FCC Radio Test Report

FCC ID	:	**2AS8G-WM20X-SERIES**
Equipment	:	**2.4G wireless audio transceiver**
Brand Name	:	**MACmike**
Model Name	:	**WM20xxxxxx (x=A-Z, a-z, 0-9, /, \, blank)**
Applicant	:	**SHYH FONG INDUSTRIAL CO., LTD. No. 12, Ln. 57, Dongshun St., Shulin Dist., New Taipei City 238, Taiwan (R.O.C.)**
Manufacturer	:	**SHYH FONG INDUSTRIAL CO., LTD. No. 12, Ln. 57, Dongshun St., Shulin Dist., New Taipei City 238, Taiwan (R.O.C.)**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Jun. 24, 2021, and testing was started from Jul. 19, 2021 and completed on Sep. 02, 2021. 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.

Allen Lin

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

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

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PHOTOGRAPHS OF EUT V01

History of this test report

Report No.	Version	Description	Issued Date
FR162317AZ	01	Initial issue of report	Sep. 10, 2021
FR162317AZ	02	Revised typo (This report is the latest version replacing for the report issued on Sep. 10, 2021.)	Sep. 16, 2021

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: Sam Tsai

Report Producer: Michelle Tsai

1 General Description

1.1 Information

Both TX and RX sample has a PCB antenna on the main borad that will not be used in the normal mode.

1.1.1 RF General Information

Frequency Range (MHz)	Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	SRD	2401-2475	00-29 [75]

Band	Modulation	BWch (MHz)	Nant
2.4-2.4835GHz	FSK	2.0	1TX

Note:
- BWch is the nominal channel bandwidth.

Channel	Freq0(MHz)	Freq1(MHz)	Freq2(MHz)	Channel	Freq0(MHz)	Freq1(MHz)	Freq2(MHz)
00	2401	2426	2451	**15**	2416	2441	2466
01	2402	2427	2452	**16**	2417	2442	2467
02	2403	2428	2453	**17**	2418	2443	2468
03	2404	2429	2454	**18**	2419	2444	2469
04	2405	2430	2455	**19**	2420	2445	2470
05	2406	2431	2456	**20**	2421	2446	2471
06	2407	2432	2457	**21**	2422	2447	2472
07	2408	2433	2458	**22**	2423	2448	2473
08	2409	2434	2459	**23**	2424	2449	2474
09	2410	2435	2460	**24**	2425	2450	2475
10	2411	2436	2461	**25**	2450	2460	2406
11	2412	2437	2462	**26**	2475	2442	2401
12	2413	2438	2463	**27**	2430	2420	2465
13	2414	2439	2464	**28**	2442	2470	2431
14	2415	2440	2465	**29**	2473	2465	2410

Note:Regarding to more detail and other information, please refer to Applicant.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Cortec.Technology Inc.	AN2400-06304BF	Dipole	I-PEX	2

For 2.4G SRD FSK mode (1TX/1RX)

Ant. 1 could transmit/receive.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From Battery / USB			
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	T(s)	VBW(Hz) ≥ 1/T
SRD	0.222	6.54	1.112m

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

1.1.5 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	Description
WM20xxxxxx (x=A-Z, a-z, 0-9, /, \, blank)	All the models are identical, the different model served as marketing strategy, and there are different colors of enclosure.

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	Billy Wang	20.1~21.7°C / 59~60%	26/Jul/2021~01/Sep/2021
RF Conducted	TH07-HY	Alan Chien	20.1~26.9°C / 50~60%	22/Jul/2021
Radiated	03CH02-HY	Tony Chang	23.1~26.2°C / 56~60%	19/Jul/2021~23/Jul/2021, 01/Sep/2021~02/Sep/2021
☐ 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**
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	N/A

Note: Transmit by EUT itself.

Mode	Power Setting
SRD_Nss1_1TX	-
2401MHz	P4
2442MHz	P4
2475MHz	P5

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	USB Mode
2	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	USB Mode		
2	Adapter Mode		
Operating Mode > 1GHz	CTX		
1	USB Mode		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
Worst Planes of EUT			V

2.3 Accessories

Battery	Brand Name	Ufine	Model Name	UFX 701535
	Power Rating	3.7Vdc,350 mAh	Type	Li-ion Polymer Battery
USB male A to USB Type-C Cable	Brand Name	MACmike	Model Name	CBL00004
	Signal Line	0.3 meter,non-shielded cable, w/o ferrite core		
3.5M Audio Cable	Brand Name	MACmike	Model Name	CBL00003
	Signal Line	0.3 meter, B-shielded cable, w/o ferrite core		
ADP-3.5Fto6.3M	Brand Name	MACmike	Model Name	ACR00012
Wireless Microphone Receiver	Brand Name	MACmike	Model Name	WM200

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

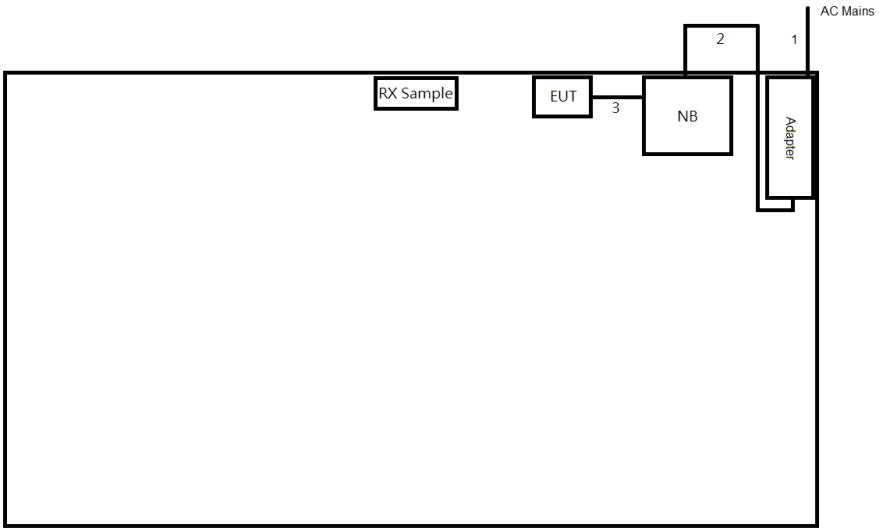
2.4 Support Equipment

Support Equipment – AC Conduction and Radiated					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Notebook	HP	5220M	-	-
2	AC Adapter (for NB)	HP	PPP012L-E	-	-
3	AC Power cable	Power sync	PW-GPC180-3	-	-
4	AC Adapter	Apple	A1385	-	-

Support Equipment – Conducted					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Notebook	HP	5220M	-	-

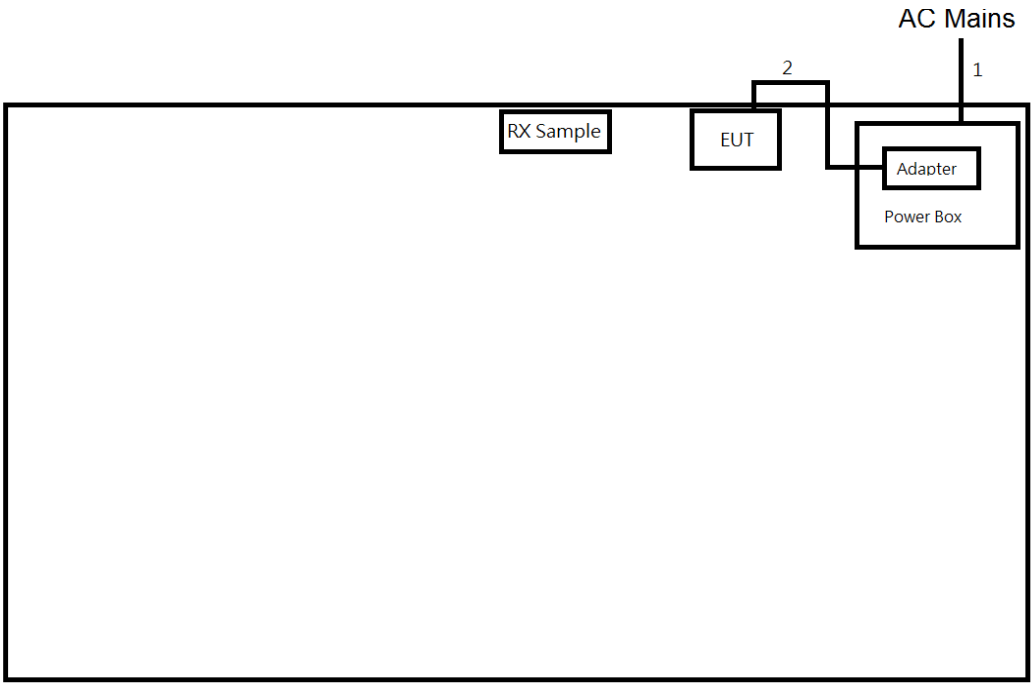
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test_USB Mode



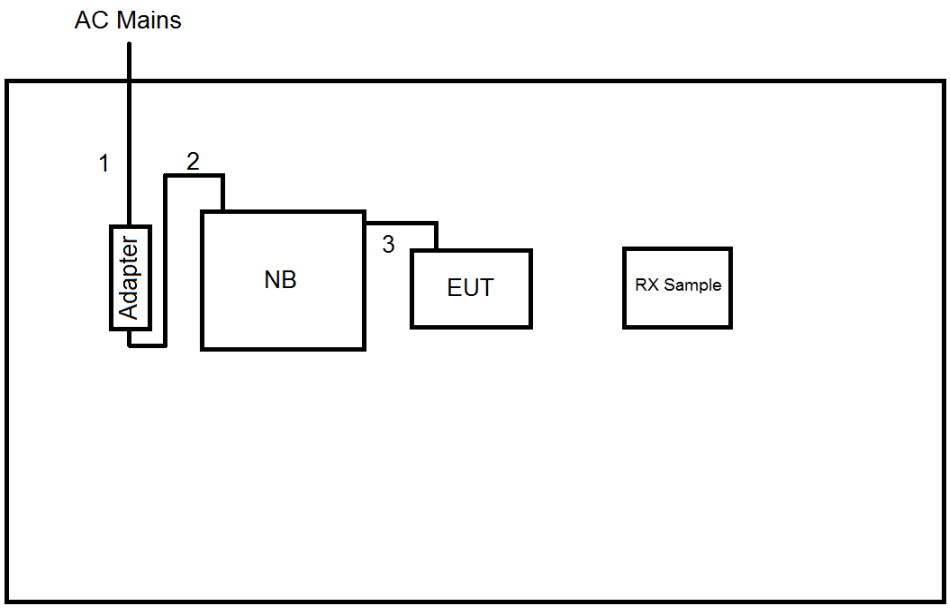
Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	DC Power Cable	No	1.5	-
3	USB male A to USB Type-C Cable	No	0.3	-

Test Setup Diagram – AC Line Conducted Emission Test_Adapter Mode



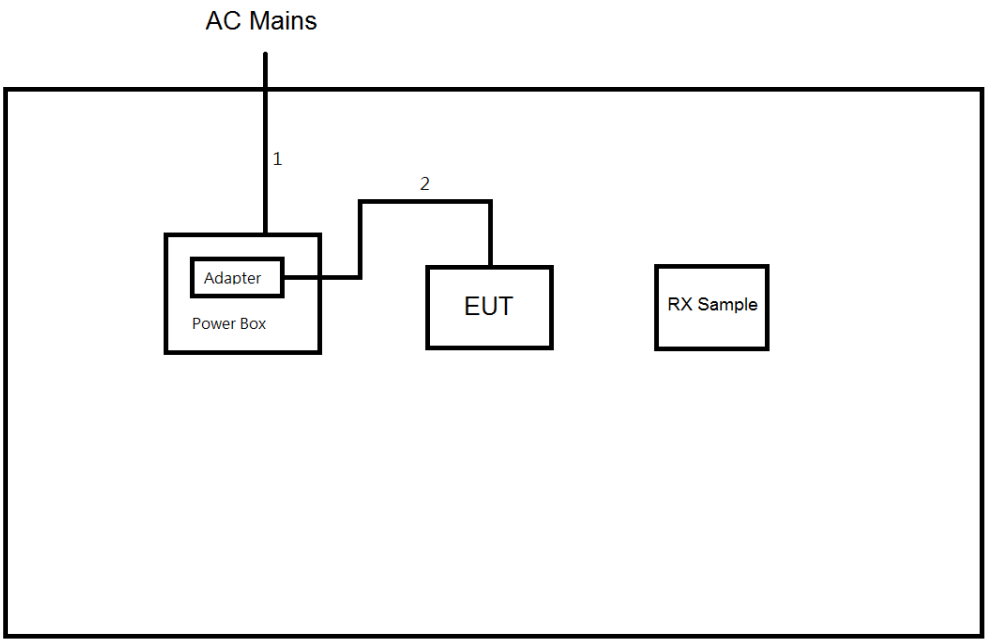
Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.5	-
2	USB male A to USB Type-C Cable	No	0.3	-

Test Setup Diagram – Radiated Test_USB Mode



Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	DC Power Cable	No	1.5	-
3	USB male A to USB Type-C Cable	No	0.3	-

Test Setup Diagram – Radiated Test_Adapter Mode



Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	USB male A to USB Type-C Cable	No	0.3	-

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

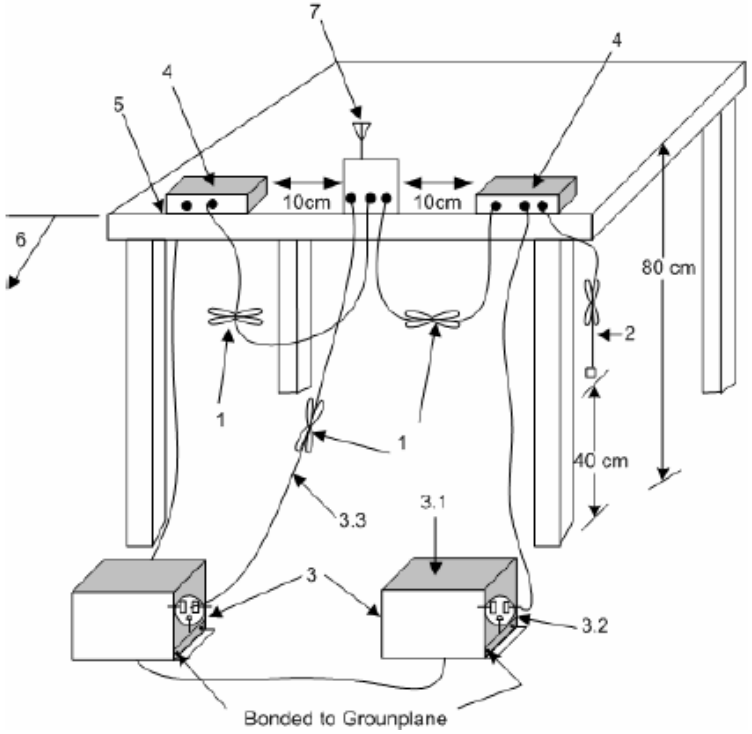
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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 50Ωloads. 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.

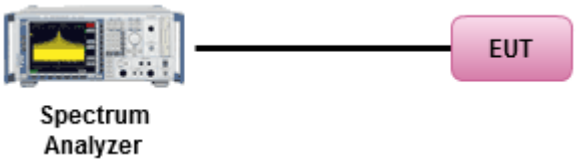
3.2.2 Measuring Instruments

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 $G_{TX} \leq 6$ 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): $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX}])$ dBm		
	▪ Smart antenna system (SAS)		
		- Single beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm	
		- Overlap beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm	
		- Aggregate power on all beams: $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX} + 8])$ 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

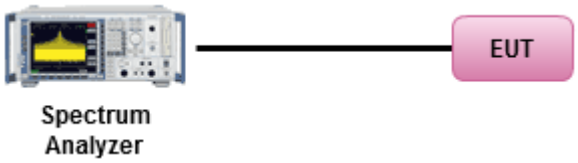
3.4.2 Measuring Instruments

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

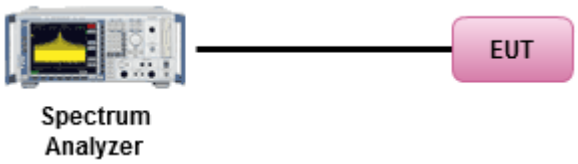
Refer a test equipment and calibration data table in this test report.

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.

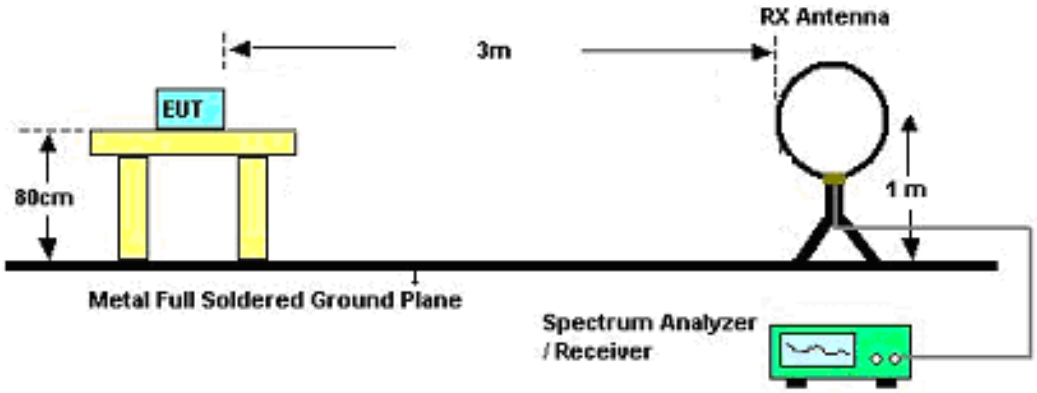
3.6.4 Measurement Results Calculation

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

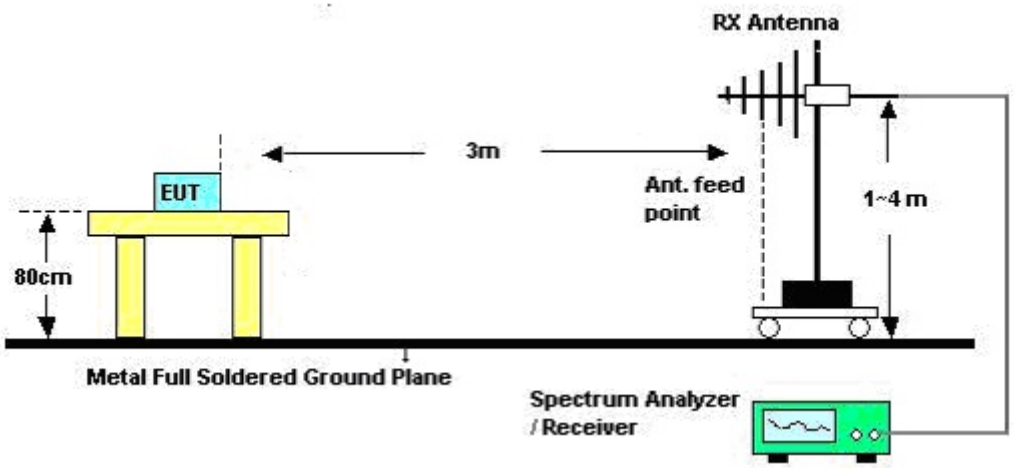
3.6.5 Test Setup

Emissions in Restricted Frequency Bands

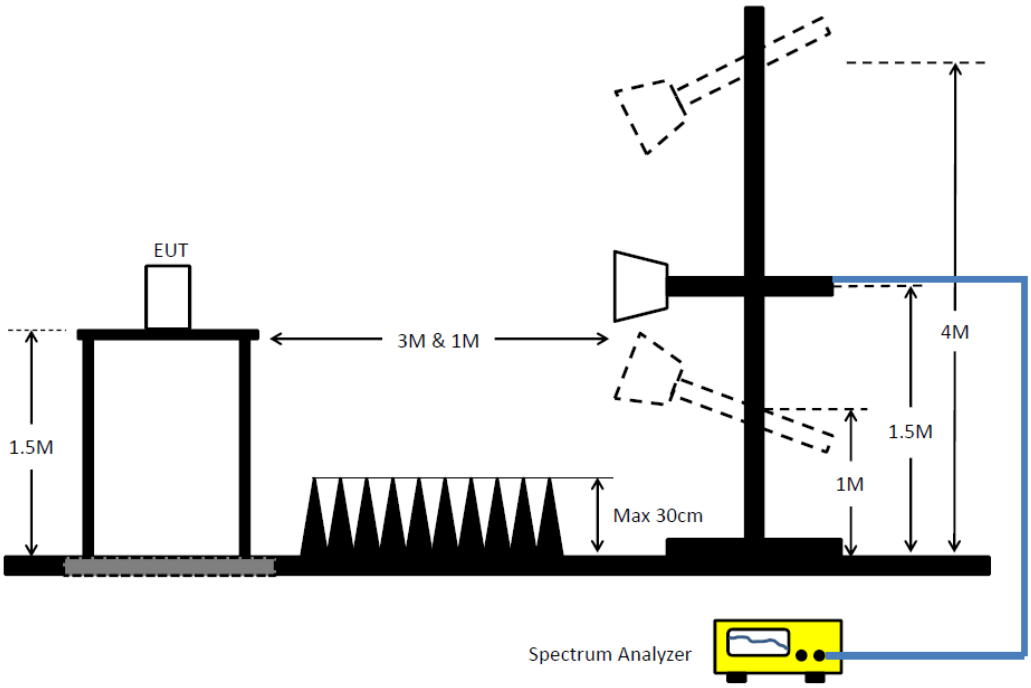
9kHz ~30MHz



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	102052	9kHz ~ 3.6GHz	19/Apr/2021	18/Apr/2022
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	11/Nov/2020	10/Nov/2021
RF Cable 5m	TITAN	TITAN	CO04-cable-01	0.1MHz~200MHz	03/Mar/2021	02/Mar/2022
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	21/Sep/2020	20/Sep/2021
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127477	9kHz ~ 30MHz	25/Feb/2021	24/Feb/2022

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101515	10Hz~40GHz	26/Mar/2021	25/Mar/2022
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	20/Oct/2020	19/Oct/2021
Pulse Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	27/Nov/2020	26/Nov/2021
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	27/Nov/2020	26/Nov/2021

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	04/Aug/2020	03/Aug/2021
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3m	02/Aug/2020	01/Aug/2021
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	12/Mar/2021	11/Mar/2022
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	29/Jun/2021	28/Jun/2022
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~26.5GHz	23/Oct/2020	22/Oct/2021
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	06/Sep/2020	05/Sep/2021
Double Ridged Guide Horn Antenna	SCHWARZBEC	BBHA 9120 D	BBHA 9120 D 01543	1GHz~18GHz	04/Jun/2021	03/Jun/2022
RF Cable	MVE	400LL	MVE-1-0802	9kHz~30MHz	05/May/2021	04/May/2022
RF Cable	MVE	400LL	MVE-1-0802	30MHz~1GHz	05/May/2021	04/May/2022
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX104	805193/4+805192/4	1GHz~40GHz	06/Apr/2021	05/Apr/2022
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz~40GHz	11/Mar/2021	10/Mar/2022
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz~40GHz	09/Mar/2021	08/Mar/2022
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	19/Apr/2021	18/Apr/2022
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2021	15/Mar/2022

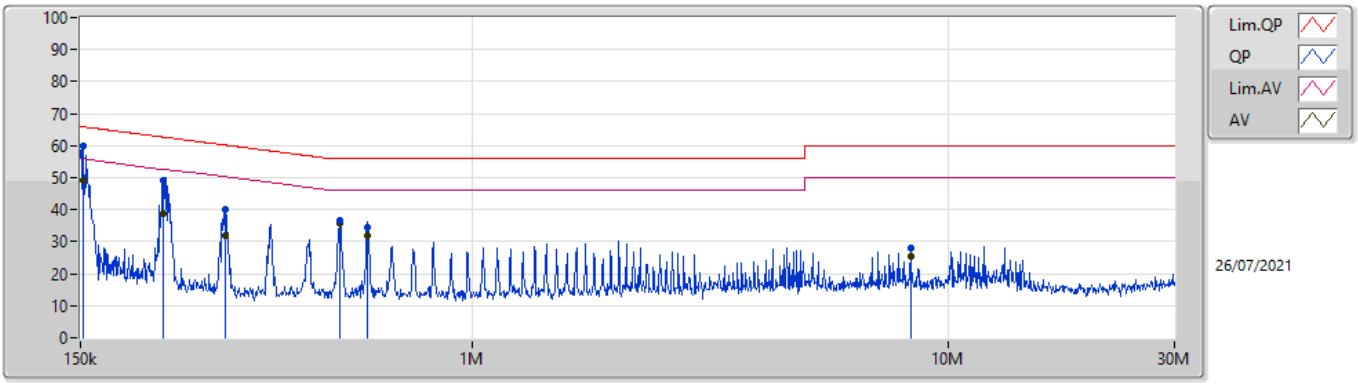
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	150k	60.79	66.00	-5.21	Neutral
Mode 2	Pass	AV	566.784k	42.79	46.00	-3.21	Neutral

Mode Configure

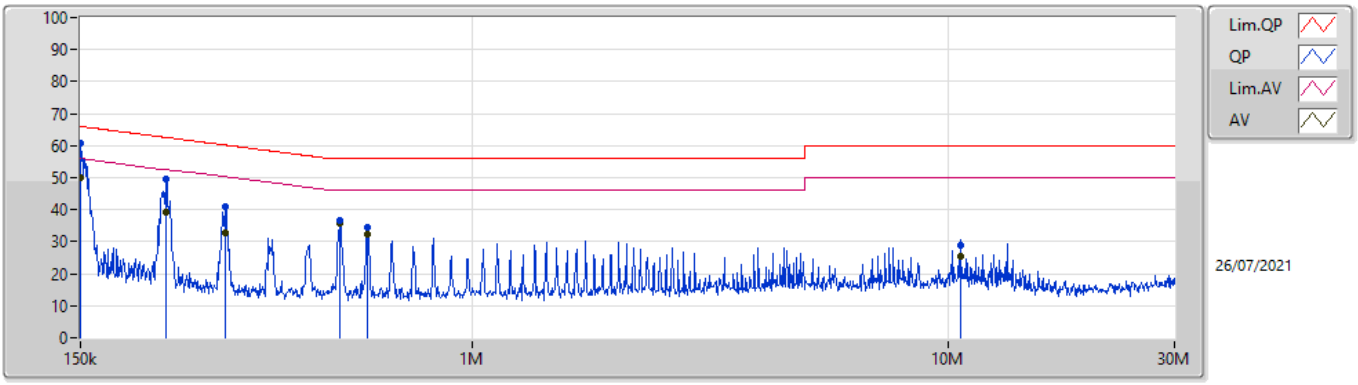
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	151.807k	59.72	65.90	-6.18	Line	-
Mode 1	Pass	AV	151.807k	48.98	55.90	-6.92	Line	-
Mode 1	Pass	QP	224.49k	49.25	62.65	-13.40	Line	-
Mode 1	Pass	AV	224.49k	38.86	52.65	-13.79	Line	-
Mode 1	Pass	QP	302.848k	40.27	60.17	-19.90	Line	-
Mode 1	Pass	AV	302.848k	31.96	50.17	-18.21	Line	-
Mode 1	Pass	QP	527.486k	36.74	56.00	-19.26	Line	-
Mode 1	Pass	AV	527.486k	35.59	46.00	-10.41	Line	-
Mode 1	Pass	QP	601.76k	34.49	56.00	-21.51	Line	-
Mode 1	Pass	AV	601.76k	32.04	46.00	-13.96	Line	-
Mode 1	Pass	QP	8.355M	28.14	60.00	-31.86	Line	-
Mode 1	Pass	AV	8.355M	25.23	50.00	-24.77	Line	-
Mode 1	Pass	QP	150k	60.79	66.00	-5.21	Neutral	-
Mode 1	Pass	AV	150k	50.10	56.00	-5.90	Neutral	-
Mode 1	Pass	QP	226.289k	49.66	62.58	-12.92	Neutral	-
Mode 1	Pass	AV	226.289k	39.26	52.58	-13.32	Neutral	-
Mode 1	Pass	QP	301.641k	40.92	60.21	-19.29	Neutral	-
Mode 1	Pass	AV	301.641k	32.89	50.21	-17.32	Neutral	-
Mode 1	Pass	QP	527.486k	36.82	56.00	-19.18	Neutral	-
Mode 1	Pass	AV	527.486k	35.72	46.00	-10.28	Neutral	-
Mode 1	Pass	QP	601.76k	34.43	56.00	-21.57	Neutral	-
Mode 1	Pass	AV	601.76k	32.16	46.00	-13.84	Neutral	-
Mode 1	Pass	QP	10.616M	28.78	60.00	-31.22	Neutral	-
Mode 1	Pass	AV	10.616M	25.48	50.00	-24.52	Neutral	-
Mode 2	Pass	QP	212.287k	33.65	63.11	-29.46	Line	-
Mode 2	Pass	AV	212.287k	25.19	53.11	-27.92	Line	-
Mode 2	Pass	QP	356.703k	32.06	58.81	-26.75	Line	-
Mode 2	Pass	AV	356.703k	26.41	48.81	-22.40	Line	-
Mode 2	Pass	QP	426.898k	33.07	57.32	-24.25	Line	-
Mode 2	Pass	AV	426.898k	28.50	47.32	-18.82	Line	-
Mode 2	Pass	QP	566.784k	41.26	56.00	-14.74	Line	-
Mode 2	Pass	AV	566.784k	36.47	46.00	-9.53	Line	-
Mode 2	Pass	QP	638.894k	36.35	56.00	-19.65	Line	-
Mode 2	Pass	AV	638.894k	32.01	46.00	-13.99	Line	-
Mode 2	Pass	QP	12.355M	28.71	60.00	-31.29	Line	-
Mode 2	Pass	AV	12.355M	25.51	50.00	-24.49	Line	-
Mode 2	Pass	QP	212.287k	39.98	63.11	-23.13	Neutral	-
Mode 2	Pass	AV	212.287k	33.38	53.11	-19.73	Neutral	-
Mode 2	Pass	QP	353.867k	38.83	58.87	-20.04	Neutral	-
Mode 2	Pass	AV	353.867k	34.09	48.87	-14.78	Neutral	-
Mode 2	Pass	QP	425.197k	39.06	57.34	-18.28	Neutral	-
Mode 2	Pass	AV	425.197k	34.93	47.34	-12.41	Neutral	-
Mode 2	Pass	QP	566.784k	47.53	56.00	-8.47	Neutral	-
Mode 2	Pass	AV	566.784k	42.79	46.00	-3.21	Neutral	-
Mode 2	Pass	QP	638.894k	42.26	56.00	-13.74	Neutral	-
Mode 2	Pass	AV	638.894k	37.73	46.00	-8.27	Neutral	-
Mode 2	Pass	QP	10.365M	35.17	60.00	-24.83	Neutral	-
Mode 2	Pass	AV	10.365M	30.40	50.00	-19.60	Neutral	-

Conducted Emissions at Powerline_Mode 1



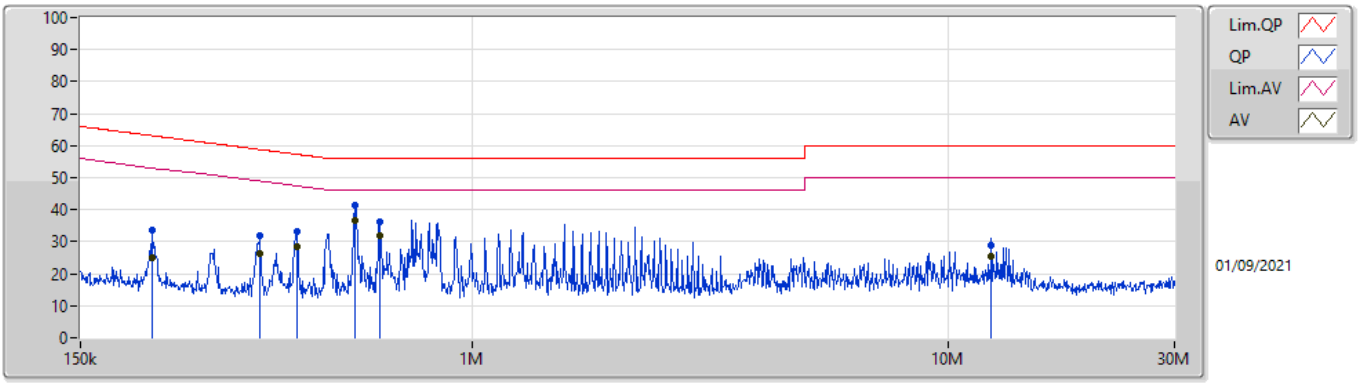
Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	151.807k	59.72	65.90	-6.18	19.63	Line	-	40.09	9.69	0.04	9.90
AV	151.807k	48.98	55.90	-6.92	19.63	Line	-	29.35	9.69	0.04	9.90
QP	224.49k	49.25	62.65	-13.40	19.62	Line	-	29.63	9.68	0.04	9.90
AV	224.49k	38.86	52.65	-13.79	19.62	Line	-	19.24	9.68	0.04	9.90
QP	302.848k	40.27	60.17	-19.90	19.62	Line	-	20.65	9.67	0.05	9.90
AV	302.848k	31.96	50.17	-18.21	19.62	Line	-	12.34	9.67	0.05	9.90
QP	527.486k	36.74	56.00	-19.26	19.61	Line	-	17.13	9.67	0.07	9.87
AV	527.486k	35.59	46.00	-10.41	19.61	Line	-	15.98	9.67	0.07	9.87
QP	601.76k	34.49	56.00	-21.51	19.60	Line	-	14.89	9.67	0.07	9.86
AV	601.76k	32.04	46.00	-13.96	19.60	Line	-	12.44	9.67	0.07	9.86
QP	8.355M	28.14	60.00	-31.86	19.80	Line	-	8.34	9.71	0.19	9.90
AV	8.355M	25.23	50.00	-24.77	19.80	Line	-	5.43	9.71	0.19	9.90

Conducted Emissions at Powerline_Mode 1



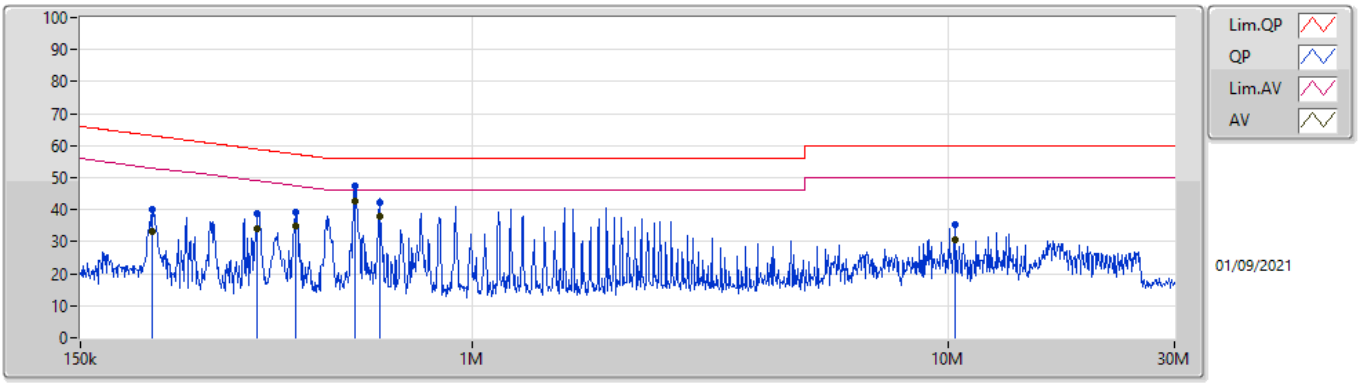
Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	150k	60.79	66.00	-5.21	19.63	Neutral	-	41.16	9.69	0.04	9.90
AV	150k	50.10	56.00	-5.90	19.63	Neutral	-	30.47	9.69	0.04	9.90
QP	226.289k	49.66	62.58	-12.92	19.62	Neutral	-	30.04	9.68	0.04	9.90
AV	226.289k	39.26	52.58	-13.32	19.62	Neutral	-	19.64	9.68	0.04	9.90
QP	301.641k	40.92	60.21	-19.29	19.62	Neutral	-	21.30	9.67	0.05	9.90
AV	301.641k	32.89	50.21	-17.32	19.62	Neutral	-	13.27	9.67	0.05	9.90
QP	527.486k	36.82	56.00	-19.18	19.61	Neutral	-	17.21	9.67	0.07	9.87
AV	527.486k	35.72	46.00	-10.28	19.61	Neutral	-	16.11	9.67	0.07	9.87
QP	601.76k	34.43	56.00	-21.57	19.60	Neutral	-	14.83	9.67	0.07	9.86
AV	601.76k	32.16	46.00	-13.84	19.60	Neutral	-	12.56	9.67	0.07	9.86
QP	10.616M	28.78	60.00	-31.22	19.84	Neutral	-	8.94	9.73	0.21	9.90
AV	10.616M	25.48	50.00	-24.52	19.84	Neutral	-	5.64	9.73	0.21	9.90

Conducted Emissions at Powerline_Mode 2



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	212.287k	33.65	63.11	-29.46	19.62	Line	-	14.03	9.68	0.04	9.90
AV	212.287k	25.19	53.11	-27.92	19.62	Line	-	5.57	9.68	0.04	9.90
QP	356.703k	32.06	58.81	-26.75	19.63	Line	-	12.43	9.67	0.06	9.90
AV	356.703k	26.41	48.81	-22.40	19.63	Line	-	6.78	9.67	0.06	9.90
QP	426.898k	33.07	57.32	-24.25	19.62	Line	-	13.45	9.67	0.06	9.89
AV	426.898k	28.50	47.32	-18.82	19.62	Line	-	8.88	9.67	0.06	9.89
QP	566.784k	41.26	56.00	-14.74	19.60	Line	-	21.66	9.67	0.07	9.86
AV	566.784k	36.47	46.00	-9.53	19.60	Line	-	16.87	9.67	0.07	9.86
QP	638.894k	36.35	56.00	-19.65	19.59	Line	-	16.76	9.67	0.07	9.85
AV	638.894k	32.01	46.00	-13.99	19.59	Line	-	12.42	9.67	0.07	9.85
QP	12.355M	28.71	60.00	-31.29	19.83	Line	-	8.88	9.70	0.23	9.90
AV	12.355M	25.51	50.00	-24.49	19.83	Line	-	5.68	9.70	0.23	9.90

Conducted Emissions at Powerline_Mode 2



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	212.287k	39.98	63.11	-23.13	19.62	Neutral	-	20.36	9.68	0.04	9.90
AV	212.287k	33.38	53.11	-19.73	19.62	Neutral	-	13.76	9.68	0.04	9.90
QP	353.867k	38.83	58.87	-20.04	19.63	Neutral	-	19.20	9.67	0.06	9.90
AV	353.867k	34.09	48.87	-14.78	19.63	Neutral	-	14.46	9.67	0.06	9.90
QP	425.197k	39.06	57.34	-18.28	19.62	Neutral	-	19.44	9.67	0.06	9.89
AV	425.197k	34.93	47.34	-12.41	19.62	Neutral	-	15.31	9.67	0.06	9.89
QP	566.784k	47.53	56.00	-8.47	19.60	Neutral	-	27.93	9.67	0.07	9.86
AV	566.784k	42.79	46.00	-3.21	19.60	Neutral	-	23.19	9.67	0.07	9.86
QP	638.894k	42.26	56.00	-13.74	19.59	Neutral	-	22.67	9.67	0.07	9.85
AV	638.894k	37.73	46.00	-8.27	19.59	Neutral	-	18.14	9.67	0.07	9.85
QP	10.365M	35.17	60.00	-24.83	19.83	Neutral	-	15.34	9.73	0.20	9.90
AV	10.365M	30.40	50.00	-19.60	19.83	Neutral	-	10.57	9.73	0.20	9.90

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
SRD_Nss1_1TX	687.5k	1.084M	1M08D1D	650k	1.072M

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

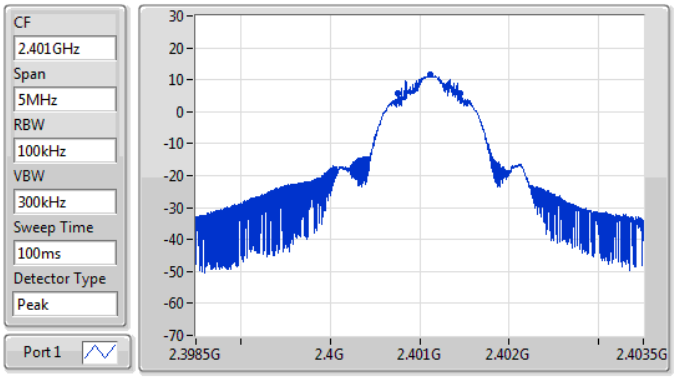
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
SRD_Nss1_1TX	-	-	-	-
2401MHz	Pass	500k	687.5k	1.072M
2442MHz	Pass	500k	650k	1.084M
2475MHz	Pass	500k	675k	1.082M

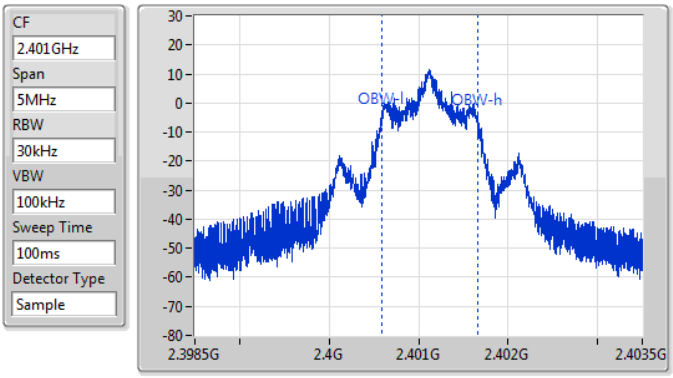
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

SRD_Nss1_1TX EBW-DTS

2401MHz

22/07/2021



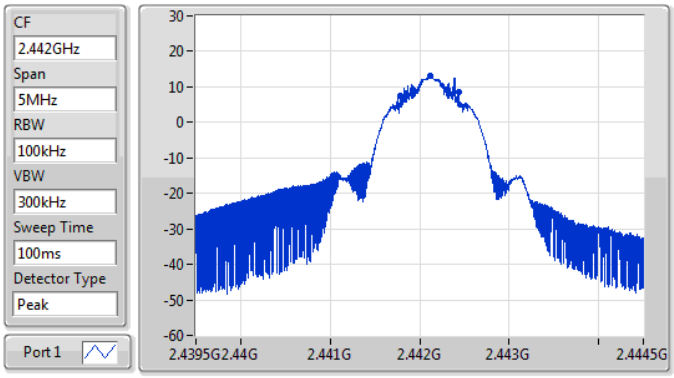


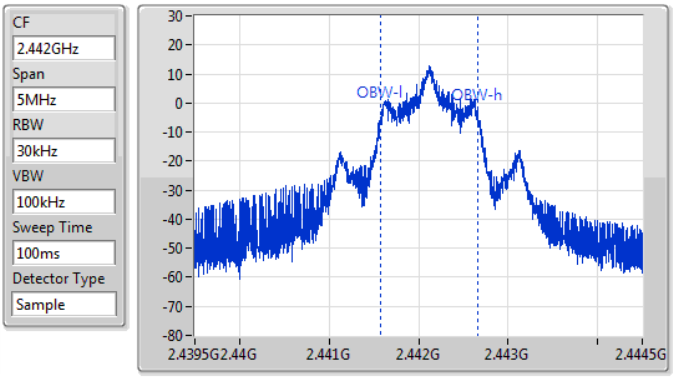
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
687.5k	2.400763G	2.40145G	1.072M	2.400583G	2.401655G	500k	1

SRD_Nss1_1TX EBW-DTS

2442MHz

22/07/2021



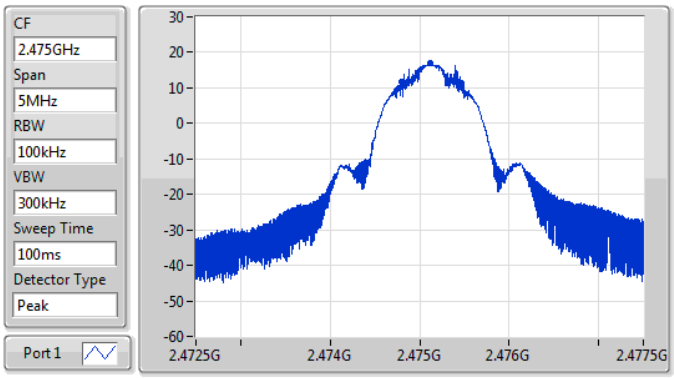


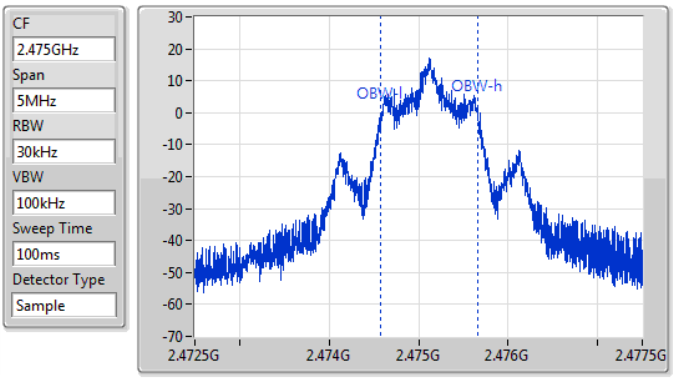
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
650k	2.441788G	2.442438G	1.084M	2.44158G	2.442665G	500k	1

SRD_Nss1_1TX **EBW-DTS**

2475MHz

22/07/2021





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
675k	2.474793G	2.475468G	1.082M	2.47458G	2.475662G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
SRD_Nss1_1TX	17.44	0.05546

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
SRD_Nss1_1TX	-	-	-	-
2401MHz	Pass	2.00	12.02	30.00
2442MHz	Pass	2.00	13.17	30.00
2475MHz	Pass	2.00	17.44	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
SRD_Nss1_1TX	6.97

RBW = 3kHz;

Result

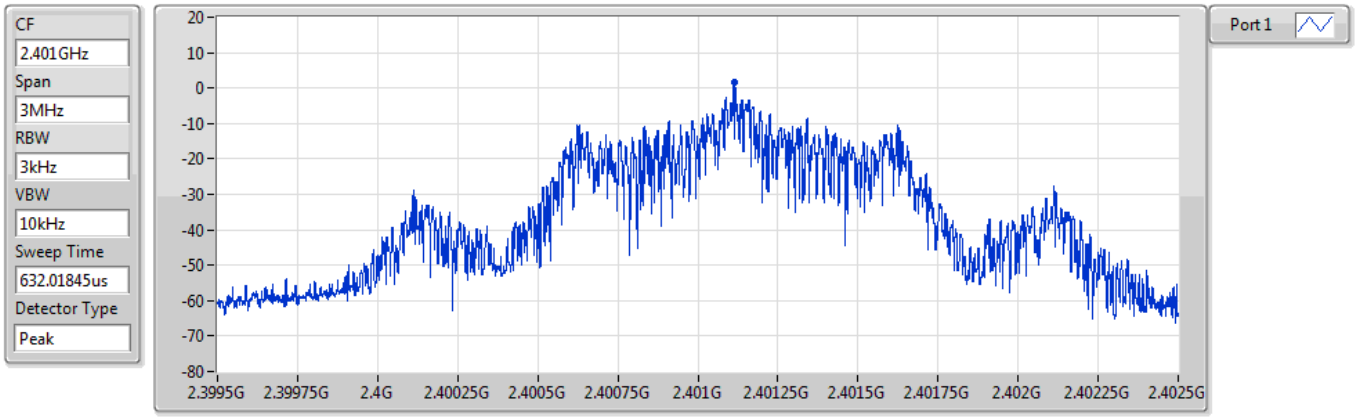
Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
SRD_Nss1_1TX	-	-	-	-
2401MHz	Pass	2.00	1.57	8.00
2442MHz	Pass	2.00	5.94	8.00
2475MHz	Pass	2.00	6.97	8.00

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;

SRD_Nss1_1TX PSD

2401MHz

22/07/2021

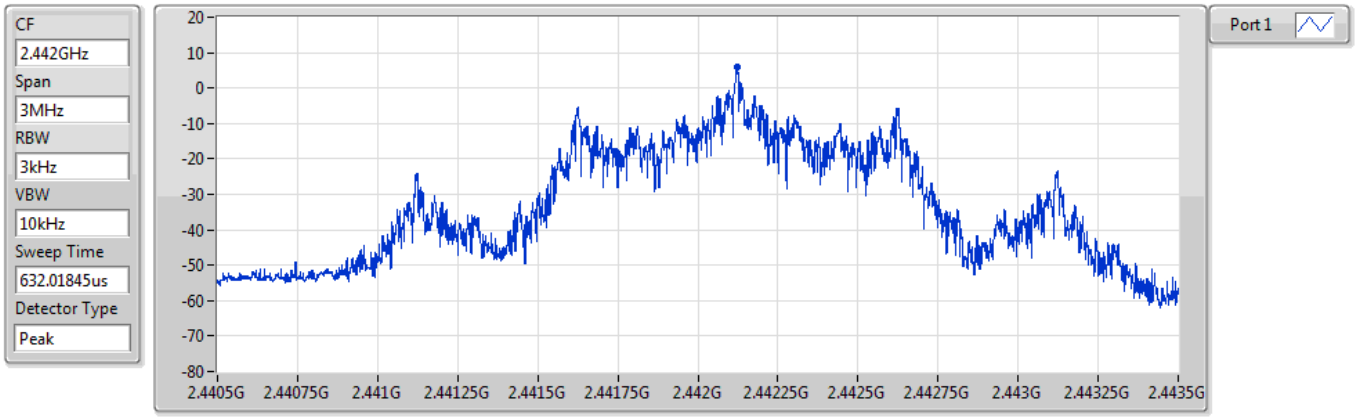


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
1.57	1.57	1.57

SRD_Nss1_1TX PSD

2442MHz

22/07/2021

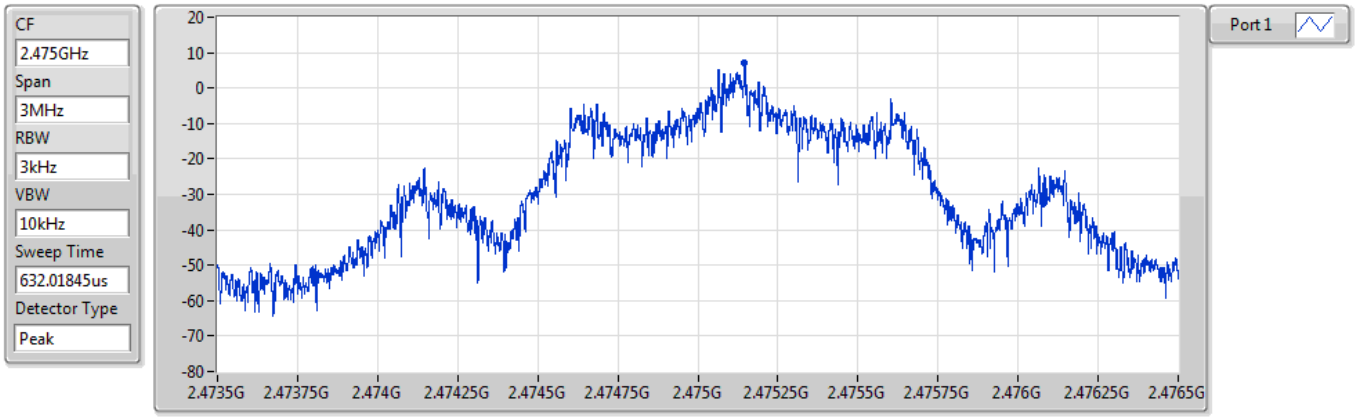


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.94	5.94	5.94

SRD_Nss1_1TX **PSD**

2475MHz

22/07/2021



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
6.97	6.97	6.97

Summary

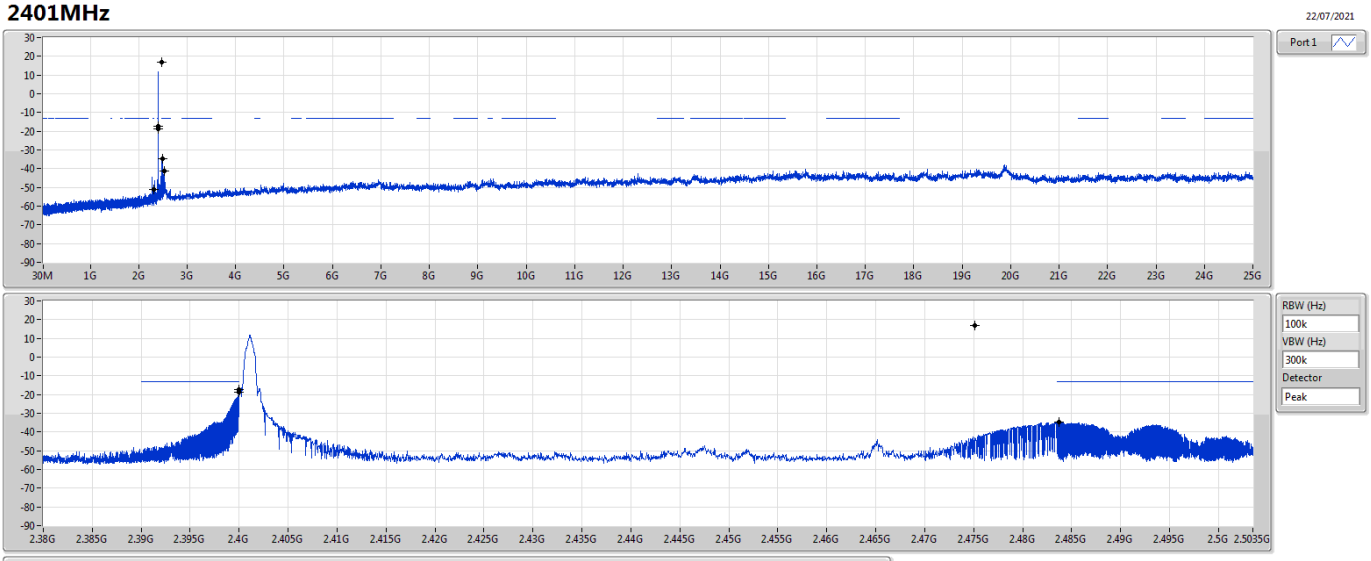
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SRD_Nss1_1TX	Pass	2.47515G	17.09	-12.91	2.30392G	-51.22	2.39998G	-18.76	2.4G	-17.43	2.48375G	-34.80	2.52881G	-41.04	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
SRD_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2401MHz	Pass	2.47515G	17.09	-12.91	2.30392G	-51.22	2.39998G	-18.76	2.4G	-17.43	2.48375G	-34.80	2.52881G	-41.04	1
2442MHz	Pass	2.47515G	17.09	-12.91	2.30598G	-52.79	2.39613G	-48.03	2.4835G	-52.80	2.48788G	-44.64	2.56818G	-38.13	1
2475MHz	Pass	2.47515G	17.09	-12.91	2.30098G	-49.66	2.39152G	-45.88	2.4835G	-50.55	2.48354G	-43.69	2.60192G	-34.35	1

SRD_Nss1_1TX **CSENdB-DTS**

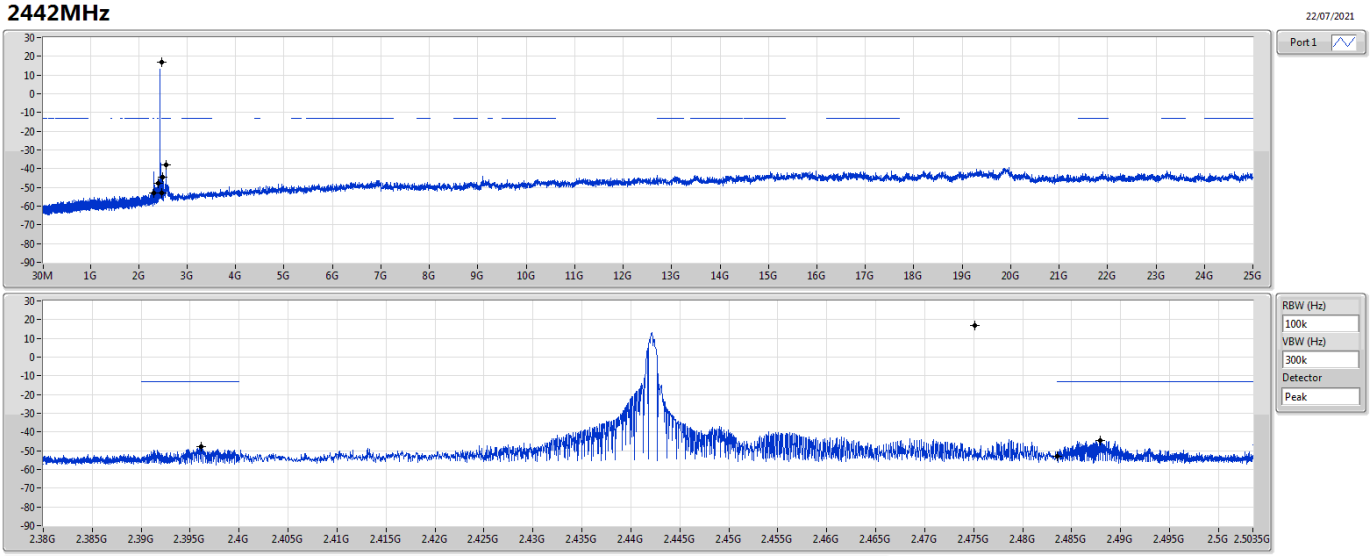
2401MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47515G	17.09	-12.91	2.30392G	-51.22	2.39998G	-18.76	2.4G	-17.43	2.48375G	-34.80	2.52881G	-41.04	1

SRD_Nss1_1TX **CSENdB-DTS**

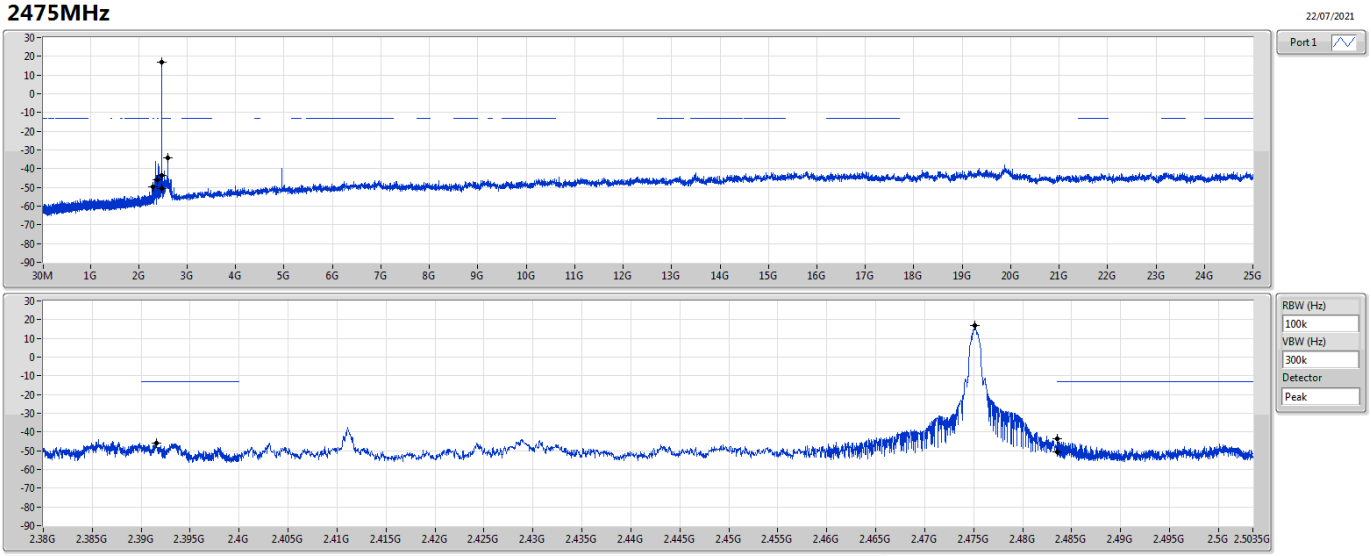
2442MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47515G	17.09	-12.91	2.30598G	-52.79	2.39613G	-48.03	2.4835G	-52.80	2.48788G	-44.64	2.56818G	-38.13	1

SRD_Nss1_1TX **CSENdB-DTS**

2475MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47515G	17.09	-12.91	2.30098G	-49.66	2.39152G	-45.88	2.4835G	-50.55	2.48354G	-43.69	2.60192G	-34.35	1

Summary

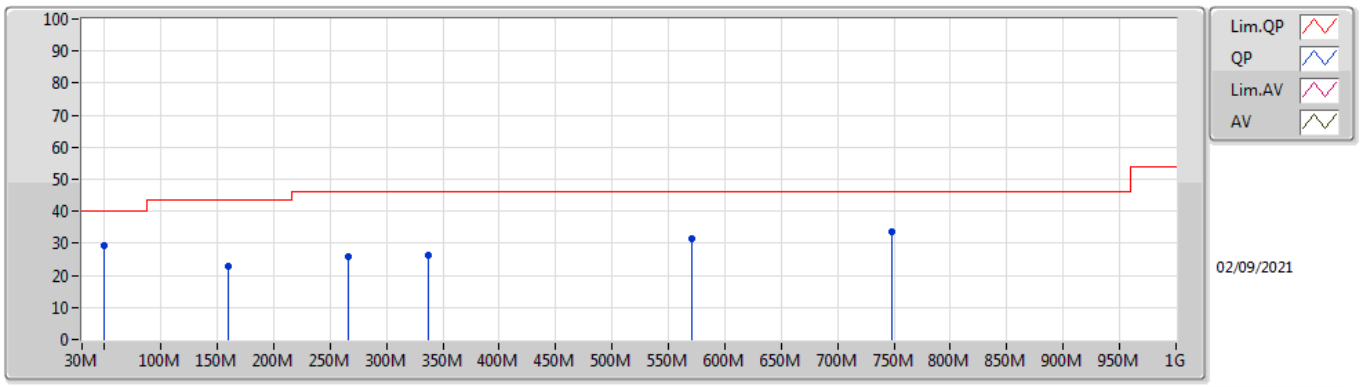
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
SRD_Nss1_1TX	Pass	PK	30M	35.79	40.00	-4.21	3	Horizontal	360	1.00	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
SRD_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-
2442MHz	Pass	PK	49.4M	29.44	40.00	-10.56	3	Vertical	0	1.00	-
2442MHz	Pass	PK	159.98M	22.90	43.50	-20.60	3	Vertical	0	1.00	-
2442MHz	Pass	PK	266.68M	25.94	46.00	-20.06	3	Vertical	0	1.00	-
2442MHz	Pass	PK	336.52M	26.08	46.00	-19.92	3	Vertical	0	1.00	-
2442MHz	Pass	PK	571.26M	31.37	46.00	-14.63	3	Vertical	0	1.00	-
2442MHz	Pass	PK	747.8M	33.53	46.00	-12.47	3	Vertical	0	1.00	-
2442MHz	Pass	PK	49.4M	24.16	40.00	-15.84	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	165.8M	25.69	43.50	-17.81	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	266.68M	29.26	46.00	-16.74	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	336.52M	33.29	46.00	-12.71	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	344.28M	30.27	46.00	-15.73	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	551.86M	31.87	46.00	-14.13	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	30M	34.22	40.00	-5.78	3	Vertical	0	1.00	-
2442MHz	Pass	PK	47.46M	35.72	40.00	-4.28	3	Vertical	0	1.00	-
2442MHz	Pass	PK	251.16M	30.15	46.00	-15.85	3	Vertical	0	1.00	-
2442MHz	Pass	PK	336.52M	29.08	46.00	-16.92	3	Vertical	0	1.00	-
2442MHz	Pass	PK	482.02M	30.14	46.00	-15.86	3	Vertical	0	1.00	-
2442MHz	Pass	PK	670.2M	30.67	46.00	-15.33	3	Vertical	0	1.00	-
2442MHz	Pass	PK	30M	35.79	40.00	-4.21	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	47.46M	32.61	40.00	-7.39	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	235.64M	33.80	46.00	-12.20	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	344.28M	29.32	46.00	-16.68	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	367.56M	29.86	46.00	-16.14	3	Horizontal	360	1.00	-
2442MHz	Pass	PK	837.04M	35.76	46.00	-10.24	3	Horizontal	360	1.00	-

SRD_Nss1_1TX

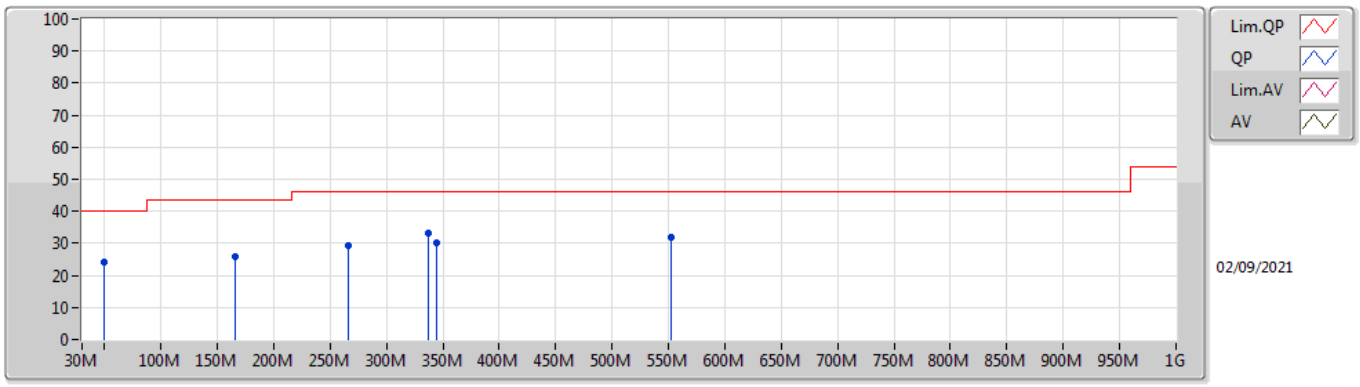
2442MHz_USB



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	49.4M	29.44	40.00	-10.56	-13.24	3	Vertical	0	1.00	-	42.68	13.40	1.06	27.70
PK	159.98M	22.90	43.50	-20.60	-10.54	3	Vertical	0	1.00	-	33.44	15.21	1.77	27.52
PK	266.68M	25.94	46.00	-20.06	-6.40	3	Vertical	0	1.00	-	32.34	18.41	2.22	27.03
PK	336.52M	26.08	46.00	-19.92	-5.74	3	Vertical	0	1.00	-	31.82	19.02	2.50	27.26
PK	571.26M	31.37	46.00	-14.63	-1.08	3	Vertical	0	1.00	-	32.45	24.02	3.27	28.37
PK	747.8M	33.53	46.00	-12.47	0.51	3	Vertical	0	1.00	-	33.02	24.89	3.70	28.08

SRD_Nss1_1TX

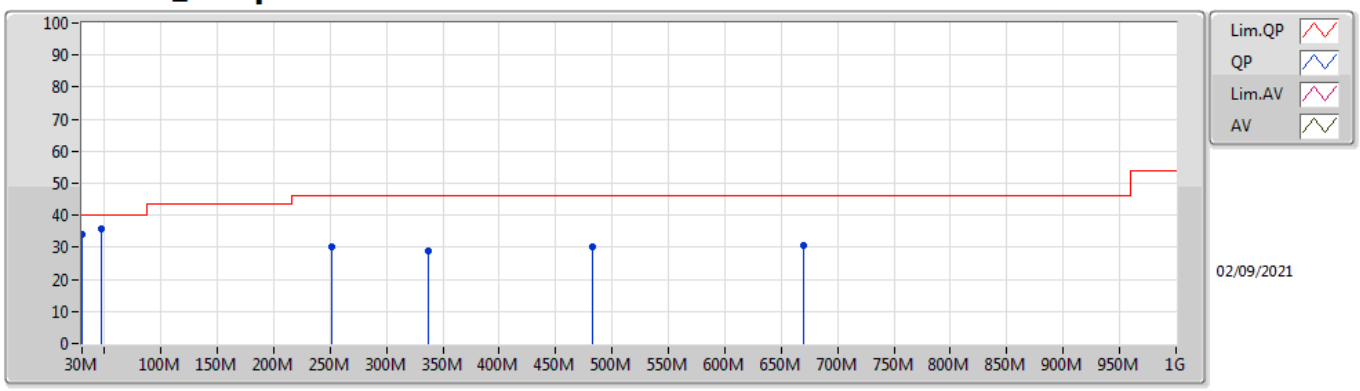
2442MHz_USB



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	49.4M	24.16	40.00	-15.84	-13.24	3	Horizontal	360	1.00	-	37.40	13.40	1.06	27.70
PK	165.8M	25.69	43.50	-17.81	-10.78	3	Horizontal	360	1.00	-	36.47	14.92	1.80	27.50
PK	266.68M	29.26	46.00	-16.74	-6.40	3	Horizontal	360	1.00	-	35.66	18.41	2.22	27.03
PK	336.52M	33.29	46.00	-12.71	-5.74	3	Horizontal	360	1.00	-	39.03	19.02	2.50	27.26
PK	344.28M	30.27	46.00	-15.73	-5.48	3	Horizontal	360	1.00	-	35.75	19.29	2.53	27.30
PK	551.86M	31.87	46.00	-14.13	-1.08	3	Horizontal	360	1.00	-	32.95	24.04	3.20	28.32

SRD_Nss1_1TX

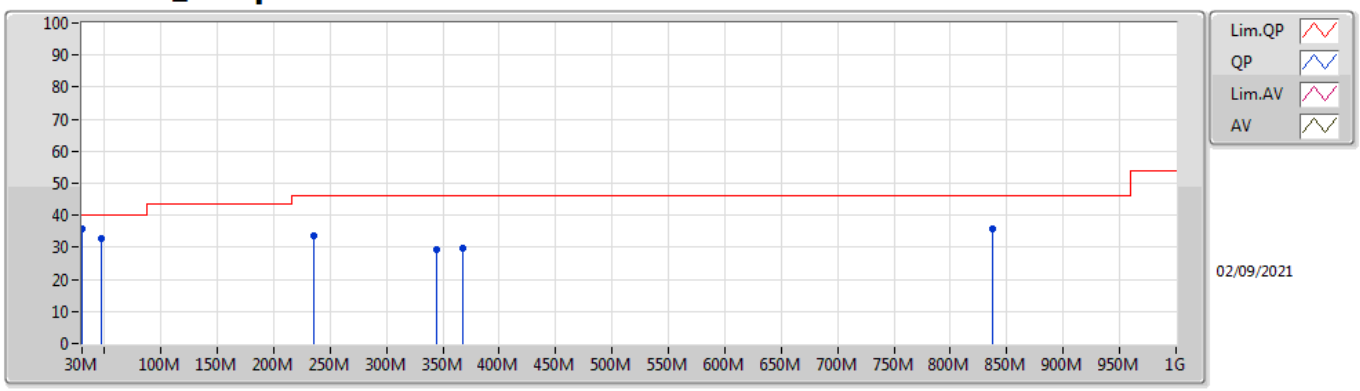
2442MHz_Adapter



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	34.22	40.00	-5.78	-2.81	3	Vertical	0	1.00	-	37.03	23.32	0.86	26.99
PK	47.46M	35.72	40.00	-4.28	-12.55	3	Vertical	0	1.00	-	48.27	14.05	1.04	27.64
PK	251.16M	30.15	46.00	-15.85	-7.21	3	Vertical	0	1.00	-	37.36	17.66	2.15	27.02
PK	336.52M	29.08	46.00	-16.92	-5.74	3	Vertical	0	1.00	-	34.82	19.02	2.50	27.26
PK	482.02M	30.14	46.00	-15.86	-2.43	3	Vertical	0	1.00	-	32.57	22.80	3.02	28.25
PK	670.2M	30.67	46.00	-15.33	-0.55	3	Vertical	0	1.00	-	31.22	24.16	3.51	28.22

SRD_Nss1_1TX

2442MHz_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	35.79	40.00	-4.21	-2.81	3	Horizontal	360	1.00	-	38.60	23.32	0.86	26.99
PK	47.46M	32.61	40.00	-7.39	-12.55	3	Horizontal	360	1.00	-	45.16	14.05	1.04	27.64
PK	235.64M	33.80	46.00	-12.20	-9.05	3	Horizontal	360	1.00	-	42.85	15.96	2.10	27.11
PK	344.28M	29.32	46.00	-16.68	-5.48	3	Horizontal	360	1.00	-	34.80	19.29	2.53	27.30
PK	367.56M	29.86	46.00	-16.14	-4.91	3	Horizontal	360	1.00	-	34.77	19.96	2.62	27.49
PK	837.04M	35.76	46.00	-10.24	1.60	3	Horizontal	360	1.00	-	34.16	25.40	3.96	27.76

Summary

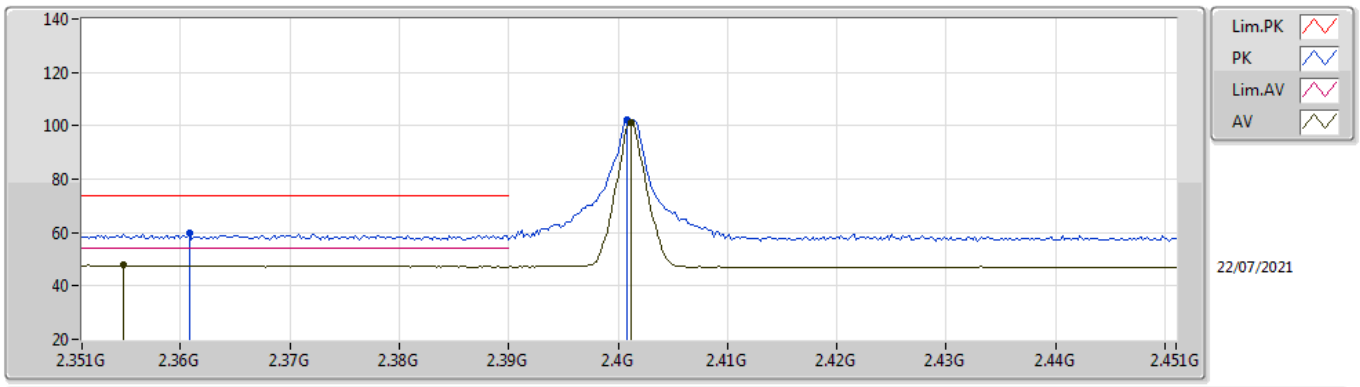
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
SRD_Nss1_1TX	Pass	AV	2.378G	53.73	54.00	-0.27	3	Horizontal	189	1.50	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
SRD_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-
2401MHz	Pass	AV	2.3548G	47.78	54.00	-6.22	3	Vertical	77	2.80	-
2401MHz	Pass	AV	2.4012G	101.05	Inf	-Inf	3	Vertical	77	2.80	-
2401MHz	Pass	PK	2.3608G	59.68	74.00	-14.32	3	Vertical	77	2.80	-
2401MHz	Pass	PK	2.4008G	102.50	Inf	-Inf	3	Vertical	77	2.80	-
2401MHz	Pass	AV	2.3546G	51.04	54.00	-2.96	3	Horizontal	182	1.96	-
2401MHz	Pass	AV	2.4012G	112.51	Inf	-Inf	3	Horizontal	182	1.96	-
2401MHz	Pass	PK	2.3894G	67.07	74.00	-6.93	3	Horizontal	182	1.96	-
2401MHz	Pass	PK	2.4008G	113.83	Inf	-Inf	3	Horizontal	182	1.96	-
2401MHz	Pass	AV	4.80232G	40.92	54.00	-13.08	3	Vertical	8	2.94	-
2401MHz	Pass	PK	4.80167G	47.75	74.00	-26.25	3	Vertical	8	2.94	-
2401MHz	Pass	AV	4.80225G	45.36	54.00	-8.64	3	Horizontal	262	1.00	-
2401MHz	Pass	PK	4.80181G	50.39	74.00	-23.61	3	Horizontal	262	1.00	-
2442MHz	Pass	AV	2.3488G	47.56	54.00	-6.44	3	Vertical	242	2.56	-
2442MHz	Pass	AV	2.442G	92.97	Inf	-Inf	3	Vertical	242	2.56	-
2442MHz	Pass	AV	2.4912G	47.10	54.00	-6.90	3	Vertical	242	2.56	-
2442MHz	Pass	PK	2.354G	59.48	74.00	-14.52	3	Vertical	242	2.56	-
2442MHz	Pass	PK	2.4424G	94.27	Inf	-Inf	3	Vertical	242	2.56	-
2442MHz	Pass	PK	2.4892G	58.62	74.00	-15.38	3	Vertical	242	2.56	-
2442MHz	Pass	AV	2.378G	53.73	54.00	-0.27	3	Horizontal	189	1.50	-
2442MHz	Pass	AV	2.442G	107.22	Inf	-Inf	3	Horizontal	189	1.50	-
2442MHz	Pass	AV	2.4884G	48.07	54.00	-5.93	3	Horizontal	189	1.50	-
2442MHz	Pass	PK	2.3784G	62.32	74.00	-11.68	3	Horizontal	189	1.50	-
2442MHz	Pass	PK	2.442G	108.72	Inf	-Inf	3	Horizontal	189	1.50	-
2442MHz	Pass	PK	2.4884G	58.92	74.00	-15.08	3	Horizontal	189	1.50	-
2442MHz	Pass	AV	4.88421G	41.61	54.00	-12.39	3	Vertical	323	2.95	-
2442MHz	Pass	AV	7.32677G	38.01	54.00	-15.99	3	Vertical	333	1.05	-
2442MHz	Pass	PK	4.88357G	50.11	74.00	-23.89	3	Vertical	323	2.95	-
2442MHz	Pass	PK	7.32529G	53.52	74.00	-20.48	3	Vertical	333	1.05	-
2442MHz	Pass	AV	4.88427G	45.03	54.00	-8.97	3	Horizontal	267	1.15	-
2442MHz	Pass	AV	7.32598G	38.04	54.00	-15.96	3	Horizontal	120	1.00	-
2442MHz	Pass	PK	4.88352G	52.75	74.00	-21.25	3	Horizontal	267	1.15	-
2442MHz	Pass	PK	7.32514G	61.55	74.00	-12.45	3	Horizontal	120	1.00	-
2475MHz	Pass	AV	2.4752G	100.12	Inf	-Inf	3	Vertical	127	3.00	-
2475MHz	Pass	AV	2.4972G	47.07	54.00	-6.93	3	Vertical	127	3.00	-
2475MHz	Pass	PK	2.475G	101.48	Inf	-Inf	3	Vertical	127	3.00	-
2475MHz	Pass	PK	2.4938G	58.98	74.00	-15.02	3	Vertical	127	3.00	-
2475MHz	Pass	AV	2.4752G	110.35	Inf	-Inf	3	Horizontal	218	2.66	-
2475MHz	Pass	AV	2.4835G	48.40	54.00	-5.60	3	Horizontal	218	2.66	-
2475MHz	Pass	PK	2.4748G	111.62	Inf	-Inf	3	Horizontal	218	2.66	-
2475MHz	Pass	PK	2.4835G	65.67	74.00	-8.33	3	Horizontal	218	2.66	-
2475MHz	Pass	AV	4.95021G	47.04	54.00	-6.96	3	Vertical	257	2.75	-
2475MHz	Pass	AV	7.42538G	49.52	54.00	-4.48	3	Vertical	79	2.82	-
2475MHz	Pass	PK	4.95042G	52.18	74.00	-21.82	3	Vertical	257	2.75	-
2475MHz	Pass	PK	7.42593G	60.45	74.00	-13.55	3	Vertical	79	2.82	-
2475MHz	Pass	AV	4.95024G	51.41	54.00	-2.59	3	Horizontal	151	2.74	-
2475MHz	Pass	AV	7.42539G	50.19	54.00	-3.81	3	Horizontal	121	1.09	-
2475MHz	Pass	PK	4.94976G	56.01	74.00	-17.99	3	Horizontal	151	2.74	-
2475MHz	Pass	PK	7.42742G	67.68	74.00	-6.32	3	Horizontal	121	1.09	-

SRD_Nss1_1TX

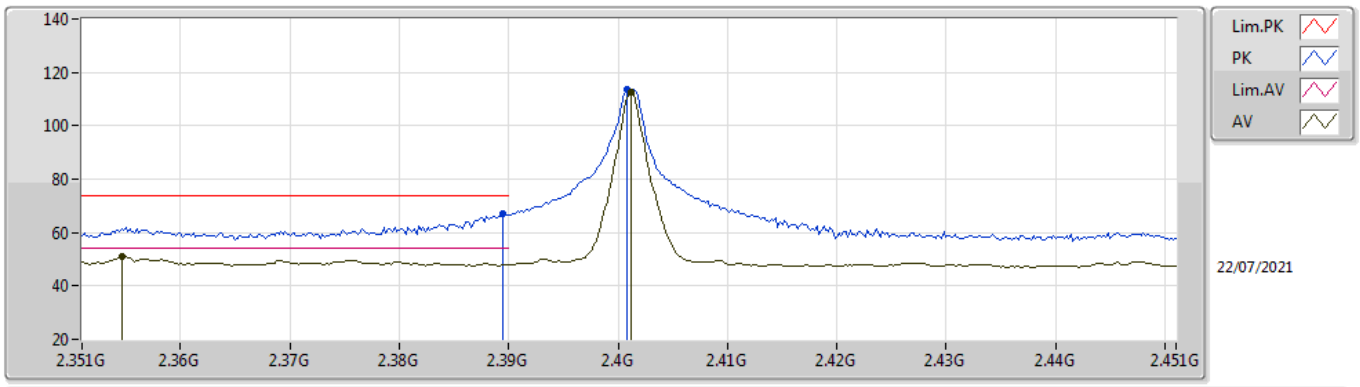
2401MHz_TX



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	2.3548G	47.78	54.00	-6.22	35.03	3	Vertical	77	2.80	-	12.75	27.79	7.24	-
AV	2.4012G	101.05	Inf	-Inf	34.95	3	Vertical	77	2.80	-	66.10	27.69	7.26	-
PK	2.3608G	59.68	74.00	-14.32	35.02	3	Vertical	77	2.80	-	24.66	27.78	7.24	-
PK	2.4008G	102.50	Inf	-Inf	34.96	3	Vertical	77	2.80	-	67.54	27.70	7.26	-

SRD_Nss1_1TX

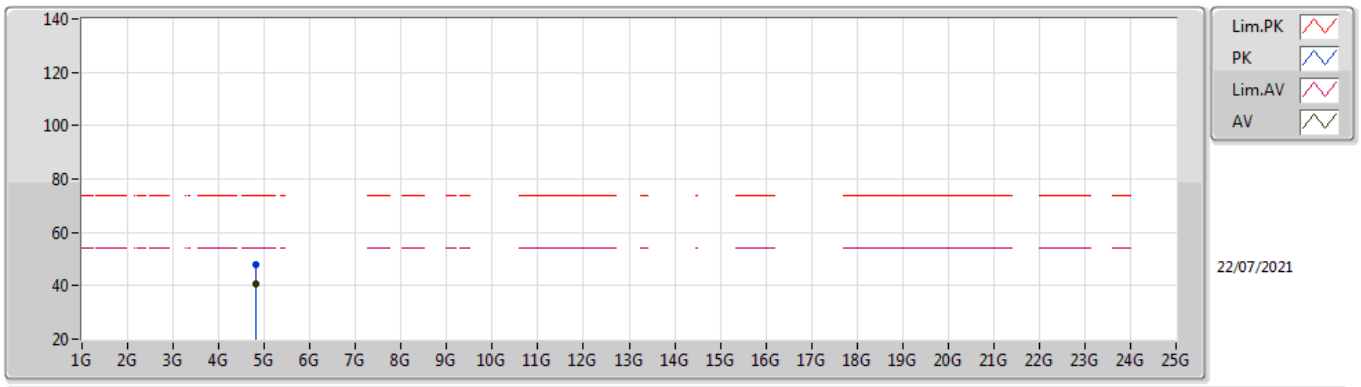
2401MHz_TX



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	2.3546G	51.04	54.00	-2.96	35.03	3	Horizontal	182	1.96	-	16.01	27.79	7.24	-
AV	2.4012G	112.51	Inf	-Inf	34.95	3	Horizontal	182	1.96	-	77.56	27.69	7.26	-
PK	2.3894G	67.07	74.00	-6.93	34.98	3	Horizontal	182	1.96	-	32.09	27.72	7.26	-
PK	2.4008G	113.83	Inf	-Inf	34.96	3	Horizontal	182	1.96	-	78.87	27.70	7.26	-

SRD_Nss1_1TX

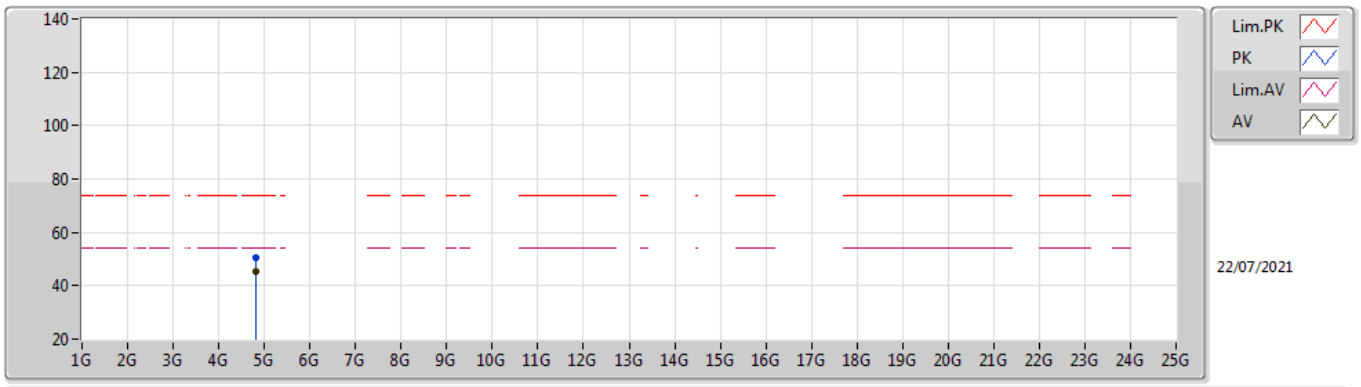
2401MHz_TX



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	4.80232G	40.92	54.00	-13.08	5.71	3	Vertical	8	2.94	-	35.21	31.10	8.90	34.29
PK	4.80167G	47.75	74.00	-26.25	5.71	3	Vertical	8	2.94	-	42.04	31.10	8.90	34.29

SRD_Nss1_1TX

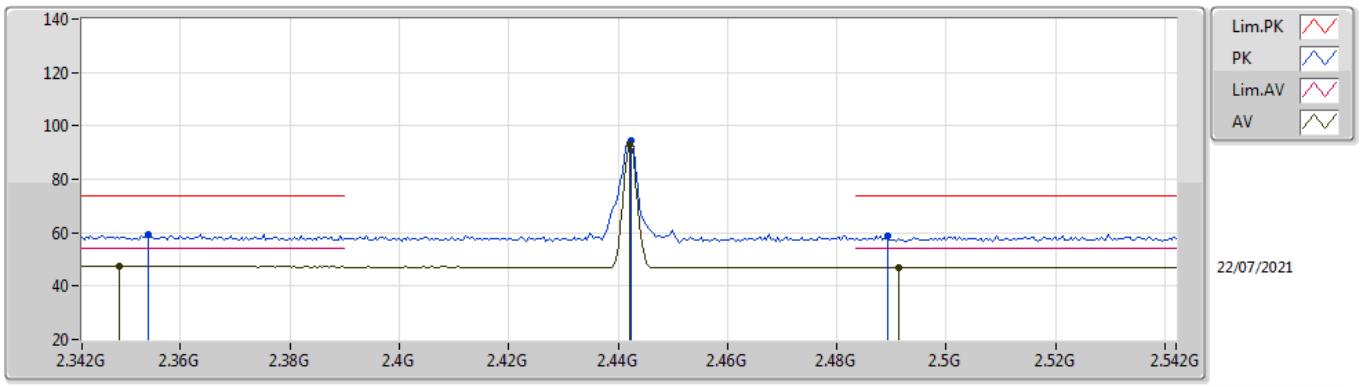
2401MHz_TX



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	4.80225G	45.36	54.00	-8.64	5.71	3	Horizontal	262	1.00	-	39.65	31.10	8.90	34.29
PK	4.80181G	50.39	74.00	-23.61	5.71	3	Horizontal	262	1.00	-	44.68	31.10	8.90	34.29

SRD_Nss1_1TX

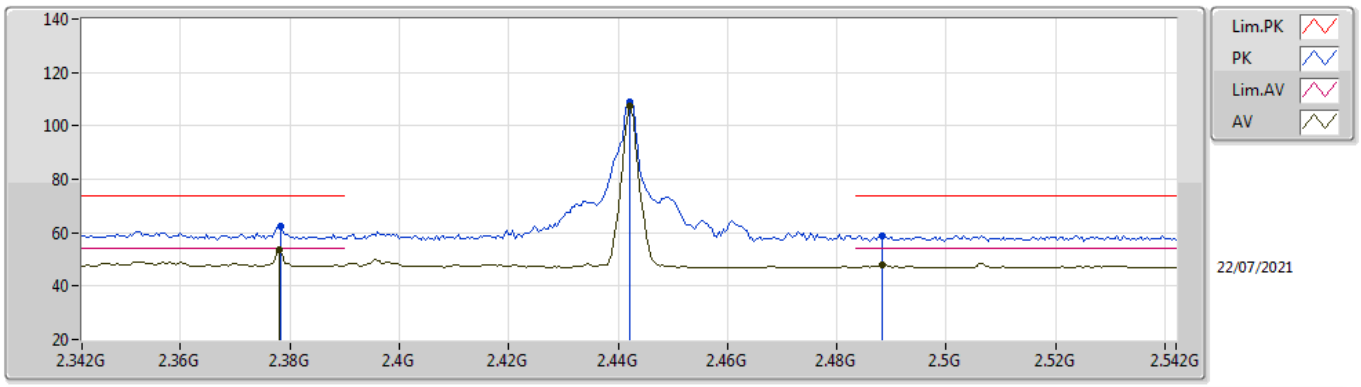
2442MHz_TX



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	2.3488G	47.56	54.00	-6.44	35.04	3	Vertical	242	2.56	-	12.52	27.80	7.24	-
AV	2.442G	92.97	Inf	-Inf	34.74	3	Vertical	242	2.56	-	58.23	27.45	7.29	-
AV	2.4912G	47.10	54.00	-6.90	34.73	3	Vertical	242	2.56	-	12.37	27.40	7.33	-
PK	2.354G	59.48	74.00	-14.52	35.03	3	Vertical	242	2.56	-	24.45	27.79	7.24	-
PK	2.4424G	94.27	Inf	-Inf	34.74	3	Vertical	242	2.56	-	59.53	27.45	7.29	-
PK	2.4892G	58.62	74.00	-15.38	34.73	3	Vertical	242	2.56	-	23.89	27.40	7.33	-

SRD_Nss1_1TX

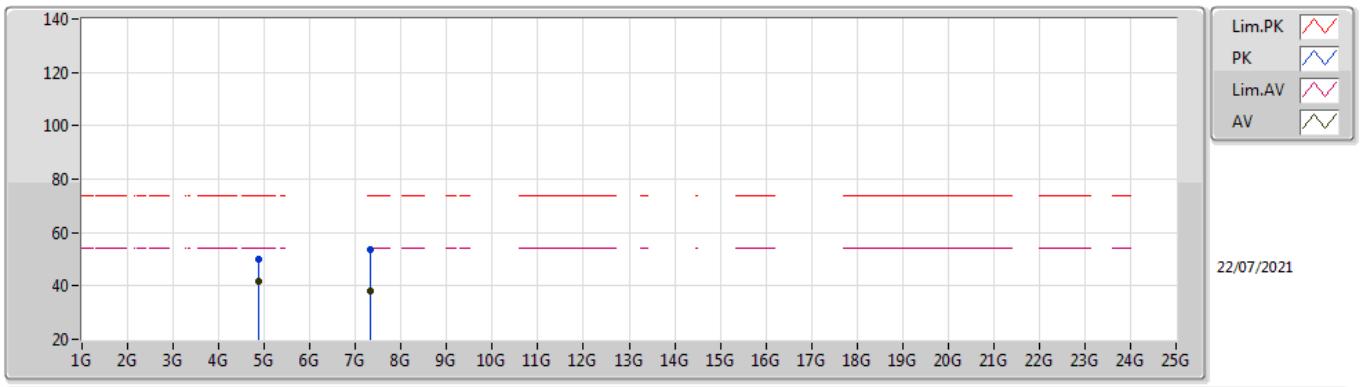
2442MHz_TX



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	2.378G	53.73	54.00	-0.27	34.99	3	Horizontal	189	1.50	-	18.74	27.74	7.25	-
AV	2.442G	107.22	Inf	-Inf	34.74	3	Horizontal	189	1.50	-	72.48	27.45	7.29	-
AV	2.4884G	48.07	54.00	-5.93	34.73	3	Horizontal	189	1.50	-	13.34	27.40	7.33	-
PK	2.3784G	62.32	74.00	-11.68	34.99	3	Horizontal	189	1.50	-	27.33	27.74	7.25	-
PK	2.442G	108.72	Inf	-Inf	34.74	3	Horizontal	189	1.50	-	73.98	27.45	7.29	-
PK	2.4884G	58.92	74.00	-15.08	34.73	3	Horizontal	189	1.50	-	24.19	27.40	7.33	-

SRD_Nss1_1TX

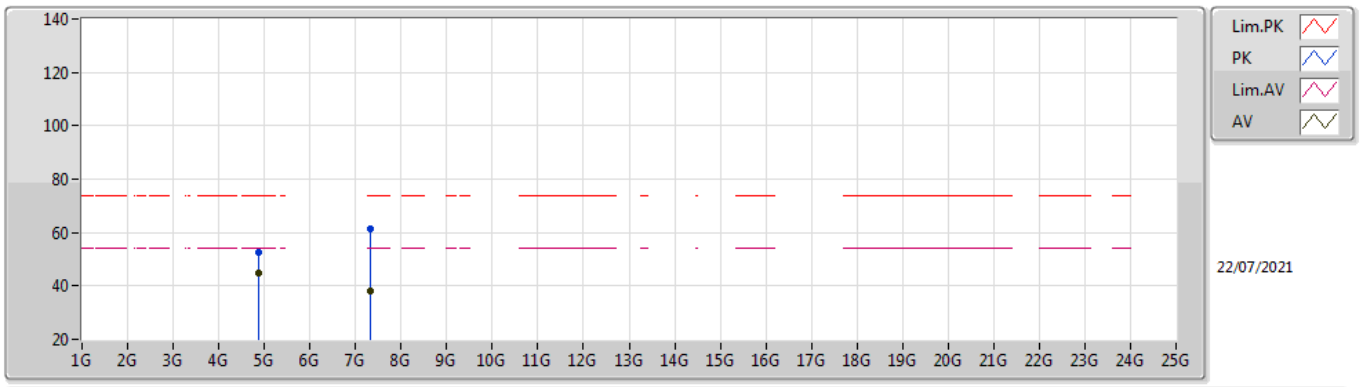
2442MHz_TX



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	4.88421G	41.61	54.00	-12.39	5.90	3	Vertical	323	2.95	-	35.71	31.20	8.96	34.26
AV	7.32677G	38.01	54.00	-15.99	12.41	3	Vertical	333	1.05	-	25.60	36.35	10.64	34.58
PK	4.88357G	50.11	74.00	-23.89	5.90	3	Vertical	323	2.95	-	44.21	31.20	8.96	34.26
PK	7.32529G	53.52	74.00	-20.48	12.41	3	Vertical	333	1.05	-	41.11	36.35	10.64	34.58

SRD_Nss1_1TX

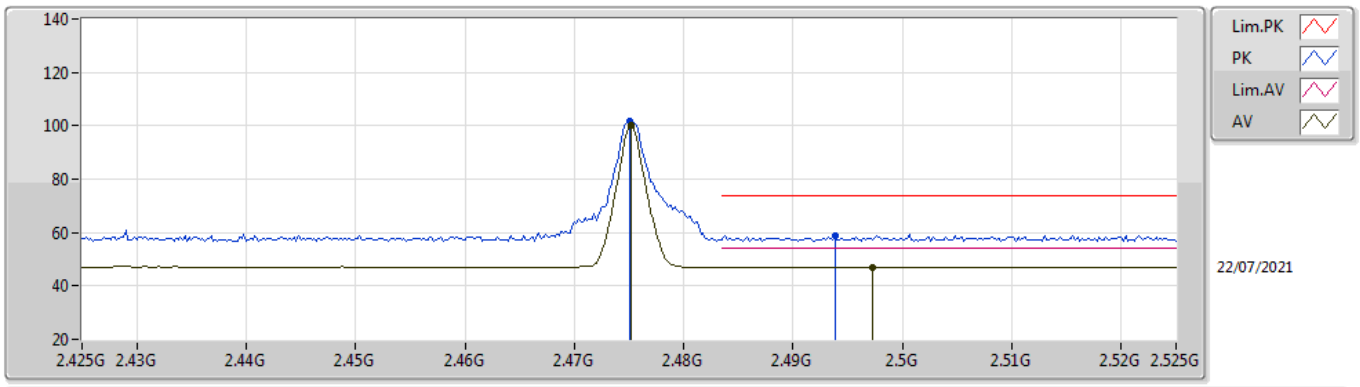
2442MHz_TX



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	4.88427G	45.03	54.00	-8.97	5.90	3	Horizontal	267	1.15	-	39.13	31.20	8.96	34.26
AV	7.32598G	38.04	54.00	-15.96	12.41	3	Horizontal	120	1.00	-	25.63	36.35	10.64	34.58
PK	4.88352G	52.75	74.00	-21.25	5.90	3	Horizontal	267	1.15	-	46.85	31.20	8.96	34.26
PK	7.32514G	61.55	74.00	-12.45	12.41	3	Horizontal	120	1.00	-	49.14	36.35	10.64	34.58

SRD_Nss1_1TX

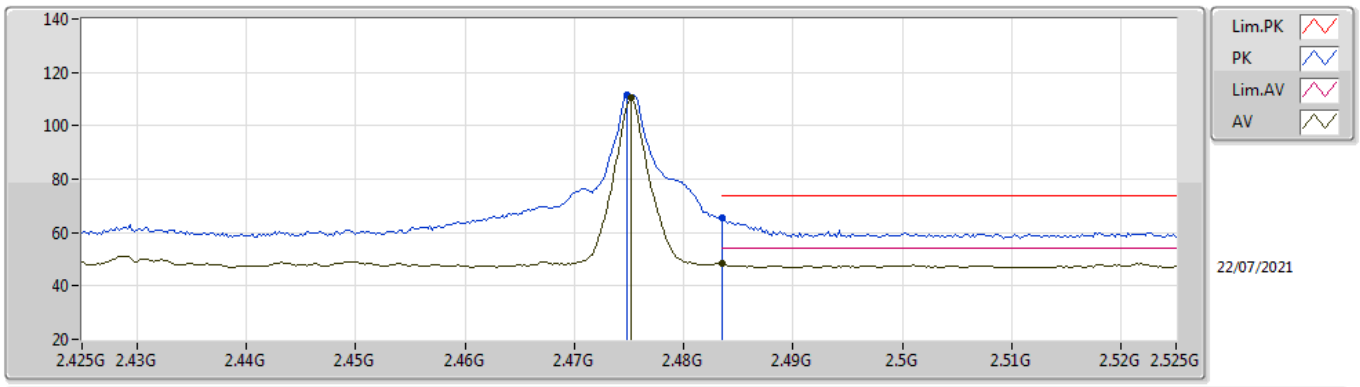
2475MHz_TX



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	2.4752G	100.12	Inf	-Inf	34.72	3	Vertical	127	3.00	-	65.40	27.40	7.32	-
AV	2.4972G	47.07	54.00	-6.93	34.74	3	Vertical	127	3.00	-	12.33	27.40	7.34	-
PK	2.475G	101.48	Inf	-Inf	34.72	3	Vertical	127	3.00	-	66.76	27.40	7.32	-
PK	2.4938G	58.98	74.00	-15.02	34.74	3	Vertical	127	3.00	-	24.24	27.40	7.34	-

SRD_Nss1_1TX

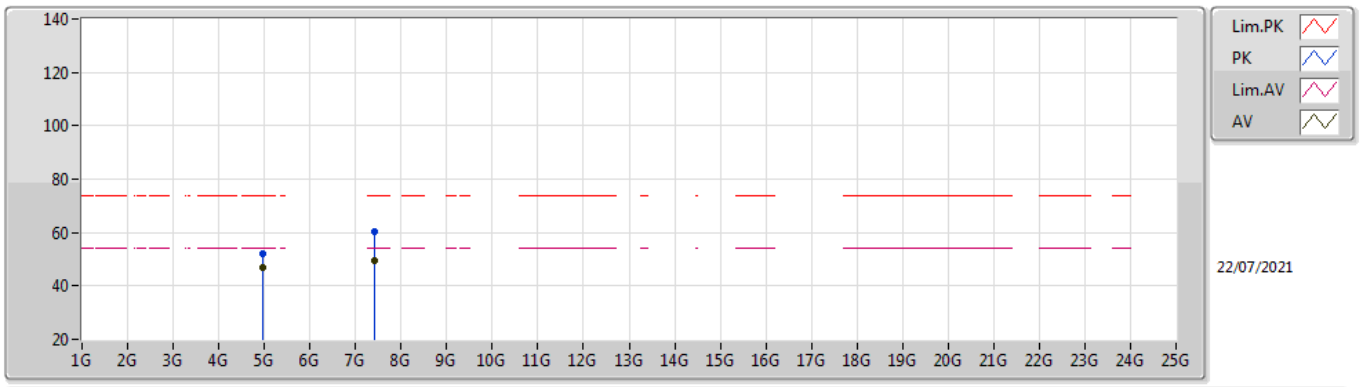
2475MHz_TX



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	2.4752G	110.35	Inf	-Inf	34.72	3	Horizontal	218	2.66	-	75.63	27.40	7.32	-
AV	2.4835G	48.40	54.00	-5.60	34.73	3	Horizontal	218	2.66	-	13.67	27.40	7.33	-
PK	2.4748G	111.62	Inf	-Inf	34.72	3	Horizontal	218	2.66	-	76.90	27.40	7.32	-
PK	2.4835G	65.67	74.00	-8.33	34.73	3	Horizontal	218	2.66	-	30.94	27.40	7.33	-

SRD_Nss1_1TX

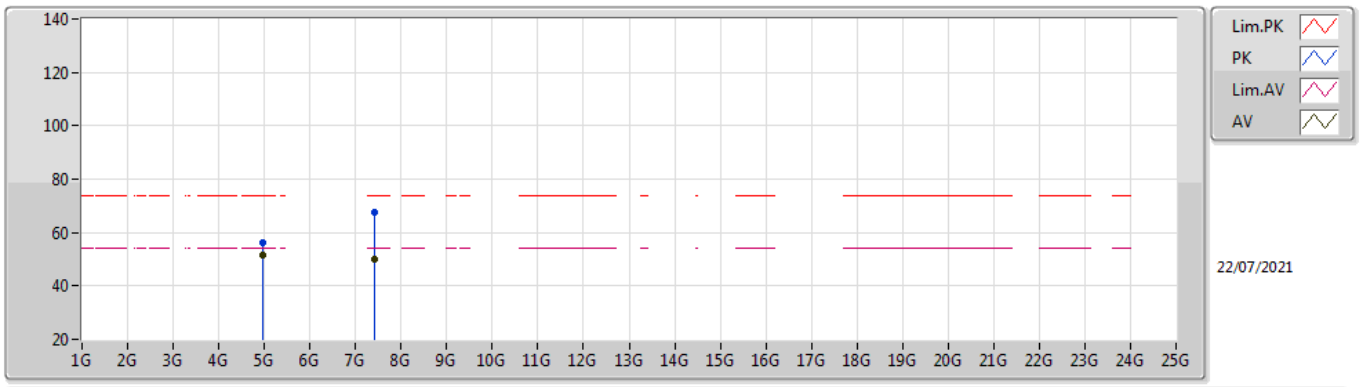
2475MHz_TX



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	4.95021G	47.04	54.00	-6.96	6.17	3	Vertical	257	2.75	-	40.87	31.40	9.01	34.24
AV	7.42538G	49.52	54.00	-4.48	12.37	3	Vertical	79	2.82	-	37.15	36.25	10.71	34.59
PK	4.95042G	52.18	74.00	-21.82	6.17	3	Vertical	257	2.75	-	46.01	31.40	9.01	34.24
PK	7.42593G	60.45	74.00	-13.55	12.37	3	Vertical	79	2.82	-	48.08	36.25	10.71	34.59

SRD_Nss1_1TX

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	4.95024G	51.41	54.00	-2.59	6.17	3	Horizontal	151	2.74	-	45.24	31.40	9.01	34.24
AV	7.42539G	50.19	54.00	-3.81	12.37	3	Horizontal	121	1.09	-	37.82	36.25	10.71	34.59
PK	4.94976G	56.01	74.00	-17.99	6.17	3	Horizontal	151	2.74	-	49.84	31.40	9.01	34.24
PK	7.42742G	67.68	74.00	-6.32	12.37	3	Horizontal	121	1.09	-	55.31	36.25	10.71	34.59