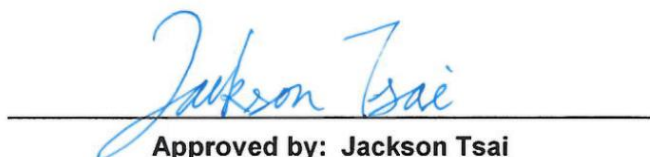


FCC Radio Test Report

FCC ID : RSE-OWM0131
Equipment : WiFi Extender
Brand Name : technicolor
Model Name : OWM0131TCH
Applicant : Technicolor Delivery Technologies Belgium
Prins Boudewijnlaan 47
Edegem B-2650
Belgium
Manufacturer : Technicolor Delivery Technologies Belgium
Prins Boudewijnlaan 47
Edegem B-2650
Belgium
Standard : 47 CFR FCC Part 15.247

The product was received on Jun. 23, 2022, and testing was started from Jun. 27, 2022 and completed on Sep. 02, 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.)



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History of this test report

[illegible]

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: Michelle Tsai

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	Support
1	NA	NA	PCB	I-Pex	2.4GHz
2	NA	NA	PCB	I-Pex	2.4GHz
3	NA	NA	PCB	I-Pex	5GHz
4	NA	NA	PCB	I-Pex	5GHz
5	NA	NA	PCB	I-Pex	5GHz
6	NA	NA	PCB	I-Pex	5GHz
7	NA	NA	PCB	I-Pex	Bluetooth
8	NA	NA	PCB	I-Pex	Zigbee
9	NA	NA	PCB	I-Pex	Z-Wave

Ant.	Port	Gain (dBi)					
		2.4G	U-NII-1	U-NII-3	Bluetooth	Zigbee	Z-Wave
1	1	2.28	-	-	-	-	-
2	2	3.20	-	-	-	-	-
3	1	-	4.09	3.29	-	-	-
4	2	-	2.57	2.70	-	-	-
5	3	-	2.33	2.51	-	-	-
6	4	-	3.75	2.65	-	-	-
7	1	-	-	-	2.9	-	-
8	1	-	-	-	-	4.8	-
9	1	-	-	-	-	-	0.9

Composite Gain (dBi)			
Stream	2.4G	U-NII-1	U-NII-3
1SS	3.23	5.23	5.41
2SS	3.2	4.09	3.29
3SS	-	4.09	3.29
4SS	-	4.09	3.29

Note 1: The EUT has nine antennas.

For 2.4GHz function:

For IEEE 802.11b mode (1TX/1RX)

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

For IEEE 802.11 b/g/n/VHT/ax mode (2TX/2RX)

Ant. 1 (port 1) ~ Ant. 2 (port 2) could transmit/receive simultaneously.

For BT function:

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

Ant. 7 can be used as transmitting/receiving antenna.

For 5GHz function:

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

Ant. 3 (port 1) ~ Ant. 6 (port 4) could transmit/receive simultaneously.

For Zigbee function:

For Zigbee mode (1TX/1RX)

Ant. 8 (port 1) could transmit/receive.

For Z-Wave function:

For Z-Wave mode (1TX/1RX)

Ant. 9 (port 1) could transmit/receive.

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From AC Adapter		
Software Version	5.04L.03		
Hardware Version	LAB1		
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) $\geq 1/T$
Zigbee	1	0	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 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 (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Edward Wang	22.1~23.6℃ / 50~60%	15/Jul/2022
RF Conducted	TH01-HY	Johnny Yu	22.3~26.5℃ / 52~53%	23/Jul/2022~15/Aug/2022
Radiated	03CH02-HY	Jack Tang	21.4~22.4℃ / 56~63%	27/Jun/2022~28/Jul/2022
Radiated (Co-location)	03CH02-HY	Jack Tang	21.4~22.4℃ / 56~63%	02/Sep/2022
☐ Wen 33rd.St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
	TEL: 886-3-318-0787		FAX: 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				

1.4 Measurement Uncertainty

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

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

2 Test Configuration of EUT

2.1 Test Channel Mode

Test Software Version	Dos V6.1
-----------------------	----------

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

2.2 The Worst Case Measurement Configuration

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

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

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

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	CTX
1	WLAN 2.4GHz + WLAN 5GHz + Bluetooth + Zigbee + Zwave
Refer to Sporton Test Report No.: FA262320 for Co-location RF Exposure Evaluation and Appendix G for Radiated Emission Co-location.	

2.3 Accessories

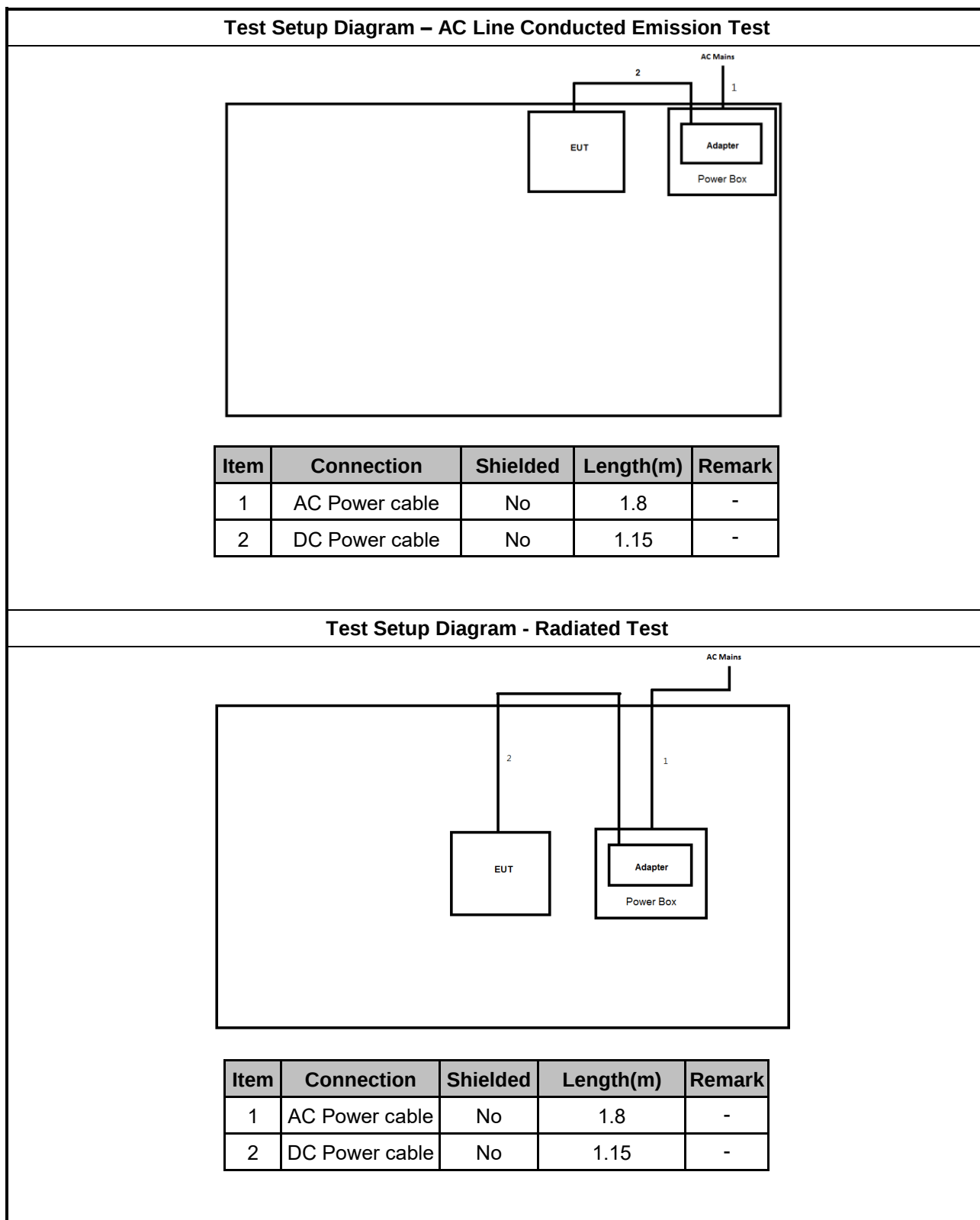
Accessories				
AC Adapter	Brand Name	HONOR	Model Name	ADS-24FUA-12 12024EPCU
	Power Rating	I/P: 100 - 240Vac, 0.7 A, O/P: 12 Vdc, 2.0A		
	Power Cord	1.15 meter, non-shielded cable, w/o ferrite core		
Stand	Brand Name	NA	Model Name	NA

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



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

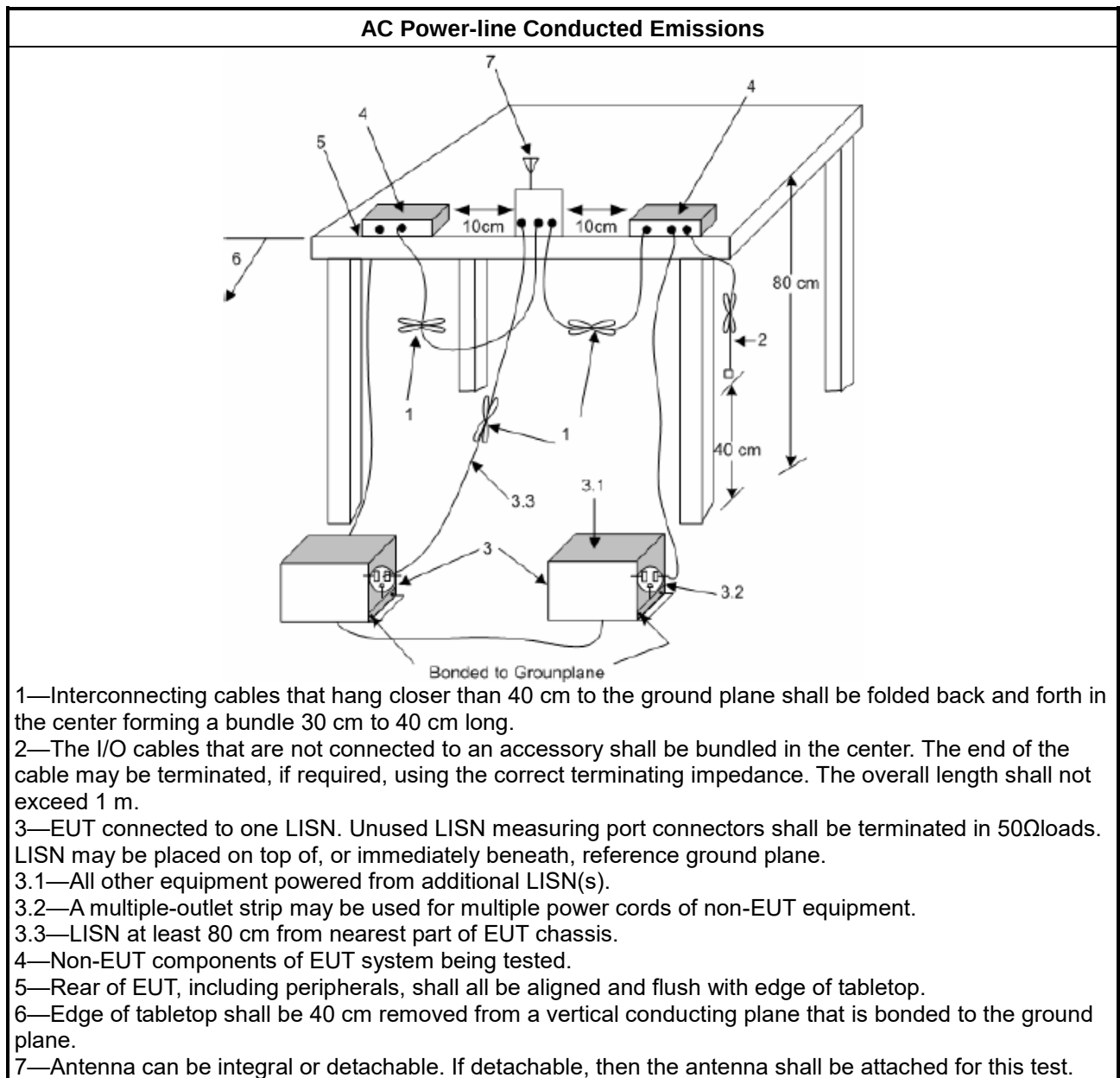
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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



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 $\geq$ 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 occupied bandwidth testing
☐	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup



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
e.i.r.p. Power Limit:	
	2400-2483.5 MHz Band
	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
	Smart antenna system (SAS)
	- Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ 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.	

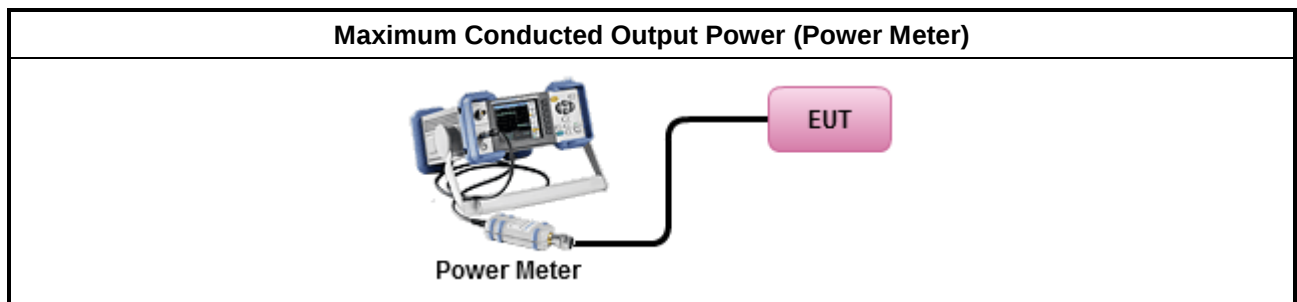
3.3.2 Measuring Instruments

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: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.3.4 Test Setup



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

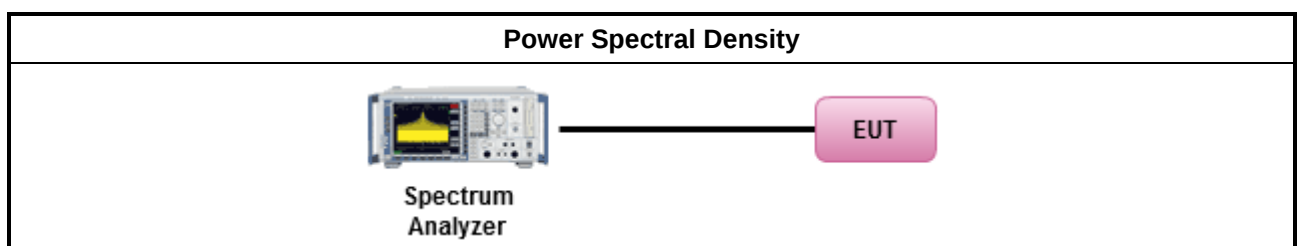
3.4.2 Measuring Instruments

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



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.	

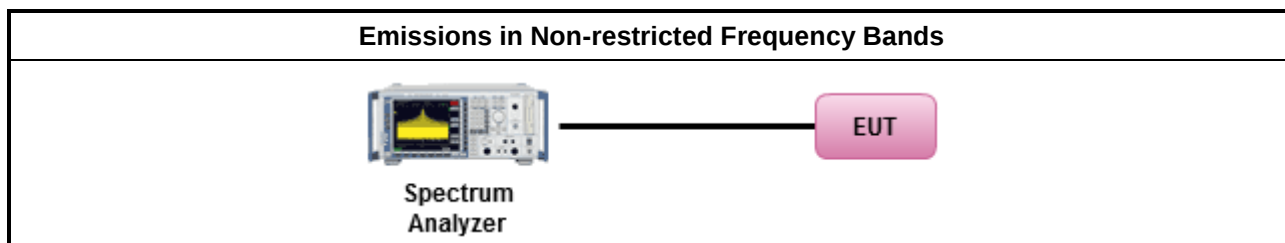
3.5.2 Measuring Instruments

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



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

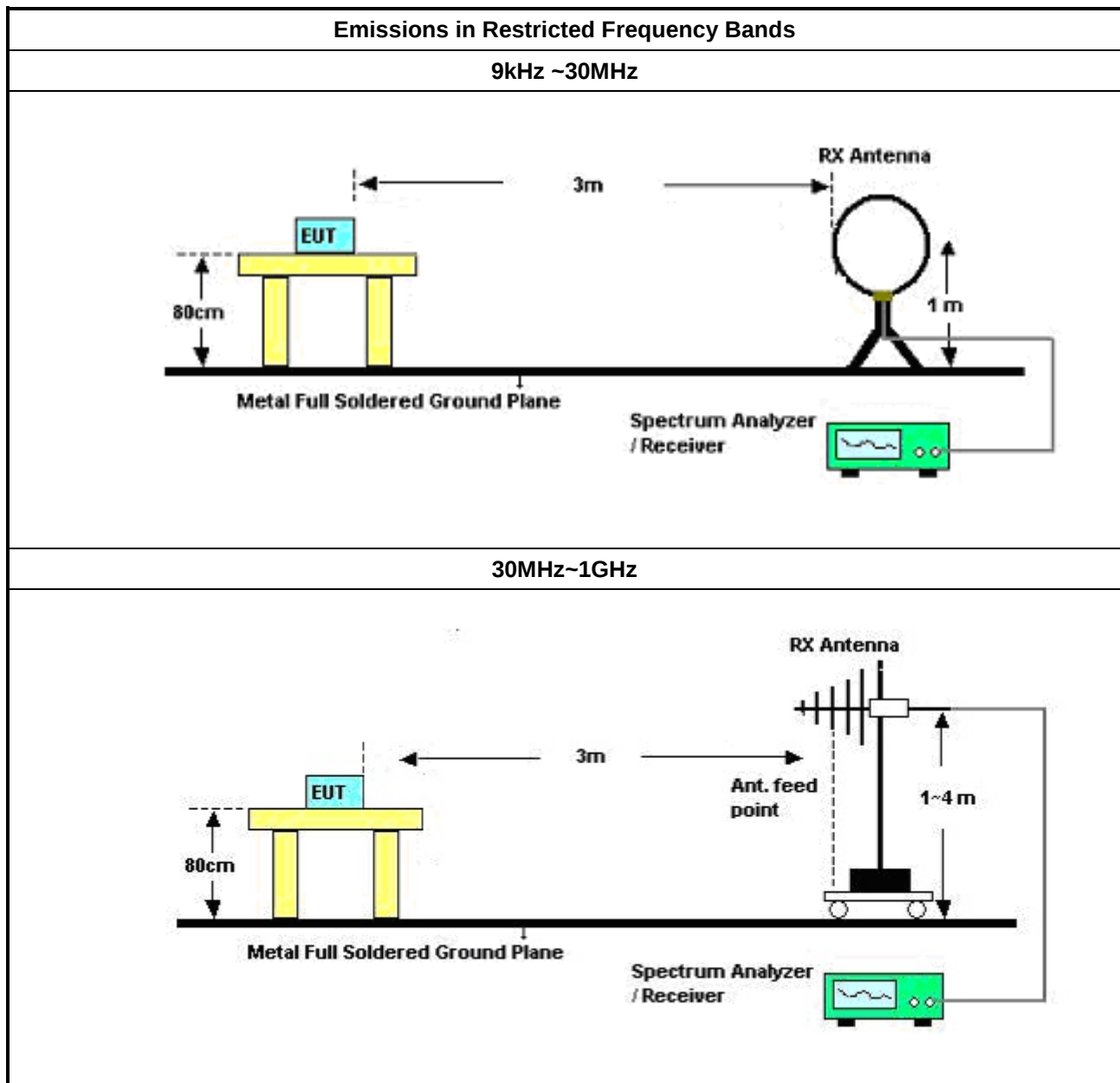
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted 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 $f \geq 1$ 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.

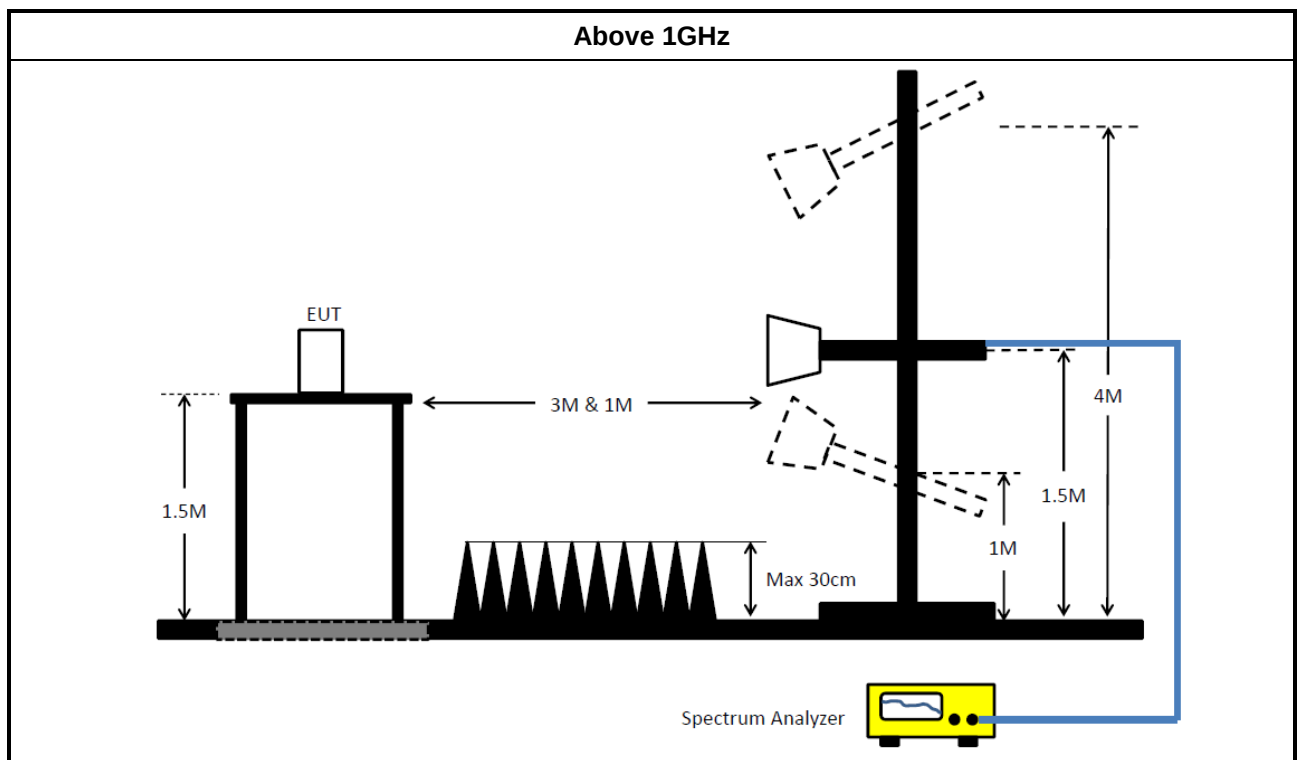
3.6.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.6.5 Test Setup





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	ESR3	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	V5.1014	-	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	101013	10Hz~40GHz	01/Apr/2022	31/Mar/2023
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	21/Oct/2021	20/Oct/2022
Pulse Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	21/Feb/2022	20/Feb/2023
Power Meter	Anritsu	ML2495A	0949003	300MHz~40GHz	21/Feb/2022	20/Feb/2023
SENSE-15247_DTS	Sporton	V5.10.8.3	N/A	N/A	N/A	N/A

Instrument for Radiated Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	02/Aug/2021	01/Aug/2022
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
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	28/Jun/2022	27/Jun/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
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	04/Sep/2021	03/Sep/2022
RF Cable	MVE	400LL	MVE-1-0802	9kHz~30MHz	04/May/2022	03/May/2023
RF Cable	MVE	400LL	MVE-1-0802	30MHz~1GHz	04/May/2022	03/May/2023
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 Preamplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz~40GHz	08/Mar/2022	07/Mar/2023
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	18/Mar/2022	17/Mar/2023
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	13/May/2022	12/May/2023
SENSE-15247_FS	Sporton	V5.10.7.14	N/A	N/A	N/A	N/A

Instrument for Radiated Test (Co-location)

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	30/Jul/2022	29/Jul/2023
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-EMI	Sporton	V5.10.8	N/A	N/A	N/A	N/A



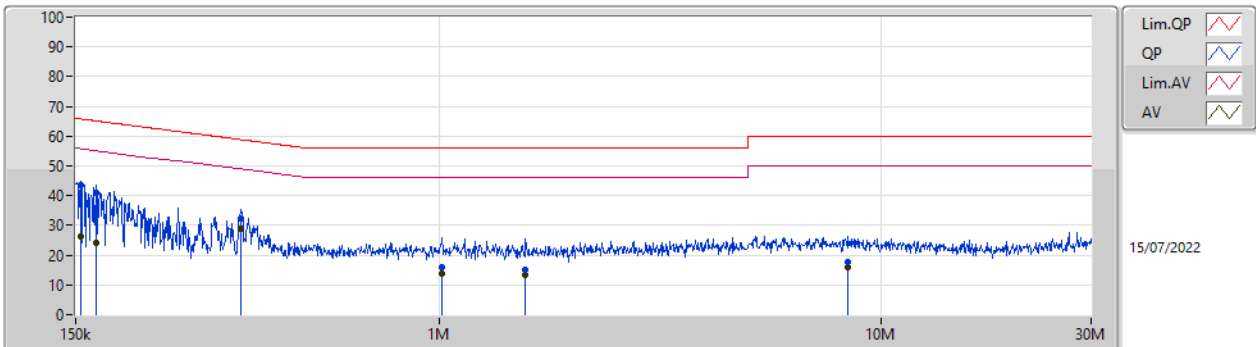
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	355.282k	28.77	48.83	-20.06	Line

Mode config

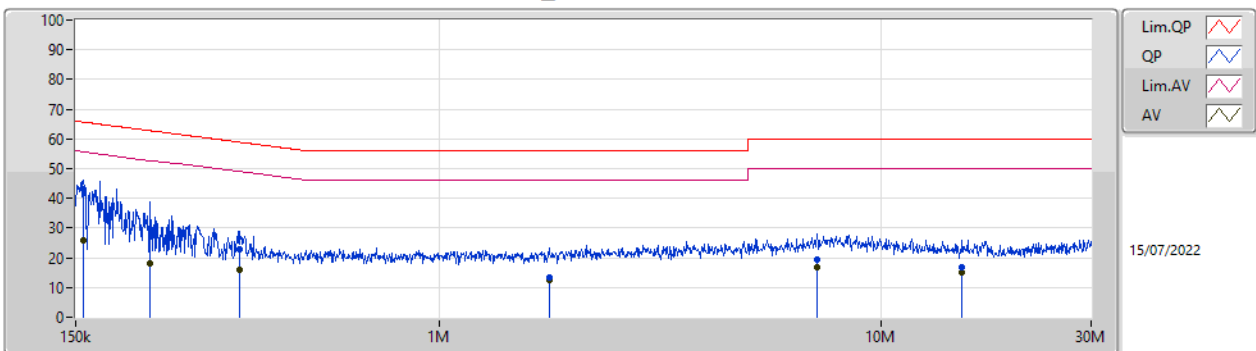
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	153.636k	43.59	65.81	-22.22	Line	-
Mode 1	Pass	AV	153.636k	26.27	55.81	-29.54	Line	-
Mode 1	Pass	QP	167.071k	40.99	65.10	-24.11	Line	-
Mode 1	Pass	AV	167.071k	24.01	55.10	-31.09	Line	-
Mode 1	Pass	QP	355.282k	32.21	58.83	-26.62	Line	-
Mode 1	Pass	AV	355.282k	28.77	48.83	-20.06	Line	-
Mode 1	Pass	QP	1.015M	15.98	56.00	-40.02	Line	-
Mode 1	Pass	AV	1.015M	13.66	46.00	-32.34	Line	-
Mode 1	Pass	QP	1.569M	14.98	56.00	-41.02	Line	-
Mode 1	Pass	AV	1.569M	13.40	46.00	-32.60	Line	-
Mode 1	Pass	QP	8.456M	17.47	60.00	-42.53	Line	-
Mode 1	Pass	AV	8.456M	15.79	50.00	-34.21	Line	-
Mode 1	Pass	QP	156.109k	42.89	65.67	-22.78	Neutral	-
Mode 1	Pass	AV	156.109k	25.68	55.67	-29.99	Neutral	-
Mode 1	Pass	QP	220.933k	29.79	62.79	-33.00	Neutral	-
Mode 1	Pass	AV	220.933k	17.93	52.79	-34.86	Neutral	-
Mode 1	Pass	QP	353.867k	22.70	58.87	-36.17	Neutral	-
Mode 1	Pass	AV	353.867k	15.89	48.87	-32.98	Neutral	-
Mode 1	Pass	QP	1.775M	13.53	56.00	-42.47	Neutral	-
Mode 1	Pass	AV	1.775M	12.60	46.00	-33.40	Neutral	-
Mode 1	Pass	QP	7.179M	19.34	60.00	-40.66	Neutral	-
Mode 1	Pass	AV	7.179M	16.82	50.00	-33.18	Neutral	-
Mode 1	Pass	QP	15.327M	16.60	60.00	-43.40	Neutral	-
Mode 1	Pass	AV	15.327M	14.95	50.00	-35.05	Neutral	-

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	153.636k	43.59	65.81	-22.22	19.63	Line	-	23.96	9.69	0.03	9.91			
AV	153.636k	26.27	55.81	-29.54	19.63	Line	-	6.64	9.69	0.03	9.91			
QP	167.071k	40.99	65.10	-24.11	19.63	Line	-	21.36	9.69	0.03	9.91			
AV	167.071k	24.01	55.10	-31.09	19.63	Line	-	4.38	9.69	0.03	9.91			
QP	355.282k	32.21	58.83	-26.62	19.63	Line	-	12.58	9.68	0.04	9.91			
AV	355.282k	28.77	48.83	-20.06	19.63	Line	-	9.14	9.68	0.04	9.91			
QP	1.015M	15.98	56.00	-40.02	19.65	Line	-	-3.67	9.68	0.05	9.92			
AV	1.015M	13.66	46.00	-32.34	19.65	Line	-	-5.99	9.68	0.05	9.92			
QP	1.569M	14.98	56.00	-41.02	19.68	Line	-	-4.70	9.69	0.07	9.92			
AV	1.569M	13.40	46.00	-32.60	19.68	Line	-	-6.28	9.69	0.07	9.92			
QP	8.456M	17.47	60.00	-42.53	19.89	Line	-	-2.42	9.79	0.17	9.93			
AV	8.456M	15.79	50.00	-34.21	19.89	Line	-	-4.10	9.79	0.17	9.93			

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	156.109k	42.89	65.67	-22.78	19.67	Neutral	-	23.22	9.73	0.03	9.91			
AV	156.109k	25.68	55.67	-29.99	19.67	Neutral	-	6.01	9.73	0.03	9.91			
QP	220.933k	29.79	62.79	-33.00	19.66	Neutral	-	10.13	9.72	0.03	9.91			
AV	220.933k	17.93	52.79	-34.86	19.66	Neutral	-	-1.73	9.72	0.03	9.91			
QP	353.867k	22.70	58.87	-36.17	19.67	Neutral	-	3.03	9.72	0.04	9.91			
AV	353.867k	15.89	48.87	-32.98	19.67	Neutral	-	-3.78	9.72	0.04	9.91			
QP	1.775M	13.53	56.00	-42.47	19.73	Neutral	-	-6.20	9.74	0.07	9.92			
AV	1.775M	12.60	46.00	-33.40	19.73	Neutral	-	-7.13	9.74	0.07	9.92			
QP	7.179M	19.34	60.00	-40.66	19.93	Neutral	-	-0.59	9.84	0.16	9.93			
AV	7.179M	16.82	50.00	-33.18	19.93	Neutral	-	-3.11	9.84	0.16	9.93			
QP	15.327M	16.60	60.00	-43.40	20.12	Neutral	-	-3.52	9.95	0.24	9.93			
AV	15.327M	14.95	50.00	-35.05	20.12	Neutral	-	-5.17	9.95	0.24	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	1.644M	2.28M	2M28G1D	1.619M	2.261M

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	1.619M	2.261M
2440MHz	Pass	500k	1.644M	2.261M
2475MHz	Pass	500k	1.644M	2.28M

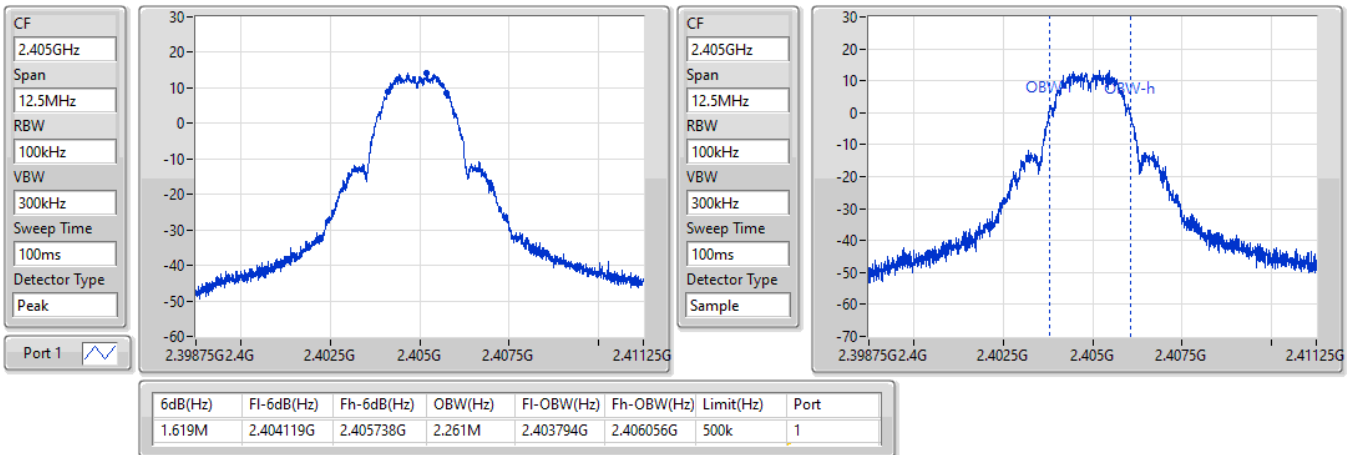
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

Zigbee

2405MHz

EBW

23/07/2022

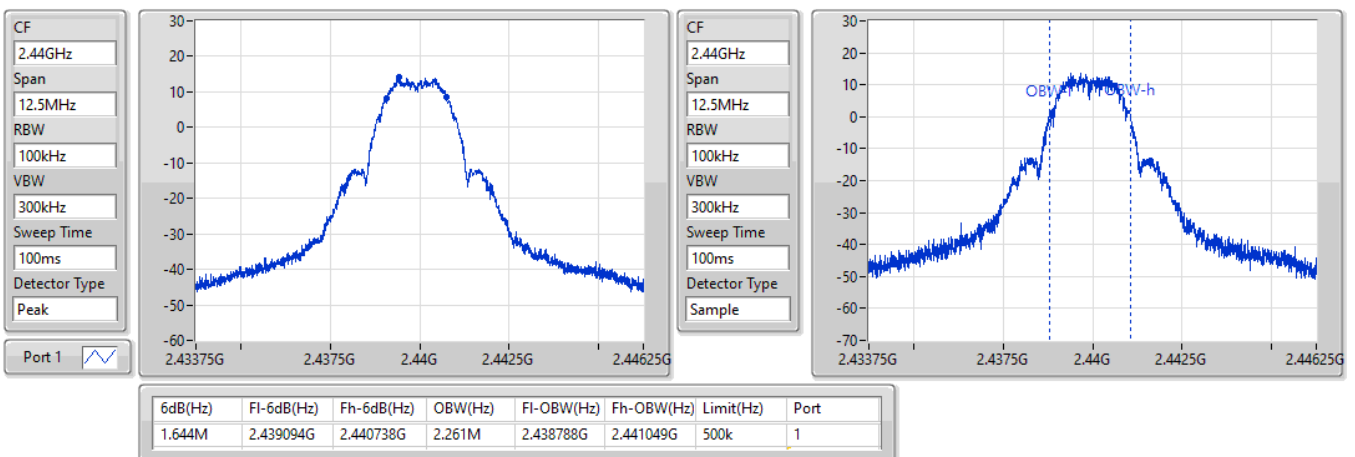


Zigbee

2440MHz

EBW

23/07/2022

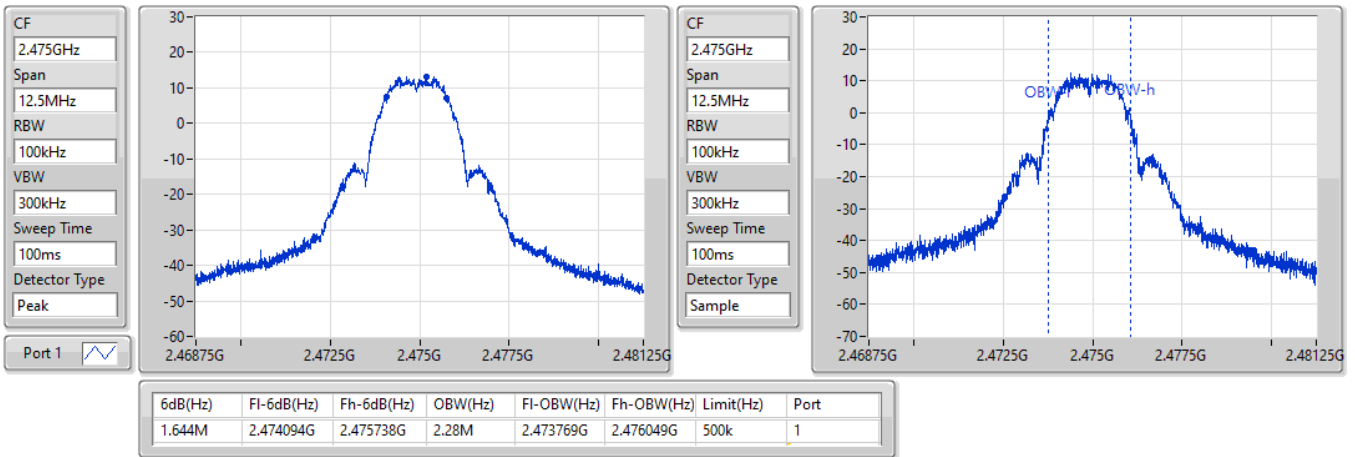


Zigbee

2475MHz

EBW

23/07/2022





Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	18.10	0.06457



Average Power

Appendix C

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-
2405MHz	Pass	4.80	18.00	18.00	30.00
2440MHz	Pass	4.80	18.04	18.04	30.00
2475MHz	Pass	4.80	18.10	18.10	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Zigbee	-4.15

RBW = 3kHz;



Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-
2405MHz	Pass	4.80	-4.52	-4.52	8.00
2440MHz	Pass	4.80	-4.15	-4.15	8.00
2475MHz	Pass	4.80	-4.53	-4.53	8.00

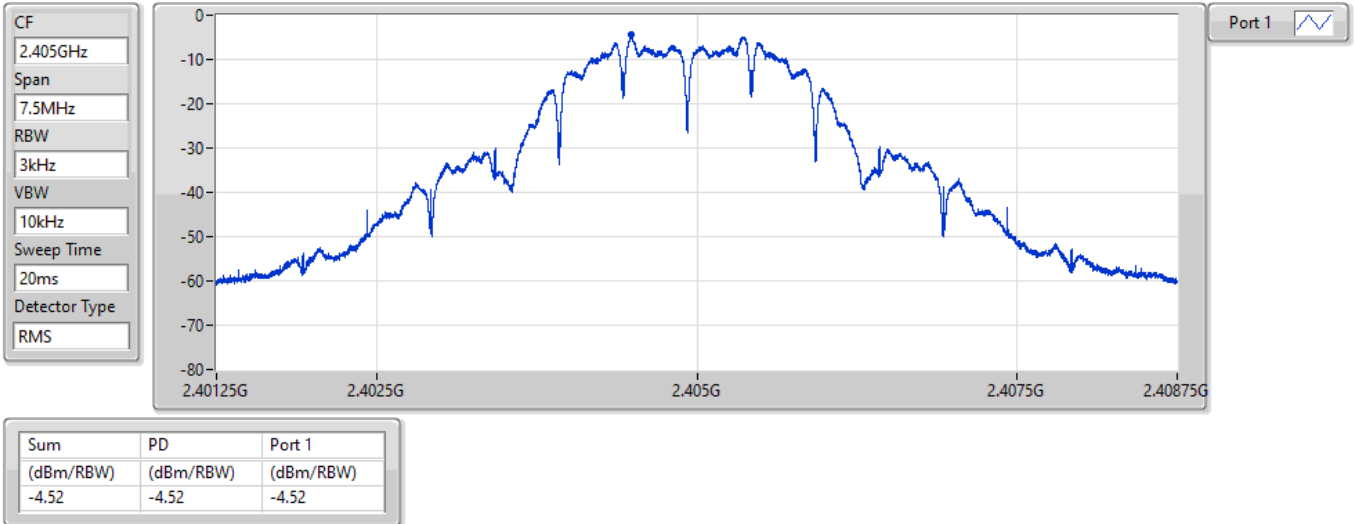
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

Zigbee

2405MHz

PSD

15/08/2022

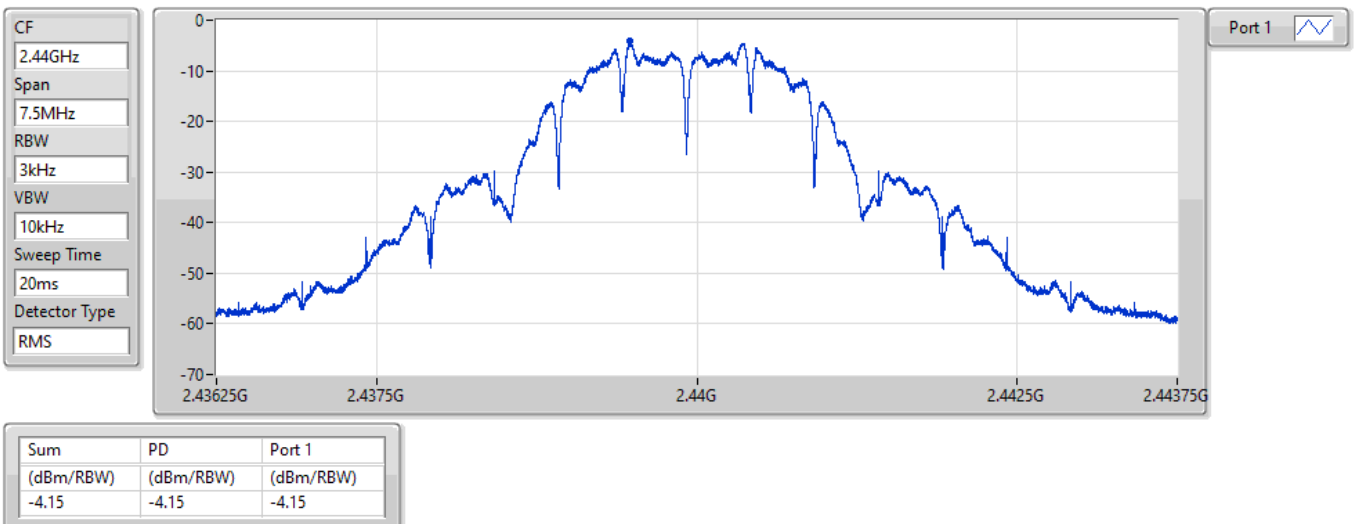


Zigbee

2440MHz

PSD

15/08/2022

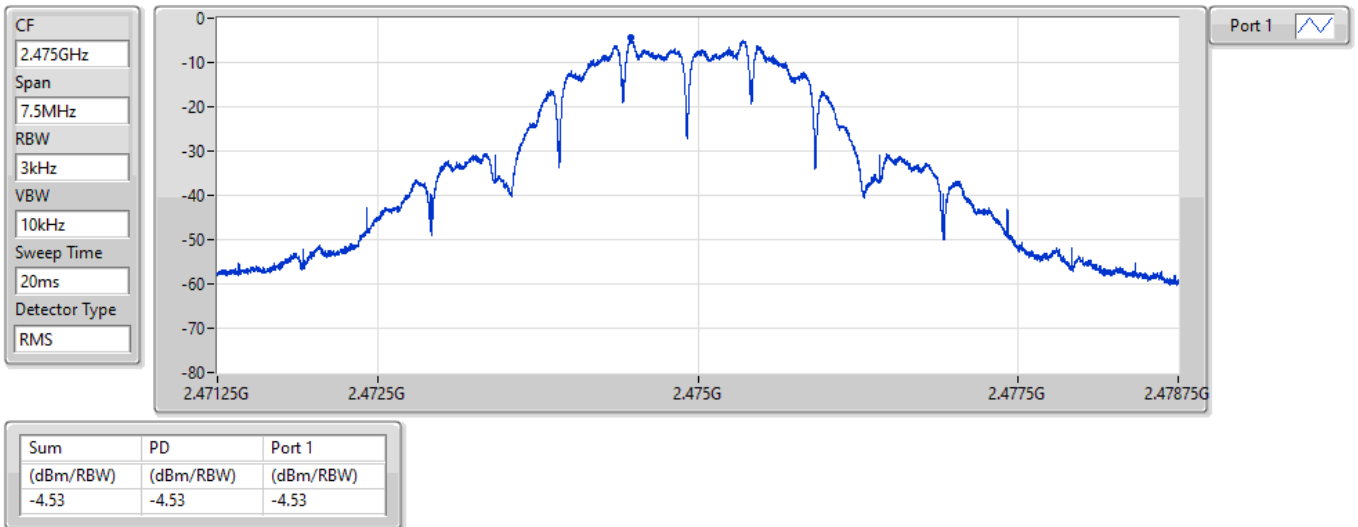


Zigbee

2475MHz

PSD

15/08/2022



**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	2.47548G	13.76	-16.24	2.02066G	-56.19	2.39746G	-54.41	2.4G	-56.49	24.16726G	-40.78	1



Result

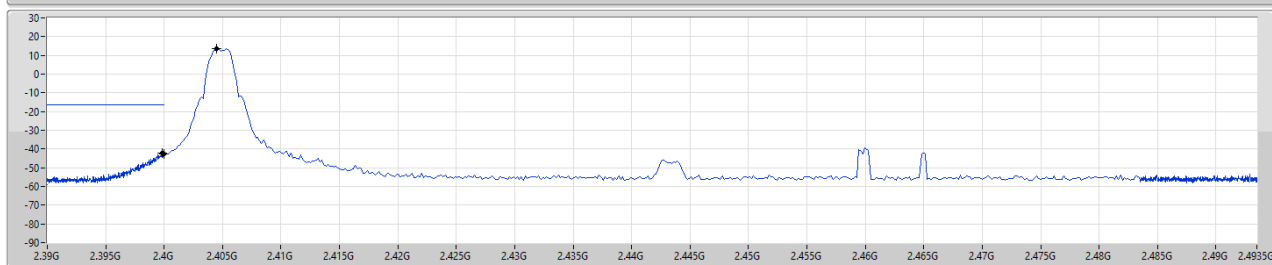
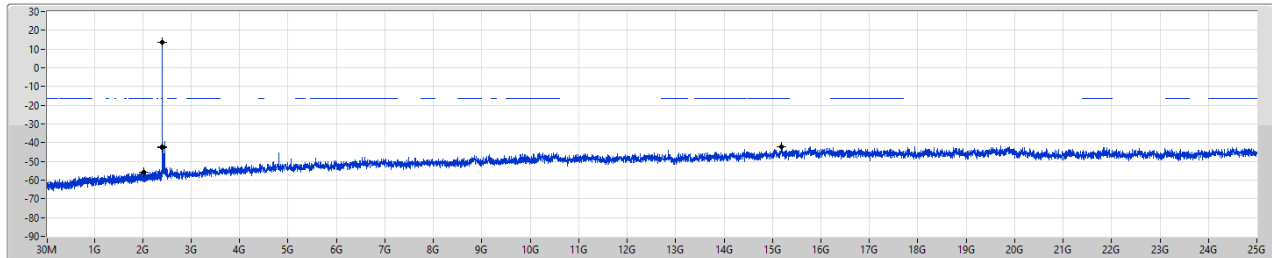
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.40451G	13.80	-16.20	2.02538G	-55.55	2.39986G	-41.98	2.4G	-42.68	15.18998G	-42.19	1
2440MHz	Pass	2.43975G	14.15	-15.85	1.95458G	-54.99	2.39102G	-53.89	2.4G	-55.81	17.12273G	-42.12	1
2475MHz	Pass	2.47548G	13.76	-16.24	2.02066G	-56.19	2.39746G	-54.41	2.4G	-56.49	24.16726G	-40.78	1

Zigbee
2405MHz

CSEndB

15/08/2022

Port 1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

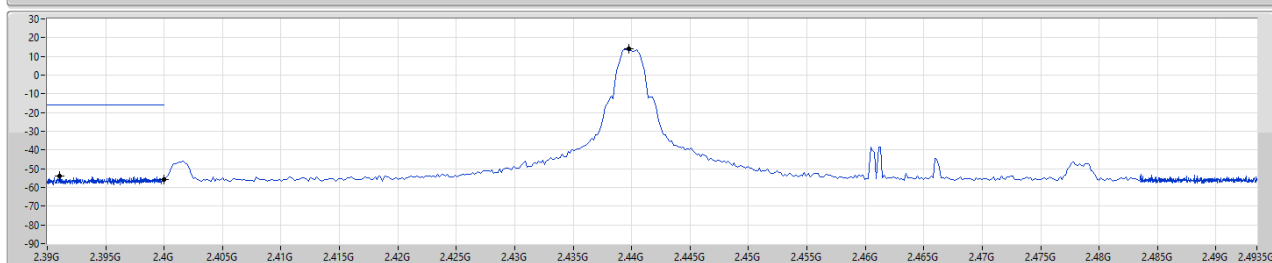
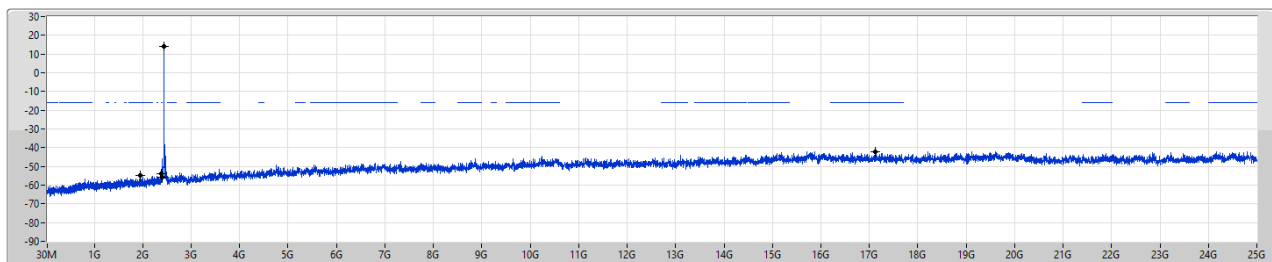
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40451G	13.80	-16.20	2.02538G	-55.55	2.39986G	-41.98	2.4G	-42.68	15.18998G	-42.19	1

Zigbee
2440MHz

CSEndB

15/08/2022

Port 1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

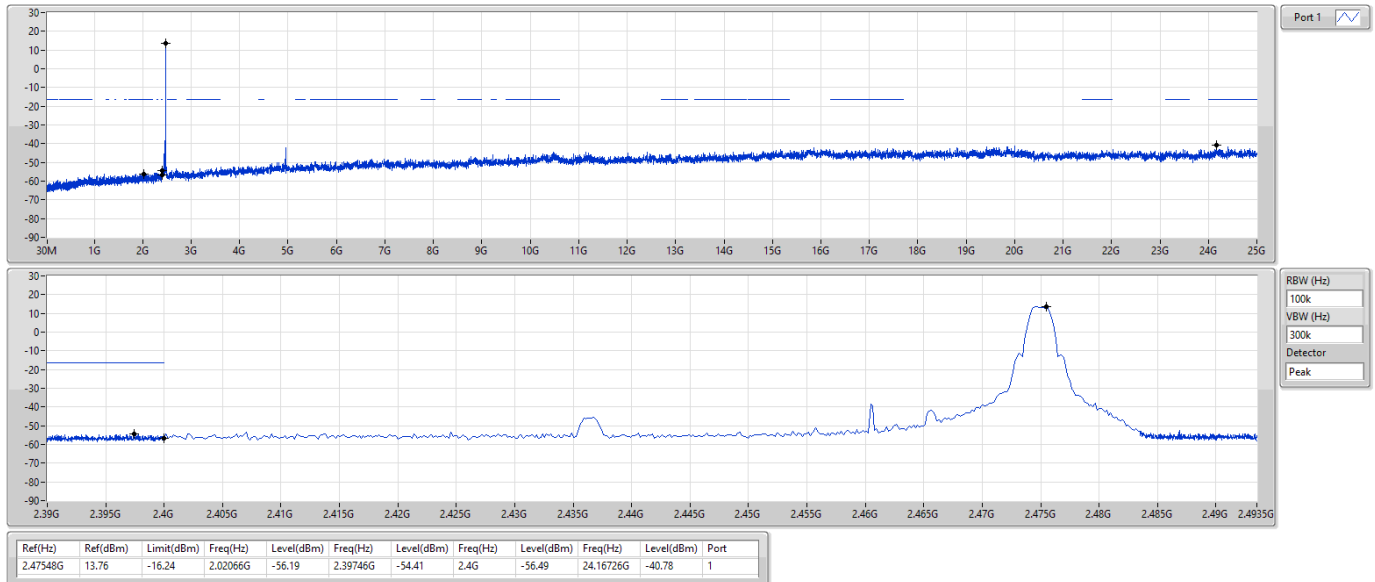
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	14.15	-15.85	1.95458G	-54.99	2.39102G	-53.89	2.4G	-55.81	17.12273G	-42.12	1

Zigbee

2475MHz

CSEndB

15/08/2022





Summary

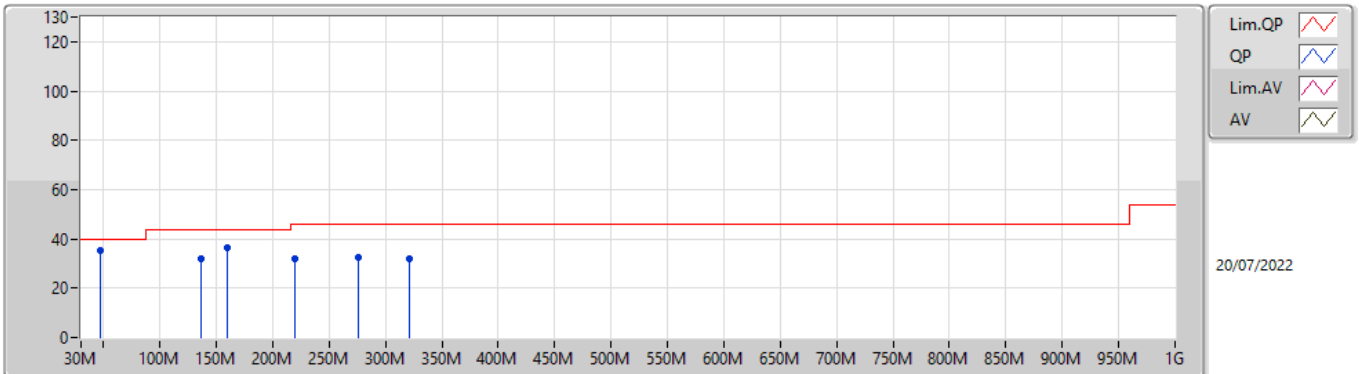
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	PK	49.4M	36.03	40.00	-3.97	3	Horizontal	360	1.00	-

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	47.46M	35.40	40.00	-4.60	3	Vertical	0	1.00	-
2440MHz	Pass	PK	136.7M	32.04	43.50	-11.46	3	Vertical	0	1.00	-
2440MHz	Pass	PK	159.98M	36.39	43.50	-7.11	3	Vertical	0	1.00	-
2440MHz	Pass	PK	220.12M	31.87	46.00	-14.13	3	Vertical	0	1.00	-
2440MHz	Pass	PK	276.38M	32.36	46.00	-13.64	3	Vertical	0	1.00	-
2440MHz	Pass	PK	321M	32.17	46.00	-13.83	3	Vertical	0	1.00	-
2440MHz	Pass	PK	49.4M	36.03	40.00	-3.97	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	165.8M	37.95	43.50	-5.55	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	288.02M	35.38	46.00	-10.62	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	311.3M	33.01	46.00	-12.99	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	375.32M	29.02	46.00	-16.98	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	144.46M	32.23	43.50	-11.27	3	Horizontal	360	1.00	-

Zigbee

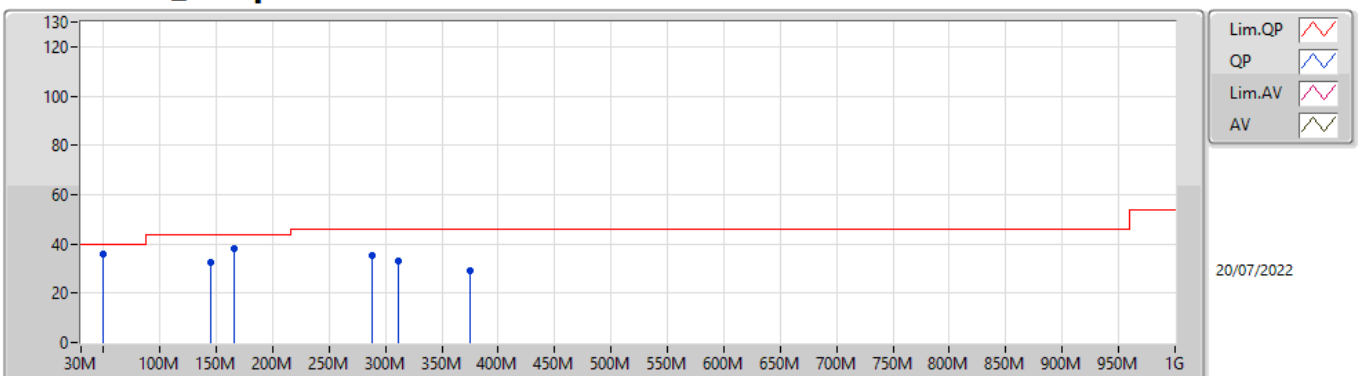
2440MHz_Adapter



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	47.46M	35.40	40.00	-4.60	-12.11	3	Vertical	0	1.00	-	47.51	14.15	1.03	27.29
PK	136.7M	32.04	43.50	-11.46	-9.43	3	Vertical	0	1.00	-	41.47	16.65	1.65	27.73
PK	159.98M	36.39	43.50	-7.11	-10.63	3	Vertical	0	1.00	-	47.02	15.22	1.78	27.63
PK	220.12M	31.87	46.00	-14.13	-10.80	3	Vertical	0	1.00	-	42.67	14.39	2.12	27.31
PK	276.38M	32.36	46.00	-13.64	-6.80	3	Vertical	0	1.00	-	39.16	17.99	2.39	27.18
PK	321M	32.17	46.00	-13.83	-5.92	3	Vertical	0	1.00	-	38.09	18.81	2.59	27.32

Zigbee

2440MHz_Adapter



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	49.4M	36.03	40.00	-3.97	-12.90	3	Horizontal	360	1.00	-	48.93	13.45	1.04	27.39
PK	165.8M	37.95	43.50	-5.55	-10.69	3	Horizontal	360	1.00	-	48.64	15.08	1.82	27.59
PK	288.02M	35.38	46.00	-10.62	-6.63	3	Horizontal	360	1.00	-	42.01	18.10	2.45	27.18
PK	311.3M	33.01	46.00	-12.99	-6.01	3	Horizontal	360	1.00	-	39.02	18.69	2.56	27.26
PK	375.32M	29.02	46.00	-16.98	-4.80	3	Horizontal	360	1.00	-	33.82	20.07	2.80	27.67
PK	144.46M	32.23	43.50	-11.27	-10.05	3	Horizontal	360	1.00	-	42.28	15.96	1.69	27.70



Summary

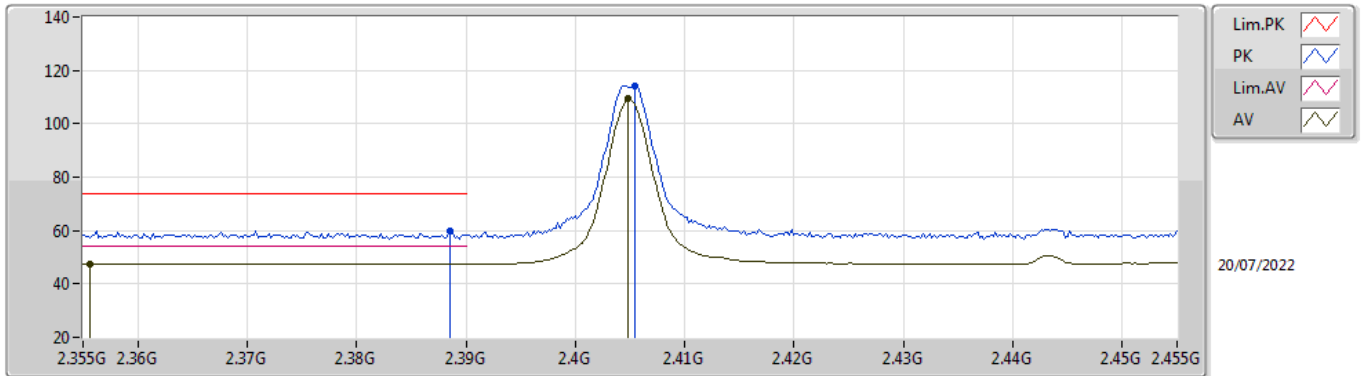
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	4.95077G	51.14	54.00	-2.86	3	Vertical	351	2.54	-

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	2.3556G	47.53	54.00	-6.47	3	Vertical	357	1.22	-
2405MHz	Pass	AV	2.4048G	109.30	Inf	-Inf	3	Vertical	357	1.22	-
2405MHz	Pass	PK	2.3886G	59.88	74.00	-14.12	3	Vertical	357	1.22	-
2405MHz	Pass	PK	2.4054G	114.28	Inf	-Inf	3	Vertical	357	1.22	-
2405MHz	Pass	AV	2.3634G	47.51	54.00	-6.49	3	Horizontal	75	1.03	-
2405MHz	Pass	AV	2.4048G	108.56	Inf	-Inf	3	Horizontal	75	1.03	-
2405MHz	Pass	PK	2.3726G	59.17	74.00	-14.83	3	Horizontal	75	1.03	-
2405MHz	Pass	PK	2.4054G	113.57	Inf	-Inf	3	Horizontal	75	1.03	-
2405MHz	Pass	AV	4.81077G	38.11	54.00	-15.89	3	Vertical	291	2.37	-
2405MHz	Pass	PK	4.81081G	49.44	74.00	-24.56	3	Vertical	291	2.37	-
2405MHz	Pass	AV	4.81077G	33.12	54.00	-20.88	3	Horizontal	20	1.50	-
2405MHz	Pass	PK	4.8107G	46.23	74.00	-27.77	3	Horizontal	20	1.50	-
2440MHz	Pass	AV	2.3628G	47.63	54.00	-6.37	3	Vertical	360	1.09	-
2440MHz	Pass	AV	2.44G	110.38	Inf	-Inf	3	Vertical	360	1.09	-
2440MHz	Pass	AV	2.4896G	48.11	54.00	-5.89	3	Vertical	360	1.09	-
2440MHz	Pass	PK	2.3768G	59.23	74.00	-14.77	3	Vertical	360	1.09	-
2440MHz	Pass	PK	2.4396G	115.25	Inf	-Inf	3	Vertical	360	1.09	-
2440MHz	Pass	PK	2.4924G	59.73	74.00	-14.27	3	Vertical	360	1.09	-
2440MHz	Pass	AV	2.3456G	47.60	54.00	-6.40	3	Horizontal	76	1.21	-
2440MHz	Pass	AV	2.44G	109.86	Inf	-Inf	3	Horizontal	76	1.21	-
2440MHz	Pass	AV	2.4996G	48.10	54.00	-5.90	3	Horizontal	76	1.21	-
2440MHz	Pass	PK	2.372G	59.37	74.00	-14.63	3	Horizontal	76	1.21	-
2440MHz	Pass	PK	2.4392G	114.81	Inf	-Inf	3	Horizontal	76	1.21	-
2440MHz	Pass	PK	2.4948G	60.05	74.00	-13.95	3	Horizontal	76	1.21	-
2440MHz	Pass	AV	4.87878G	35.87	54.00	-18.13	3	Vertical	283	2.73	-
2440MHz	Pass	AV	7.32136G	44.19	54.00	-9.81	3	Vertical	81	3.00	-
2440MHz	Pass	PK	4.8787G	47.78	74.00	-26.22	3	Vertical	283	2.73	-
2440MHz	Pass	PK	7.32156G	55.58	74.00	-18.42	3	Vertical	81	3.00	-
2440MHz	Pass	AV	4.87878G	34.64	54.00	-19.36	3	Horizontal	16	1.00	-
2440MHz	Pass	AV	7.32122G	44.89	54.00	-9.11	3	Horizontal	34	1.33	-
2440MHz	Pass	PK	4.87848G	46.58	74.00	-27.42	3	Horizontal	16	1.00	-
2440MHz	Pass	PK	7.32114G	56.54	74.00	-17.46	3	Horizontal	34	1.33	-
2475MHz	Pass	AV	2.4748G	109.75	Inf	-Inf	3	Vertical	354	1.11	-
2475MHz	Pass	AV	2.4982G	48.17	54.00	-5.83	3	Vertical	354	1.11	-
2475MHz	Pass	PK	2.4744G	114.62	Inf	-Inf	3	Vertical	354	1.11	-
2475MHz	Pass	PK	2.4934G	60.14	74.00	-13.86	3	Vertical	354	1.11	-
2475MHz	Pass	AV	2.4748G	109.05	Inf	-Inf	3	Horizontal	94	1.00	-
2475MHz	Pass	AV	2.5G	48.14	54.00	-5.86	3	Horizontal	94	1.00	-
2475MHz	Pass	PK	2.4744G	114.00	Inf	-Inf	3	Horizontal	94	1.00	-
2475MHz	Pass	PK	2.4914G	60.04	74.00	-13.96	3	Horizontal	94	1.00	-
2475MHz	Pass	AV	4.95077G	51.14	54.00	-2.86	3	Vertical	351	2.54	-
2475MHz	Pass	AV	7.4232G	43.07	54.00	-10.93	3	Vertical	275	1.05	-
2475MHz	Pass	PK	4.95082G	60.30	74.00	-13.70	3	Vertical	351	2.54	-
2475MHz	Pass	PK	7.42635G	55.09	74.00	-18.91	3	Vertical	275	1.05	-
2475MHz	Pass	AV	4.9508G	46.47	54.00	-7.53	3	Horizontal	263	2.41	-
2475MHz	Pass	AV	7.42618G	45.88	54.00	-8.12	3	Horizontal	37	2.00	-
2475MHz	Pass	PK	4.95091G	56.11	74.00	-17.89	3	Horizontal	263	2.41	-
2475MHz	Pass	PK	7.42631G	57.11	74.00	-16.89	3	Horizontal	37	2.00	-

Zigbee

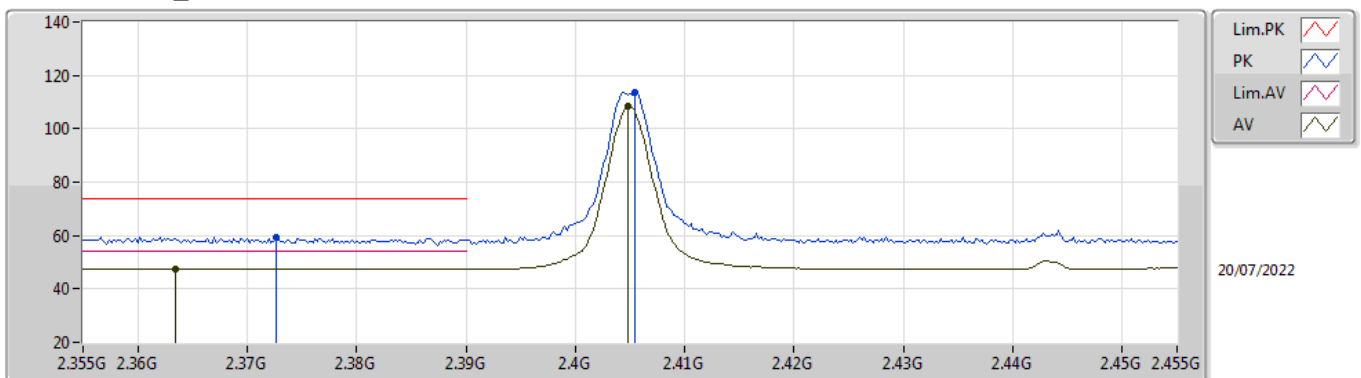
2405MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3556G	47.53	54.00	-6.47	35.47	3	Vertical	357	1.22	-	12.06	27.21	8.26	-
AV	2.4048G	109.30	Inf	-Inf	35.61	3	Vertical	357	1.22	-	73.69	27.32	8.29	-
PK	2.3886G	59.88	74.00	-14.12	35.56	3	Vertical	357	1.22	-	24.32	27.28	8.28	-
PK	2.4054G	114.28	Inf	-Inf	35.61	3	Vertical	357	1.22	-	78.67	27.32	8.29	-

Zigbee

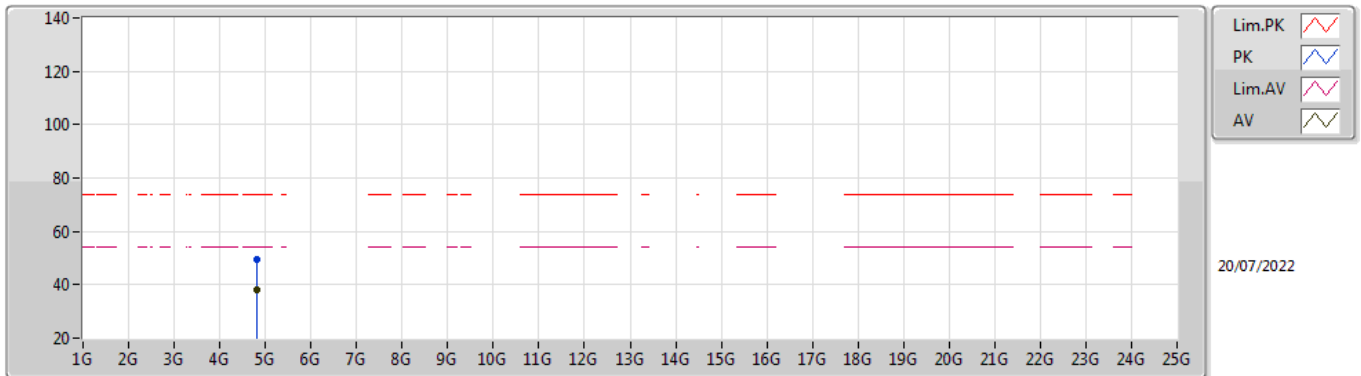
2405MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3634G	47.51	54.00	-6.49	35.49	3	Horizontal	75	1.03	-	12.02	27.23	8.26	-
AV	2.4048G	108.56	Inf	-Inf	35.61	3	Horizontal	75	1.03	-	72.95	27.32	8.29	-
PK	2.3726G	59.17	74.00	-14.83	35.52	3	Horizontal	75	1.03	-	23.65	27.25	8.27	-
PK	2.4054G	113.57	Inf	-Inf	35.61	3	Horizontal	75	1.03	-	77.96	27.32	8.29	-

Zigbee

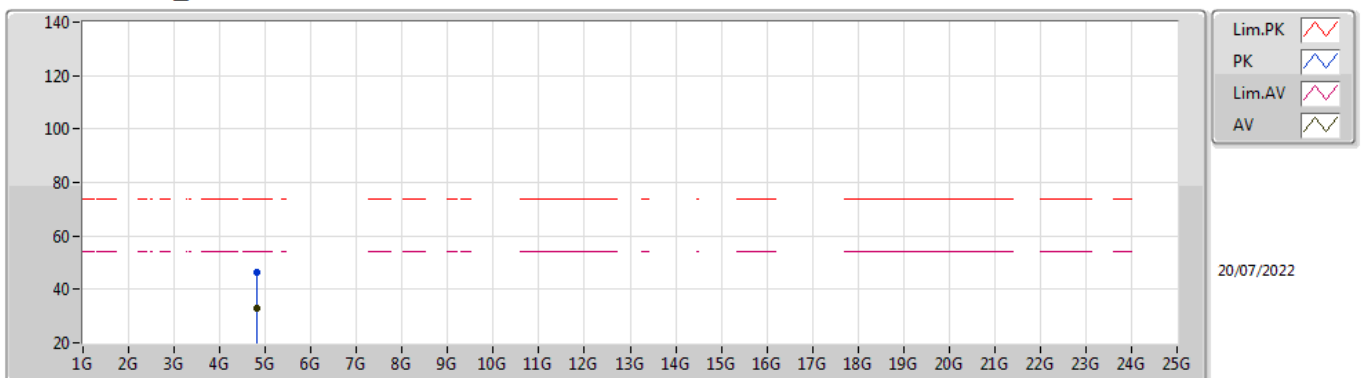
2405MHz_TX



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	4.81077G	38.11	54.00	-15.89	8.00	3	Vertical	291	2.37	-	30.11	32.52	9.67	34.19
PK	4.81081G	49.44	74.00	-24.56	8.00	3	Vertical	291	2.37	-	41.44	32.52	9.67	34.19

Zigbee

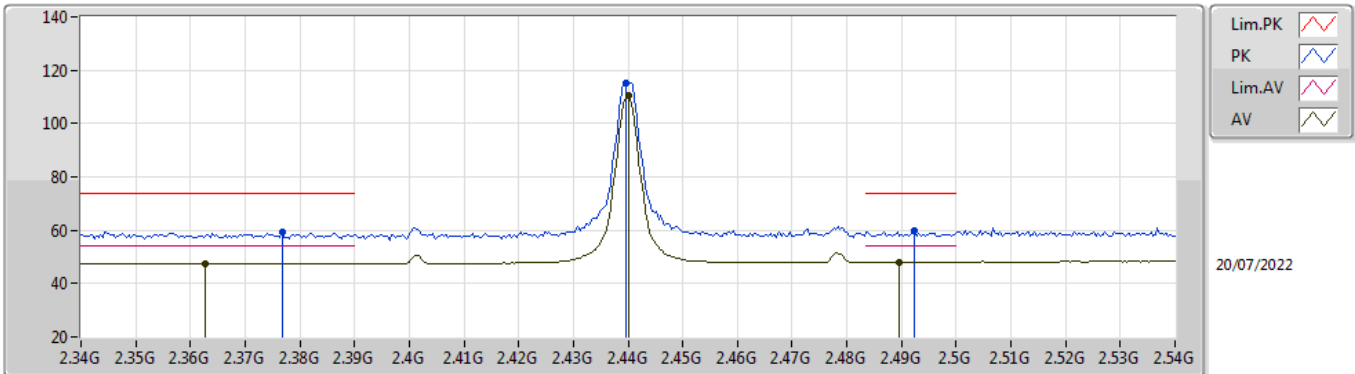
2405MHz_TX



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	4.81077G	33.12	54.00	-20.88	8.00	3	Horizontal	20	1.50	-	25.12	32.52	9.67	34.19
PK	4.8107G	46.23	74.00	-27.77	8.00	3	Horizontal	20	1.50	-	38.23	32.52	9.67	34.19

Zigbee

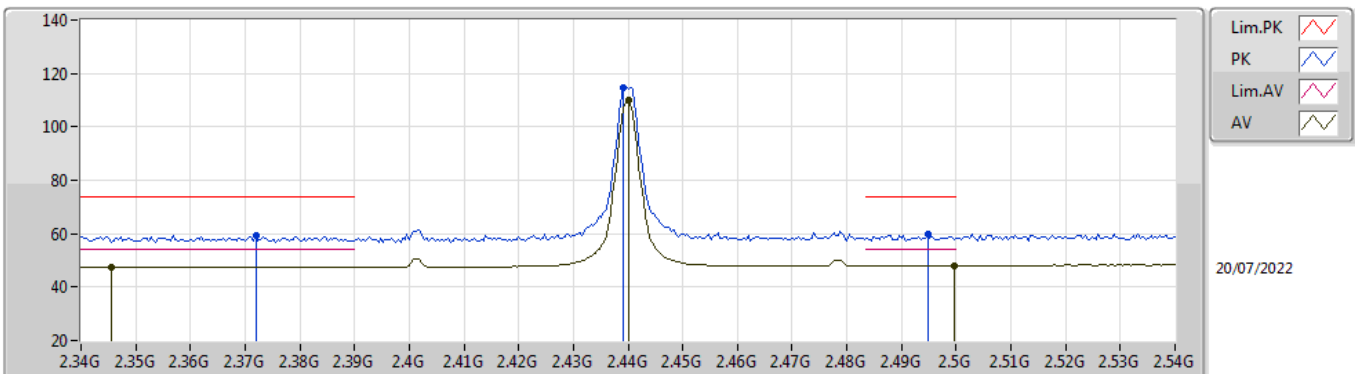
2440MHz_TX



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	2.3628G	47.63	54.00	-6.37	35.49	3	Vertical	360	1.09	-	12.14	27.23	8.26	-
AV	2.44G	110.38	Inf	-Inf	35.78	3	Vertical	360	1.09	-	74.60	27.46	8.32	-
AV	2.4896G	48.11	54.00	-5.89	36.09	3	Vertical	360	1.09	-	12.02	27.74	8.35	-
PK	2.3768G	59.23	74.00	-14.77	35.52	3	Vertical	360	1.09	-	23.71	27.25	8.27	-
PK	2.4396G	115.25	Inf	-Inf	35.78	3	Vertical	360	1.09	-	79.47	27.46	8.32	-
PK	2.4924G	59.73	74.00	-14.27	36.10	3	Vertical	360	1.09	-	23.63	27.75	8.35	-

Zigbee

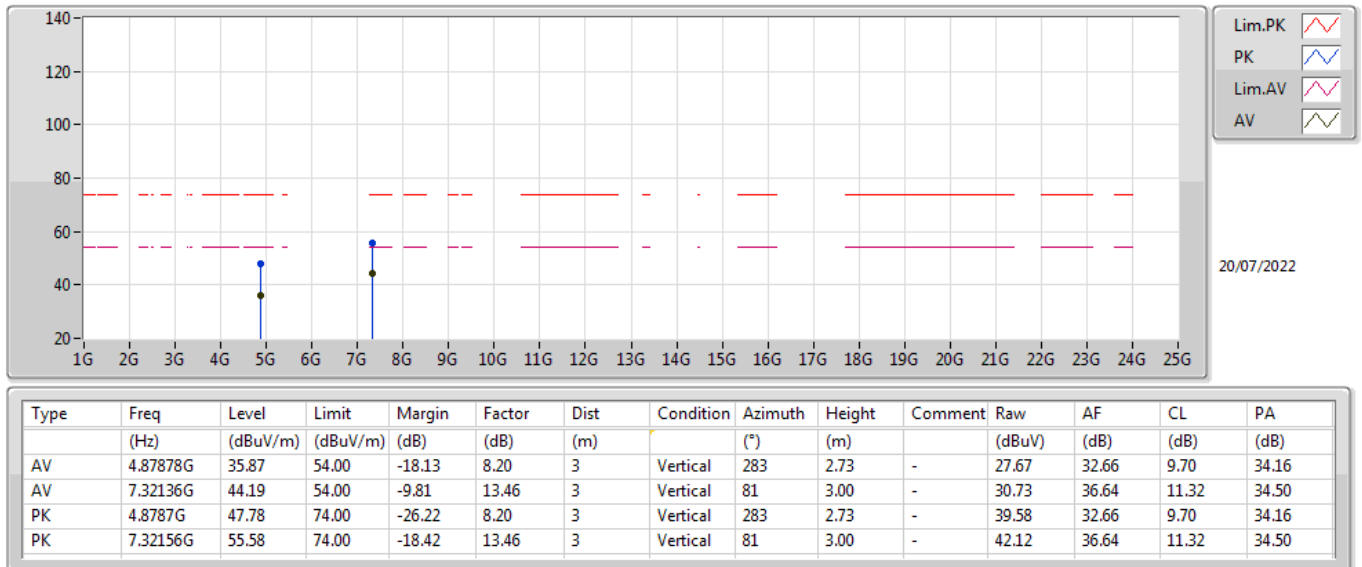
2440MHz_TX



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	2.3456G	47.60	54.00	-6.40	35.43	3	Horizontal	76	1.21	-	12.17	27.18	8.25	-
AV	2.44G	109.86	Inf	-Inf	35.78	3	Horizontal	76	1.21	-	74.08	27.46	8.32	-
AV	2.4996G	48.10	54.00	-5.90	36.15	3	Horizontal	76	1.21	-	11.95	27.80	8.35	-
PK	2.372G	59.37	74.00	-14.63	35.51	3	Horizontal	76	1.21	-	23.86	27.24	8.27	-
PK	2.4392G	114.81	Inf	-Inf	35.78	3	Horizontal	76	1.21	-	79.03	27.46	8.32	-
PK	2.4948G	60.05	74.00	-13.95	36.12	3	Horizontal	76	1.21	-	23.93	27.77	8.35	-

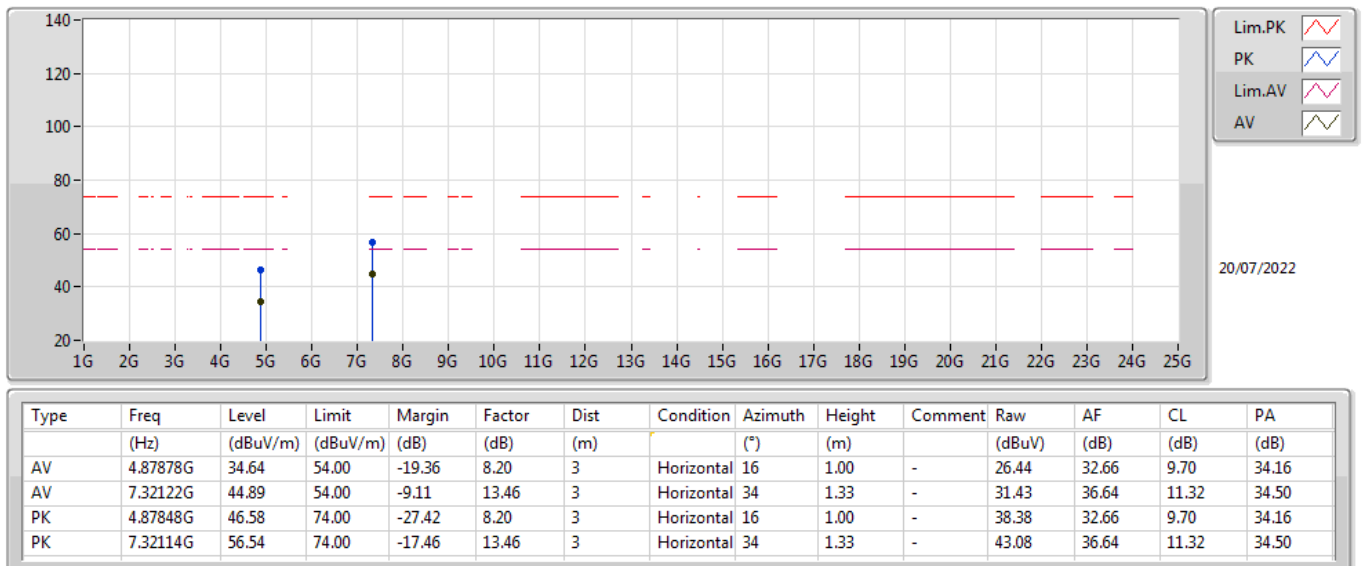
Zigbee

2440MHz_TX



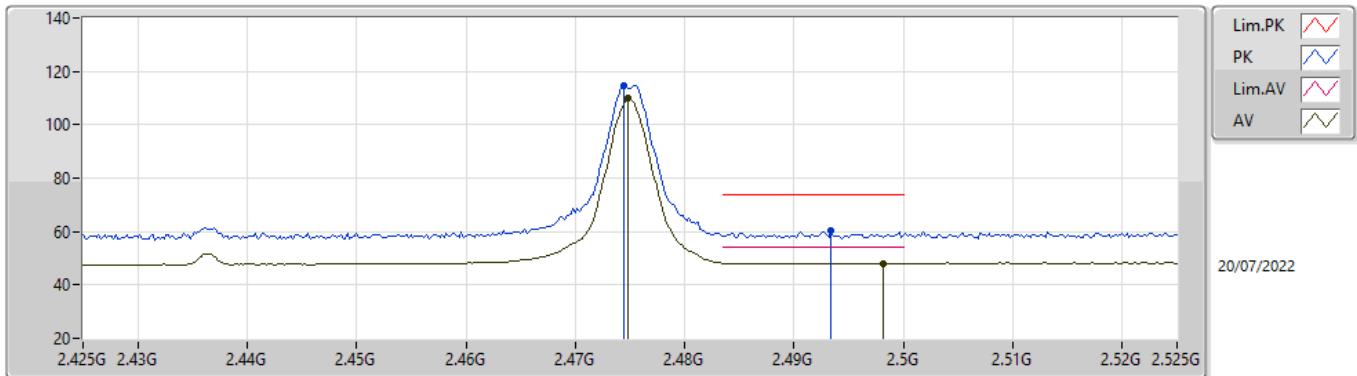
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2440MHz_TX



Zigbee

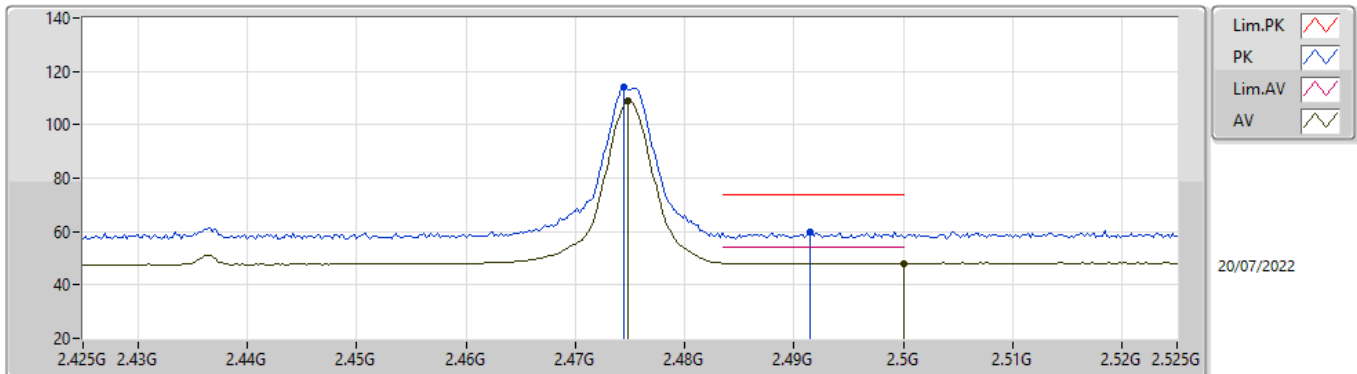
2475MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.4748G	109.75	Inf	-Inf	35.99	3	Vertical	354	1.11	-	73.76	27.65	8.34	-
AV	2.4982G	48.17	54.00	-5.83	36.14	3	Vertical	354	1.11	-	12.03	27.79	8.35	-
PK	2.4744G	114.62	Inf	-Inf	35.99	3	Vertical	354	1.11	-	78.63	27.65	8.34	-
PK	2.4934G	60.14	74.00	-13.86	36.11	3	Vertical	354	1.11	-	24.03	27.76	8.35	-

Zigbee

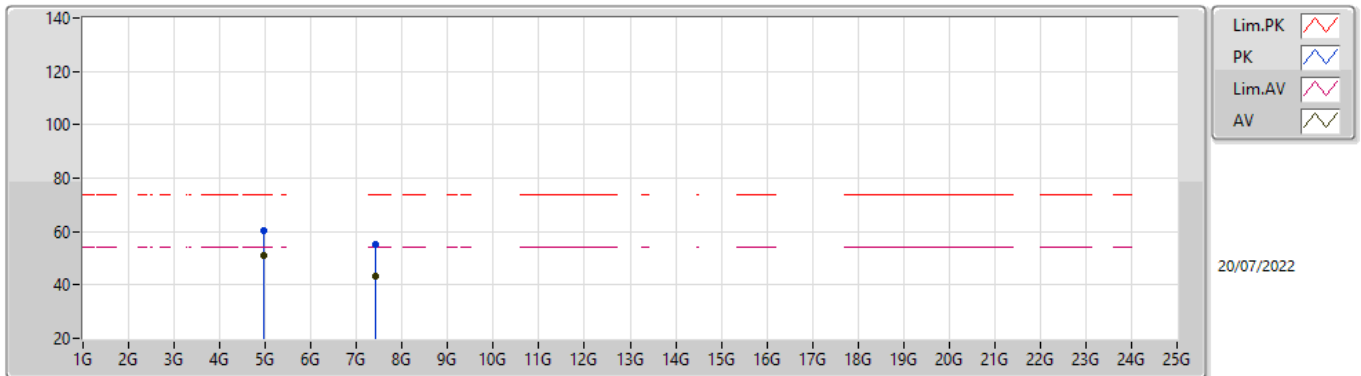
2475MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.4748G	109.05	Inf	-Inf	35.99	3	Horizontal	94	1.00	-	73.06	27.65	8.34	-
AV	2.5G	48.14	54.00	-5.86	36.16	3	Horizontal	94	1.00	-	11.98	27.80	8.36	-
PK	2.4744G	114.00	Inf	-Inf	35.99	3	Horizontal	94	1.00	-	78.01	27.65	8.34	-
PK	2.4914G	60.04	74.00	-13.96	36.10	3	Horizontal	94	1.00	-	23.94	27.75	8.35	-

Zigbee

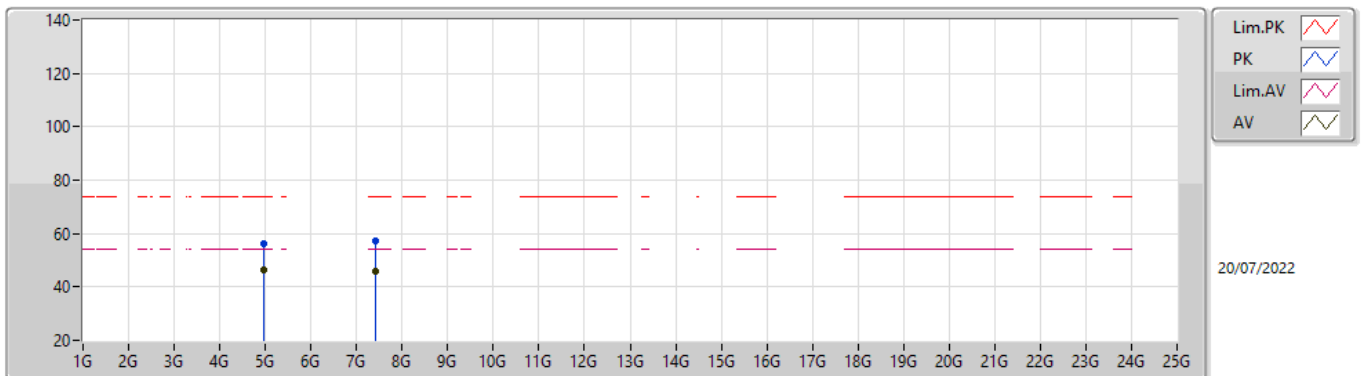
2475MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.95077G	51.14	54.00	-2.86	8.51	3	Vertical	351	2.54	-	42.63	32.90	9.73	34.12
AV	7.4232G	43.07	54.00	-10.93	13.14	3	Vertical	275	1.05	-	29.93	36.31	11.32	34.49
PK	4.95082G	60.30	74.00	-13.70	8.51	3	Vertical	351	2.54	-	51.79	32.90	9.73	34.12
PK	7.42635G	55.09	74.00	-18.91	13.11	3	Vertical	275	1.05	-	41.98	36.29	11.31	34.49

Zigbee

2475MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.9508G	46.47	54.00	-7.53	8.51	3	Horizontal	263	2.41	-	37.96	32.90	9.73	34.12
AV	7.42618G	45.88	54.00	-8.12	13.12	3	Horizontal	37	2.00	-	32.76	36.30	11.31	34.49
PK	4.95091G	56.11	74.00	-17.89	8.51	3	Horizontal	263	2.41	-	47.60	32.90	9.73	34.12
PK	7.42631G	57.11	74.00	-16.89	13.11	3	Horizontal	37	2.00	-	44.00	36.29	11.31	34.49



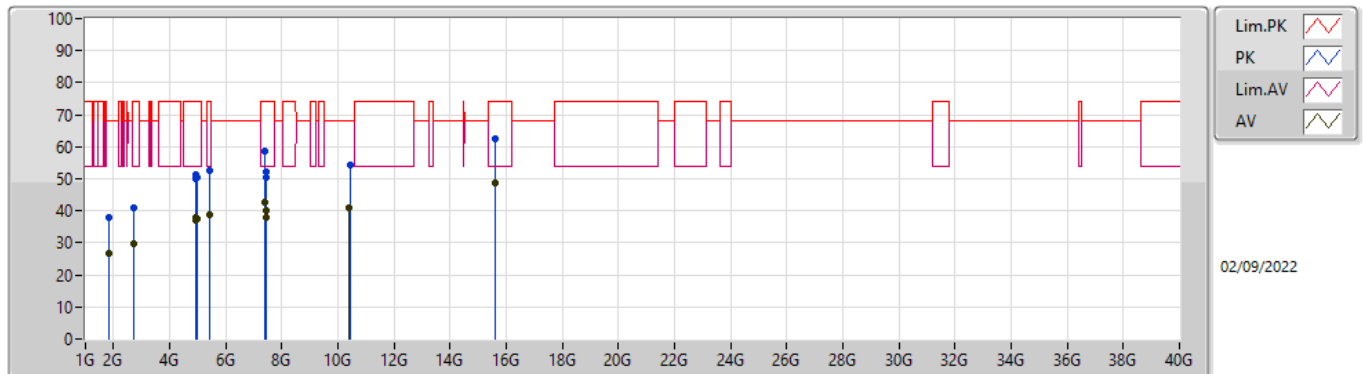
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	15.63169G	49.01	54.00	-4.99	Horizontal

Result

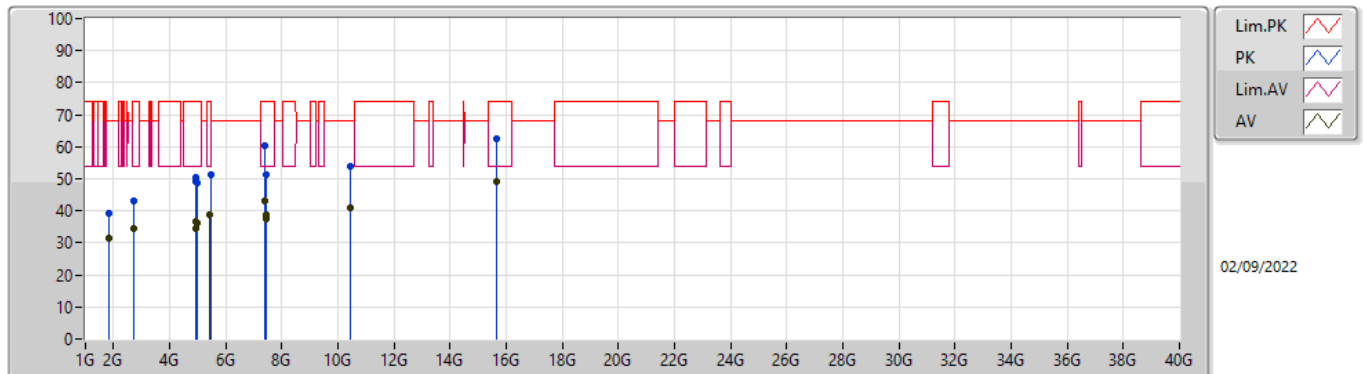
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
Mode 1	Pass	AV	1.81675G	26.60	68.20	-41.60	3	Vertical	22	2.90	-
Mode 1	Pass	AV	2.72511G	29.53	54.00	-24.47	3	Vertical	350	1.68	-
Mode 1	Pass	AV	4.92393G	37.07	54.00	-16.93	3	Vertical	135	1.96	-
Mode 1	Pass	AV	4.9497G	37.98	54.00	-16.02	3	Vertical	115	1.80	-
Mode 1	Pass	AV	4.96071G	37.63	54.00	-16.37	3	Vertical	105	1.74	-
Mode 1	Pass	AV	5.44804G	38.86	54.00	-15.14	3	Vertical	106	1.73	-
Mode 1	Pass	AV	7.38449G	42.73	54.00	-11.27	3	Vertical	140	1.72	-
Mode 1	Pass	AV	7.42458G	37.72	54.00	-16.28	3	Vertical	270	1.00	-
Mode 1	Pass	AV	7.43874G	39.97	54.00	-14.03	3	Vertical	77	1.89	-
Mode 1	Pass	AV	10.41248G	40.98	68.20	-27.22	3	Vertical	242	1.02	-
Mode 1	Pass	AV	15.63077G	48.86	54.00	-5.14	3	Vertical	189	1.95	-
Mode 1	Pass	PK	1.8169G	38.05	68.20	-30.15	3	Vertical	22	2.90	-
Mode 1	Pass	PK	2.72506G	40.83	74.00	-33.17	3	Vertical	350	1.68	-
Mode 1	Pass	PK	4.92398G	50.12	74.00	-23.88	3	Vertical	135	1.96	-
Mode 1	Pass	PK	4.9498G	51.45	74.00	-22.55	3	Vertical	115	1.80	-
Mode 1	Pass	PK	4.96154G	50.62	74.00	-23.38	3	Vertical	105	1.74	-
Mode 1	Pass	PK	5.45004G	52.46	74.00	-21.54	3	Vertical	106	1.73	-
Mode 1	Pass	PK	7.38217G	58.66	74.00	-15.34	3	Vertical	140	1.72	-
Mode 1	Pass	PK	7.42528G	50.64	74.00	-23.36	3	Vertical	270	1.00	-
Mode 1	Pass	PK	7.4399G	52.23	74.00	-21.77	3	Vertical	77	1.89	-
Mode 1	Pass	PK	10.42254G	54.18	68.20	-14.02	3	Vertical	242	1.02	-
Mode 1	Pass	PK	15.62245G	62.58	74.00	-11.42	3	Vertical	189	1.95	-
Mode 1	Pass	AV	1.8167G	31.52	68.20	-36.68	3	Horizontal	293	1.58	-
Mode 1	Pass	AV	2.72514G	34.51	54.00	-19.49	3	Horizontal	300	1.06	-
Mode 1	Pass	AV	4.92399G	34.52	54.00	-19.48	3	Horizontal	319	1.48	-
Mode 1	Pass	AV	4.94911G	36.45	54.00	-17.55	3	Horizontal	142	1.74	-
Mode 1	Pass	AV	4.96047G	36.21	54.00	-17.79	3	Horizontal	151	1.50	-
Mode 1	Pass	AV	5.45032G	38.59	54.00	-15.41	3	Horizontal	328	1.77	-
Mode 1	Pass	AV	7.38647G	43.25	54.00	-10.75	3	Horizontal	353	1.67	-
Mode 1	Pass	AV	7.42219G	37.57	54.00	-16.43	3	Horizontal	40	1.95	-
Mode 1	Pass	AV	7.44129G	38.86	54.00	-15.14	3	Horizontal	35	1.50	-
Mode 1	Pass	AV	10.42264G	40.95	68.20	-27.25	3	Horizontal	190	1.91	-
Mode 1	Pass	AV	15.63169G	49.01	54.00	-4.99	3	Horizontal	46	1.50	-
Mode 1	Pass	PK	1.81678G	39.08	68.20	-29.12	3	Horizontal	293	1.58	-
Mode 1	Pass	PK	2.725G	42.94	74.00	-31.06	3	Horizontal	300	1.06	-
Mode 1	Pass	PK	4.92366G	49.20	74.00	-24.80	3	Horizontal	319	1.48	-
Mode 1	Pass	PK	4.94983G	50.26	74.00	-23.74	3	Horizontal	142	1.74	-
Mode 1	Pass	PK	4.95968G	48.68	74.00	-25.32	3	Horizontal	151	1.50	-
Mode 1	Pass	PK	5.45121G	51.49	74.00	-22.51	3	Horizontal	328	1.77	-
Mode 1	Pass	PK	7.39152G	60.30	74.00	-13.70	3	Horizontal	353	1.67	-
Mode 1	Pass	PK	7.42868G	51.21	74.00	-22.79	3	Horizontal	40	1.95	-
Mode 1	Pass	PK	7.44145G	51.34	74.00	-22.66	3	Horizontal	35	1.50	-
Mode 1	Pass	PK	10.4251G	54.04	68.20	-14.16	3	Horizontal	190	1.91	-
Mode 1	Pass	PK	15.63348G	62.31	74.00	-11.69	3	Horizontal	46	1.50	-

Radiated Emissions above 1GHz_Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
AV	1.81675G	26.60	68.20	-41.60	-1.75	3	Vertical	22	2.90	-	28.35	24.87	7.54	34.16
AV	2.72511G	29.53	54.00	-24.47	2.44	3	Vertical	350	1.68	-	27.09	28.30	8.49	34.35
AV	4.92393G	37.07	54.00	-16.93	8.38	3	Vertical	135	1.96	-	28.69	32.80	9.72	34.14
AV	4.9497G	37.98	54.00	-16.02	8.51	3	Vertical	115	1.80	-	29.47	32.90	9.73	34.12
AV	4.96071G	37.63	54.00	-16.37	8.55	3	Vertical	105	1.74	-	29.08	32.94	9.73	34.12
AV	5.44804G	38.86	54.00	-15.14	8.74	3	Vertical	106	1.73	-	30.12	32.90	10.02	34.18
AV	7.38449G	42.73	54.00	-11.27	13.34	3	Vertical	140	1.72	-	29.39	36.49	11.34	34.49
AV	7.42458G	37.72	54.00	-16.28	13.13	3	Vertical	270	1.00	-	24.59	36.30	11.32	34.49
AV	7.43874G	39.97	54.00	-14.03	13.06	3	Vertical	77	1.89	-	26.91	36.25	11.30	34.49
AV	10.41248G	40.98	68.20	-27.22	16.83	3	Vertical	242	1.02	-	24.15	38.69	12.69	34.55
AV	15.63077G	48.86	54.00	-5.14	19.82	3	Vertical	189	1.95	-	29.04	38.55	15.75	34.48
PK	1.8169G	38.05	68.20	-30.15	-1.75	3	Vertical	22	2.90	-	39.80	24.87	7.54	34.16
PK	2.72506G	40.83	74.00	-33.17	2.44	3	Vertical	350	1.68	-	38.39	28.30	8.49	34.35
PK	4.92398G	50.12	74.00	-23.88	8.38	3	Vertical	135	1.96	-	41.74	32.80	9.72	34.14
PK	4.9498G	51.45	74.00	-22.55	8.51	3	Vertical	115	1.80	-	42.94	32.90	9.73	34.12
PK	4.96154G	50.62	74.00	-23.38	8.56	3	Vertical	105	1.74	-	42.06	32.95	9.73	34.12
PK	5.45004G	52.46	74.00	-21.54	8.74	3	Vertical	106	1.73	-	43.72	32.90	10.02	34.18
PK	7.38217G	58.66	74.00	-15.34	13.36	3	Vertical	140	1.72	-	45.30	36.51	11.34	34.49
PK	7.42528G	50.64	74.00	-23.36	13.12	3	Vertical	270	1.00	-	37.52	36.30	11.31	34.49
PK	7.4399G	52.23	74.00	-21.77	13.05	3	Vertical	77	1.89	-	39.18	36.24	11.30	34.49
PK	10.42254G	54.18	68.20	-14.02	16.82	3	Vertical	242	1.02	-	37.36	38.68	12.69	34.55
PK	15.62245G	62.58	74.00	-11.42	19.85	3	Vertical	189	1.95	-	42.73	38.59	15.74	34.48

Radiated Emissions above 1GHz_Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
AV	1.8167G	31.52	68.20	-36.68	-1.75	3	Horizontal	293	1.58	-	33.27	24.87	7.54	34.16
AV	2.72514G	34.51	54.00	-19.49	2.44	3	Horizontal	300	1.06	-	32.07	28.30	8.49	34.35
AV	4.92399G	34.52	54.00	-19.48	8.38	3	Horizontal	319	1.48	-	26.14	32.80	9.72	34.14
AV	4.94911G	36.45	54.00	-17.55	8.51	3	Horizontal	142	1.74	-	27.94	32.90	9.73	34.12
AV	4.96047G	36.21	54.00	-17.79	8.55	3	Horizontal	151	1.50	-	27.66	32.94	9.73	34.12
AV	5.45032G	38.59	54.00	-15.41	8.74	3	Horizontal	328	1.77	-	29.85	32.90	10.02	34.18
AV	7.38647G	43.25	54.00	-10.75	13.33	3	Horizontal	353	1.67	-	29.92	36.48	11.34	34.49
AV	7.42219G	37.57	54.00	-16.43	13.14	3	Horizontal	40	1.95	-	24.43	36.31	11.32	34.49
AV	7.44129G	38.86	54.00	-15.14	13.04	3	Horizontal	35	1.50	-	25.82	36.23	11.30	34.49
AV	10.42264G	40.95	68.20	-27.25	16.82	3	Horizontal	190	1.91	-	24.13	38.68	12.69	34.55
AV	15.63169G	49.01	54.00	-4.99	19.81	3	Horizontal	46	1.50	-	29.20	38.54	15.75	34.48
PK	1.81678G	39.08	68.20	-29.12	-1.75	3	Horizontal	293	1.58	-	40.83	24.87	7.54	34.16
PK	2.725G	42.94	74.00	-31.06	2.44	3	Horizontal	300	1.06	-	40.50	28.30	8.49	34.35
PK	4.92366G	49.20	74.00	-24.80	8.37	3	Horizontal	319	1.48	-	40.83	32.79	9.72	34.14
PK	4.94983G	50.26	74.00	-23.74	8.51	3	Horizontal	142	1.74	-	41.75	32.90	9.73	34.12
PK	4.95968G	48.68	74.00	-25.32	8.55	3	Horizontal	151	1.50	-	40.13	32.94	9.73	34.12
PK	5.45121G	51.49	74.00	-22.51	8.74	3	Horizontal	328	1.77	-	42.75	32.90	10.02	34.18
PK	7.39152G	60.30	74.00	-13.70	13.30	3	Horizontal	353	1.67	-	47.00	36.45	11.34	34.49
PK	7.42868G	51.21	74.00	-22.79	13.11	3	Horizontal	40	1.95	-	38.10	36.29	11.31	34.49
PK	7.44145G	51.34	74.00	-22.66	13.04	3	Horizontal	35	1.50	-	38.30	36.23	11.30	34.49
PK	10.4251G	54.04	68.20	-14.16	16.83	3	Horizontal	190	1.91	-	37.21	38.67	12.70	34.54
PK	15.63348G	62.31	74.00	-11.69	19.80	3	Horizontal	46	1.50	-	42.51	38.53	15.75	34.48