

FCC Test Report

FCC ID : UJ9IRM23R
Contain ID : UJ9DG009
Equipment : 2.4GHz Cordless Silent Mouse
Brand Name : i-rocks
Model Name : M23R
Applicant : I-Rocks Technology Co., Ltd.
7F., No. 786, Zhongzheng Rd., Zhonghe Dist.,
New Taipei City 23586, Taiwan (R.O.C.)
Manufacturer : G. TECH TECHNOLOGY LTD.
No.8, Jinyuan 1st Road,High-tech Zone,
Zhuhai City, Guangdong, China 519085
Standard : 47 CFR FCC Part 15.247

The product was received on Aug. 24, 2020, and testing was started from Sep. 10, 2020 and completed on Oct. 05, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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History of this test report

Report No.	Version	Description	Issued Date
FR081811	01	Initial issue of report	Oct. 26, 2020

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
-	15.207	AC Power-line Conducted Emissions	Not Required	Only employ battery power.
3.1	15.247(a)	DTS Bandwidth	PASS	-
3.2	15.247(b)	Maximum Conducted Output Power	PASS	-
3.3	15.247(e)	Power Spectral Density	PASS	-
3.4	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.5	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

1.1.1 RF General Information

Frequency Range (MHz)	Modulation	Ch. Frequency (MHz)	Channel Number
2400-2483.5	FSK	2408-2474	1-34 [34]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	SRD	2.0	1TX

Channel	Freq.(MHz)	Channel	Freq.(MHz)
1	2408	18	2442
2	2410	19	2444
3	2412	20	2446
4	2414	21	2448
5	2416	22	2450
6	2418	23	2452
7	2420	24	2454
8	2422	25	2456
9	2424	26	2458
10	2426	27	2460
11	2428	28	2462
12	2430	29	2464
13	2432	30	2466
14	2434	31	2468
15	2436	32	2470
16	2438	33	2472
17	2440	34	2474

Note:

- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	i-rocks	2.4G ANT	PCB	N/A

Ant.	Port	Gain (dBi)
1	1	-2.2725

For SRD 2.4GHz function:

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

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

1.1.3 EUT Information

Operational Condition				
EUT Power Type		From Battery		
EUT Function		☐ Point-to-multipoint	☒ Point-to-point	
Beamforming Function		☐ With beamforming	☒ Without beamforming	
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) $\geq 1/T$
SRD_Nss1_1TX	0.127	8.96	7.819m	300

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

Testing Location				
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)		
		TEL : 886-3-327-3456	FAX : 886-3-327-0973	
Test site Designation No. TW1190 with FCC.				
☐	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)		
		TEL : 886-3-656-9065	FAX : 886-3-656-9085	
Test site Designation No. TW0006 with FCC.				
☒	Wen Shan	ADD : No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)		
		TEL : 886-3-318-0787	FAX : 886-3-318-0287	
Test site Designation No. TW1097 with FCC.				

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Vivi Jiang	20.1~26.8°C / 50~60%	10/Sep/2020
Radiated	03CH09-HY	Lego Lin	22.8~24.2°C / 56~60%	05/Oct/2020

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 Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	1.5V

2.2 Test Channel Mode

Mode	Power Setting
SRD_Nss1_1TX	-
2408MHz	Default
2440MHz	Default
2474MHz	Default

2.3 The Worst Case Measurement Configuration

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

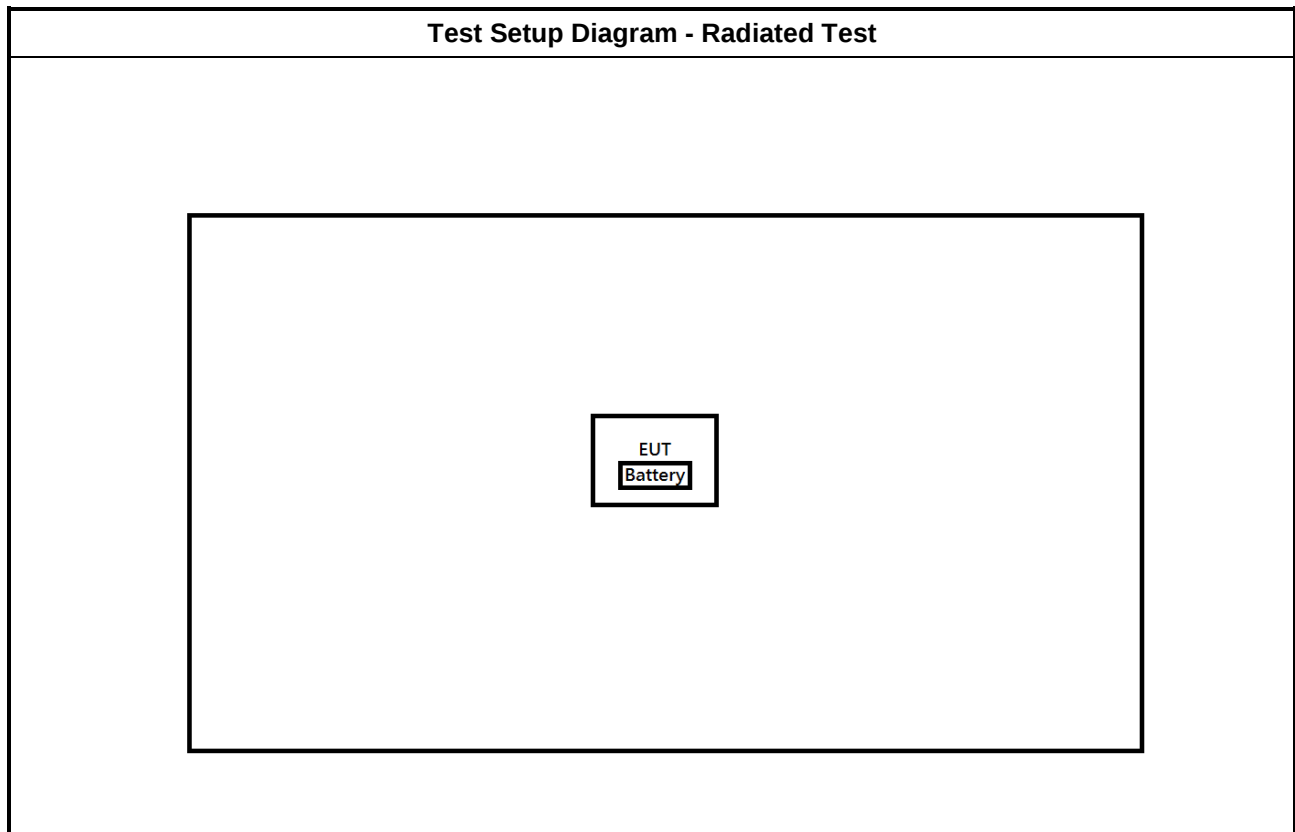
The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be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

2.4 Accessories

Accessories				
Li-ion Battery	Brand Name	TENERG	Model Name	LR6 AA SIZE AM3 1.5V
	Manufacturer	Shenzhen Tenerg Electronic Co Ltd.		
USB Dongle	Brand Name	i-rocks	Model Name	UJ9DG009
	Manufacturer	G,TECH TECHNOLOGY LTD.		

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

2.5 Test Setup Diagram



3 Transmitter Test Result

3.1 DTS Bandwidth

3.1.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
▪	6 dB bandwidth $\geq$ 500 kHz.

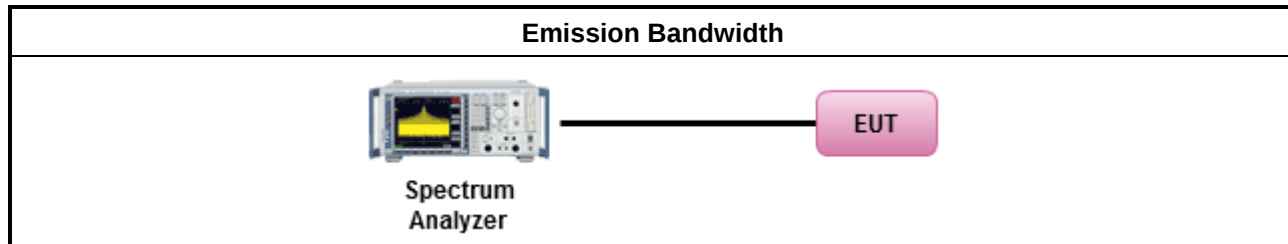
3.1.2 Measuring Instruments

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

3.1.3 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.

3.1.4 Test Setup



3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 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.		

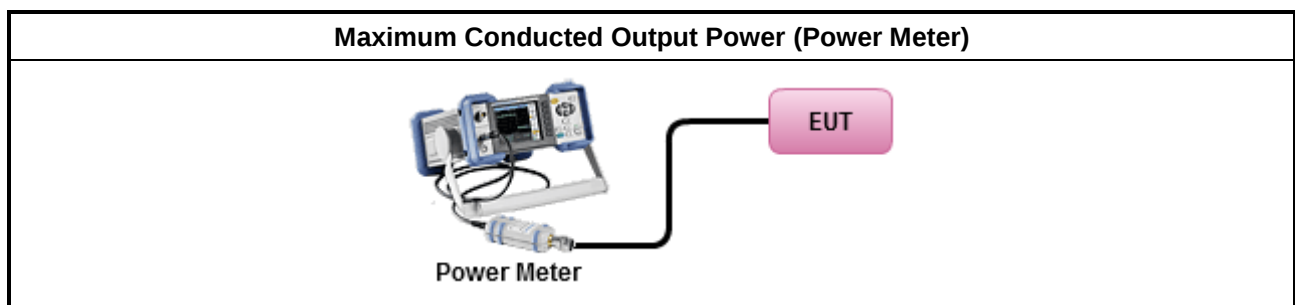
3.2.2 Measuring Instruments

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

3.2.3 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]) $EIRP_{total} = P_{total} + DG$	

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Power Spectral Density

3.3.1 Power Spectral Density Limit

Power Spectral Density Limit	
▪	Power Spectral Density (PSD) $\leq$ 8 dBm/3kHz

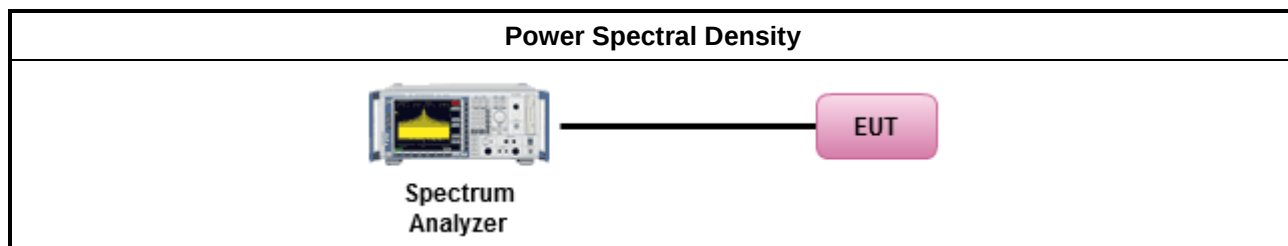
3.3.2 Measuring Instruments

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

3.3.3 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.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Refer as Appendix C

3.4 Emissions in Non-restricted Frequency Bands

3.4.1 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.	

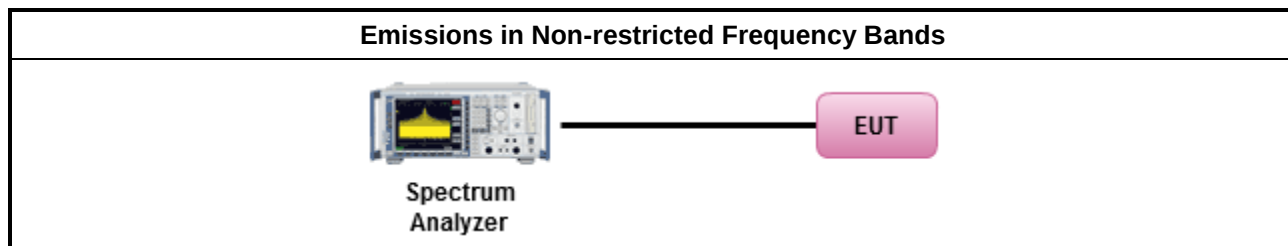
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

3.5 Emissions in Restricted Frequency Bands

3.5.1 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.

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

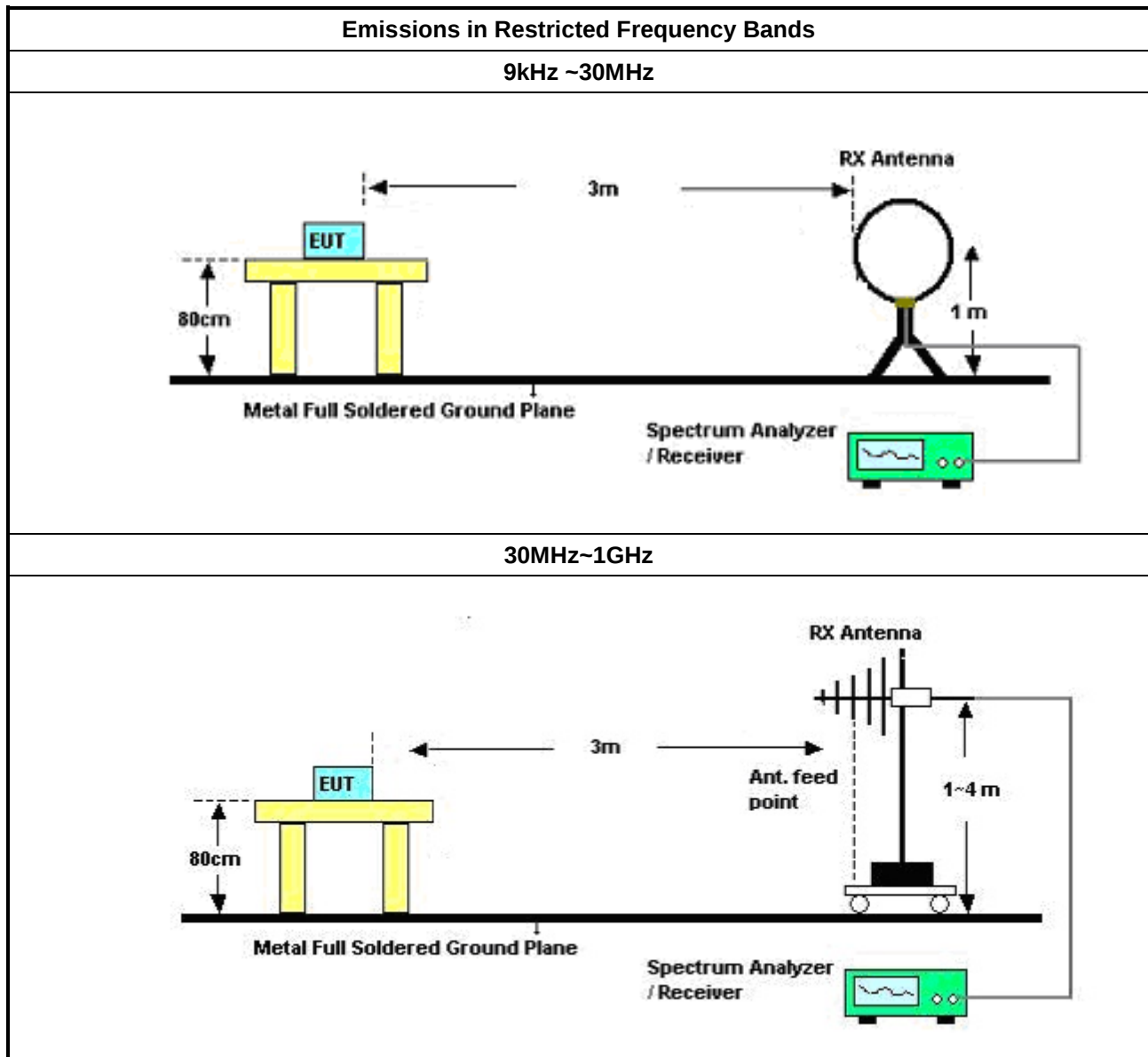
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted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

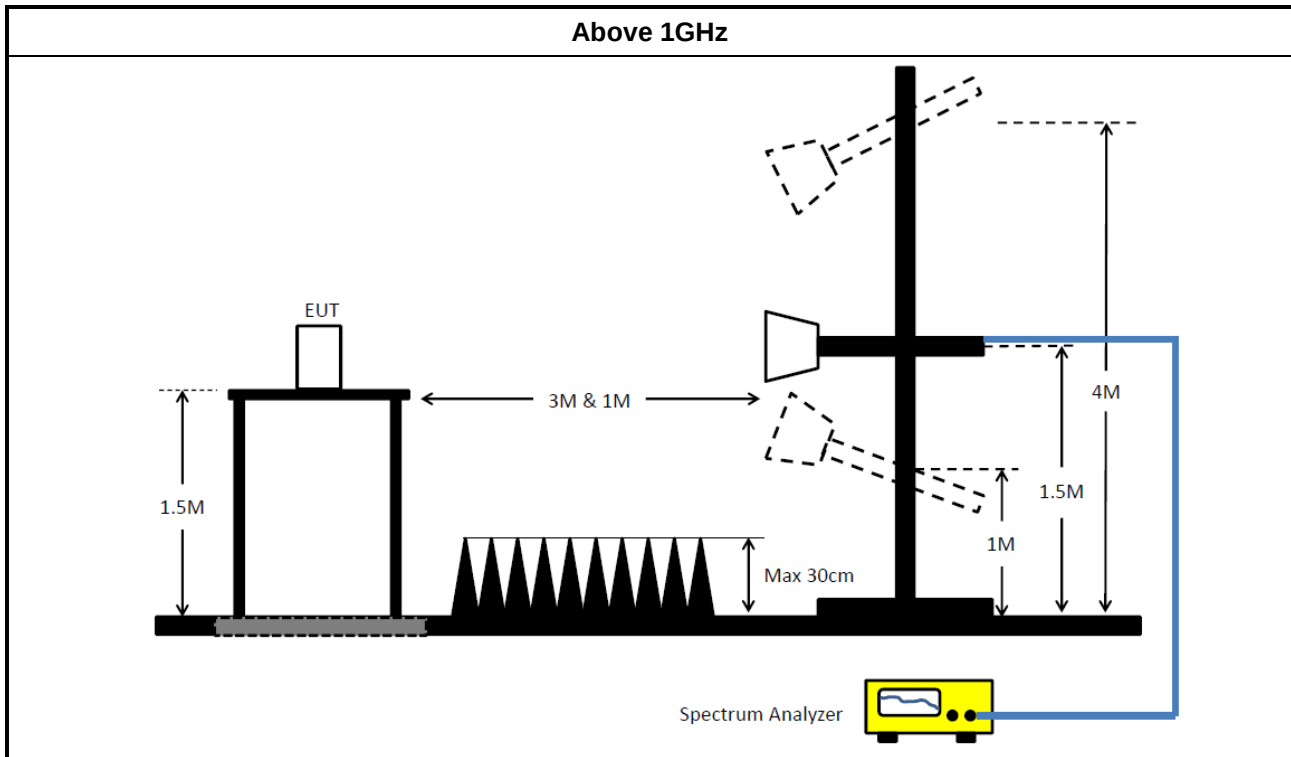
3.5.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.5.5 Test Setup





3.5.6 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.

3.5.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix E

4 Test Equipment and Calibration Data

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101013	10Hz~40GHz	19/Mar/2020	18/Mar/2021
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	11/Nov/2020
Pulse Sensor	Anritsu	MA2411B	917017	300MHz~40GHz	17/Feb/2020	16/Feb/2021
Power Meter	Anritsu	ML2495A	949003	300MHz~40GHz	17/Feb/2020	16/Feb/2021

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz~1GHz 3m	27/Mar/2020	26/Mar/2021
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz~18GHz 3m	19/Mar/2020	18/Mar/2021
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	17/Aug/2020	16/Aug/2021
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	14/Apr/2020	13/Apr/2021
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	24/Jun/2020	23/Jun/2021
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MTJ6 102-05	35418 & 3	30MHz~1GHz	06/Sep/2020	05/Sep/2021
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	28/May/2020	27/May/2021
RF Cable-low	Jye Bao	RG142	CB031+324530/4	30MHz~1GHz	12/Feb/2020	11/Feb/2021
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX104	324530/4+17173/ 4	1GHz~40GHz	12/Feb/2020	11/Feb/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	13/Mar/2020	12/Mar/2021
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2020	15/Mar/2021
EMI Test Receiver	R&S	ESR3	102051	9kHz~3.6GHz	29/May/2020	28/May/2021

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	1.358M	2.111M	2M11D1D	1.323M	2.035M

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

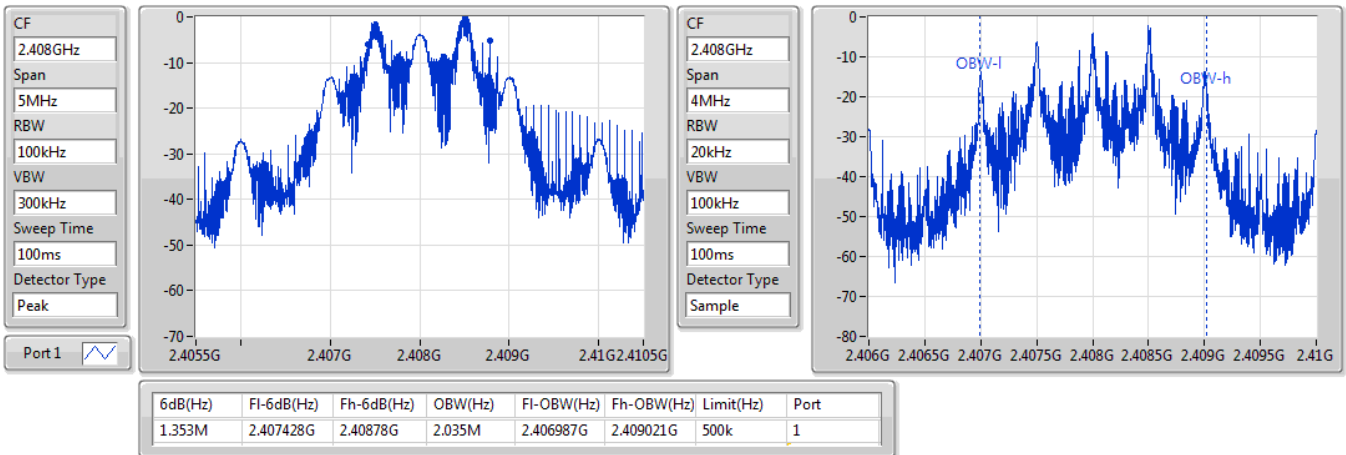
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
SRD_Nss1_1TX	-	-	-	-
2408MHz	Pass	500k	1.353M	2.035M
2440MHz	Pass	500k	1.358M	2.111M
2474MHz	Pass	500k	1.323M	2.065M

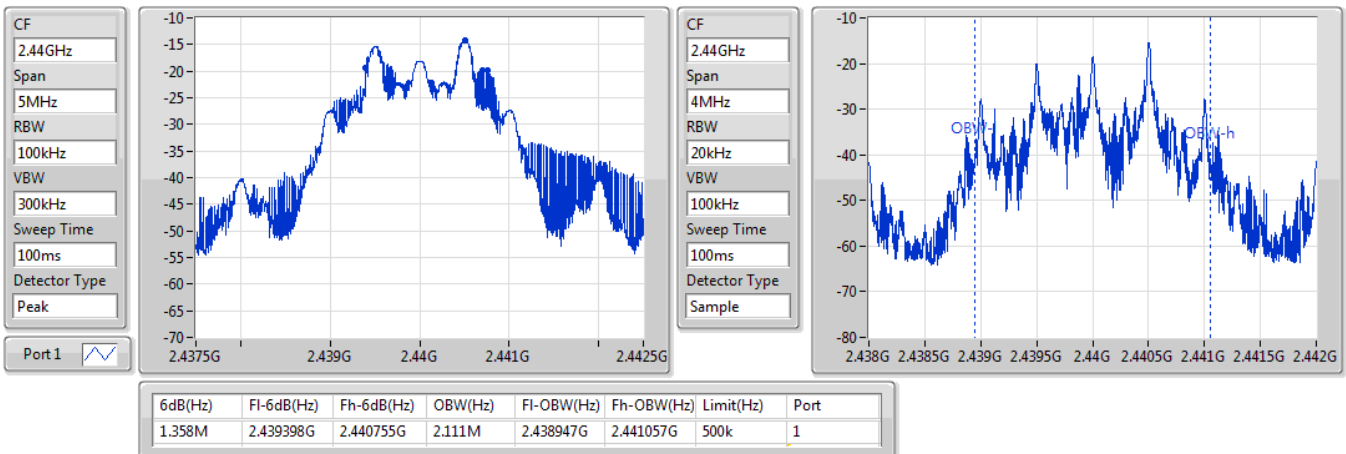
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

SRD_Nss1_1TX
EBW
2408MHz

10/09/2020


SRD_Nss1_1TX
EBW
2440MHz

10/09/2020

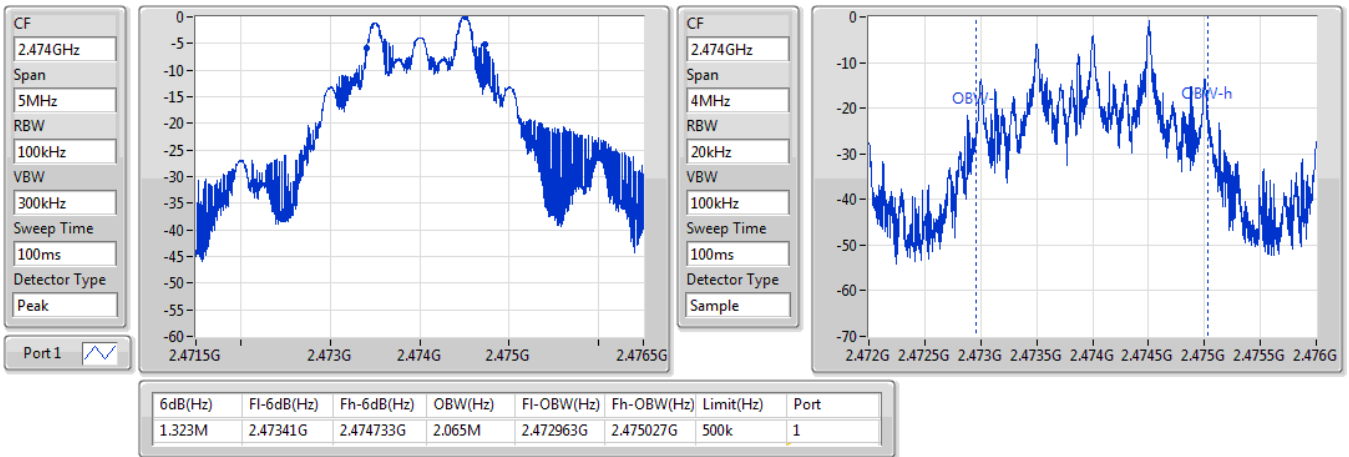


SRD_Nss1_1TX

2474MHz

EBW

10/09/2020





Average Power

Appendix B

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
SRD_Nss1_1TX	-0.10	0.00098



Average Power

Appendix B

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
SRD_Nss1_1TX	-	-	-	-	-
2408MHz_TnomVnom	Pass	-2.2725	-0.18	-0.18	30.00
2440MHz_TnomVnom	Pass	-2.2725	-0.71	-0.71	30.00
2474MHz_TnomVnom	Pass	-2.2725	-0.10	-0.10	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
SRD_Nss1_1TX	-5.66

RBW = 3kHz;

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
SRD_Nss1_1TX	-	-	-	-	-
2408MHz_TnomVnom	Pass	-2.2725	-5.68	-5.68	8.00
2440MHz_TnomVnom	Pass	-2.2725	-6.22	-6.22	8.00
2474MHz_TnomVnom	Pass	-2.2725	-5.66	-5.66	8.00

DG = Directional Gain; RBW = 3kHz;

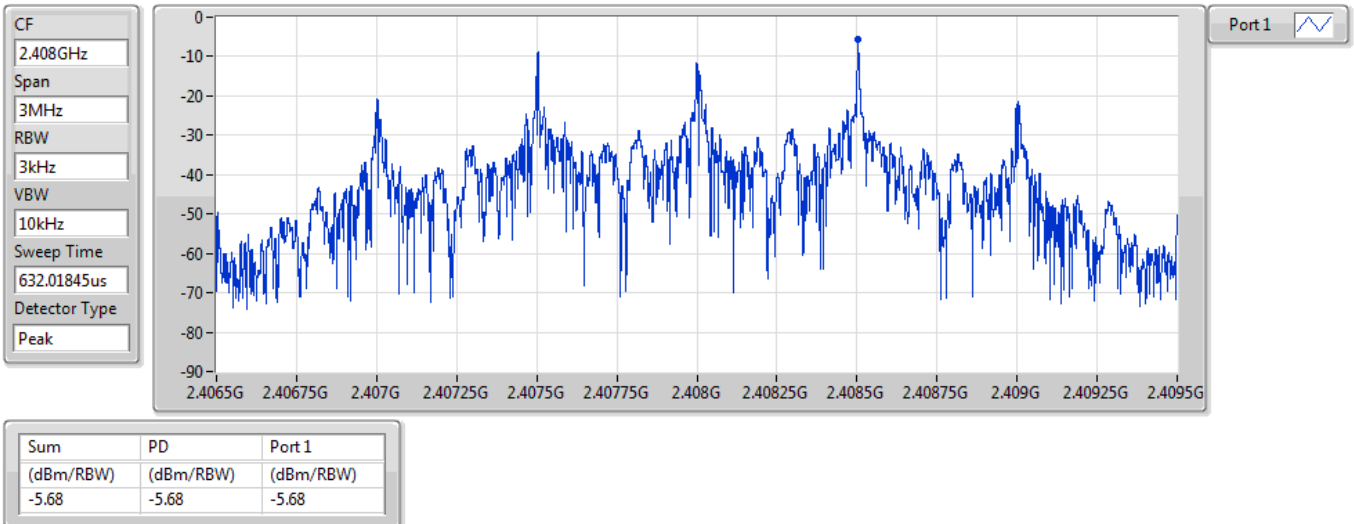
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

SRD_Nss1_1TX

PSD

2408MHz

10/09/2020

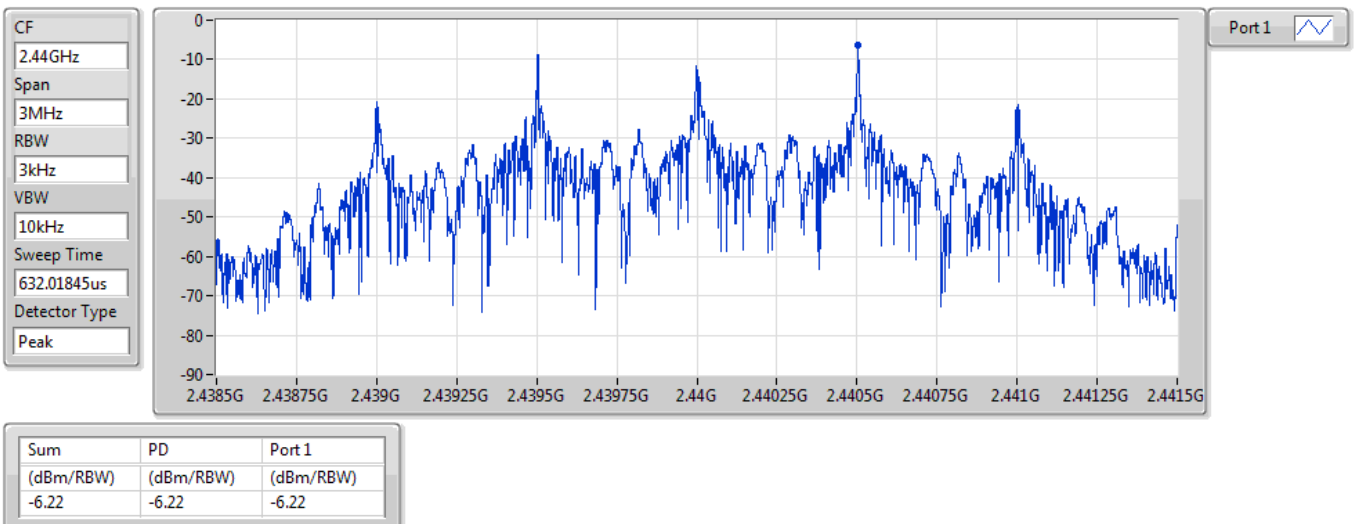


SRD_Nss1_1TX

PSD

2440MHz

10/09/2020

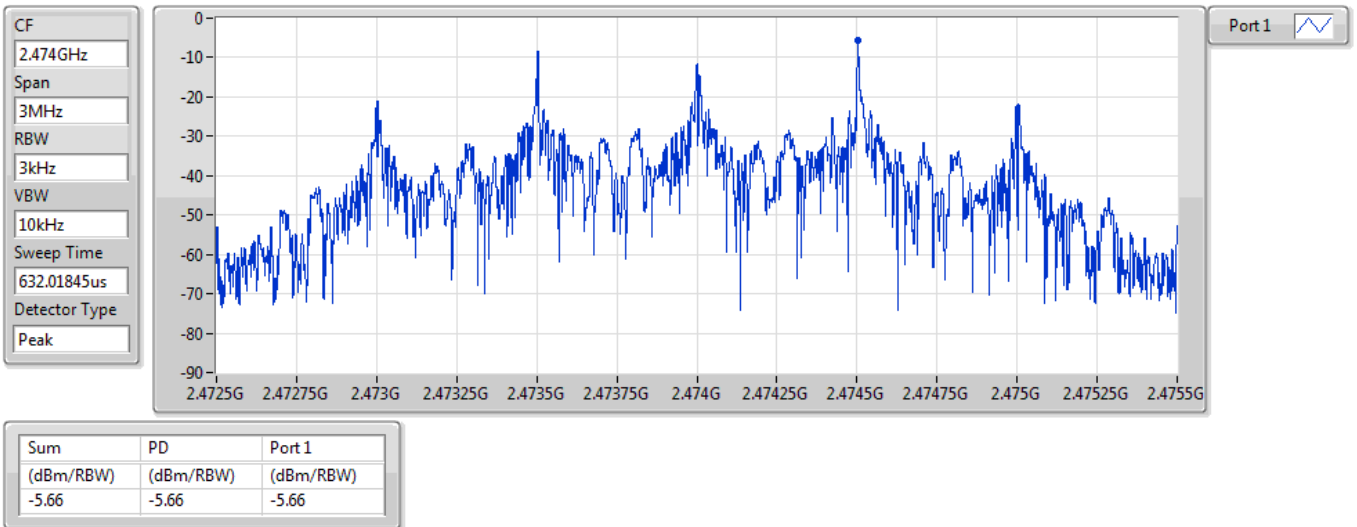


SRD_Nss1_1TX

PSD

2474MHz

10/09/2020





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	2.47452G	-0.17	-30.17	1.9231G	-55.67	2.39626G	-36.53	2.4G	-57.39	2.48554G	-54.60	7.22357G	-41.68	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2408MHz	Pass	2.47452G	-0.17	-30.17	1.9231G	-55.67	2.39626G	-36.53	2.4G	-57.39	2.48554G	-54.60	7.22357G	-41.68	1
2440MHz	Pass	2.47452G	-0.17	-30.17	2.10676G	-56.01	2.39661G	-54.97	2.4835G	-56.70	2.48466G	-53.77	16.6563G	-43.30	1
2474MHz	Pass	2.47452G	-0.17	-30.17	2.30875G	-56.28	2.39662G	-54.48	2.4G	-58.79	2.4875G	-39.29	17.51741G	-42.29	1

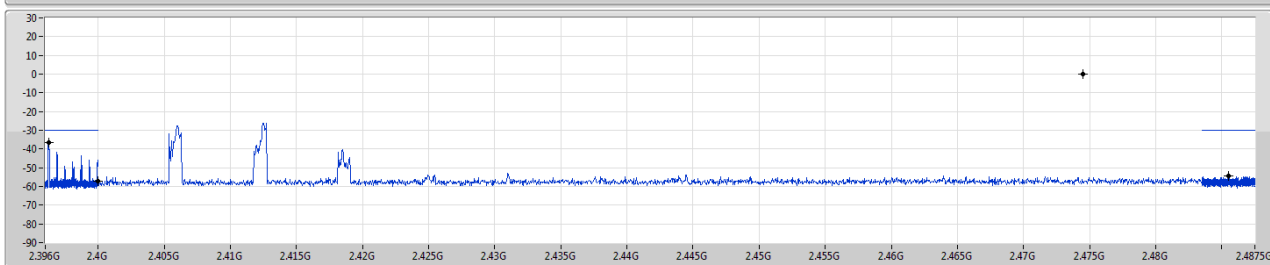
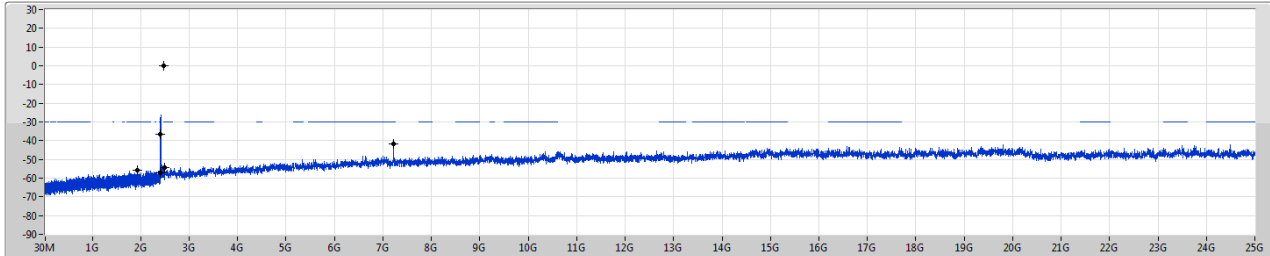
SRD_Nss1_1TX

2408MHz

CSENdB

10/09/2020

Port1



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)	Freq(Hz)	Level(dBm)	Port
2.47452G	-0.17	-30.17	1.9231G	-55.67	2.39626G	-36.53	2.4G	-57.39	2.48554G	-54.60	7.22357G	-41.68	1

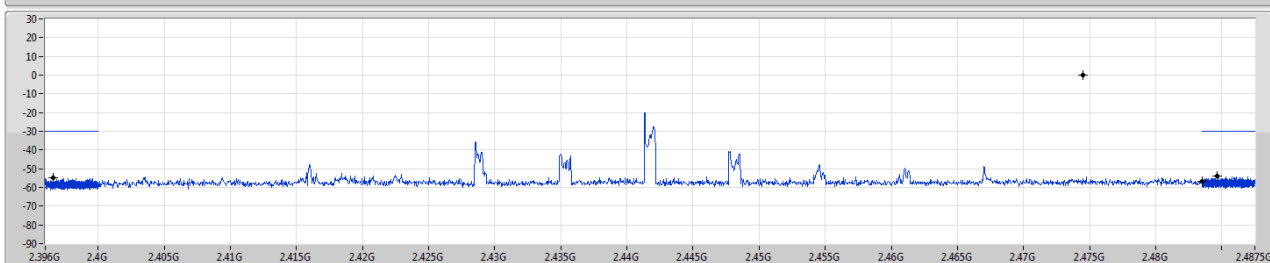
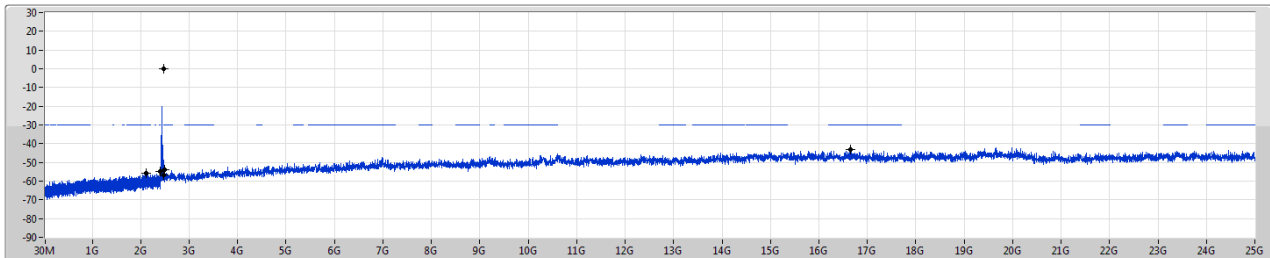
SRD_Nss1_1TX

2440MHz

CSENdB

10/09/2020

Port1



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

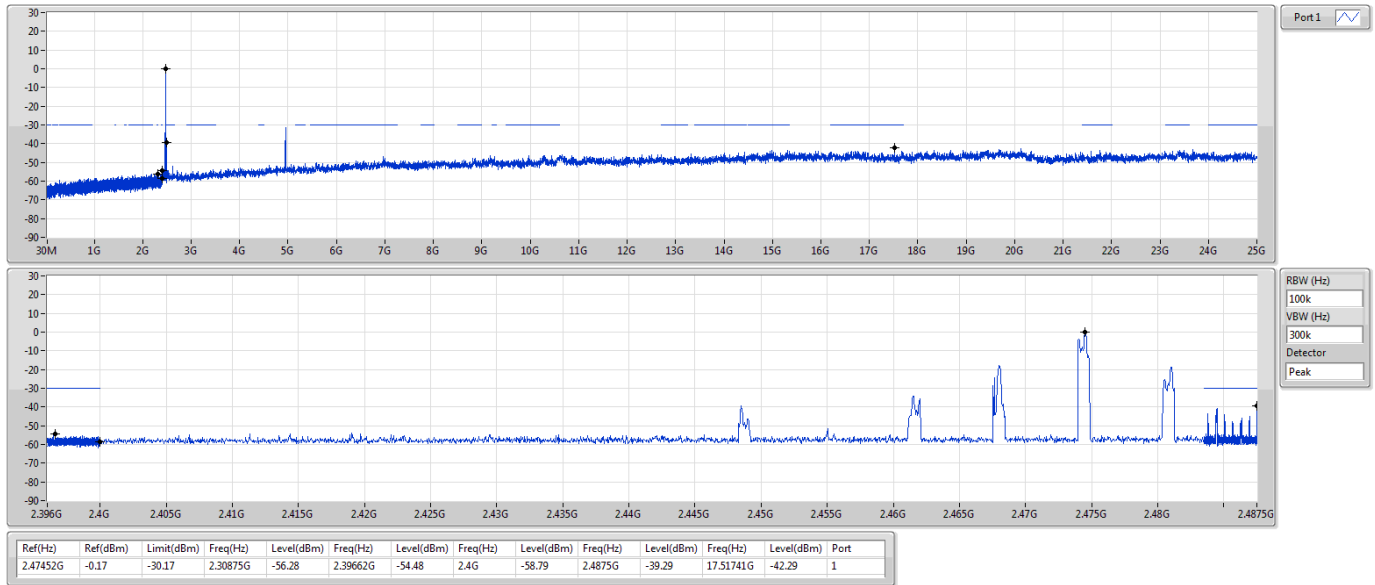
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47452G	-0.17	-30.17	2.10676G	-56.01	2.39661G	-54.97	2.4835G	-56.70	2.48466G	-53.77	16.6563G	-43.30	1

SRD_Nss1_1TX

2474MHz

CSEndB

10/09/2020





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	70.74M	28.21	40.00	-11.79	3	Vertical	0	1.00	-

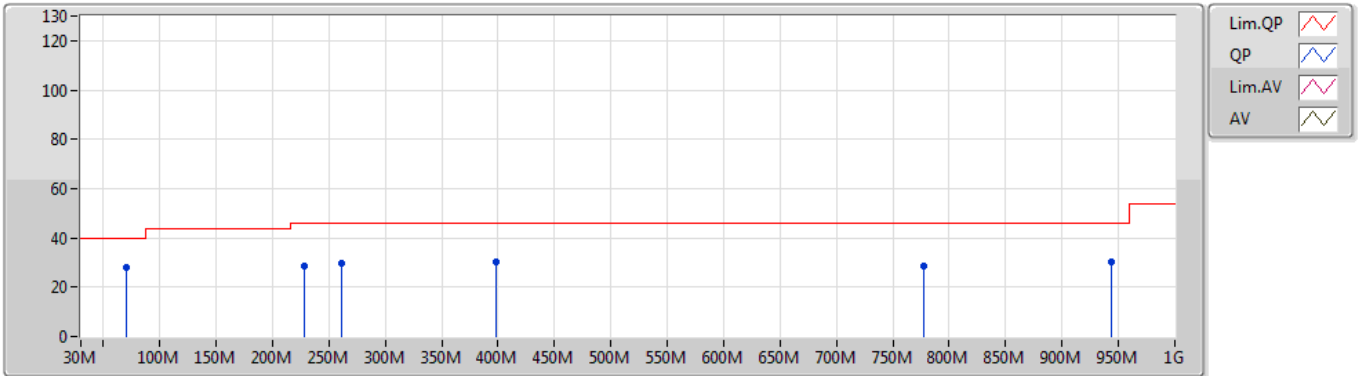
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
SRD_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	70.74M	28.21	40.00	-11.79	3	Vertical	0	1.00	-
2440MHz	Pass	PK	227.88M	28.73	46.00	-17.27	3	Vertical	0	1.00	-
2440MHz	Pass	PK	260.86M	29.91	46.00	-16.09	3	Vertical	0	1.00	-
2440MHz	Pass	PK	398.6M	30.14	46.00	-15.86	3	Vertical	0	1.00	-
2440MHz	Pass	PK	776.9M	28.30	46.00	-17.70	3	Vertical	0	1.00	-
2440MHz	Pass	PK	943.74M	30.33	46.00	-15.67	3	Vertical	0	1.00	-
2440MHz	Pass	PK	61.04M	24.40	40.00	-15.60	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	80.44M	24.01	40.00	-15.99	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	311.3M	27.97	46.00	-18.03	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	396.66M	22.42	46.00	-23.58	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	565.44M	29.37	46.00	-16.63	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	945.68M	30.07	46.00	-15.93	3	Horizontal	360	1.00	-

SRD_Nss1_1TX

05/10/2020

2440MHz_Battery

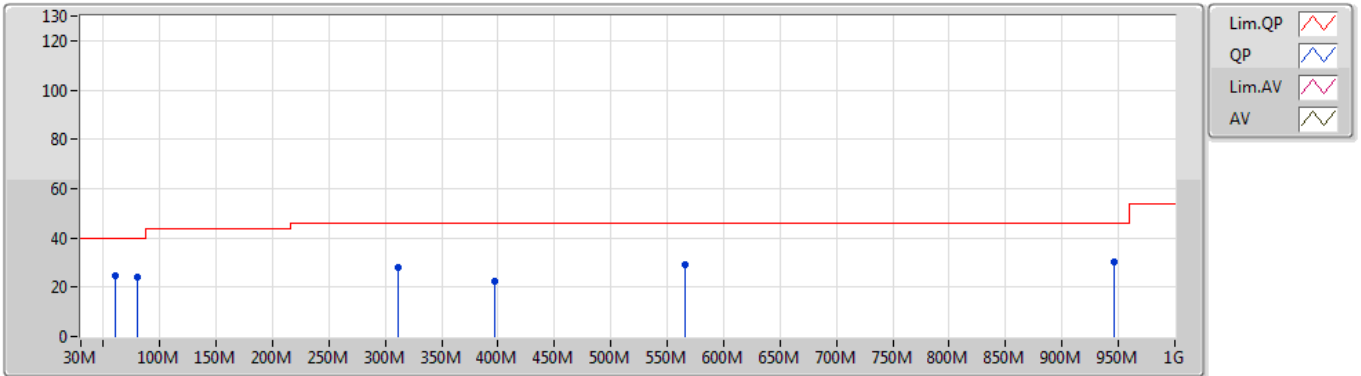


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	70.74M	28.21	40.00	-11.79	-24.81	3	Vertical	0	1.00	-	53.02	11.43	0.61	36.85
PK	227.88M	28.73	46.00	-17.27	-19.92	3	Vertical	0	1.00	-	48.65	15.19	1.21	36.32
PK	260.86M	29.91	46.00	-16.09	-15.93	3	Vertical	0	1.00	-	45.84	19.16	1.32	36.41
PK	398.6M	30.14	46.00	-15.86	-13.68	3	Vertical	0	1.00	-	43.82	21.05	1.69	36.42
PK	776.9M	28.30	46.00	-17.70	-7.46	3	Vertical	0	1.00	-	35.76	27.36	2.55	37.37
PK	943.74M	30.33	46.00	-15.67	-4.69	3	Vertical	0	1.00	-	35.02	29.80	2.89	37.38

SRD_Nss1_1TX

05/10/2020

2440MHz_Battery



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	61.04M	24.40	40.00	-15.60	-25.52	3	Horizontal	360	1.00	-	49.92	10.86	0.60	36.98
PK	80.44M	24.01	40.00	-15.99	-23.48	3	Horizontal	360	1.00	-	47.49	12.55	0.70	36.73
PK	311.3M	27.97	46.00	-18.03	-16.48	3	Horizontal	360	1.00	-	44.45	18.48	1.42	36.38
PK	396.66M	22.42	46.00	-23.58	-13.77	3	Horizontal	360	1.00	-	36.19	20.97	1.69	36.43
PK	565.44M	29.37	46.00	-16.63	-9.71	3	Horizontal	360	1.00	-	39.08	25.34	2.06	37.11
PK	945.68M	30.07	46.00	-15.93	-4.57	3	Horizontal	360	1.00	-	34.64	29.91	2.89	37.37



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	2.3826G	45.08	54.00	-8.92	3	Vertical	199	3.00	-

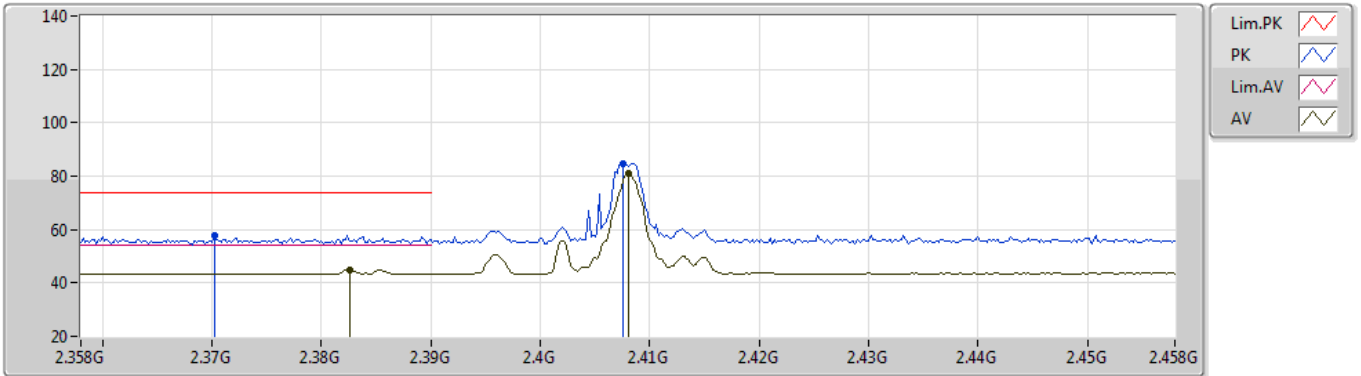
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
SRD_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-
2408MHz	Pass	AV	2.3826G	45.08	54.00	-8.92	3	Vertical	199	3.00	-
2408MHz	Pass	AV	2.408G	81.28	Inf	-Inf	3	Vertical	199	3.00	-
2408MHz	Pass	PK	2.3702G	57.85	74.00	-16.15	3	Vertical	199	3.00	-
2408MHz	Pass	PK	2.4076G	84.90	Inf	-Inf	3	Vertical	199	3.00	-
2408MHz	Pass	AV	2.3826G	43.82	54.00	-10.18	3	Horizontal	37	1.25	-
2408MHz	Pass	AV	2.408G	77.69	Inf	-Inf	3	Horizontal	37	1.25	-
2408MHz	Pass	PK	2.3586G	57.09	74.00	-16.91	3	Horizontal	37	1.25	-
2408MHz	Pass	PK	2.4074G	81.40	Inf	-Inf	3	Horizontal	37	1.25	-
2408MHz	Pass	AV	4.81694G	37.34	54.00	-16.66	3	Vertical	178	1.00	-
2408MHz	Pass	PK	4.81489G	48.26	74.00	-25.74	3	Vertical	178	1.00	-
2408MHz	Pass	AV	4.81696G	39.85	54.00	-14.15	3	Horizontal	26	1.00	-
2408MHz	Pass	PK	4.81498G	50.33	74.00	-23.67	3	Horizontal	26	1.00	-
2440MHz	Pass	AV	2.3592G	43.53	54.00	-10.47	3	Vertical	199	2.95	-
2440MHz	Pass	AV	2.44G	80.74	Inf	-Inf	3	Vertical	199	2.95	-
2440MHz	Pass	AV	2.4976G	44.05	54.00	-9.95	3	Vertical	199	2.95	-
2440MHz	Pass	PK	2.3784G	56.65	74.00	-17.35	3	Vertical	199	2.95	-
2440MHz	Pass	PK	2.4396G	84.41	Inf	-Inf	3	Vertical	199	2.95	-
2440MHz	Pass	PK	2.4912G	57.12	74.00	-16.88	3	Vertical	199	2.95	-
2440MHz	Pass	AV	2.3496G	43.54	54.00	-10.46	3	Horizontal	153	2.95	-
2440MHz	Pass	AV	2.44G	82.63	Inf	-Inf	3	Horizontal	153	2.95	-
2440MHz	Pass	AV	2.5G	43.89	54.00	-10.11	3	Horizontal	153	2.95	-
2440MHz	Pass	PK	2.3572G	56.95	74.00	-17.05	3	Horizontal	153	2.95	-
2440MHz	Pass	PK	2.4396G	86.28	Inf	-Inf	3	Horizontal	153	2.95	-
2440MHz	Pass	PK	2.4916G	58.54	74.00	-15.46	3	Horizontal	153	2.95	-
2440MHz	Pass	AV	4.88095G	40.07	54.00	-13.93	3	Vertical	39	2.79	-
2440MHz	Pass	PK	4.88097G	49.32	74.00	-24.68	3	Vertical	39	2.79	-
2440MHz	Pass	AV	4.88095G	40.63	54.00	-13.37	3	Horizontal	28	1.00	-
2440MHz	Pass	PK	4.87903G	50.10	74.00	-23.90	3	Horizontal	28	1.00	-
2474MHz	Pass	AV	2.474G	78.61	Inf	-Inf	3	Vertical	199	2.60	-
2474MHz	Pass	AV	2.4942G	43.97	54.00	-10.03	3	Vertical	199	2.60	-
2474MHz	Pass	PK	2.4734G	82.26	Inf	-Inf	3	Vertical	199	2.60	-
2474MHz	Pass	PK	2.4886G	57.48	74.00	-16.52	3	Vertical	199	2.60	-
2474MHz	Pass	AV	2.474G	81.84	Inf	-Inf	3	Horizontal	159	1.25	-
2474MHz	Pass	AV	2.4862G	44.25	54.00	-9.75	3	Horizontal	159	1.25	-
2474MHz	Pass	PK	2.4736G	85.52	Inf	-Inf	3	Horizontal	159	1.25	-
2474MHz	Pass	PK	2.4962G	57.50	74.00	-16.50	3	Horizontal	159	1.25	-
2474MHz	Pass	AV	4.94898G	42.36	54.00	-11.64	3	Vertical	42	2.61	-
2474MHz	Pass	PK	4.94893G	51.31	74.00	-22.69	3	Vertical	42	2.61	-
2474MHz	Pass	AV	4.94894G	42.74	54.00	-11.26	3	Horizontal	59	1.00	-
2474MHz	Pass	PK	4.94901G	52.26	74.00	-21.74	3	Horizontal	59	1.00	-

SRD_Nss1_1TX

05/10/2020

2408MHz_TX

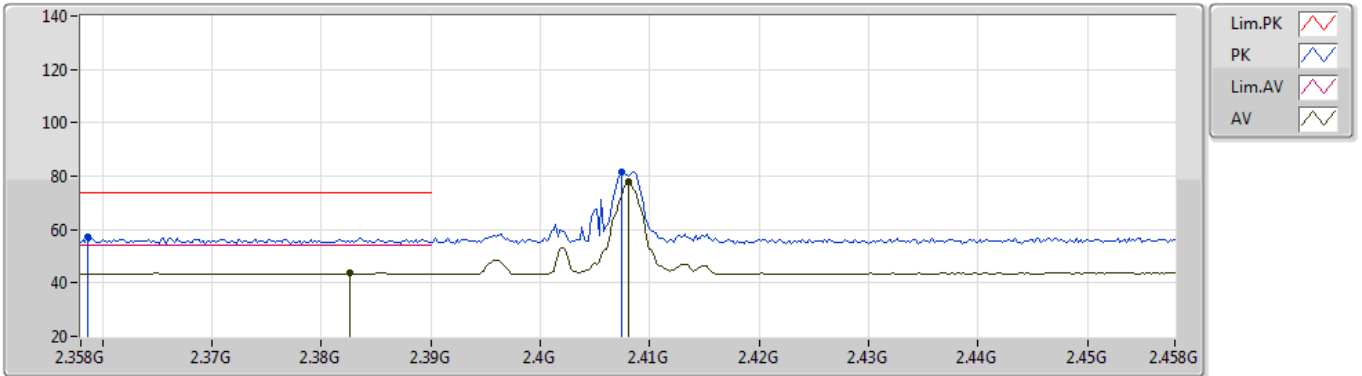


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3826G	45.08	54.00	-8.92	31.54	3	Vertical	199	3.00	-	13.54	27.67	3.87	-
AV	2.408G	81.28	Inf	-Inf	31.51	3	Vertical	199	3.00	-	49.77	27.60	3.91	-
PK	2.3702G	57.85	74.00	-16.15	31.58	3	Vertical	199	3.00	-	26.27	27.72	3.86	-
PK	2.4076G	84.90	Inf	-Inf	31.51	3	Vertical	199	3.00	-	53.39	27.60	3.91	-

SRD_Nss1_1TX

05/10/2020

2408MHz_TX

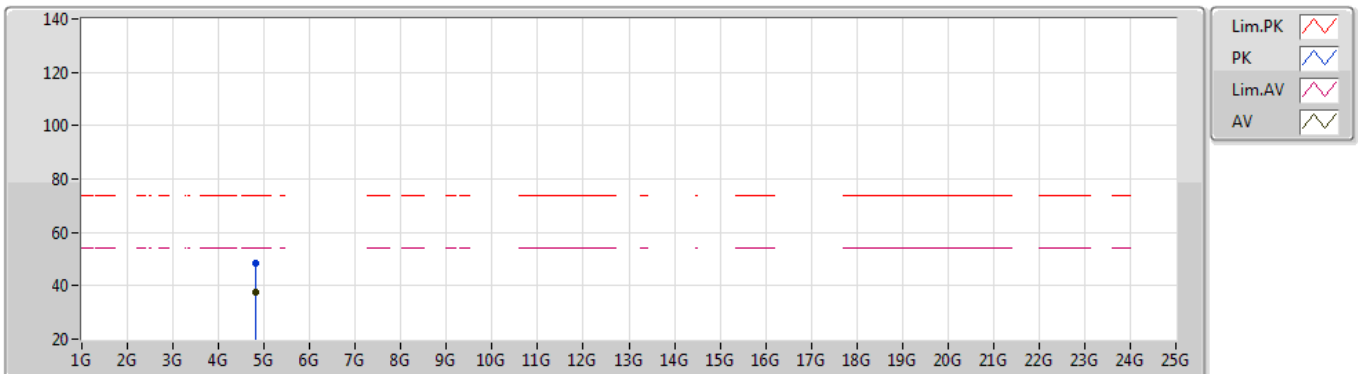


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3826G	43.82	54.00	-10.18	31.54	3	Horizontal	37	1.25	-	12.28	27.67	3.87	-
AV	2.408G	77.69	Inf	-Inf	31.51	3	Horizontal	37	1.25	-	46.18	27.60	3.91	-
PK	2.3586G	57.09	74.00	-16.91	31.61	3	Horizontal	37	1.25	-	25.48	27.77	3.84	-
PK	2.4074G	81.40	Inf	-Inf	31.51	3	Horizontal	37	1.25	-	49.89	27.60	3.91	-

SRD_Nss1_1TX

05/10/2020

2408MHz_TX

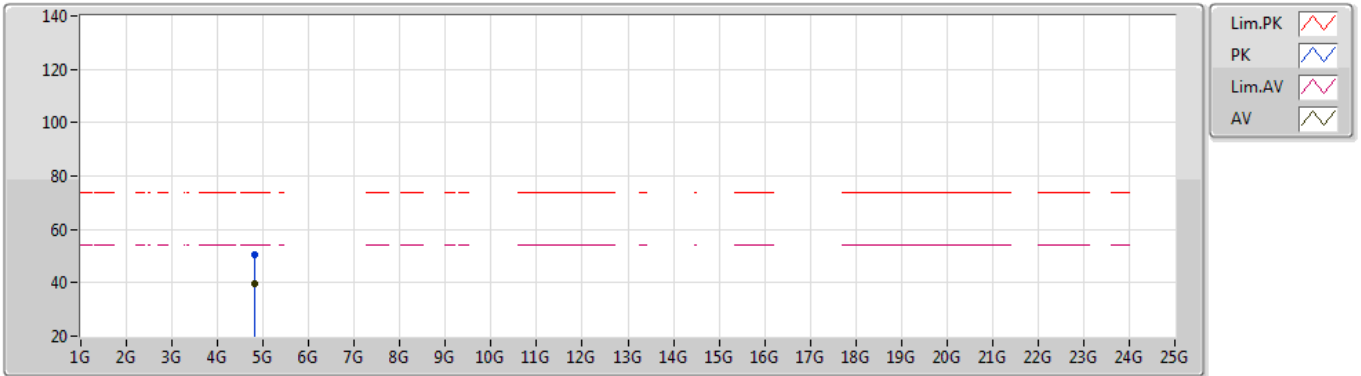


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.81694G	37.34	54.00	-16.66	1.55	3	Vertical	178	1.00	-	35.79	31.17	5.31	34.93
PK	4.81489G	48.26	74.00	-25.74	1.54	3	Vertical	178	1.00	-	46.72	31.16	5.31	34.93

SRD_Nss1_1TX

05/10/2020

2408MHz_TX

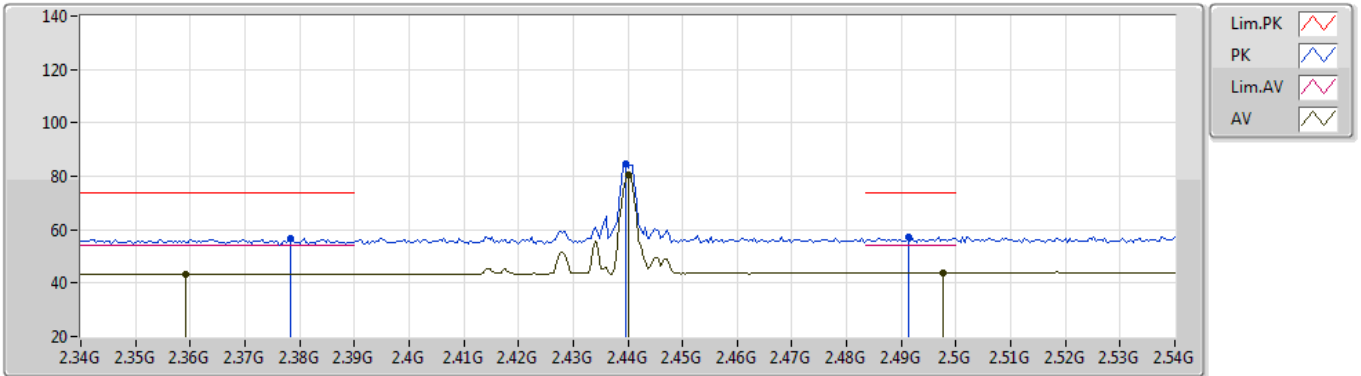


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.81696G	39.85	54.00	-14.15	1.55	3	Horizontal	26	1.00	-	38.30	31.17	5.31	34.93
PK	4.81498G	50.33	74.00	-23.67	1.54	3	Horizontal	26	1.00	-	48.79	31.16	5.31	34.93

SRD_Nss1_1TX

05/10/2020

2440MHz_TX

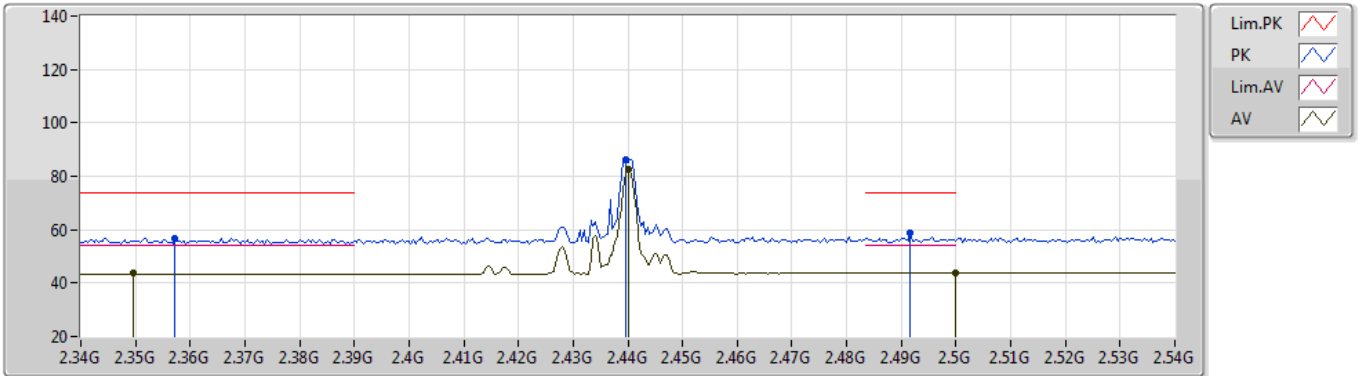


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3592G	43.53	54.00	-10.47	31.60	3	Vertical	199	2.95	-	11.93	27.76	3.84	-
AV	2.44G	80.74	Inf	-Inf	31.56	3	Vertical	199	2.95	-	49.18	27.60	3.96	-
AV	2.4976G	44.05	54.00	-9.95	31.65	3	Vertical	199	2.95	-	12.40	27.60	4.05	-
PK	2.3784G	56.65	74.00	-17.35	31.56	3	Vertical	199	2.95	-	25.09	27.69	3.87	-
PK	2.4396G	84.41	Inf	-Inf	31.56	3	Vertical	199	2.95	-	52.85	27.60	3.96	-
PK	2.4912G	57.12	74.00	-16.88	31.64	3	Vertical	199	2.95	-	25.48	27.60	4.04	-

SRD_Nss1_1TX

05/10/2020

2440MHz_TX

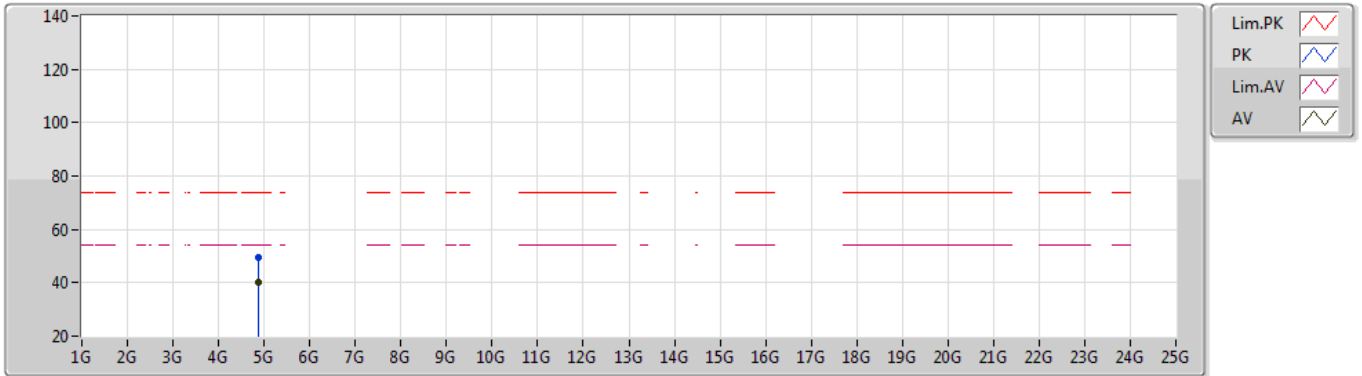


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3496G	43.54	54.00	-10.46	31.62	3	Horizontal	153	2.95	-	11.92	27.80	3.82	-
AV	2.44G	82.63	Inf	-Inf	31.56	3	Horizontal	153	2.95	-	51.07	27.60	3.96	-
AV	2.5G	43.89	54.00	-10.11	31.65	3	Horizontal	153	2.95	-	12.24	27.60	4.05	-
PK	2.3572G	56.95	74.00	-17.05	31.61	3	Horizontal	153	2.95	-	25.34	27.77	3.84	-
PK	2.4396G	86.28	Inf	-Inf	31.56	3	Horizontal	153	2.95	-	54.72	27.60	3.96	-
PK	2.4916G	58.54	74.00	-15.46	31.64	3	Horizontal	153	2.95	-	26.90	27.60	4.04	-

SRD_Nss1_1TX

05/10/2020

2440MHz_TX

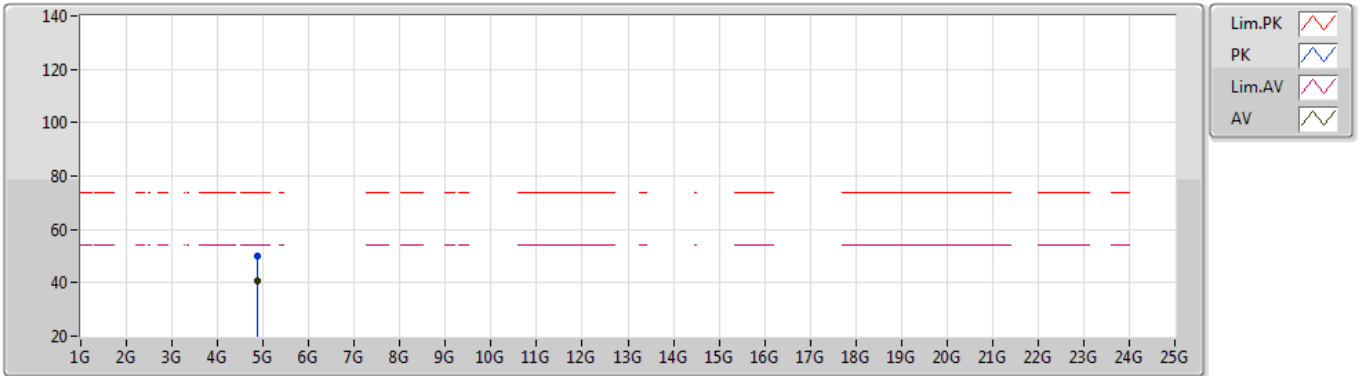


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88095G	40.07	54.00	-13.93	1.65	3	Vertical	39	2.79	-	38.42	31.24	5.34	34.93
PK	4.88097G	49.32	74.00	-24.68	1.65	3	Vertical	39	2.79	-	47.67	31.24	5.34	34.93

SRD_Nss1_1TX

05/10/2020

2440MHz_TX

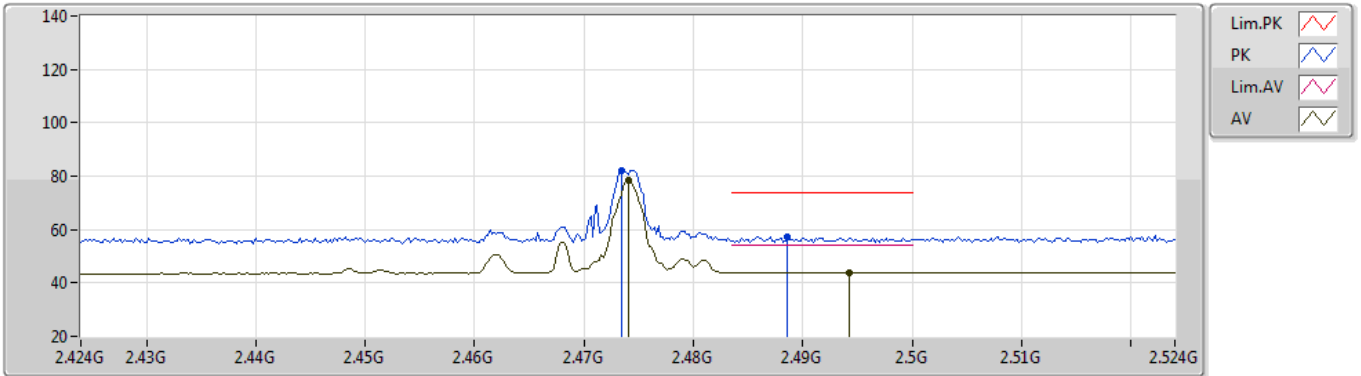


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88095G	40.63	54.00	-13.37	1.65	3	Horizontal	28	1.00	-	38.98	31.24	5.34	34.93
PK	4.87903G	50.10	74.00	-23.90	1.65	3	Horizontal	28	1.00	-	48.45	31.24	5.34	34.93

SRD_Nss1_1TX

05/10/2020

2474MHz_TX

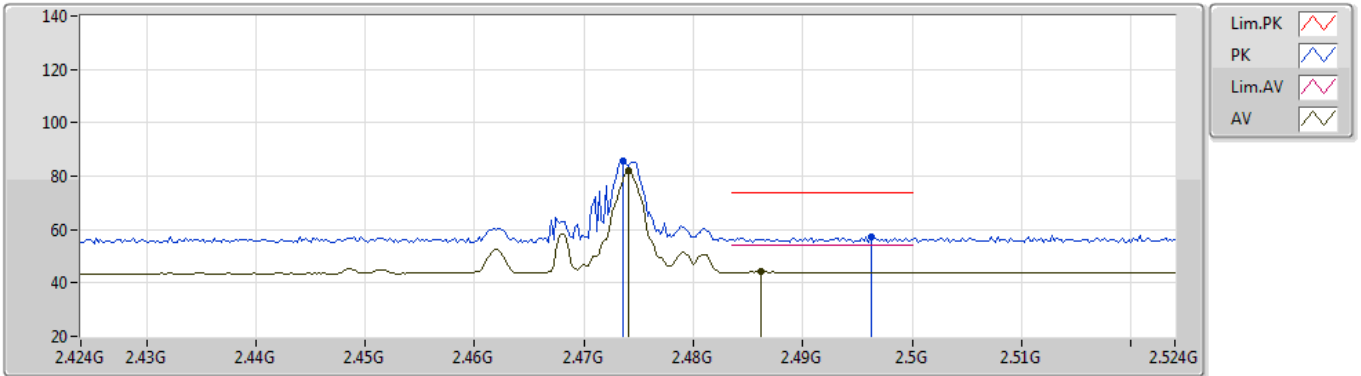


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.474G	78.61	Inf	-Inf	31.61	3	Vertical	199	2.60	-	47.00	27.60	4.01	-
AV	2.4942G	43.97	54.00	-10.03	31.64	3	Vertical	199	2.60	-	12.33	27.60	4.04	-
PK	2.4734G	82.26	Inf	-Inf	31.61	3	Vertical	199	2.60	-	50.65	27.60	4.01	-
PK	2.4886G	57.48	74.00	-16.52	31.63	3	Vertical	199	2.60	-	25.85	27.60	4.03	-

SRD_Nss1_1TX

05/10/2020

2474MHz_TX

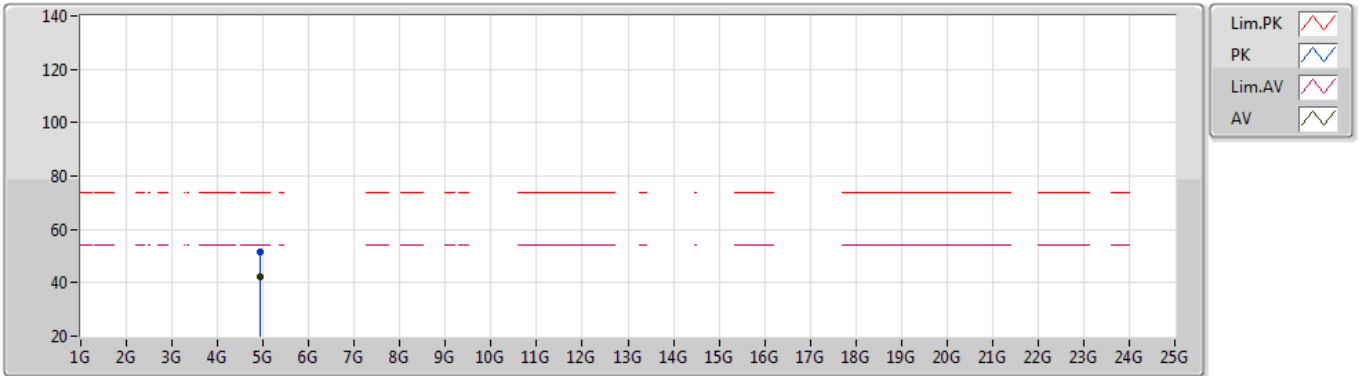


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.474G	81.84	Inf	-Inf	31.61	3	Horizontal	159	1.25	-	50.23	27.60	4.01	-
AV	2.4862G	44.25	54.00	-9.75	31.63	3	Horizontal	159	1.25	-	12.62	27.60	4.03	-
PK	2.4736G	85.52	Inf	-Inf	31.61	3	Horizontal	159	1.25	-	53.91	27.60	4.01	-
PK	2.4962G	57.50	74.00	-16.50	31.64	3	Horizontal	159	1.25	-	25.86	27.60	4.04	-

SRD_Nss1_1TX

05/10/2020

2474MHz_TX

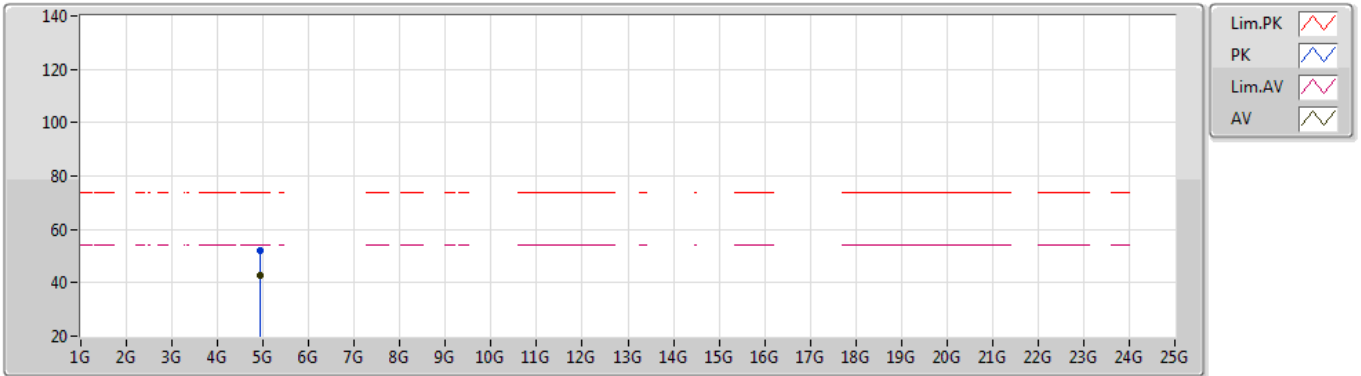


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.94898G	42.36	54.00	-11.64	1.83	3	Vertical	42	2.61	-	40.53	31.40	5.37	34.94
PK	4.94893G	51.31	74.00	-22.69	1.83	3	Vertical	42	2.61	-	49.48	31.40	5.37	34.94

SRD_Nss1_1TX

05/10/2020

2474MHz_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	4.94894G	42.74	54.00	-11.26	1.83	3	Horizontal	59	1.00	-	40.91	31.40	5.37	34.94
PK	4.94901G	52.26	74.00	-21.74	1.83	3	Horizontal	59	1.00	-	50.43	31.40	5.37	34.94