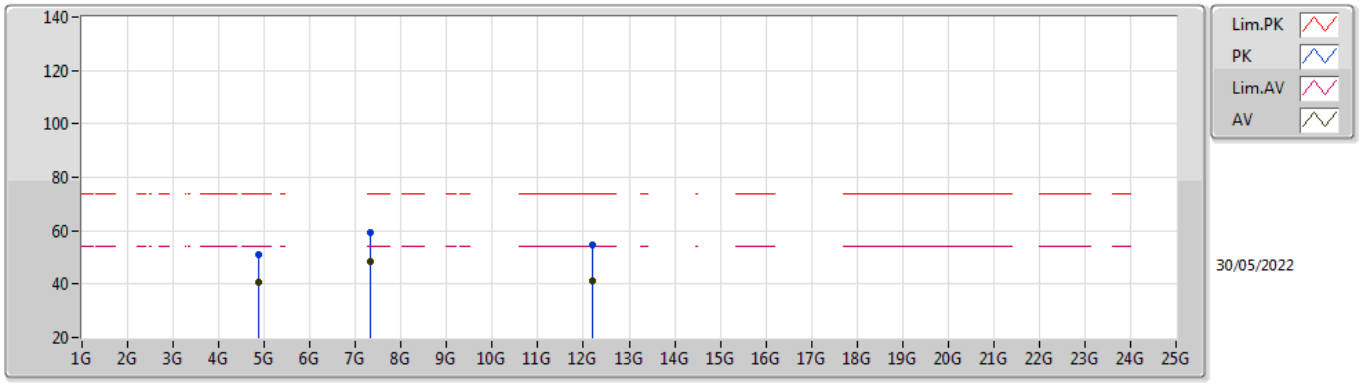
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87906G	46.39	54.00	-7.61	8.20	3	Vertical	0	1.70	-	38.19	32.66	9.70	34.16
AV	7.32162G	50.93	54.00	-3.07	13.46	3	Vertical	0	2.98	-	37.47	36.64	11.32	34.50
AV	12.19946G	40.85	54.00	-13.15	18.20	3	Vertical	67	2.38	-	22.65	39.00	13.43	34.23
PK	4.87912G	55.70	74.00	-18.30	8.20	3	Vertical	0	1.70	-	47.50	32.66	9.70	34.16
PK	7.32158G	61.03	74.00	-12.97	13.46	3	Vertical	0	2.98	-	47.57	36.64	11.32	34.50
PK	12.20436G	55.30	74.00	-18.70	18.20	3	Vertical	67	2.38	-	37.10	38.99	13.44	34.23

Zigbee

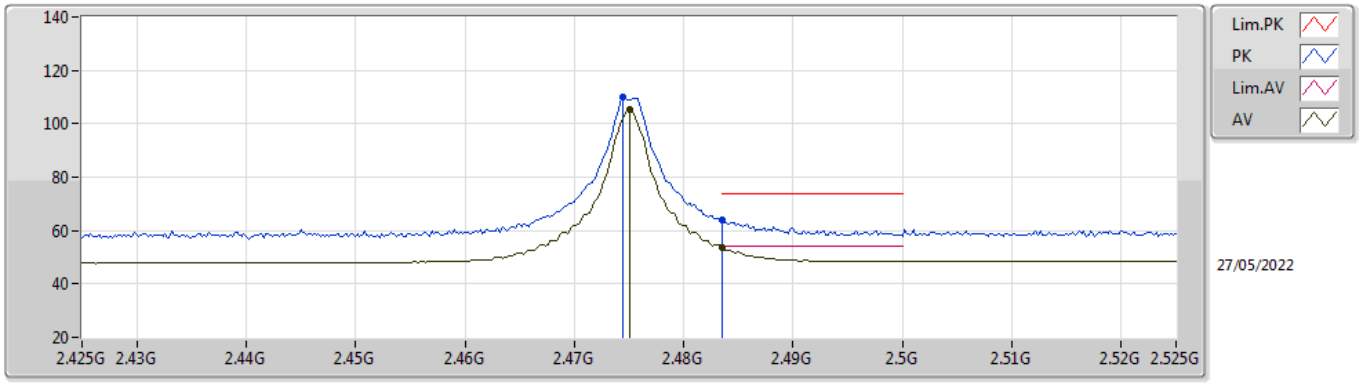
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.88102G	40.65	54.00	-13.35	8.20	3	Horizontal	330	1.48	-	32.45	32.66	9.70	34.16
AV	7.32142G	48.65	54.00	-5.35	13.46	3	Horizontal	221	1.50	-	35.19	36.64	11.32	34.50
AV	12.20302G	41.06	54.00	-12.94	18.19	3	Horizontal	354	1.49	-	22.87	38.99	13.43	34.23
PK	4.88108G	51.29	74.00	-22.71	8.20	3	Horizontal	330	1.48	-	43.09	32.66	9.70	34.16
PK	7.32164G	59.38	74.00	-14.62	13.46	3	Horizontal	221	1.50	-	45.92	36.64	11.32	34.50
PK	12.19746G	54.78	74.00	-19.22	18.20	3	Horizontal	354	1.49	-	36.58	39.00	13.43	34.23

Zigbee

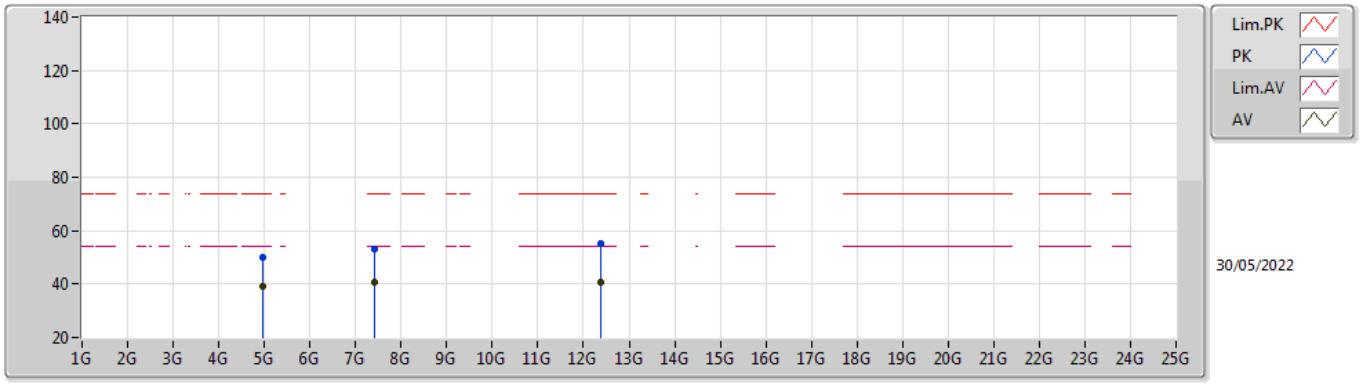
2475MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.475G	105.22	Inf	-Inf	35.99	3	Vertical	56	2.16	-	69.23	27.65	8.34	-
AV	2.4835G	53.70	54.00	-0.30	36.04	3	Vertical	56	2.16	-	17.66	27.70	8.34	-
PK	2.4744G	109.79	Inf	-Inf	35.99	3	Vertical	56	2.16	-	73.80	27.65	8.34	-
PK	2.4835G	63.90	74.00	-10.10	36.04	3	Vertical	56	2.16	-	27.86	27.70	8.34	-

Zigbee

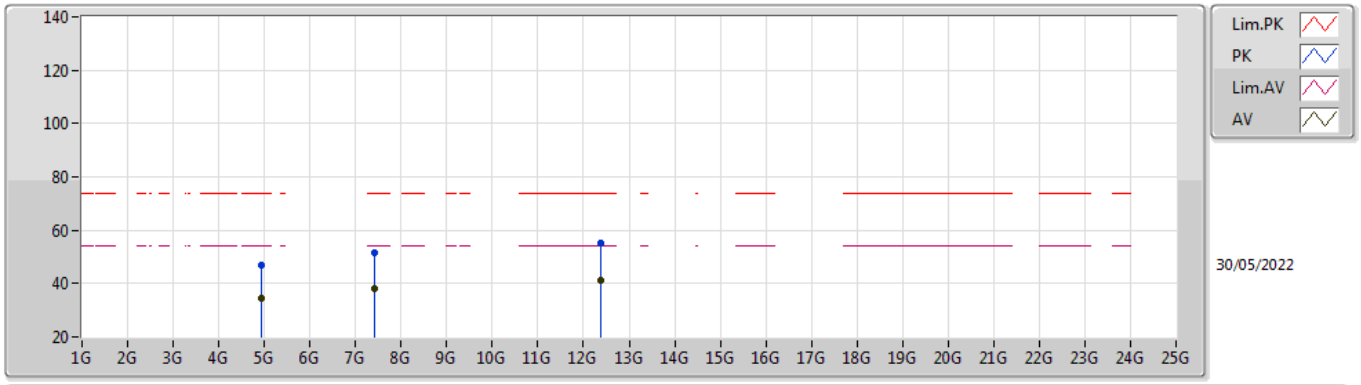
2475MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.9511G	39.23	54.00	-14.77	8.51	3	Vertical	1	1.50	-	30.72	32.90	9.73	34.12
AV	7.42664G	40.56	54.00	-13.44	13.11	3	Vertical	0	2.55	-	27.45	36.29	11.31	34.49
AV	12.37074G	40.93	54.00	-13.07	18.27	3	Vertical	238	2.56	-	22.66	38.87	13.54	34.14
PK	4.95118G	49.87	74.00	-24.13	8.51	3	Vertical	1	1.50	-	41.36	32.90	9.73	34.12
PK	7.4265G	52.91	74.00	-21.09	13.11	3	Vertical	0	2.55	-	39.80	36.29	11.31	34.49
PK	12.37422G	55.17	74.00	-18.83	18.27	3	Vertical	238	2.56	-	36.90	38.87	13.54	34.14

Zigbee

2475MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.94904G	34.42	54.00	-19.58	8.51	3	Horizontal	265	1.50	-	25.91	32.90	9.73	34.12
AV	7.42662G	38.07	54.00	-15.93	13.11	3	Horizontal	0	1.00	-	24.96	36.29	11.31	34.49
AV	12.3701G	40.98	54.00	-13.02	18.27	3	Horizontal	144	1.00	-	22.71	38.87	13.54	34.14
PK	4.94954G	46.96	74.00	-27.04	8.51	3	Horizontal	265	1.50	-	38.45	32.90	9.73	34.12
PK	7.42686G	51.53	74.00	-22.47	13.11	3	Horizontal	0	1.00	-	38.42	36.29	11.31	34.49
PK	12.37832G	54.99	74.00	-19.01	18.28	3	Horizontal	144	1.00	-	36.71	38.88	13.54	34.14