FCC Test Report

FCC ID	:	**PPQ-WCBN3509R**
Equipment	:	**802.11a/b/g/n/ac 2Tx2R+BT5.0 USB WLAN Module**
Brand Name	:	**LITE-ON**
Model Name	:	**WCBN3509R, WCBN3509R(AU)**
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,**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Aug. 12, 2019, and testing was started from Aug. 22, 2019 and completed on Aug. 23, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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PHOTOGRAPHS OF EUT V01

History of this test report

Report No.	Version	Description	Issued Date
FR980219AL	01	Initial issue of report	Oct. 07, 2019
FR980219AL	02	Revised typo This report is the latest version replacing for the report issued on Oct. 07, 2019.	Oct. 09, 2019

Summary of Test Result

Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and explanations:
None

Reviewed by: Sam Tsai

Report Producer: Amber Chiu

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
2.4-2.4835GHz	BT-LE(2Mbps)	2.0	1TX

Note:
- Bluetooth LE uses a GFSK (1Mbps/2Mbps) modulation for DSSS.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Support	Remark
1	HONGBO	290-10569	PIFA	I-Pex	2.4G+5G	Group 1
2	HONGBO	290-10569	PIFA	I-Pex	2.4G+5G	
3	HONGBO	290-10569	PIFA	I-Pex	BT	
4	PSA	RFMTA401030IML B702	PIFA	I-Pex	2.4G+5G	Group 2
5	PSA	RFMTA401030IML B702	PIFA	I-Pex	2.4G+5G	
6	PSA	RFMTA401030IML B702	PIFA	I-Pex	BT	
7	HONGBO	290-10843	PIFA	I-Pex	2.4G+5G	Group 3
8	HONGBO	290-10843	PIFA	I-Pex	2.4G+5G	
9	HONGBO	290-10843	PIFA	I-Pex	BT	
10	PSA	RFMTA401050IML B706	PIFA	I-Pex	2.4G+5G	Group 4
11	PSA	RFMTA401050IML B706	PIFA	I-Pex	2.4G+5G	
12	PSA	RFMTA401050IML B706	PIFA	I-Pex	BT	
13	HONGBO	290-10844	PIFA	I-Pex	2.4G+5G	Group 5
14	HONGBO	290-10844	PIFA	I-Pex	2.4G+5G	
15	HONGBO	290-10844	PIFA	I-Pex	BT	

Ant.	Brand	Model Name	Antenna Type	Connector	Support	Remark
16	PSA	RFMTA401080IML B704	PIFA	I-Pex	2.4G+5G	Group 6
17	PSA	RFMTA401080IML B704	PIFA	I-Pex	2.4G+5G	
18	PSA	RFMTA401080IML B704	PIFA	I-Pex	BT	
19	PSA	RFMTA340730IML B305	PIFA	I-Pex	2.4G+5G	Group 7
20	PSA	RFMTA340715IML B302	PIFA	I-Pex	2.4G+5G	
21	PSA	RFMTA340730IML B305	PIFA	I-Pex	BT	

Ant.	Port	Gain (dBi)			Remark
		2.4G	5G	BT	
1	1	**3.74**	**3.8**	**-**	**Group 1**
2	2	**3.74**	**3.8**	**-**	
3	3	**-**	**-**	**3.74**	
4	1	3.74	3.8	-	Group 2
5	2	3.74	3.8	-	
6	3	-	-	3.74	
7	1	3.05	1.59	-	Group 3
8	2	3.05	1.59	-	
9	3	-	-	3.05	
10	1	3.05	1.59	-	Group 4
11	2	3.05	1.59	-	
12	3	-	-	3.05	
13	1	2.38	1.49	-	Group 5
14	2	2.38	1.49	-	
15	3	-	-	2.38	
16	1	1.72	1.25	-	Group 6
17	2	1.72	1.25	-	
18	3	-	-	1.72	
19	1	-0.5	3.28	-	Group 7
20	2	-1.68	3.08	-	
21	3	-	-	-0.5	

Note 1: The EUT has twenty one antennas.
Note 2: EUT can match with above antennas for using. Group 1 was used to perform the worst configuration and result of that was recorded as the final test result.

For 2.4GHz function:
For IEEE 802.11 b/g/n/ac mode (2TX/2RX)
Ant. 1~2, 4~5, 7~8, 10~11, 13~14, 16~17, 19~20 could transmit/receive simultaneously.

For BT function:
For IEEE 802.15.1 Bluetooth mode (1TX/1RX)
Ant. 3, 6, 9, 12, 15, 18, 21 could transmit/receive simultaneously.

For 5GHz function:
For IEEE 802.11 a/n/ac mode (2TX/2RX)
Ant. 1~2, 4~5, 7~8, 10~11, 13~14, 16~17, 19~20 could transmit/receive simultaneously.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From Host System			
EUT Function	☒	Point-to-multipoint	☐	Point-to-point

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

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.85	0.71	2.125m	1k
BT-LE(2Mbps)	0.575	2.4	1.069m	1k

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

1.1.5 Table for Multiple Listing

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

Model Name	Description
WCBN3509R	All the models are identical, the difference are "chip model name" and "software".
WCBN3509R(AU)	

Note: The Model Name WCBN3509R(AU) configuration was pretested and found to be the worst case and measured during the test.

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- KDB 558074 D01 v05r02
- KDB 414788 D01 v01r01

1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Dexter Dai	25.4~25.8°C / 58~60%	22/Aug/2019
Radiated	03CH09-HY	Lego Lin	22.3~23.9°C / 51.1~55.6%	22/Aug/2019
AC Conduction	CO04-HY	Edward Wang	23.1~25.4°C / 63.5~67.9%	23/Aug/2019

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.54 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	1.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °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	120V

2.2 Test Channel Mode

Test Software Version	WCN_Combo_Tool 1747

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-LE(2Mbps)	-
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	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	USB Mode
Operating Mode > 1GHz	CTX
Orthogonal Planes of EUT	**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.: FA980219 for Co-location RF Exposure Evaluation.	

2.4 Support Equipment

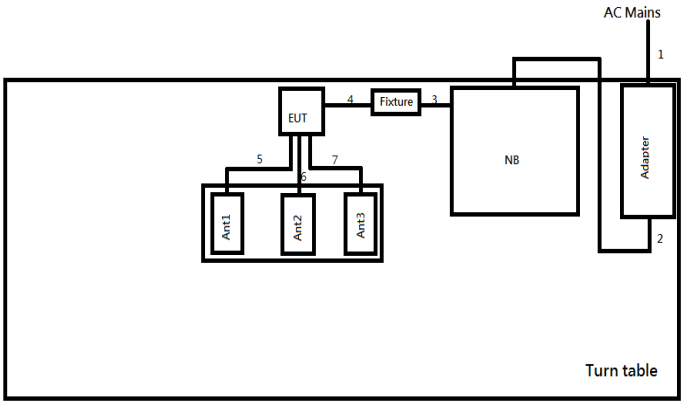
Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Power Cable	Power sync	PW-GPC180-3	N/A
2	Notebook	Dell	E4300	N/A
3	Adapter	DELL	LA90PM111	N/A
4	Fixture	LITE-ON	TB001	N/A
5	Antenna	N/A	N/A	N/A

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	AC Power Source	GW	APS-9102	N/A
4	Fixture	Lite-on	TB001	N/A

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Power Cable	Power sync	PW-GPC180-3	N/A
2	Notebook	Dell	E4300	N/A
3	Adapter	DELL	LA90PM111	N/A
4	Fixture	LITE-ON	TB001	N/A
5	Antenna	N/A	N/A	N/A

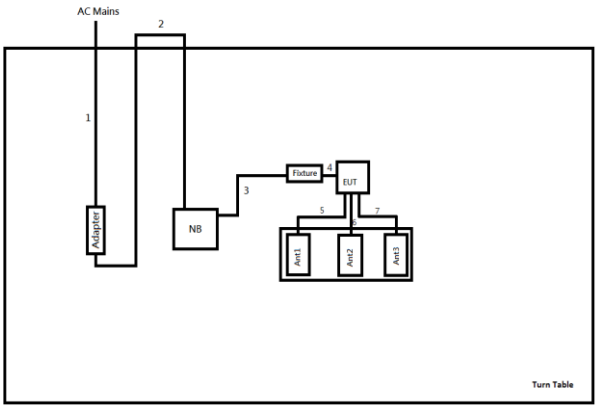
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	DC Power Cable	No	2.0	-
3	USB Cable	No	0.1	-
4	DATA Cable	No	0.05	-
5	RF Cable	No	0.3	-
6	RF Cable	No	0.3	-
7	RF Cable	No	0.3	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	DC Power Cable	No	2.0	-
3	USB Cable	No	0.1	-
4	DATA Cable	No	0.05	-
5	RF Cable	No	0.3	-
6	RF Cable	No	0.3	-
7	RF Cable	No	0.3	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

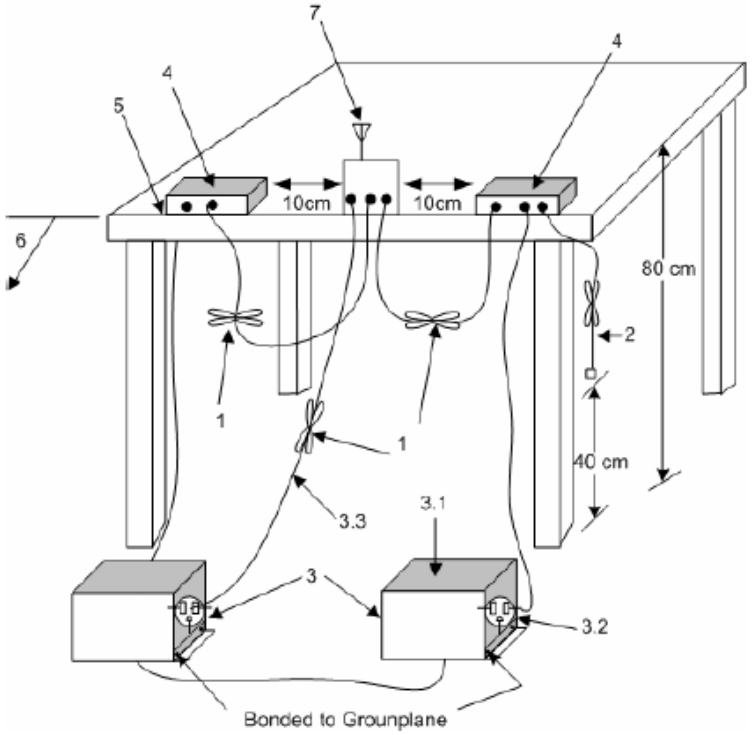
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



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

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
▪ 6 dB bandwidth ≥ 500 kHz.

3.2.2 Measuring Instruments

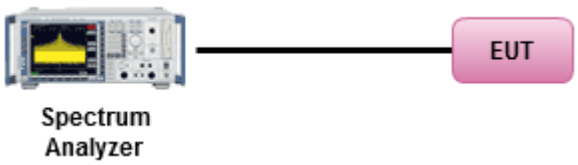
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
	☐ Refer as RSS-Gen, clause 6.7 for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

3.3.2 Measuring Instruments

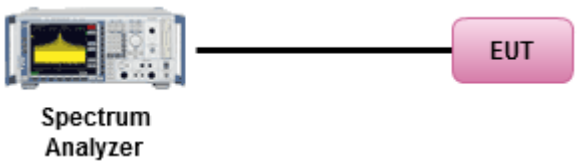
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
	☐ Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
	☐ Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
▪ Maximum Average Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
	☒ Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Spectrum Analyzer)



Maximum Conducted Output Power (Power Meter)

3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
▪ Power Spectral Density (PSD)≤8 dBm/3kHz

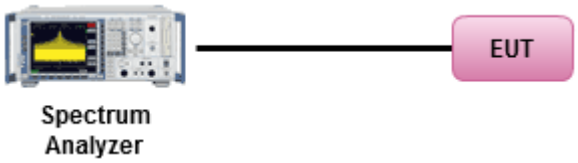
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Method PKPSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		▪ Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.4.4 Test Setup

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average level.	

3.5.2 Measuring Instruments

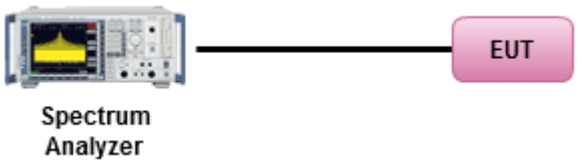
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements 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.

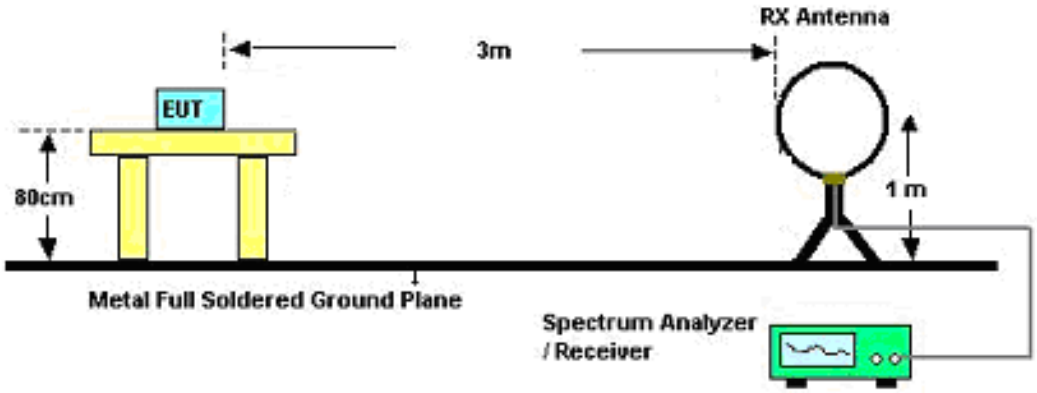
3.6.3 Test Procedures

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 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
▪ For the transmitter band-edge emissions shall be measured using following options below:	
	▪ Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	▪ Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	▪ Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels.
▪ Use the following spectrum analyzer settings:	
	▪ Set RBW=100 kHz for f < 1 GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	▪ Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4.
▪ KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.	
	▪ Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
	▪ Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

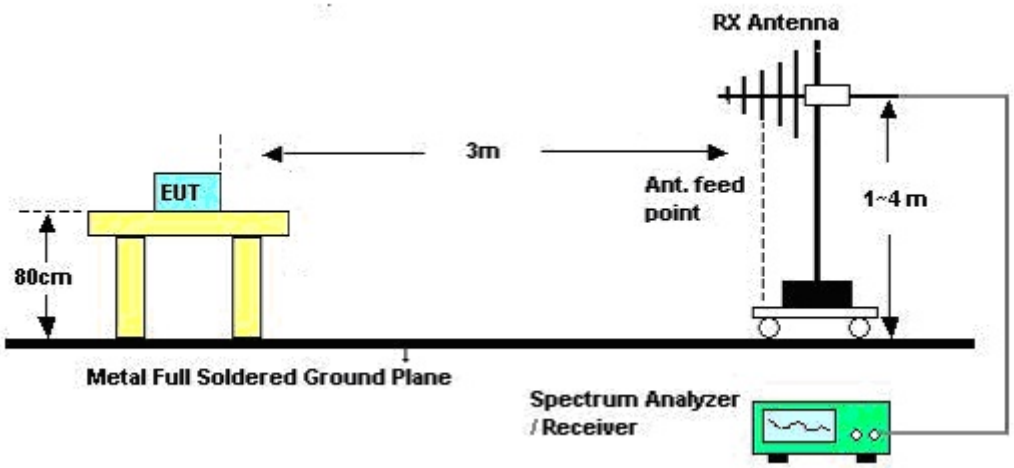
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

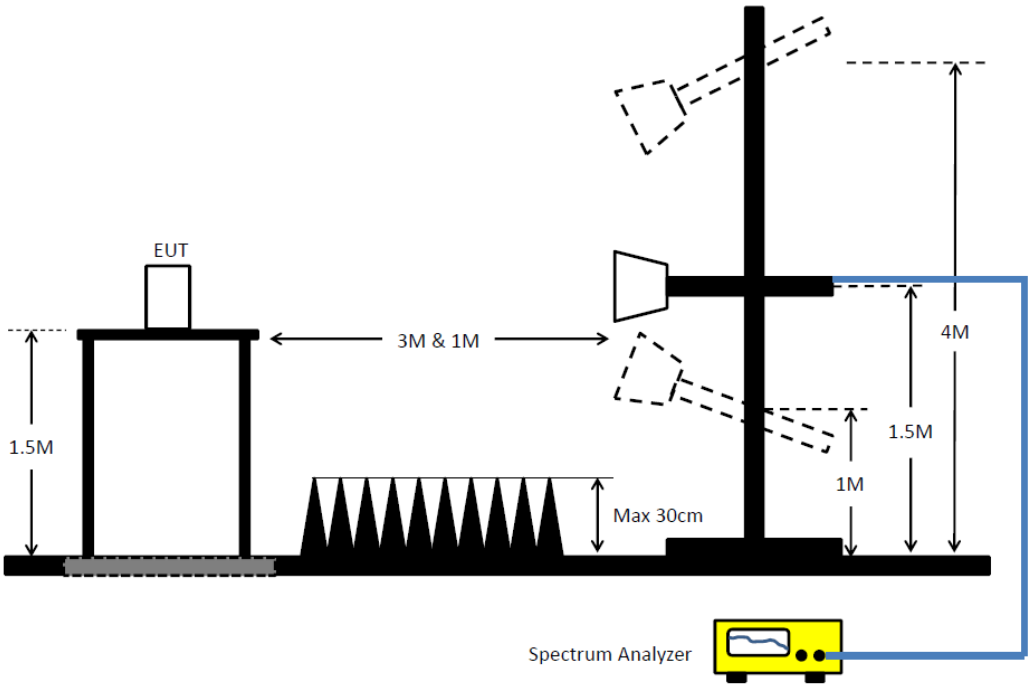
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

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

NCR : Non-Calibration Require.

Instrument for Radiated Test

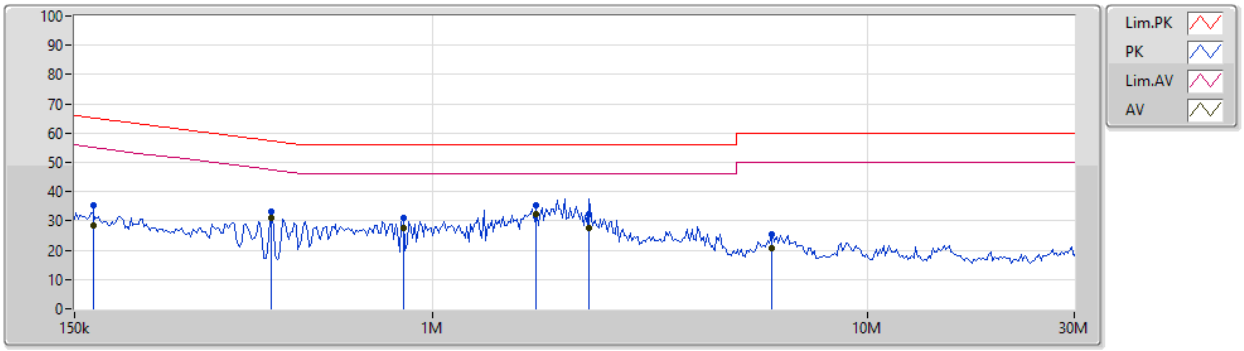
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	22/Apr/2019	21/Apr/2020
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	13/Jun/2019	12/Jun/2020
Microwave System Premplifier	KEYSIGHT	87422A	MY53270197	1GHz ~ 18GHz	30/Nov/2018	29/Nov/2019
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	22/Apr/2019	21/Apr/2020
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2019	08/Apr/2020
Spectrum Analyzer	R&S	FSP30	100793	9 kHz ~ 30GHz	05/Jun/2019	04/Jun/2020
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D & MTJ6102-05	35418 / 3	30MHz~1GHz	02/Oct/2018	03/Oct/2019
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	22/May/2019	21/May/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170614	18GHz~40GHz	22/May/2019	21/May/2020
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	24/Aug/2018	23/Aug/2019
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	15/Mar/2019	14/Mar/2020
LF-CABLE-2019 0218	Jye Bao	RG142	CB028	9kHz ~ 1GHz	18/Feb/2019	17/Feb/2020
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	SN 556626/4 + 556627	1GHz ~ 40GHz	13/Mar/2019	12/Mar/2020

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020
Power Sensor	Anritsu	MA2411B	1339407	300MHz ~ 40GHz	17/Nov/2018	16/Nov/2019
Power Meter	Anritsu	ML2495A	1517010	300MHz ~ 40GHz	17/Nov/2018	16/Nov/2019
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz ~18G	10/Jan/2019	09/Jan/2020
Cable 0.2m	HUBER	MY10711/4	RF Cable - 02	30MHz ~18G	10/Jan/2019	09/Jan/2020
Cable 0.5m	HUBER	MY39470/4	RF Cable - 29	30MHz ~18G	10/Jan/2019	09/Jan/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020

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

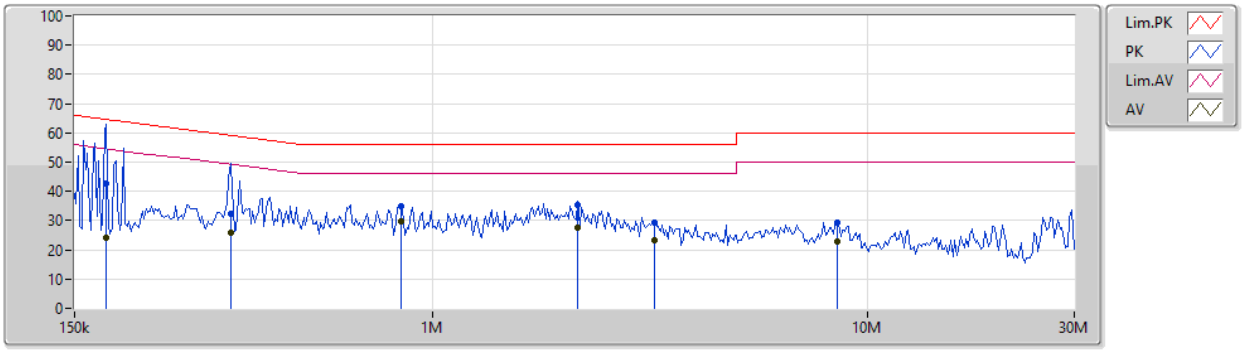
23/08/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	165.693k	35.49	65.18	-29.69	19.48	Neutral	-	16.01	9.60	0.01	9.87
AV	165.693k	28.65	55.18	-26.53	19.48	Neutral	-	9.17	9.60	0.01	9.87
QP	426.418k	33.23	57.32	-24.09	19.48	Neutral	-	13.75	9.59	0.01	9.88
AV	426.418k	31.20	47.32	-16.12	19.48	Neutral	-	11.72	9.59	0.01	9.88
QP	855.72k	30.90	56.00	-25.10	19.49	Neutral	-	11.41	9.59	0.02	9.88
AV	855.72k	27.53	46.00	-18.47	19.49	Neutral	-	8.04	9.59	0.02	9.88
QP	1.734M	35.52	56.00	-20.48	19.53	Neutral	-	15.99	9.61	0.03	9.89
AV	1.734M	32.27	46.00	-13.73	19.53	Neutral	"Worst"	12.74	9.61	0.03	9.89
QP	2.292M	32.25	56.00	-23.75	19.54	Neutral	-	12.71	9.61	0.04	9.89
AV	2.292M	27.42	46.00	-18.58	19.54	Neutral	-	7.88	9.61	0.04	9.89
QP	6.016M	25.39	60.00	-34.61	19.59	Neutral	-	5.80	9.64	0.06	9.89
AV	6.016M	20.81	50.00	-29.19	19.59	Neutral	-	1.22	9.64	0.06	9.89

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

23/08/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	177.646k	42.60	64.59	-21.99	19.48	Line	-	23.12	9.60	0.01	9.87
AV	177.646k	24.19	54.59	-30.40	19.48	Line	-	4.71	9.60	0.01	9.87
QP	342.583k	32.49	59.14	-26.65	19.48	Line	-	13.01	9.59	0.01	9.88
AV	342.583k	25.91	49.14	-23.23	19.48	Line	-	6.43	9.59	0.01	9.88
QP	847.248k	34.72	56.00	-21.28	19.50	Line	-	15.22	9.60	0.02	9.88
AV	847.248k	29.65	46.00	-16.35	19.50	Line	"Worst"	10.15	9.60	0.02	9.88
QP	2.159M	35.18	56.00	-20.82	19.54	Line	-	15.64	9.62	0.03	9.89
AV	2.159M	27.52	46.00	-18.48	19.54	Line	-	7.98	9.62	0.03	9.89
QP	3.246M	29.10	56.00	-26.90	19.56	Line	-	9.54	9.63	0.04	9.89
AV	3.246M	23.25	46.00	-22.75	19.56	Line	-	3.69	9.63	0.04	9.89
QP	8.523M	29.34	60.00	-30.66	19.62	Line	-	9.72	9.66	0.07	9.89
AV	8.523M	22.97	50.00	-27.03	19.62	Line	-	3.35	9.66	0.07	9.89

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)	665k	1.034M	1M03F1D	661.25k	1.032M
BT-LE(2Mbps)	1.238M	2.066M	2M07F1D	1.235M	2.051M

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

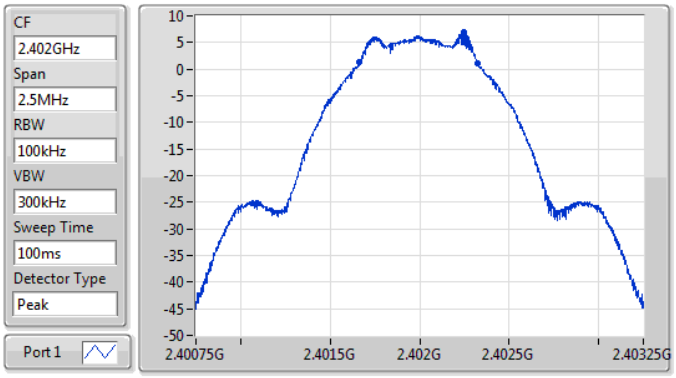
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	661.25k	1.032M
2440MHz_TnomVnom	Pass	500k	665k	1.032M
2480MHz_TnomVnom	Pass	500k	663.75k	1.034M
BT-LE(2Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	1.235M	2.059M
2440MHz_TnomVnom	Pass	500k	1.235M	2.051M
2480MHz_TnomVnom	Pass	500k	1.238M	2.066M

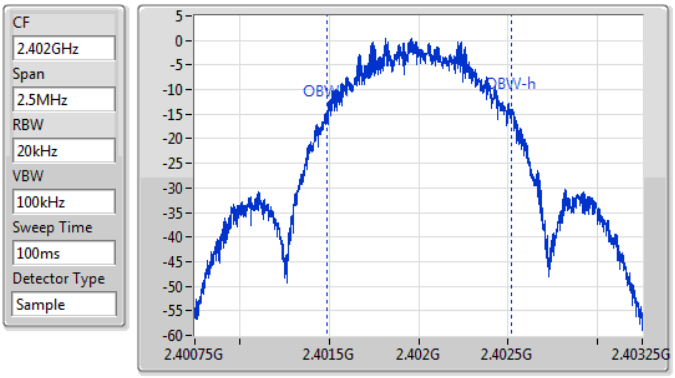
Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

BT-LE(1Mbps) EBW

2402MHz

22/08/2019



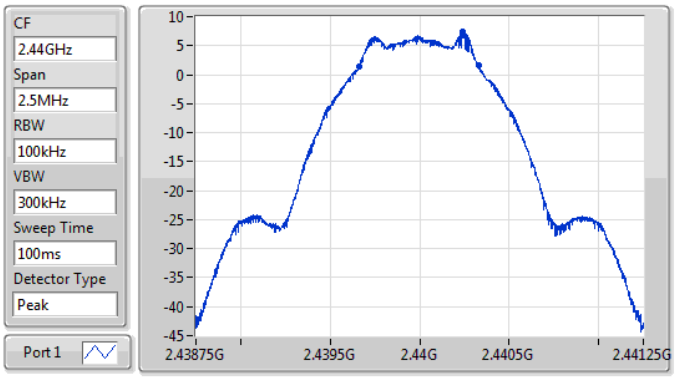


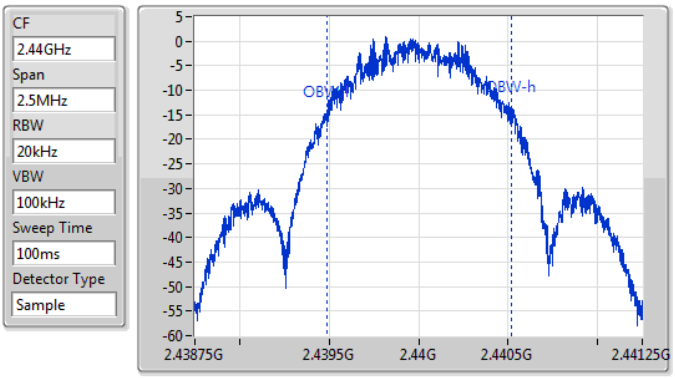
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
661.25k	2.401664G	2.402325G	1.032M	2.401485G	2.402517G	500k	1

BT-LE(1Mbps) EBW

2440MHz

22/08/2019



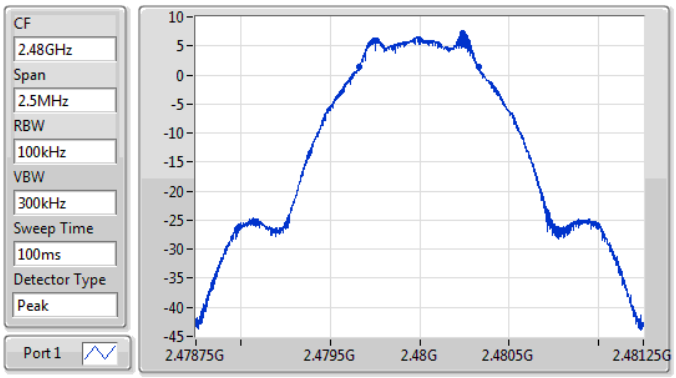


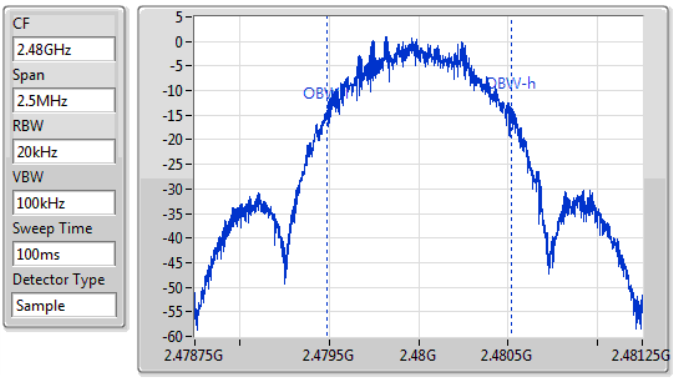
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
665k	2.439664G	2.440329G	1.032M	2.439485G	2.440517G	500k	1

BT-LE(1Mbps) EBW

2480MHz

22/08/2019



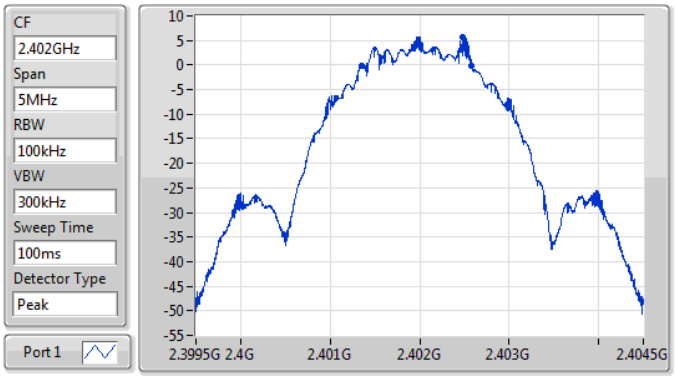


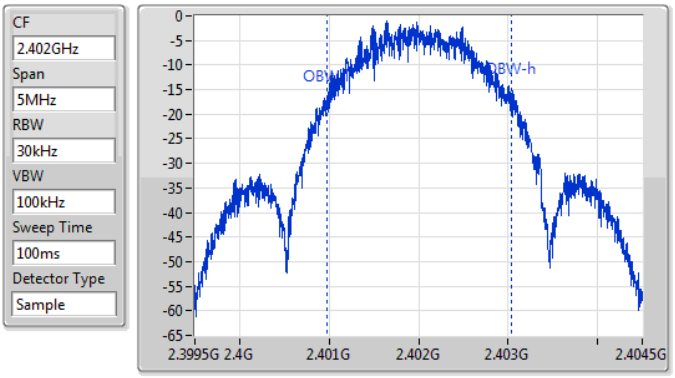
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
663.75k	2.479664G	2.480328G	1.034M	2.479485G	2.48052G	500k	1

BT-LE(2Mbps) EBW

2402MHz

22/08/2019



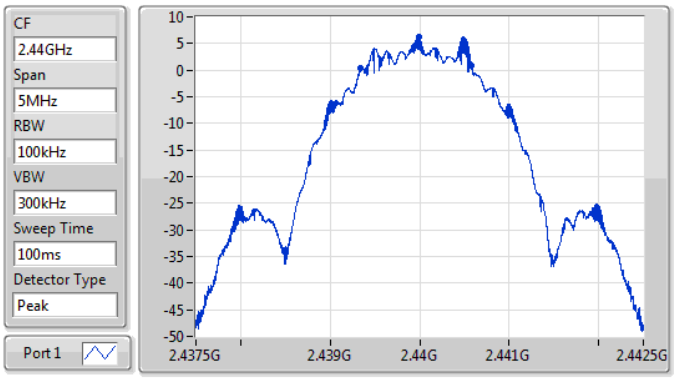


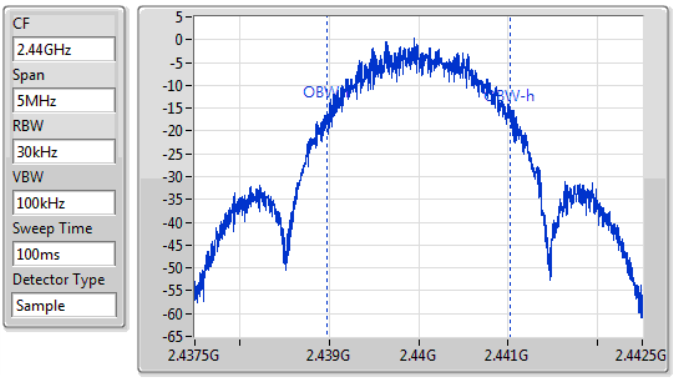
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.235M	2.401348G	2.402583G	2.059M	2.400976G	2.403034G	500k	1

BT-LE(2Mbps) EBW

2440MHz

22/08/2019



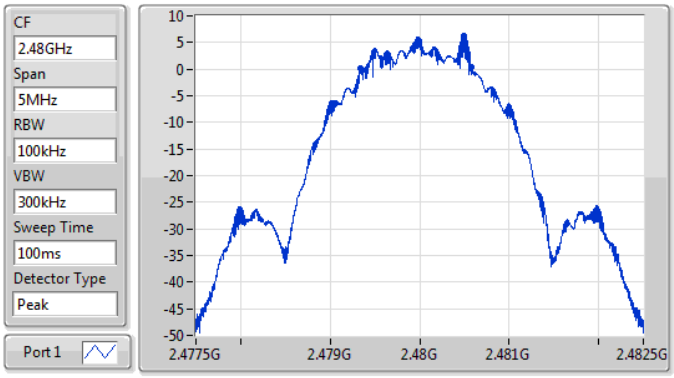


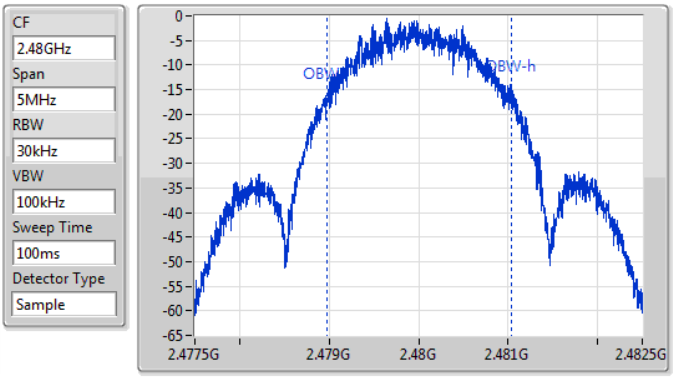
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.235M	2.439345G	2.44058G	2.051M	2.438976G	2.441027G	500k	1

BT-LE(2Mbps) EBW

2480MHz

22/08/2019





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.238M	2.479345G	2.480583G	2.066M	2.478971G	2.481037G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	7.47	0.00558
BT-LE(2Mbps)	7.48	0.00560

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.74	7.03	30.00
2440MHz_TnomVnom	Pass	3.74	7.34	30.00
2480MHz_TnomVnom	Pass	3.74	7.47	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.74	6.99	30.00
2440MHz_TnomVnom	Pass	3.74	7.45	30.00
2480MHz_TnomVnom	Pass	3.74	7.48	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-9.37
BT-LE(2Mbps)	-13.66

RBW=3 kHz.

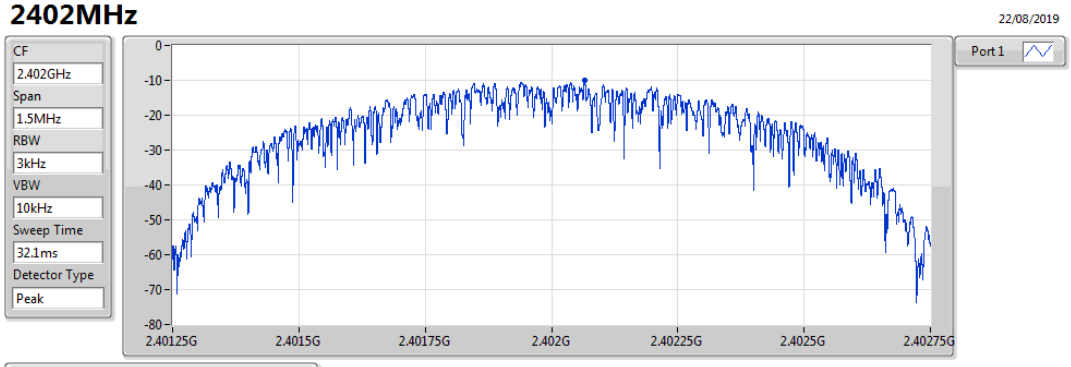
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.74	-9.91	8.00
2440MHz_TnomVnom	Pass	3.74	-9.37	8.00
2480MHz_TnomVnom	Pass	3.74	-9.95	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.74	-13.82	8.00
2440MHz_TnomVnom	Pass	3.74	-13.66	8.00
2480MHz_TnomVnom	Pass	3.74	-13.90	8.00

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

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

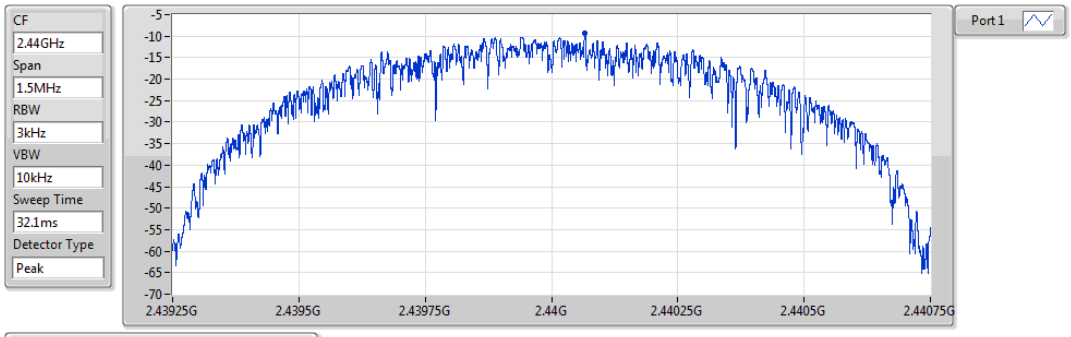
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.91	-9.91	-9.91

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

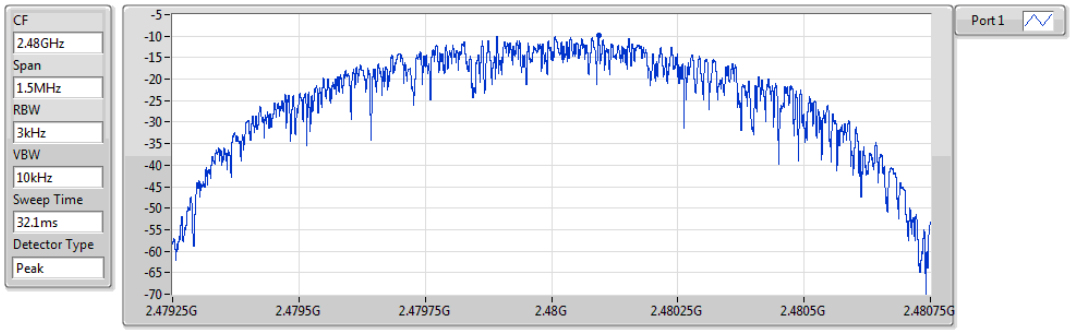
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.37	-9.37	-9.37

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

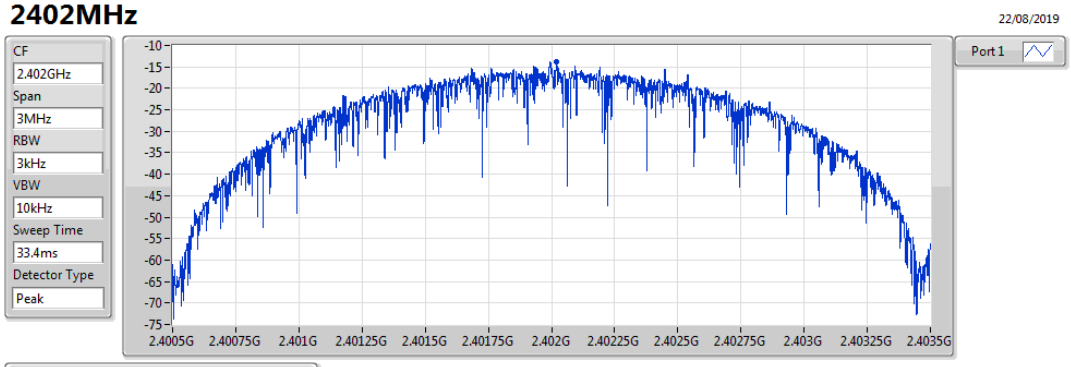
2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.95	-9.95	-9.95

BT-LE(2Mbps) **PSD**

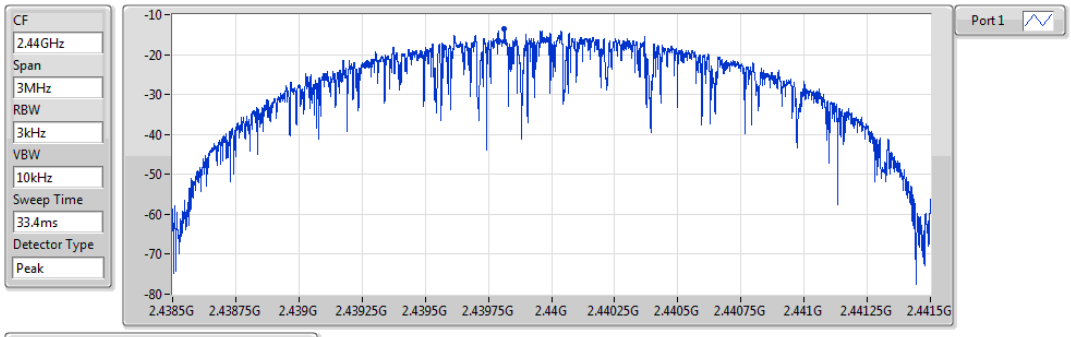
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-13.82	-13.82	-13.82

BT-LE(2Mbps) **PSD**

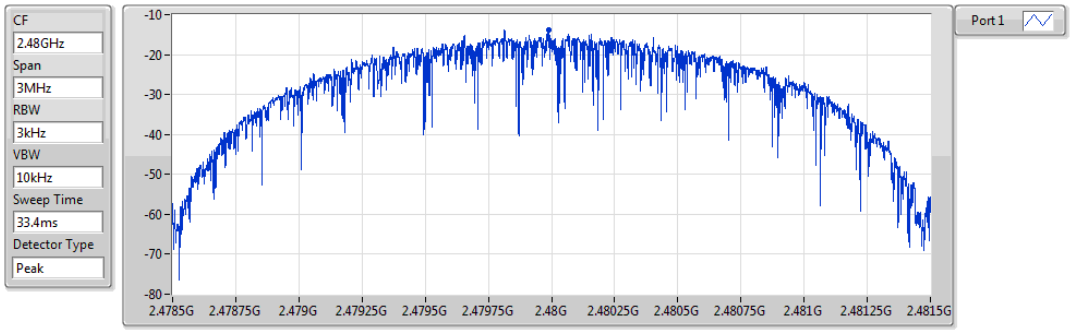
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-13.66	-13.66	-13.66

BT-LE(2Mbps) **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-13.90	-13.90	-13.90

Summary

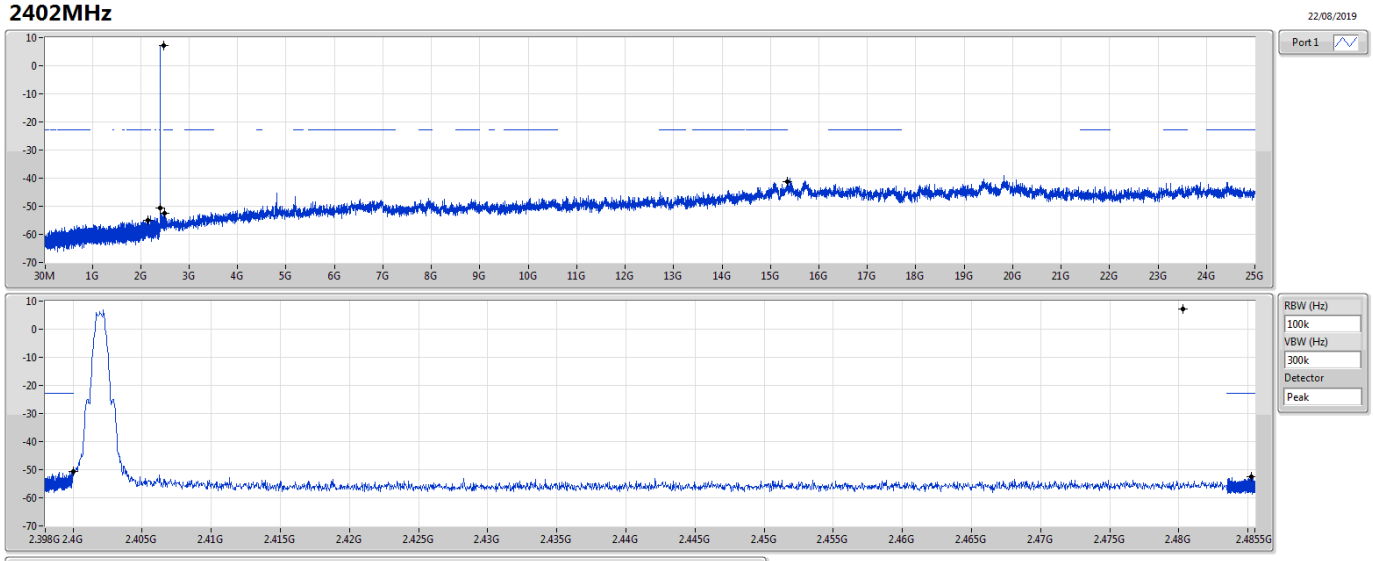
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.48029G	7.27	-22.73	2.17393G	-52.65	2.3982G	-52.53	2.48454G	-50.46	15.31595G	-39.85	1
BT-LE(2Mbps)	Pass	2.48054G	5.88	-24.12	1.99112G	-53.06	2.39999G	-26.07	2.48396G	-51.56	16.22857G	-41.01	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_TnomVnom	Pass	2.48029G	7.27	-22.73	2.14018G	-54.95	2.4G	-50.55	2.48525G	-52.64	15.34972G	-41.32	1
2440MHz_TnomVnom	Pass	2.48029G	7.27	-22.73	2.09134G	-54.37	2.39826G	-53.62	2.48546G	-52.72	24.47935G	-41.20	1
2480MHz_TnomVnom	Pass	2.48029G	7.27	-22.73	2.17393G	-52.65	2.3982G	-52.53	2.48454G	-50.46	15.31595G	-39.85	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.48054G	5.88	-24.12	1.99112G	-53.06	2.39999G	-26.07	2.48396G	-51.56	16.22857G	-41.01	1
2440MHz_TnomVnom	Pass	2.48054G	5.88	-24.12	2.39009G	-53.97	2.39753G	-53.58	2.48432G	-52.39	15.30555G	-40.15	1
2480MHz_TnomVnom	Pass	2.48054G	5.88	-24.12	2.12539G	-53.97	2.398G	-53.19	2.4845G	-49.63	24.13608G	-41.00	1

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

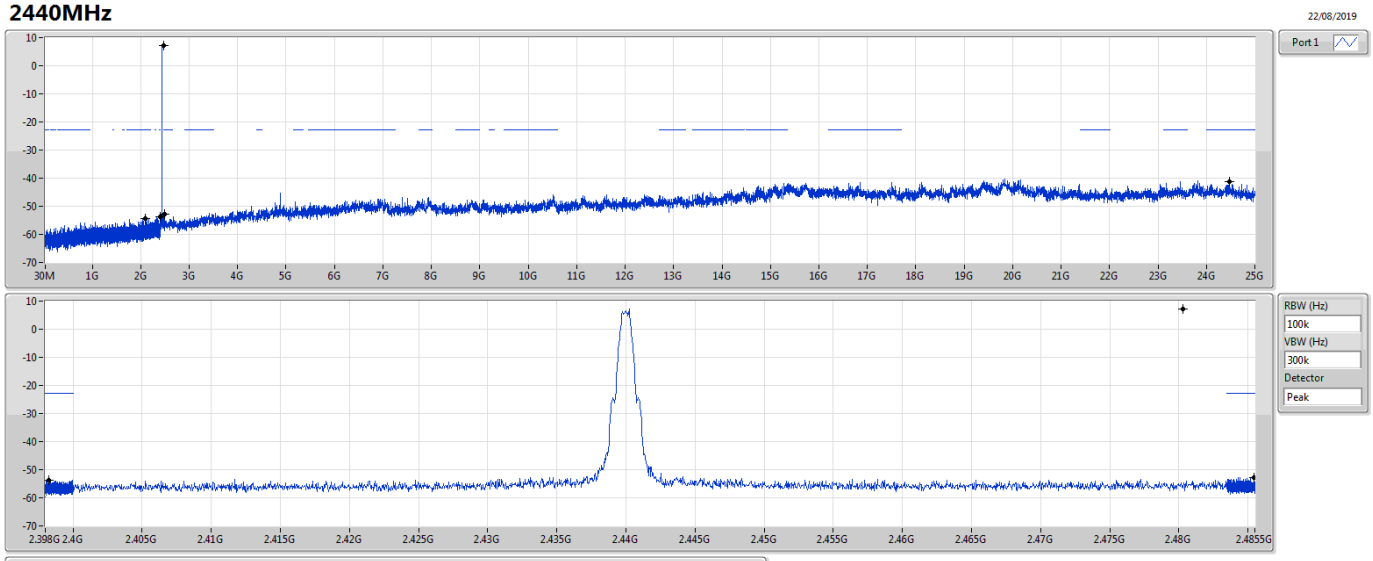
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48029G	7.27	-22.73	2.14018G	-54.95	2.4G	-50.55	2.48525G	-52.64	15.34972G	-41.32	1

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

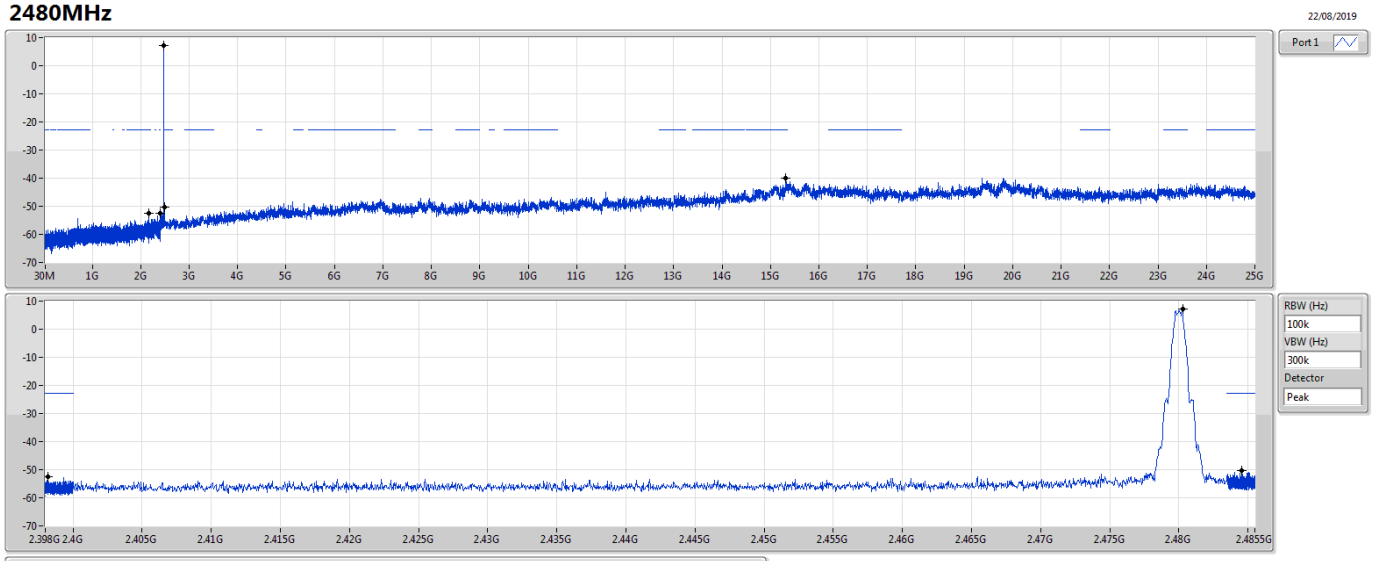
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48029G	7.27	-22.73	2.09134G	-54.37	2.39826G	-53.62	2.48546G	-52.72	24.47935G	-41.20	1

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

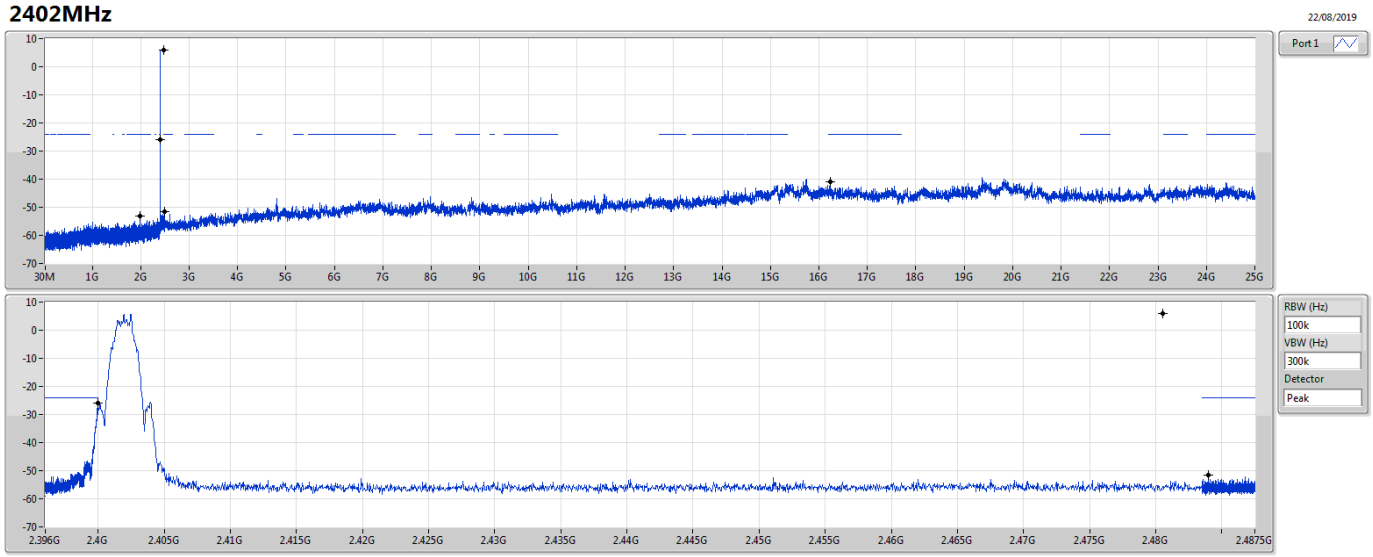
2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48029G	7.27	-22.73	2.17393G	-52.65	2.3982G	-52.53	2.48454G	-50.46	15.31595G	-39.85	1

BT-LE(2Mbps) **CSE NdB**

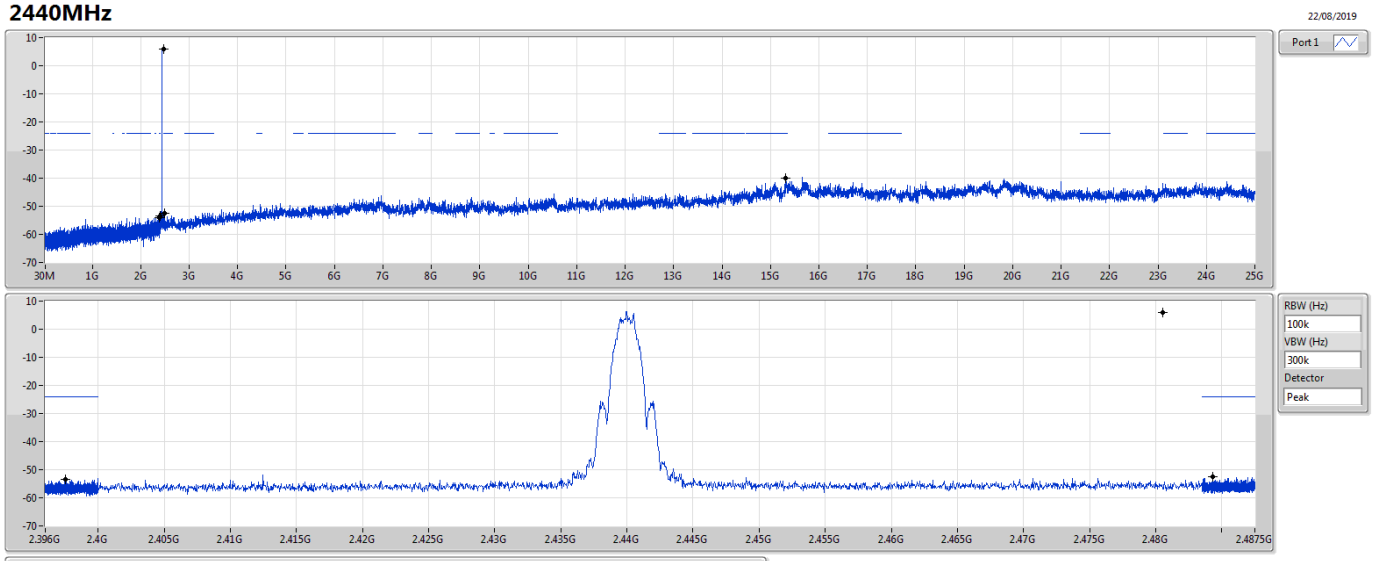
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48054G	5.88	-24.12	1.99112G	-53.06	2.39999G	-26.07	2.48396G	-51.56	16.22857G	-41.01	1

BT-LE(2Mbps) **CSE NdB**

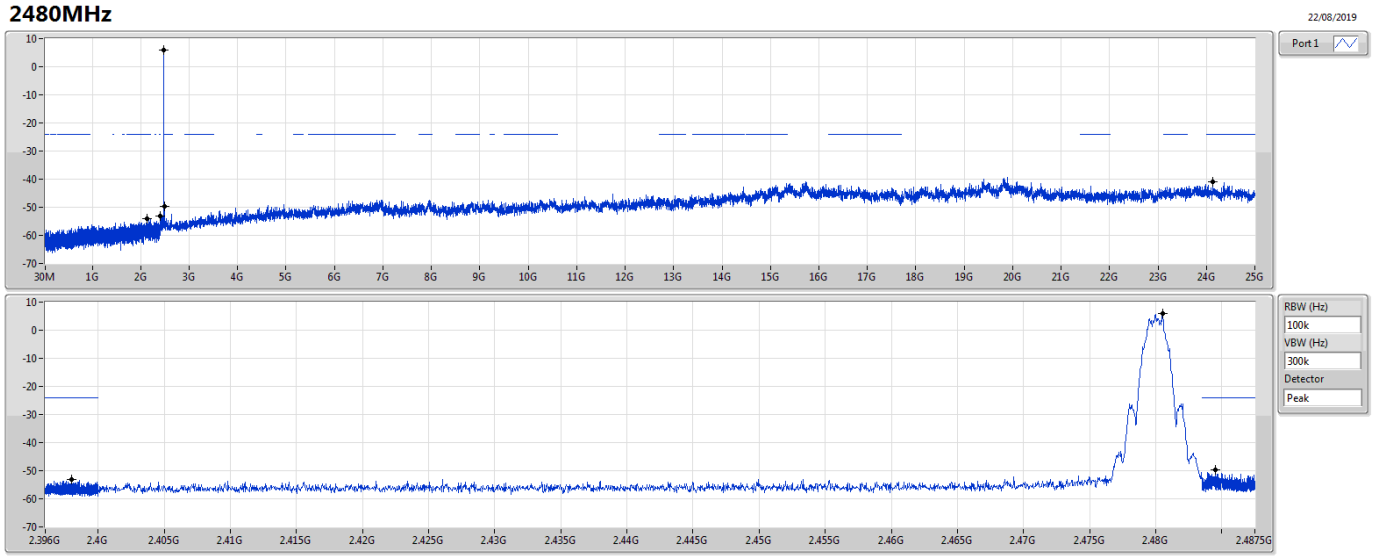
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48054G	5.88	-24.12	2.39009G	-53.97	2.39753G	-53.58	2.48432G	-52.39	15.30555G	-40.15	1

BT-LE(2Mbps) **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
2.48054G	5.88	-24.12	2.12539G	-53.97	2.398G	-53.19	2.4845G	-49.63	24.13608G	-41.00	1

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(2Mbps)	Pass	PK	105.66M	37.39	43.50	-6.11	3	Vertical	0	2.00	-

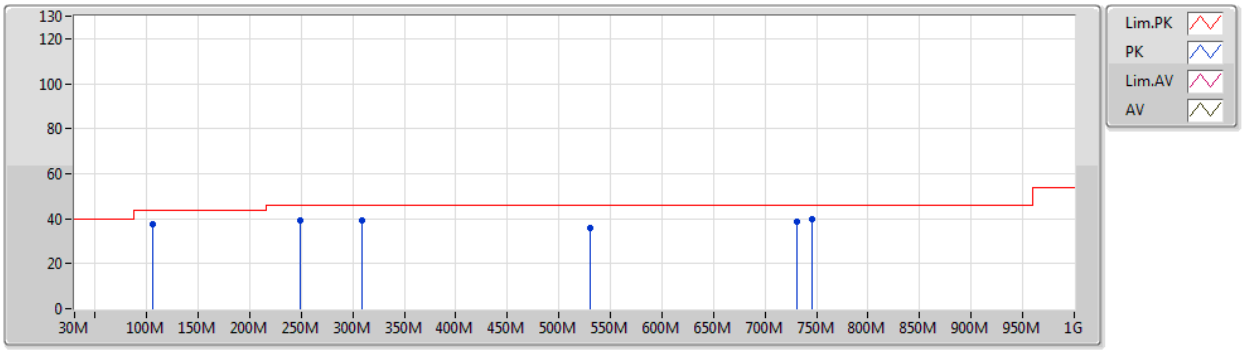
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	105.66M	37.39	43.50	-6.11	3	Vertical	0	2.00	-
2440MHz	Pass	PK	249.22M	39.22	46.00	-6.78	3	Vertical	0	2.00	-
2440MHz	Pass	PK	309.36M	39.39	46.00	-6.61	3	Vertical	0	2.00	-
2440MHz	Pass	PK	530.52M	35.92	46.00	-10.08	3	Vertical	0	2.00	-
2440MHz	Pass	PK	730.34M	38.87	46.00	-7.13	3	Vertical	0	2.00	-
2440MHz	Pass	PK	745.86M	39.51	46.00	-6.49	3	Vertical	0	2.00	-
2440MHz	Pass	PK	113.42M	37.28	43.50	-6.22	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	154.16M	37.05	43.50	-6.45	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	303.54M	38.63	46.00	-7.37	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	480.08M	34.25	46.00	-11.75	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	730.34M	39.63	46.00	-6.37	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	745.86M	39.00	46.00	-7.00	3	Horizontal	360	1.00	-

BT-LE(2Mbps)

2440MHz_USB

22/08/2019

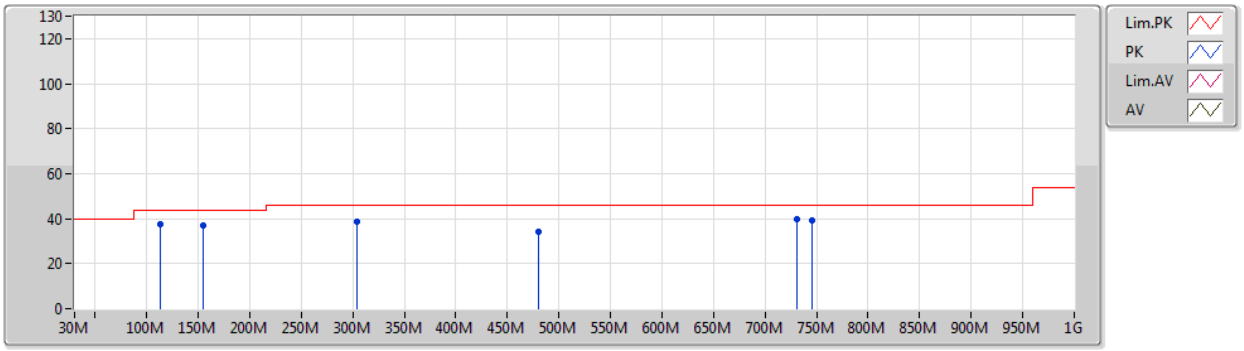


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	105.66M	37.39	43.50	-6.11	-20.21	3	Vertical	0	2.00	-	57.60	15.72	0.83	36.76
PK	249.22M	39.22	46.00	-6.78	-17.23	3	Vertical	0	2.00	-	56.45	17.90	1.29	36.42
PK	309.36M	39.39	46.00	-6.61	-16.52	3	Vertical	0	2.00	-	55.91	18.50	1.47	36.49
PK	530.52M	35.92	46.00	-10.08	-11.74	3	Vertical	0	2.00	-	47.66	23.31	1.96	37.01
PK	730.34M	38.87	46.00	-7.13	-8.42	3	Vertical	0	2.00	-	47.29	26.66	2.32	37.40
PK	745.86M	39.51	46.00	-6.49	-7.97	3	Vertical	0	2.00	-	47.48	27.11	2.35	37.43

BT-LE(2Mbps)

2440MHz_USB

22/08/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	113.42M	37.28	43.50	-6.22	-19.52	3	Horizontal	360	1.00	-	56.80	16.35	0.86	36.73
PK	154.16M	37.05	43.50	-6.45	-19.48	3	Horizontal	360	1.00	-	56.53	16.06	1.01	36.55
PK	303.54M	38.63	46.00	-7.37	-16.60	3	Horizontal	360	1.00	-	55.23	18.43	1.45	36.48
PK	480.08M	34.25	46.00	-11.75	-12.10	3	Horizontal	360	1.00	-	46.35	22.90	1.86	36.86
PK	730.34M	39.63	46.00	-6.37	-8.42	3	Horizontal	360	1.00	-	48.05	26.66	2.32	37.40
PK	745.86M	39.00	46.00	-7.00	-7.97	3	Horizontal	360	1.00	-	46.97	27.11	2.35	37.43

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.3532G	47.32	54.00	-6.68	3	Horizontal	63	1.02	-
BT-LE(2Mbps)	Pass	AV	2.4835G	48.24	54.00	-5.76	3	Horizontal	64	1.10	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3646G	47.16	54.00	-6.84	3	Vertical	231	1.43	-
2402MHz	Pass	AV	2.402G	98.12	Inf	-Inf	3	Vertical	231	1.43	-
2402MHz	Pass	PK	2.3584G	59.19	74.00	-14.81	3	Vertical	231	1.43	-
2402MHz	Pass	PK	2.4018G	99.11	Inf	-Inf	3	Vertical	231	1.43	-
2402MHz	Pass	AV	2.3532G	47.32	54.00	-6.68	3	Horizontal	63	1.02	-
2402MHz	Pass	AV	2.402G	101.99	Inf	-Inf	3	Horizontal	63	1.02	-
2402MHz	Pass	PK	2.3522G	58.95	74.00	-15.05	3	Horizontal	63	1.02	-
2402MHz	Pass	PK	2.4022G	102.93	Inf	-Inf	3	Horizontal	63	1.02	-
2402MHz	Pass	AV	4.80396G	43.67	54.00	-10.33	3	Vertical	327	2.71	-
2402MHz	Pass	PK	4.80388G	53.67	74.00	-20.33	3	Vertical	327	2.71	-
2402MHz	Pass	AV	4.80396G	43.35	54.00	-10.65	3	Horizontal	217	2.99	-
2402MHz	Pass	PK	4.80384G	53.79	74.00	-20.21	3	Horizontal	217	2.99	-
2440MHz	Pass	AV	2.344G	46.37	54.00	-7.63	3	Vertical	231	1.07	-
2440MHz	Pass	AV	2.44G	100.08	Inf	-Inf	3	Vertical	231	1.07	-
2440MHz	Pass	AV	2.5G	46.51	54.00	-7.49	3	Vertical	231	1.07	-
2440MHz	Pass	PK	2.3884G	59.22	74.00	-14.78	3	Vertical	231	1.07	-
2440MHz	Pass	PK	2.4404G	101.13	Inf	-Inf	3	Vertical	231	1.07	-
2440MHz	Pass	PK	2.486G	58.60	74.00	-15.40	3	Vertical	231	1.07	-
2440MHz	Pass	AV	2.3552G	46.39	54.00	-7.61	3	Horizontal	64	1.00	-
2440MHz	Pass	AV	2.44G	103.39	Inf	-Inf	3	Horizontal	64	1.00	-
2440MHz	Pass	AV	2.49G	46.39	54.00	-7.61	3	Horizontal	64	1.00	-
2440MHz	Pass	PK	2.3796G	58.80	74.00	-15.20	3	Horizontal	64	1.00	-
2440MHz	Pass	PK	2.4396G	104.44	Inf	-Inf	3	Horizontal	64	1.00	-
2440MHz	Pass	PK	2.4936G	59.37	74.00	-14.63	3	Horizontal	64	1.00	-
2440MHz	Pass	AV	4.87993G	42.59	54.00	-11.41	3	Vertical	97	2.32	-
2440MHz	Pass	PK	4.88011G	52.11	74.00	-21.89	3	Vertical	97	2.32	-
2440MHz	Pass	AV	4.88003G	41.46	54.00	-12.54	3	Horizontal	201	2.87	-
2440MHz	Pass	PK	4.87998G	51.30	74.00	-22.70	3	Horizontal	201	2.87	-
2480MHz	Pass	AV	2.48G	99.35	Inf	-Inf	3	Vertical	171	1.54	-
2480MHz	Pass	AV	2.4842G	46.65	54.00	-7.35	3	Vertical	171	1.54	-
2480MHz	Pass	PK	2.4802G	100.42	Inf	-Inf	3	Vertical	171	1.54	-
2480MHz	Pass	PK	2.4964G	59.12	74.00	-14.88	3	Vertical	171	1.54	-
2480MHz	Pass	AV	2.48G	101.18	Inf	-Inf	3	Horizontal	65	1.09	-
2480MHz	Pass	AV	2.488G	46.71	54.00	-7.29	3	Horizontal	65	1.09	-
2480MHz	Pass	PK	2.4802G	102.20	Inf	-Inf	3	Horizontal	65	1.09	-
2480MHz	Pass	PK	2.4966G	59.02	74.00	-14.98	3	Horizontal	65	1.09	-
2480MHz	Pass	AV	4.96003G	41.59	54.00	-12.41	3	Vertical	98	2.71	-
2480MHz	Pass	PK	4.95982G	52.12	74.00	-21.88	3	Vertical	98	2.71	-
2480MHz	Pass	AV	4.95999G	39.67	54.00	-14.33	3	Horizontal	203	1.08	-
2480MHz	Pass	PK	4.96016G	49.91	74.00	-24.09	3	Horizontal	203	1.08	-
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3706G	46.24	54.00	-7.76	3	Vertical	233	1.22	-
2402MHz	Pass	AV	2.402G	96.14	Inf	-Inf	3	Vertical	233	1.22	-
2402MHz	Pass	PK	2.3706G	59.10	74.00	-14.90	3	Vertical	233	1.22	-
2402MHz	Pass	PK	2.4016G	99.14	Inf	-Inf	3	Vertical	233	1.22	-
2402MHz	Pass	AV	2.3544G	46.38	54.00	-7.62	3	Horizontal	63	1.03	-
2402MHz	Pass	AV	2.402G	99.77	Inf	-Inf	3	Horizontal	63	1.03	-

Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

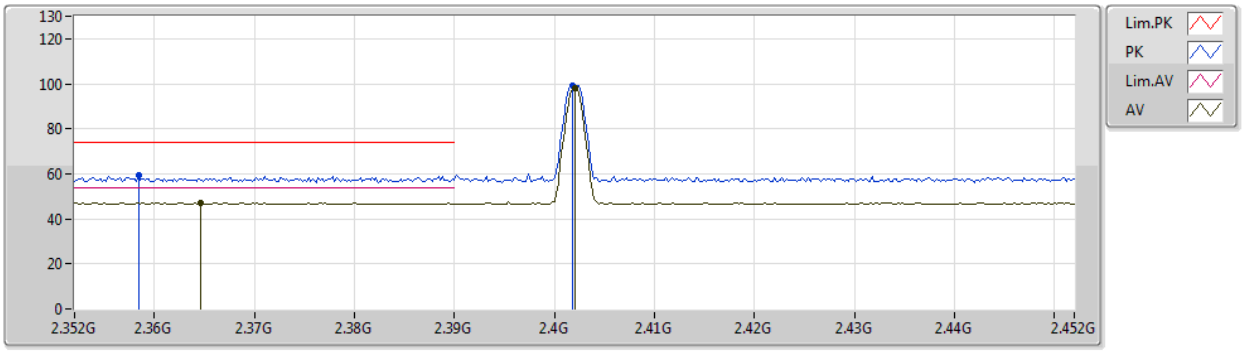
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2402MHz	Pass	PK	2.382G	59.09	74.00	-14.91	3	Horizontal	63	1.03	-
2402MHz	Pass	PK	2.4024G	102.82	Inf	-Inf	3	Horizontal	63	1.03	-
2402MHz	Pass	AV	4.80402G	43.33	54.00	-10.67	3	Vertical	329	2.93	-
2402MHz	Pass	PK	4.8041G	53.51	74.00	-20.49	3	Vertical	329	2.93	-
2402MHz	Pass	AV	4.80404G	43.46	54.00	-10.54	3	Horizontal	219	2.97	-
2402MHz	Pass	PK	4.80405G	52.82	74.00	-21.18	3	Horizontal	219	2.97	-
2440MHz	Pass	AV	2.364G	46.29	54.00	-7.71	3	Vertical	230	1.08	-
2440MHz	Pass	AV	2.44G	98.46	Inf	-Inf	3	Vertical	230	1.08	-
2440MHz	Pass	AV	2.4912G	46.52	54.00	-7.48	3	Vertical	230	1.08	-
2440MHz	Pass	PK	2.3556G	59.11	74.00	-14.89	3	Vertical	230	1.08	-
2440MHz	Pass	PK	2.4404G	101.53	Inf	-Inf	3	Vertical	230	1.08	-
2440MHz	Pass	PK	2.4908G	59.14	74.00	-14.86	3	Vertical	230	1.08	-
2440MHz	Pass	AV	2.3648G	46.40	54.00	-7.60	3	Horizontal	64	1.00	-
2440MHz	Pass	AV	2.44G	101.43	Inf	-Inf	3	Horizontal	64	1.00	-
2440MHz	Pass	AV	2.494G	46.42	54.00	-7.58	3	Horizontal	64	1.00	-
2440MHz	Pass	PK	2.3424G	59.84	74.00	-14.16	3	Horizontal	64	1.00	-
2440MHz	Pass	PK	2.4396G	104.42	Inf	-Inf	3	Horizontal	64	1.00	-
2440MHz	Pass	PK	2.4984G	58.86	74.00	-15.14	3	Horizontal	64	1.00	-
2440MHz	Pass	AV	4.87995G	41.62	54.00	-12.38	3	Vertical	327	2.87	-
2440MHz	Pass	PK	4.88007G	51.39	74.00	-22.61	3	Vertical	327	2.87	-
2440MHz	Pass	AV	4.88003G	40.55	54.00	-13.45	3	Horizontal	201	2.87	-
2440MHz	Pass	PK	4.8801G	50.10	74.00	-23.90	3	Horizontal	201	2.87	-
2480MHz	Pass	AV	2.48G	97.50	Inf	-Inf	3	Vertical	298	2.79	-
2480MHz	Pass	AV	2.4835G	47.55	54.00	-6.45	3	Vertical	298	2.79	-
2480MHz	Pass	PK	2.4804G	100.56	Inf	-Inf	3	Vertical	298	2.79	-
2480MHz	Pass	PK	2.4896G	59.04	74.00	-14.96	3	Vertical	298	2.79	-
2480MHz	Pass	AV	2.48G	99.39	Inf	-Inf	3	Horizontal	64	1.10	-
2480MHz	Pass	AV	2.4835G	48.24	54.00	-5.76	3	Horizontal	64	1.10	-
2480MHz	Pass	PK	2.4804G	102.38	Inf	-Inf	3	Horizontal	64	1.10	-
2480MHz	Pass	PK	2.4868G	59.07	74.00	-14.93	3	Horizontal	64	1.10	-
2480MHz	Pass	AV	4.95997G	38.53	54.00	-15.47	3	Vertical	332	2.70	-
2480MHz	Pass	PK	4.96038G	49.08	74.00	-24.92	3	Vertical	332	2.70	-
2480MHz	Pass	AV	4.95997G	39.13	54.00	-14.87	3	Horizontal	201	2.79	-
2480MHz	Pass	PK	4.95974G	49.33	74.00	-24.67	3	Horizontal	201	2.79	-

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(1Mbps)

2402MHz_TX

22/08/2019

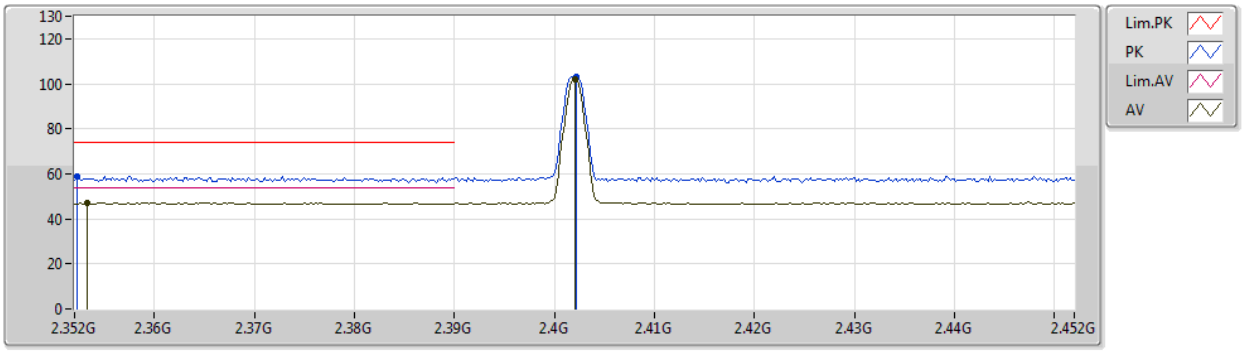


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3646G	47.16	54.00	-6.84	33.86	3	Vertical	231	1.43	-	13.30	27.74	6.12	-
AV	2.402G	98.12	Inf	-Inf	33.71	3	Vertical	231	1.43	-	64.41	27.60	6.11	-
PK	2.3584G	59.19	74.00	-14.81	33.89	3	Vertical	231	1.43	-	25.30	27.77	6.12	-
PK	2.4018G	99.11	Inf	-Inf	33.71	3	Vertical	231	1.43	-	65.40	27.60	6.11	-

BT-LE(1Mbps)

2402MHz_TX

22/08/2019

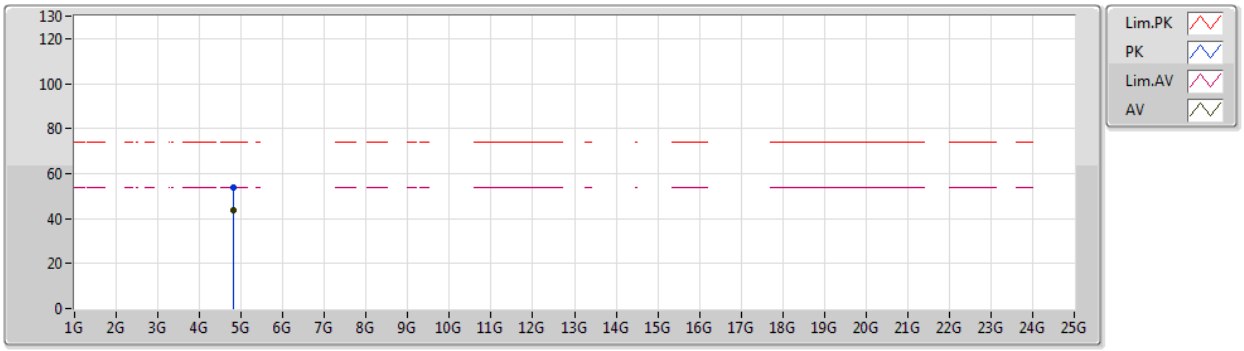


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3532G	47.32	54.00	-6.68	33.91	3	Horizontal	63	1.02	-	13.41	27.79	6.12	-
AV	2.402G	101.99	Inf	-Inf	33.71	3	Horizontal	63	1.02	-	68.28	27.60	6.11	-
PK	2.3522G	58.95	74.00	-15.05	33.91	3	Horizontal	63	1.02	-	25.04	27.79	6.12	-
PK	2.4022G	102.93	Inf	-Inf	33.71	3	Horizontal	63	1.02	-	69.22	27.60	6.11	-

BT-LE(1Mbps)

2402MHz_TX

22/08/2019



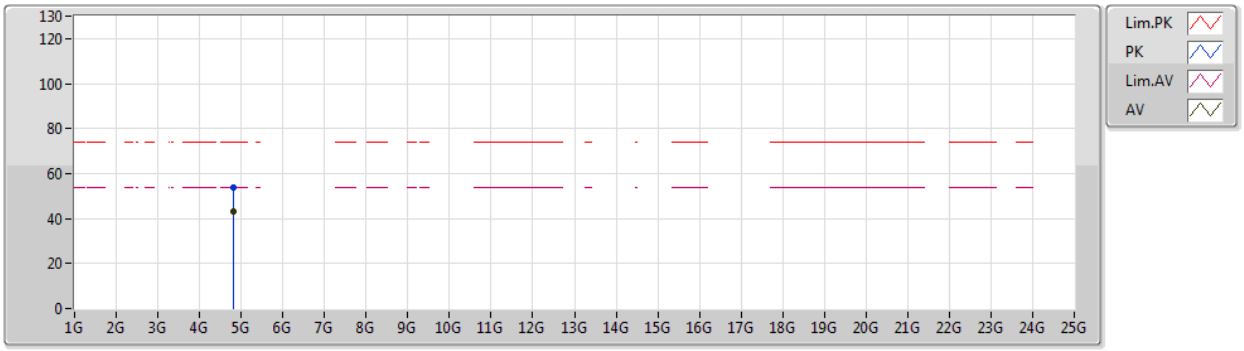
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80396G	43.67	54.00	-10.33	5.70	3	Vertical	327	2.71	-	37.97	31.10	8.90	34.30
PK	4.80388G	53.67	74.00	-20.33	5.70	3	Vertical	327	2.71	-	47.97	31.10	8.90	34.30

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(1Mbps)

2402MHz_TX

22/08/2019



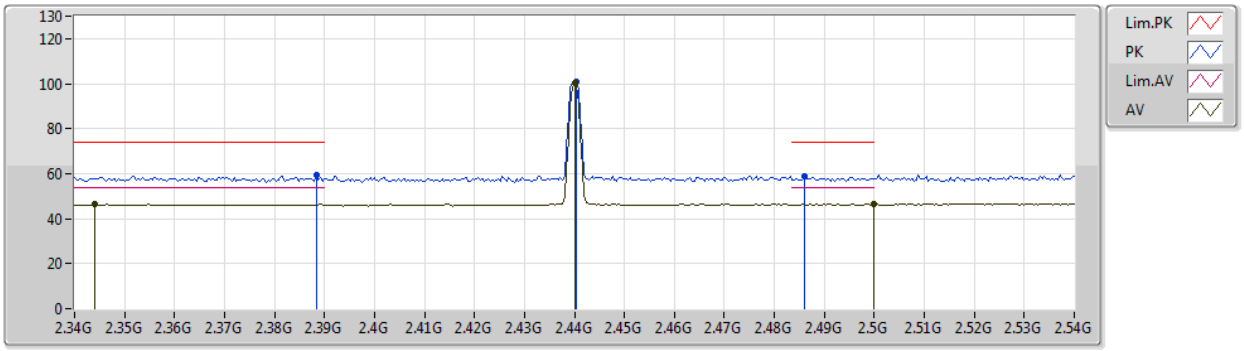
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80396G	43.35	54.00	-10.65	5.70	3	Horizontal	217	2.99	-	37.65	31.10	8.90	34.30
PK	4.80384G	53.79	74.00	-20.21	5.70	3	Horizontal	217	2.99	-	48.09	31.10	8.90	34.30

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(1Mbps)

2440MHz_TX

22/08/2019

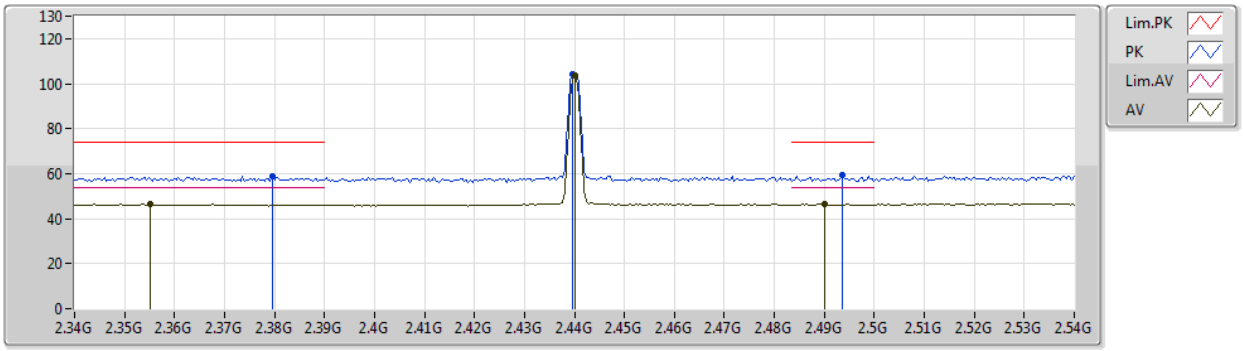


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.344G	46.37	54.00	-7.63	33.94	3	Vertical	231	1.07	-	12.43	27.82	6.12	-
AV	2.44G	100.08	Inf	-Inf	33.69	3	Vertical	231	1.07	-	66.39	27.56	6.13	-
AV	2.5G	46.51	54.00	-7.49	33.65	3	Vertical	231	1.07	-	12.86	27.50	6.15	-
PK	2.3884G	59.22	74.00	-14.78	33.76	3	Vertical	231	1.07	-	25.46	27.65	6.11	-
PK	2.4404G	101.13	Inf	-Inf	33.69	3	Vertical	231	1.07	-	67.44	27.56	6.13	-
PK	2.486G	58.60	74.00	-15.40	33.66	3	Vertical	231	1.07	-	24.94	27.51	6.15	-

BT-LE(1Mbps)

2440MHz_TX

22/08/2019

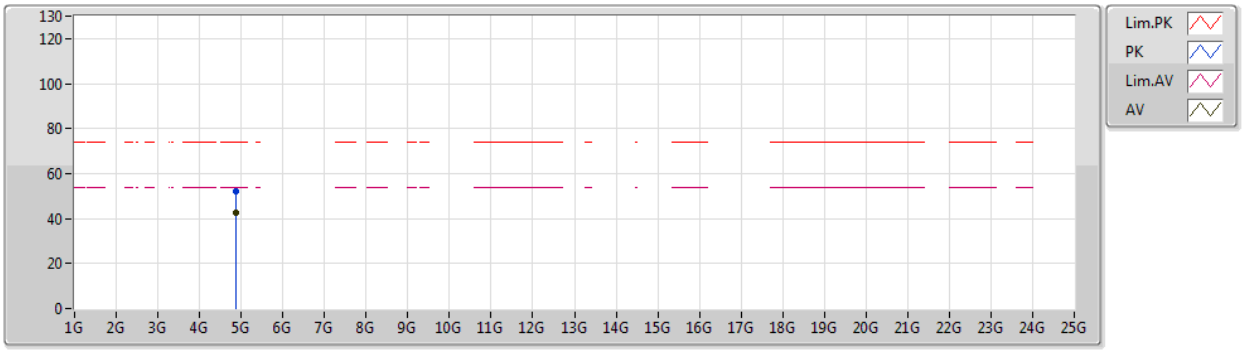


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3552G	46.39	54.00	-7.61	33.90	3	Horizontal	64	1.00	-	12.49	27.78	6.12	-
AV	2.44G	103.39	Inf	-Inf	33.69	3	Horizontal	64	1.00	-	69.70	27.56	6.13	-
AV	2.49G	46.39	54.00	-7.61	33.66	3	Horizontal	64	1.00	-	12.73	27.51	6.15	-
PK	2.3796G	58.80	74.00	-15.20	33.79	3	Horizontal	64	1.00	-	25.01	27.68	6.11	-
PK	2.4396G	104.44	Inf	-Inf	33.69	3	Horizontal	64	1.00	-	70.75	27.56	6.13	-
PK	2.4936G	59.37	74.00	-14.63	33.66	3	Horizontal	64	1.00	-	25.71	27.51	6.15	-

BT-LE(1Mbps)

2440MHz_TX

22/08/2019



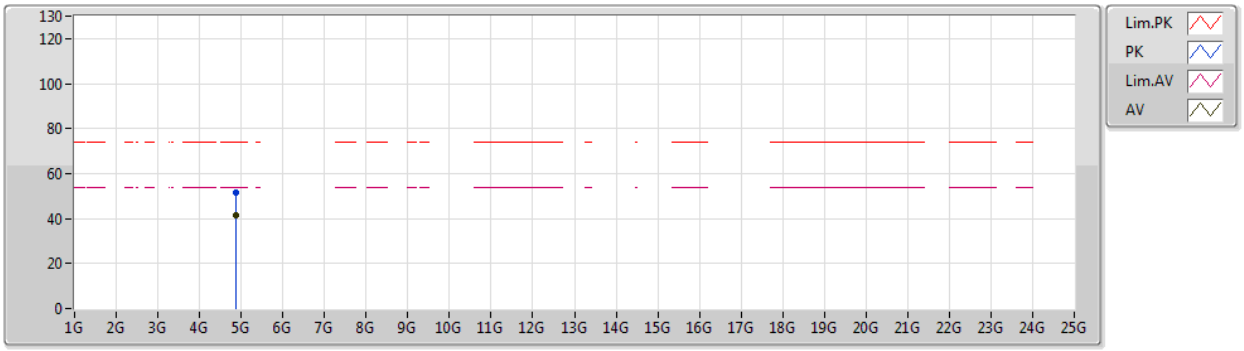
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87993G	42.59	54.00	-11.41	5.78	3	Vertical	97	2.32	-	36.81	31.10	8.96	34.28
PK	4.88011G	52.11	74.00	-21.89	5.78	3	Vertical	97	2.32	-	46.33	31.10	8.96	34.28

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(1Mbps)

2440MHz_TX

22/08/2019



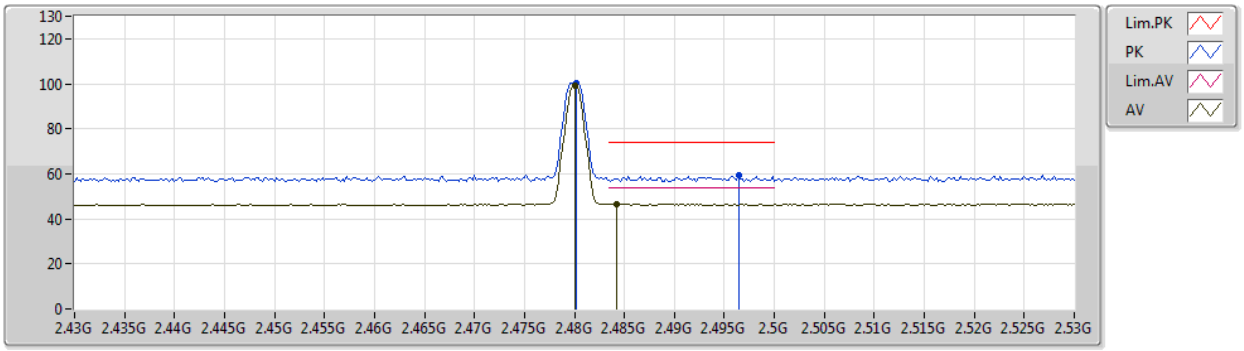
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.88003G	41.46	54.00	-12.54	5.78	3	Horizontal	201	2.87	-	35.68	31.10	8.96	34.28
PK	4.87998G	51.30	74.00	-22.70	5.78	3	Horizontal	201	2.87	-	45.52	31.10	8.96	34.28

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(1Mbps)

2480MHz_TX

22/08/2019



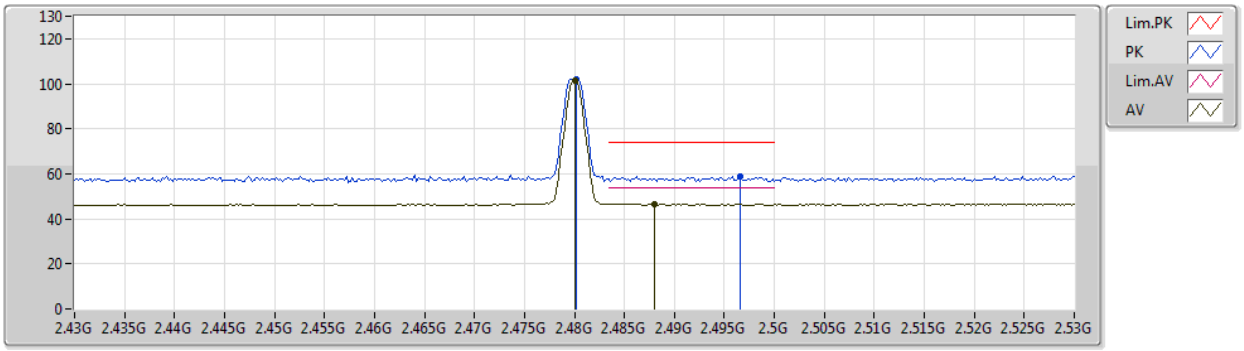
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	99.35	Inf	-Inf	33.67	3	Vertical	171	1.54	-	65.68	27.52	6.15	-
AV	2.4842G	46.65	54.00	-7.35	33.67	3	Vertical	171	1.54	-	12.98	27.52	6.15	-
PK	2.4802G	100.42	Inf	-Inf	33.67	3	Vertical	171	1.54	-	66.75	27.52	6.15	-
PK	2.4964G	59.12	74.00	-14.88	33.65	3	Vertical	171	1.54	-	25.47	27.50	6.15	-

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(1Mbps)

2480MHz_TX

22/08/2019

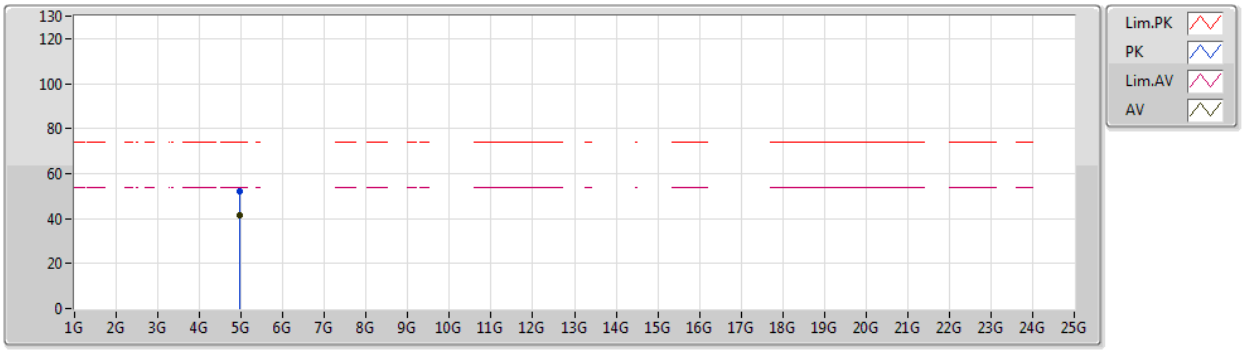


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	101.18	Inf	-Inf	33.67	3	Horizontal	65	1.09	-	67.51	27.52	6.15	-
AV	2.488G	46.71	54.00	-7.29	33.66	3	Horizontal	65	1.09	-	13.05	27.51	6.15	-
PK	2.4802G	102.20	Inf	-Inf	33.67	3	Horizontal	65	1.09	-	68.53	27.52	6.15	-
PK	2.4966G	59.02	74.00	-14.98	33.65	3	Horizontal	65	1.09	-	25.37	27.50	6.15	-

BT-LE(1Mbps)

2480MHz_TX

22/08/2019



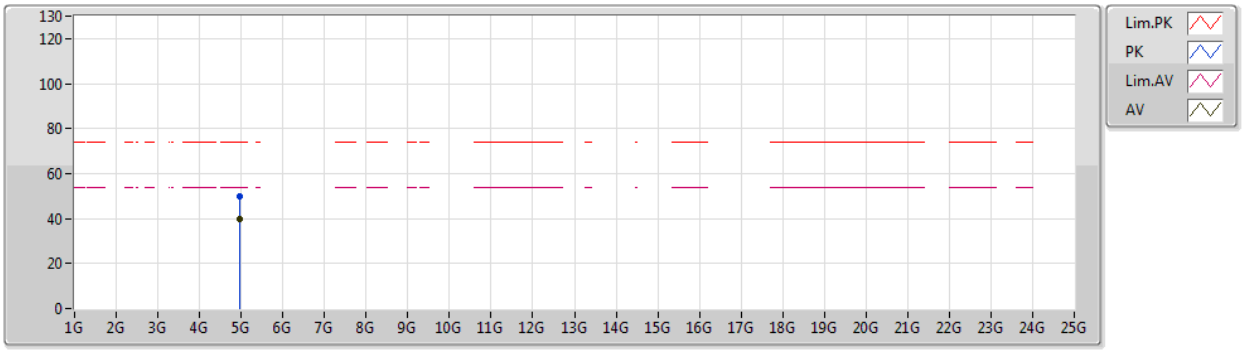
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.96003G	41.59	54.00	-12.41	6.21	3	Vertical	98	2.71	-	35.38	31.34	9.03	34.16
PK	4.95982G	52.12	74.00	-21.88	6.21	3	Vertical	98	2.71	-	45.91	31.34	9.03	34.16

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(1Mbps)

2480MHz_TX

22/08/2019



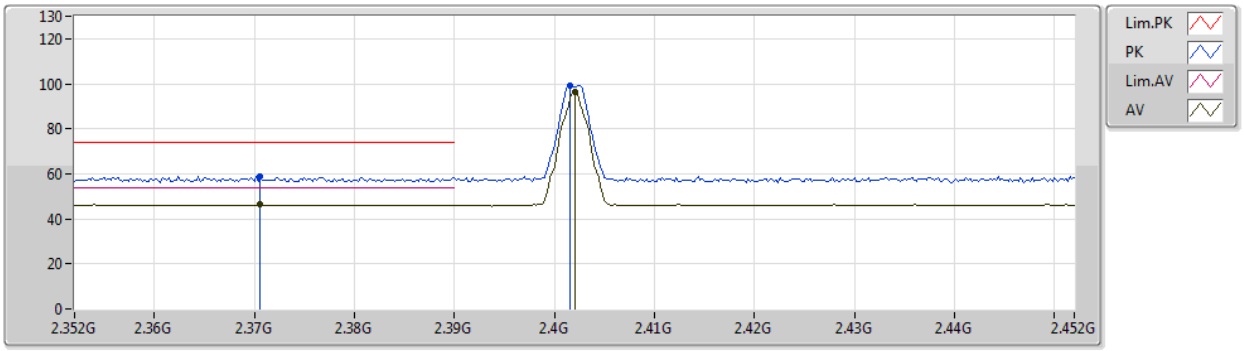
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.95999G	39.67	54.00	-14.33	6.21	3	Horizontal	203	1.08	-	33.46	31.34	9.03	34.16
PK	4.96016G	49.91	74.00	-24.09	6.21	3	Horizontal	203	1.08	-	43.70	31.34	9.03	34.16

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(2Mbps)

2402MHz_TX

22/08/2019



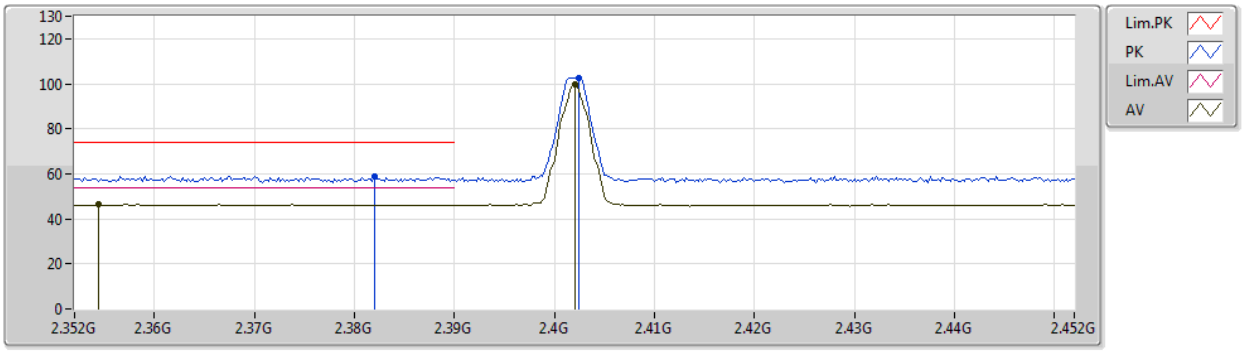
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3706G	46.24	54.00	-7.76	33.84	3	Vertical	233	1.22	-	12.40	27.72	6.12	-
AV	2.402G	96.14	Inf	-Inf	33.71	3	Vertical	233	1.22	-	62.43	27.60	6.11	-
PK	2.3706G	59.10	74.00	-14.90	33.84	3	Vertical	233	1.22	-	25.26	27.72	6.12	-
PK	2.4016G	99.14	Inf	-Inf	33.71	3	Vertical	233	1.22	-	65.43	27.60	6.11	-

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(2Mbps)

2402MHz_TX

22/08/2019



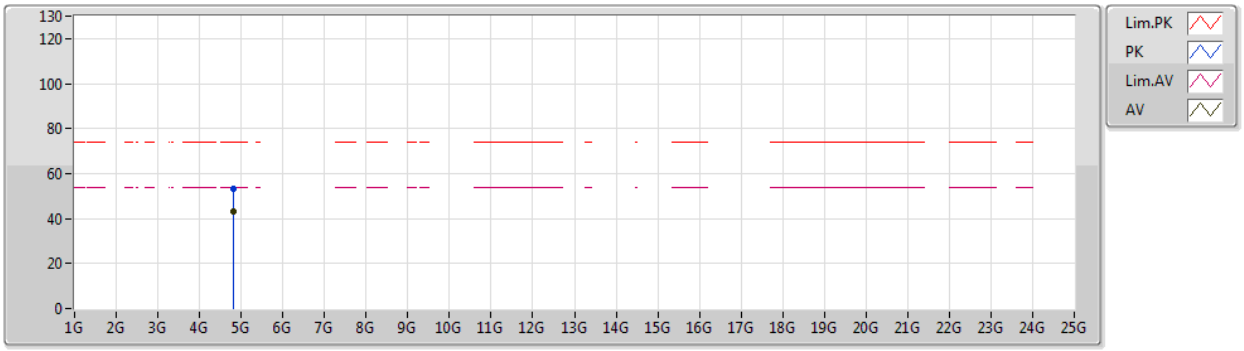
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3544G	46.38	54.00	-7.62	33.90	3	Horizontal	63	1.03	-	12.48	27.78	6.12	-
AV	2.402G	99.77	Inf	-Inf	33.71	3	Horizontal	63	1.03	-	66.06	27.60	6.11	-
PK	2.382G	59.09	74.00	-14.91	33.78	3	Horizontal	63	1.03	-	25.31	27.67	6.11	-
PK	2.4024G	102.82	Inf	-Inf	33.71	3	Horizontal	63	1.03	-	69.11	27.60	6.11	-

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(2Mbps)

2402MHz_TX

22/08/2019

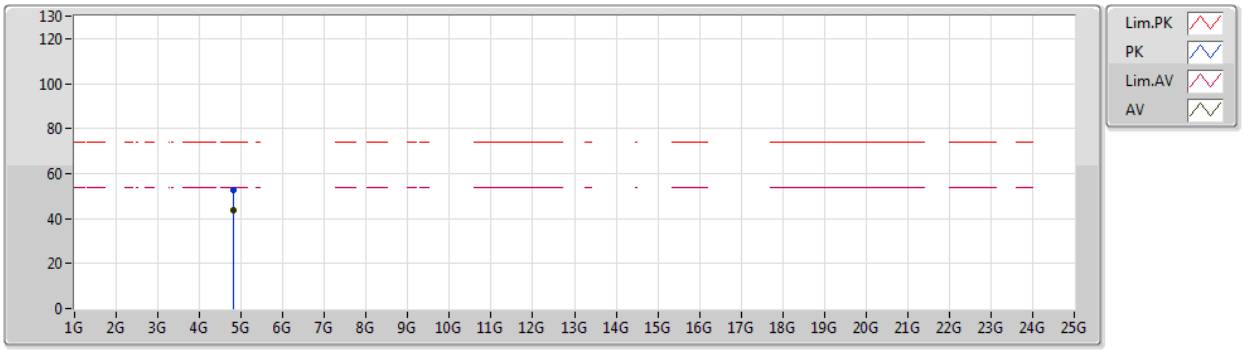


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80402G	43.33	54.00	-10.67	5.70	3	Vertical	329	2.93	-	37.63	31.10	8.90	34.30
PK	4.8041G	53.51	74.00	-20.49	5.70	3	Vertical	329	2.93	-	47.81	31.10	8.90	34.30

BT-LE(2Mbps)

2402MHz_TX

22/08/2019



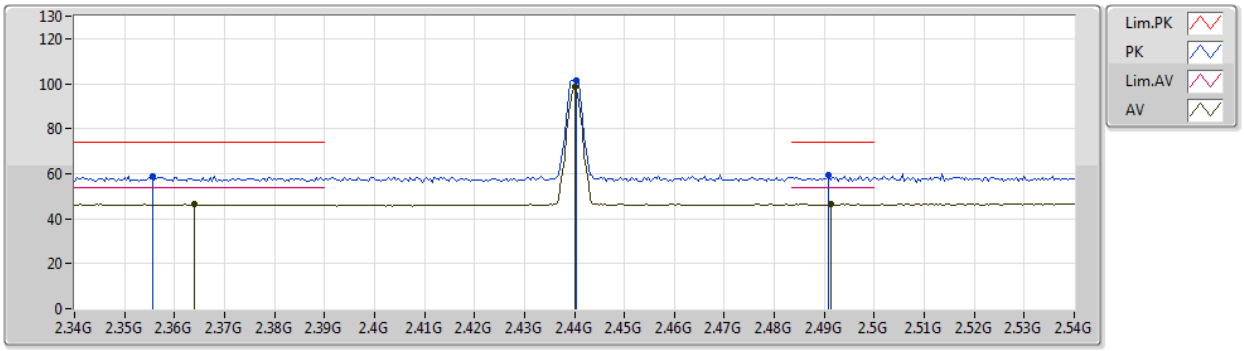
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80404G	43.46	54.00	-10.54	5.70	3	Horizontal	219	2.97	-	37.76	31.10	8.90	34.30
PK	4.80405G	52.82	74.00	-21.18	5.70	3	Horizontal	219	2.97	-	47.12	31.10	8.90	34.30

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(2Mbps)

2440MHz_TX

22/08/2019

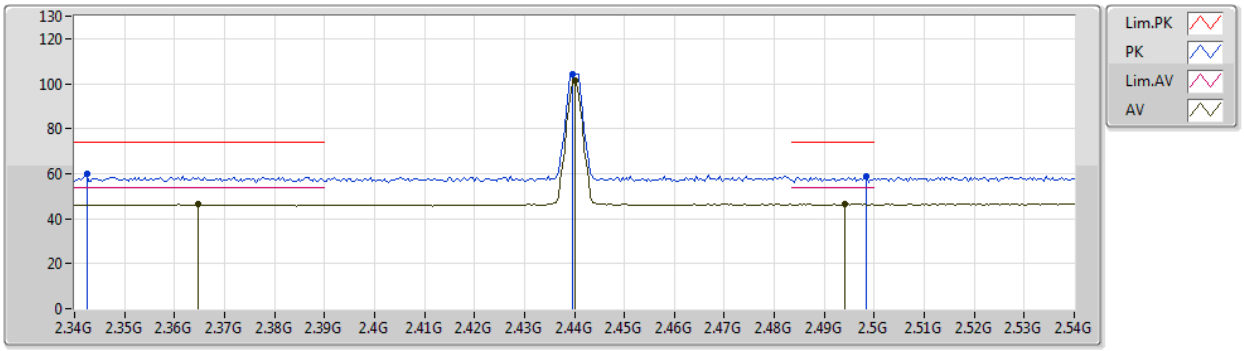


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.364G	46.29	54.00	-7.71	33.86	3	Vertical	230	1.08	-	12.43	27.74	6.12	-
AV	2.44G	98.46	Inf	-Inf	33.69	3	Vertical	230	1.08	-	64.77	27.56	6.13	-
AV	2.4912G	46.52	54.00	-7.48	33.66	3	Vertical	230	1.08	-	12.86	27.51	6.15	-
PK	2.3556G	59.11	74.00	-14.89	33.90	3	Vertical	230	1.08	-	25.21	27.78	6.12	-
PK	2.4404G	101.53	Inf	-Inf	33.69	3	Vertical	230	1.08	-	67.84	27.56	6.13	-
PK	2.4908G	59.14	74.00	-14.86	33.66	3	Vertical	230	1.08	-	25.48	27.51	6.15	-

BT-LE(2Mbps)

2440MHz_TX

22/08/2019

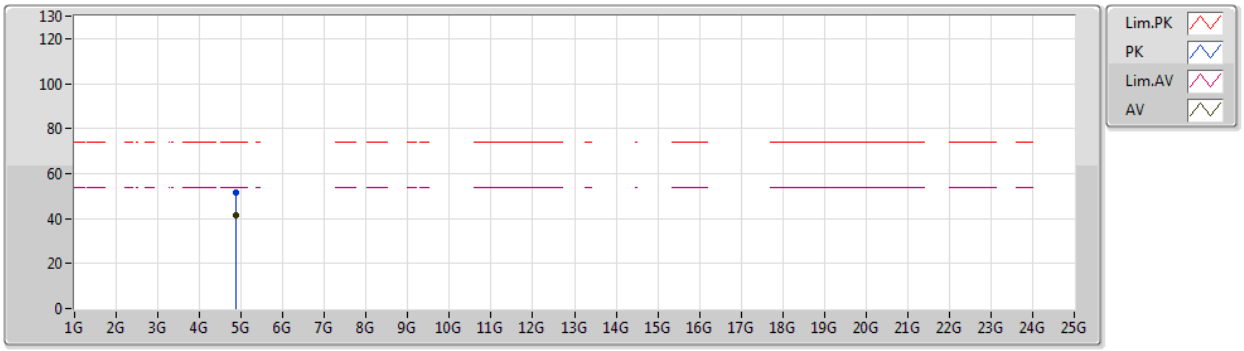


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3648G	46.40	54.00	-7.60	33.86	3	Horizontal	64	1.00	-	12.54	27.74	6.12	-
AV	2.44G	101.43	Inf	-Inf	33.69	3	Horizontal	64	1.00	-	67.74	27.56	6.13	-
AV	2.494G	46.42	54.00	-7.58	33.66	3	Horizontal	64	1.00	-	12.76	27.51	6.15	-
PK	2.3424G	59.84	74.00	-14.16	33.95	3	Horizontal	64	1.00	-	25.89	27.83	6.12	-
PK	2.4396G	104.42	Inf	-Inf	33.69	3	Horizontal	64	1.00	-	70.73	27.56	6.13	-
PK	2.4984G	58.86	74.00	-15.14	33.65	3	Horizontal	64	1.00	-	25.21	27.50	6.15	-

BT-LE(2Mbps)

2440MHz_TX

22/08/2019



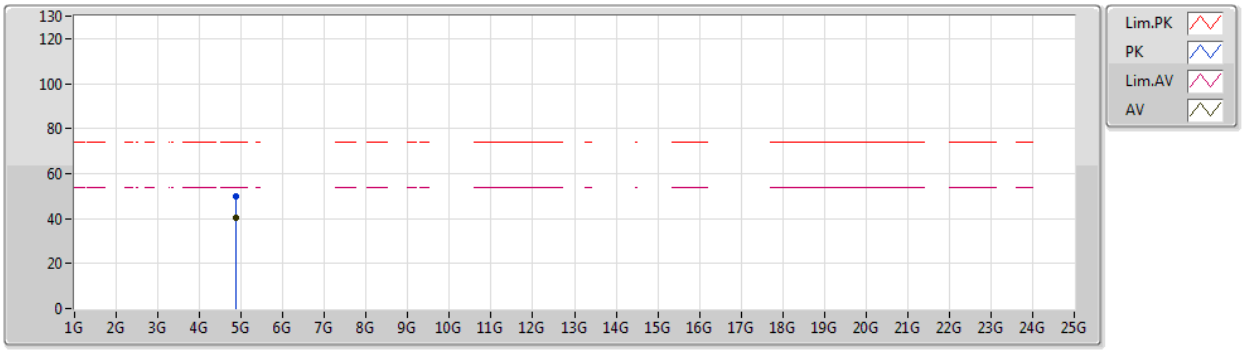
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87995G	41.62	54.00	-12.38	5.78	3	Vertical	327	2.87	-	35.84	31.10	8.96	34.28
PK	4.88007G	51.39	74.00	-22.61	5.78	3	Vertical	327	2.87	-	45.61	31.10	8.96	34.28

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(2Mbps)

2440MHz_TX

22/08/2019



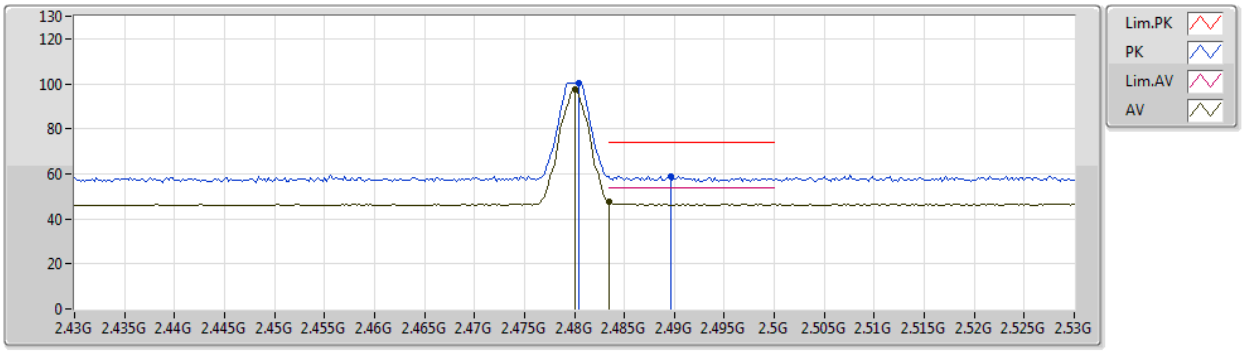
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.88003G	40.55	54.00	-13.45	5.78	3	Horizontal	201	2.87	-	34.77	31.10	8.96	34.28
PK	4.8801G	50.10	74.00	-23.90	5.78	3	Horizontal	201	2.87	-	44.32	31.10	8.96	34.28

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(2Mbps)

2480MHz_TX

22/08/2019

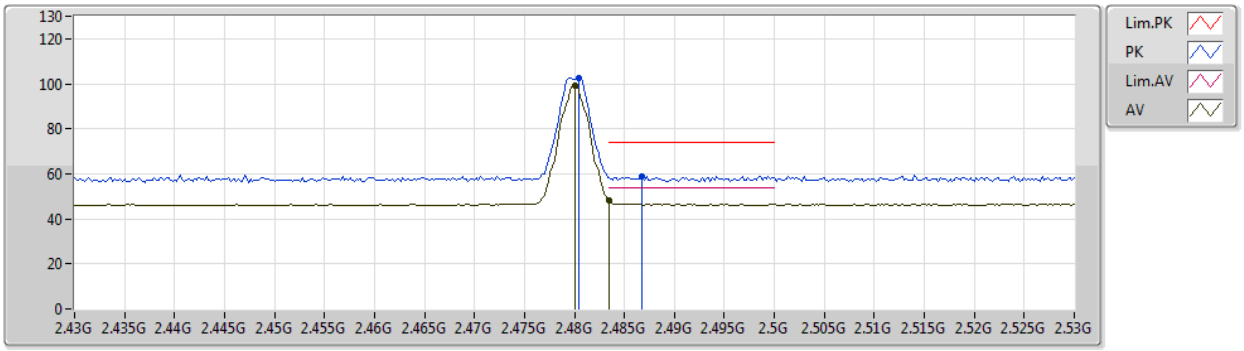


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	97.50	Inf	-Inf	33.67	3	Vertical	298	2.79	-	63.83	27.52	6.15	-
AV	2.4835G	47.55	54.00	-6.45	33.67	3	Vertical	298	2.79	-	13.88	27.52	6.15	-
PK	2.4804G	100.56	Inf	-Inf	33.67	3	Vertical	298	2.79	-	66.89	27.52	6.15	-
PK	2.4896G	59.04	74.00	-14.96	33.66	3	Vertical	298	2.79	-	25.38	27.51	6.15	-

BT-LE(2Mbps)

2480MHz_TX

22/08/2019

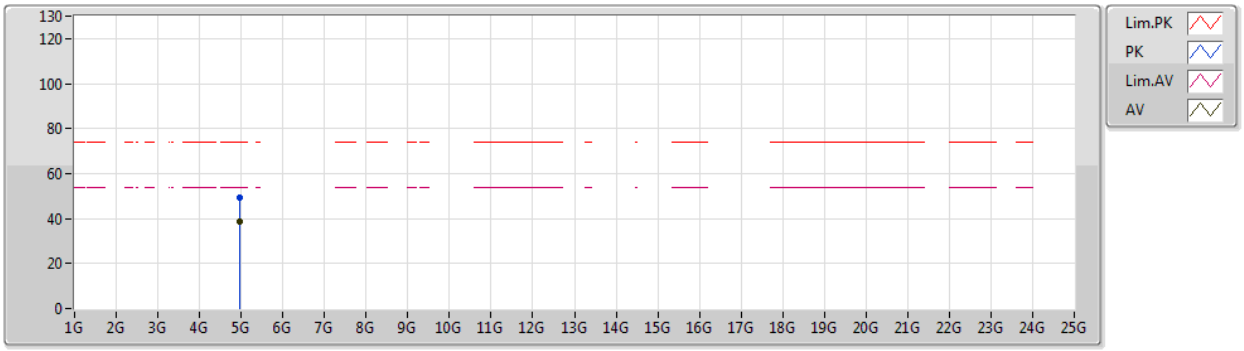


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	99.39	Inf	-Inf	33.67	3	Horizontal	64	1.10	-	65.72	27.52	6.15	-
AV	2.4835G	48.24	54.00	-5.76	33.67	3	Horizontal	64	1.10	-	14.57	27.52	6.15	-
PK	2.4804G	102.38	Inf	-Inf	33.67	3	Horizontal	64	1.10	-	68.71	27.52	6.15	-
PK	2.4868G	59.07	74.00	-14.93	33.66	3	Horizontal	64	1.10	-	25.41	27.51	6.15	-

BT-LE(2Mbps)

2480MHz_TX

22/08/2019



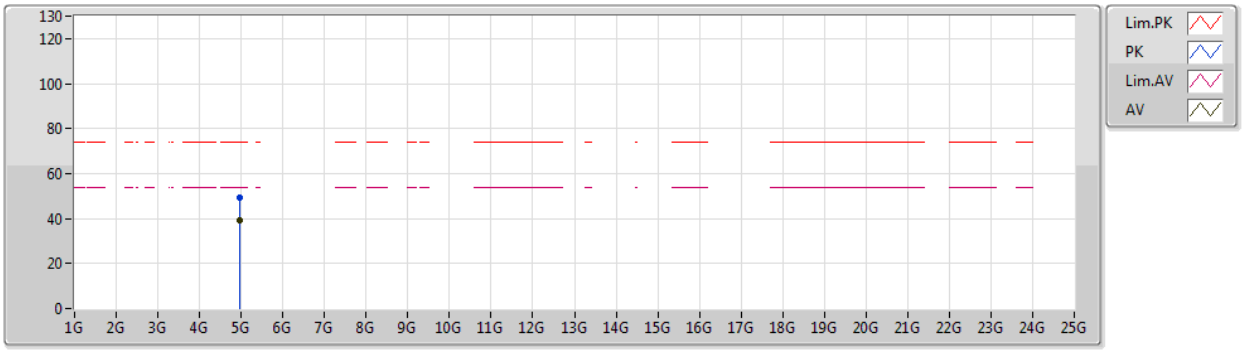
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.95997G	38.53	54.00	-15.47	6.21	3	Vertical	332	2.70	-	32.32	31.34	9.03	34.16
PK	4.96038G	49.08	74.00	-24.92	6.21	3	Vertical	332	2.70	-	42.87	31.34	9.03	34.16

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

BT-LE(2Mbps)

2480MHz_TX

22/08/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.95997G	39.13	54.00	-14.87	6.21	3	Horizontal	201	2.79	-	32.92	31.34	9.03	34.16
PK	4.95974G	49.33	74.00	-24.67	6.21	3	Horizontal	201	2.79	-	43.12	31.34	9.03	34.16

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)