Testing Laboratory 1190

FCC Test Report

FCC ID	:	SWX-UCKG2P
Equipment	:	UniFi CLOUD KEY GEN2+
Brand Name	:	UBIQUITI
Model Name	:	UCK-G2-PLUS
Applicant/ Manufacturer	:	Ubiquiti Networks, Inc. 685 Third Avenue, 27th Floor New York, New York 10017 USA
Standard	:	47 CFR FCC Part 15.247

The product was received on Jan. 16, 2018, and testing was started from Jan. 17, 2018 and completed on Apr. 03, 2018. We, SPORTON INTERTIONAL 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 INTERTIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Allen Lin

Approved by: Allen Lin

SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory

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

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR592427-03AL	01	Initial issue of report	Apr. 19, 2018

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	FCC 15.203
3.1	15.207	AC Power-line Conducted Emissions	PASS	FCC 15.207
3.2	15.247(a)	DTS Bandwidth	PASS	≥500kHz
3.3	15.247(b)	Maximum Conducted Output Power	PASS	Power [dBm]:30
3.4	15.247(e)	Power Spectral Density	PASS	PSD [dBm/3kHz]:8
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	Non-Restricted Bands: >30 dBc
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	Restricted Bands: FCC 15.209

Reviewed by: Jeremy Lin

Report Producer: Jenny Yang

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX

Note:
- Bluetooth LE uses a GFSK (1Mbps) modulation for DSSS.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	-	-	internal Antenna	I-PEX	0

1.1.3 EUT Information

Operational Condition		
EUT Power Type	From PoE / From host system	
Type of EUT		
☒	Stand-alone	
☐	Combined (EUT where the radio part is fully integrated within another device)	
	Combined Equipment - Brand Name / Model No.:	…
☐	Plug-in radio (EUT intended for a variety of host systems)	
	Host System - Brand Name / Model No.:	…
☐	Other:	

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.631	2	396.875u	3k

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 v04

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	Kevin	23.5°C / 56%	02/Apr/2018
RF Conducted	TH07-HY	Ryan	23.3°C / 65%	17/Jan/2018
Radiated	03CH02-HY	Andy	22.5°C / 58%	03/Apr/2018

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)	3.6 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.0 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 °C	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	3.8V

2.2 Test Channel Mode

Test Software Version	QRCT v3.0.265.0

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	default
2440MHz	default
2480MHz	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	PoE mode
2	USB 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	PoE mode		
2	USB mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT	V		

2.4 Support Equipment

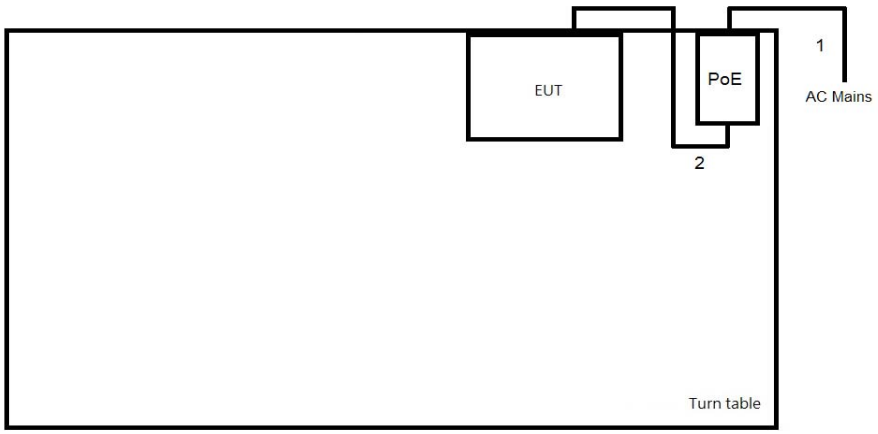
Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC
2	AC adapter for NB	DELL	LA65NS2-01	-
3	PoE	UBIQUITI	GP-H480-050G	-

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC
2	Adapter for NB	DELL	HA65NM130	DoC

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC
2	AC adapter for NB	DELL	LA65NS2-01	-
3	PoE	UBIQUITI	GP-H480-050G	-

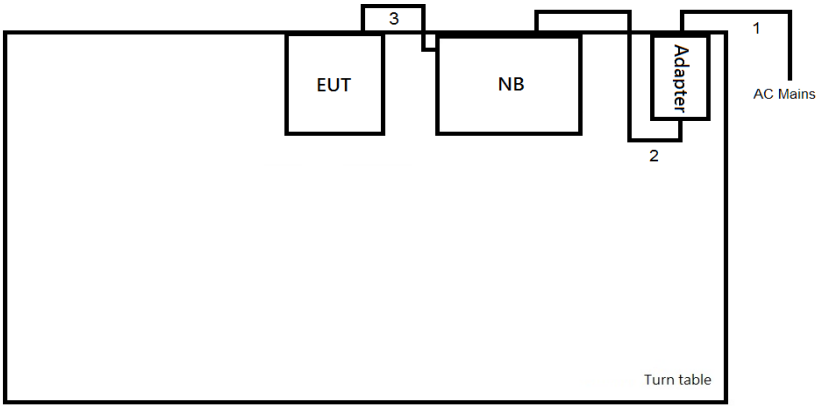
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test – PoE mode



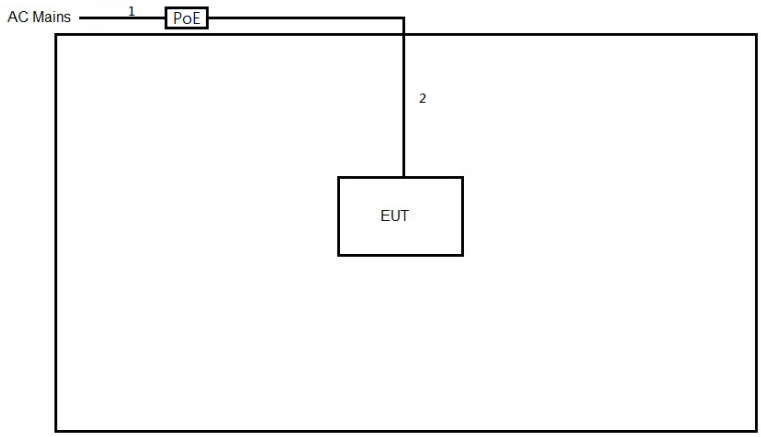
Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.5m	-
2	RJ45 Cable	No	10m	-

Test Setup Diagram – AC Line Conducted Emission Test – USB mode



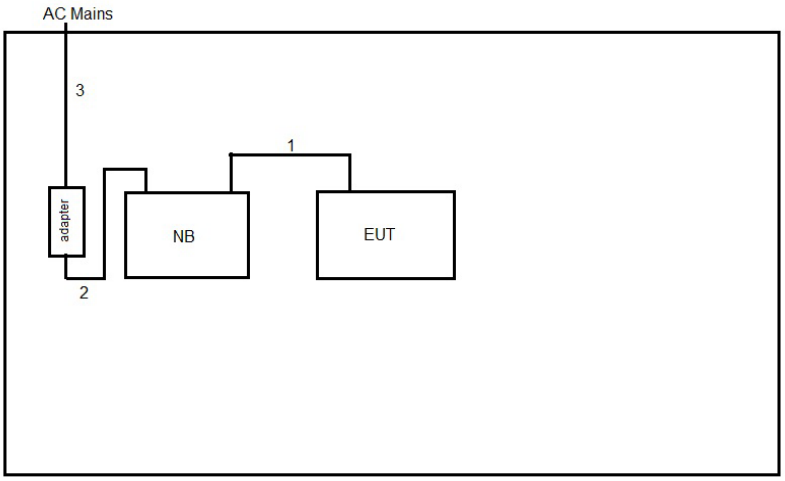
Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.5m	-
2	DC Power line	No	1.5m	-
3	USB Cable	No	1.0m	-

Test Setup Diagram - Radiated Test – PoE mode



Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.5m	-
2	RJ45 Cable	No	10m	-

Test Setup Diagram - Radiated Test – USB mode



Item	Connection	Shielded	Length(m)	Remark
1	USB Cable	No	1.0m	-
2	DC Power line	No	1.5m	-
3	AC Power line	No	1.8m	-

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

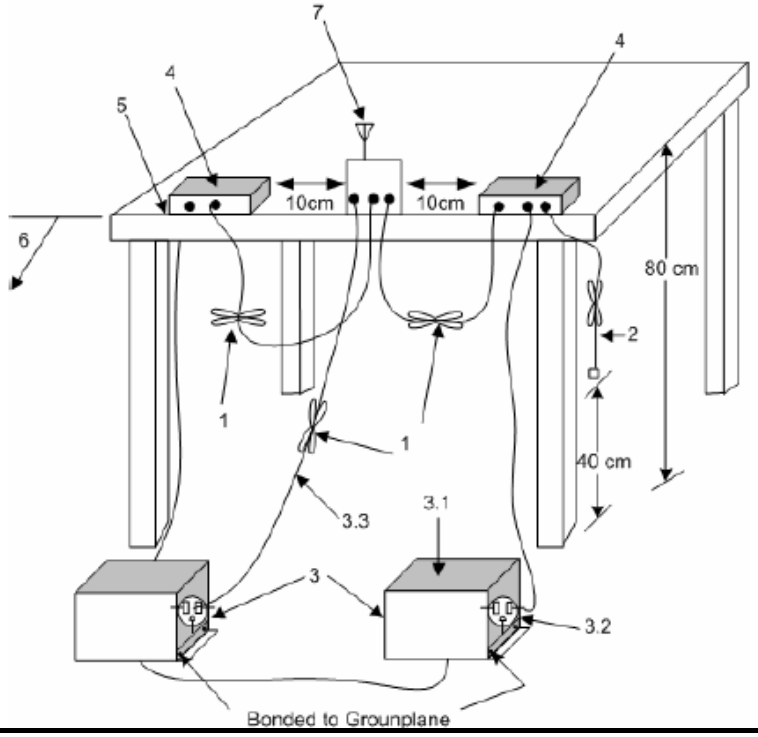
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Test Setup

AC Power-line Conducted Emissions



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.

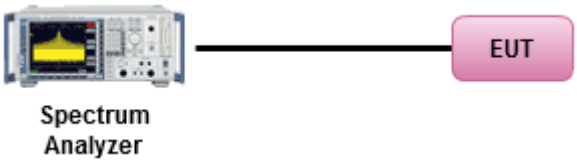
3.2.2 Measuring Instruments

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 8.1 Option 1 for 6 dB bandwidth measurement.
	☐ Refer as KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.
	☐ Refer as RSS-Gen, clause 6.6 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)	
	▪ Point-to-multipoint systems (P2M): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) dBm	
	▪ Point-to-point systems (P2P): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm	
	▪ Smart antenna system (SAS):	
		- Single beam: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm
		- Overlap beam: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm
		- Aggregate power on all beams: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 + 8dB dBm
e.i.r.p. Power Limit:		
▪ 2400-2483.5 MHz Band		
	▪ Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W)	
	▪ Point-to-point systems (P2P): P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX}]) dBm	
	▪ Smart antenna system (SAS)	
		- Single beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
		- Overlap beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
		- Aggregate power on all beams: P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX} + 8]) dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi.		

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
	☐ Refer as KDB 558074, clause 9.1.2 Option 2 (integrated band power method)
	☐ Refer as KDB 558074, clause 9.1.3 Option 3 (peak power meter for VBW ≥ DTS BW)
▪ Maximum Average Conducted Output Power	
	Duty cycle ≥ 98%
	☐ Refer as KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
	Duty cycle < 98%
	☐ Refer as KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
	☒ Refer as KDB 558074, clause 9.2.3.1 Method AVGPM (using an RF average 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

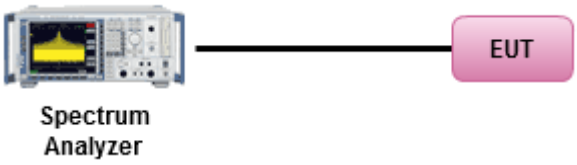
3.4.2 Measuring Instruments

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 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).	
▪ 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 PSD 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 PSD level.	

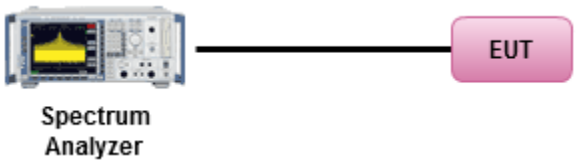
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method
▪ Refer as KDB 558074, clause 11 for unwanted emissions into non-restricted 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 below30 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.

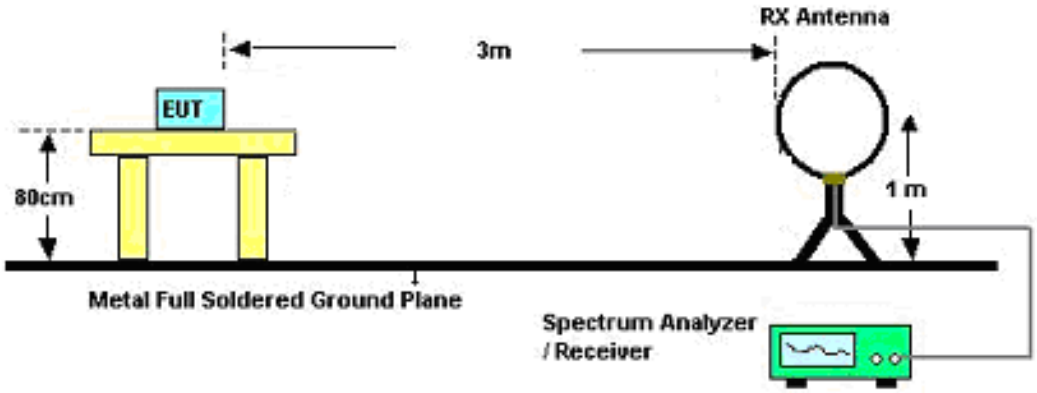
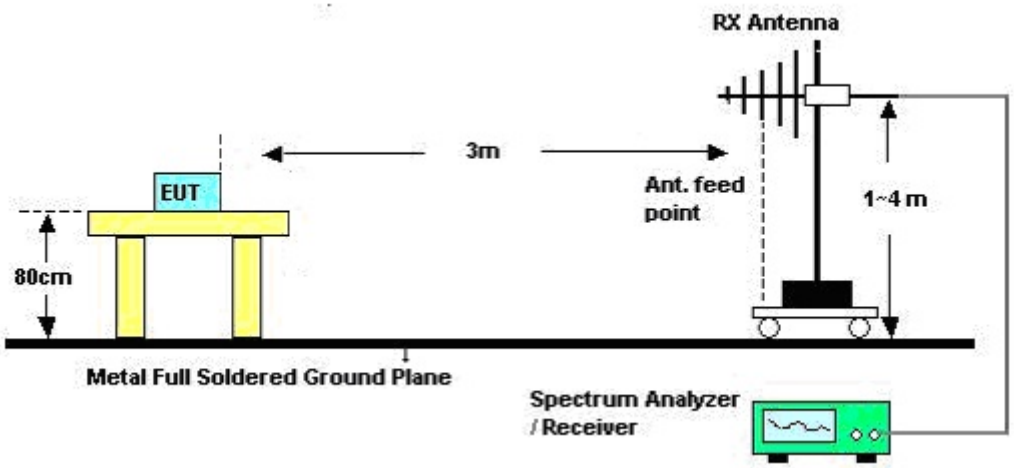
3.6.2 Measuring Instruments

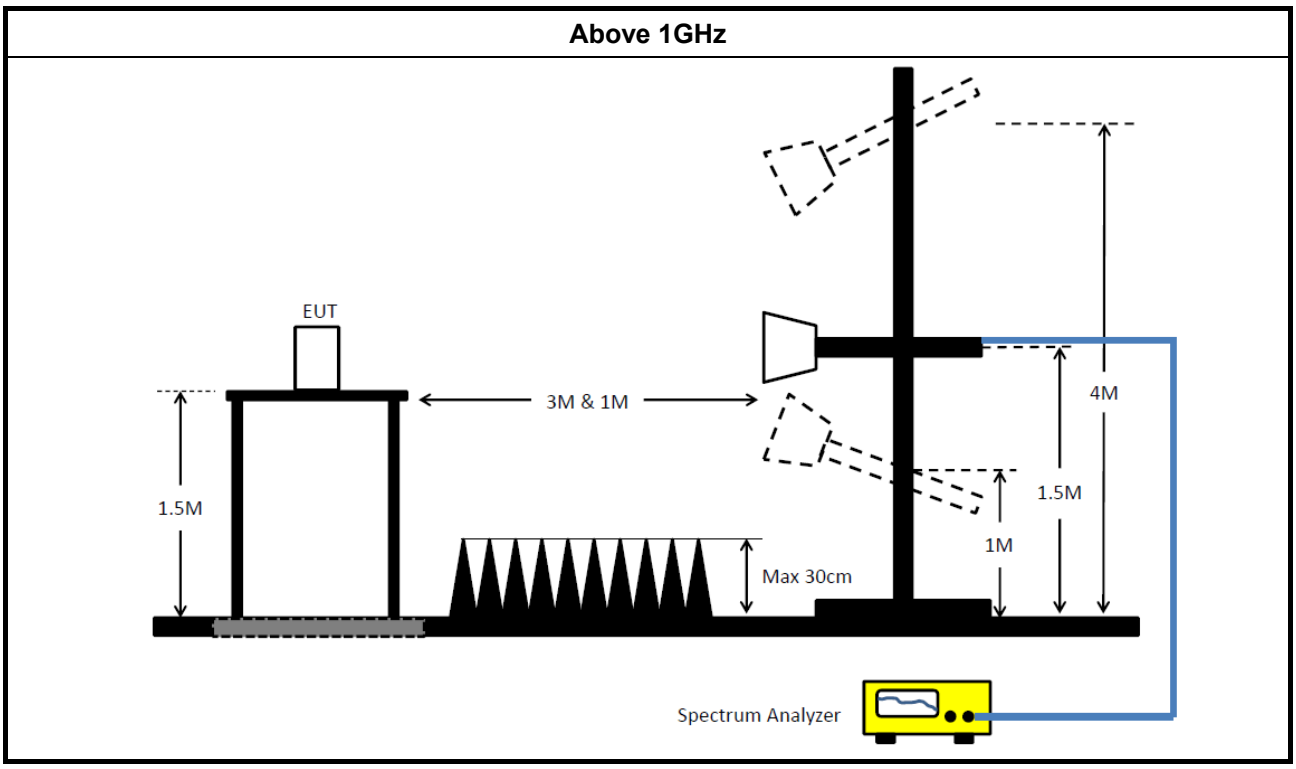
Refer a test equipment and calibration data table in this test report.

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 12 for unwanted emissions into restricted bands.
☒ Refer as KDB 558074, clause 12.2.5.3 (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW≥1/T.
☒ Refer as KDB 558074, clause 12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:
▪ Refer as KDB 558074 clause 13.1, 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 13.2 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
▪ Refer as KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
▪ For conducted and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2.
▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
▪ For KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

3.6.4 Test Setup

Emissions in Restricted Frequency Bands
9kHz ~30MHz

30MHz~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	29/Apr/2017	28/Apr/2018
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	17/Nov/2017	16/Nov/2018
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	06/Oct/2017	05/Oct/2018
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/2017	11/Oct/2018

NCR : Non-Calibration Require

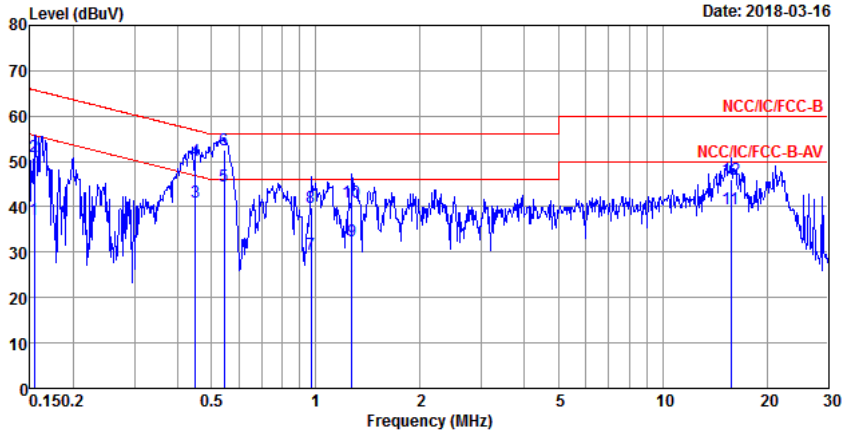
Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101515	9kHz~40GHz	08/Dec/2017	07/Dec/2018
Power Sensor	Anritsu	MA2411B	1339407	300MHz ~ 40GHz	10/May/2017	09/May/2018
Power Meter	Anritsu	ML2495A	1517010	300MHz ~ 40GHz	06/Nov/2017	05/Nov/2018
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10712/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.5m	HUBER+SUHNER	SUCOFLEX_104	MY10713/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	27/Jul/2017	26/Jul/2018

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSP40	100305	9KHz - 40GHz	12/Dec/2017	11/Dec/2018
3m Semi Anechoic	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz-1GHz	20/Oct/2017	19/Oct/2018
3m Semi Anechoic	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz ~ 18GHz	27/Oct/2017	26/Oct/2018
Amplifier	Agilent	8447D	2944A11149	100KHz-1.3GHz	29/Jun/2017	28/Jun/2018
Amplifier	Ketsight	8449B	3008A02602	1GHz-26.5GHz	19/Sep/2017	18/Sep/2018
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA9120D 01531	1GHz-18GHz	11/May/2017	10/May/2018
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	18GHz-40GHz	06/Feb/2018	05/Feb/2019
Bilog Antenna	SCHAFFNER	CBL6112B	2723	30MHz-1GHz	09/Sep/2017	08/Sep/2018
Loop Antenna	TESEQ	HLA 6120	31244	9KHz-30MHz	02/Mar/2017	01/Mar/2018
RF Cable-high	SUHNER	SUCOFLEX104	MY34918/4	1GHz ~ 40GHz	19/Jan/2018	18/Jan/2019
RF Cable-R03m	Jye Bao	RG142	CB017	9kHz ~ 1GHz	19/Jan/2018	18/Jan/2019
Receiver	R&S	ESU3	102052	9kHz ~ 3.6GHz	29/Apr/2017	28/Apr/2018

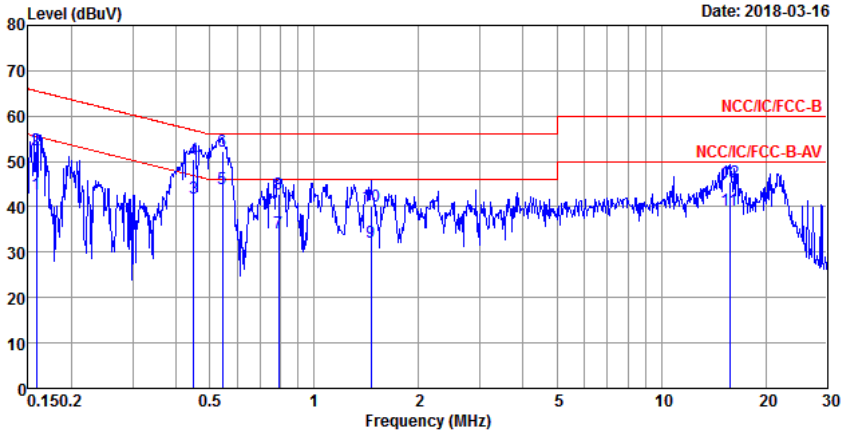
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	PoE mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1540	37.21	-18.57	55.78	27.54	9.63	0.04	Average
2	0.1540	50.99	-14.79	65.78	41.32	9.63	0.04	QP
3	0.4492	41.00	-5.89	46.89	31.30	9.61	0.09	Average
4	0.4492	50.24	-6.65	56.89	40.54	9.61	0.09	QP
5 MAX	0.5436	44.48	-1.52	46.00	34.80	9.61	0.07	Average
6	0.5436	52.49	-3.51	56.00	42.81	9.61	0.07	QP
7	0.9684	29.64	-16.36	46.00	20.02	9.62	0.00	Average
8	0.9684	39.79	-16.21	56.00	30.17	9.62	0.00	QP
9	1.2688	32.53	-13.47	46.00	22.91	9.62	0.00	Average
10	1.2688	40.92	-15.08	56.00	31.30	9.62	0.00	QP
11	15.7179	39.66	-10.34	50.00	29.92	9.70	0.04	Average
12	15.7179	45.98	-14.02	60.00	36.24	9.70	0.04	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

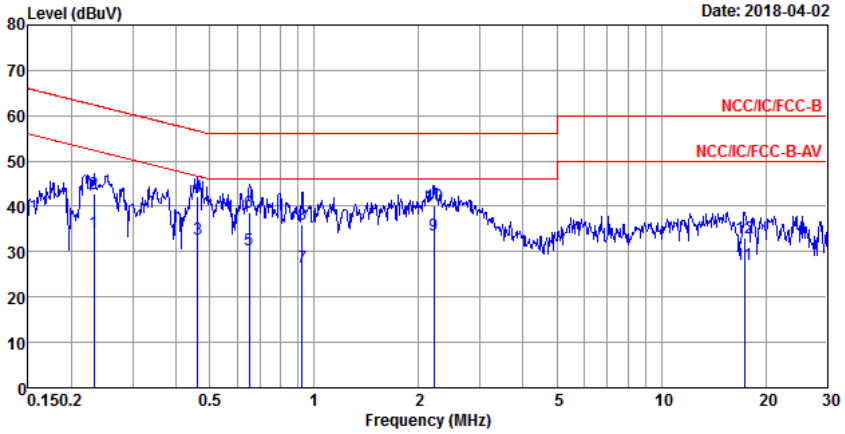
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	PoE mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1582	42.90	-12.66	55.56	33.25	9.62	0.03	Average
2	0.1582	52.58	-12.98	65.56	42.93	9.62	0.03	QP
3	0.4492	41.93	-4.96	46.89	32.23	9.61	0.09	Average
4	0.4492	50.56	-6.33	56.89	40.86	9.61	0.09	QP
5 MAX	0.5436	44.06	-1.94	46.00	34.38	9.61	0.07	Average
6	0.5436	52.35	-3.65	56.00	42.67	9.61	0.07	QP
7	0.7918	34.38	-11.62	46.00	24.74	9.61	0.03	Average
8	0.7918	42.92	-13.08	56.00	33.28	9.61	0.03	QP
9	1.4562	32.12	-13.88	46.00	22.50	9.62	0.00	Average
10	1.4562	40.12	-15.88	56.00	30.50	9.62	0.00	QP
11	15.7179	39.15	-10.85	50.00	29.48	9.63	0.04	Average
12	15.7179	45.32	-14.68	60.00	35.65	9.63	0.04	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

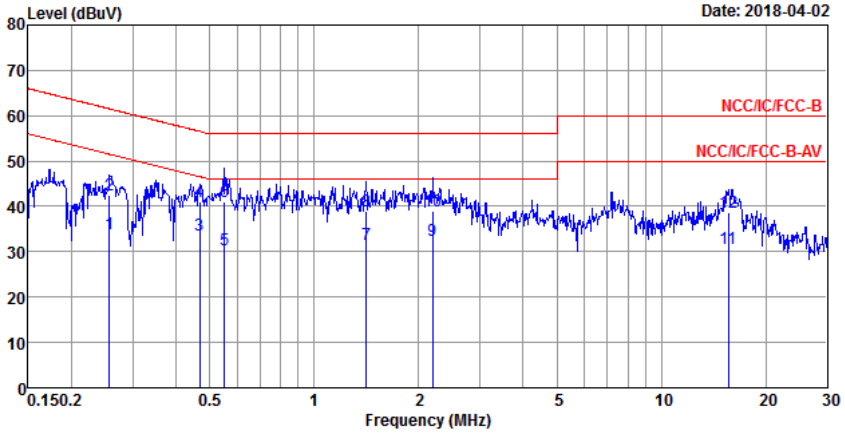
AC Power-line Conducted Emissions Result			
Operating Mode	2	**Power Phase**	Neutral
Operating Function	USB mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2316	34.19	-18.20	52.39	24.55	9.62	0.02	Average
2	0.2316	42.83	-19.56	62.39	33.19	9.62	0.02	QP
3	0.4612	32.91	-13.76	46.67	23.22	9.61	0.08	Average
4	0.4612	42.27	-14.40	56.67	32.58	9.61	0.08	QP
5	0.6508	30.30	-15.70	46.00	20.63	9.62	0.05	Average
6	0.6508	38.67	-17.33	56.00	29.00	9.62	0.05	QP
7	0.9233	26.55	-19.45	46.00	16.92	9.62	0.01	Average
8	0.9233	36.15	-19.85	56.00	26.52	9.62	0.01	QP
9 MAX	2.2132	33.53	-12.47	46.00	23.89	9.63	0.01	Average
10	2.2132	40.08	-15.92	56.00	30.44	9.63	0.01	QP
11	17.3826	27.23	-22.77	50.00	17.42	9.71	0.10	Average
12	17.3826	33.21	-26.79	60.00	23.40	9.71	0.10	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Operating Mode	2	**Power Phase**	Line
Operating Function	USB mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2575	34.03	-17.48	51.51	24.37	9.62	0.04	Average
2	0.2575	42.41	-19.10	61.51	32.75	9.62	0.04	QP
3 MAX	0.4686	33.72	-12.82	46.54	24.03	9.61	0.08	Average
4	0.4686	40.92	-15.62	56.54	31.23	9.61	0.08	QP
5	0.5523	30.30	-15.70	46.00	20.63	9.61	0.06	Average
6	0.5523	40.99	-15.01	56.00	31.32	9.61	0.06	QP
7	1.4107	31.49	-14.51	46.00	21.88	9.61	0.00	Average
8	1.4107	38.98	-17.02	56.00	29.37	9.61	0.00	QP
9	2.1898	32.44	-13.56	46.00	22.81	9.62	0.01	Average
10	2.1898	38.96	-17.04	56.00	29.33	9.62	0.01	QP
11	15.6349	30.73	-19.27	50.00	21.07	9.63	0.03	Average
12	15.6349	38.60	-21.40	60.00	28.94	9.63	0.03	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	680k	1.061M	1M06F1D	676.25k	1.056M

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;

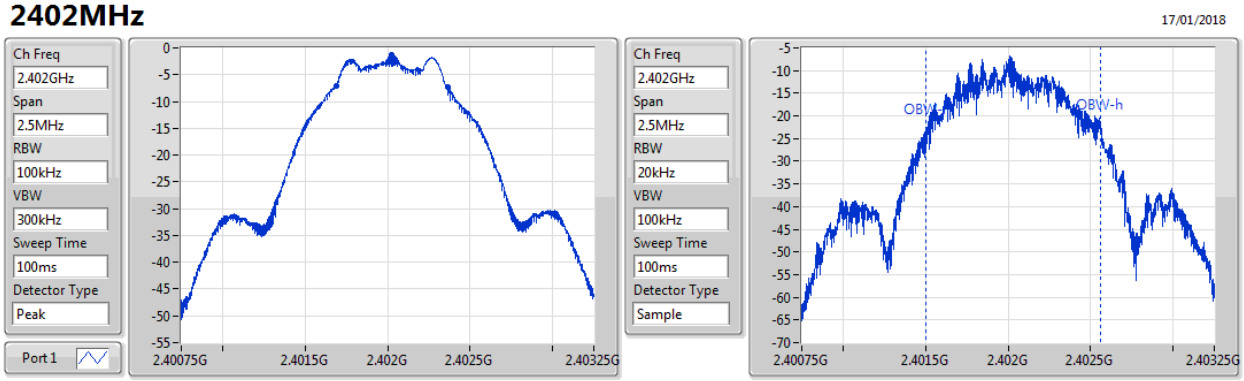
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	678.75k	1.058M
2440MHz	Pass	500k	676.25k	1.061M
2480MHz	Pass	500k	680k	1.056M

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

BT-LE(1Mbps) **EBW**

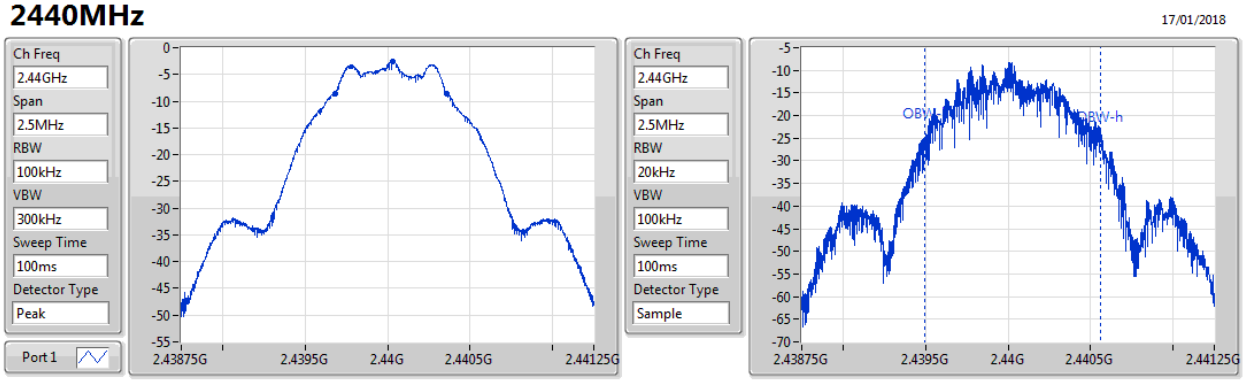
2402MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
678.75k	2.401688G	2.402366G	1.058M	2.401504G	2.402562G	500k	1

BT-LE(1Mbps) **EBW**

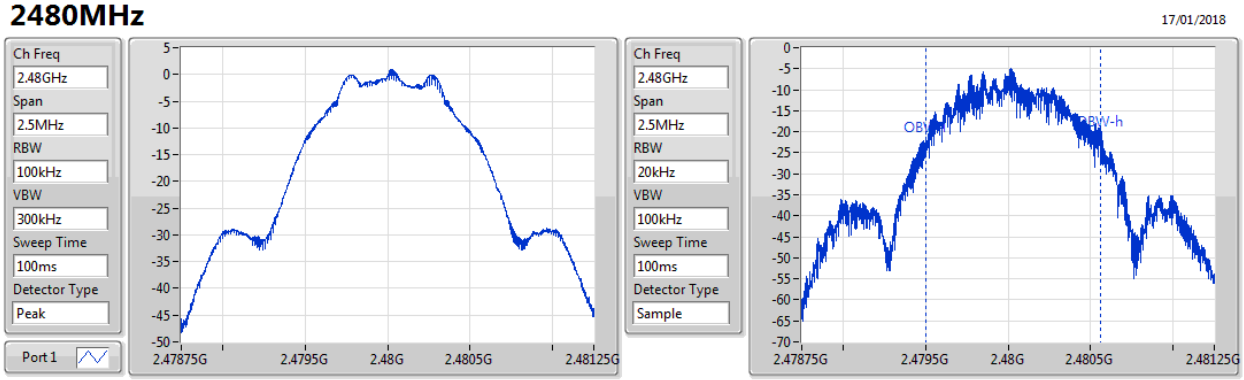
2440MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
676.25k	2.439685G	2.440361G	1.061M	2.439498G	2.440558G	500k	1

BT-LE(1Mbps) **EBW**

2480MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
680k	2.47968G	2.48036G	1.056M	2.479505G	2.480561G	500k	1

Summary

Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	1.04	0.00127

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.00	-0.97	30.00
2440MHz	Pass	0.00	-2.37	30.00
2480MHz	Pass	0.00	1.04	30.00

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-16.29

RBW=3kHz.

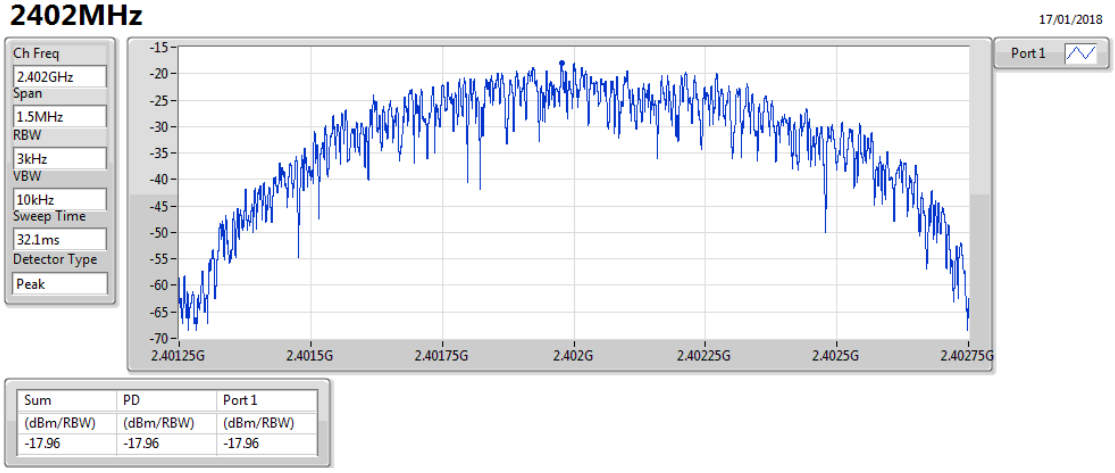
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.00	-17.96	8.00
2440MHz	Pass	0.00	-17.88	8.00
2480MHz	Pass	0.00	-16.29	8.00

RBW=3kHz.

BT-LE(1Mbps) **PSD**

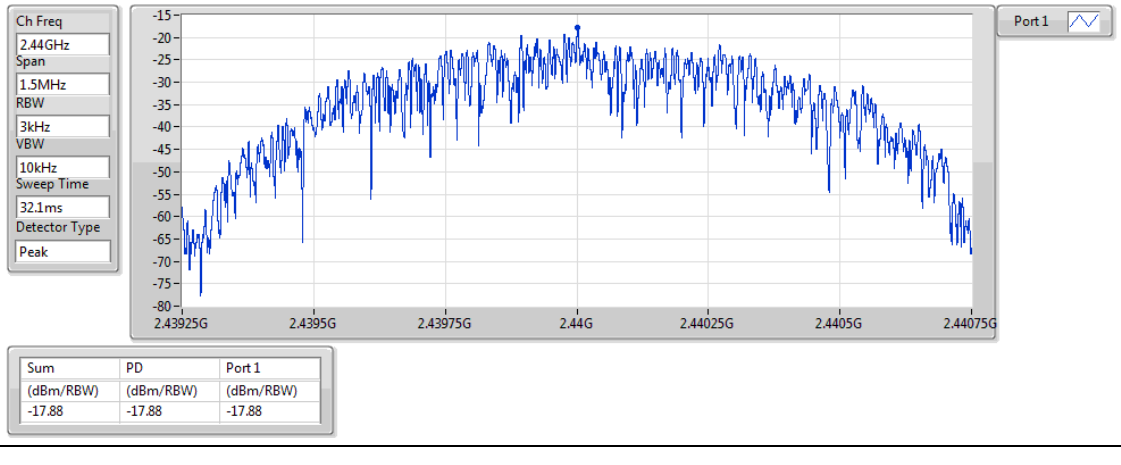
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-17.96	-17.96	-17.96

BT-LE(1Mbps) **PSD**

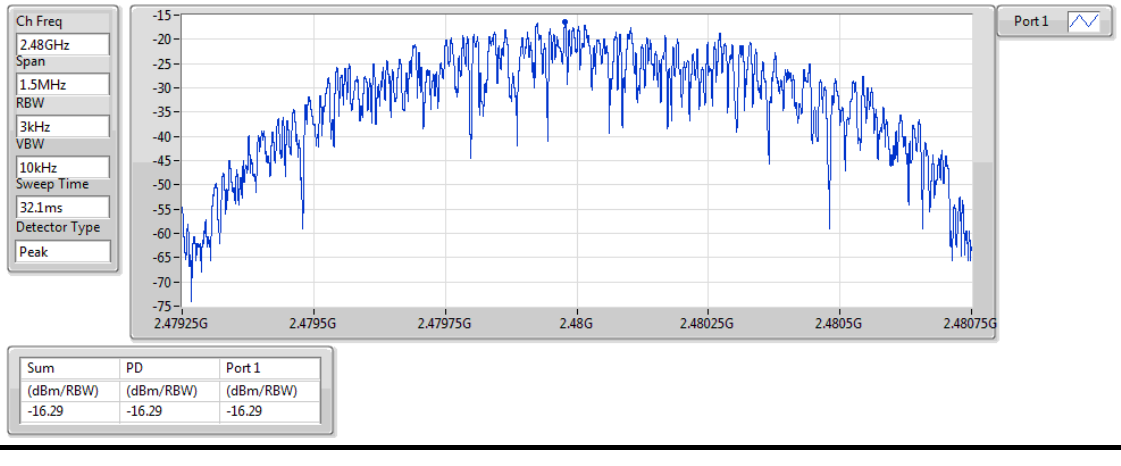
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-17.88	-17.88	-17.88

BT-LE(1Mbps) **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-16.29	-16.29	-16.29

Summary

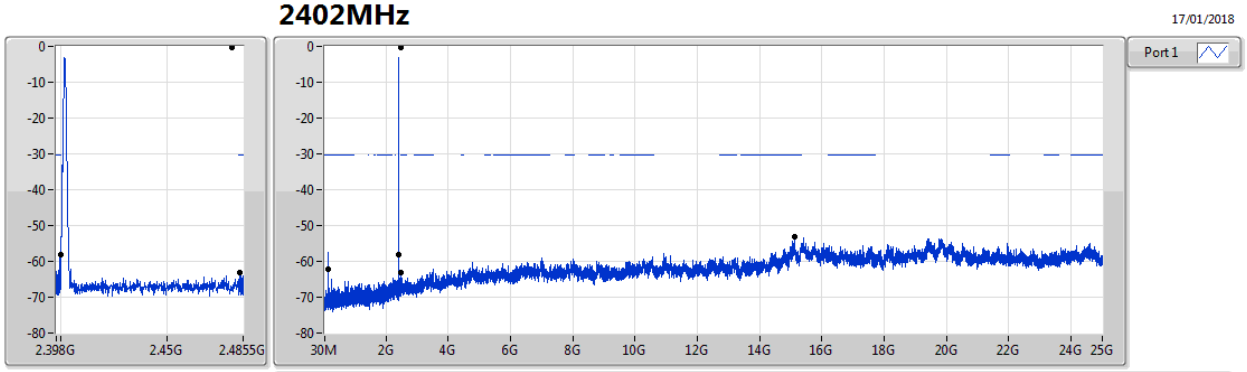
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.480327G	-0.32	-30.32	147.216M	-62.26	2.399976G	-58.00	2.483724G	-62.98	15.104877G	-53.14	1

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
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.480327G	-0.32	-30.32	147.216M	-62.26	2.399976G	-58.00	2.483724G	-62.98	15.104877G	-53.14	1
2440MHz	Pass	2.480327G	-0.32	-30.32	147.216M	-62.08	2.398732G	-64.55	2.485188G	-63.60	15.349722G	-55.04	1
2480MHz	Pass	2.480327G	-0.32	-30.32	147.216M	-60.69	2.398808G	-64.11	2.4836G	-62.31	15.062663G	-54.24	1

BT-LE(1Mbps) **CSE NdB**

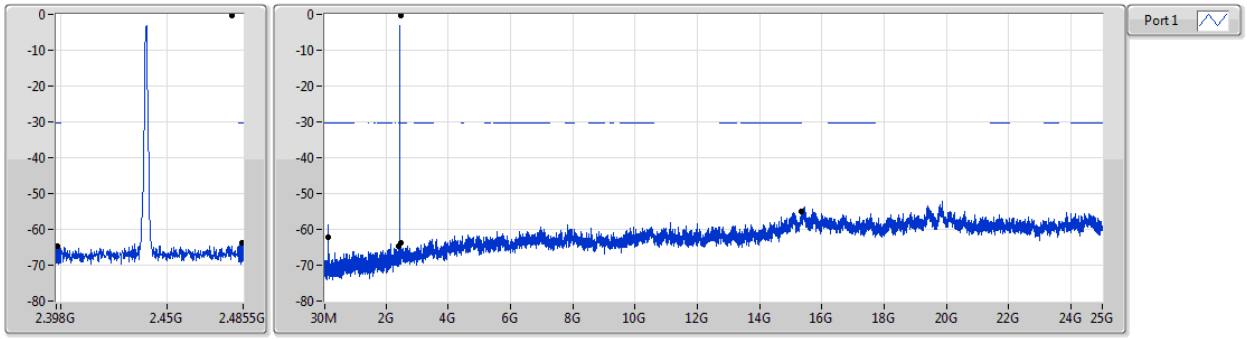
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.480327G	-0.32	-30.32	147.216M	-62.26	2.399976G	-58.00	2.483724G	-62.98	15.104877G	-53.14	1

BT-LE(1Mbps) **CSE NdB**

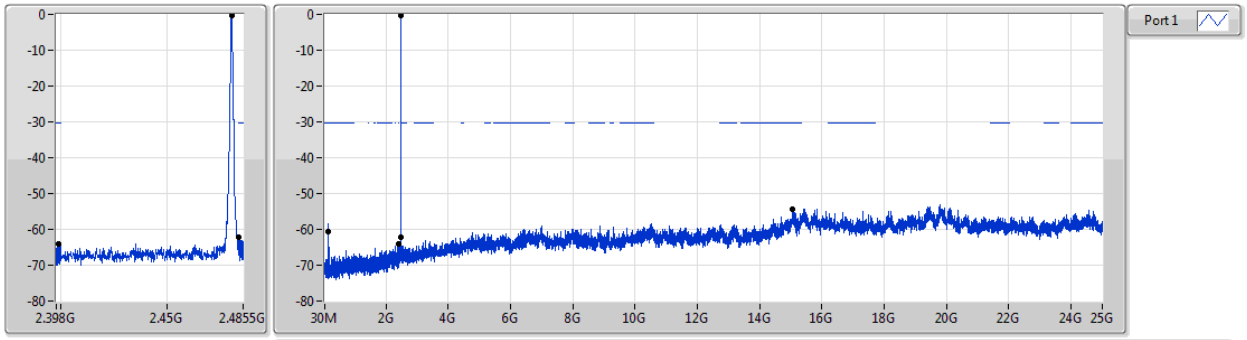
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.480327G	-0.32	-30.32	147.216M	-62.08	2.398732G	-64.55	2.485188G	-63.60	15.349722G	-55.04	1

BT-LE(1Mbps) **CSE NdB**

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.480327G	-0.32	-30.32	147.216M	-60.69	2.398808G	-64.11	2.4836G	-62.31	15.062663G	-54.24	1

Summary

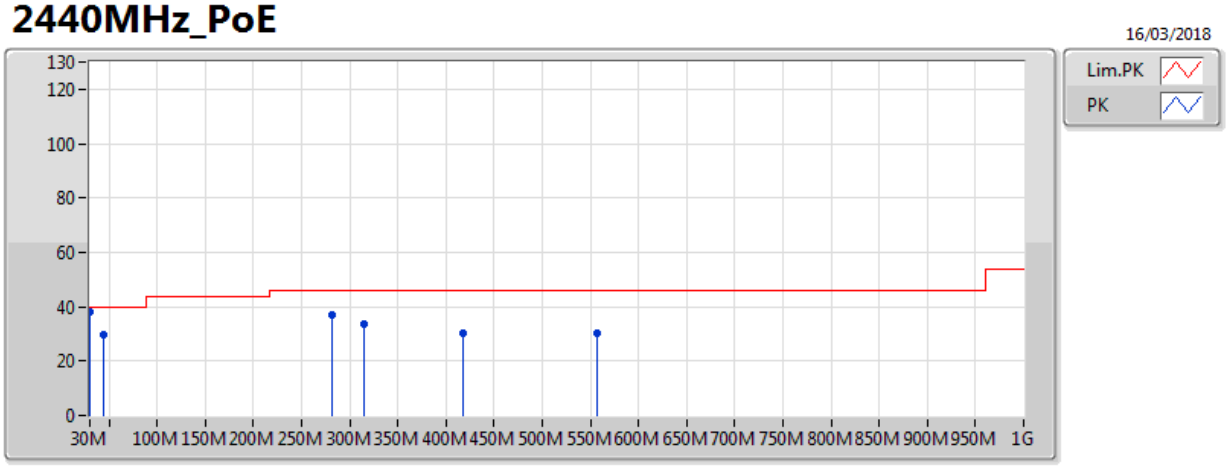
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	QP	30M	38.08	40.00	-1.92	-8.21	3	Vertical	207	1.34	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	123.12M	31.22	43.50	-12.28	-14.17	3	Horizontal	307	2.35	-
2440MHz	Pass	PK	231.76M	33.90	46.00	-12.10	-15.06	3	Horizontal	307	2.35	-
2440MHz	Pass	PK	276.38M	43.25	46.00	-2.75	-12.35	3	Horizontal	307	2.35	-
2440MHz	Pass	PK	315.18M	38.51	46.00	-7.49	-11.47	3	Horizontal	307	2.35	-
2440MHz	Pass	PK	418M	31.51	46.00	-14.49	-7.78	3	Horizontal	307	2.35	-
2440MHz	Pass	PK	710.94M	31.06	46.00	-14.94	-4.23	3	Horizontal	307	2.35	-
2440MHz	Pass	PK	43.58M	29.47	40.00	-10.53	-15.40	3	Vertical	247	1.98	-
2440MHz	Pass	PK	282.2M	37.15	46.00	-8.85	-12.31	3	Vertical	247	1.98	-
2440MHz	Pass	PK	315.18M	33.87	46.00	-12.13	-11.47	3	Vertical	247	1.98	-
2440MHz	Pass	PK	418M	30.06	46.00	-15.94	-7.78	3	Vertical	247	1.98	-
2440MHz	Pass	PK	557.68M	30.03	46.00	-15.97	-4.89	3	Vertical	247	1.98	-
2440MHz	Pass	QP	30M	38.08	40.00	-1.92	-8.21	3	Vertical	207	1.34	-
2440MHz	Pass	PK	56.710145M	34.14	40.00	-5.86	-14.87	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	149.492754M	30.74	43.50	-12.76	-10.27	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	274.608696M	38.31	46.00	-7.69	-6.33	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	349.115942M	32.81	46.00	-13.19	-4.87	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	450.333333M	31.86	46.00	-14.14	-2.94	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	869.26087M	32.15	46.00	-13.85	2.21	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	58.115942M	33.33	40.00	-6.67	-14.98	3	Vertical	360	1.00	-
2440MHz	Pass	PK	148.086957M	24.64	43.50	-18.86	-10.17	3	Vertical	360	1.00	-
2440MHz	Pass	PK	274.608696M	30.75	46.00	-15.25	-6.33	3	Vertical	360	1.00	-
2440MHz	Pass	PK	446.115942M	29.67	46.00	-16.33	-3.00	3	Vertical	360	1.00	-
2440MHz	Pass	PK	533.275362M	36.11	46.00	-9.89	-1.83	3	Vertical	360	1.00	-
2440MHz	Pass	PK	921.275362M	33.07	46.00	-12.93	2.95	3	Vertical	360	1.00	-

BT-LE(1Mbps)

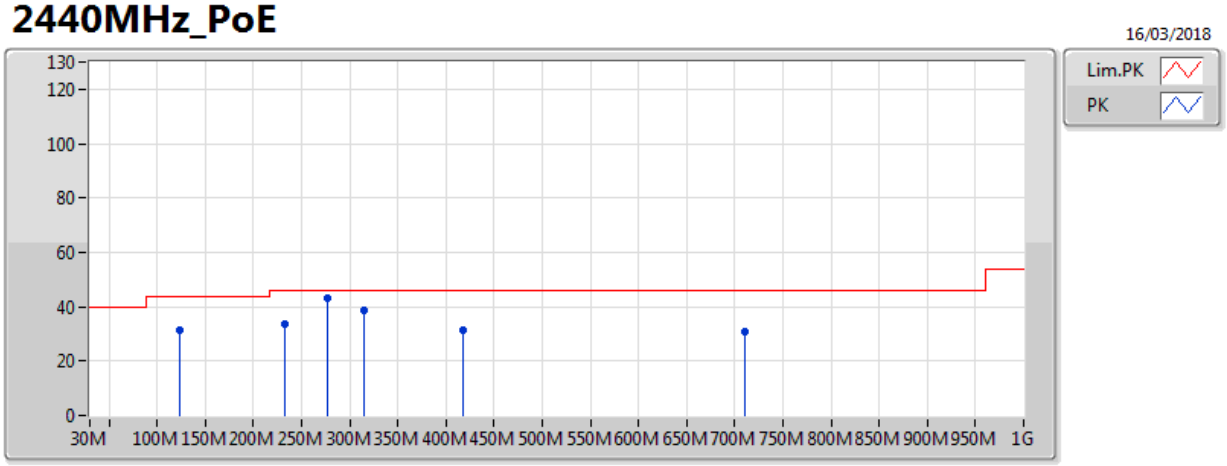
2440MHz_PoE



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	43.58M	29.47	40.00	-10.53	-15.40	3	Vertical	247	1.98	-	44.87	16.34	0.80	32.54
PK	282.2M	37.15	46.00	-8.85	-12.31	3	Vertical	247	1.98	-	49.46	17.92	2.07	32.30
PK	315.18M	33.87	46.00	-12.13	-11.47	3	Vertical	247	1.98	-	45.34	18.57	2.20	32.24
PK	418M	30.06	46.00	-15.94	-7.78	3	Vertical	247	1.98	-	37.84	21.63	2.65	32.06
PK	557.68M	30.03	46.00	-15.97	-4.89	3	Vertical	247	1.98	-	34.92	23.84	3.11	31.84
QP	30M	38.08	40.00	-1.92	-8.21	3	Vertical	207	1.34	-	46.29	23.65	0.69	32.55

BT-LE(1Mbps)

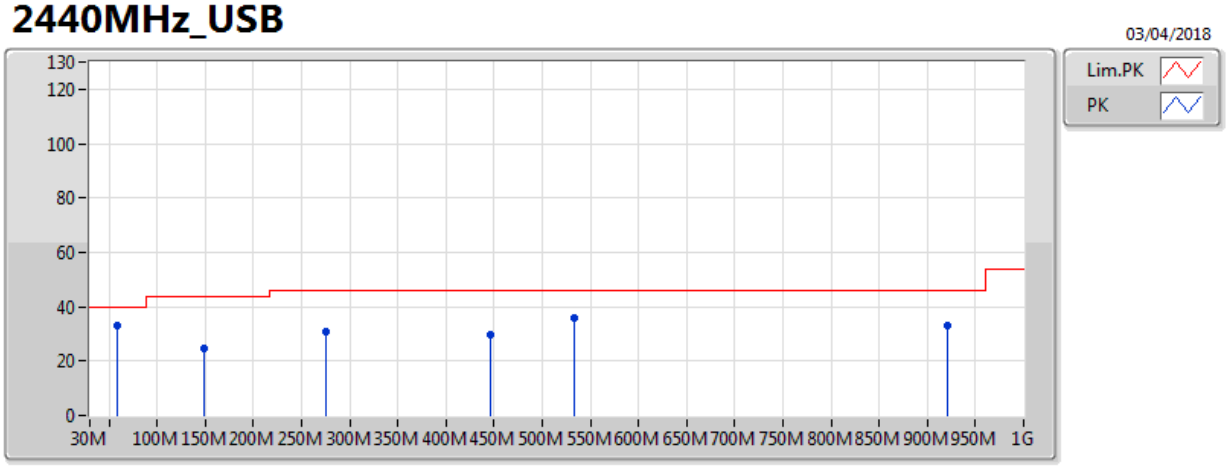
2440MHz_PoE



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	123.12M	31.22	43.50	-12.28	-14.17	3	Horizontal	307	2.35	-	45.39	16.98	1.35	32.50
PK	231.76M	33.90	46.00	-12.10	-15.06	3	Horizontal	307	2.35	-	48.96	15.45	1.86	32.37
PK	276.38M	43.25	46.00	-2.75	-12.35	3	Horizontal	307	2.35	-	55.60	17.91	2.04	32.30
PK	315.18M	38.51	46.00	-7.49	-11.47	3	Horizontal	307	2.35	-	49.98	18.57	2.20	32.24
PK	418M	31.51	46.00	-14.49	-7.78	3	Horizontal	307	2.35	-	39.29	21.63	2.65	32.06
PK	710.94M	31.06	46.00	-14.94	-4.23	3	Horizontal	307	2.35	-	35.29	24.08	3.37	31.68

BT-LE(1Mbps)

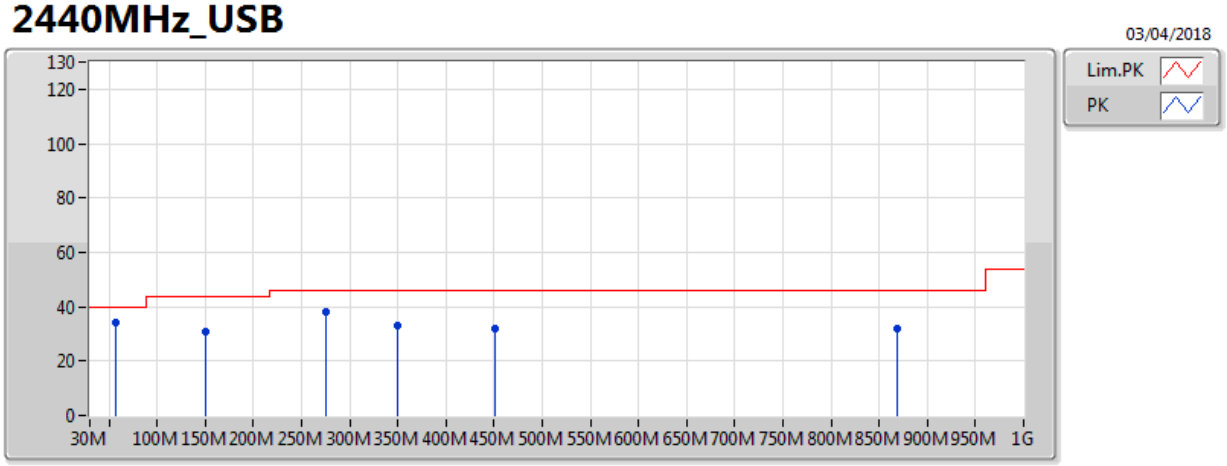
2440MHz_USB



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	58.115942M	33.33	40.00	-6.67	-14.98	3	Vertical	360	1.00	-	48.31	11.70	0.92	27.60
PK	148.086957M	24.64	43.50	-18.86	-10.17	3	Vertical	360	1.00	-	34.81	15.64	1.82	27.64
PK	274.608696M	30.75	46.00	-15.25	-6.33	3	Vertical	360	1.00	-	37.08	18.09	2.84	27.26
PK	446.115942M	29.67	46.00	-16.33	-3.00	3	Vertical	360	1.00	-	32.67	21.97	3.23	28.20
PK	533.275362M	36.11	46.00	-9.89	-1.83	3	Vertical	360	1.00	-	37.94	23.18	3.50	28.51
PK	921.275362M	33.07	46.00	-12.93	2.95	3	Vertical	360	1.00	-	30.12	25.96	4.56	27.57

BT-LE(1Mbps)

2440MHz_USB



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	56.710145M	34.14	40.00	-5.86	-14.87	3	Horizontal	0	1.00	-	49.01	11.81	0.91	27.59
PK	149.492754M	30.74	43.50	-12.76	-10.27	3	Horizontal	0	1.00	-	41.01	15.54	1.83	27.63
PK	274.608696M	38.31	46.00	-7.69	-6.33	3	Horizontal	0	1.00	-	44.64	18.09	2.84	27.26
PK	349.115942M	32.81	46.00	-13.19	-4.87	3	Horizontal	0	1.00	-	37.68	19.61	3.10	27.57
PK	450.333333M	31.86	46.00	-14.14	-2.94	3	Horizontal	0	1.00	-	34.80	22.05	3.23	28.22
PK	869.26087M	32.15	46.00	-13.85	2.21	3	Horizontal	0	1.00	-	29.94	25.71	4.29	27.78

Summary

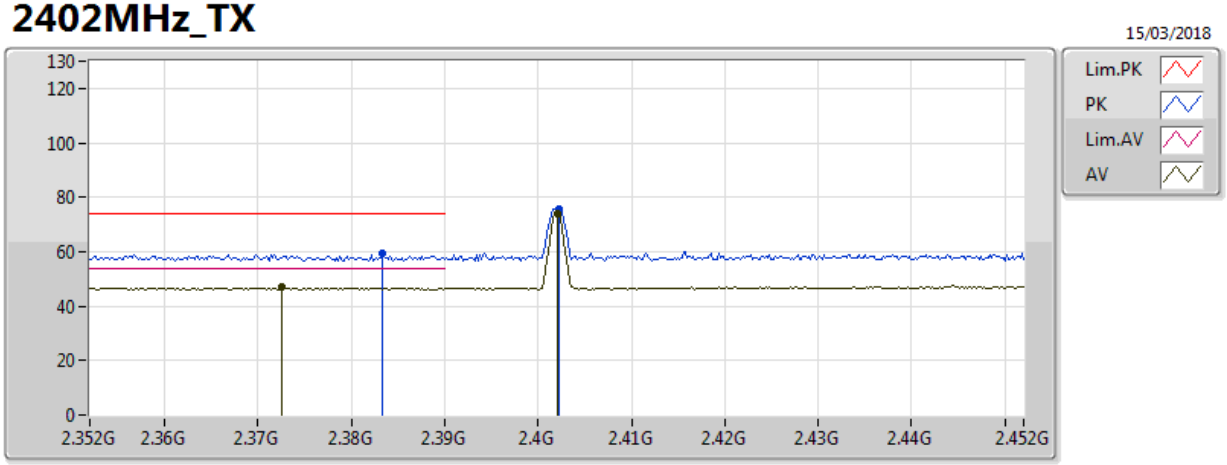
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.495G	47.60	54.00	-6.40	32.58	3	Horizontal	313	2.67	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3772G	47.04	54.00	-6.96	32.19	3	Horizontal	310	1.73	-
2402MHz	Pass	AV	2.402G	78.21	Inf	-Inf	32.28	3	Horizontal	310	1.73	-
2402MHz	Pass	PK	2.3738G	59.21	74.00	-14.79	32.17	3	Horizontal	310	1.73	-
2402MHz	Pass	PK	2.4022G	79.65	Inf	-Inf	32.28	3	Horizontal	310	1.73	-
2402MHz	Pass	AV	2.3726G	46.89	54.00	-7.11	32.17	3	Vertical	164	3.06	-
2402MHz	Pass	AV	2.402G	74.15	Inf	-Inf	32.28	3	Vertical	164	3.06	-
2402MHz	Pass	PK	2.3834G	59.15	74.00	-14.85	32.21	3	Vertical	164	3.06	-
2402MHz	Pass	PK	2.4022G	75.84	Inf	-Inf	32.28	3	Vertical	164	3.06	-
2402MHz	Pass	AV	4.811106G	33.50	54.00	-20.50	3.69	3	Horizontal	315	1.56	-
2402MHz	Pass	PK	4.807433G	45.86	74.00	-28.14	3.68	3	Horizontal	315	1.56	-
2402MHz	Pass	AV	4.812463G	31.95	54.00	-22.05	3.69	3	Vertical	319	1.04	-
2402MHz	Pass	PK	4.797772G	45.73	74.00	-28.27	3.65	3	Vertical	319	1.04	-
2440MHz	Pass	AV	2.3864G	46.89	54.00	-7.11	32.22	3	Horizontal	168	1.76	-
2440MHz	Pass	AV	2.44G	74.76	Inf	-Inf	32.40	3	Horizontal	168	1.76	-
2440MHz	Pass	AV	2.4896G	47.45	54.00	-6.55	32.56	3	Horizontal	168	1.76	-
2440MHz	Pass	PK	2.346G	59.83	74.00	-14.17	32.07	3	Horizontal	168	1.76	-
2440MHz	Pass	PK	2.44G	76.57	Inf	-Inf	32.40	3	Horizontal	168	1.76	-
2440MHz	Pass	PK	2.499998G	59.95	74.00	-14.05	32.59	3	Horizontal	168	1.76	-
2440MHz	Pass	AV	2.3456G	46.75	54.00	-7.25	32.06	3	Vertical	163	2.69	-
2440MHz	Pass	AV	2.44G	71.08	Inf	-Inf	32.40	3	Vertical	163	2.69	-
2440MHz	Pass	AV	2.4992G	47.41	54.00	-6.59	32.59	3	Vertical	163	2.69	-
2440MHz	Pass	PK	2.3864G	59.19	74.00	-14.81	32.22	3	Vertical	163	2.69	-
2440MHz	Pass	PK	2.4396G	73.15	Inf	-Inf	32.40	3	Vertical	163	2.69	-
2440MHz	Pass	PK	2.4916G	60.46	74.00	-13.54	32.56	3	Vertical	163	2.69	-
2440MHz	Pass	AV	4.87976G	35.45	54.00	-18.55	3.88	3	Horizontal	89	1.76	-
2440MHz	Pass	PK	4.877565G	46.10	74.00	-27.90	3.88	3	Horizontal	89	1.76	-
2440MHz	Pass	AV	4.879691G	33.14	54.00	-20.86	3.88	3	Vertical	57	1.00	-
2440MHz	Pass	PK	4.878583G	46.85	74.00	-27.15	3.88	3	Vertical	57	1.00	-
2480MHz	Pass	AV	2.48G	83.60	Inf	-Inf	32.53	3	Horizontal	313	2.67	-
2480MHz	Pass	AV	2.495G	47.60	54.00	-6.40	32.58	3	Horizontal	313	2.67	-
2480MHz	Pass	PK	2.4798G	84.84	Inf	-Inf	32.53	3	Horizontal	313	2.67	-
2480MHz	Pass	PK	2.4914G	59.63	74.00	-14.37	32.56	3	Horizontal	313	2.67	-
2480MHz	Pass	AV	2.48G	75.27	Inf	-Inf	32.53	3	Vertical	61	3.19	-
2480MHz	Pass	AV	2.497G	47.41	54.00	-6.59	32.58	3	Vertical	61	3.19	-
2480MHz	Pass	PK	2.4798G	76.91	Inf	-Inf	32.53	3	Vertical	61	3.19	-
2480MHz	Pass	PK	2.4892G	59.40	74.00	-14.60	32.56	3	Vertical	61	3.19	-
2480MHz	Pass	AV	4.960519G	34.41	54.00	-19.59	4.14	3	Horizontal	351	1.58	-
2480MHz	Pass	PK	4.960519G	46.25	74.00	-27.75	4.14	3	Horizontal	351	1.58	-
2480MHz	Pass	AV	4.962635G	33.77	54.00	-20.23	4.15	3	Vertical	232	1.72	-
2480MHz	Pass	PK	4.955768G	46.49	74.00	-27.51	4.12	3	Vertical	232	1.72	-

BT-LE(1Mbps)

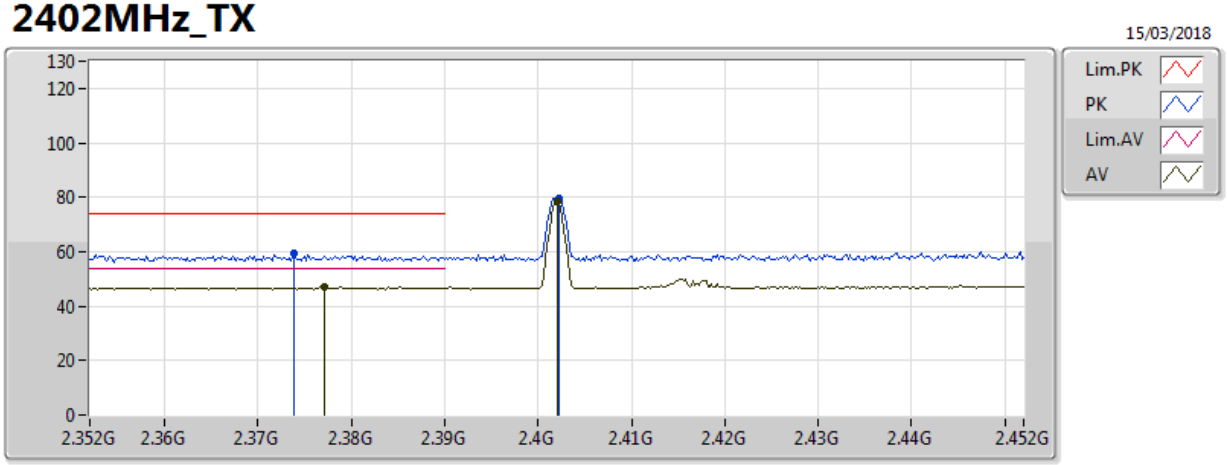
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3726G	46.89	54.00	-7.11	32.17	3	Vertical	164	3.06	-	14.72	27.01	5.16	-
AV	2.402G	74.15	Inf	-Inf	32.28	3	Vertical	164	3.06	-	41.87	27.07	5.20	-
PK	2.3834G	59.15	74.00	-14.85	32.21	3	Vertical	164	3.06	-	26.94	27.03	5.18	-
PK	2.4022G	75.84	Inf	-Inf	32.28	3	Vertical	164	3.06	-	43.56	27.08	5.20	-

BT-LE(1Mbps)

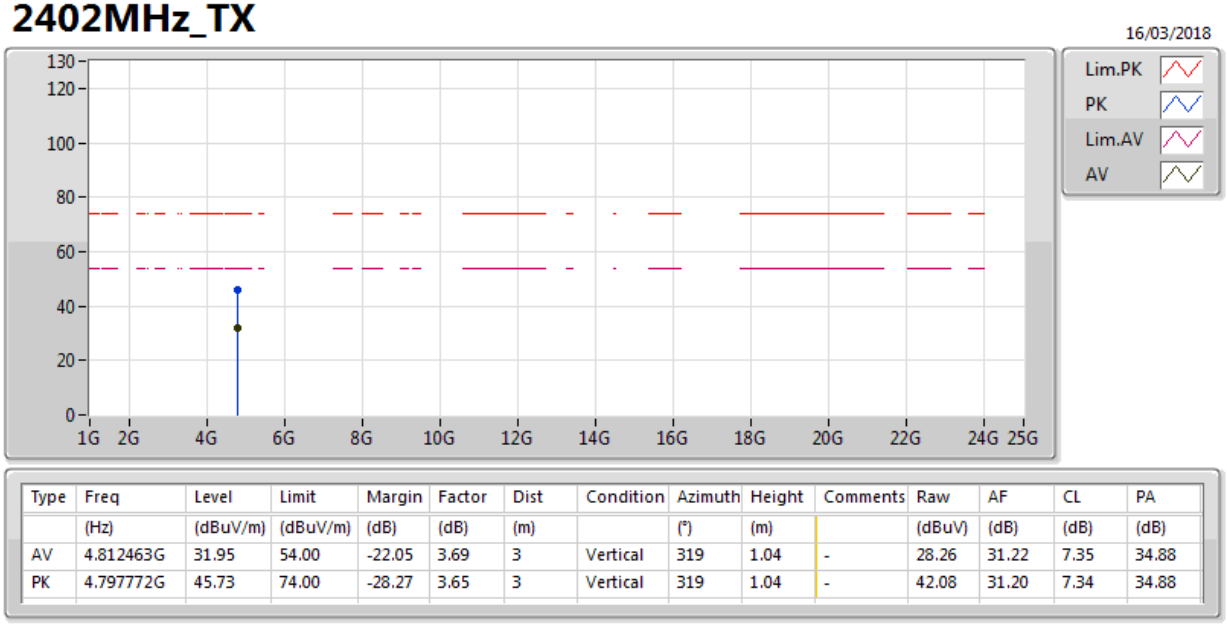
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3772G	47.04	54.00	-6.96	32.19	3	Horizontal	310	1.73	-	14.85	27.02	5.17	-
AV	2.402G	78.21	Inf	-Inf	32.28	3	Horizontal	310	1.73	-	45.93	27.07	5.20	-
PK	2.3738G	59.21	74.00	-14.79	32.17	3	Horizontal	310	1.73	-	27.04	27.01	5.16	-
PK	2.4022G	79.65	Inf	-Inf	32.28	3	Horizontal	310	1.73	-	47.37	27.08	5.20	-

BT-LE(1Mbps)

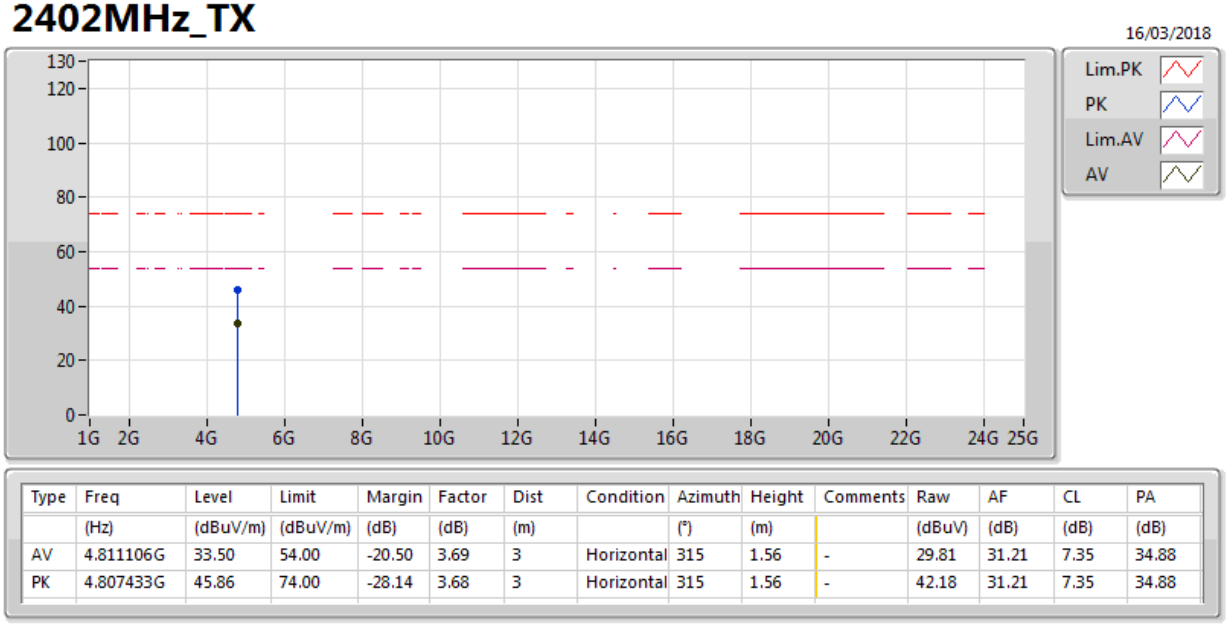
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.812463G	31.95	54.00	-22.05	3.69	3	Vertical	319	1.04	-	28.26	31.22	7.35	34.88
PK	4.797772G	45.73	74.00	-28.27	3.65	3	Vertical	319	1.04	-	42.08	31.20	7.34	34.88

BT-LE(1Mbps)

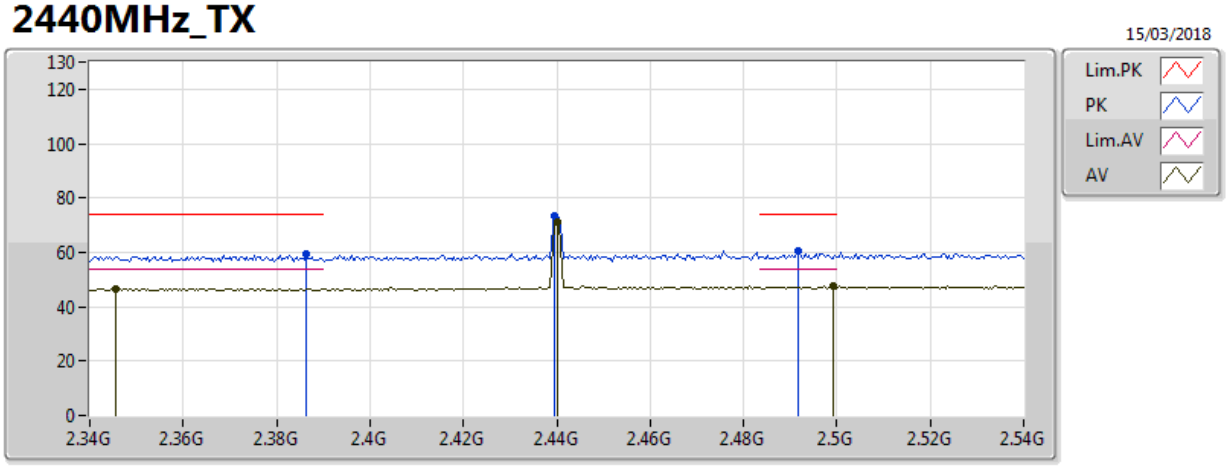
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.811106G	33.50	54.00	-20.50	3.69	3	Horizontal	315	1.56	-	29.81	31.21	7.35	34.88
PK	4.807433G	45.86	74.00	-28.14	3.68	3	Horizontal	315	1.56	-	42.18	31.21	7.35	34.88

BT-LE(1Mbps)

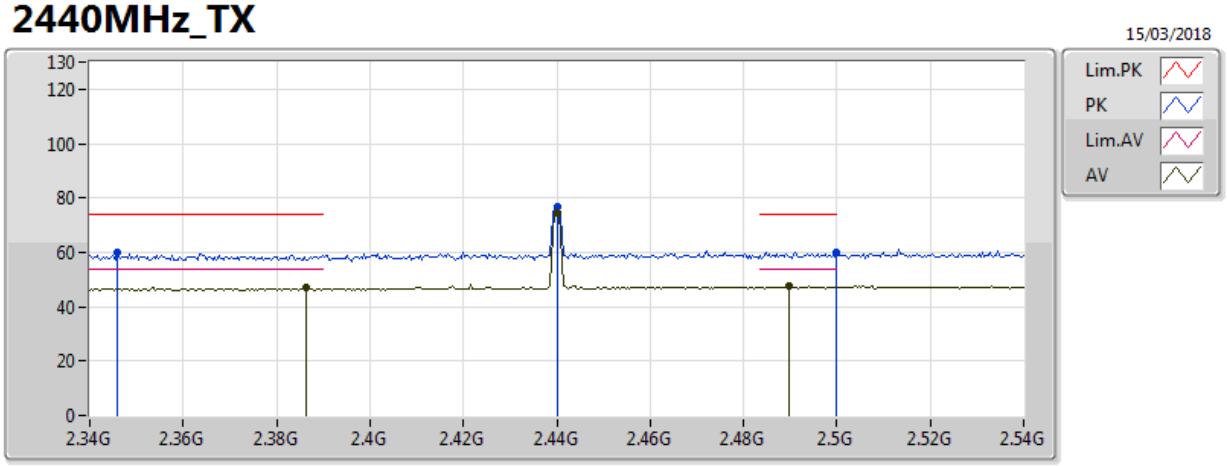
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3456G	46.75	54.00	-7.25	32.06	3	Vertical	163	2.69	-	14.69	26.94	5.12	-
AV	2.44G	71.08	Inf	-Inf	32.40	3	Vertical	163	2.69	-	38.68	27.16	5.24	-
AV	2.4992G	47.41	54.00	-6.59	32.59	3	Vertical	163	2.69	-	14.82	27.30	5.29	-
PK	2.3864G	59.19	74.00	-14.81	32.22	3	Vertical	163	2.69	-	26.97	27.04	5.18	-
PK	2.4396G	73.15	Inf	-Inf	32.40	3	Vertical	163	2.69	-	40.75	27.16	5.24	-
PK	2.4916G	60.46	74.00	-13.54	32.56	3	Vertical	163	2.69	-	27.90	27.28	5.28	-

BT-LE(1Mbps)

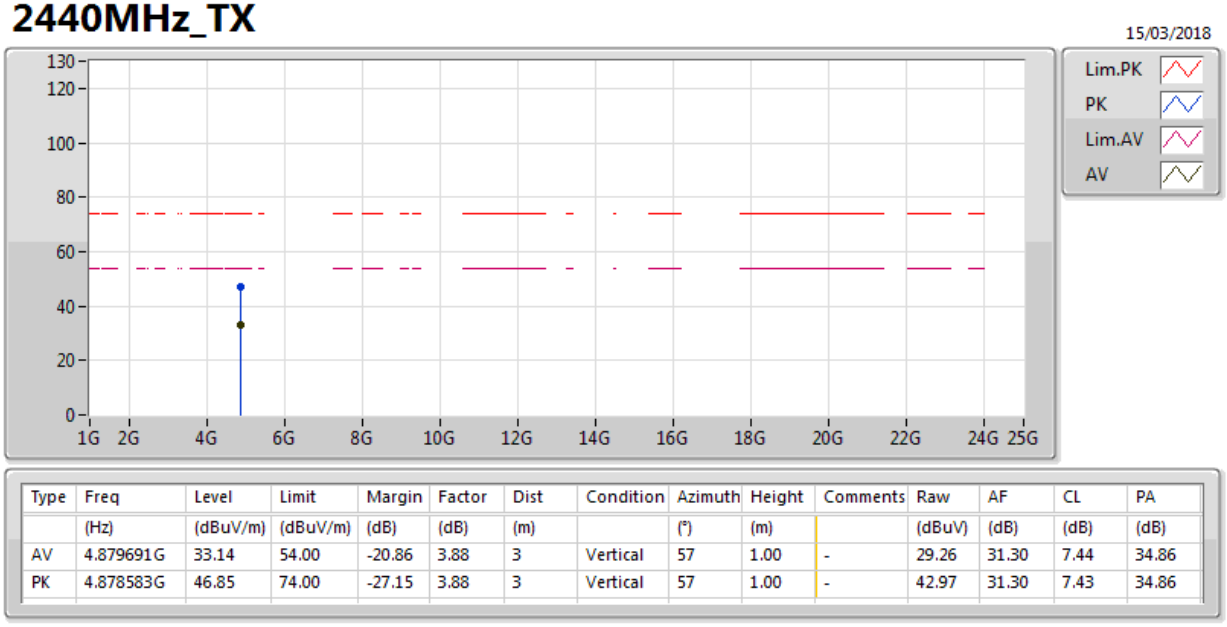
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3864G	46.89	54.00	-7.11	32.22	3	Horizontal	168	1.76	-	14.67	27.04	5.18	-
AV	2.44G	74.76	Inf	-Inf	32.40	3	Horizontal	168	1.76	-	42.36	27.16	5.24	-
AV	2.4896G	47.45	54.00	-6.55	32.56	3	Horizontal	168	1.76	-	14.89	27.28	5.28	-
PK	2.346G	59.83	74.00	-14.17	32.07	3	Horizontal	168	1.76	-	27.76	26.95	5.12	-
PK	2.44G	76.57	Inf	-Inf	32.40	3	Horizontal	168	1.76	-	44.17	27.16	5.24	-
PK	2.499998G	59.95	74.00	-14.05	32.59	3	Horizontal	168	1.76	-	27.36	27.30	5.29	-

BT-LE(1Mbps)

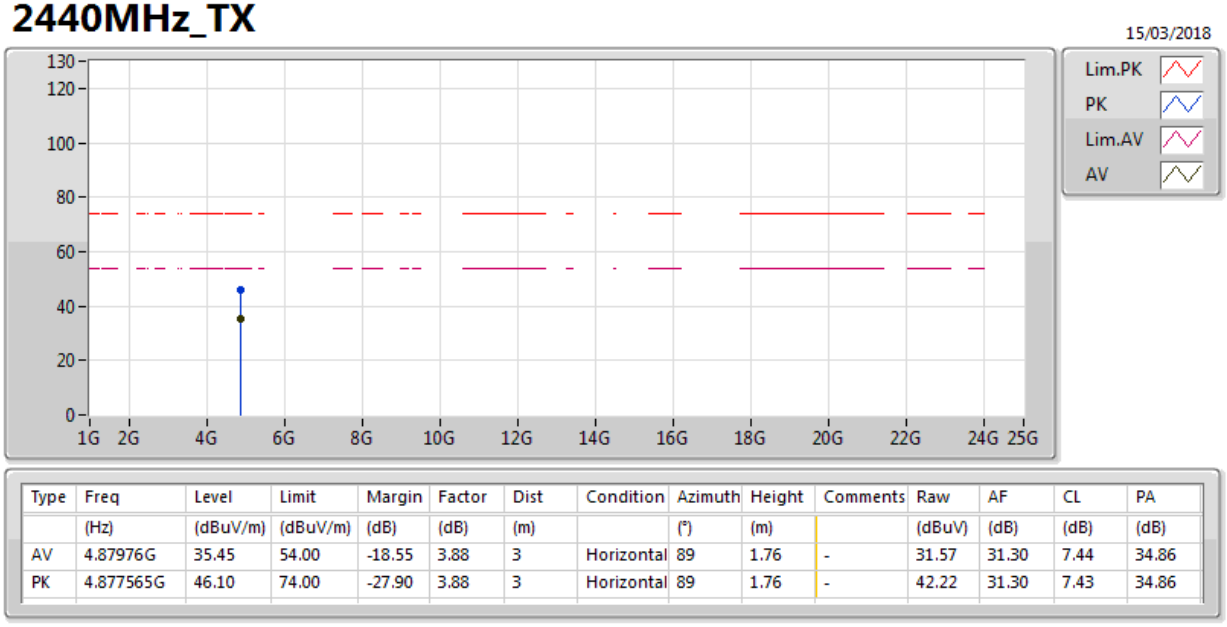
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.879691G	33.14	54.00	-20.86	3.88	3	Vertical	57	1.00	-	29.26	31.30	7.44	34.86
PK	4.878583G	46.85	74.00	-27.15	3.88	3	Vertical	57	1.00	-	42.97	31.30	7.43	34.86

BT-LE(1Mbps)

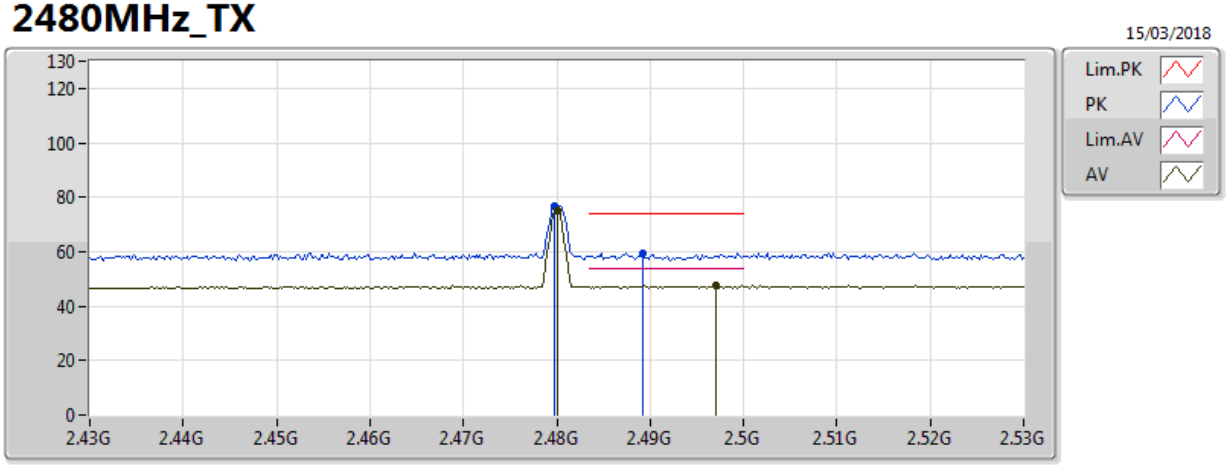
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87976G	35.45	54.00	-18.55	3.88	3	Horizontal	89	1.76	-	31.57	31.30	7.44	34.86
PK	4.877565G	46.10	74.00	-27.90	3.88	3	Horizontal	89	1.76	-	42.22	31.30	7.43	34.86

BT-LE(1Mbps)

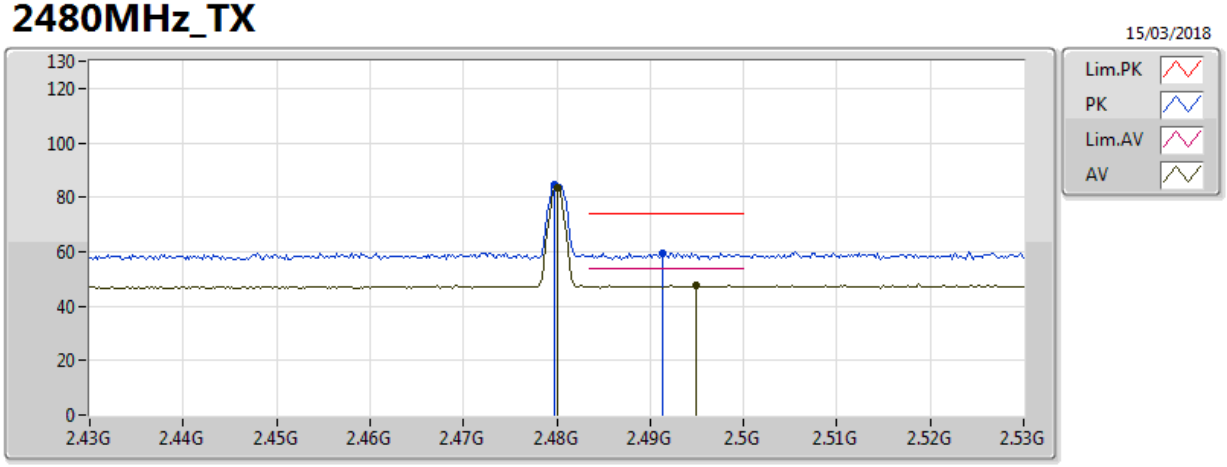
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	75.27	Inf	-Inf	32.53	3	Vertical	61	3.19	-	42.74	27.25	5.27	-
AV	2.497G	47.41	54.00	-6.59	32.58	3	Vertical	61	3.19	-	14.83	27.29	5.29	-
PK	2.4798G	76.91	Inf	-Inf	32.53	3	Vertical	61	3.19	-	44.38	27.25	5.27	-
PK	2.4892G	59.40	74.00	-14.60	32.56	3	Vertical	61	3.19	-	26.84	27.28	5.28	-

BT-LE(1Mbps)

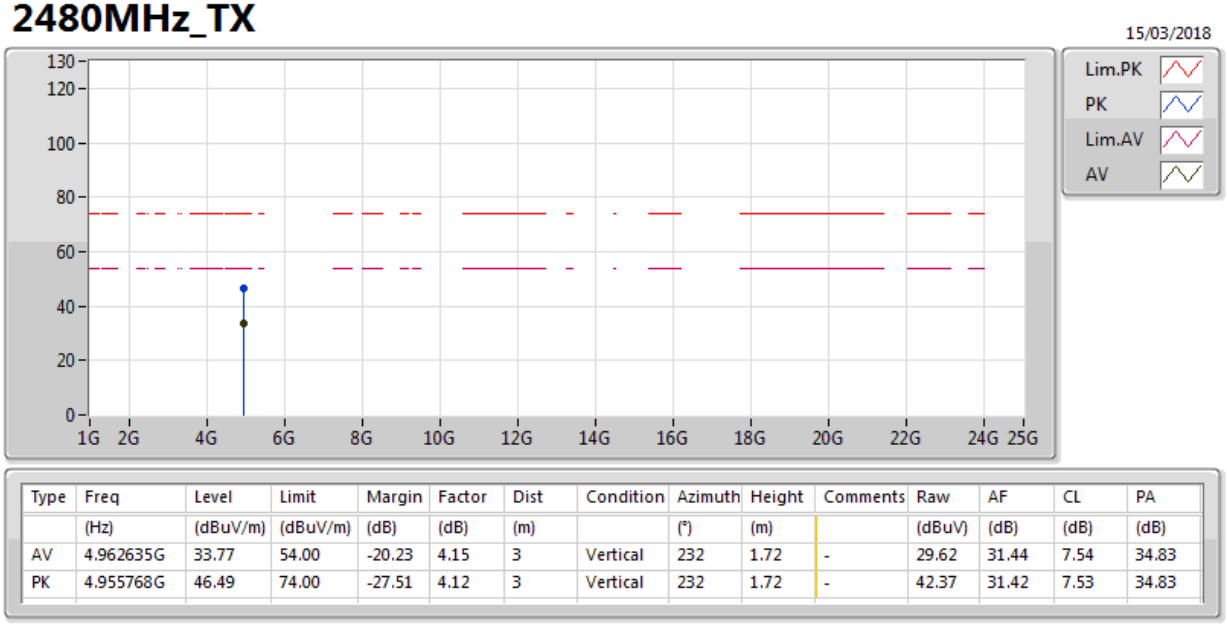
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	83.60	Inf	-Inf	32.53	3	Horizontal	313	2.67	-	51.07	27.25	5.27	-
AV	2.495G	47.60	54.00	-6.40	32.58	3	Horizontal	313	2.67	-	15.02	27.29	5.29	-
PK	2.4798G	84.84	Inf	-Inf	32.53	3	Horizontal	313	2.67	-	52.31	27.25	5.27	-
PK	2.4914G	59.63	74.00	-14.37	32.56	3	Horizontal	313	2.67	-	27.07	27.28	5.28	-

BT-LE(1Mbps)

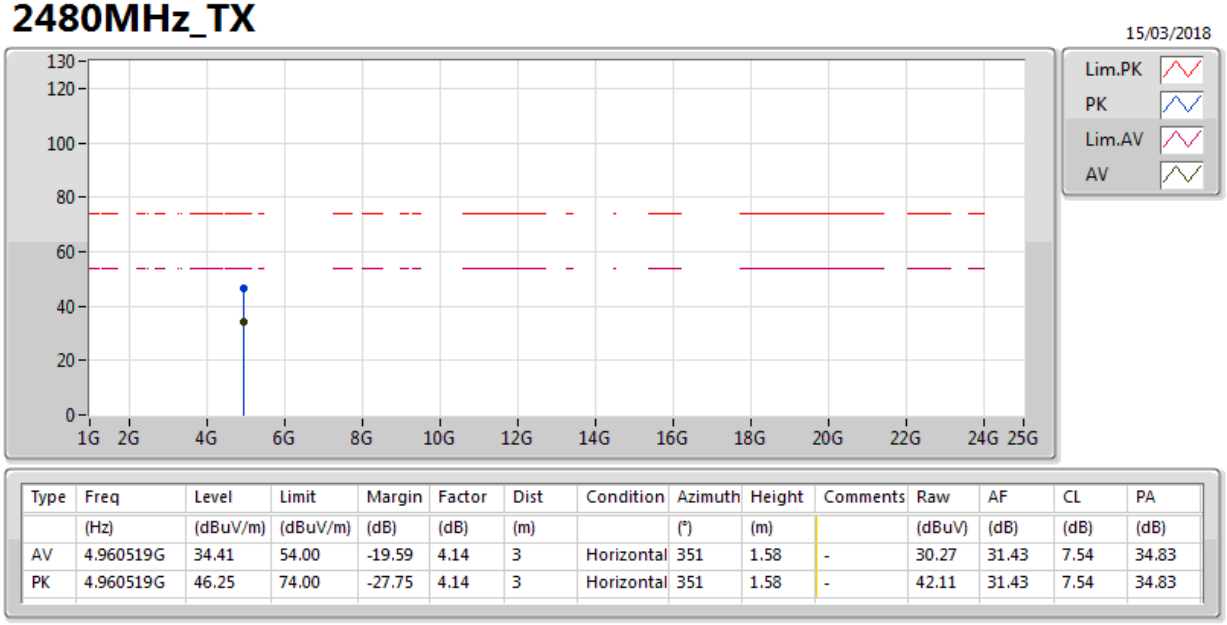
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.962635G	33.77	54.00	-20.23	4.15	3	Vertical	232	1.72	-	29.62	31.44	7.54	34.83
PK	4.955768G	46.49	74.00	-27.51	4.12	3	Vertical	232	1.72	-	42.37	31.42	7.53	34.83

BT-LE(1Mbps)

2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.960519G	34.41	54.00	-19.59	4.14	3	Horizontal	351	1.58	-	30.27	31.43	7.54	34.83
PK	4.960519G	46.25	74.00	-27.75	4.14	3	Horizontal	351	1.58	-	42.11	31.43	7.54	34.83