FCC Test Report

FCC ID	:	**2ATD8-MN-01**
Equipment	:	**Mesh Node**
Brand Name	:	**Scandinavian Reach Technologies AS**
Model Name	:	**SRT MN-01**
Applicant	:	**Scandinavian Reach Technologies AS Skjenet 11, 5354 Straume, Norway**
Manufacturer	:	**Topro Industri AS Rambekkvegen 1, 2816 Gjøvik, Norway**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Sep. 10, 2019, and testing was started from Sep. 13, 2019 and completed on Oct. 14, 2019. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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.

Allen Lin

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
FR990210AC	01	Initial issue of report	Dec. 16, 2019

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.3	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: Jackson Tsai

Report Producer: Jenny Yang

1 General Description

1.1 Information

1.1.1 Abbreviation

EUT: Unit under test

BW: Bandwidth

BWch: Bandwidth per channel

1.1.2 RF General Information

Frequency Range (MHz)	Modulation	Channel Frequency (MHz)	Channel Spacing (MHz)	Channel Number
2400-2483.5	QPSK-DSSS	2405-2475	5	0-14 [15]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	2.4GHz Prop	5	1TX

Note:
- 2.4GHz Prop mode uses a combination of QPSK-DSSS modulation.
- BWch is the nominal channel bandwidth.
- Nant is the number of outputs.

1.1.3 Antenna Information

Antenna	Brand	Model Name	Antenna Type	Connector
1	Texas Instruments	DN007	PCB	N/A
2	Texas Instruments	DN007	PCB	N/A
3	Texas Instruments	DN038	PCB	N/A
4	pulselarsen	W5017	Dipole	I-Pex

Antenna	Port	Gain (dBi)		
		2.4G Prop	BT	Sub-1GHz
1	1	-	3.3	-
2	1	3.3	-	-
3	1	-	-	0.01
4	2	-	-	0.9

Note 1: The EUT has four antennas.

For 2.4GHz Prop function:

For 2.4GHz Prop mode (1TX/1RX)

Ant. 2 (port 1) can be used as transmitting/receiving antenna.

For BT function:

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

Ant. 1 (port 1) can be used as transmitting/receiving antenna.

For Sub-1GHz function:

For Sub-1GHz mode (1TX/1RX)

Ant. 3 (port 1) or Ant. 4 (port 2) can be used as transmitting/receiving antenna.

1.1.4 EUT Information

Operational Condition					
EUT Power Type	From AC Adapter / Form Battery / Form Host system				
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:				

1.1.5 Mode Test Duty Cycle

Mode	Duty Cycle	Duty Cycle Factor (dB)	T(s)	VBW(Hz) ≥ 1/T
2.4GHz Prop	1	0	n/a (Duty Cycle >=0.98)	n/a (Duty Cycle >=0.98)

Note. If Duty Cycle < 0.98, the Duty Cycle Factor 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
- 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.			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Edward Wang	22.3~23.8°C / 64.3~66.2%	13/Sep/2019
RF Conducted	TH06-HY	Gary Wang	23.1~26°C / 61~67%	19/Sep/2019~ 01/Oct/2019
Radiated	03CH02-HY	Edward Wang	22.3~23.7°C / 65.3~69.2%	13/Sep/2019~ 14/Oct/2019

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.54 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	1.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 ℃	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	3.6V

2.2 Test Channel Mode

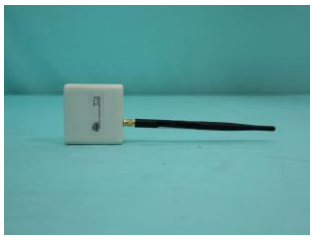
Test Software	Command

Mode	Power Setting
2.4GHz Prop	-
2405MHz	default
2440MHz	default
2475MHz	default

2.3 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
Operating Mode	CTX
1	Adapter mode

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

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

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	Sub-1GHz + 2.4G Prop + Bluetooth
Refer to Sporton Test Report No.: FA990210 for Co-location RF Exposure Evaluation.	

2.4 Accessories and Support Equipment

Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	AC adapter	ARTESYN	DA10-050EU	-

Note: Support equipment No.1 was provided by customer.

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Laptop	HP	EliteBook 820	-
2	Adapter for Laptop	HP	HSTNN-DA40	-

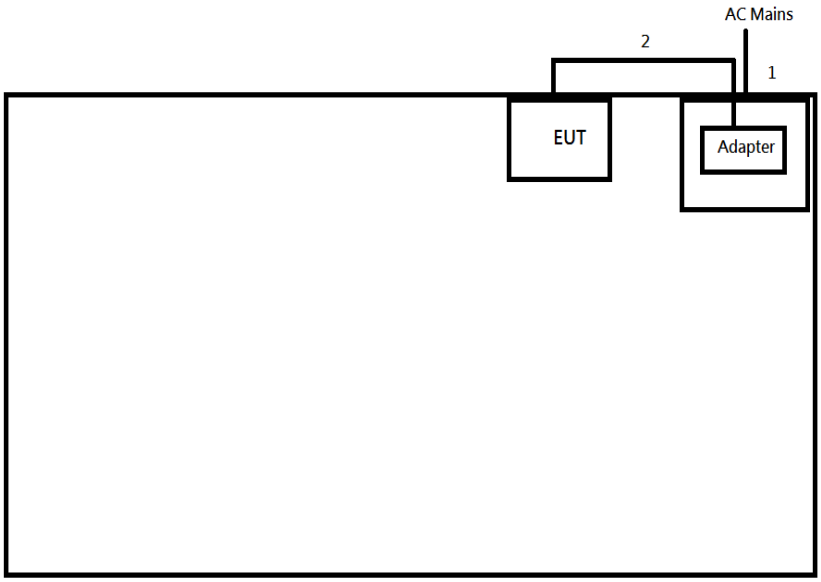
Note: Support equipment No.1 & 2 were provided by customer.

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	AC adapter	ARTESYN	DA10-050EU	-

Note: Support equipment No.1 was provided by customer.

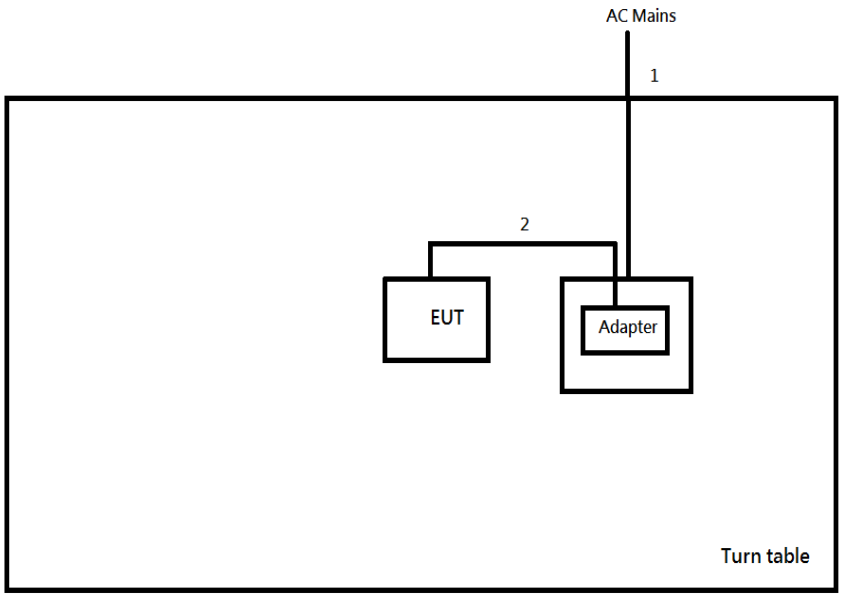
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	USB Cable	No	1.0	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	USB Cable	No	1.0	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

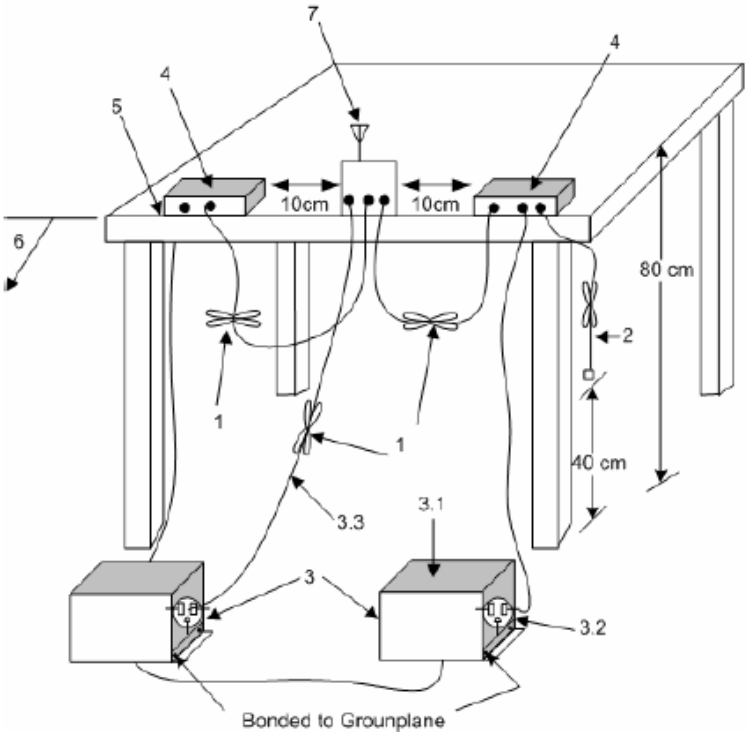
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 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

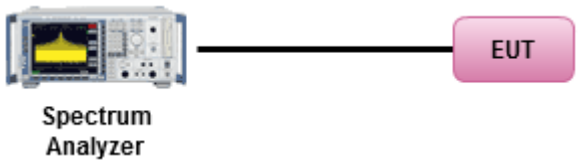
Refer a test equipment and calibration data table in this test report.

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 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

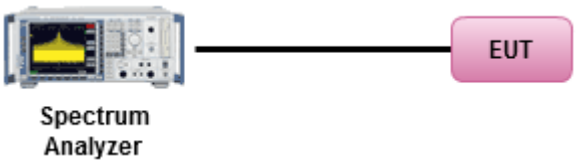
3.4.2 Measuring Instruments

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) Method PKPSD.	
▪ 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.	

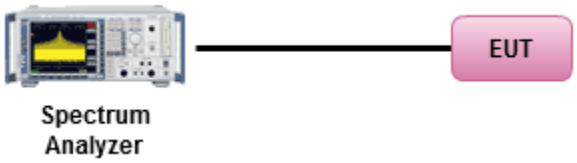
3.5.2 Measuring Instruments

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.

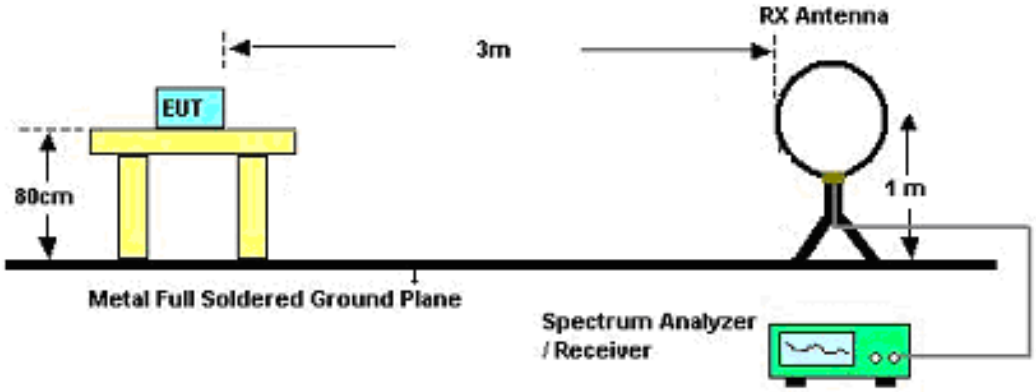
3.6.3 Test Procedures

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.
▪ 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.

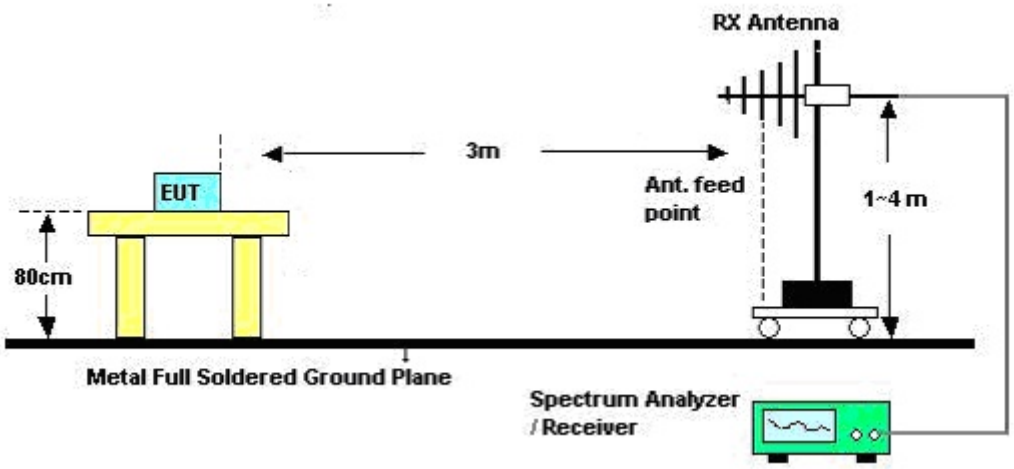
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

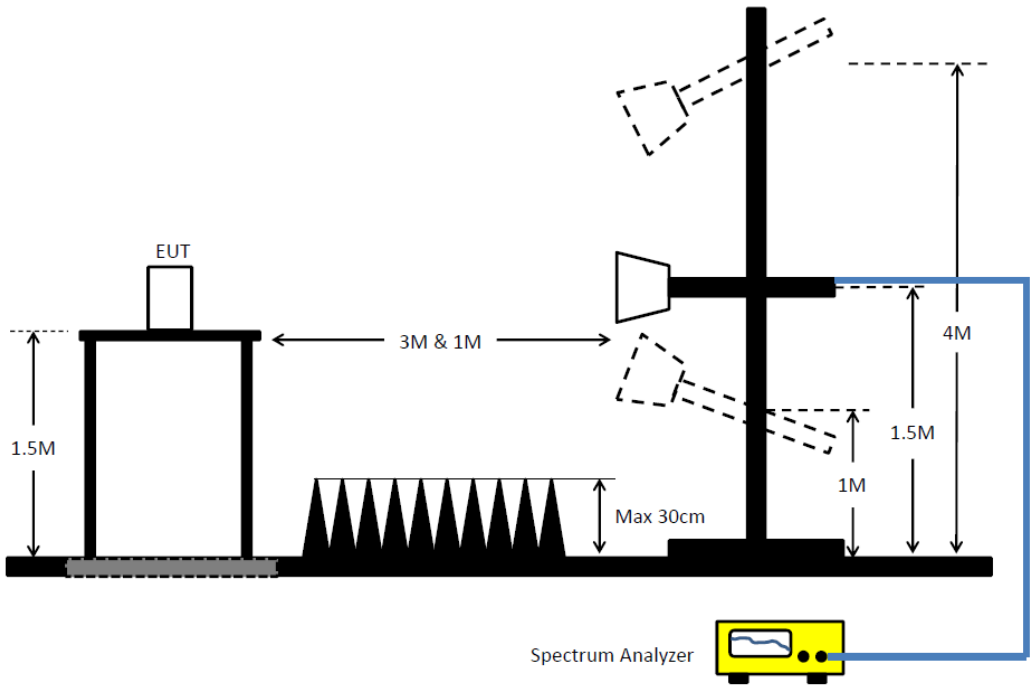
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 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.

3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2019	08/Apr/2020
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	08/Nov/2018	07/Nov/2019
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	17/Sep/2018	16/Sep/2019
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2018	11/Oct/2019

NCR : Non-Calibration Require

Instrument for Conducted Test

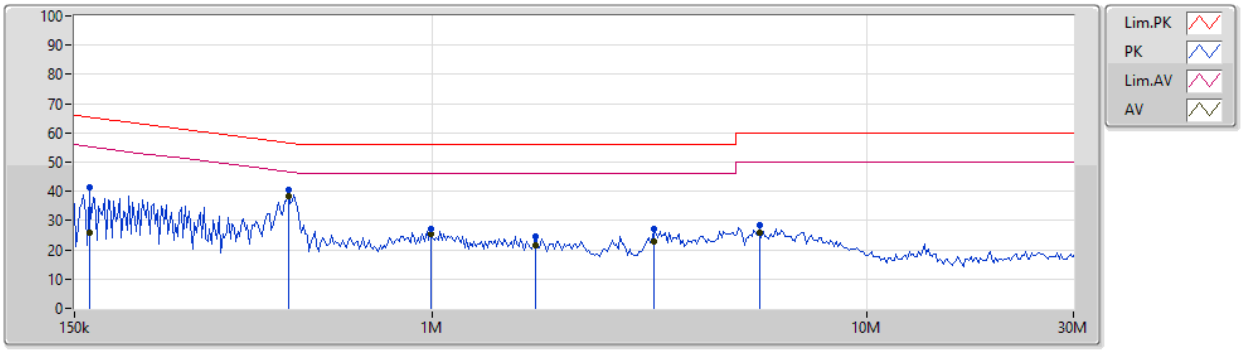
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz ~18G	10/Jan/2019	09/Jan/2020
Cable 0.2m	HUBER	MY10711/4	RF Cable - 02	30MHz ~18G	10/Jan/2019	09/Jan/2020
Cable 0.5m	HUBER	MY10714/4	RF Cable – 05	30MHz~1G	10/Jan/2019	09/Jan/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	19/Oct/2018	18/Oct/2019
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz ~ 18GHz 3m	17/Oct/2018	16/Oct/2019
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	02Jul/2019	01/Jul/2020
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz ~ 26.5GHz	23/Oct/2018	22/Oct/2019
Spectrum Analyzer	Rohde & Schwarz	FSP40	100593	9KHz - 40GHz	27/Dec/2018	26/Dec/2019
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2019	08/Apr/2020
RF Cable-R03m	Jye Bao	RG142	CB017	9kHz ~ 1GHz	26/Mar/2019	25/Mar/2020
RF Cable-high 6m	SUHNER	SUCOFLEX104	10567868 / SN805193/4	1GHz~40GHz	09/Apr/2019	08/Apr/2020
RF Cable-high 7m	SUHNER	SUCOFLEX104	10567868 / SN805192/4	1GHz~40GHz	09/Apr/2019	08/Apr/2020
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz ~ 1GHz	08/Sep/2019	07/Sep/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz ~ 40GHz	22/Mar2019	21/Mar2020
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	05/Aug/2019	04/Aug/2020
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	15/Mar/2019	14/Mar/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 01543	1GHz ~ 18GHz	03/Jun/2019	02/Jun/2020

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	Adapter mode		

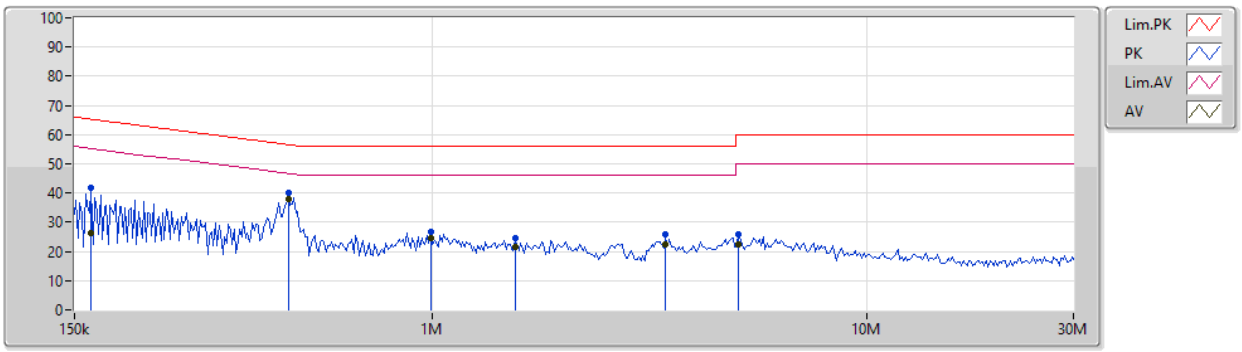
13/09/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	162.429k	41.46	65.33	-23.87	19.48	Neutral	-	21.98	9.60	0.01	9.87
AV	162.429k	25.98	55.33	-29.35	19.48	Neutral	-	6.50	9.60	0.01	9.87
QP	466.367k	40.51	56.57	-16.06	19.48	Neutral	-	21.03	9.59	0.01	9.88
AV	466.367k	38.38	46.57	-8.19	19.48	Neutral	"Worst"	18.90	9.59	0.01	9.88
QP	993.464k	27.23	56.00	-28.77	19.49	Neutral	-	7.74	9.59	0.02	9.88
AV	993.464k	25.27	46.00	-20.73	19.49	Neutral	-	5.78	9.59	0.02	9.88
QP	1.734M	24.36	56.00	-31.64	19.53	Neutral	-	4.83	9.61	0.03	9.89
AV	1.734M	21.37	46.00	-24.63	19.53	Neutral	-	1.84	9.61	0.03	9.89
QP	3.246M	27.27	56.00	-28.73	19.54	Neutral	-	7.73	9.61	0.04	9.89
AV	3.246M	23.01	46.00	-22.99	19.54	Neutral	-	3.47	9.61	0.04	9.89
QP	5.668M	28.55	60.00	-31.45	19.57	Neutral	-	8.98	9.63	0.05	9.89
AV	5.668M	25.69	50.00	-24.31	19.57	Neutral	-	6.12	9.63	0.05	9.89

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	Adapter mode		

13/09/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	164.053k	41.77	65.25	-23.48	19.48	Line	-	22.29	9.60	0.01	9.87
AV	164.053k	26.29	55.25	-28.96	19.48	Line	-	6.81	9.60	0.01	9.87
QP	466.367k	40.01	56.57	-16.56	19.48	Line	-	20.53	9.59	0.01	9.88
AV	466.367k	37.72	46.57	-8.85	19.48	Line	"Worst"	18.24	9.59	0.01	9.88
QP	993.464k	26.66	56.00	-29.34	19.50	Line	-	7.16	9.60	0.02	9.88
AV	993.464k	24.68	46.00	-21.32	19.50	Line	-	5.18	9.60	0.02	9.88
QP	1.555M	24.44	56.00	-31.56	19.53	Line	-	4.91	9.61	0.03	9.89
AV	1.555M	21.44	46.00	-24.56	19.53	Line	-	1.91	9.61	0.03	9.89
QP	3.446M	26.05	56.00	-29.95	19.56	Line	-	6.49	9.63	0.04	9.89
AV	3.446M	22.20	46.00	-23.80	19.56	Line	-	2.64	9.63	0.04	9.89
QP	5.08M	25.67	60.00	-34.33	19.58	Line	-	6.09	9.64	0.05	9.89
AV	5.08M	22.62	50.00	-27.38	19.58	Line	-	3.04	9.64	0.05	9.89

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
2.4GHz Prop	1.588M	2.592M	2M59G1D	1.563M	2.549M

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;

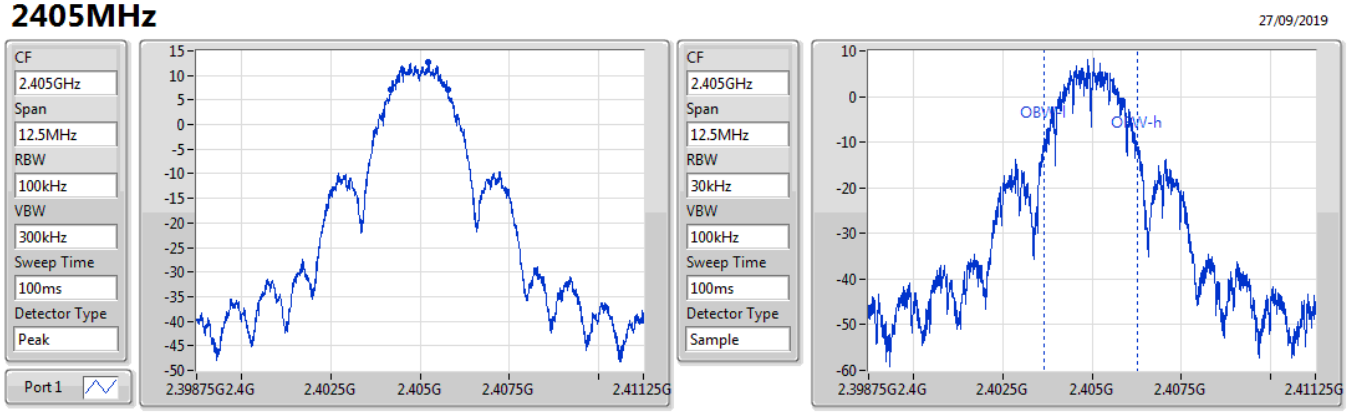
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
2.4GHz Prop	-	-	-	-
2405MHz_TnomVnom	Pass	500k	1.588M	2.592M
2440MHz_TnomVnom	Pass	500k	1.563M	2.567M
2475MHz_TnomVnom	Pass	500k	1.569M	2.549M

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

2.4GHz Prop EBW

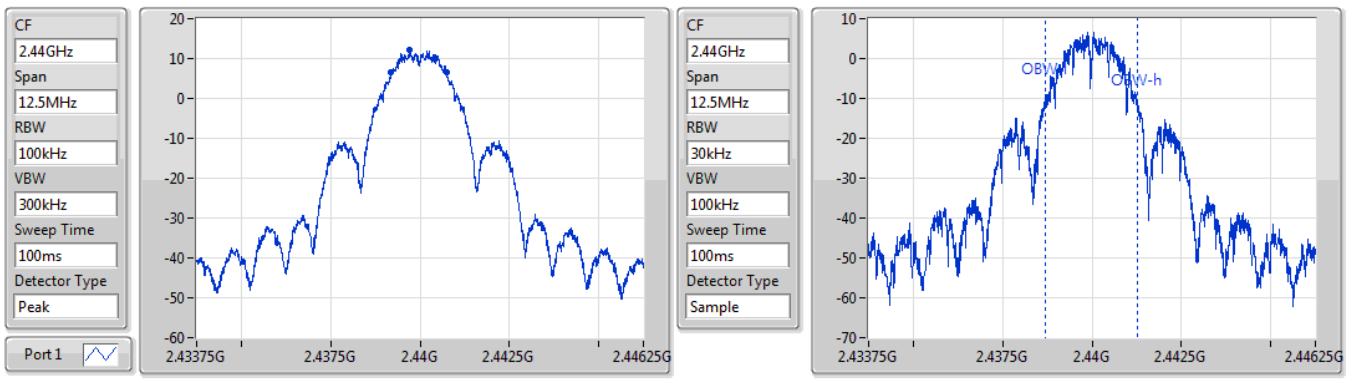
2405MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.588M	2.404181G	2.405769G	2.592M	2.403676G	2.406268G	500k	1

2.4GHz Prop EBW

2440MHz

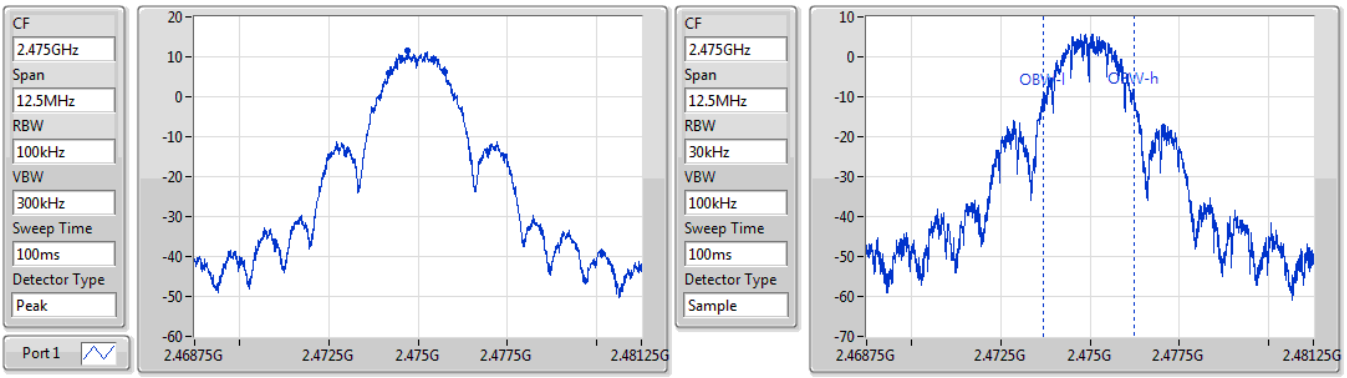


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.563M	2.439188G	2.44075G	2.567M	2.438688G	2.441256G	500k	1

2.4GHz Prop **EBW**

2475MHz

27/09/2019



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.569M	2.474181G	2.47575G	2.549M	2.473694G	2.476243G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
2.4GHz Prop	16.00	0.03981

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
2.4GHz Prop	-	-	-	-	-
2405MHz_TnomVnom	Pass	3.30	16.00	16.00	30.00
2440MHz_TnomVnom	Pass	3.30	15.43	15.43	30.00
2475MHz_TnomVnom	Pass	3.30	15.03	15.03	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
2.4GHz Prop	-0.32

RBW=3 kHz.

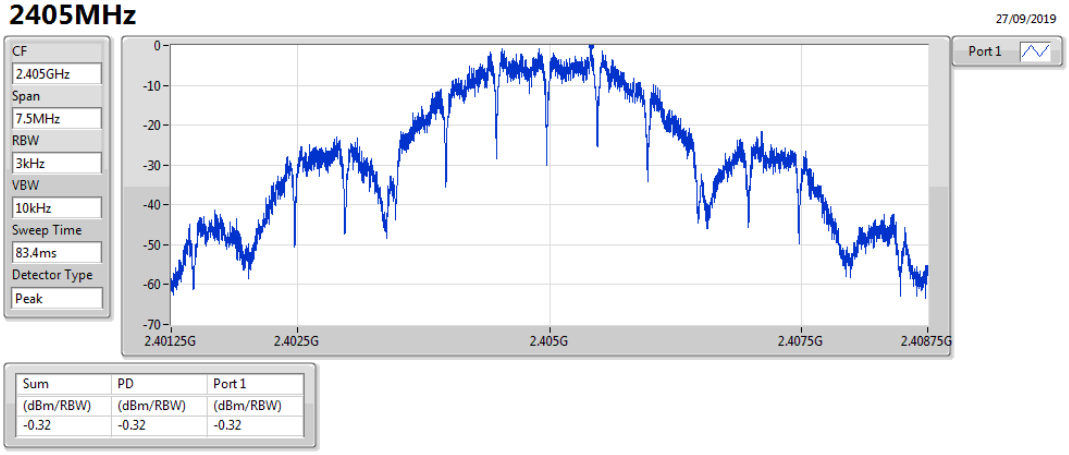
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
2.4GHz Prop	-	-	-	-	-
2405MHz_TnomVnom	Pass	3.30	-0.32	-0.32	8.00
2440MHz_TnomVnom	Pass	3.30	-0.61	-0.61	8.00
2475MHz_TnomVnom	Pass	3.30	-0.73	-0.73	8.00

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

2.4GHz Prop **PSD**

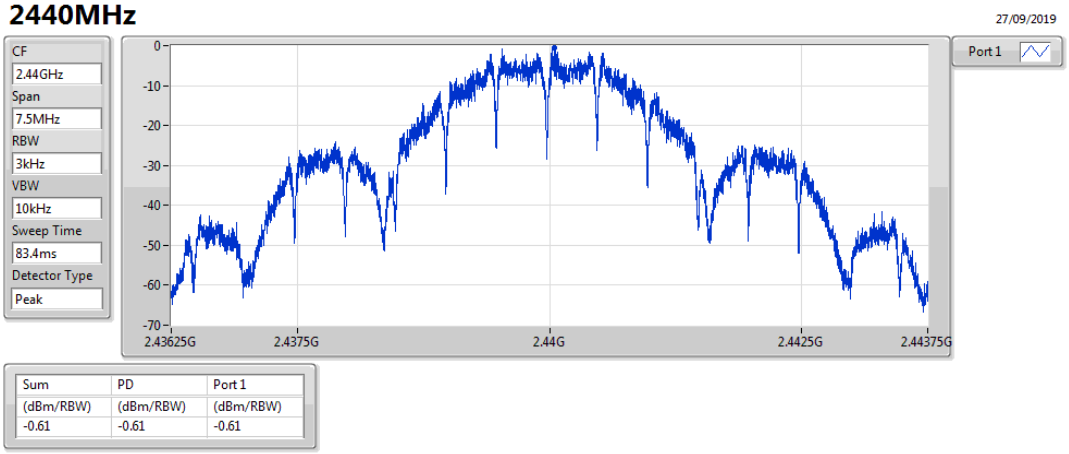
2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-0.32	-0.32	-0.32

2.4GHz Prop **PSD**

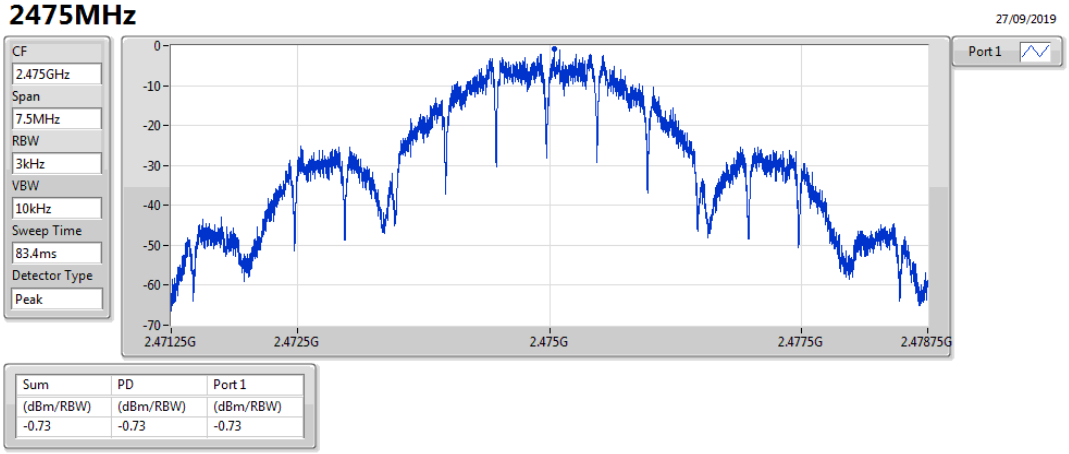
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-0.61	-0.61	-0.61

2.4GHz Prop **PSD**

2475MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-0.73	-0.73	-0.73

Summary

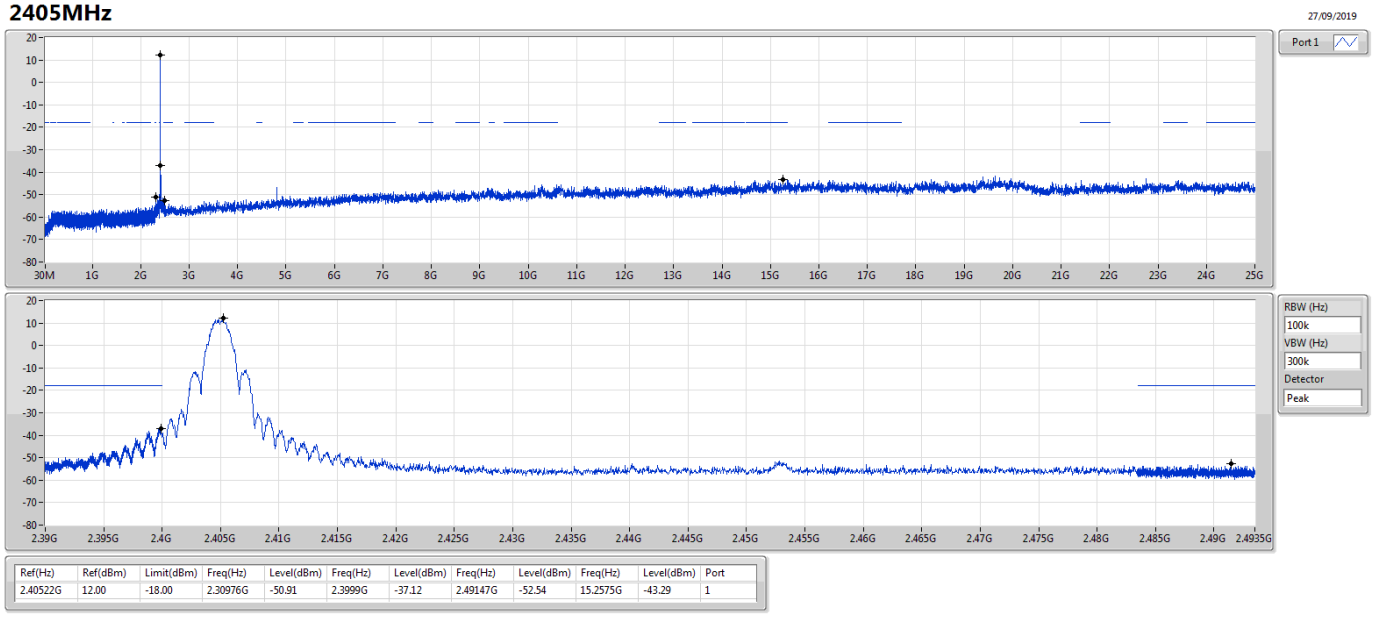
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4GHz Prop	Pass	2.40522G	12.00	-18.00	2.30976G	-50.91	2.3999G	-37.12	2.49147G	-52.54	15.2575G	-43.29	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4GHz Prop	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz_TnomVnom	Pass	2.40522G	12.00	-18.00	2.30976G	-50.91	2.3999G	-37.12	2.49147G	-52.54	15.2575G	-43.29	1
2440MHz_TnomVnom	Pass	2.40522G	12.00	-18.00	1.95429G	-55.83	2.3919G	-49.87	2.48818G	-50.01	23.35703G	-42.88	1
2475MHz_TnomVnom	Pass	2.40522G	12.00	-18.00	514.39M	-55.73	2.39799G	-52.68	2.48408G	-46.48	16.72886G	-42.72	1

2.4GHz Prop **CSE NdB**

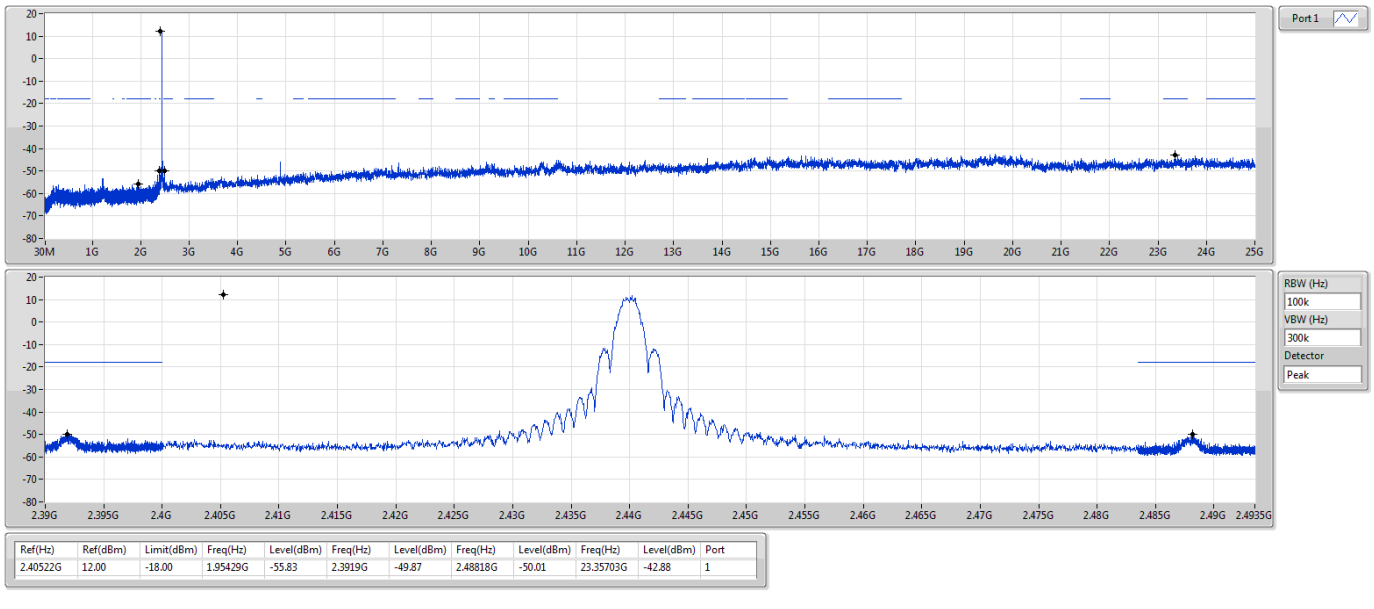
2405MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40522G	12.00	-18.00	2.30976G	-50.91	2.3999G	-37.12	2.49147G	-52.54	15.2575G	-43.29	1

2.4GHz Prop **CSE NdB**

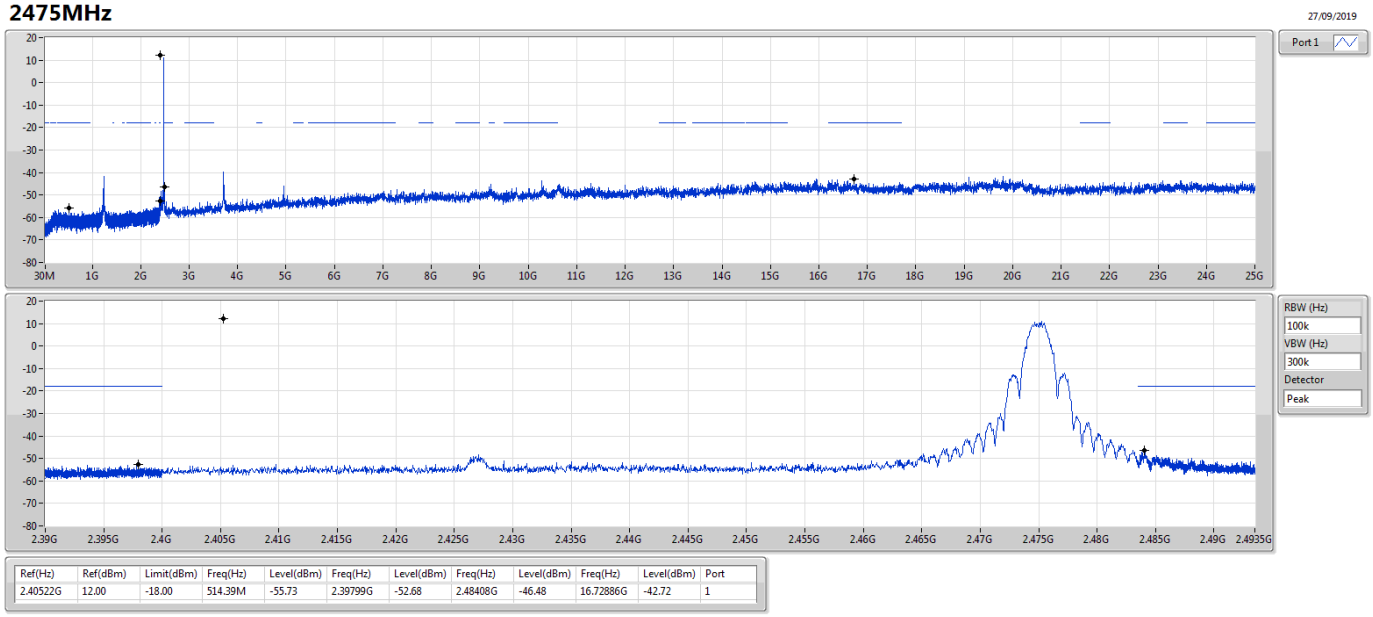
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40522G	12.00	-18.00	1.95429G	-55.83	2.3919G	-49.87	2.48818G	-50.01	23.35703G	-42.88	1

2.4GHz Prop **CSE NdB**

2475MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40522G	12.00	-18.00	514.39M	-55.73	2.39799G	-52.68	2.48408G	-46.48	16.72886G	-42.72	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	-	-	-	-	-	-	-	-	-	-	-
2.4GHz Prop	Pass	PK	934.04M	36.92	46.00	-9.08	3	Vertical	0	1.00	-

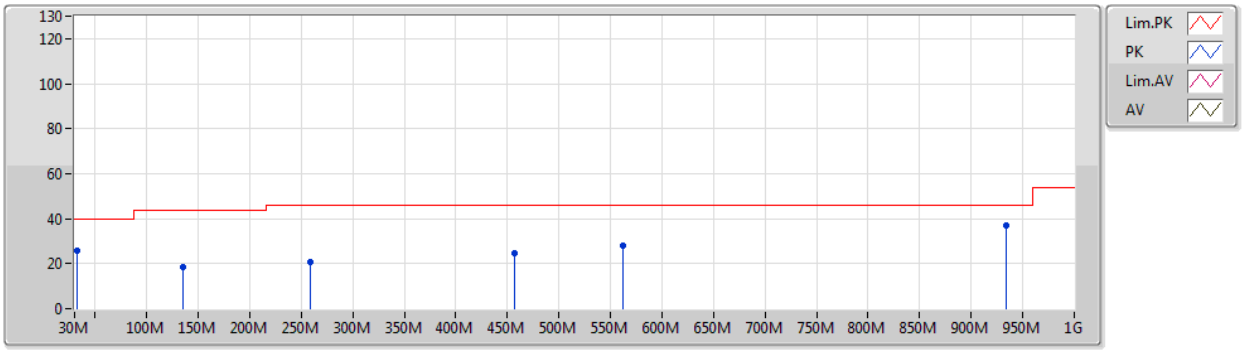
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4GHz Prop	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	31.94M	25.66	40.00	-14.34	3	Vertical	0	1.00	-
2440MHz	Pass	PK	134.76M	18.66	43.50	-24.84	3	Vertical	0	1.00	-
2440MHz	Pass	PK	258.92M	20.67	46.00	-25.33	3	Vertical	0	1.00	-
2440MHz	Pass	PK	456.8M	24.56	46.00	-21.44	3	Vertical	0	1.00	-
2440MHz	Pass	PK	561.56M	27.90	46.00	-18.10	3	Vertical	0	1.00	-
2440MHz	Pass	PK	934.04M	36.92	46.00	-9.08	3	Vertical	0	1.00	-
2440MHz	Pass	PK	30M	22.54	40.00	-17.46	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	134.76M	19.54	43.50	-23.96	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	272.5M	22.30	46.00	-23.70	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	478.14M	26.02	46.00	-19.98	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	769.14M	30.55	46.00	-15.45	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	926.28M	36.04	46.00	-9.96	3	Horizontal	360	1.00	-

2.4GHz Prop

2440MHz_Adapter

14/10/2019

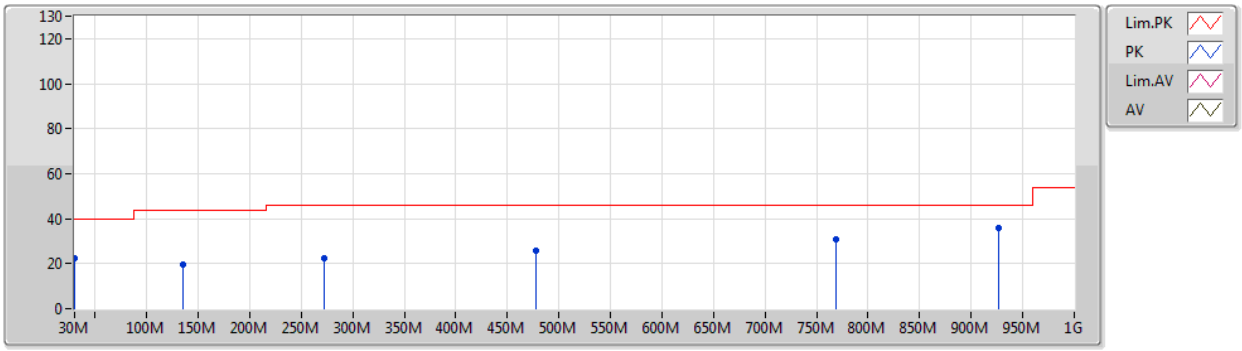


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	31.94M	25.66	40.00	-14.34	-5.43	3	Vertical	0	1.00	-	31.09	21.90	0.36	27.69
PK	134.76M	18.66	43.50	-24.84	-9.38	3	Vertical	0	1.00	-	28.04	16.57	1.74	27.69
PK	258.92M	20.67	46.00	-25.33	-5.85	3	Vertical	0	1.00	-	26.52	18.57	2.76	27.18
PK	456.8M	24.56	46.00	-21.44	-2.99	3	Vertical	0	1.00	-	27.55	22.09	3.24	28.32
PK	561.56M	27.90	46.00	-18.10	-1.13	3	Vertical	0	1.00	-	29.03	23.87	3.61	28.61
PK	934.04M	36.92	46.00	-9.08	2.95	3	Vertical	0	1.00	-	33.97	25.89	4.70	27.64

2.4GHz Prop

2440MHz_Adapter

14/10/2019



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	22.54	40.00	-17.46	-4.40	3	Horizontal	360	1.00	-	26.94	23.01	0.29	27.70
PK	134.76M	19.54	43.50	-23.96	-9.38	3	Horizontal	360	1.00	-	28.92	16.57	1.74	27.69
PK	272.5M	22.30	46.00	-23.70	-6.12	3	Horizontal	360	1.00	-	28.42	18.24	2.82	27.18
PK	478.14M	26.02	46.00	-19.98	-2.49	3	Horizontal	360	1.00	-	28.51	22.60	3.28	28.37
PK	769.14M	30.55	46.00	-15.45	0.93	3	Horizontal	360	1.00	-	29.62	25.05	4.14	28.26
PK	926.28M	36.04	46.00	-9.96	2.81	3	Horizontal	360	1.00	-	33.23	25.84	4.62	27.65

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	-	-	-	-	-	-	-	-	-	-	-
2.4GHz Prop	Pass	AV	4.95094G	48.53	54.00	-5.47	3	Vertical	332	2.54	-

Result

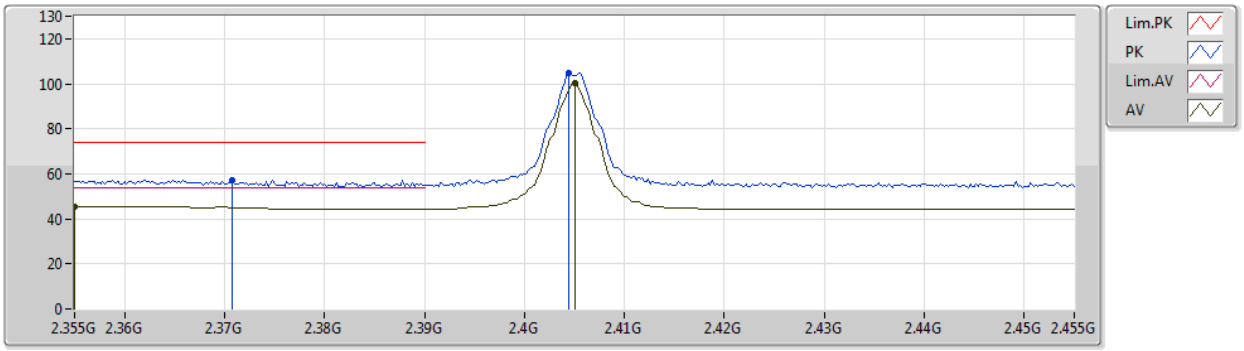
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4GHz Prop	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	AV	2.355G	45.50	54.00	-8.50	3	Vertical	298	1.06	-
2405MHz	Pass	AV	2.405G	100.42	Inf	-Inf	3	Vertical	298	1.06	-
2405MHz	Pass	PK	2.3708G	57.38	74.00	-16.62	3	Vertical	298	1.06	-
2405MHz	Pass	PK	2.4044G	104.80	Inf	-Inf	3	Vertical	298	1.06	-
2405MHz	Pass	AV	2.3628G	44.40	54.00	-9.60	3	Horizontal	353	1.00	-
2405MHz	Pass	AV	2.405G	96.80	Inf	-Inf	3	Horizontal	353	1.00	-
2405MHz	Pass	PK	2.3636G	56.72	74.00	-17.28	3	Horizontal	353	1.00	-
2405MHz	Pass	PK	2.4054G	101.17	Inf	-Inf	3	Horizontal	353	1.00	-
2405MHz	Pass	AV	4.80892G	46.20	54.00	-7.80	3	Vertical	328	2.27	-
2405MHz	Pass	PK	4.80899G	54.38	74.00	-19.62	3	Vertical	328	2.27	-
2405MHz	Pass	AV	4.80895G	40.56	54.00	-13.44	3	Horizontal	6	1.21	-
2405MHz	Pass	PK	4.80891G	49.89	74.00	-24.11	3	Horizontal	6	1.21	-
2440MHz	Pass	AV	2.3436G	44.86	54.00	-9.14	3	Vertical	305	1.21	-
2440MHz	Pass	AV	2.44G	95.34	Inf	-Inf	3	Vertical	305	1.21	-
2440MHz	Pass	AV	2.4992G	44.42	54.00	-9.58	3	Vertical	305	1.21	-
2440MHz	Pass	PK	2.3732G	57.20	74.00	-16.80	3	Vertical	305	1.21	-
2440MHz	Pass	PK	2.4396G	99.79	Inf	-Inf	3	Vertical	305	1.21	-
2440MHz	Pass	PK	2.494G	56.27	74.00	-17.73	3	Vertical	305	1.21	-
2440MHz	Pass	AV	2.366G	44.01	54.00	-9.99	3	Horizontal	23	1.25	-
2440MHz	Pass	AV	2.44G	94.14	Inf	-Inf	3	Horizontal	23	1.25	-
2440MHz	Pass	AV	2.4984G	44.43	54.00	-9.57	3	Horizontal	23	1.25	-
2440MHz	Pass	PK	2.3588G	55.99	74.00	-18.01	3	Horizontal	23	1.25	-
2440MHz	Pass	PK	2.4396G	98.50	Inf	-Inf	3	Horizontal	23	1.25	-
2440MHz	Pass	PK	2.4852G	55.88	74.00	-18.12	3	Horizontal	23	1.25	-
2440MHz	Pass	AV	4.88094G	45.79	54.00	-8.21	3	Vertical	298	1.20	-
2440MHz	Pass	AV	7.3187G	45.54	54.00	-8.46	3	Vertical	270	2.15	-
2440MHz	Pass	PK	4.88086G	54.08	74.00	-19.92	3	Vertical	298	1.20	-
2440MHz	Pass	PK	7.3184G	56.29	74.00	-17.71	3	Vertical	270	2.15	-
2440MHz	Pass	AV	4.87893G	47.03	54.00	-6.97	3	Horizontal	0	1.18	-
2440MHz	Pass	AV	7.31864G	43.31	54.00	-10.69	3	Horizontal	160	1.10	-
2440MHz	Pass	PK	4.87898G	55.17	74.00	-18.83	3	Horizontal	0	1.18	-
2440MHz	Pass	PK	7.31858G	54.52	74.00	-19.48	3	Horizontal	160	1.10	-
2475MHz	Pass	AV	2.475G	89.98	Inf	-Inf	3	Vertical	122	1.23	-
2475MHz	Pass	AV	2.4835G	44.45	54.00	-9.55	3	Vertical	122	1.23	-
2475MHz	Pass	PK	2.4754G	94.34	Inf	-Inf	3	Vertical	122	1.23	-
2475MHz	Pass	PK	2.4948G	56.23	74.00	-17.77	3	Vertical	122	1.23	-
2475MHz	Pass	AV	2.475G	93.35	Inf	-Inf	3	Horizontal	26	2.96	-
2475MHz	Pass	AV	2.4835G	44.47	54.00	-9.53	3	Horizontal	26	2.96	-
2475MHz	Pass	PK	2.4744G	97.74	Inf	-Inf	3	Horizontal	26	2.96	-
2475MHz	Pass	PK	2.4842G	57.53	74.00	-16.47	3	Horizontal	26	2.96	-
2475MHz	Pass	AV	4.95094G	48.53	54.00	-5.47	3	Vertical	332	2.54	-
2475MHz	Pass	AV	7.42361G	45.23	54.00	-8.77	3	Vertical	15	1.00	-
2475MHz	Pass	PK	4.94894G	56.64	74.00	-17.36	3	Vertical	332	2.54	-
2475MHz	Pass	PK	7.42635G	56.64	74.00	-17.36	3	Vertical	15	1.00	-
2475MHz	Pass	AV	4.94893G	45.37	54.00	-8.63	3	Horizontal	26	1.29	-
2475MHz	Pass	AV	7.42621G	41.61	54.00	-12.39	3	Horizontal	0	1.90	-
2475MHz	Pass	PK	4.94895G	53.80	74.00	-20.20	3	Horizontal	26	1.29	-

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2475MHz	Pass	PK	7.42642G	53.60	74.00	-20.40	3	Horizontal	0	1.90	-

2.4GHz Prop

2405MHz_TX

14/10/2019

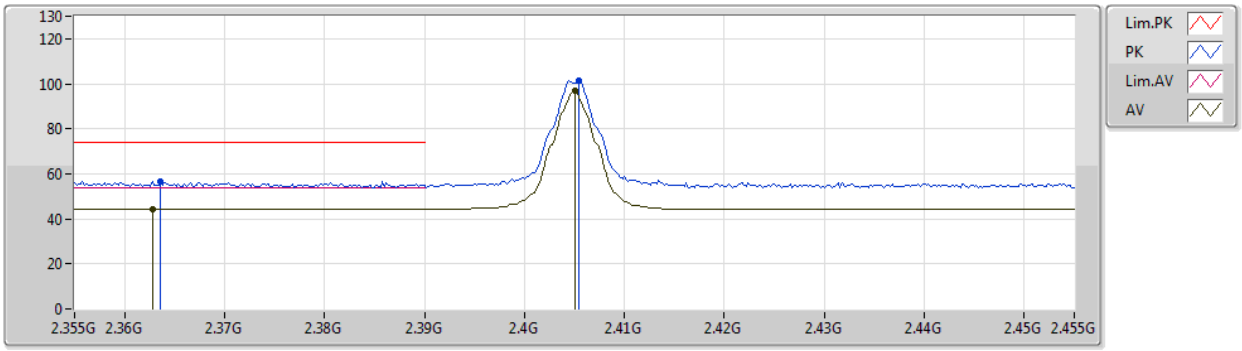


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.355G	45.50	54.00	-8.50	31.95	3	Vertical	298	1.06	-	13.55	27.27	4.68	-
AV	2.405G	100.42	Inf	-Inf	32.15	3	Vertical	298	1.06	-	68.27	27.41	4.74	-
PK	2.3708G	57.38	74.00	-16.62	32.01	3	Vertical	298	1.06	-	25.37	27.31	4.70	-
PK	2.4044G	104.80	Inf	-Inf	32.15	3	Vertical	298	1.06	-	72.65	27.41	4.74	-

2.4GHz Prop

2405MHz_TX

14/10/2019

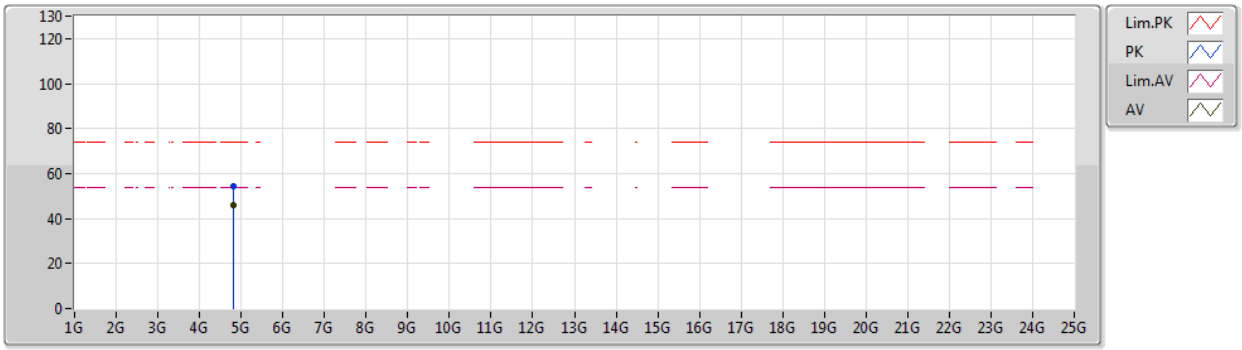


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3628G	44.40	54.00	-9.60	31.98	3	Horizontal	353	1.00	-	12.42	27.29	4.69	-
AV	2.405G	96.80	Inf	-Inf	32.15	3	Horizontal	353	1.00	-	64.65	27.41	4.74	-
PK	2.3636G	56.72	74.00	-17.28	31.98	3	Horizontal	353	1.00	-	24.74	27.29	4.69	-
PK	2.4054G	101.17	Inf	-Inf	32.16	3	Horizontal	353	1.00	-	69.01	27.42	4.74	-

2.4GHz Prop_Nss1_1TX

2405MHz_TX

14/10/2019

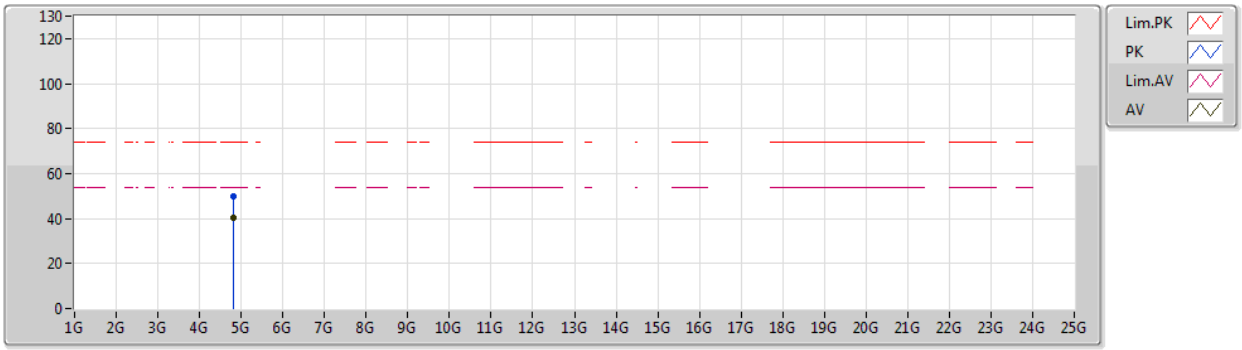


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80892G	46.20	54.00	-7.80	3.66	3	Vertical	328	2.27	-	42.54	31.36	6.79	34.49
PK	4.80899G	54.38	74.00	-19.62	3.66	3	Vertical	328	2.27	-	50.72	31.36	6.79	34.49

2.4GHz Prop

2405MHz_TX

14/10/2019

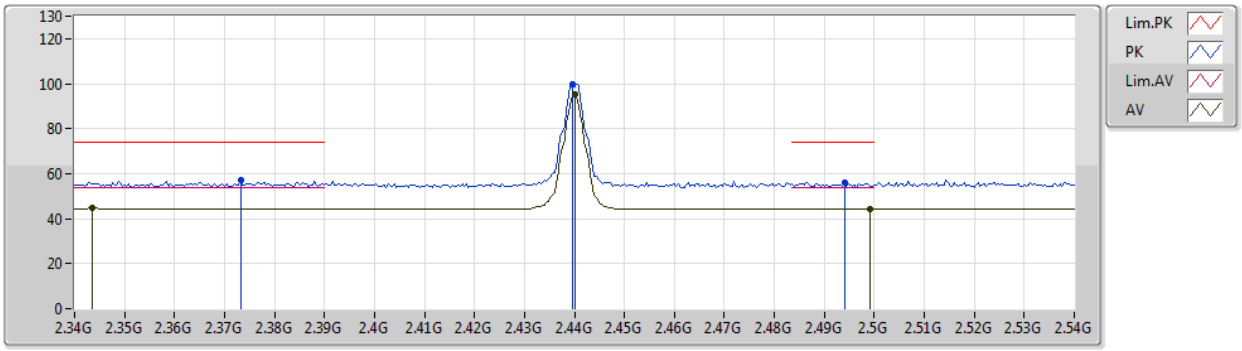


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80895G	40.56	54.00	-13.44	3.66	3	Horizontal	6	1.21	-	36.90	31.36	6.79	34.49
PK	4.80891G	49.89	74.00	-24.11	3.66	3	Horizontal	6	1.21	-	46.23	31.36	6.79	34.49

2.4GHz Prop

2440MHz_TX

14/10/2019

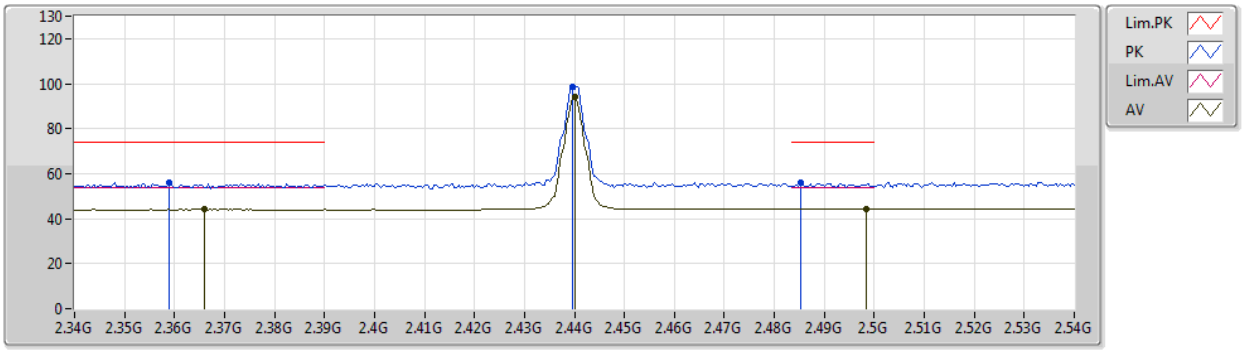


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3436G	44.86	54.00	-9.14	31.89	3	Vertical	305	1.21	-	12.97	27.23	4.66	-
AV	2.44G	95.34	Inf	-Inf	32.30	3	Vertical	305	1.21	-	63.04	27.52	4.78	-
AV	2.4992G	44.42	54.00	-9.58	32.55	3	Vertical	305	1.21	-	11.87	27.70	4.85	-
PK	2.3732G	57.20	74.00	-16.80	32.02	3	Vertical	305	1.21	-	25.18	27.32	4.70	-
PK	2.4396G	99.79	Inf	-Inf	32.30	3	Vertical	305	1.21	-	67.49	27.52	4.78	-
PK	2.494G	56.27	74.00	-17.73	32.52	3	Vertical	305	1.21	-	23.75	27.68	4.84	-

2.4GHz Prop

2440MHz_TX

14/10/2019

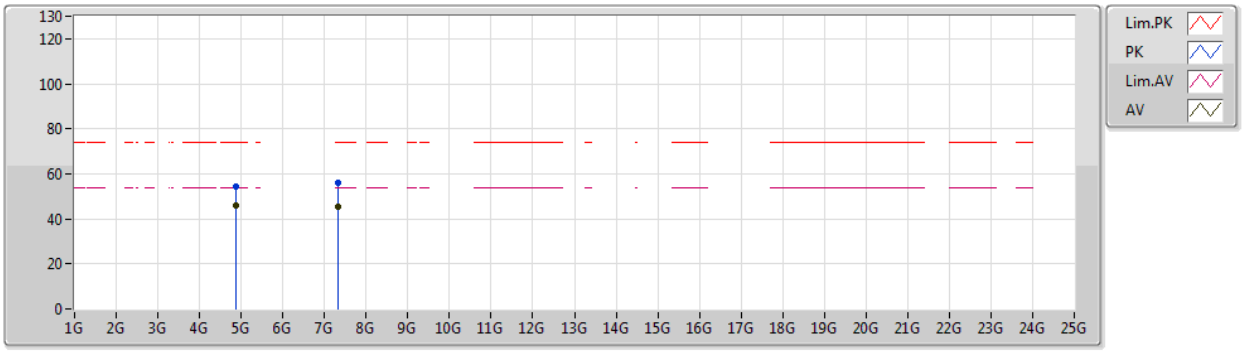


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.366G	44.01	54.00	-9.99	31.99	3	Horizontal	23	1.25	-	12.02	27.30	4.69	-
AV	2.44G	94.14	Inf	-Inf	32.30	3	Horizontal	23	1.25	-	61.84	27.52	4.78	-
AV	2.4984G	44.43	54.00	-9.57	32.55	3	Horizontal	23	1.25	-	11.88	27.70	4.85	-
PK	2.3588G	55.99	74.00	-18.01	31.96	3	Horizontal	23	1.25	-	24.03	27.28	4.68	-
PK	2.4396G	98.50	Inf	-Inf	32.30	3	Horizontal	23	1.25	-	66.20	27.52	4.78	-
PK	2.4852G	55.88	74.00	-18.12	32.49	3	Horizontal	23	1.25	-	23.39	27.66	4.83	-

2.4GHz Prop

2440MHz_TX

14/10/2019

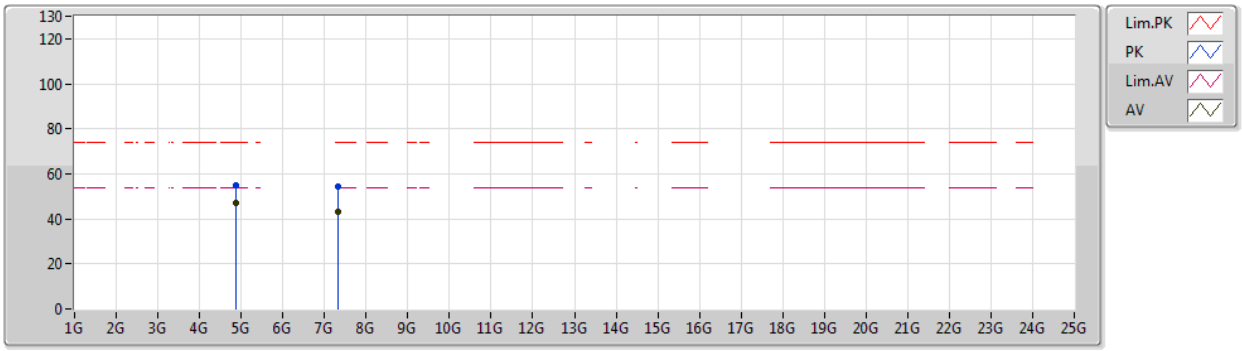


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.88094G	45.79	54.00	-8.21	3.83	3	Vertical	298	1.20	-	41.96	31.49	6.81	34.47
AV	7.3187G	45.54	54.00	-8.46	9.90	3	Vertical	270	2.15	-	35.64	36.03	8.62	34.75
PK	4.88086G	54.08	74.00	-19.92	3.83	3	Vertical	298	1.20	-	50.25	31.49	6.81	34.47
PK	7.3184G	56.29	74.00	-17.71	9.90	3	Vertical	270	2.15	-	46.39	36.03	8.62	34.75

2.4GHz Prop

2440MHz_TX

14/10/2019

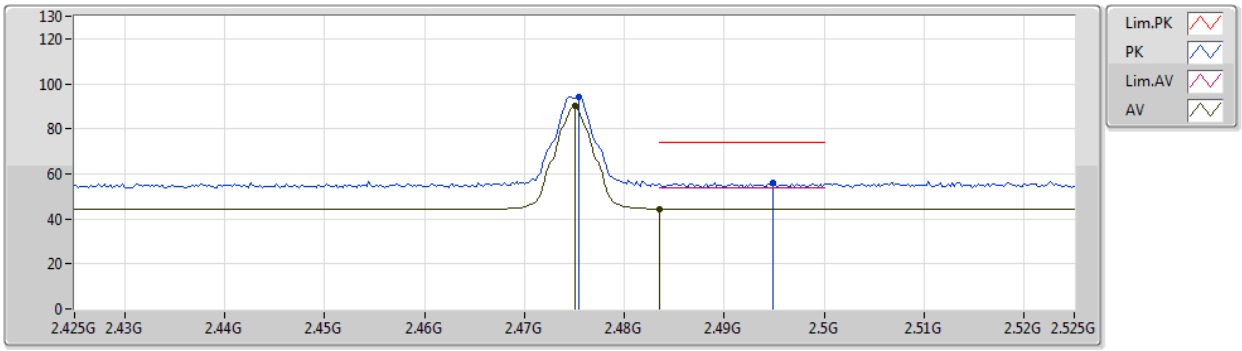


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87893G	47.03	54.00	-6.97	3.82	3	Horizontal	0	1.18	-	43.21	31.48	6.81	34.47
AV	7.31864G	43.31	54.00	-10.69	9.90	3	Horizontal	160	1.10	-	33.41	36.03	8.62	34.75
PK	4.87898G	55.17	74.00	-18.83	3.82	3	Horizontal	0	1.18	-	51.35	31.48	6.81	34.47
PK	7.31858G	54.52	74.00	-19.48	9.90	3	Horizontal	160	1.10	-	44.62	36.03	8.62	34.75

2.4GHz Prop

2475MHz_TX

14/10/2019

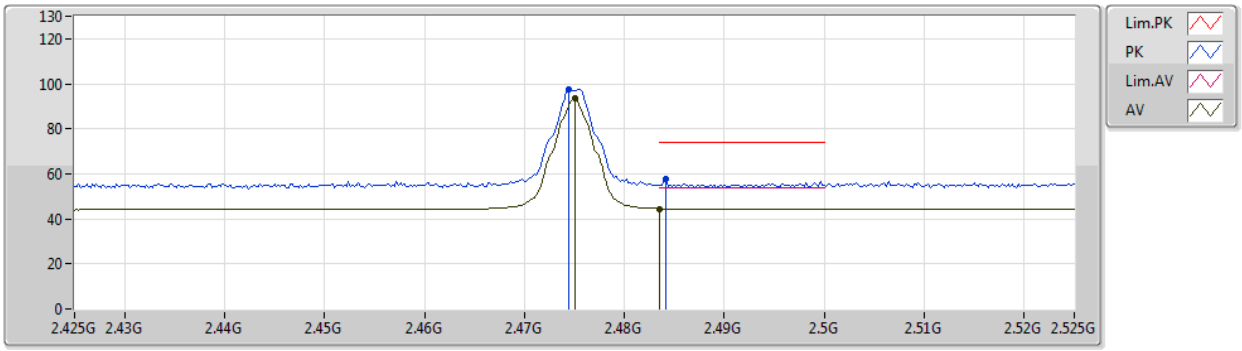


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.475G	89.98	Inf	-Inf	32.44	3	Vertical	122	1.23	-	57.54	27.62	4.82	-
AV	2.4835G	44.45	54.00	-9.55	32.48	3	Vertical	122	1.23	-	11.97	27.65	4.83	-
PK	2.4754G	94.34	Inf	-Inf	32.45	3	Vertical	122	1.23	-	61.89	27.63	4.82	-
PK	2.4948G	56.23	74.00	-17.77	32.52	3	Vertical	122	1.23	-	23.71	27.68	4.84	-

2.4GHz Prop

2475MHz_TX

14/10/2019

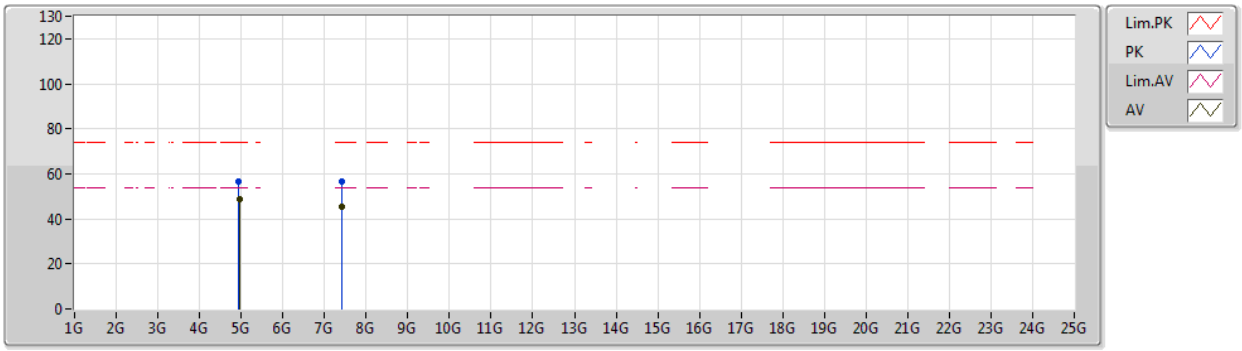


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.475G	93.35	Inf	-Inf	32.44	3	Horizontal	26	2.96	-	60.91	27.62	4.82	-
AV	2.4835G	44.47	54.00	-9.53	32.48	3	Horizontal	26	2.96	-	11.99	27.65	4.83	-
PK	2.4744G	97.74	Inf	-Inf	32.44	3	Horizontal	26	2.96	-	65.30	27.62	4.82	-
PK	2.4842G	57.53	74.00	-16.47	32.48	3	Horizontal	26	2.96	-	25.05	27.65	4.83	-

2.4GHz Prop

2475MHz_TX

14/10/2019

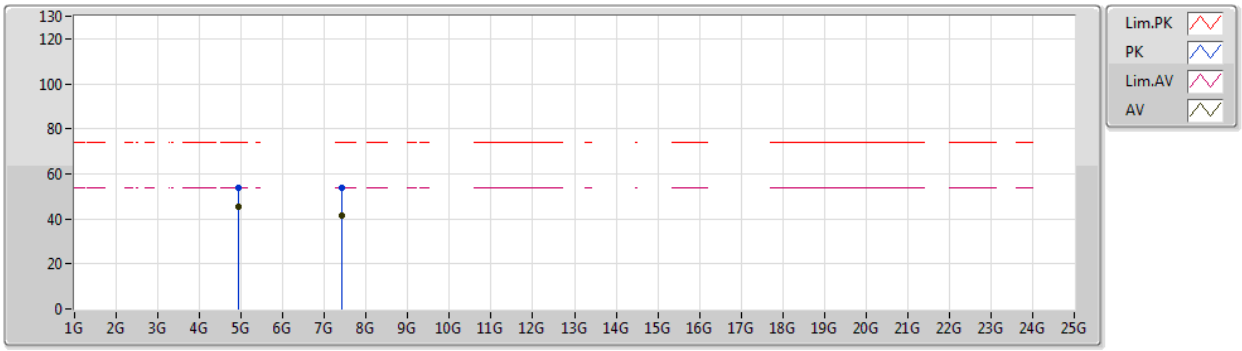


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.95094G	48.53	54.00	-5.47	4.00	3	Vertical	332	2.54	-	44.53	31.61	6.83	34.44
AV	7.42361G	45.23	54.00	-8.77	10.19	3	Vertical	15	1.00	-	35.04	36.30	8.67	34.78
PK	4.94894G	56.64	74.00	-17.36	3.99	3	Vertical	332	2.54	-	52.65	31.61	6.83	34.45
PK	7.42635G	56.64	74.00	-17.36	10.20	3	Vertical	15	1.00	-	46.44	36.31	8.67	34.78

2.4GHz Prop

2475MHz_TX

14/10/2019



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	4.94893G	45.37	54.00	-8.63	3.99	3	Horizontal	26	1.29	-	41.38	31.61	6.83	34.45
AV	7.42621G	41.61	54.00	-12.39	10.20	3	Horizontal	0	1.90	-	31.41	36.31	8.67	34.78
PK	4.94895G	53.80	74.00	-20.20	3.99	3	Horizontal	26	1.29	-	49.81	31.61	6.83	34.45
PK	7.42642G	53.60	74.00	-20.40	10.20	3	Horizontal	0	1.90	-	43.40	36.31	8.67	34.78