FCC Test Report

Equipment	:	802.11 a/b/g/n/ac 2T2R+BT V4.2LE combo module
Brand Name	:	LITE-ON
Model No.	:	WCBN3510A
FCC ID	:	PPQ-WCBN3510A
Standard	:	47 CFR FCC Part 15.247
Operating Band	:	2400 MHz – 2483.5 MHz
Function	:	☒Point-to-multipoint; ☐Point-to-point
Applicant	:	LITE-ON Technology Corp. Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C
Manufacturer	:	LITE-ON TECHNOLOGY (Changzhou) CO., LTD A9 Building,No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone ,Changzhou City, Jiangsu Province 213100 China

The product sample received on Nov. 27, 2017 and completely tested on Dec. 14, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONALINC., the test report shall not be reproduced except in full.

Phoenix Chen / Assistant Manager

Testing Laboratory
1190

Table of Contents

1 GENERAL DESCRIPTION 5

1.1 Information 5
1.2 Testing Applied Standards 8
1.3 Testing Location Information 8
1.4 Measurement Uncertainty 8

2 TEST CONFIGURATION OF EUT 9

2.1 Test Condition 9
2.2 Test Channel Mode 9
2.3 The Worst Case Measurement Configuration 10
2.4 Support Equipment 11
2.5 Test Setup Diagram 12

3 TRANSMITTER TEST RESULT 13

3.1 AC Power-line Conducted Emissions 13
3.2 DTS Bandwidth 14
3.3 Maximum Conducted Output Power 15
3.4 Power Spectral Density 17
3.5 Emissions in Non-restricted Frequency Bands 18
3.6 Emissions in Restricted Frequency Bands 19

4 TEST EQUIPMENT AND CALIBRATION DATA 23

APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS

APPENDIX B. TEST RESULTS OF DTS BANDWIDTH

APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER

APPENDIX D. TEST RESULTS OF POWER SPECTRAL DENSITY

APPENDIX E. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

APPENDIX F. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS

APPENDIX G. TEST PHOTOS

PHOTOGRAPHS OF EUT V01

Summary of Test Result

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

Revision History

Report No.	Version	Description	Issued Date
FR7N1336AL	Rev. 01	Initial issue of report	Jan. 15, 2018

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.	Project	Brand	Product Name	P/N	Antenna Type	Connector
1	-	Walsin	WIFI- Antenna	RFMTA401020IMLB701	PIFA	Mini i-Pex
2	-	Walsin	WIFI-2 Antenna	RFMTA401020IMLB701	PIFA	Mini i-Pex
3	-	Walsin	BT Antenna	RFMTA401020IMLB701	PIFA	Mini i-Pex
4	Sparrow 10 inch	Shenzhen South Star Technology Co., LTD	WIFI- Antenna	N12-4140-R0A	PIFA	-
5		Shenzhen South Star Technology Co., LTD	WIFI-2 Antenna	N12-4141-R0A	PIFA	-
6		Shenzhen South Star Technology Co., LTD	BT Antenna	N14-0594-R0A	PIFA	-
7	Sparrow 8 inch	Shenzhen South Star Technology Co., LTD	WIFI- Antenna	N12-4142-R0A	PIFA	-
8		Shenzhen South Star Technology Co., LTD	WIFI-2 Antenna	N12-4143-R0A	PIFA	-
9		Shenzhen South Star Technology Co., LTD	BT Antenna	N14-0595-R0A	PIFA	-

Ant.	Port	Gain (dBi)		
		2.4G	5G	BT
1	1	3.52	4.18	-
2	2	3.52	4.18	-
3	1	-	-	3.52
4	-	2.97	4.04	-
5	-	3.41	4.05	-
6	-	-	-	3.31
7	-	3.35	3.97	-
8	-	3.33	3.86	-
9	-	-	-	2.86

Note 1: EUT can match with above antennas for using. The higher gain (Ant. 1/2/3) was used to perform the worst configuration and result of that was recorded as the final test result.

For 2.4 GHz function:

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

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

For 5 GHz function:

For IEEE 802.11a/n/ac mode (2TX/2RX)

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

For Bluetooth function:

For Bluetooth mode (1TX/1RX)

Only Ant. 3 (port 1) can be used as transmitting/receiving antenna.

1.1.3 EUT Information

Identify EUT			
RF Chip	Qualcomm QCA9379-3		
Operational Condition			
EUT Power Type	From 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)	0.657	1.824	410.938u	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
RF Conducted	TH07-HY	Ryan	24.5°C / 65%	07/Dec/2017
Radiated	03CH03-HY	Jeff	24.1°C / 63%	14/Dec/2017
AC Conduction	CO04-HY	Thor	23.9°C / 58.5%	07/Dec/2017

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%

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	120V

2.2 Test Channel Mode

Test Software Version	QCARCT 3.0.197.0

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	Adapter mode

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

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

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	Bluetooth+WLAN 2.4GHz
2	Bluetooth+WLAN 5GHz
Refer to Sporton Test Report No.: FA7N1336 for Co-location RF Exposure Evaluation.	

2.4 Support Equipment

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	DoC
2	Adapter for NB	DELL	HA65NM130	DoC
3	Notebook	DELL	E5410	DoC
4	Adapter for NB	DELL	HA65NM130	DoC
5	Fixture	-	-	N/A
6	AC adapter for Fixture	Asian	WB-18D12FU	N/A

Note: Support equipment No.5 & 6 were provided by customer.

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Fixture	-	-	N/A
2	AC adapter for Fixture	Asian	WB-18D12FU	N/A

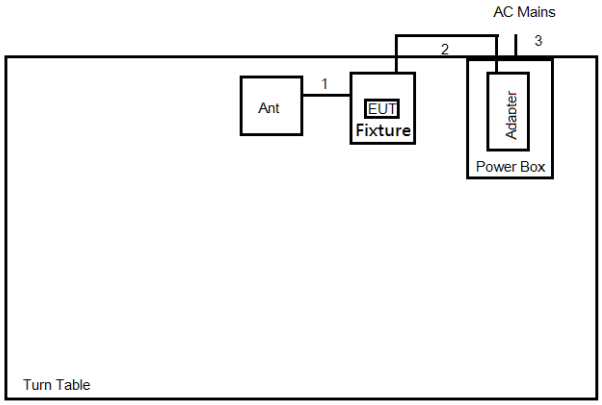
Note: Support equipment No.1 & 2 were provided by customer.

Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Fixture	-	-	N/A
2	AC adapter for Fixture	Asian	WB-18D12FU	N/A

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

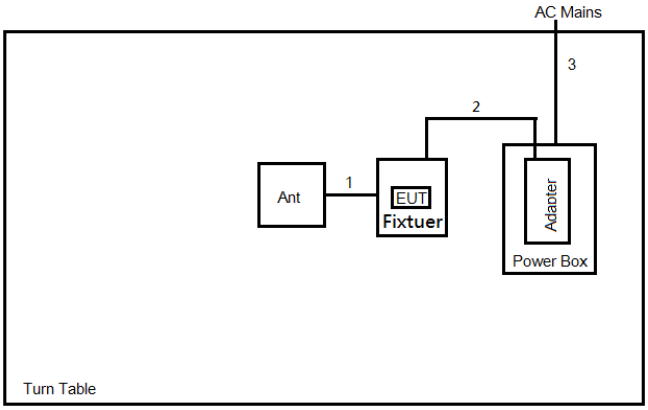
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	RF cable	No	0.2m	-
2	DC Power cable	No	1.5m	-
3	AC Power cable	No	1.5m	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	RF cable	No	0.2m	-
2	DC Power cable	No	1.5m	-
3	AC Power cable	No	1.5m	-

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

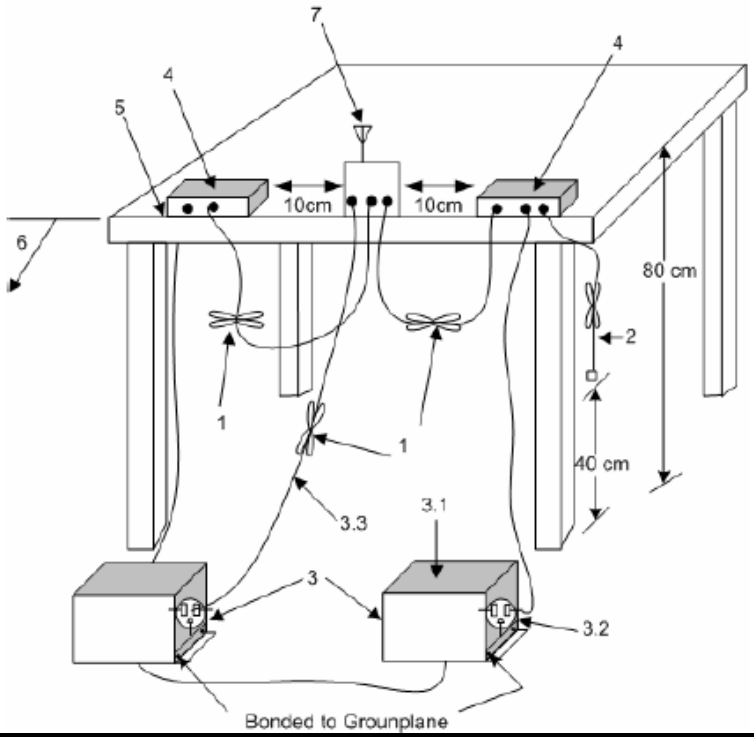
Refer a test equipment and calibration data table in this test report.

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.

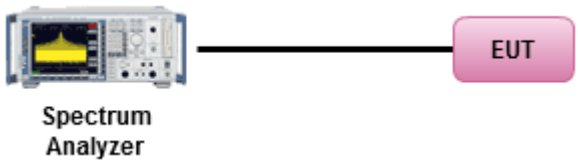
3.2.2 Measuring Instruments

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 $G_{TX} \leq 6$ 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 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

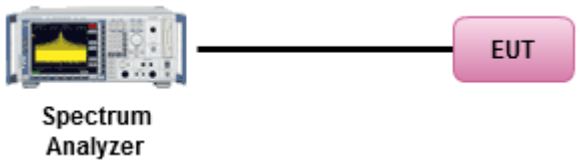
3.4.2 Measuring Instruments

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

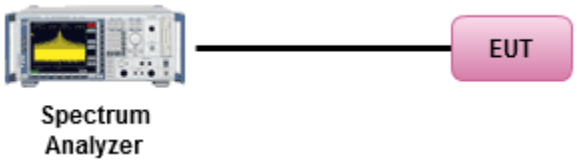
Refer a test equipment and calibration data table in this test report.

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.

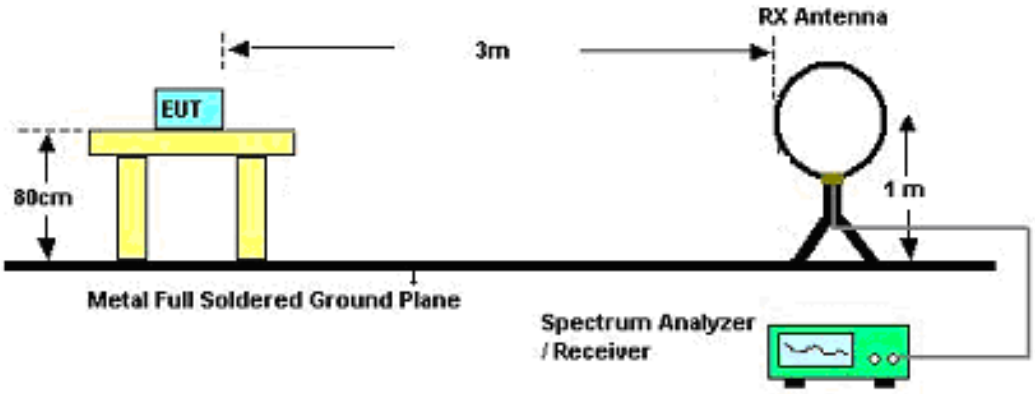
3.6.3 Test Procedures

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.	

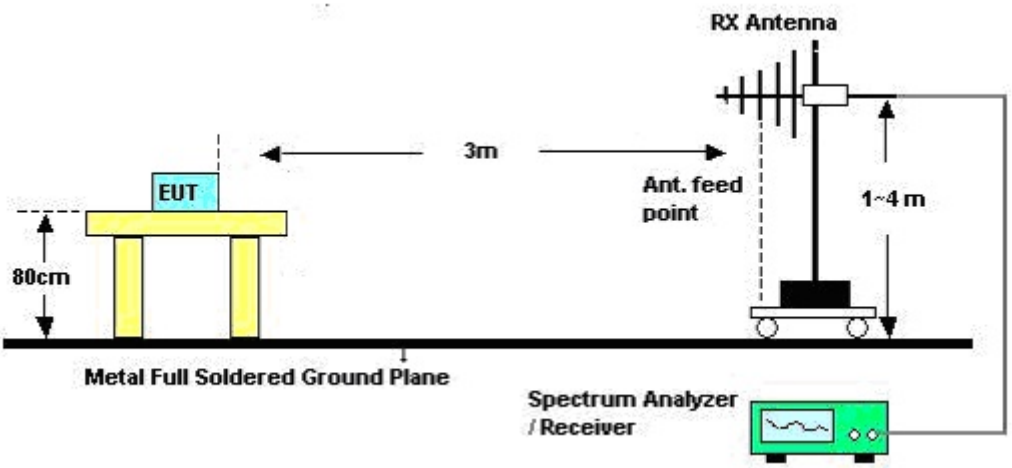
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

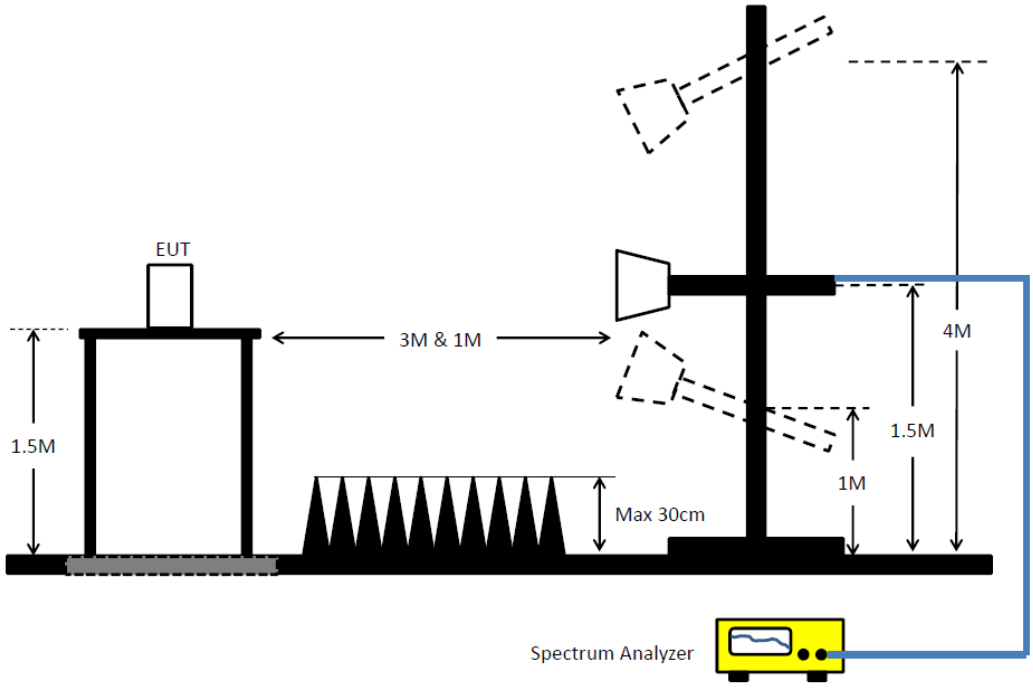
9kHz ~30MHz



30MHz~1GHz



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	29/Apr/2017	28/Apr/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
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	17/Nov/2017	16/Nov/2018

NCR : Non-Calibration Require

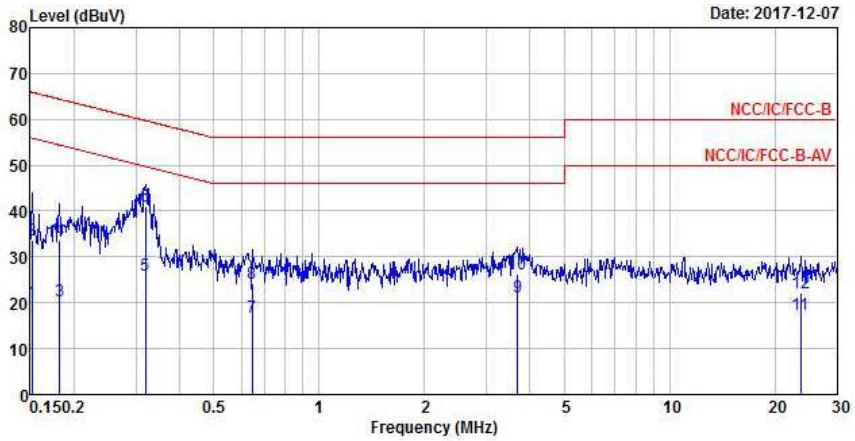
Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	31/Oct/2017	30/Oct/2018
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	01/Nov/2017	31/Oct/2018
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	19/Apr/2017	18/Apr/2018
Amplifier	Keysight	83017A	MY53270196	1GHz ~ 26.5GHz	31/Aug/2017	30/Aug/2018
Spectrum	R&S	FSV40	101500	9kHz ~ 40GHz	28/Jun/2017	27/Jun/2018
Receiver	R&S	ESR3	102052	9KHz ~ 3.6GHz	29/Apr/2017	28/Apr/2018
Bluetooth Tester	R&S	CBT	100959	Bluetooth Station	02/Mar/2017	01/Mar/2018
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	26/Jan/2017	25/Jan/2018
RF Cable-high	SUHNER	SUCOFLEX106	CB222	1GHz ~ 40GHz	26/Jan/2017	25/Jan/2018
Bilog Antenna	SCHAFFNER	CBL 6112B	22237	30MHz ~ 1GHz	08/Jul/2017	07/Jul/2018
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	18GHz ~ 40GHz	06/Feb/ 2017	05/Feb/2018
Horn Antenna	SCHWARZBECK	BBHA9120D	1531	1GHz ~ 18GHz	25/Apr/ 2017	24/Apr/2018
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	02/Mar/2017	01/Mar/2018

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9kHz~40GHz	30/Dec/2016	29/Dec/2017
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	MY10710/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	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

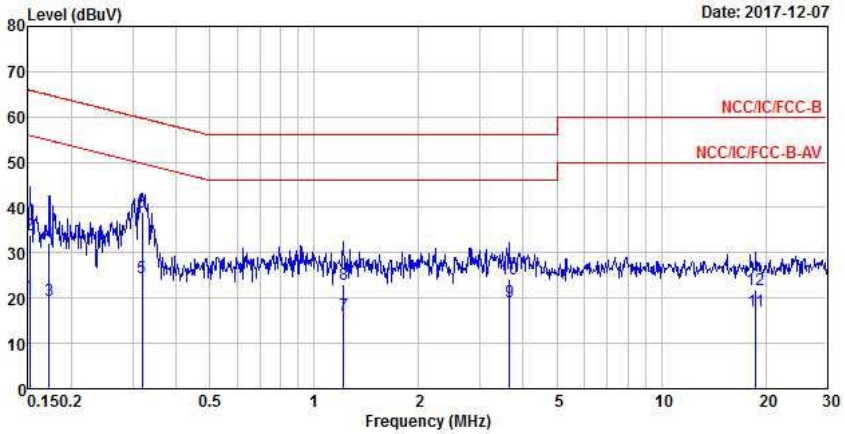
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	Adapter mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1516	19.98	-35.93	55.91	10.31	9.63	0.04	Average
2	0.1516	33.51	-32.40	65.91	23.84	9.63	0.04	QP
3	0.1815	20.25	-34.17	54.42	10.62	9.62	0.01	Average
4	0.1815	33.80	-30.62	64.42	24.17	9.62	0.01	QP
5	0.3200	25.98	-23.73	49.71	16.30	9.61	0.07	Average
6 MAX	0.3200	41.06	-18.65	59.71	31.38	9.61	0.07	QP
7	0.6440	16.92	-29.08	46.00	7.25	9.62	0.05	Average
8	0.6440	24.34	-31.66	56.00	14.67	9.62	0.05	QP
9	3.6806	21.26	-24.74	46.00	11.54	9.64	0.08	Average
10	3.6806	26.33	-29.67	56.00	16.61	9.64	0.08	QP
11	23.6361	17.42	-32.58	50.00	7.67	9.70	0.05	Average
12	23.6361	22.27	-37.73	60.00	12.52	9.70	0.05	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	Adapter mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1516	20.40	-35.51	55.91	10.74	9.62	0.04	Average
2	0.1516	33.95	-31.96	65.91	24.29	9.62	0.04	QP
3	0.1722	19.56	-35.30	54.86	9.92	9.62	0.02	Average
4	0.1722	32.13	-32.73	64.86	22.49	9.62	0.02	QP
5	0.3200	24.40	-25.31	49.71	14.72	9.61	0.07	Average
6 MAX	0.3200	38.91	-20.80	59.71	29.23	9.61	0.07	QP
7	1.2162	16.32	-29.68	46.00	6.71	9.61	0.00	Average
8	1.2162	22.91	-33.09	56.00	13.30	9.61	0.00	QP
9	3.6611	19.10	-26.90	46.00	9.39	9.63	0.08	Average
10	3.6611	24.26	-31.74	56.00	14.55	9.63	0.08	QP
11	18.7210	17.07	-32.93	50.00	7.30	9.62	0.15	Average
12	18.7210	21.92	-38.08	60.00	12.15	9.62	0.15	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)	671.25k	1.059M	1M06F1D	661.25k	1.053M

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

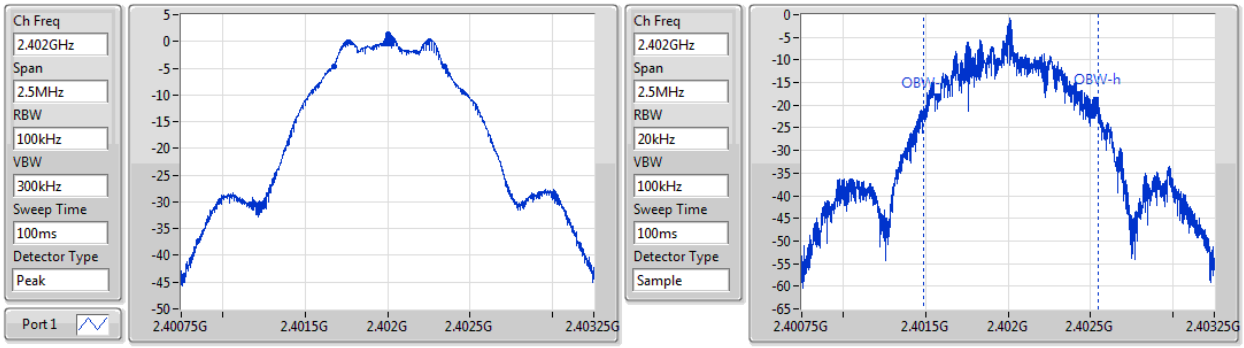
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	671.25k	1.059M
2440MHz	Pass	500k	666.25k	1.059M
2480MHz	Pass	500k	661.25k	1.053M

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

BT-LE(1Mbps) EBW

2402MHz

07/12/2017

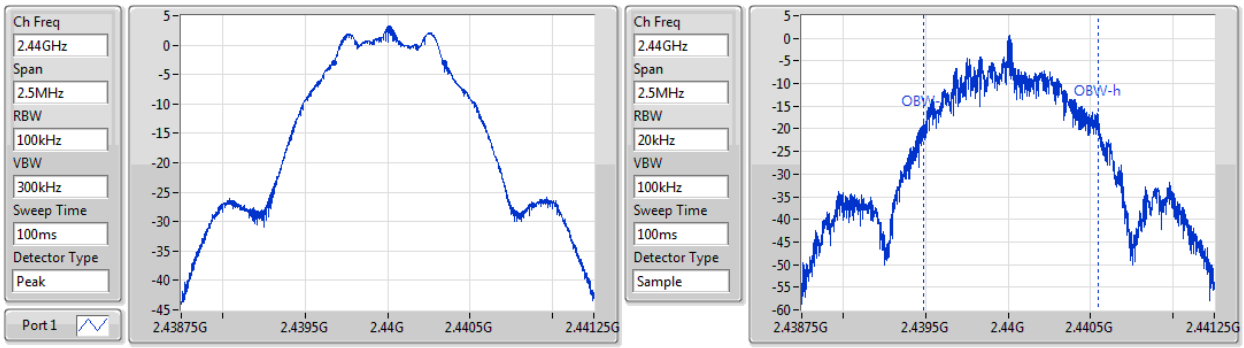


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
671.25k	2.401676G	2.402348G	1.059M	2.401488G	2.402547G	500k	1

BT-LE(1Mbps) EBW

2440MHz

07/12/2017

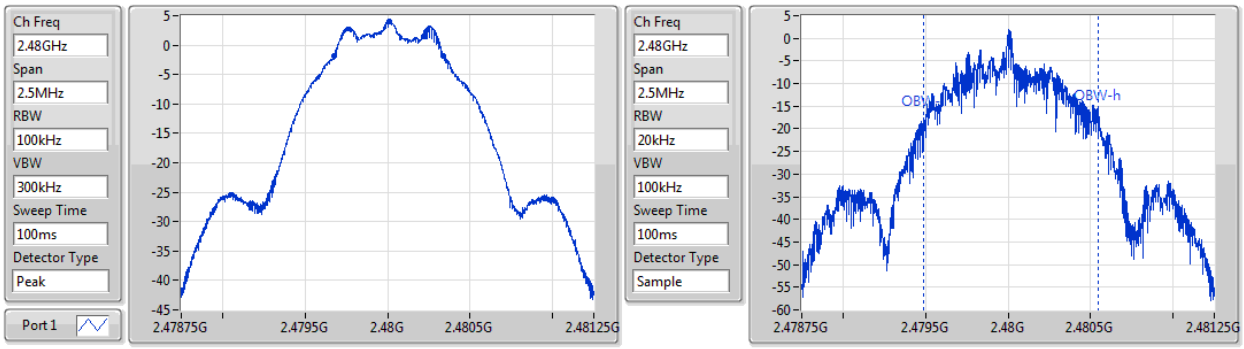


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
666.25k	2.439675G	2.440341G	1.059M	2.439485G	2.440545G	500k	1

BT-LE(1Mbps) EBW

2480MHz

07/12/2017



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
661.25k	2.479676G	2.480338G	1.053M	2.479492G	2.480545G	500k	1

Summary

Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	3.68	0.00233

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.52	0.82	30.00
2440MHz	Pass	3.52	2.50	30.00
2480MHz	Pass	3.52	3.68	30.00

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-10.74

RBW=3kHz.

Result

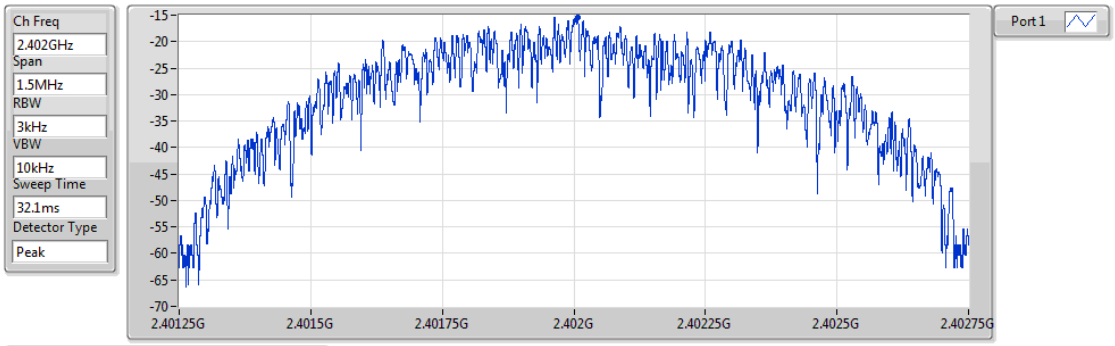
Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.52	-15.37	8.00
2440MHz	Pass	3.52	-11.79	8.00
2480MHz	Pass	3.52	-10.74	8.00

RBW=3kHz.

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

2402MHz

07/12/2017

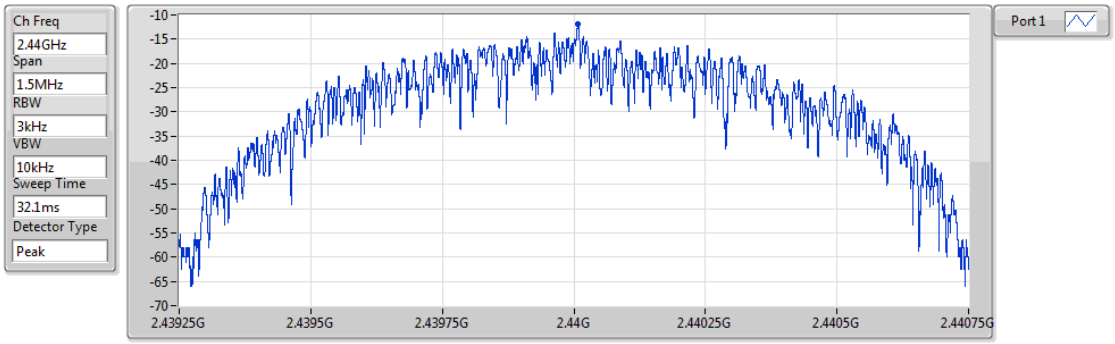


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-15.37	-15.37	-15.37

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

2440MHz

07/12/2017

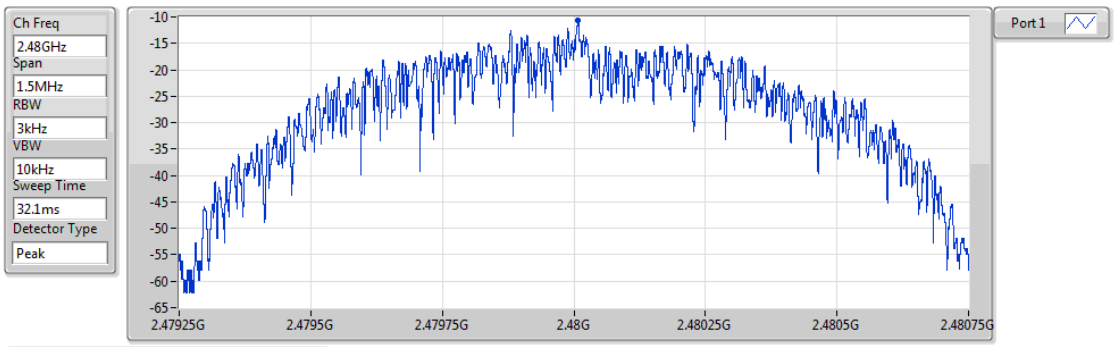


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-11.79	-11.79	-11.79

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

2480MHz

07/12/2017



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.74	-10.74	-10.74

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	2.479826G	3.12	-26.88	935.76M	-55.35	2.399548G	-56.17	2.48414G	-56.19	16.787836G	-49.26	1

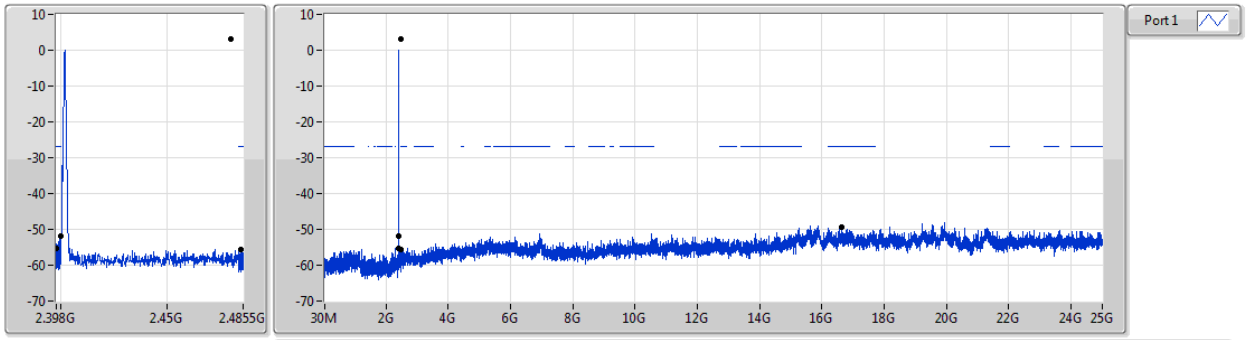
Result

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	2.479826G	3.12	-26.88	2.398G	-55.23	2.399904G	-51.88	2.48454G	-55.67	16.621792G	-49.41	1
2440MHz	Pass	2.479826G	3.12	-26.88	935.76M	-55.35	2.399548G	-56.17	2.48414G	-56.19	16.787836G	-49.26	1
2480MHz	Pass	2.479826G	3.12	-26.88	770M	-55.69	2.39978G	-56.70	2.484392G	-53.88	15.194935G	-49.47	1

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

2402MHz

07/12/2017

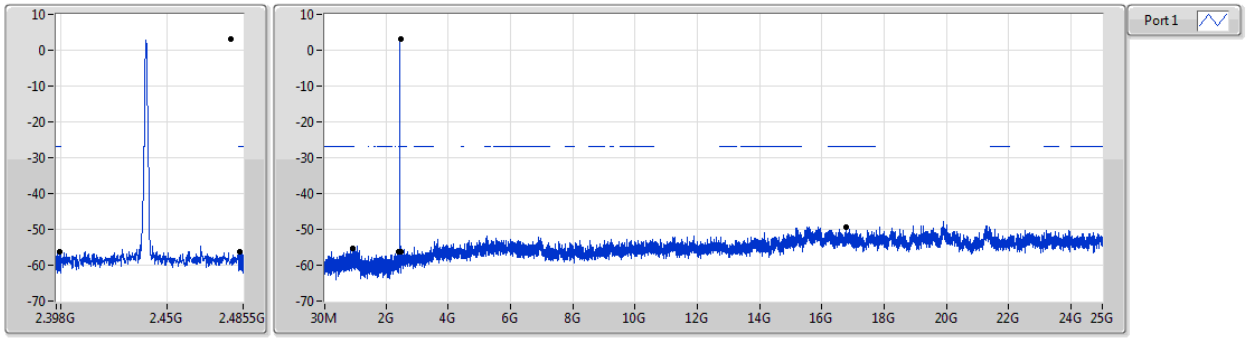


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.479826G	3.12	-26.88	2.398G	-55.23	2.399904G	-51.88	2.48454G	-55.67	16.621792G	-49.41	1

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

2440MHz

07/12/2017

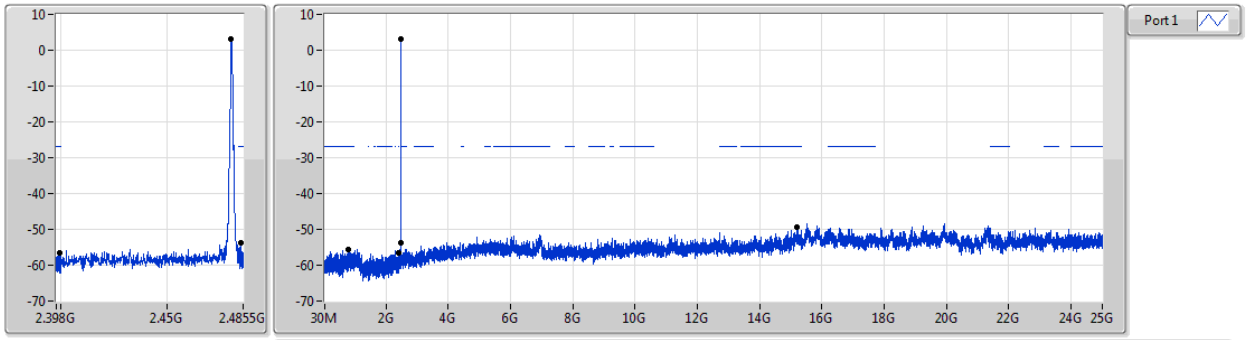


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.479826G	3.12	-26.88	935.76M	-55.35	2.399548G	-56.17	2.48414G	-56.19	16.787836G	-49.26	1

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

2480MHz

07/12/2017



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.479826G	3.12	-26.88	770M	-55.69	2.39978G	-56.70	2.484392G	-53.88	15.194935G	-49.47	1

Summary

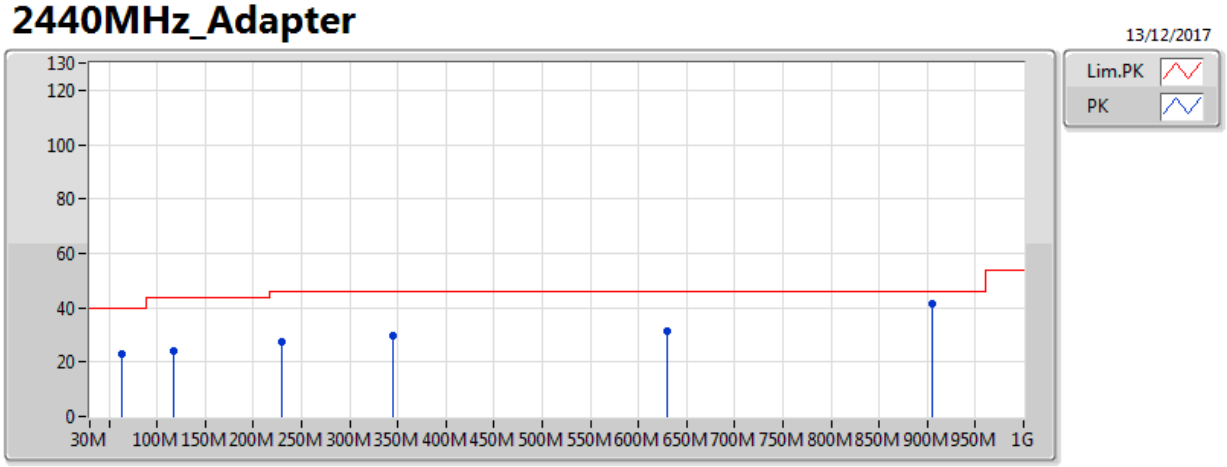
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	903M	42.14	46.00	-3.86	2.86	3	Horizontal	0	1.00	-

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	62.98M	25.75	40.00	-14.25	-14.33	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	150.28M	25.40	43.50	-18.10	-9.67	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	169.68M	23.65	43.50	-19.85	-9.74	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	573.2M	33.36	46.00	-12.64	-0.68	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	714.82M	40.57	46.00	-5.43	0.57	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	903M	42.14	46.00	-3.86	2.86	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	62.98M	22.83	40.00	-17.17	-14.33	3	Vertical	360	1.00	-
2440MHz	Pass	PK	117.3M	24.14	43.50	-19.36	-8.01	3	Vertical	360	1.00	-
2440MHz	Pass	PK	229.82M	27.50	46.00	-18.50	-9.04	3	Vertical	360	1.00	-
2440MHz	Pass	PK	344.28M	29.93	46.00	-16.07	-4.86	3	Vertical	360	1.00	-
2440MHz	Pass	PK	629.46M	31.16	46.00	-14.84	-0.02	3	Vertical	360	1.00	-
2440MHz	Pass	PK	904.94M	41.72	46.00	-4.28	2.88	3	Vertical	360	1.00	-

BT-LE(1Mbps)

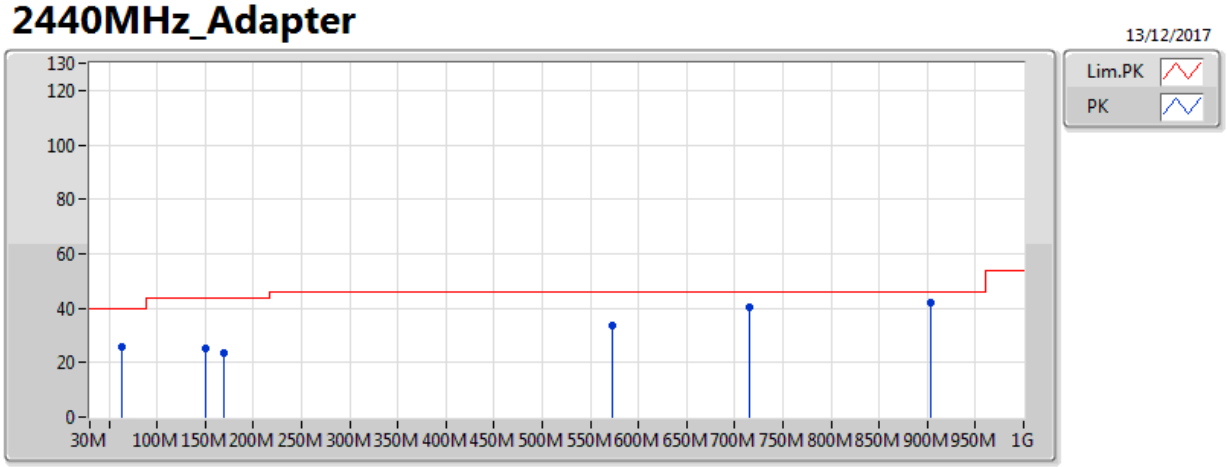
2440MHz_Adapter



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	62.98M	22.83	40.00	-17.17	-14.33	3	Vertical	360	1.00	-	37.16	11.48	1.68	27.49
PK	117.3M	24.14	43.50	-19.36	-8.01	3	Vertical	360	1.00	-	32.15	17.24	2.04	27.29
PK	229.82M	27.50	46.00	-18.50	-9.04	3	Vertical	360	1.00	-	36.54	15.29	2.51	26.84
PK	344.28M	29.93	46.00	-16.07	-4.86	3	Vertical	360	1.00	-	34.79	19.18	2.91	26.95
PK	629.46M	31.16	46.00	-14.84	-0.02	3	Vertical	360	1.00	-	31.18	23.97	3.99	27.98
PK	904.94M	41.72	46.00	-4.28	2.88	3	Vertical	360	1.00	-	38.84	25.56	4.80	27.49

BT-LE(1Mbps)

2440MHz_Adapter



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	62.98M	25.75	40.00	-14.25	-14.33	3	Horizontal	0	1.00	-	40.08	11.48	1.68	27.49
PK	150.28M	25.40	43.50	-18.10	-9.67	3	Horizontal	0	1.00	-	35.07	15.37	2.10	27.14
PK	169.68M	23.65	43.50	-19.85	-9.74	3	Horizontal	0	1.00	-	33.39	14.75	2.57	27.05
PK	573.2M	33.36	46.00	-12.64	-0.68	3	Horizontal	0	1.00	-	34.04	23.58	3.69	27.95
PK	714.82M	40.57	46.00	-5.43	0.57	3	Horizontal	0	1.00	-	40.00	24.30	4.19	27.92
PK	903M	42.14	46.00	-3.86	2.86	3	Horizontal	0	1.00	-	39.28	25.55	4.79	27.49

Summary

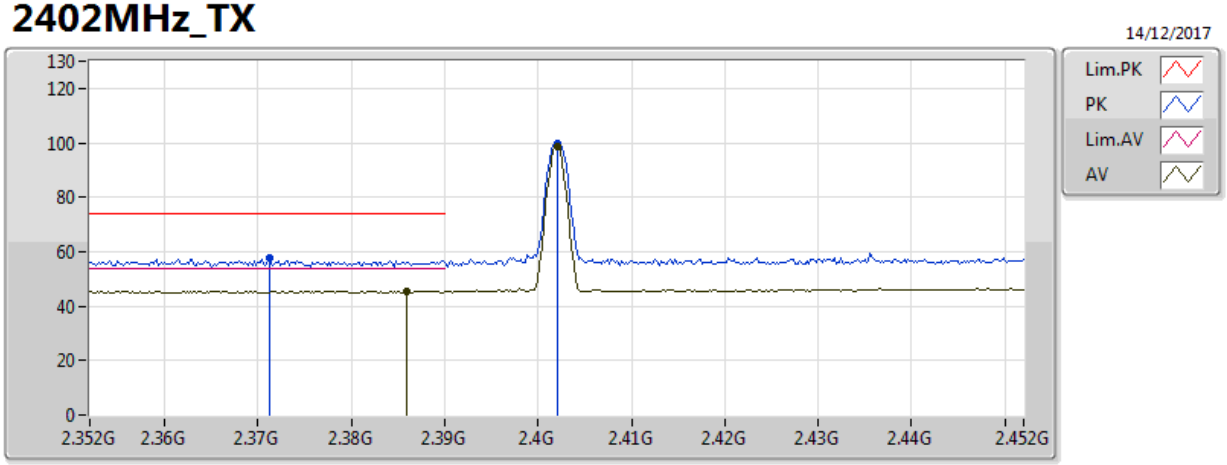
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4968G	46.82	54.00	-7.18	30.84	3	Vertical	306	1.17	-

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	2.3782G	45.44	54.00	-8.56	30.41	3	Horizontal	311	1.38	-
2402MHz	Pass	AV	2.402G	95.61	Inf	-Inf	30.50	3	Horizontal	311	1.38	-
2402MHz	Pass	PK	2.3704G	57.46	74.00	-16.54	30.39	3	Horizontal	311	1.38	-
2402MHz	Pass	PK	2.402G	96.73	Inf	-Inf	30.50	3	Horizontal	311	1.38	-
2402MHz	Pass	AV	2.386G	45.62	54.00	-8.38	30.44	3	Vertical	306	1.09	-
2402MHz	Pass	AV	2.402G	98.57	Inf	-Inf	30.50	3	Vertical	306	1.09	-
2402MHz	Pass	PK	2.3712G	57.97	74.00	-16.03	30.39	3	Vertical	306	1.09	-
2402MHz	Pass	PK	2.402G	99.71	Inf	-Inf	30.50	3	Vertical	306	1.09	-
2402MHz	Pass	AV	4.804G	31.33	54.00	-22.67	5.85	3	Horizontal	360	1.50	-
2402MHz	Pass	PK	4.804G	46.33	74.00	-27.67	5.85	3	Horizontal	360	1.50	-
2402MHz	Pass	AV	4.804G	31.60	54.00	-22.40	5.85	3	Vertical	104	2.32	-
2402MHz	Pass	PK	4.804G	45.66	74.00	-28.34	5.85	3	Vertical	104	2.32	-
2440MHz	Pass	AV	2.3852G	45.42	54.00	-8.58	30.44	3	Horizontal	311	3.07	-
2440MHz	Pass	AV	2.44G	97.38	Inf	-Inf	30.63	3	Horizontal	311	3.07	-
2440MHz	Pass	AV	2.492G	46.35	54.00	-7.65	30.82	3	Horizontal	311	3.07	-
2440MHz	Pass	PK	2.3664G	57.00	74.00	-17.00	30.37	3	Horizontal	311	3.07	-
2440MHz	Pass	PK	2.44G	98.57	Inf	-Inf	30.63	3	Horizontal	311	3.07	-
2440MHz	Pass	PK	2.4936G	58.02	74.00	-15.98	30.83	3	Horizontal	311	3.07	-
2440MHz	Pass	AV	2.3808G	45.32	54.00	-8.68	30.42	3	Vertical	306	1.05	-
2440MHz	Pass	AV	2.44G	99.52	Inf	-Inf	30.63	3	Vertical	306	1.05	-
2440MHz	Pass	AV	2.4836G	46.28	54.00	-7.72	30.79	3	Vertical	306	1.05	-
2440MHz	Pass	PK	2.3688G	57.33	74.00	-16.67	30.38	3	Vertical	306	1.05	-
2440MHz	Pass	PK	2.44G	100.69	Inf	-Inf	30.63	3	Vertical	306	1.05	-
2440MHz	Pass	PK	2.4968G	57.64	74.00	-16.36	30.84	3	Vertical	306	1.05	-
2440MHz	Pass	AV	4.88G	30.96	54.00	-23.04	6.02	3	Horizontal	268	1.50	-
2440MHz	Pass	PK	4.88G	45.47	74.00	-28.53	6.02	3	Horizontal	268	1.50	-
2440MHz	Pass	AV	4.88G	31.23	54.00	-22.77	6.02	3	Vertical	289	1.47	-
2440MHz	Pass	PK	4.88G	45.24	74.00	-28.76	6.02	3	Vertical	289	1.47	-
2480MHz	Pass	AV	2.48G	97.69	Inf	-Inf	30.78	3	Horizontal	322	1.50	-
2480MHz	Pass	AV	2.494G	46.48	54.00	-7.52	30.83	3	Horizontal	322	1.50	-
2480MHz	Pass	PK	2.48G	98.89	Inf	-Inf	30.78	3	Horizontal	322	1.50	-
2480MHz	Pass	PK	2.491G	58.37	74.00	-15.63	30.82	3	Horizontal	322	1.50	-
2480MHz	Pass	AV	2.48G	99.24	Inf	-Inf	30.78	3	Vertical	306	1.17	-
2480MHz	Pass	AV	2.4968G	46.82	54.00	-7.18	30.84	3	Vertical	306	1.17	-
2480MHz	Pass	PK	2.48G	100.42	Inf	-Inf	30.78	3	Vertical	306	1.17	-
2480MHz	Pass	PK	2.4846G	59.44	74.00	-14.56	30.79	3	Vertical	306	1.17	-
2480MHz	Pass	AV	4.96G	32.29	54.00	-21.71	6.21	3	Horizontal	236	1.03	-
2480MHz	Pass	PK	4.96G	45.74	74.00	-28.26	6.21	3	Horizontal	236	1.03	-
2480MHz	Pass	AV	4.96G	32.45	54.00	-21.55	6.21	3	Vertical	286	1.33	-
2480MHz	Pass	PK	4.96G	46.85	74.00	-27.15	6.21	3	Vertical	286	1.33	-

BT-LE(1Mbps)

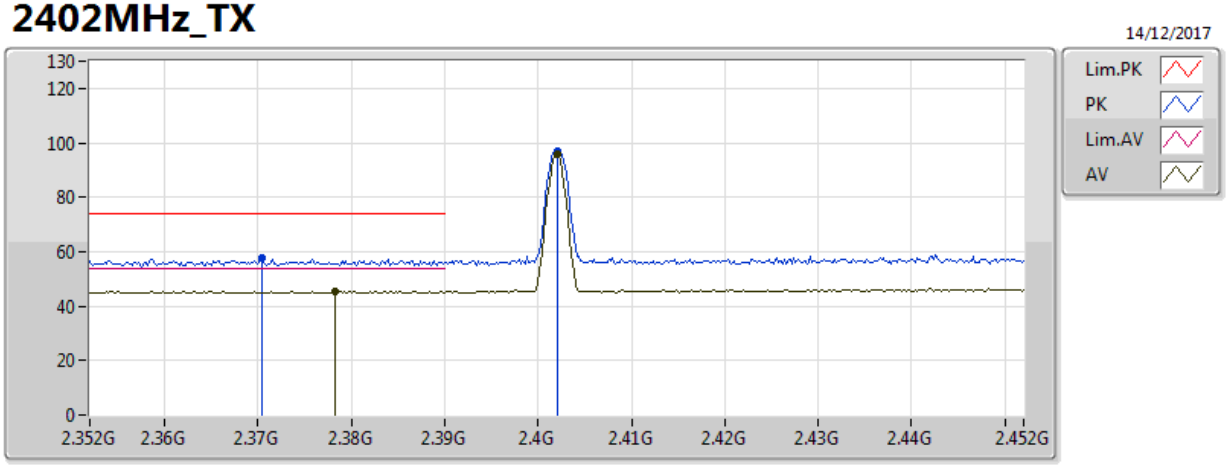
2402MHz_TX



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	2.386G	45.62	54.00	-8.38	30.44	3	Vertical	306	1.09	-	15.18	27.20	3.24	-
AV	2.402G	98.57	Inf	-Inf	30.50	3	Vertical	306	1.09	-	68.07	27.25	3.25	-
PK	2.3712G	57.97	74.00	-16.03	30.39	3	Vertical	306	1.09	-	27.58	27.17	3.22	-
PK	2.402G	99.71	Inf	-Inf	30.50	3	Vertical	306	1.09	-	69.21	27.25	3.25	-

BT-LE(1Mbps)

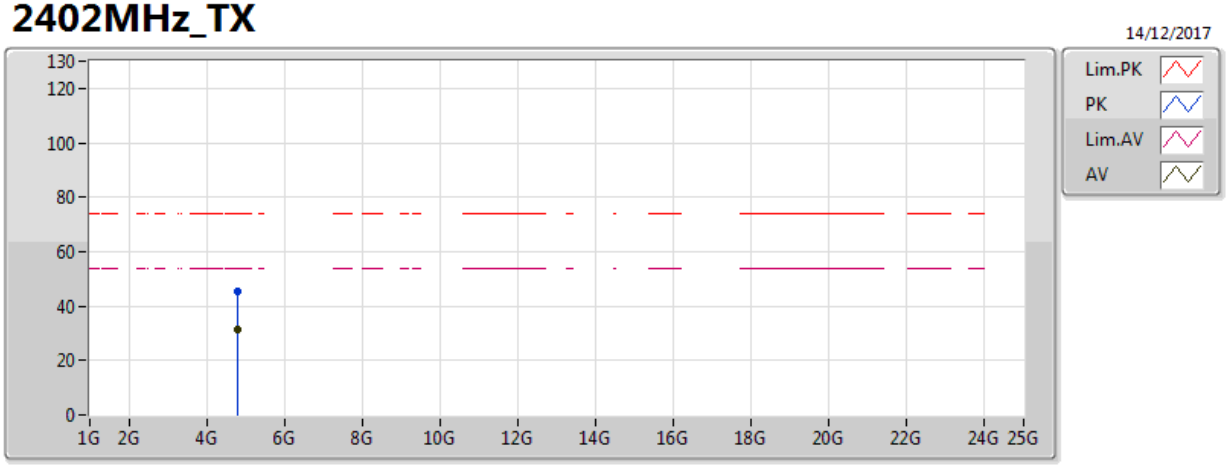
2402MHz_TX



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	2.3782G	45.44	54.00	-8.56	30.41	3	Horizontal	311	1.38	-	15.03	27.18	3.23	-
AV	2.402G	95.61	Inf	-Inf	30.50	3	Horizontal	311	1.38	-	65.11	27.25	3.25	-
PK	2.3704G	57.46	74.00	-16.54	30.39	3	Horizontal	311	1.38	-	27.07	27.16	3.22	-
PK	2.402G	96.73	Inf	-Inf	30.50	3	Horizontal	311	1.38	-	66.23	27.25	3.25	-

BT-LE(1Mbps)

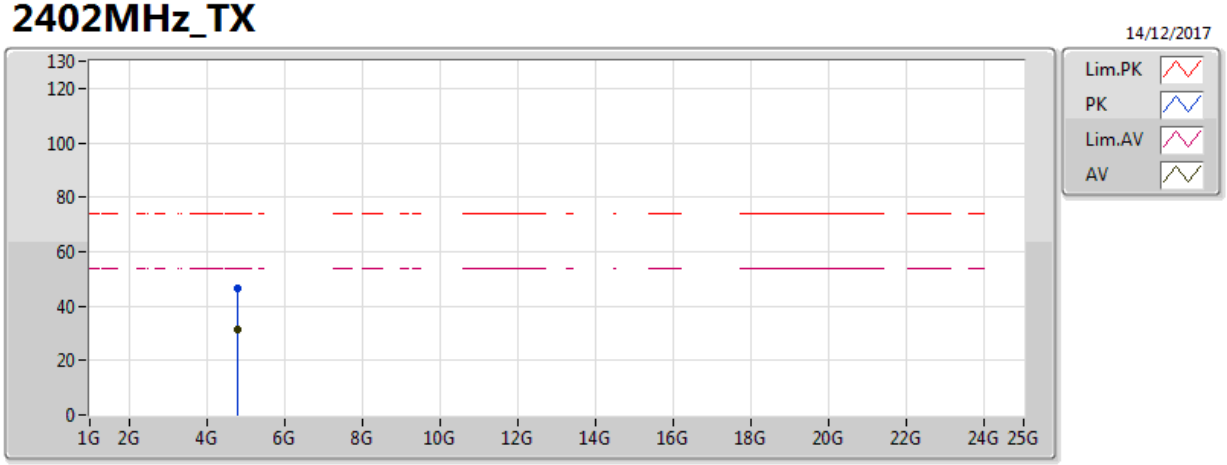
2402MHz_TX



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	4.804G	31.60	54.00	-22.40	5.85	3	Vertical	104	2.32	-	25.75	31.19	4.51	29.85
PK	4.804G	45.66	74.00	-28.34	5.85	3	Vertical	104	2.32	-	39.81	31.19	4.51	29.85

BT-LE(1Mbps)

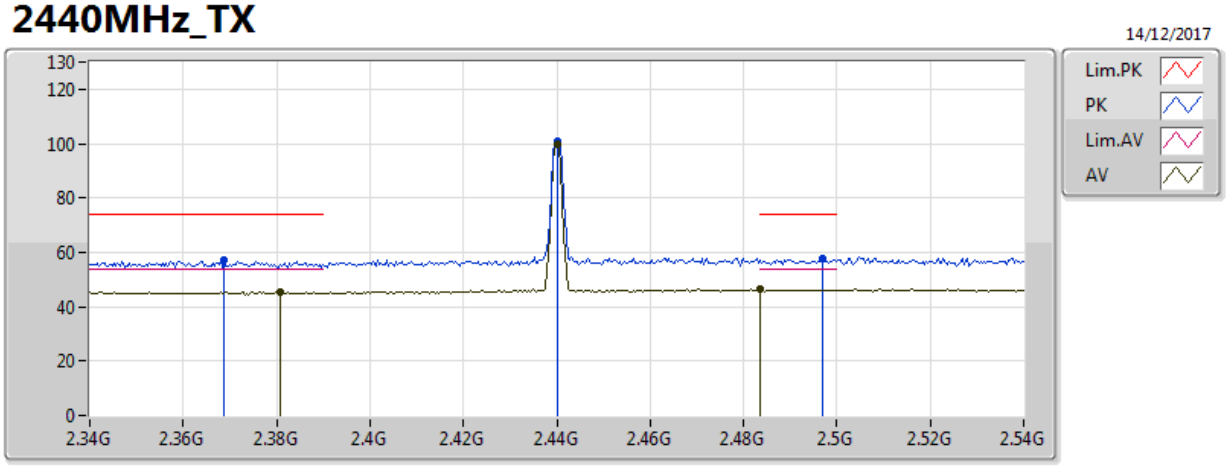
2402MHz_TX



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	4.804G	31.33	54.00	-22.67	5.85	3	Horizontal	360	1.50	-	25.48	31.19	4.51	29.85
PK	4.804G	46.33	74.00	-27.67	5.85	3	Horizontal	360	1.50	-	40.48	31.19	4.51	29.85

BT-LE(1Mbps)

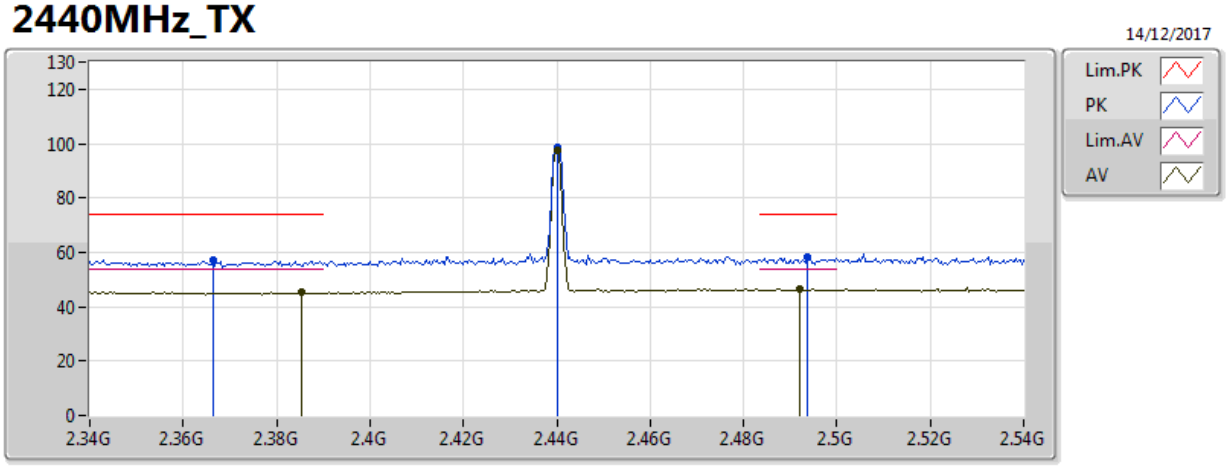
2440MHz_TX



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	2.3808G	45.32	54.00	-8.68	30.42	3	Vertical	306	1.05	-	14.90	27.19	3.23	-
AV	2.44G	99.52	Inf	-Inf	30.63	3	Vertical	306	1.05	-	68.88	27.34	3.29	-
AV	2.4836G	46.28	54.00	-7.72	30.79	3	Vertical	306	1.05	-	15.49	27.46	3.33	-
PK	2.3688G	57.33	74.00	-16.67	30.38	3	Vertical	306	1.05	-	26.95	27.16	3.22	-
PK	2.44G	100.69	Inf	-Inf	30.63	3	Vertical	306	1.05	-	70.06	27.34	3.29	-
PK	2.4968G	57.64	74.00	-16.36	30.84	3	Vertical	306	1.05	-	26.80	27.49	3.35	-

BT-LE(1Mbps)

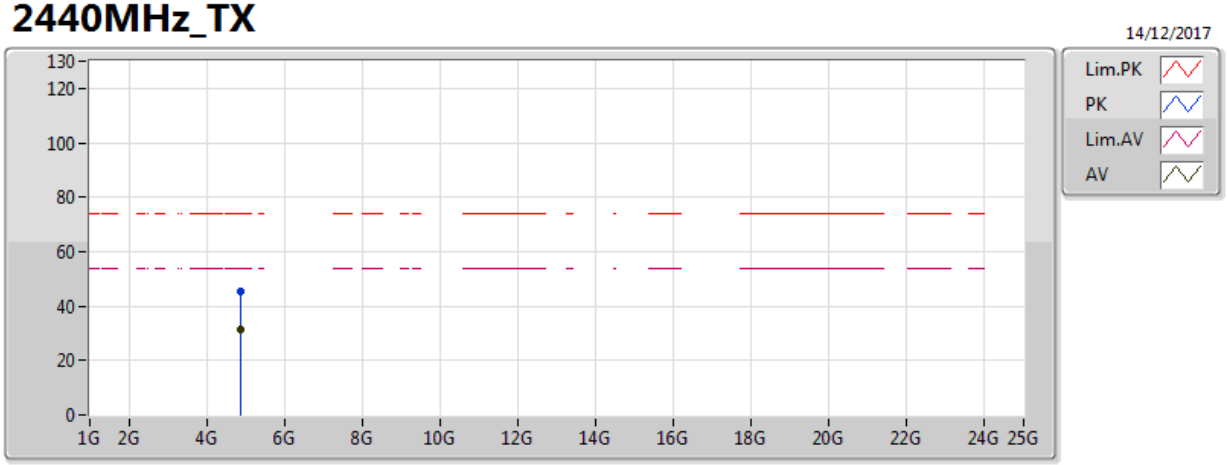
2440MHz_TX



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	2.3852G	45.42	54.00	-8.58	30.44	3	Horizontal	311	3.07	-	14.99	27.20	3.24	-
AV	2.44G	97.38	Inf	-Inf	30.63	3	Horizontal	311	3.07	-	66.75	27.34	3.29	-
AV	2.492G	46.35	54.00	-7.65	30.82	3	Horizontal	311	3.07	-	15.53	27.48	3.34	-
PK	2.3664G	57.00	74.00	-17.00	30.37	3	Horizontal	311	3.07	-	26.62	27.15	3.22	-
PK	2.44G	98.57	Inf	-Inf	30.63	3	Horizontal	311	3.07	-	67.94	27.34	3.29	-
PK	2.4936G	58.02	74.00	-15.98	30.83	3	Horizontal	311	3.07	-	27.19	27.48	3.34	-

BT-LE(1Mbps)

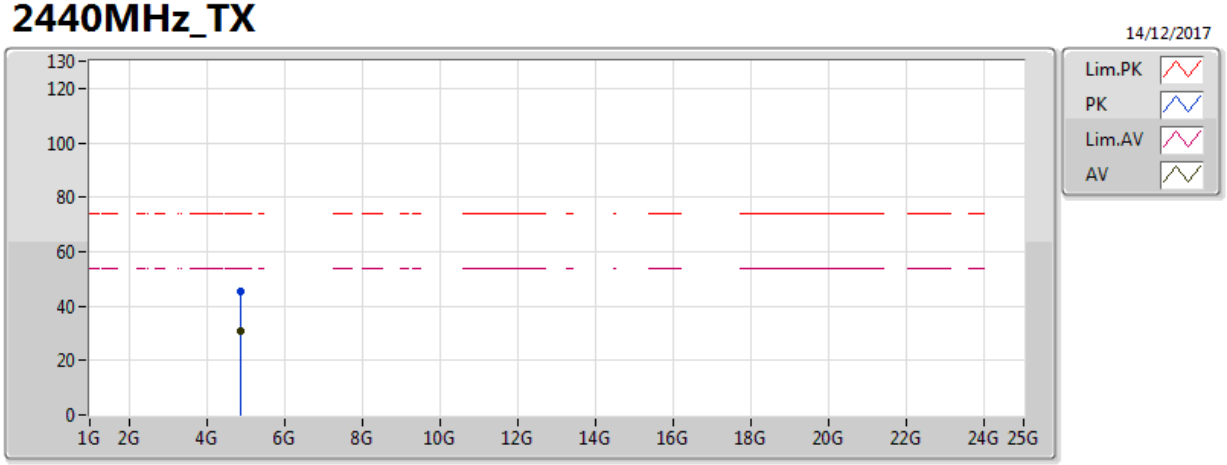
2440MHz_TX



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	4.88G	31.23	54.00	-22.77	6.02	3	Vertical	289	1.47	-	25.21	31.31	4.55	29.83
PK	4.88G	45.24	74.00	-28.76	6.02	3	Vertical	289	1.47	-	39.22	31.31	4.55	29.83

BT-LE(1Mbps)

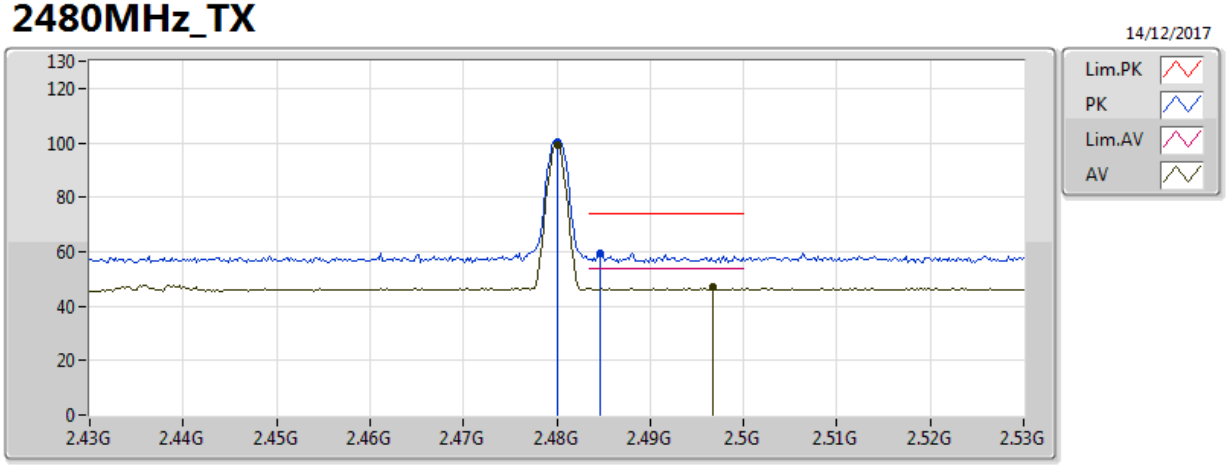
2440MHz_TX



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	4.88G	30.96	54.00	-23.04	6.02	3	Horizontal	268	1.50	-	24.94	31.31	4.55	29.83
PK	4.88G	45.47	74.00	-28.53	6.02	3	Horizontal	268	1.50	-	39.45	31.31	4.55	29.83

BT-LE(1Mbps)

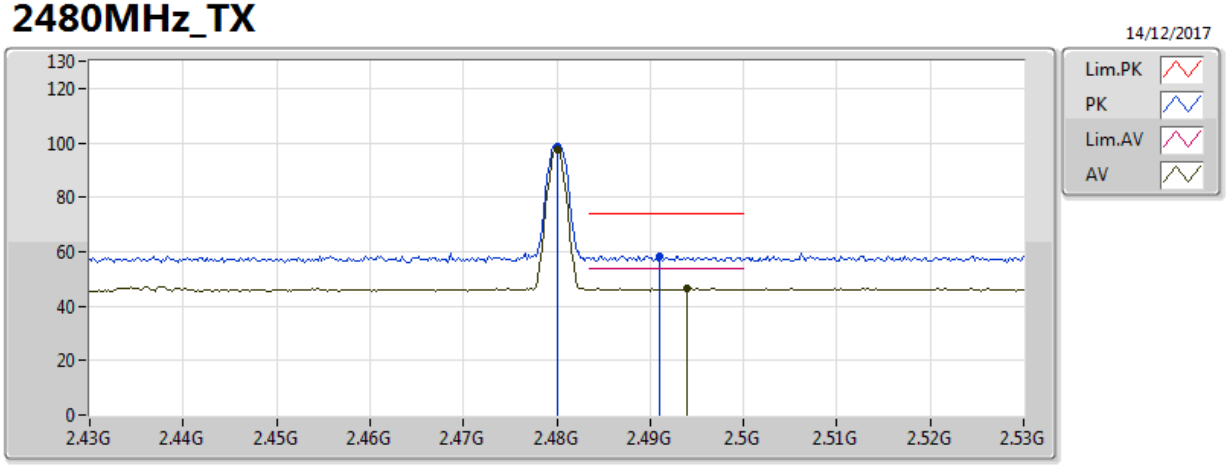
2480MHz_TX



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	2.48G	99.24	Inf	-Inf	30.78	3	Vertical	306	1.17	-	68.46	27.45	3.33	-
AV	2.4968G	46.82	54.00	-7.18	30.84	3	Vertical	306	1.17	-	15.98	27.49	3.35	-
PK	2.48G	100.42	Inf	-Inf	30.78	3	Vertical	306	1.17	-	69.64	27.45	3.33	-
PK	2.4846G	59.44	74.00	-14.56	30.79	3	Vertical	306	1.17	-	28.65	27.46	3.33	-

BT-LE(1Mbps)

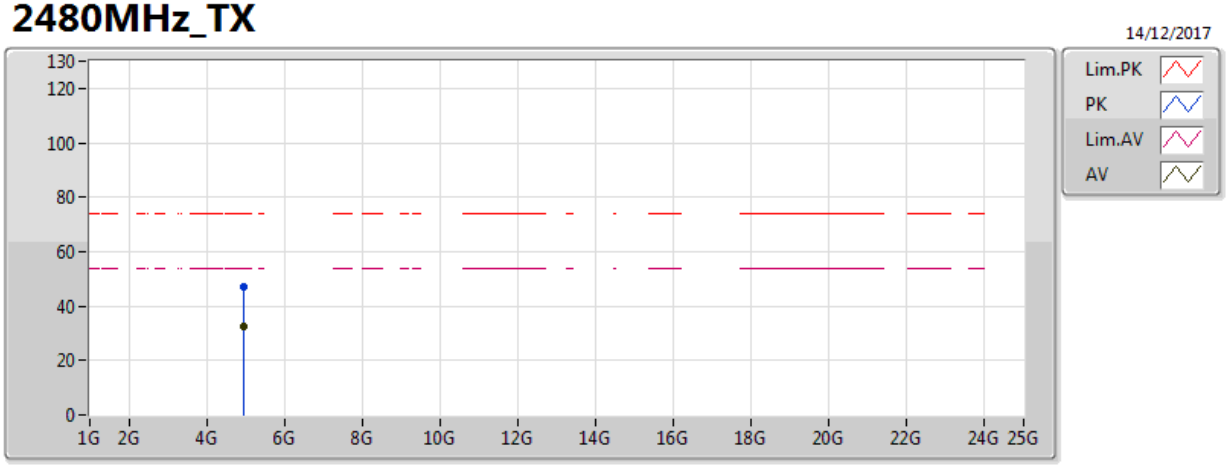
2480MHz_TX



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	97.69	Inf	-Inf	30.78	3	Horizontal	322	1.50	-	66.91	27.45	3.33	-
AV	2.494G	46.48	54.00	-7.52	30.83	3	Horizontal	322	1.50	-	15.65	27.48	3.34	-
PK	2.48G	98.89	Inf	-Inf	30.78	3	Horizontal	322	1.50	-	68.11	27.45	3.33	-
PK	2.491G	58.37	74.00	-15.63	30.82	3	Horizontal	322	1.50	-	27.55	27.48	3.34	-

BT-LE(1Mbps)

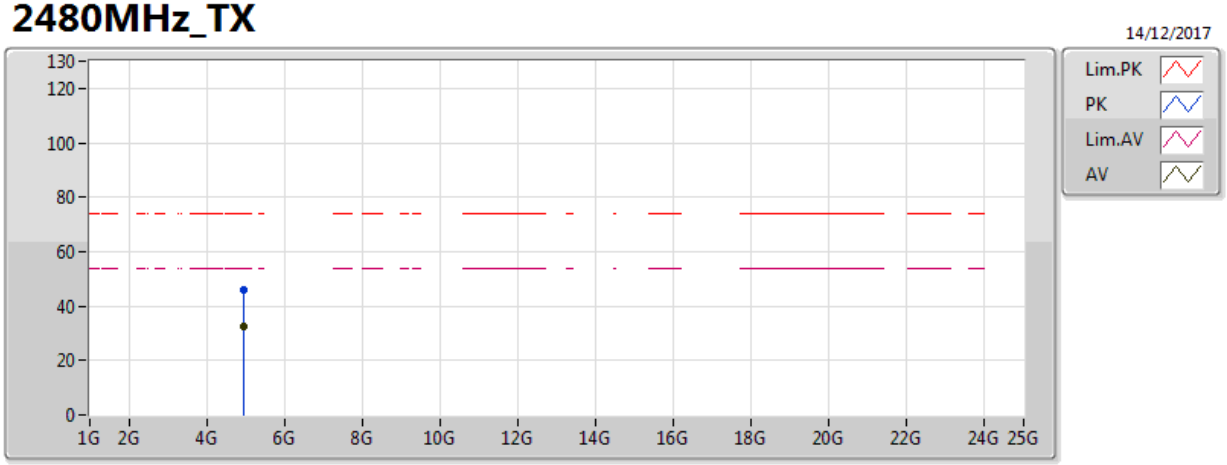
2480MHz_TX



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	4.96G	32.45	54.00	-21.55	6.21	3	Vertical	286	1.33	-	26.24	31.44	4.59	29.82
PK	4.96G	46.85	74.00	-27.15	6.21	3	Vertical	286	1.33	-	40.64	31.44	4.59	29.82

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	4.96G	32.29	54.00	-21.71	6.21	3	Horizontal	236	1.03	-	26.08	31.44	4.59	29.82
PK	4.96G	45.74	74.00	-28.26	6.21	3	Horizontal	236	1.03	-	39.53	31.44	4.59	29.82