FCC RADIO TEST REPORT

FCC ID	:	2AUBRBF508
Equipment	:	BT 5.0 Module
Brand Name	:	Syntronix
Model Name	:	SBF508M-21
Applicant	:	Syntronix Corporation 8F, No.6, Li-Hsin 6th RD., Hsinchu Taiwan
Manufacturer	:	Syntronix Corporation 8F, No.6, Li-Hsin 6th RD., Hsinchu Taiwan
Standard	:	47 CFR FCC Part 15.247

The product was received on Aug. 16, 2019, and testing was started from Aug. 21, 2019 and completed on Sep. 16, 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: Sam Chen

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
FR981347	01	Initial issue of report	Sep. 20, 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	-

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:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen
Report Producer: Cindy Peng

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 (125Kbps)	1.0	1TX
2.4-2.4835GHz	BT-LE (500Kbps)	1.0	1TX
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 modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2, 3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	Syntronix	IFMA	Printed Antenna	N/A	0

Note1: The above information was declared by manufacturer.
Note2: The EUT has one antenna. (1TX/1RX)

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(125Kbps)	0.702	1.54	1.775m	1k
BT-LE(500Kbps)	0.622	2.06	780u	3k
BT-LE(1Mbps)	0.444	3.53	278.75u	10k
BT-LE(2Mbps)	0.298	5.26	187.5u	10k

Note:
- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From host system			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	BlueLitECommander v2.4.2_00B			
Support Mode	☒	LE 1M PHY: 1 Mb/s		
	☒	LE Coded PHY (S=2): 500 Kb/s		
	☒	LE Coded PHY (S=8): 125 Kb/s		
	☒	LE 2M PHY: 2 Mb/s		

Note: The above information was declared by manufacturer.

1.2 Applicable 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
- FCC KDB 558074 D01 v05r02
- FCC 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
☒	JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.			
		TEL	:	886-3-656-9065	FAX	:	886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH02-CB	Zero Chen	25.4~26°C / 60~64%	Aug. 23, 2019~Sep. 16, 2019
Radiated below 1GHz	03CH04-CB	Eason Chen	25.5~26°C / 65~69%	Aug. 21, 2019
Radiated above 1GHz	03CH01-CB	Welson Chen	25.9~26.8°C / 61~64%	Aug. 22, 2019~Sep. 11, 2019
AC Conduction	CO01-CB	Peter Wu	23~24°C / 51~52%	Sep. 03, 2019

Test site Designation No. TW0006 with FCC.
Test site registered number IC 4086B with Industry Canada.

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)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	PowerSetting
BT-LE(125Kbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-LE(500Kbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-LE(2Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

2.2 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	Normal Link

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	Normal Link
1	EUT in Z axis
Operating Mode > 1GHz	CTX
1	EUT in X axis
2	EUT in Y axis
3	EUT in Z axis
Mode 3 has been evaluated to be the worst case after evaluating. Consequently, measurement will follow this same test mode.	

2.3 EUT Operation during Test

During the test, “BlueLitECommander v2.4.2_00B” under WIN 7 was executed the test program to control the EUT continuously transmit RF signal.

2.4 Accessories

N/A

2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Notebook	DELL	E6430	N/A
B	Mouse	Logitech	M-U0026	N/A
C	Earphone	SHYARO CHI	MIC-04	N/A
D	Smart phone	Samsung	Galaxy J2	N/A
E	Test Fixture	Syntronix Corporation	SBF508xF-48_EVB	N/A

For Radiated (below 1GHz):

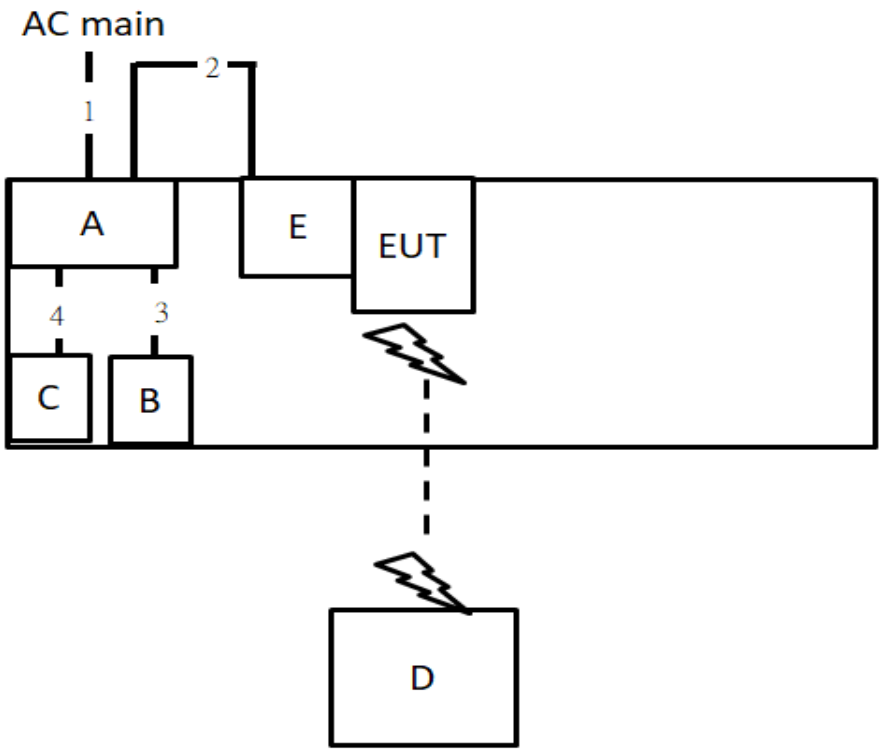
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Notebook	DELL	E4300	N/A
B	Mouse	Logitech	M-U0026	N/A
C	Earphone	e-Power	S90W	N/A
D	Smart phone	Samsung	Galaxy J2	N/A
E	Test Fixture	Syntronix Corporation	SBF508xF-48_EVB	N/A

For Radiated (above 1GHz) and RF Conducted:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Notebook	DELL	E4300	N/A
B	Test Fixture	Syntronix Corporation	SBF508xF-48_EVB	N/A

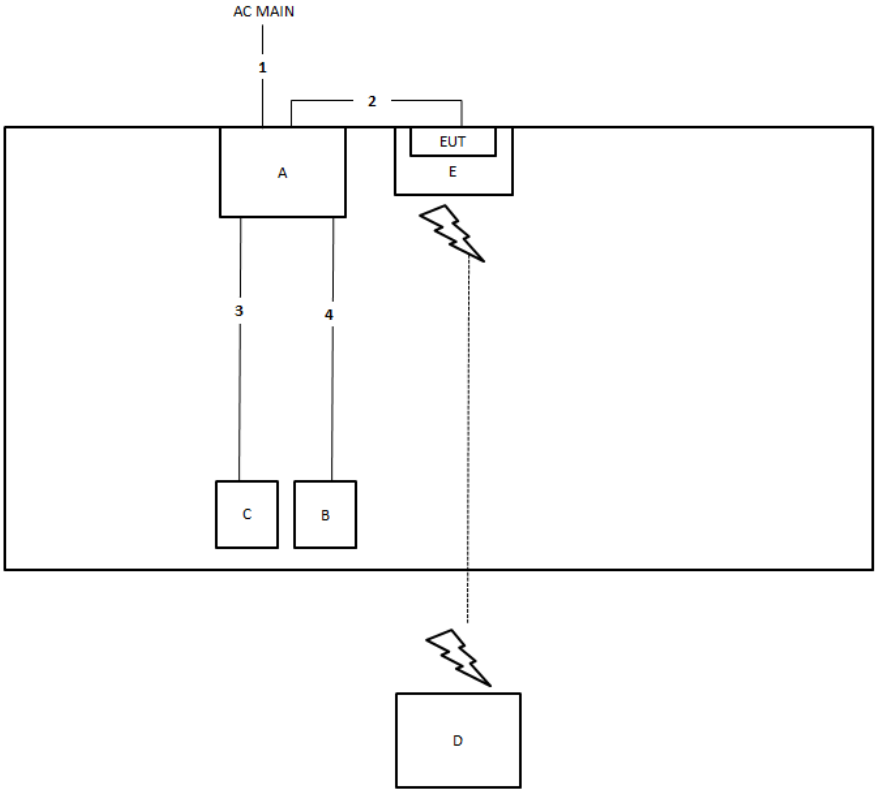
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



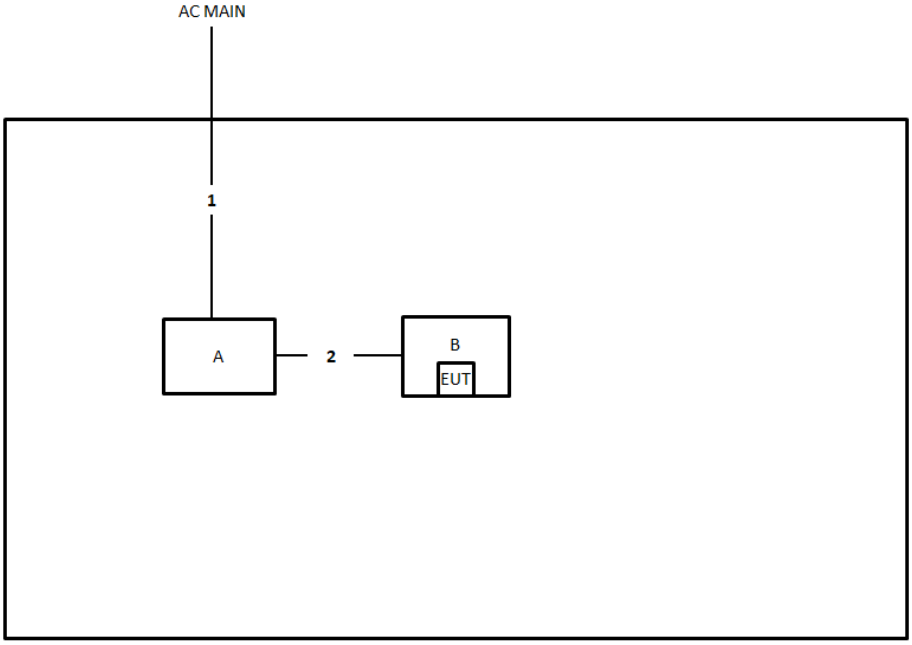
Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	USB Cable	Yes	0.8m
3	USB Cable	Yes	1.8m
4	Audio cable	No	1.4m

Test Setup Diagram - Radiated Test < 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	USB cable	Yes	0.5m
3	Audio cable	No	1.4m
4	USB cable	Yes	1.8m

Test Setup Diagram - Radiated Test > 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	USB cable	Yes	1m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

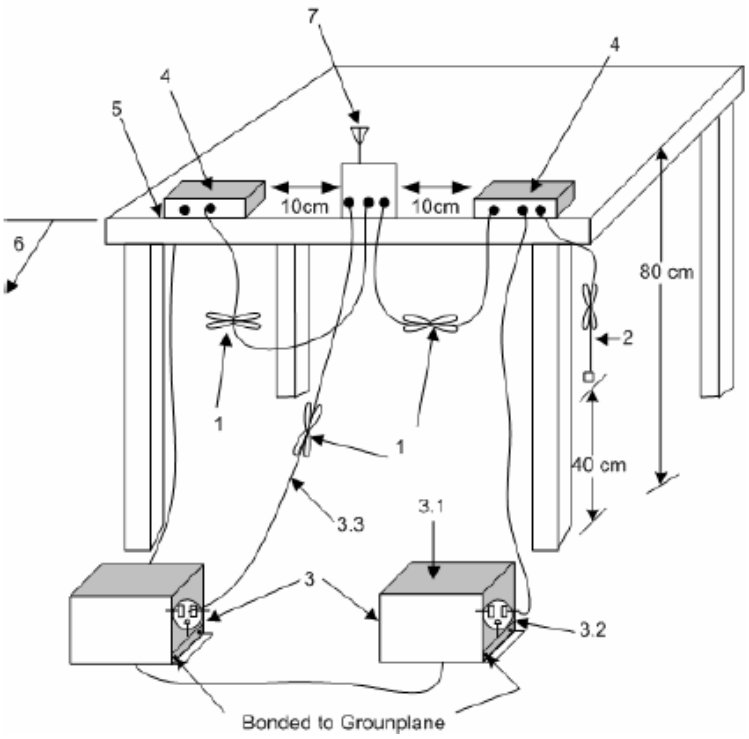
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω 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.

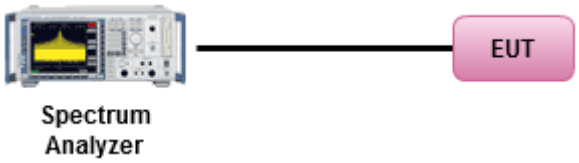
3.2.2 Measuring Instruments

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 FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
	☐ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
	☐ Refer as ANSI C63.10, clause 6.9.1 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
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 FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	☐	Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
▪ Maximum Conducted Output Power		
	[duty cycle ≥ 98% or external video / power trigger]	
	☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
	duty cycle < 98% and average over on/off periods with duty factor	
	☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
	Measurement using a power meter (PM)	
	☒	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
	☐	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).

▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC 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.

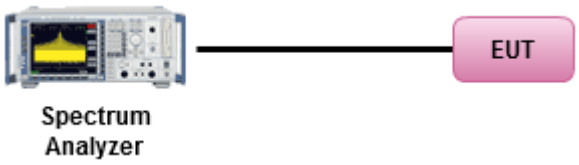
3.4.3 Test Procedures

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 FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD.	
	[duty cycle ≥ 98% or external video / power trigger]	
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPSD-1.	
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPSD-2.	
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPSD-3.	
	duty cycle < 98% and average over on/off periods with duty factor	
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPSD-1A. (alternative).	
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPSD-2A. (alternative)	
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPSD-3A. (alternative)	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		☒ Option 1: Measure and sum the spectra across the outputs. Refer as FCC 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.
		☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,

		☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

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 (dBc)**
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

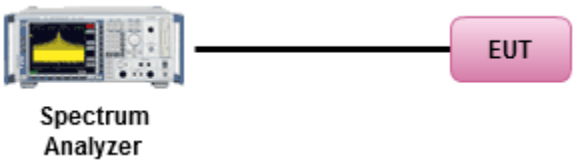
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
▪ Refer as FCC KDB 558074, clause 8.5 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.

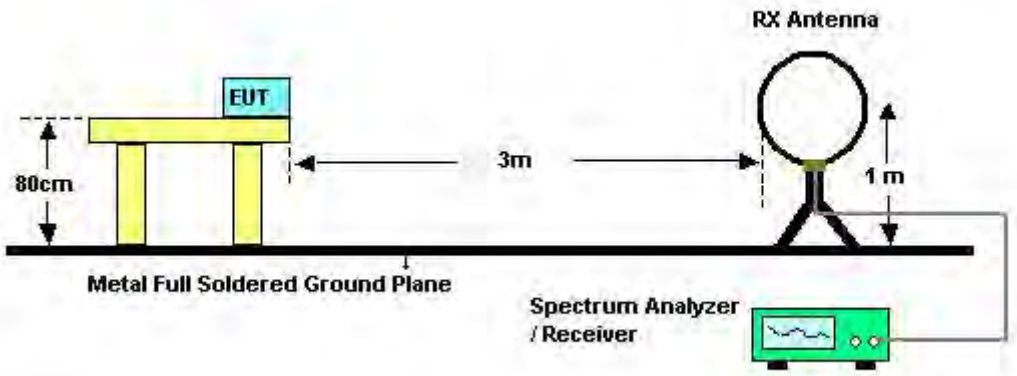
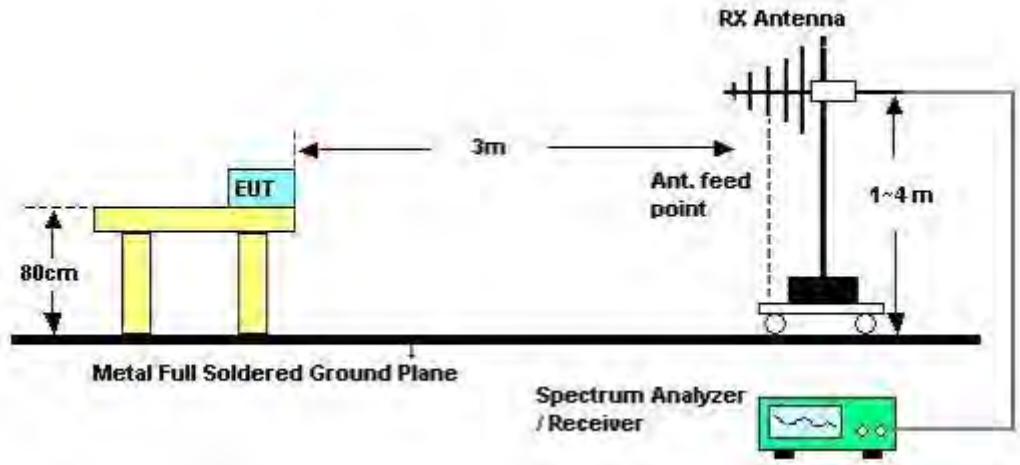
3.6.2 Measuring Instruments

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

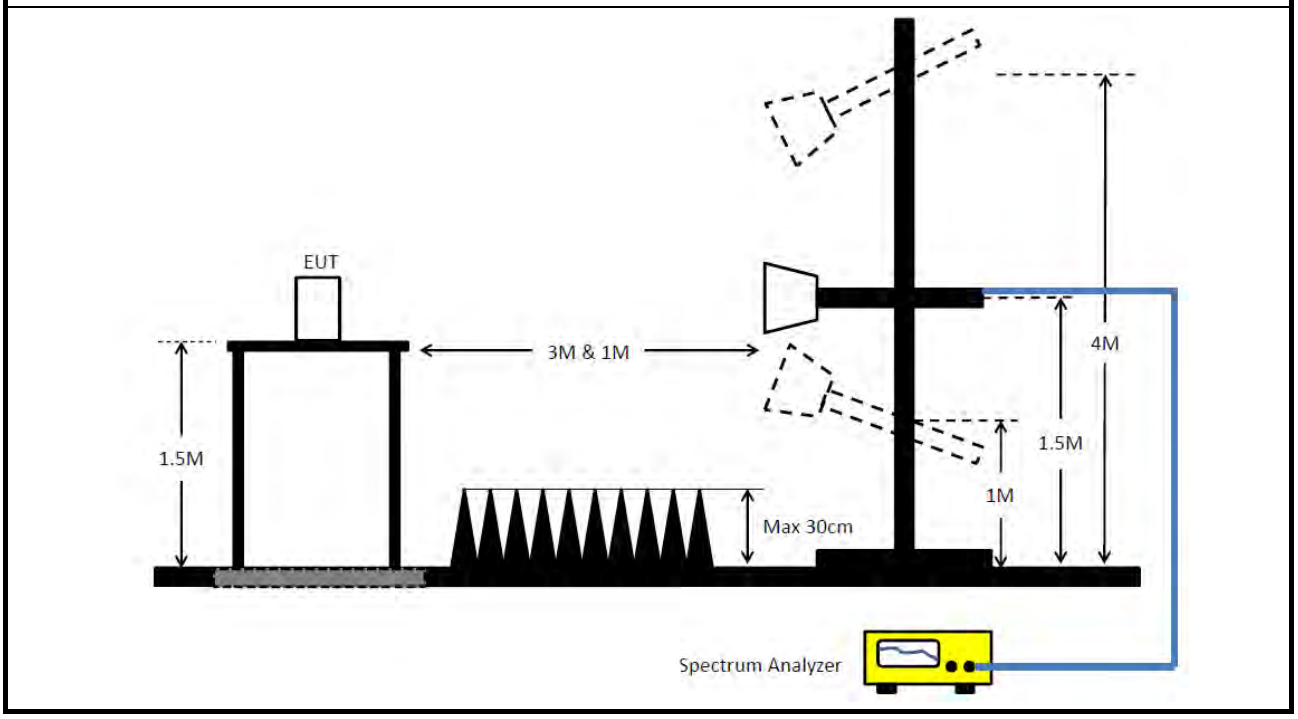
3.6.3 Test Procedures

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 FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.		
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).
		☐	Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐	Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:			
	▪ Refer as FCC KDB 558074 clause 8.7 & c63.10 clause 11.13.1, 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 FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.		
	▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).		
	▪ 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 FCC 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 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 29, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH04-CB
BILOG ANTENNA with 6 dB attenuator	Schaffner & Woken	CBL6112B & N-6-06	22021&AT-N0 607	30MHz ~ 1GHz	Oct. 12, 2018	Oct. 11, 2019	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	310N	187291	0.1MHz ~ 1GHz	Mar. 19, 2019	Mar. 18, 2020	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Dec. 26, 2018	Dec. 25, 2019	Radiation (03CH04-CB
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH04-CB)
RF Cable-low	Woken	RG402	Low Cable-03+22	30MHz – 1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH04-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 13, 2018	Nov. 12, 2019	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2019	Jan. 07, 2020	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jul. 02, 2019	Jul. 01, 2020	Conducted (TH02-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH02-CB)

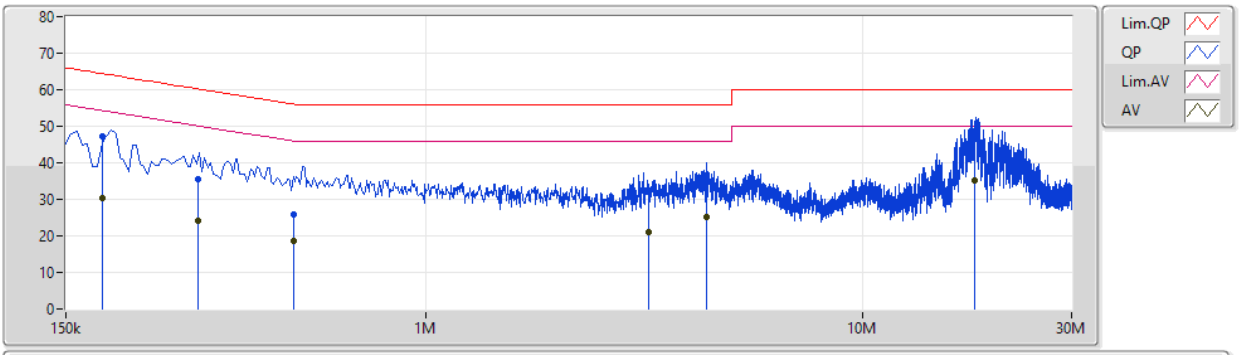
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz – 26.5 GHz	Oct. 24, 2018	Oct. 23, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)

Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.

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

03/09/2019

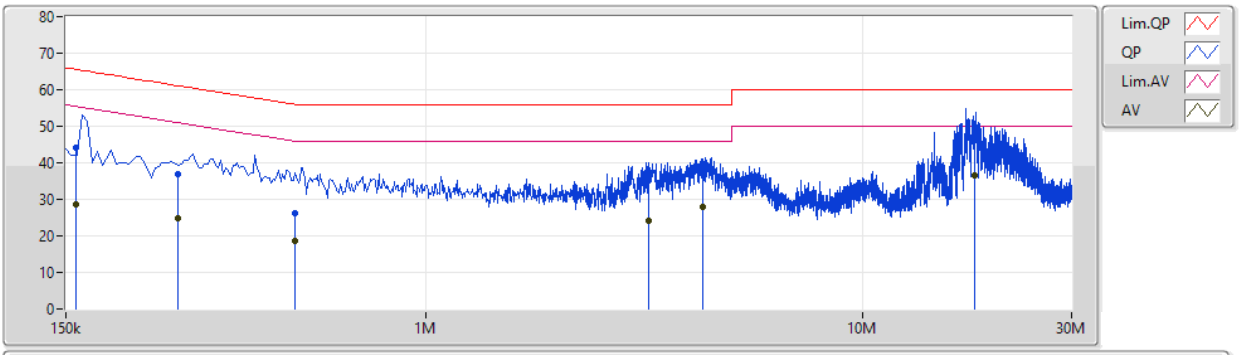


Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	181.7k	47.24	64.41	-17.17	9.91	Line	-	37.33	0.06	0.06	9.79
AV	181.7k	30.41	54.41	-24.00	9.91	Line	-	20.50	0.06	0.06	9.79
QP	300.5k	35.41	60.23	-24.82	9.92	Line	-	25.49	0.06	0.06	9.80
AV	300.5k	24.15	50.23	-26.08	9.92	Line	-	14.23	0.06	0.06	9.80
QP	498.5k	25.84	56.02	-30.18	9.94	Line	-	15.90	0.06	0.07	9.81
AV	498.5k	18.68	46.02	-27.34	9.94	Line	-	8.74	0.06	0.07	9.81
QP	3.237M	31.96	56.00	-24.04	10.08	Line	-	21.88	0.11	0.15	9.82
AV	3.237M	21.17	46.00	-24.83	10.08	Line	-	11.09	0.11	0.15	9.82
QP	4.378M	34.67	56.00	-21.33	10.13	Line	-	24.54	0.13	0.18	9.82
AV	4.378M	25.09	46.00	-20.91	10.13	Line	-	14.96	0.13	0.18	9.82
QP	17.968M	47.09	60.00	-12.91	10.48	Line	"Worst"	36.61	0.28	0.24	9.96
AV	17.968M	35.18	50.00	-14.82	10.48	Line	-	24.70	0.28	0.24	9.96

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**	Neutral
Operating Function	Normal Link		

03/09/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	157.75k	44.15	65.58	-21.43	9.89	Neutral	-	34.26	0.04	0.06	9.79
AV	157.75k	28.59	55.58	-26.99	9.89	Neutral	-	18.70	0.04	0.06	9.79
QP	271.05k	37.00	61.09	-24.09	9.90	Neutral	-	27.10	0.04	0.06	9.80
AV	271.05k	24.84	51.09	-26.25	9.90	Neutral	-	14.94	0.04	0.06	9.80
QP	501.6k	26.17	56.00	-29.83	9.92	Neutral	-	16.25	0.04	0.07	9.81
AV	501.6k	18.72	46.00	-27.28	9.92	Neutral	-	8.80	0.04	0.07	9.81
QP	3.222M	35.09	56.00	-20.91	10.06	Neutral	-	25.03	0.09	0.15	9.82
AV	3.222M	24.05	46.00	-21.95	10.06	Neutral	-	13.99	0.09	0.15	9.82
QP	4.309M	37.22	56.00	-18.78	10.10	Neutral	-	27.12	0.11	0.17	9.82
AV	4.309M	27.95	46.00	-18.05	10.10	Neutral	-	17.85	0.11	0.17	9.82
QP	17.951M	48.06	60.00	-11.94	10.44	Neutral	"Worst"	37.62	0.24	0.24	9.96
AV	17.951M	36.53	50.00	-13.47	10.44	Neutral	-	26.09	0.24	0.24	9.96

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(125Kbps)	622.5k	1.055M	1M06F1D	620k	1.048M
BT-LE(500Kbps)	657.5k	1.03M	1M03F1D	657.5k	1.02M
BT-LE(1Mbps)	662.5k	1.017M	1M02F1D	656.25k	1.006M
BT-LE(2Mbps)	1.163M	2.023M	2M02F1D	1.16M	2.02M

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

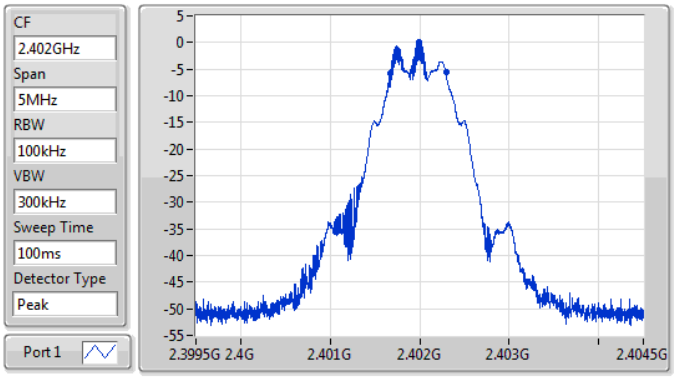
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(125Kbps)	-	-	-	-
2402MHz	Pass	500k	622.5k	1.055M
2440MHz	Pass	500k	622.5k	1.055M
2480MHz	Pass	500k	620k	1.048M
BT-LE(500Kbps)	-	-	-	-
2402MHz	Pass	500k	657.5k	1.025M
2440MHz	Pass	500k	657.5k	1.02M
2480MHz	Pass	500k	657.5k	1.03M
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	658.75k	1.006M
2440MHz	Pass	500k	656.25k	1.012M
2480MHz	Pass	500k	662.5k	1.017M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.163M	2.023M
2440MHz	Pass	500k	1.16M	2.023M
2480MHz	Pass	500k	1.163M	2.02M

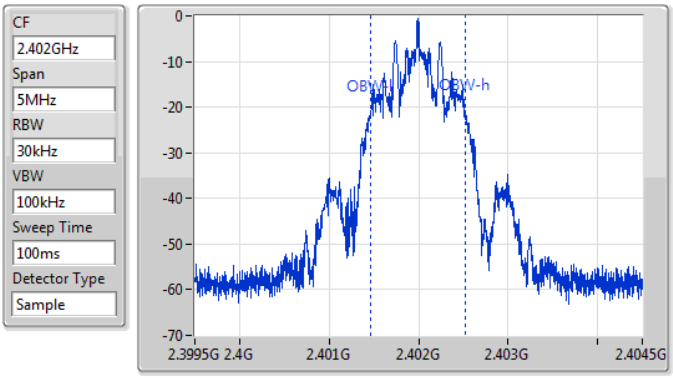
Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

BT-LE(125Kbps) EBW

2402MHz

11/09/2019



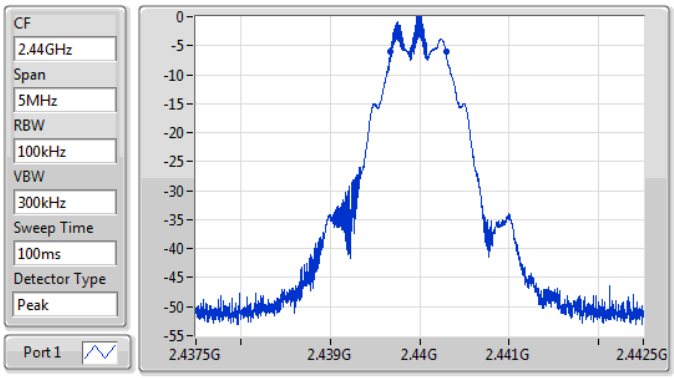


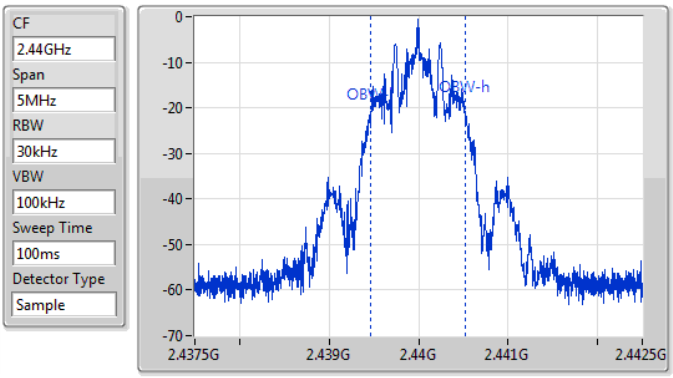
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
622.5k	2.40167G	2.402293G	1.055M	2.401465G	2.40252G	500k	1

BT-LE(125Kbps) EBW

2440MHz

11/09/2019



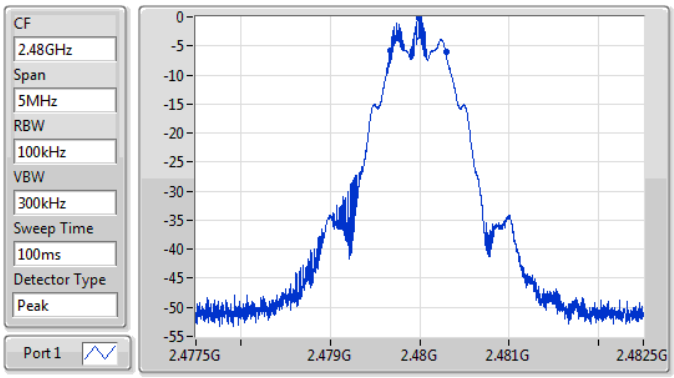


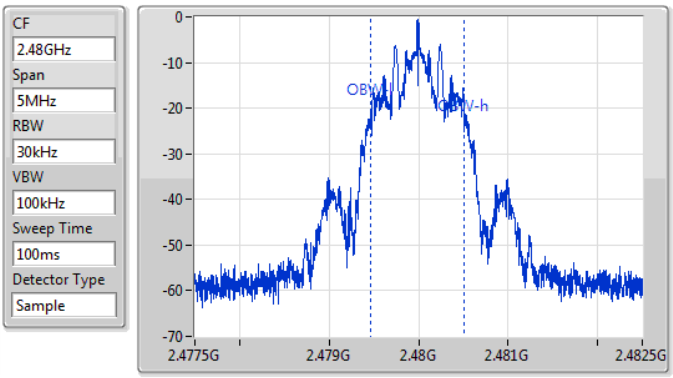
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
622.5k	2.43967G	2.440293G	1.055M	2.439465G	2.44052G	500k	1

BT-LE(125Kbps) EBW

2480MHz

11/09/2019



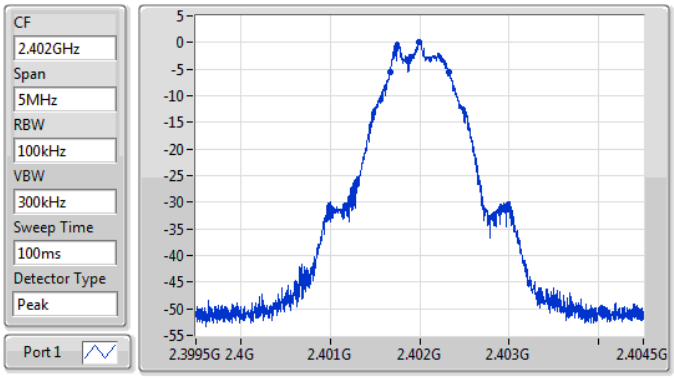


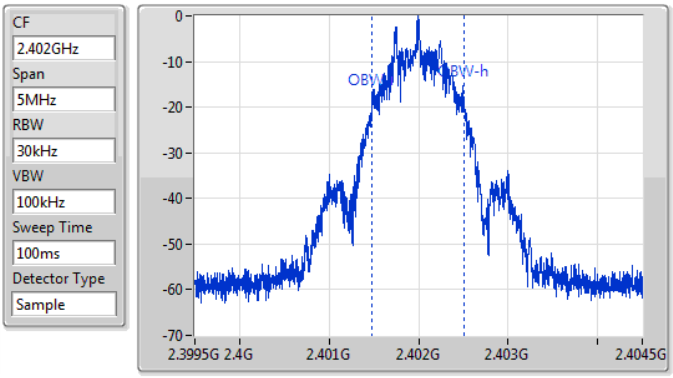
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
620k	2.479673G	2.480293G	1.048M	2.479468G	2.480515G	500k	1

BT-LE(500Kbps) EBW

2402MHz

11/09/2019



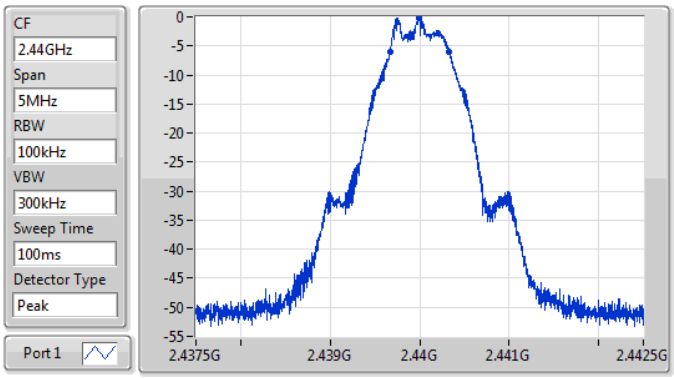


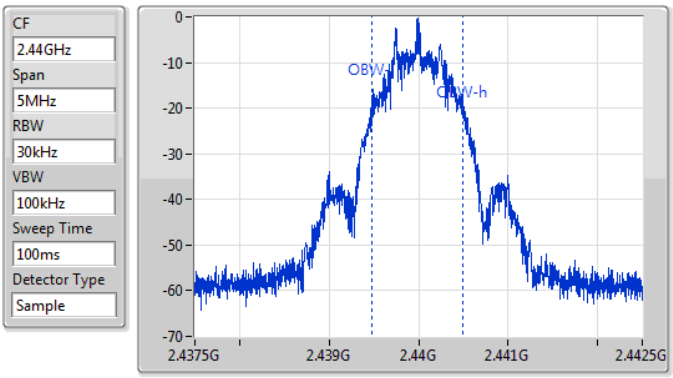
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
657.5k	2.40167G	2.402328G	1.025M	2.401483G	2.402508G	500k	1

BT-LE(500Kbps) **EBW**

2440MHz

11/09/2019



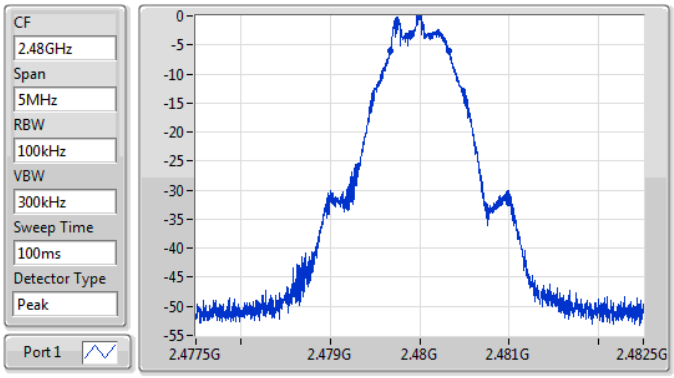


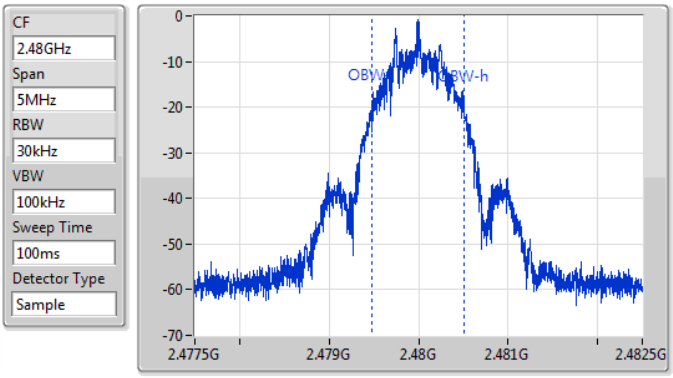
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
657.5k	2.43967G	2.440328G	1.02M	2.43948G	2.4405G	500k	1

BT-LE(500Kbps) **EBW**

2480MHz

11/09/2019



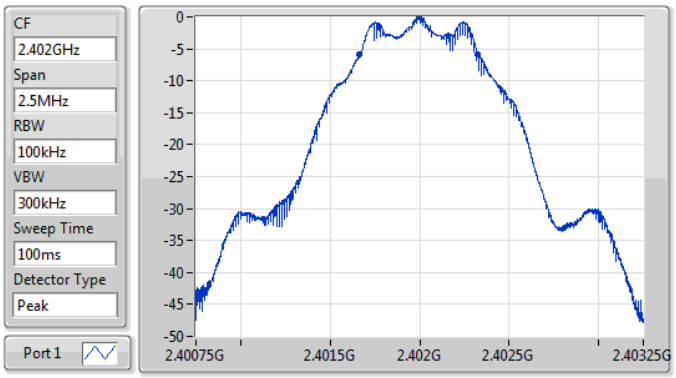


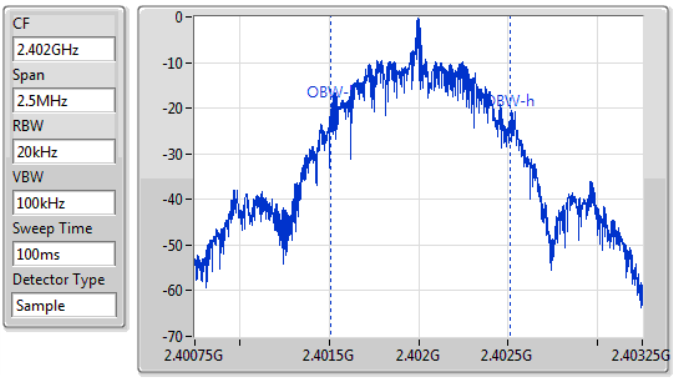
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
657.5k	2.47967G	2.480328G	1.03M	2.479475G	2.480505G	500k	1

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

2402MHz

23/08/2019



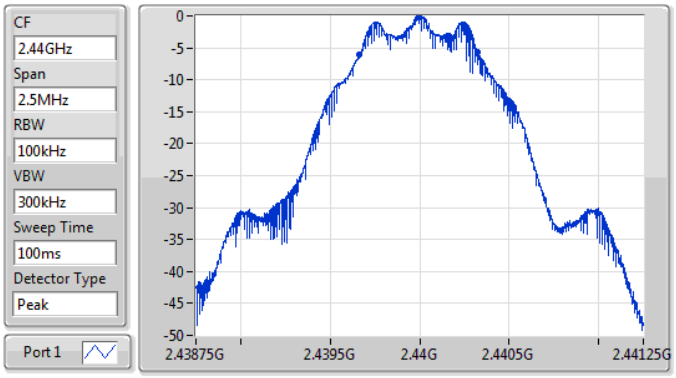


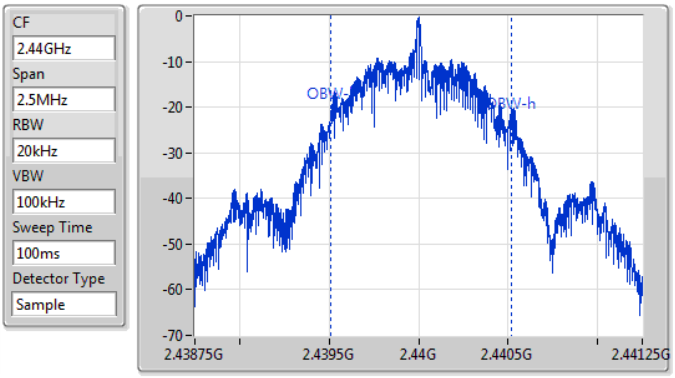
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
658.75k	2.401665G	2.402324G	1.006M	2.401508G	2.402513G	500k	1

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

2440MHz

23/08/2019



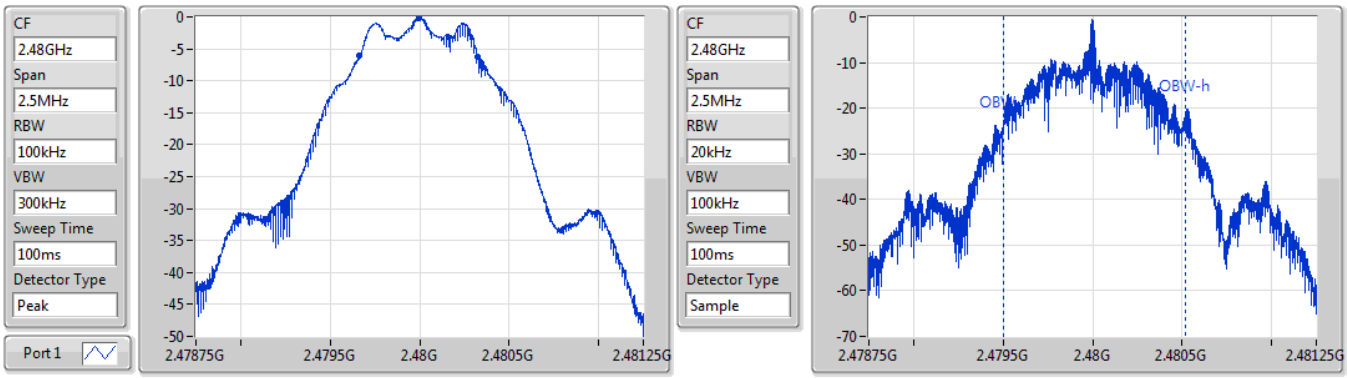


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
656.25k	2.439665G	2.440321G	1.012M	2.439508G	2.44052G	500k	1

BT-LE(1Mbps) EBW

2480MHz

23/08/2019

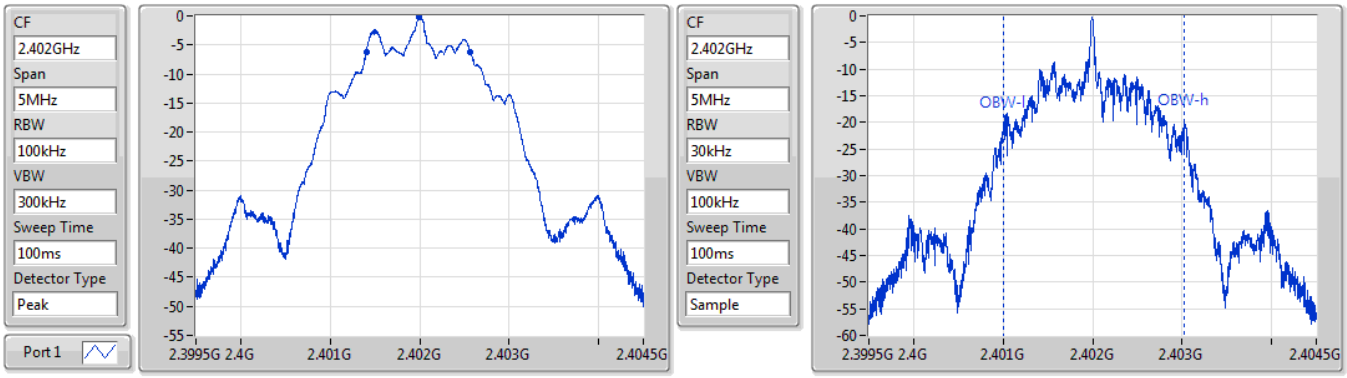


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
662.5k	2.479664G	2.480326G	1.017M	2.479504G	2.480521G	500k	1

BT-LE(2Mbps) EBW

2402MHz

16/09/2019

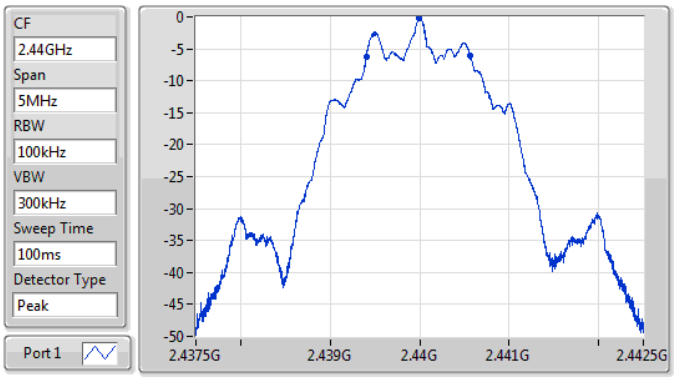


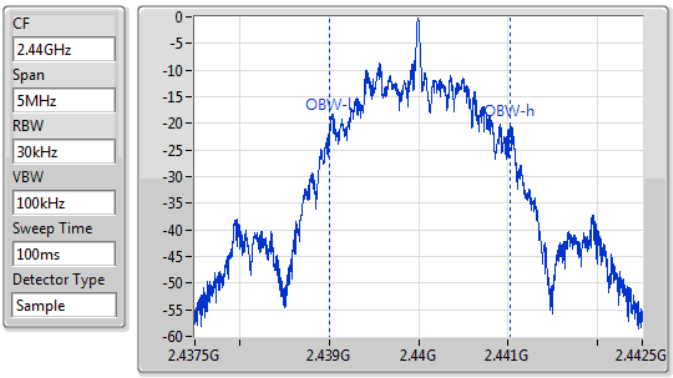
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.163M	2.401405G	2.402568G	2.023M	2.401G	2.403023G	500k	1

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

2440MHz

16/09/2019



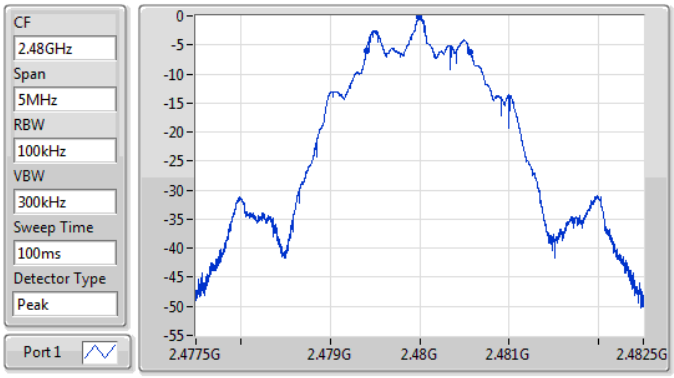


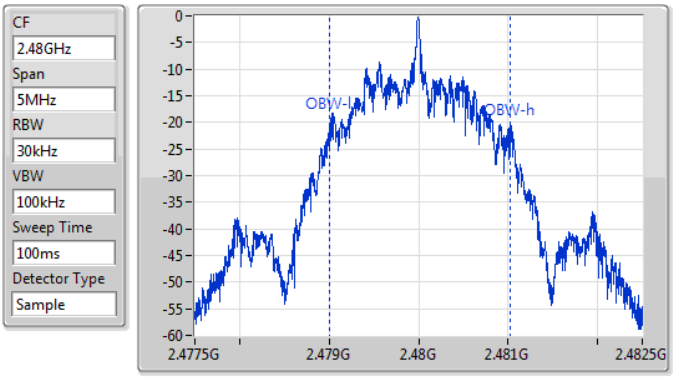
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.16M	2.439403G	2.440563G	2.023M	2.439G	2.441023G	500k	1

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

2480MHz

16/09/2019





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.163M	2.479403G	2.480565G	2.02M	2.479G	2.48102G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(125Kbps)	0.01	0.00100
BT-LE(500Kbps)	0.01	0.00100
BT-LE(1Mbps)	-0.28	0.00094
BT-LE(2Mbps)	-0.51	0.00089

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(125Kbps)	-	-	-	-
2402MHz	Pass	0.00	0.01	30.00
2440MHz	Pass	0.00	-0.25	30.00
2480MHz	Pass	0.00	-0.31	30.00
BT-LE(500Kbps)	-	-	-	-
2402MHz	Pass	0.00	0.01	30.00
2440MHz	Pass	0.00	-0.33	30.00
2480MHz	Pass	0.00	-0.37	30.00
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.00	-0.28	30.00
2440MHz	Pass	0.00	-0.33	30.00
2480MHz	Pass	0.00	-0.31	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	0.00	-0.53	30.00
2440MHz	Pass	0.00	-0.54	30.00
2480MHz	Pass	0.00	-0.51	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(125Kbps)	-5.86
BT-LE(500Kbps)	-5.95
BT-LE(1Mbps)	-10.15
BT-LE(2Mbps)	-10.08

RBW=3 kHz.

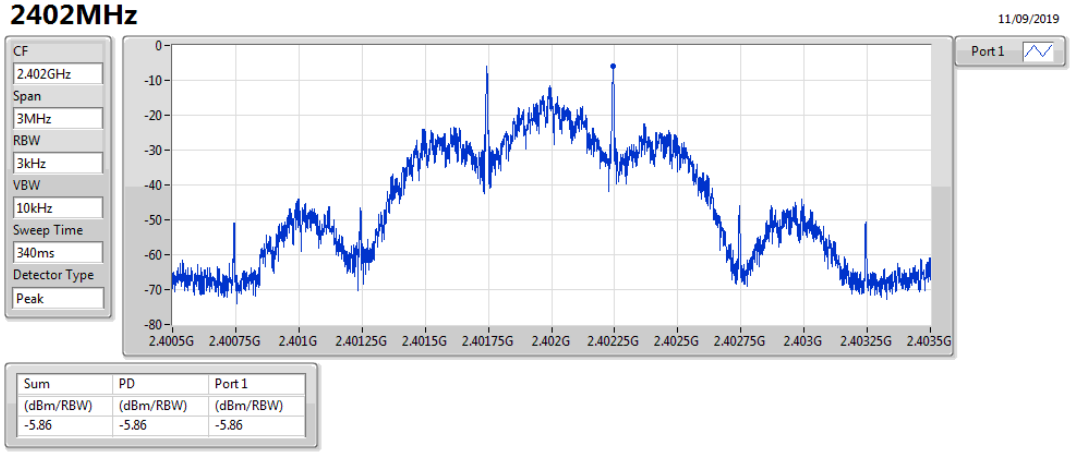
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(125Kbps)	-	-	-	-
2402MHz	Pass	0.00	-5.86	8.00
2440MHz	Pass	0.00	-6.19	8.00
2480MHz	Pass	0.00	-6.27	8.00
BT-LE(500Kbps)	-	-	-	-
2402MHz	Pass	0.00	-5.95	8.00
2440MHz	Pass	0.00	-6.17	8.00
2480MHz	Pass	0.00	-6.83	8.00
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.00	-10.15	8.00
2440MHz	Pass	0.00	-10.80	8.00
2480MHz	Pass	0.00	-10.50	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	0.00	-10.90	8.00
2440MHz	Pass	0.00	-10.20	8.00
2480MHz	Pass	0.00	-10.08	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(125Kbps) **PSD**

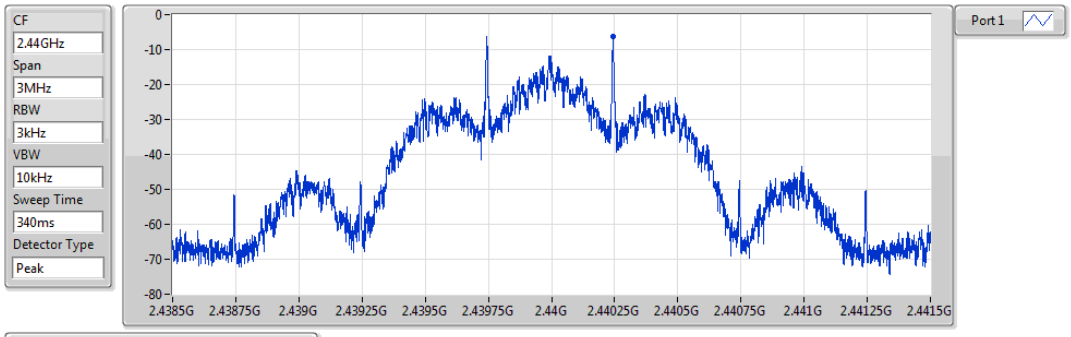
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.86	-5.86	-5.86

BT-LE(125Kbps) **PSD**

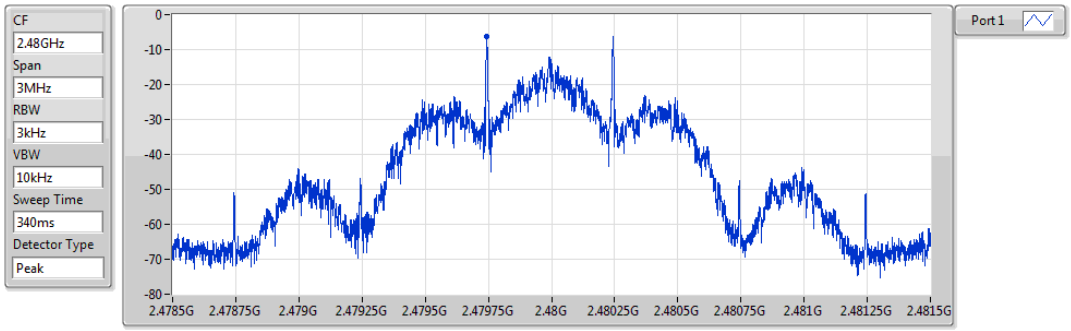
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.19	-6.19	-6.19

BT-LE(125Kbps) **PSD**

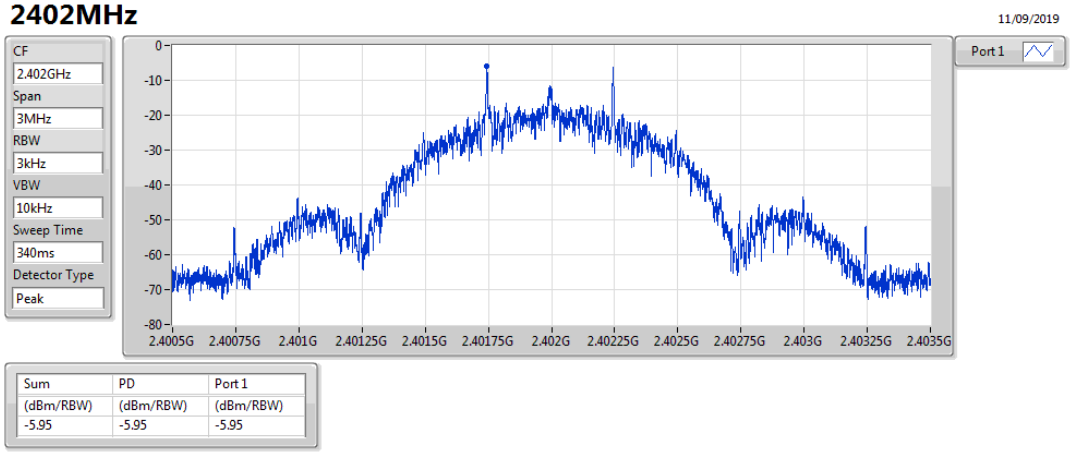
2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.27	-6.27	-6.27

BT-LE(500Kbps) **PSD**

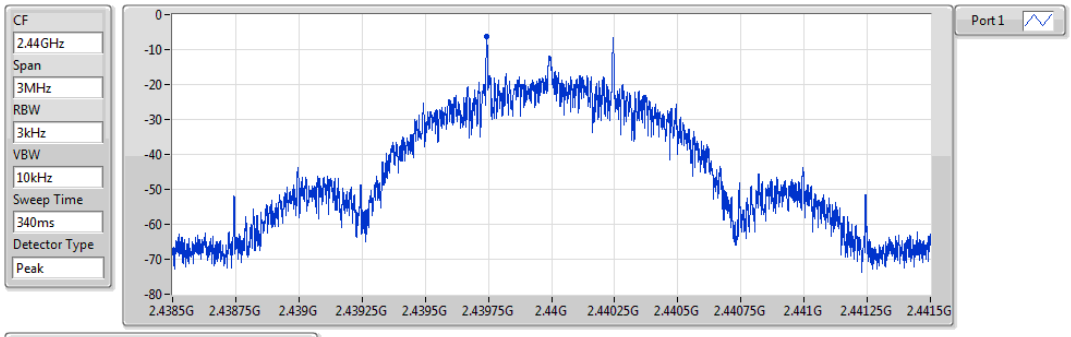
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.95	-5.95	-5.95

BT-LE(500Kbps) **PSD**

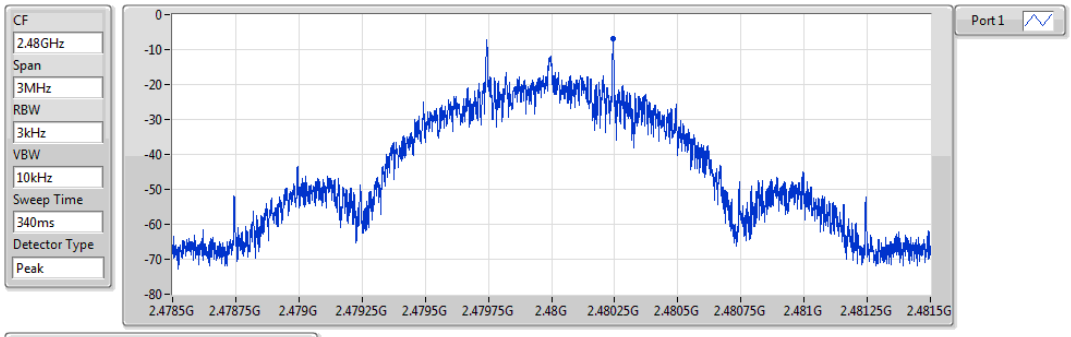
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.17	-6.17	-6.17

BT-LE(500Kbps) **PSD**

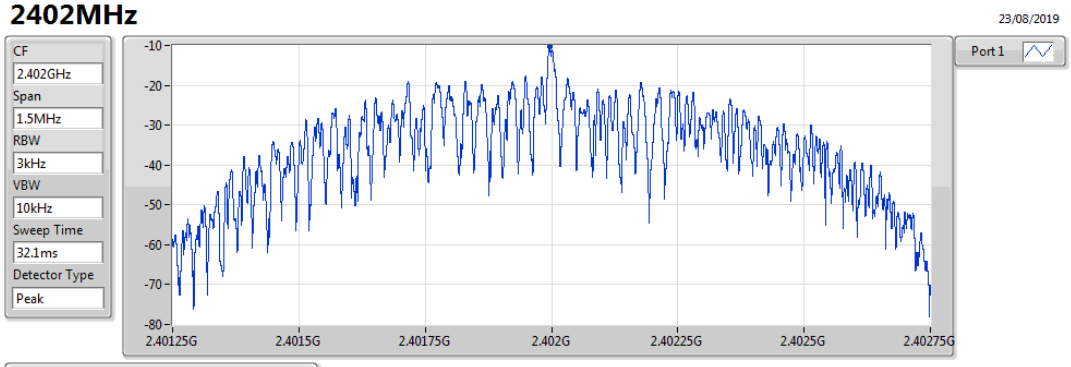
2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.83	-6.83	-6.83

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

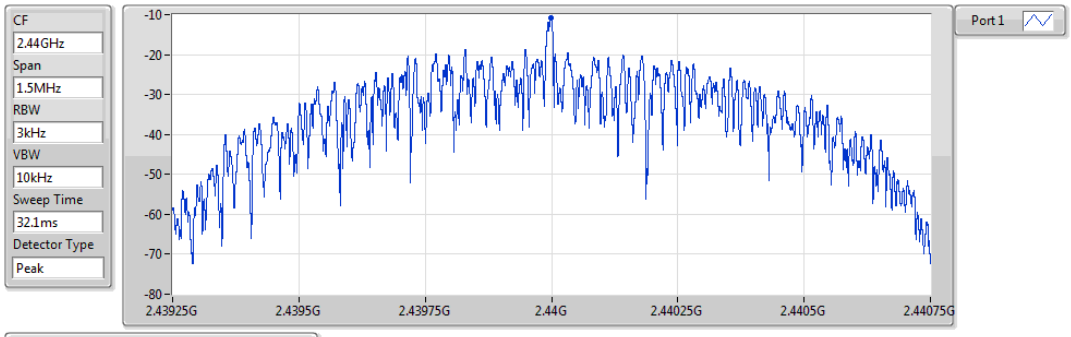
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.15	-10.15	-10.15

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

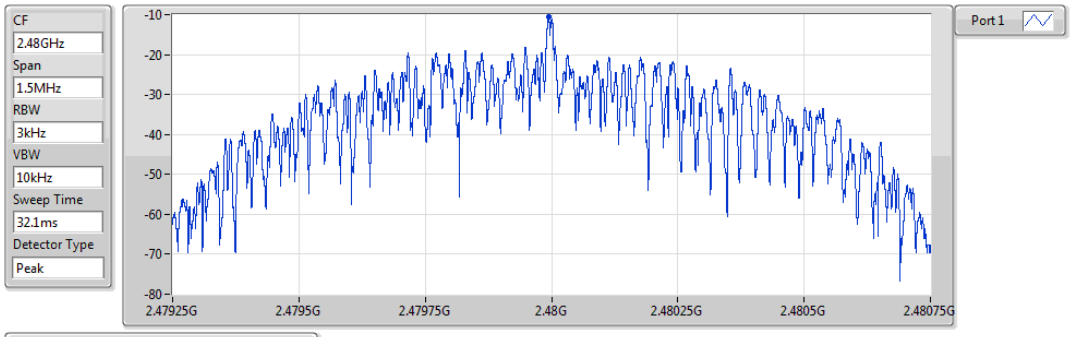
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.80	-10.80	-10.80

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

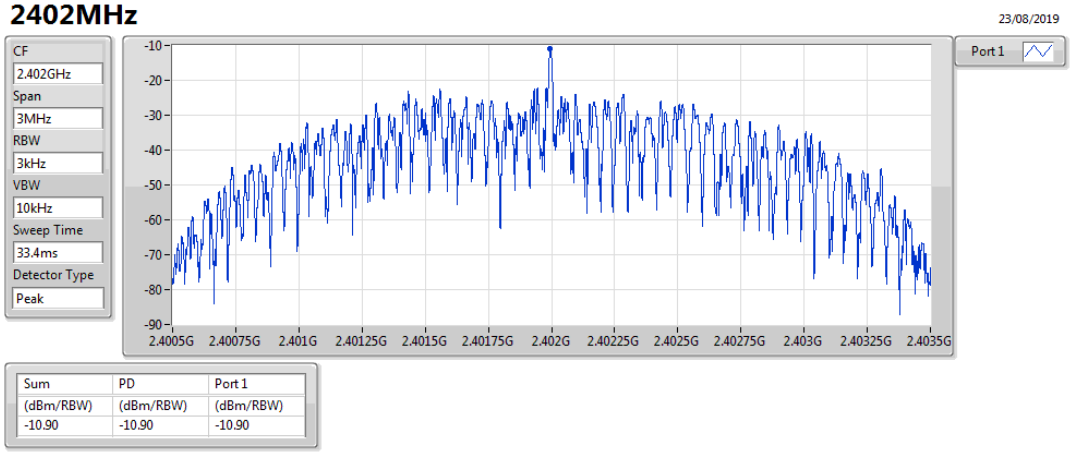
2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.50	-10.50	-10.50

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

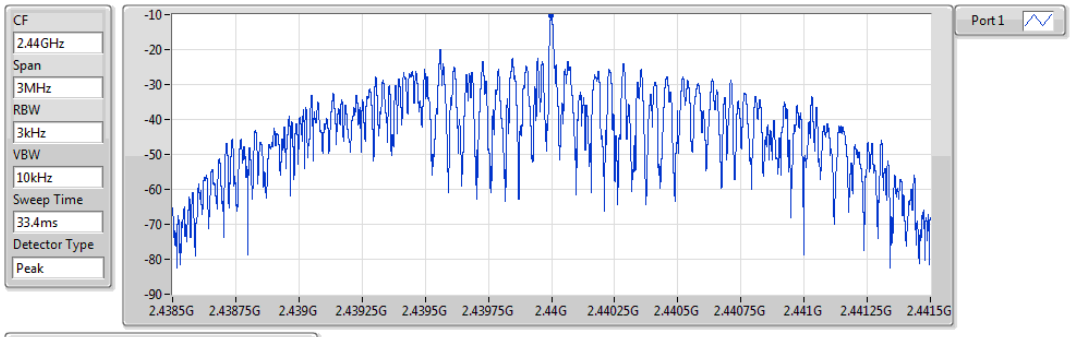
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.90	-10.90	-10.90

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

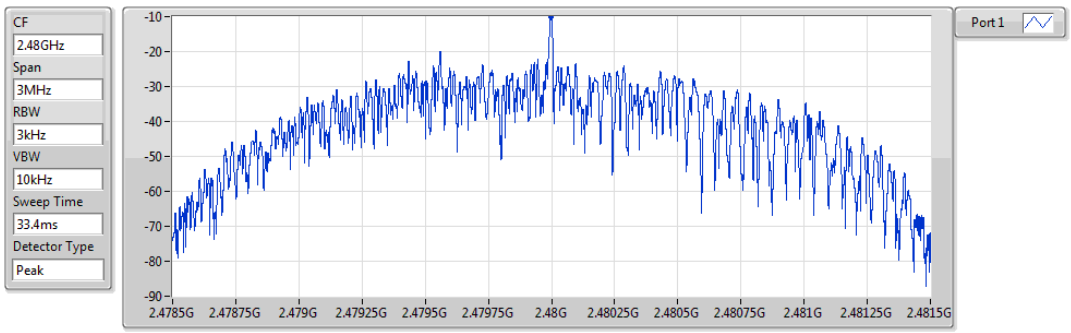
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.20	-10.20	-10.20

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

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.08	-10.08	-10.08

Summary

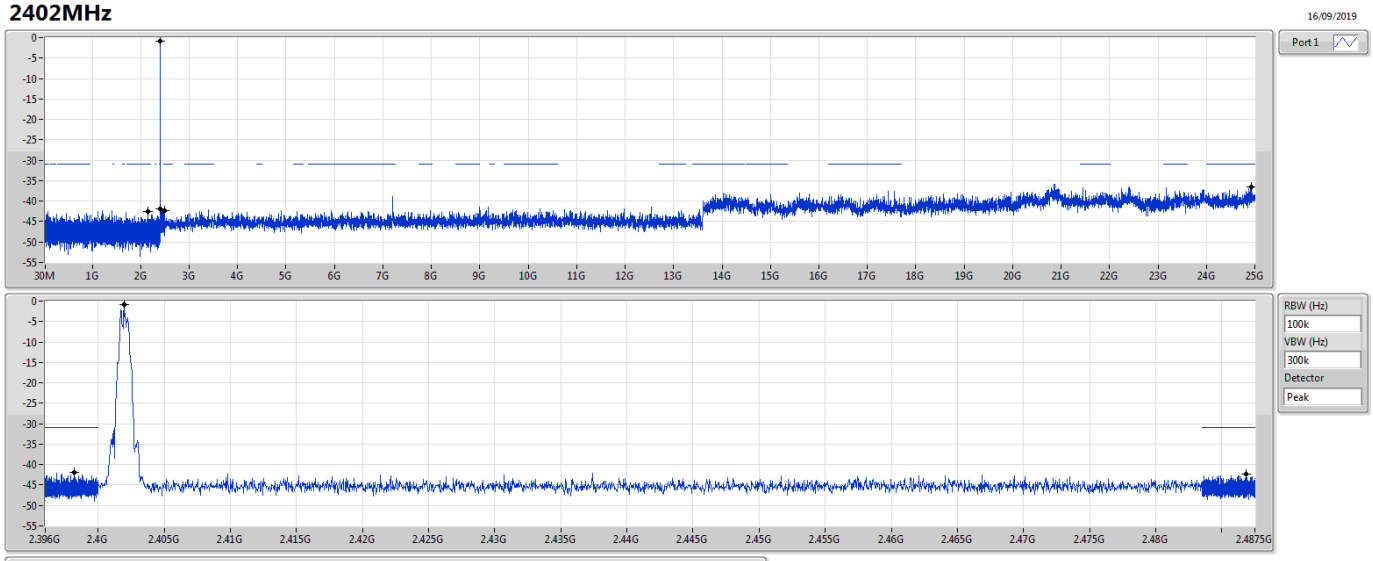
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(125Kbps)	Pass	2.40196G	-0.89	-30.89	586.31M	-41.98	2.39831G	-41.64	2.48443G	-42.44	21.92142G	-36.47	1
BT-LE(500Kbps)	Pass	2.402G	0.18	-29.82	51.89M	-52.83	2.39756G	-52.19	2.48429G	-53.78	7.20387G	-36.18	1
BT-LE(1Mbps)	Pass	2.40196G	0.00	-30.00	1.7838G	-53.27	2.39867G	-52.84	2.48485G	-51.99	16.33473G	-46.83	1
BT-LE(2Mbps)	Pass	2.47999G	-0.19	-30.19	854.55M	-53.75	2.39998G	-31.29	2.48639G	-52.24	7.20387G	-35.88	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(125Kbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40196G	-0.89	-30.89	2.14994G	-42.56	2.39822G	-41.96	2.48685G	-42.24	24.93246G	-36.57	1
2440MHz	Pass	2.40196G	-0.89	-30.89	586.31M	-41.98	2.39831G	-41.64	2.48443G	-42.44	21.92142G	-36.47	1
2480MHz	Pass	2.40196G	-0.89	-30.89	942.68M	-41.78	2.39891G	-42.58	2.48695G	-41.64	24.8593G	-36.88	1
BT-LE(500Kbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	0.18	-29.82	51.89M	-52.83	2.39756G	-52.19	2.48429G	-53.78	7.20387G	-36.18	1
2440MHz	Pass	2.402G	0.18	-29.82	565.6M	-51.95	2.39864G	-52.84	2.48626G	-52.58	21.96363G	-48.01	1
2480MHz	Pass	2.402G	0.18	-29.82	2.03193G	-53.13	2.39711G	-52.93	2.485G	-52.68	21.49649G	-48.44	1
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40196G	0.00	-30.00	785.39M	-53.34	2.39996G	-51.53	2.48374G	-52.29	16.80472G	-47.36	1
2440MHz	Pass	2.40196G	0.00	-30.00	1.7838G	-53.27	2.39867G	-52.84	2.48485G	-51.99	16.33473G	-46.83	1
2480MHz	Pass	2.40196G	0.00	-30.00	1.64823G	-53.35	2.39819G	-52.60	2.48399G	-51.81	15.12176G	-47.25	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.47999G	-0.19	-30.19	854.55M	-53.75	2.39998G	-31.29	2.48639G	-52.24	7.20387G	-35.88	1
2440MHz	Pass	2.47999G	-0.19	-30.19	2.1665G	-53.17	2.39995G	-53.09	2.48716G	-52.49	15.21269G	-44.69	1
2480MHz	Pass	2.47999G	-0.19	-30.19	2.12302G	-52.99	2.39832G	-52.68	2.48595G	-52.48	16.52967G	-46.82	1

BT-LE(125Kbps) **CSE NdB**

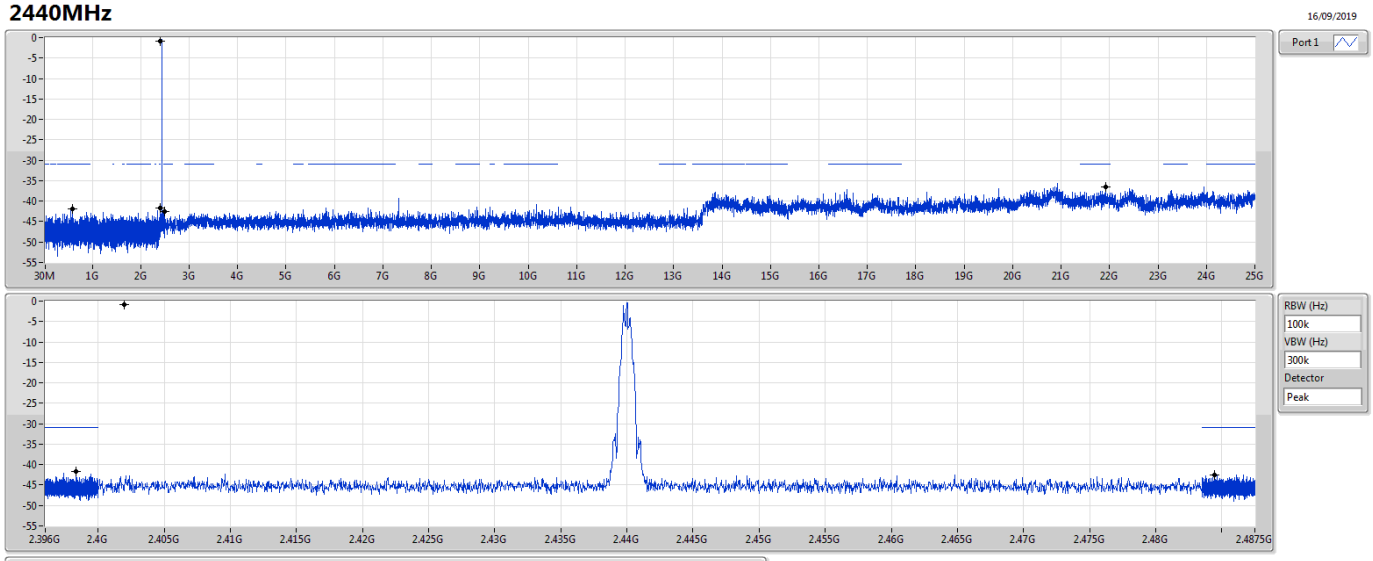
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	-0.89	-30.89	2.14994G	-42.56	2.39822G	-41.96	2.48685G	-42.24	24.93246G	-36.57	1

BT-LE(125Kbps) **CSE NdB**

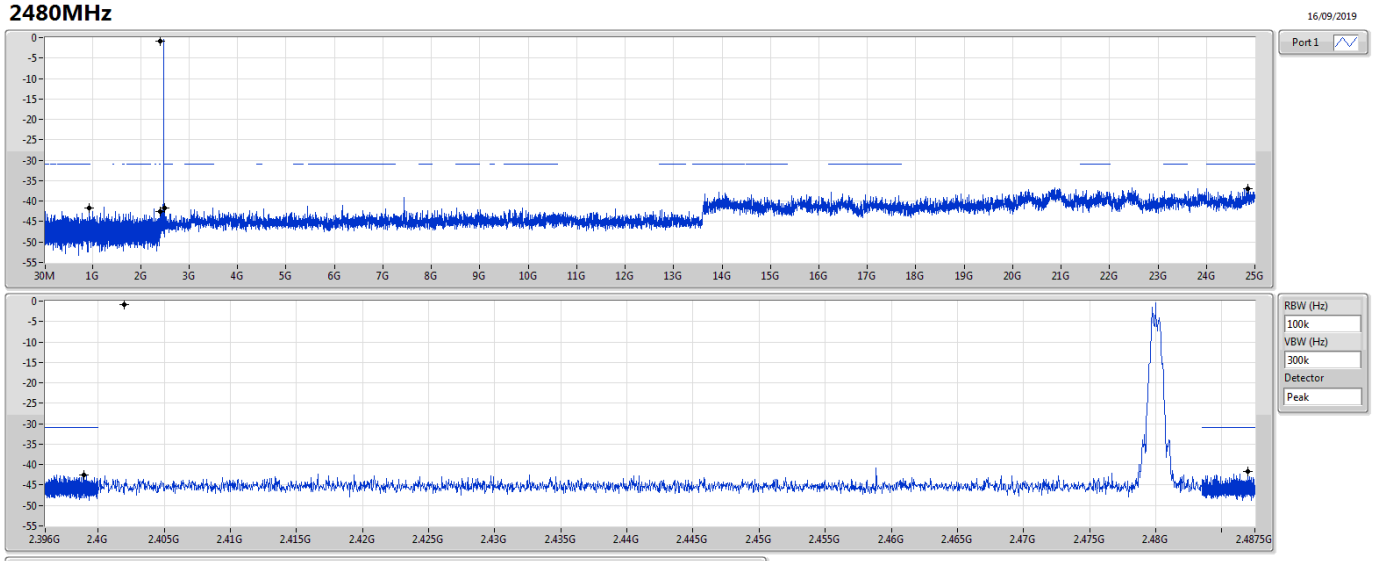
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	-0.89	-30.89	586.31M	-41.98	2.39831G	-41.64	2.48443G	-42.44	21.92142G	-36.47	1

BT-LE(125Kbps) **CSE NdB**

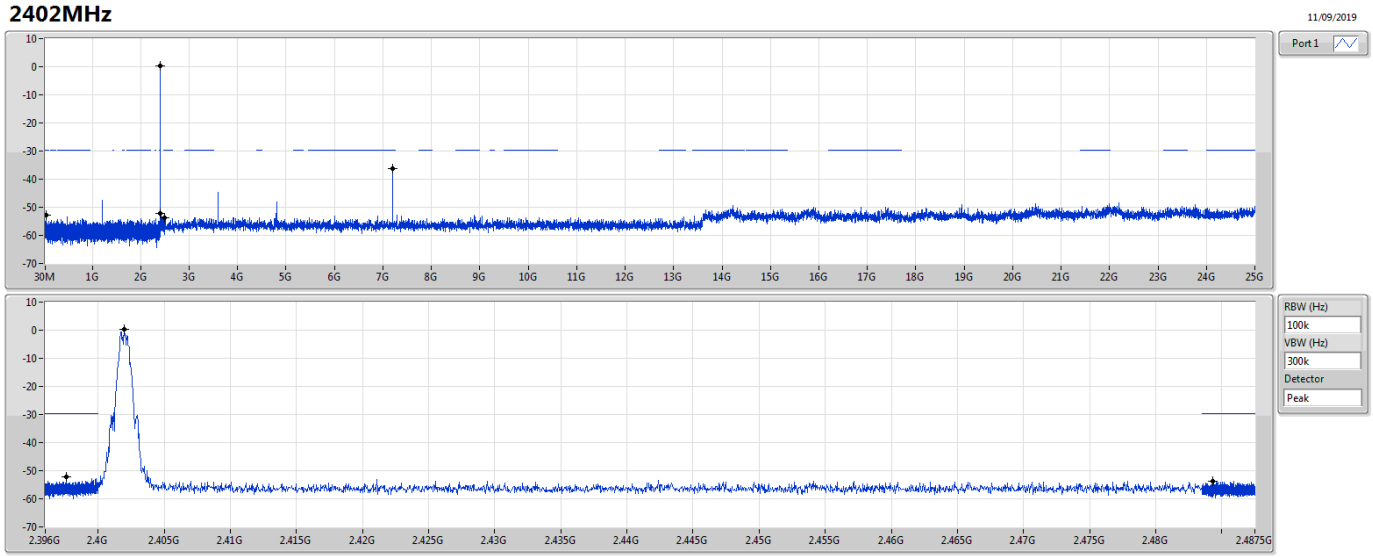
2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	-0.89	-30.89	942.68M	-41.78	2.39891G	-42.58	2.48695G	-41.64	24.8593G	-36.88	1

BT-LE(500Kbps) **CSE NdB**

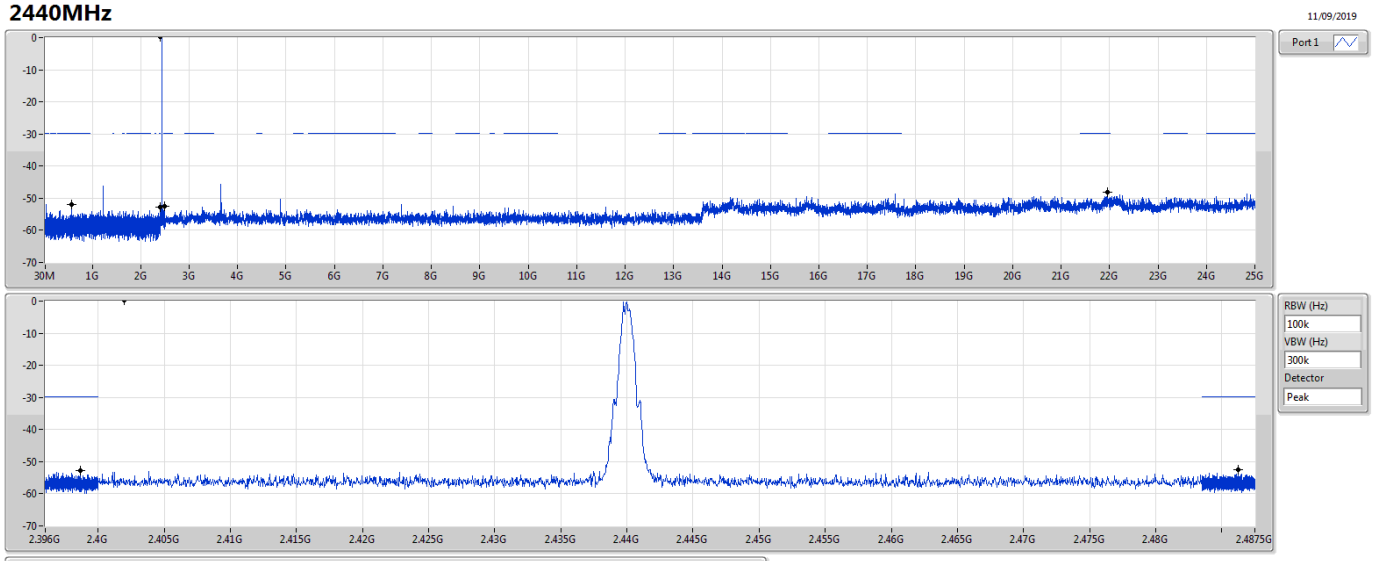
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	0.18	-29.82	51.89M	-52.83	2.39756G	-52.19	2.48429G	-53.78	7.20387G	-36.18	1

BT-LE(500Kbps) **CSE NdB**

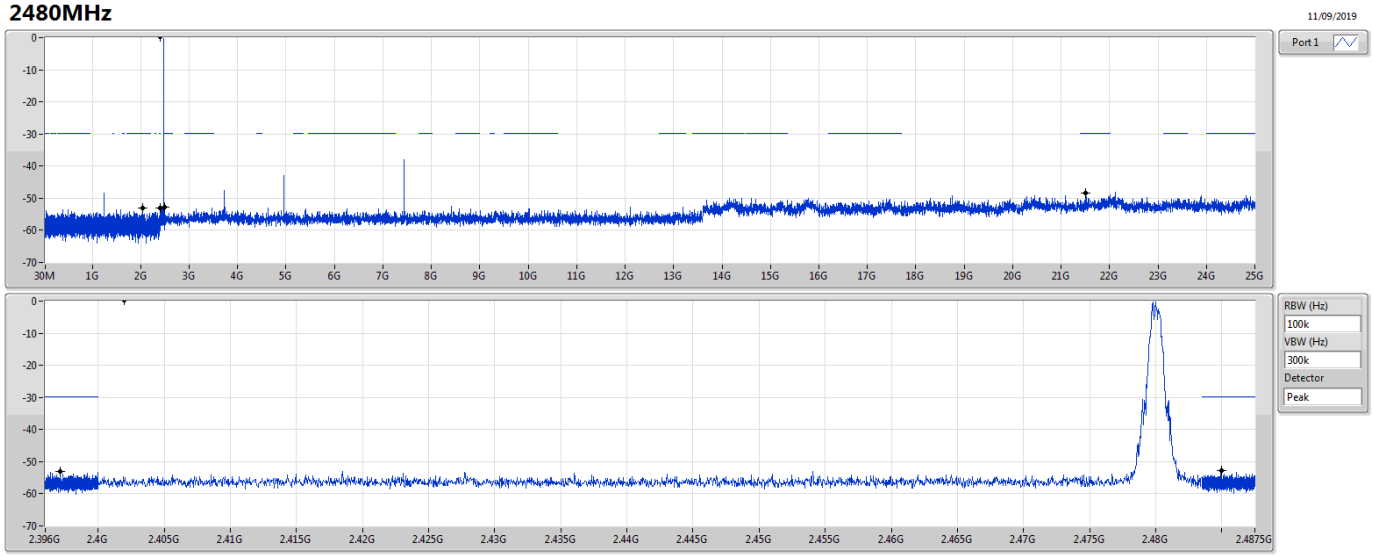
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	0.18	-29.82	565.6M	-51.95	2.39864G	-52.84	2.48626G	-52.58	21.96363G	-48.01	1

BT-LE(500Kbps) **CSE NdB**

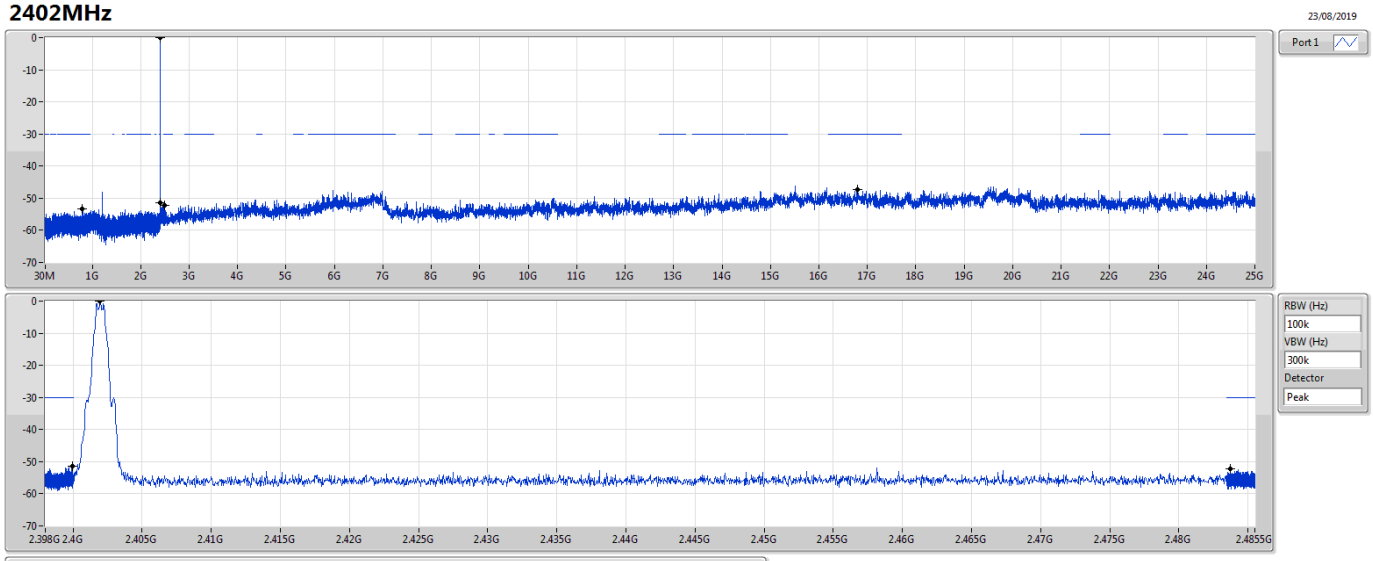
2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	0.18	-29.82	2.03193G	-53.13	2.39711G	-52.93	2.485G	-52.68	21.49649G	-48.44	1

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

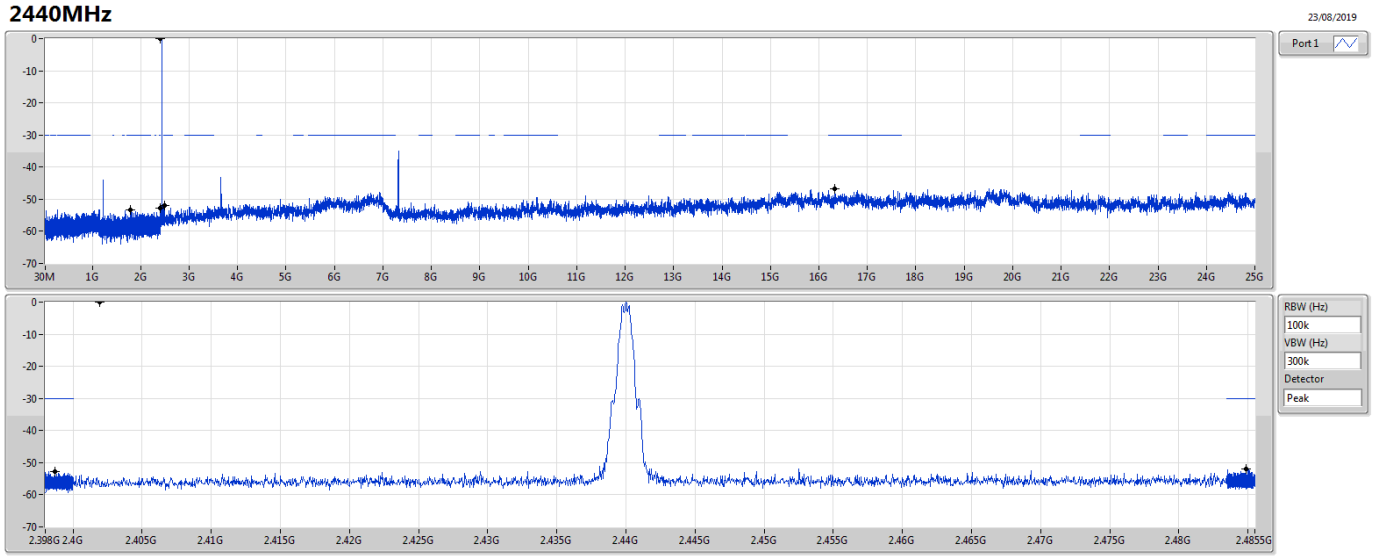
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	0.00	-30.00	785.39M	-53.34	2.39996G	-51.53	2.48374G	-52.29	16.80472G	-47.36	1

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

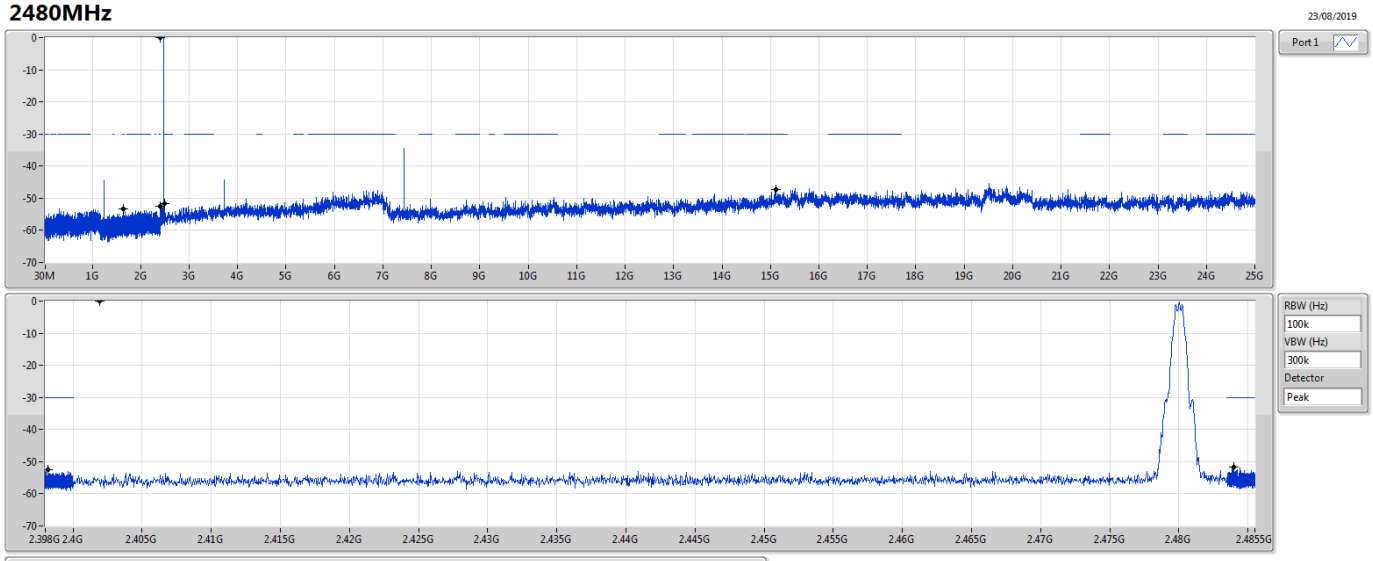
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	0.00	-30.00	1.7838G	-53.27	2.39867G	-52.84	2.48485G	-51.99	16.33473G	-46.83	1

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

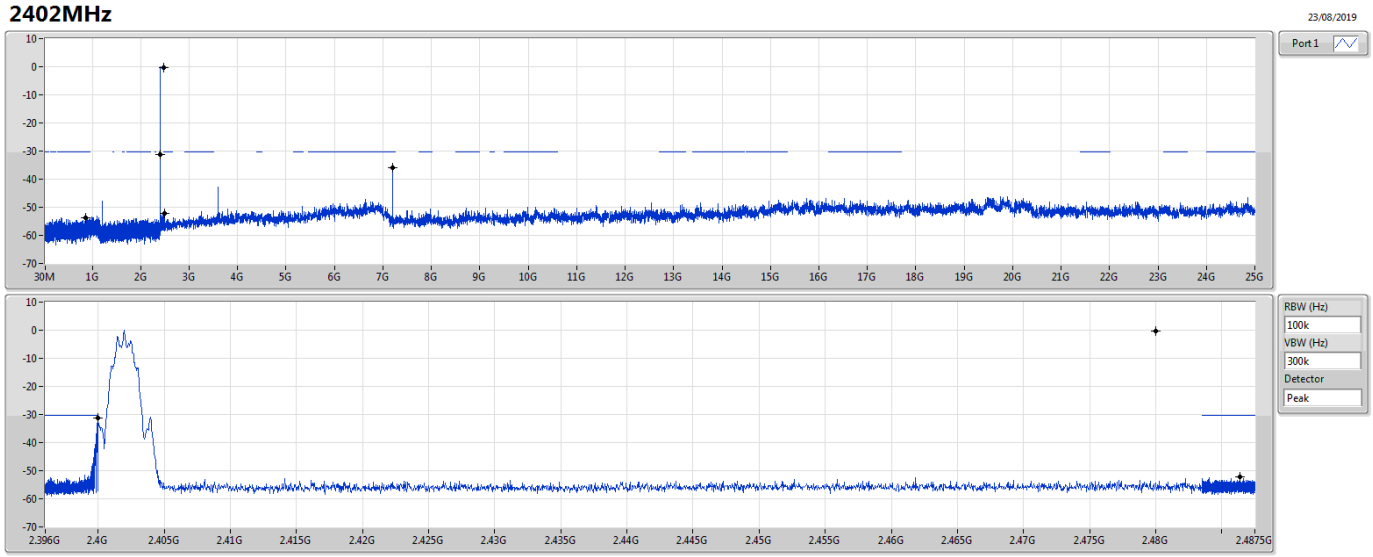
2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	0.00	-30.00	1.64823G	-53.35	2.39819G	-52.60	2.48399G	-51.81	15.12176G	-47.25	1

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

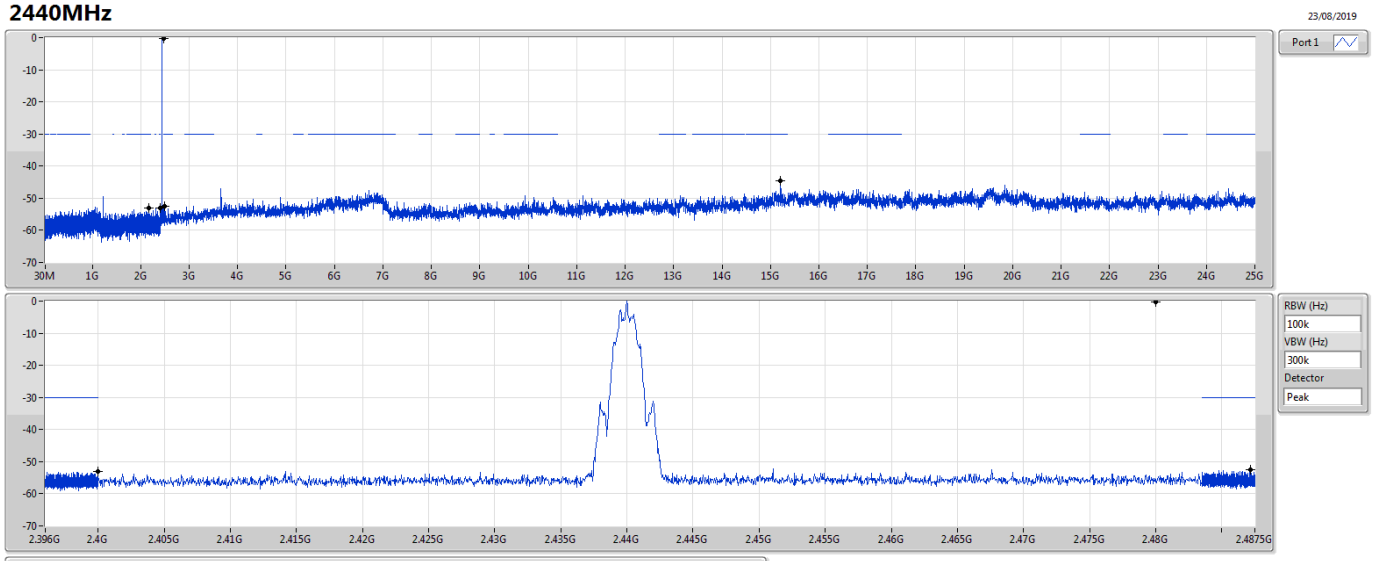
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47999G	-0.19	-30.19	854.55M	-53.75	2.39998G	-31.29	2.48639G	-52.24	7.20387G	-35.88	1

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

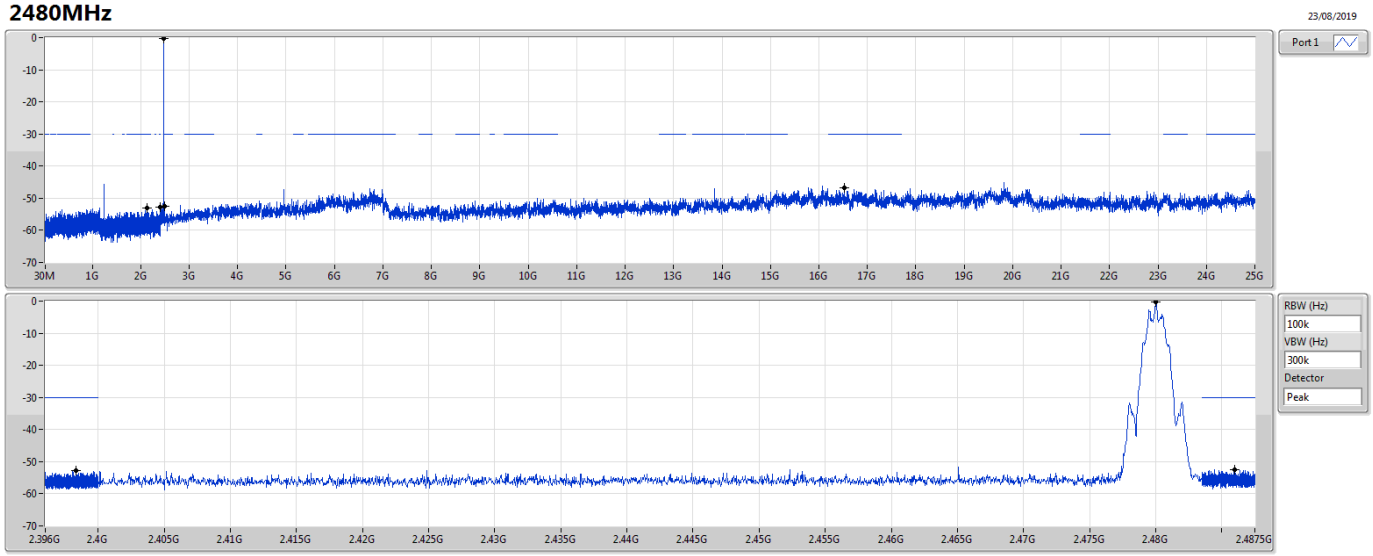
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47999G	-0.19	-30.19	2.1665G	-53.17	2.39995G	-53.09	2.48716G	-52.49	15.21269G	-44.69	1

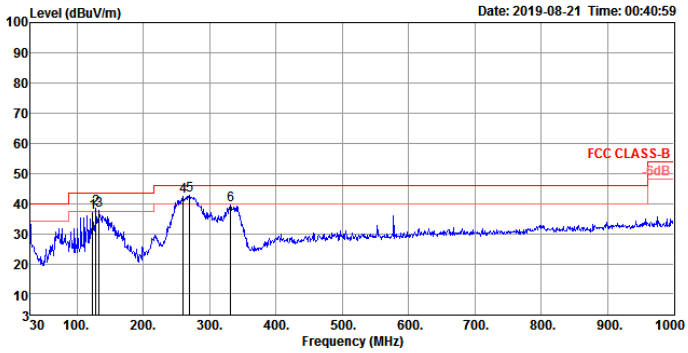
BT-LE(2Mbps) **CSE NdB**

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47999G	-0.19	-30.19	2.12302G	-52.99	2.39832G	-52.68	2.48595G	-52.48	16.52967G	-46.82	1

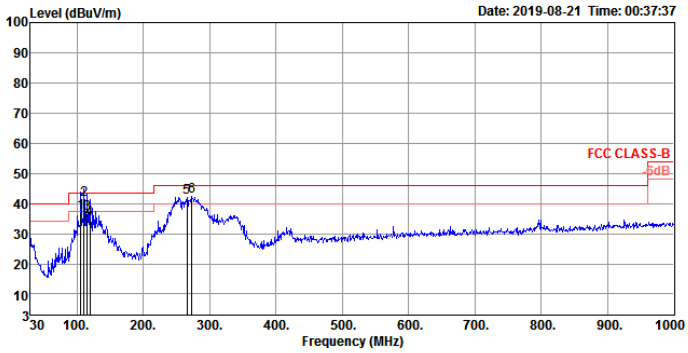
RSE below 1GHz Result			
Operating Mode	1	**Polarization**	Vertical
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	124.09	36.97	43.50	-6.53	49.83	1.14	18.12	32.12	100	260	Peak	VERTICAL
2	128.94	38.50	43.50	-5.00	51.44	1.17	18.02	32.13	100	218	Peak	VERTICAL
3	133.79	37.85	43.50	-5.65	51.07	1.19	17.73	32.14	100	209	Peak	VERTICAL
4	259.89	42.28	46.00	-3.72	53.69	1.67	18.94	32.02	200	192	Peak	VERTICAL
5	269.59	42.59	46.00	-3.41	54.11	1.71	18.80	32.03	200	0	Peak	VERTICAL
6	331.67	39.42	46.00	-6.58	49.70	1.97	19.67	31.92	200	8	Peak	VERTICAL

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.)

RSE below 1GHz Result			
Operating Mode	2	**Polarization**	Horizontal
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	105.66	37.03	43.50	-6.47	50.60	1.08	17.43	32.08	300	192	QP	HORIZONTAL
2	110.51	41.41	43.50	-2.09	54.57	1.09	17.84	32.09	300	210	QP	HORIZONTAL
3	115.36	36.79	43.50	-6.71	49.50	1.11	18.28	32.10	300	216	QP	HORIZONTAL
4	119.24	35.01	43.50	-8.49	47.70	1.12	18.30	32.11	300	180	QP	HORIZONTAL
5	265.71	42.10	46.00	-3.90	53.59	1.69	18.85	32.03	100	238	Peak	HORIZONTAL
6	273.47	42.51	46.00	-3.49	54.08	1.73	18.74	32.04	125	292	Peak	HORIZONTAL

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.)

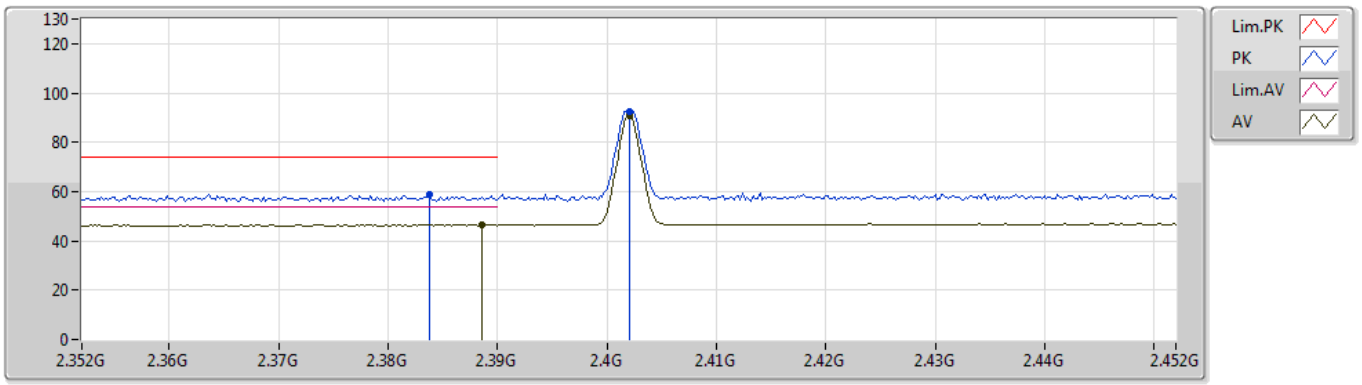
Summary

Mode	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(2Mbps)	Pass	AV	7.32004G	49.55	54.00	-4.45	9.25	3	Horizontal	178	1.01	-

BT-LE(125Kbps)

2402MHz_TX

11/09/2019



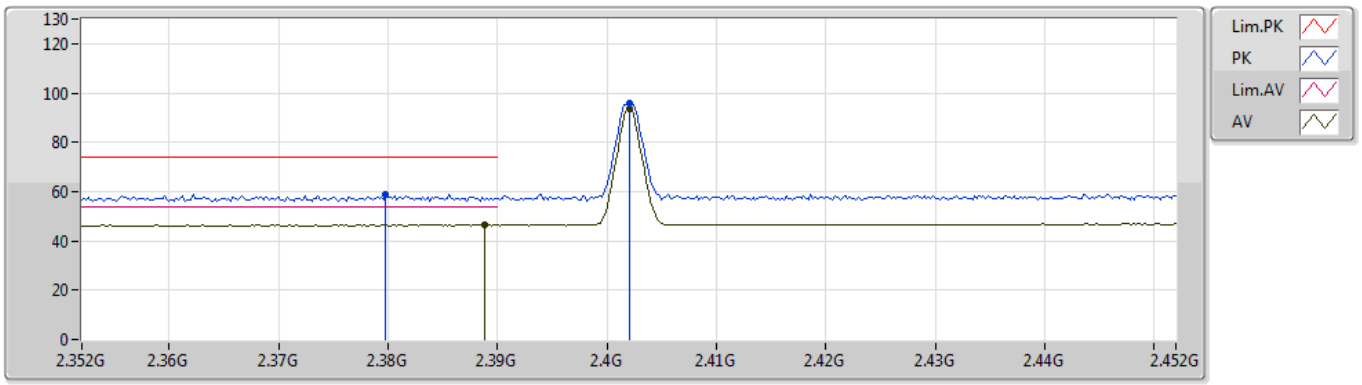
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3838G	58.97	74.00	-15.03	31.19	3	Vertical	315	2.77	-	27.78
AV	2.3886G	46.51	54.00	-7.49	31.20	3	Vertical	315	2.77	-	15.31
PK	2.402G	92.58	Inf	-Inf	31.23	3	Vertical	315	2.77	-	61.35
AV	2.402G	90.85	Inf	-Inf	31.23	3	Vertical	315	2.77	-	59.62

BT-LE(125Kbps)

2402MHz_TX

11/09/2019



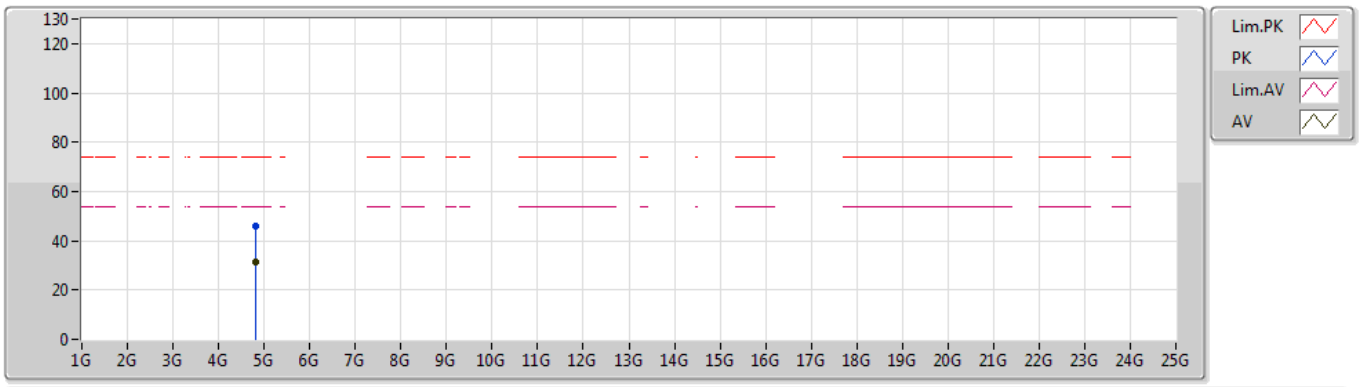
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3798G	58.95	74.00	-15.05	31.18	3	Horizontal	166	2.02	-	27.77
AV	2.3888G	46.47	54.00	-7.53	31.20	3	Horizontal	166	2.02	-	15.27
PK	2.402G	95.64	Inf	-Inf	31.23	3	Horizontal	166	2.02	-	64.41
AV	2.402G	93.80	Inf	-Inf	31.23	3	Horizontal	166	2.02	-	62.57

BT-LE(125Kbps)

2402MHz_TX

11/09/2019



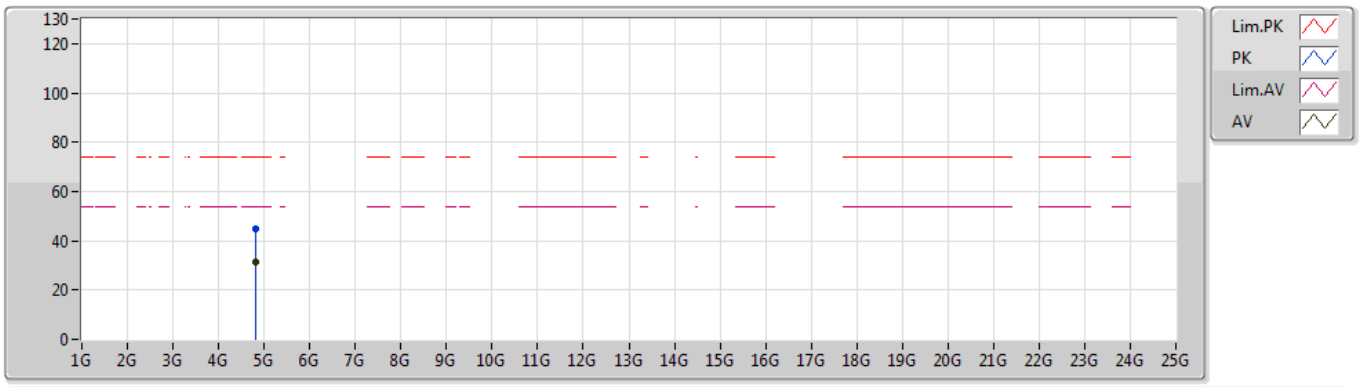
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80216G	45.71	74.00	-28.29	7.11	3	Vertical	304	2.12	-	38.60
AV	4.80684G	31.18	54.00	-22.82	7.12	3	Vertical	304	2.12	-	24.06

BT-LE(125Kbps)

11/09/2019

2402MHz_TX



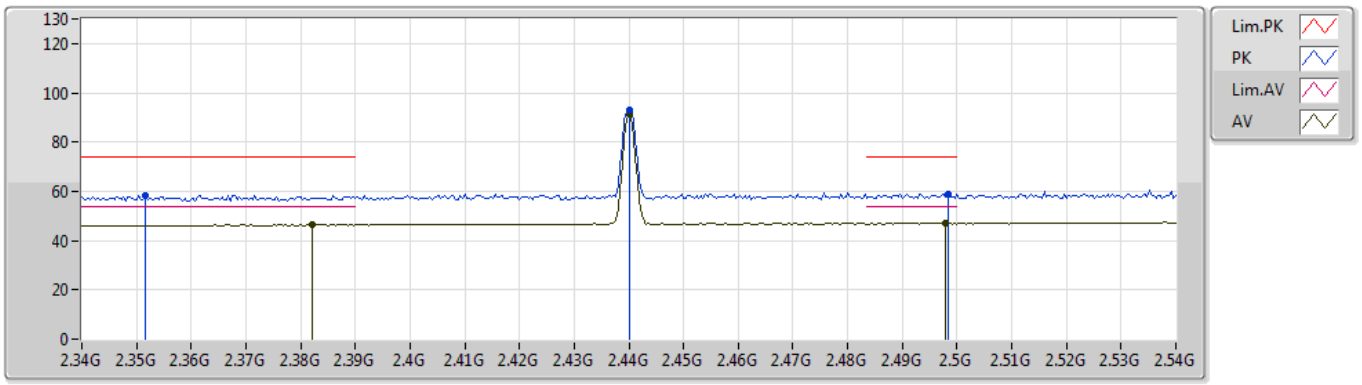
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80146G	44.94	74.00	-29.06	7.11	3	Horizontal	133	2.58	-	37.83
AV	4.80782G	31.18	54.00	-22.82	7.12	3	Horizontal	133	2.58	-	24.06

BT-LE(125Kbps)

2440MHz_TX

11/09/2019



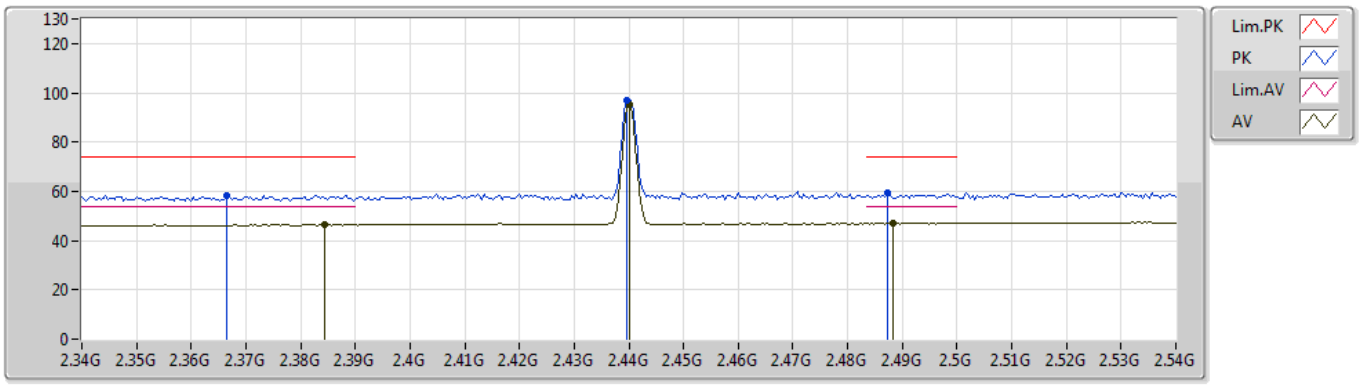
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3516G	58.30	74.00	-15.70	31.11	3	Vertical	314	3.00	-	27.19
AV	2.382G	46.38	54.00	-7.62	31.19	3	Vertical	314	3.00	-	15.19
PK	2.44G	92.77	Inf	-Inf	31.31	3	Vertical	314	3.00	-	61.46
AV	2.44G	91.06	Inf	-Inf	31.31	3	Vertical	314	3.00	-	59.75
PK	2.4984G	58.91	74.00	-15.09	31.43	3	Vertical	314	3.00	-	27.48
AV	2.498G	47.04	54.00	-6.96	31.43	3	Vertical	314	3.00	-	15.61

BT-LE(125Kbps)

2440MHz_TX

11/09/2019



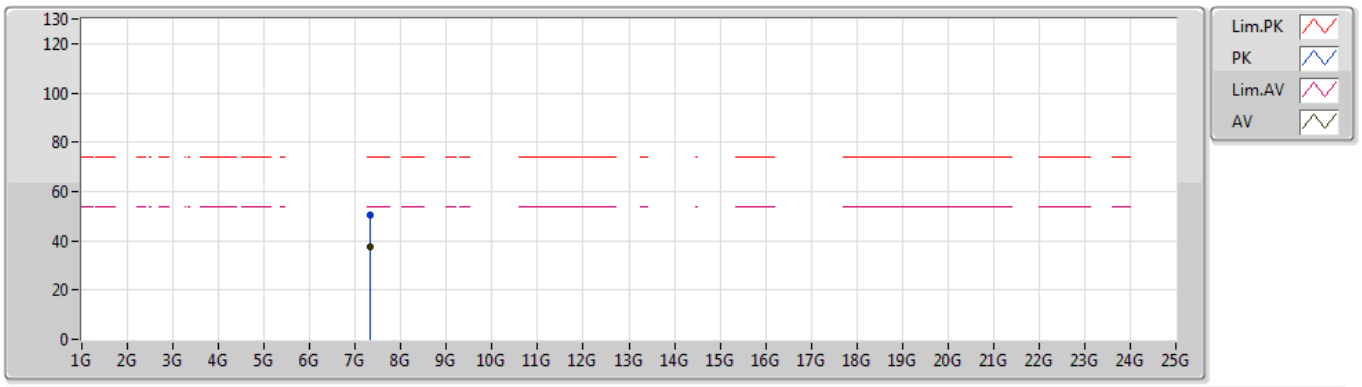
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3664G	58.42	74.00	-15.58	31.15	3	Horizontal	147	1.14	-	27.27
AV	2.3844G	46.46	54.00	-7.54	31.19	3	Horizontal	147	1.14	-	15.27
PK	2.4396G	96.88	Inf	-Inf	31.31	3	Horizontal	147	1.14	-	65.57
AV	2.44G	95.25	Inf	-Inf	31.31	3	Horizontal	147	1.14	-	63.94
PK	2.4872G	59.28	74.00	-14.72	31.40	3	Horizontal	147	1.14	-	27.88
AV	2.4884G	47.09	54.00	-6.91	31.41	3	Horizontal	147	1.14	-	15.68

BT-LE(125Kbps)

2440MHz_TX

11/09/2019



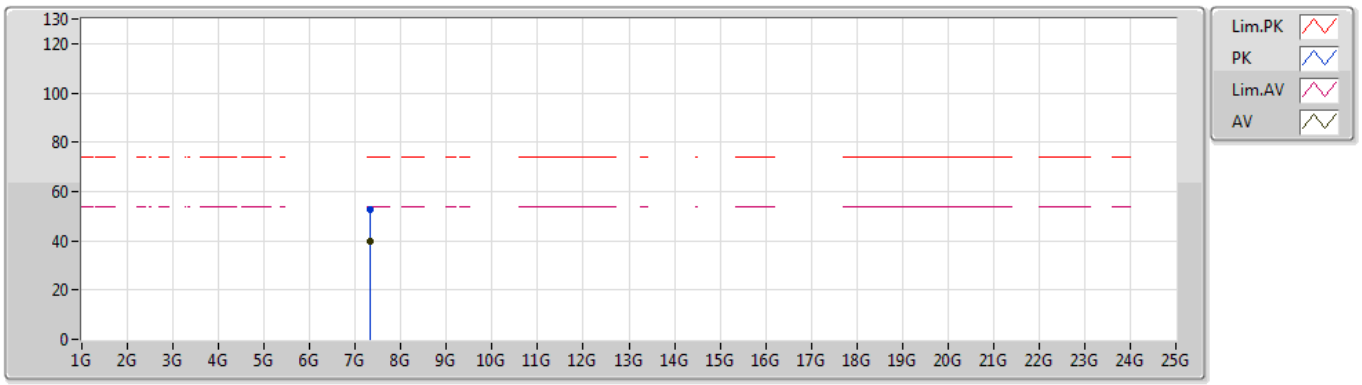
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.3195G	50.20	74.00	-23.80	10.57	3	Vertical	285	2.26	-	39.63
AV	7.31942G	37.66	54.00	-16.34	10.57	3	Vertical	285	2.26	-	27.09

BT-LE(125Kbps)

2440MHz_TX

11/09/2019



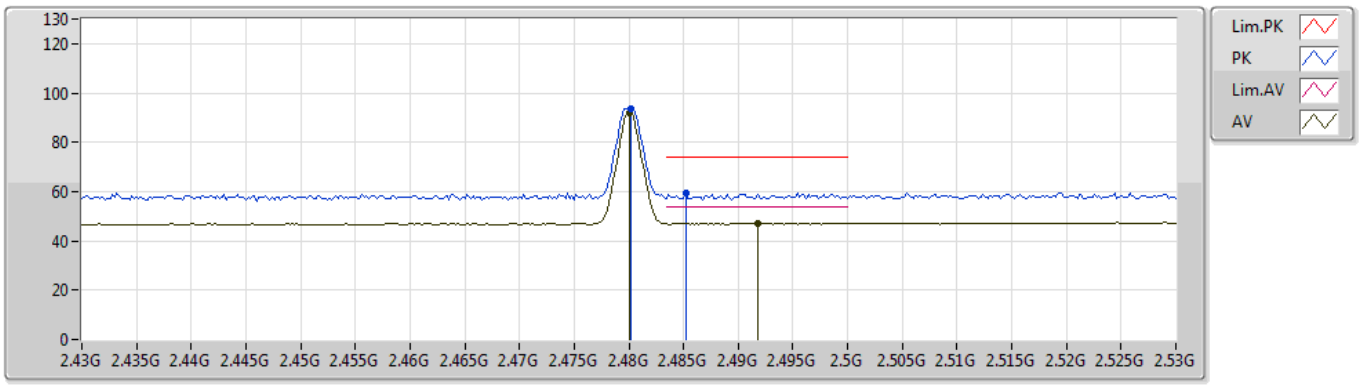
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.32078G	52.70	74.00	-21.30	10.58	3	Horizontal	173	1.32	-	42.12
AV	7.3194G	39.78	54.00	-14.22	10.57	3	Horizontal	173	1.32	-	29.21

BT-LE(125Kbps)

2480MHz_TX

11/09/2019



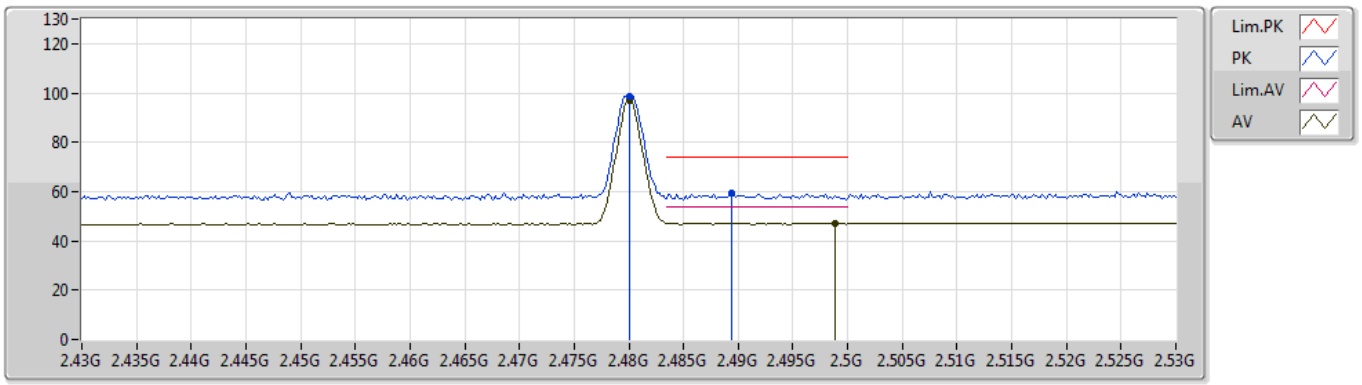
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.4802G	93.82	Inf	-Inf	31.39	3	Vertical	348	2.37	-	62.43
AV	2.48G	92.12	Inf	-Inf	31.39	3	Vertical	348	2.37	-	60.73
PK	2.4852G	59.45	74.00	-14.55	31.40	3	Vertical	348	2.37	-	28.05
AV	2.4918G	47.10	54.00	-6.90	31.42	3	Vertical	348	2.37	-	15.68

BT-LE(125Kbps)

2480MHz_TX

11/09/2019



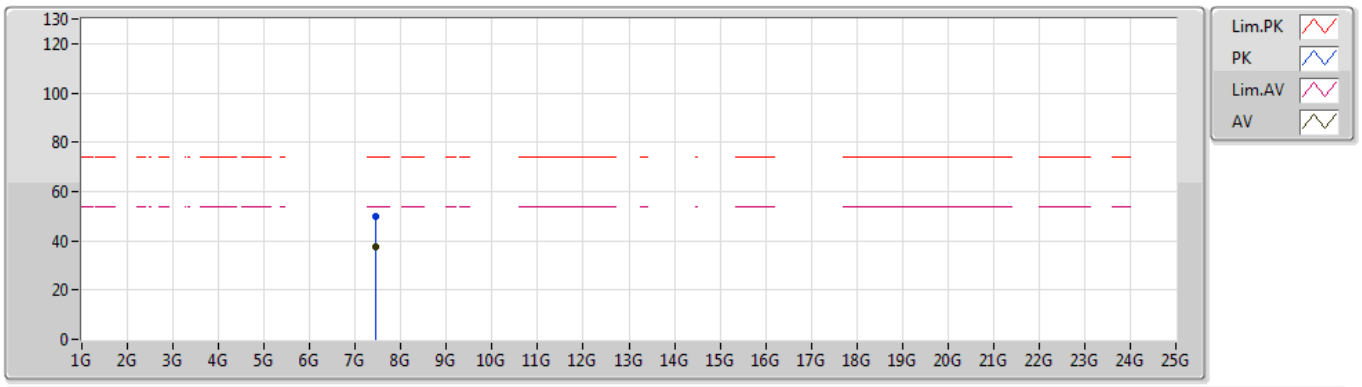
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.48G	98.86	Inf	-Inf	31.39	3	Horizontal	148	1.41	-	67.47
AV	2.48G	96.98	Inf	-Inf	31.39	3	Horizontal	148	1.41	-	65.59
PK	2.4894G	59.15	74.00	-14.85	31.41	3	Horizontal	148	1.41	-	27.74
AV	2.4988G	47.09	54.00	-6.91	31.43	3	Horizontal	148	1.41	-	15.66

BT-LE(125Kbps)

2480MHz_TX

11/09/2019



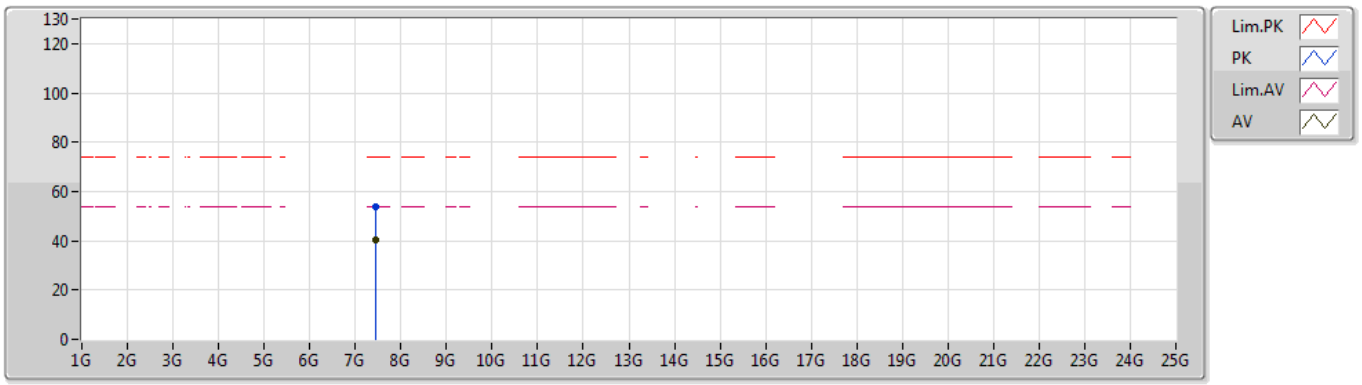
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.44054G	49.77	74.00	-24.23	10.90	3	Vertical	360	2.54	-	38.87
AV	7.44062G	37.29	54.00	-16.71	10.90	3	Vertical	360	2.54	-	26.39

BT-LE(125Kbps)

2480MHz_TX

11/09/2019



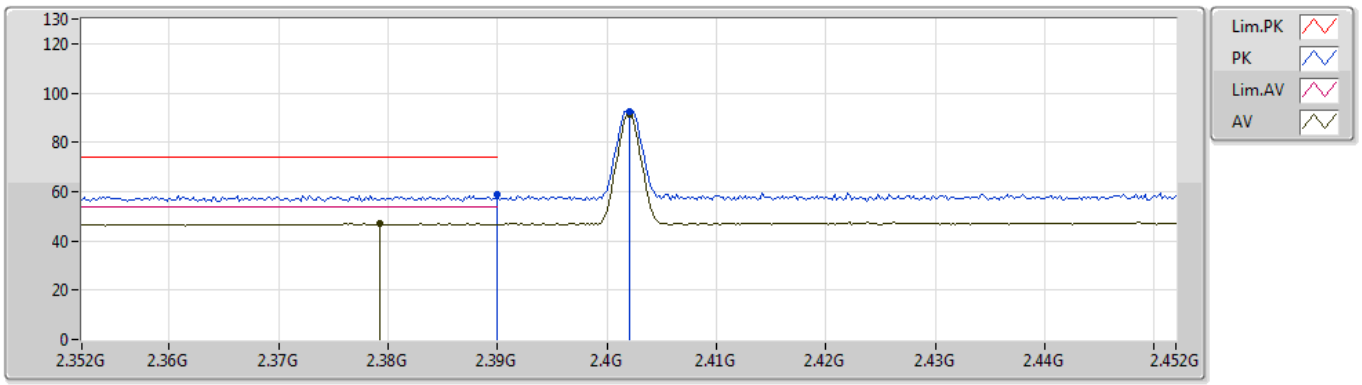
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.43928G	53.75	74.00	-20.25	10.90	3	Horizontal	333	1.34	-	42.85
AV	7.44064G	40.51	54.00	-13.49	10.90	3	Horizontal	333	1.34	-	29.61

BT-LE(500Kbps)

2402MHz_TX

11/09/2019



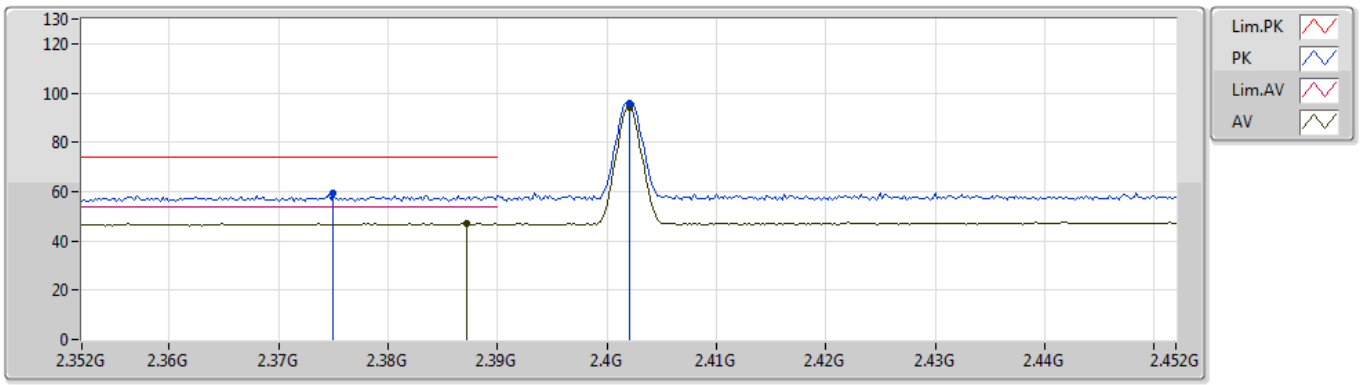
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.39G	58.56	74.00	-15.44	31.20	3	Vertical	340	2.76	-	27.36
AV	2.3792G	46.86	54.00	-7.14	31.18	3	Vertical	340	2.76	-	15.68
PK	2.402G	92.68	Inf	-Inf	31.23	3	Vertical	340	2.76	-	61.45
AV	2.402G	91.21	Inf	-Inf	31.23	3	Vertical	340	2.76	-	59.98

BT-LE(500Kbps)

11/09/2019

2402MHz_TX



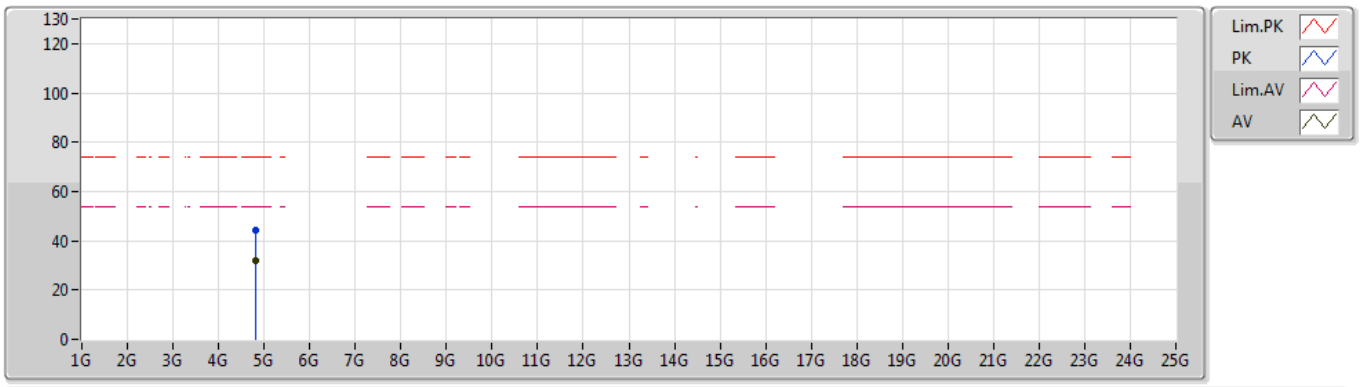
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.375G	59.23	74.00	-14.77	31.17	3	Horizontal	170	2.03	-	28.06
AV	2.3872G	47.18	54.00	-6.82	31.20	3	Horizontal	170	2.03	-	15.98
PK	2.402G	95.77	Inf	-Inf	31.23	3	Horizontal	170	2.03	-	64.54
AV	2.402G	94.25	Inf	-Inf	31.23	3	Horizontal	170	2.03	-	63.02

BT-LE(500Kbps)

11/09/2019

2402MHz_TX



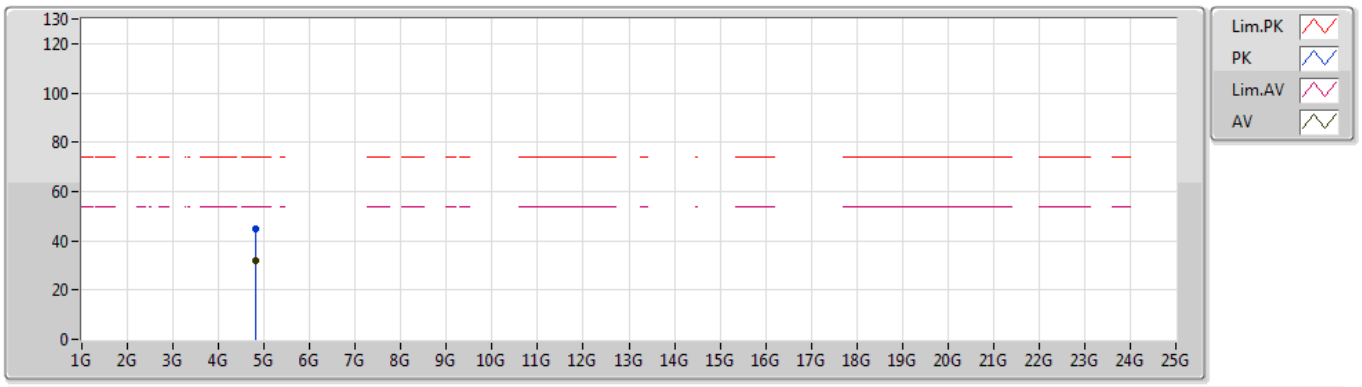
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80448G	44.33	74.00	-29.67	7.12	3	Vertical	100	1.18	-	37.21
AV	4.80308G	32.04	54.00	-21.96	7.12	3	Vertical	100	1.18	-	24.92

BT-LE(500Kbps)

11/09/2019

2402MHz_TX



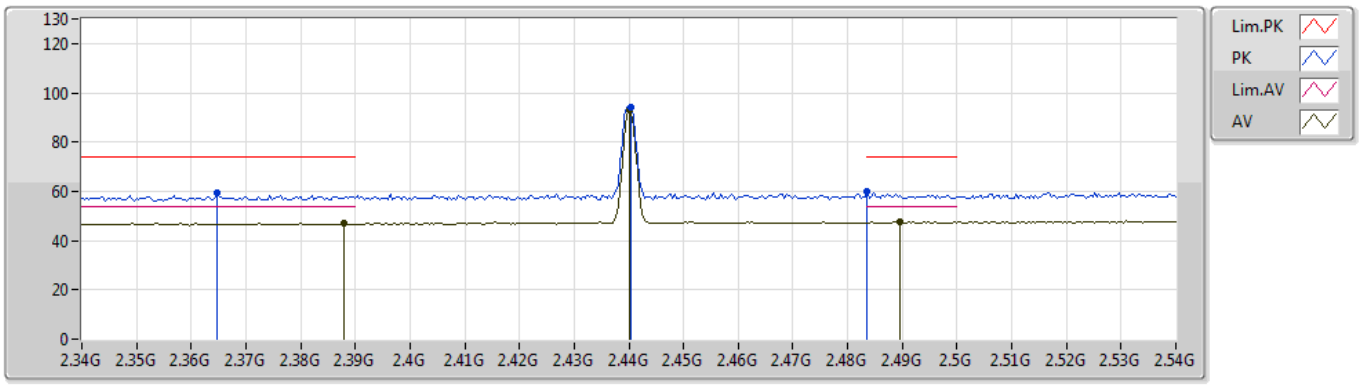
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.8034G	44.56	74.00	-29.44	7.12	3	Horizontal	197	1.01	-	37.44
AV	4.80538G	32.03	54.00	-21.97	7.12	3	Horizontal	197	1.01	-	24.91

BT-LE(500Kbps)

2440MHz_TX

11/09/2019



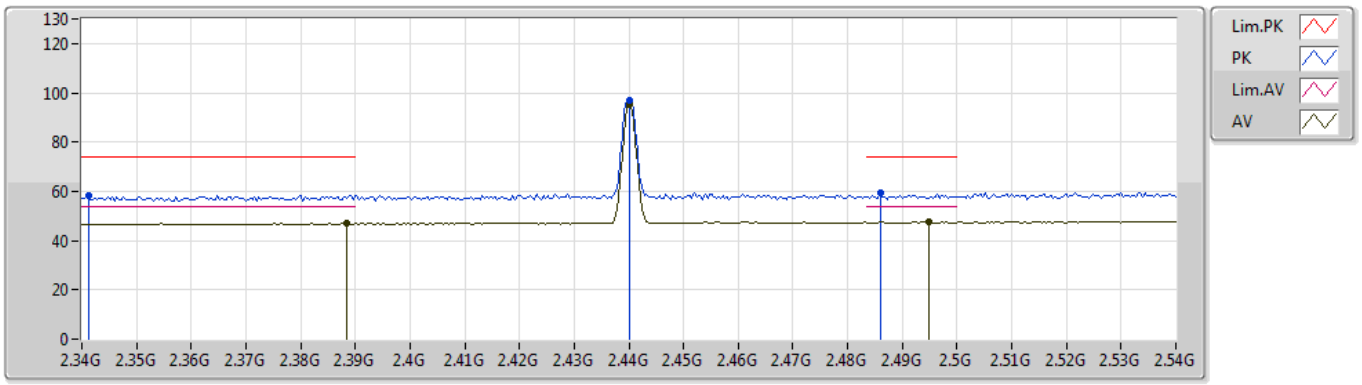
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3648G	59.20	74.00	-14.80	31.15	3	Vertical	335	2.99	-	28.05
AV	2.388G	46.97	54.00	-7.03	31.20	3	Vertical	335	2.99	-	15.77
PK	2.4404G	94.21	Inf	-Inf	31.31	3	Vertical	335	2.99	-	62.90
AV	2.44G	92.79	Inf	-Inf	31.31	3	Vertical	335	2.99	-	61.48
PK	2.4835G	59.68	74.00	-14.32	31.39	3	Vertical	335	2.99	-	28.29
AV	2.4896G	47.47	54.00	-6.53	31.41	3	Vertical	335	2.99	-	16.06

BT-LE(500Kbps)

2440MHz_TX

11/09/2019



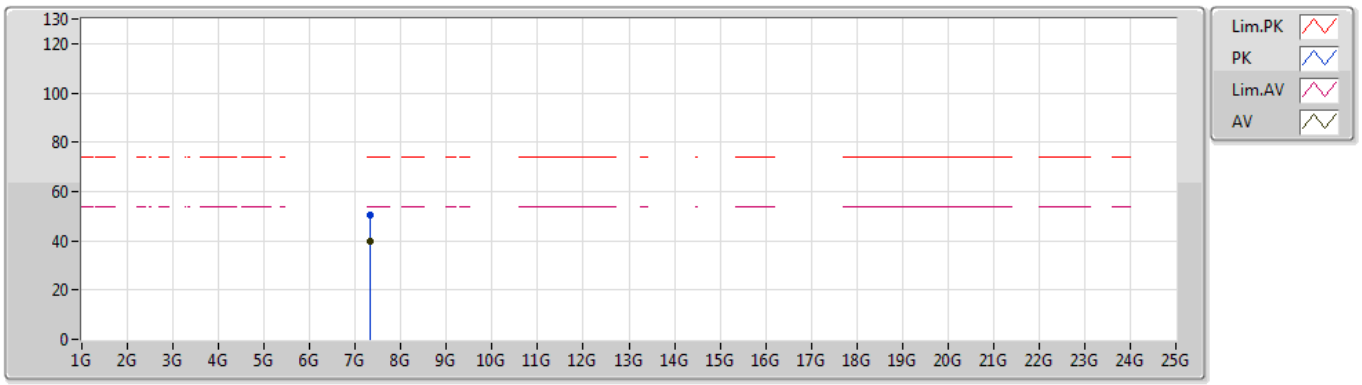
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3412G	58.51	74.00	-15.49	31.08	3	Horizontal	134	1.12	-	27.43
AV	2.3884G	47.01	54.00	-6.99	31.20	3	Horizontal	134	1.12	-	15.81
PK	2.44G	97.08	Inf	-Inf	31.31	3	Horizontal	134	1.12	-	65.77
AV	2.44G	95.47	Inf	-Inf	31.31	3	Horizontal	134	1.12	-	64.16
PK	2.486G	59.15	74.00	-14.85	31.40	3	Horizontal	134	1.12	-	27.75
AV	2.4948G	47.60	54.00	-6.40	31.42	3	Horizontal	134	1.12	-	16.18

BT-LE(500Kbps)

2440MHz_TX

11/09/2019



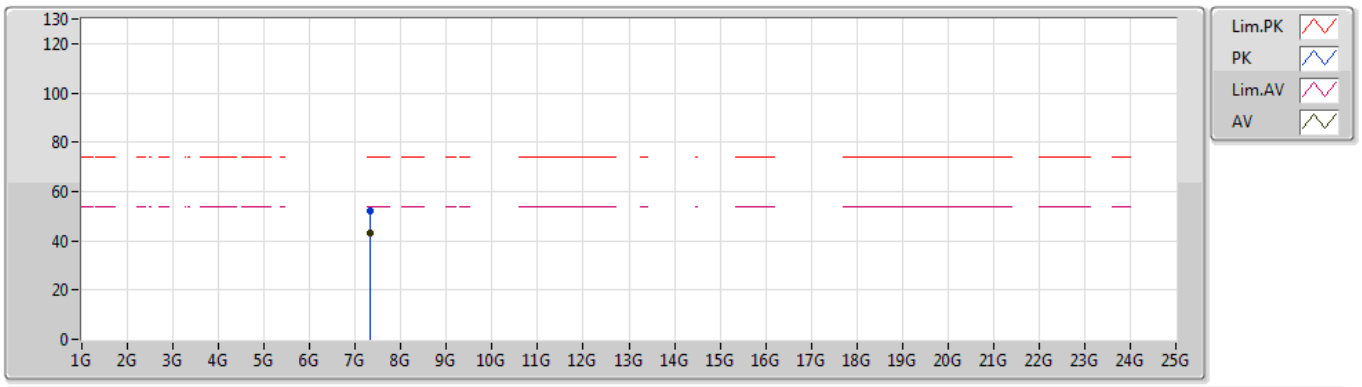
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.32064G	50.60	74.00	-23.40	10.58	3	Vertical	351	2.21	-	40.02
AV	7.31994G	39.61	54.00	-14.39	10.57	3	Vertical	351	2.21	-	29.04

BT-LE(500Kbps)

2440MHz_TX

11/09/2019



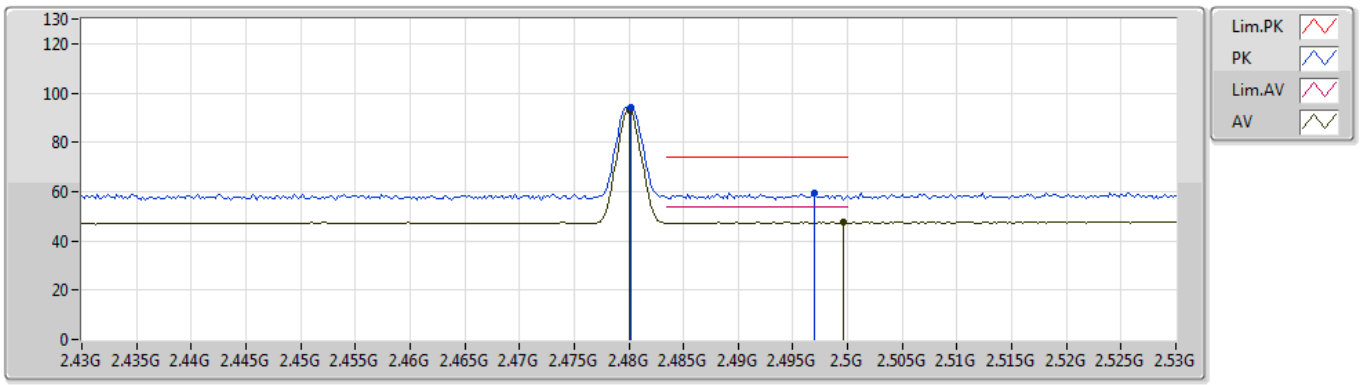
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.3192G	52.00	74.00	-22.00	10.57	3	Horizontal	277	1.02	-	41.43
AV	7.31996G	43.06	54.00	-10.94	10.57	3	Horizontal	277	1.02	-	32.49

BT-LE(500Kbps)

2480MHz_TX

11/09/2019



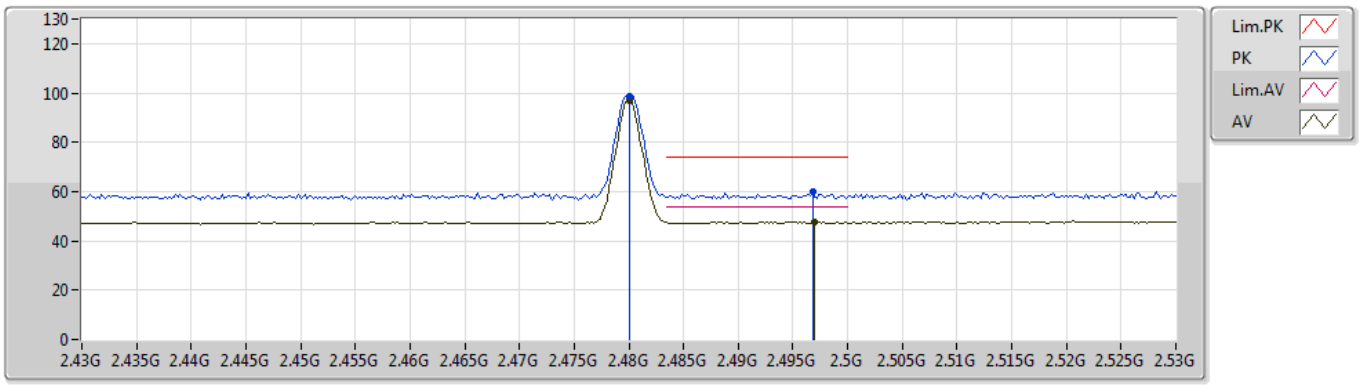
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.4802G	94.12	Inf	-Inf	31.39	3	Vertical	346	2.65	-	62.73
AV	2.48G	92.77	Inf	-Inf	31.39	3	Vertical	346	2.65	-	61.38
PK	2.497G	59.43	74.00	-14.57	31.43	3	Vertical	346	2.65	-	28.00
AV	2.4996G	47.78	54.00	-6.22	31.43	3	Vertical	346	2.65	-	16.35

BT-LE(500Kbps)

2480MHz_TX

11/09/2019



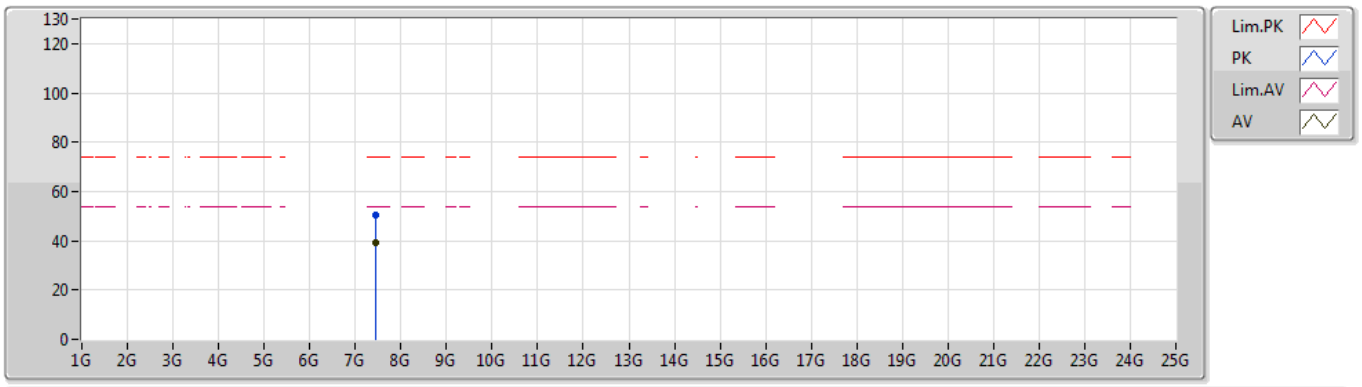
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.48G	98.66	Inf	-Inf	31.39	3	Horizontal	154	1.40	-	67.27
AV	2.48G	97.15	Inf	-Inf	31.39	3	Horizontal	154	1.40	-	65.76
PK	2.4968G	59.71	74.00	-14.29	31.42	3	Horizontal	154	1.40	-	28.29
AV	2.497G	47.61	54.00	-6.39	31.43	3	Horizontal	154	1.40	-	16.18

BT-LE(500Kbps)

2480MHz_TX

11/09/2019



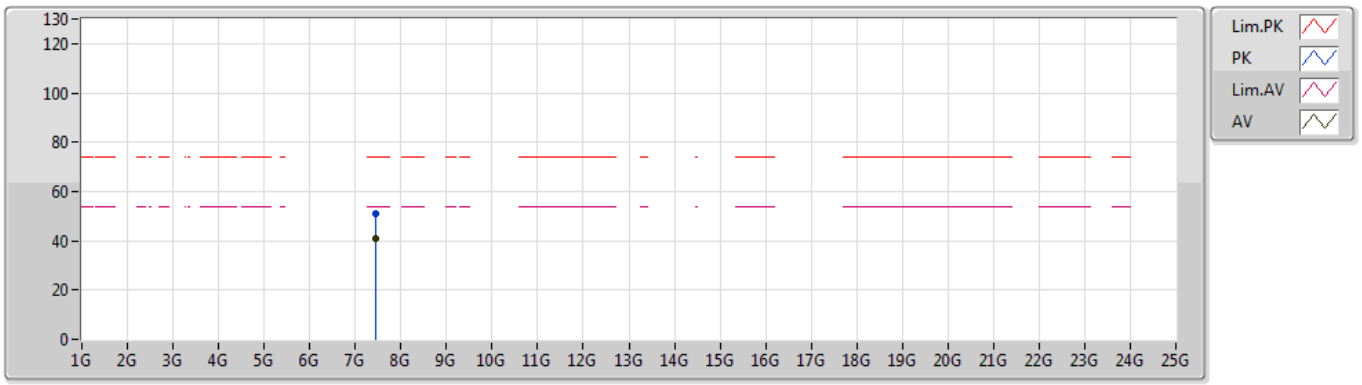
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.44046G	50.48	74.00	-23.52	10.90	3	Vertical	291	2.71	-	39.58
AV	7.43996G	39.21	54.00	-14.79	10.90	3	Vertical	291	2.71	-	28.31

BT-LE(500Kbps)

11/09/2019

2480MHz_TX



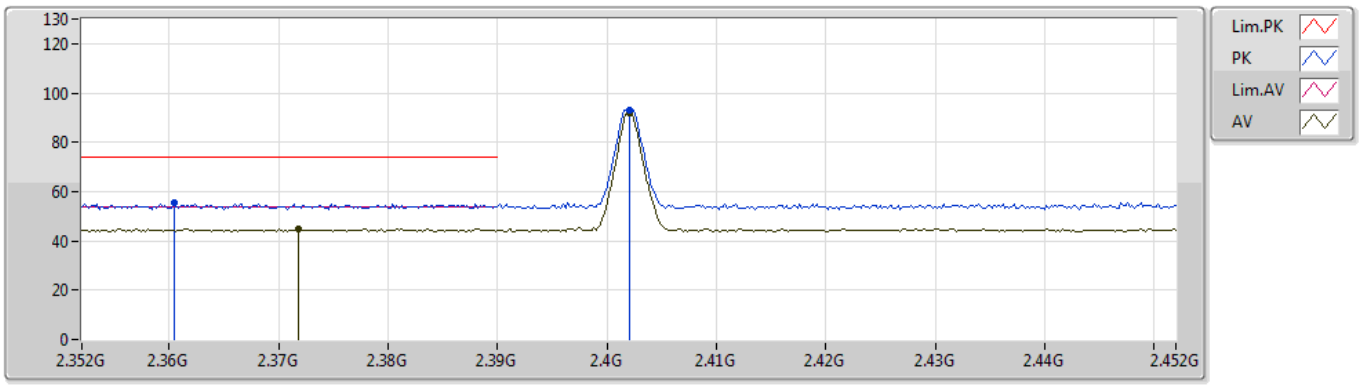
EUT Z_1TX
Setting Default
02-A-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.44072G	51.12	74.00	-22.88	10.90	3	Horizontal	124	1.04	-	40.22
AV	7.44004G	40.78	54.00	-13.22	10.90	3	Horizontal	124	1.04	-	29.88

BT-LE(1Mbps)

2402MHz_TX

22/08/2019



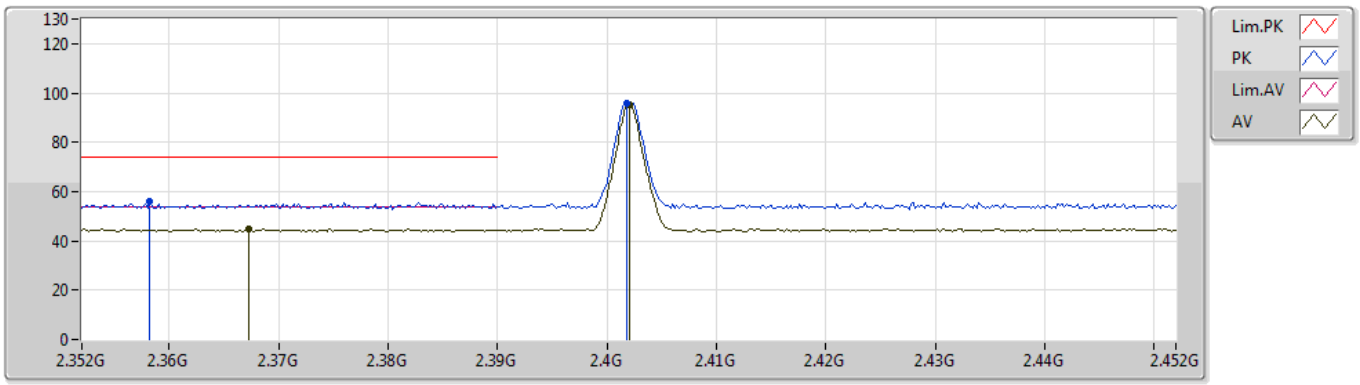
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3604G	55.72	74.00	-18.28	30.69	3	Vertical	117	2.99	-	25.03
AV	2.3718G	44.94	54.00	-9.06	30.74	3	Vertical	117	2.99	-	14.20
PK	2.402G	92.98	Inf	-Inf	30.84	3	Vertical	117	2.99	-	62.14
AV	2.402G	91.99	Inf	-Inf	30.84	3	Vertical	117	2.99	-	61.15

BT-LE(1Mbps)

2402MHz_TX

22/08/2019



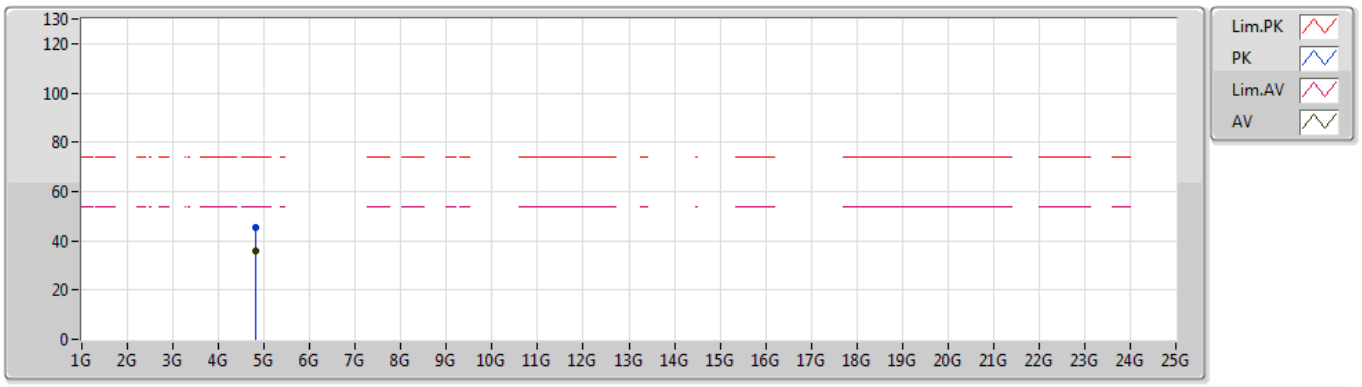
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3582G	55.78	74.00	-18.22	30.68	3	Horizontal	338	1.01	-	25.10
AV	2.3672G	44.83	54.00	-9.17	30.71	3	Horizontal	338	1.01	-	14.12
PK	2.4018G	96.09	Inf	-Inf	30.84	3	Horizontal	338	1.01	-	65.25
AV	2.402G	95.06	Inf	-Inf	30.84	3	Horizontal	338	1.01	-	64.22

BT-LE(1Mbps)

2402MHz_TX

22/08/2019



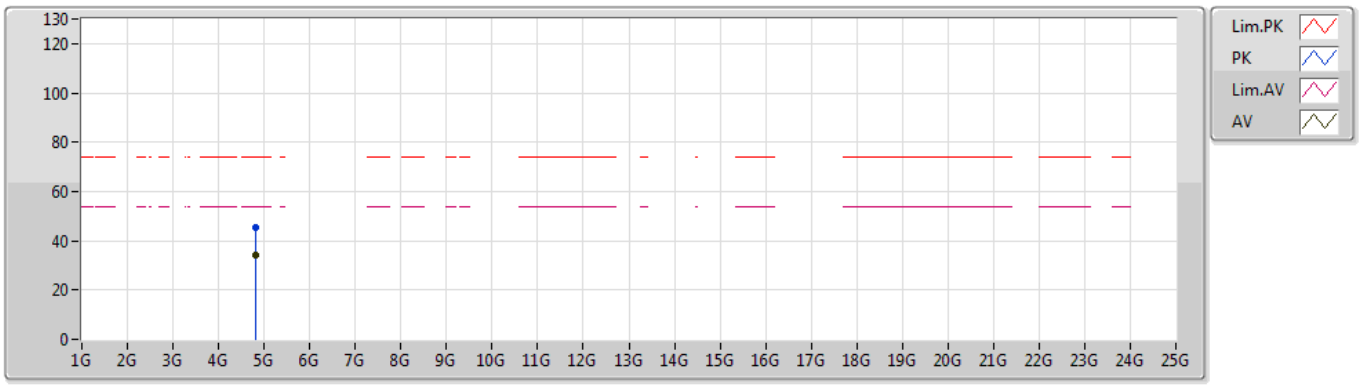
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.81G	45.34	74.00	-28.66	3.52	3	Vertical	107	1.61	-	41.82
AV	4.79968G	36.04	54.00	-17.96	3.48	3	Vertical	107	1.61	-	32.56

BT-LE(1Mbps)

2402MHz_TX

22/08/2019



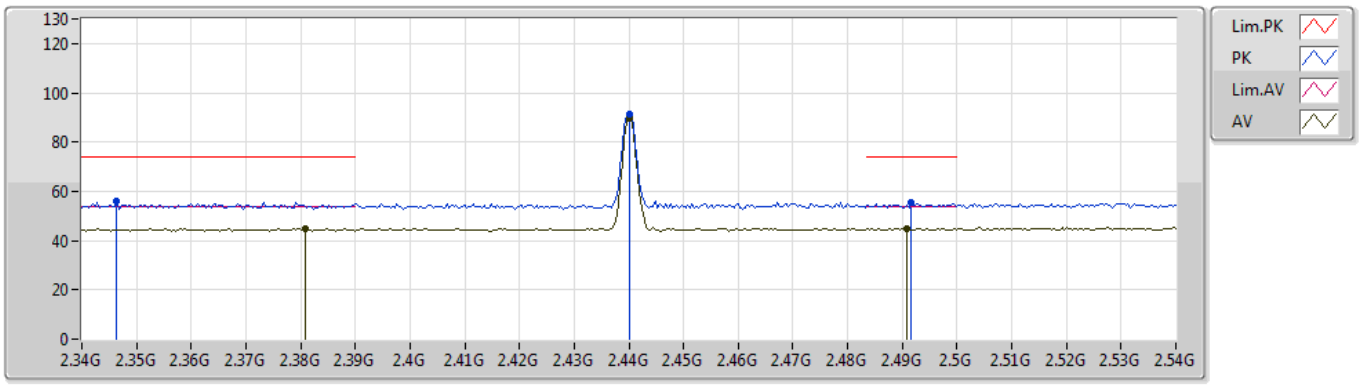
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.8009G	45.49	74.00	-28.51	3.48	3	Horizontal	125	2.74	-	42.01
AV	4.80236G	34.39	54.00	-19.61	3.49	3	Horizontal	125	2.74	-	30.90

BT-LE(1Mbps)

2440MHz_TX

22/08/2019



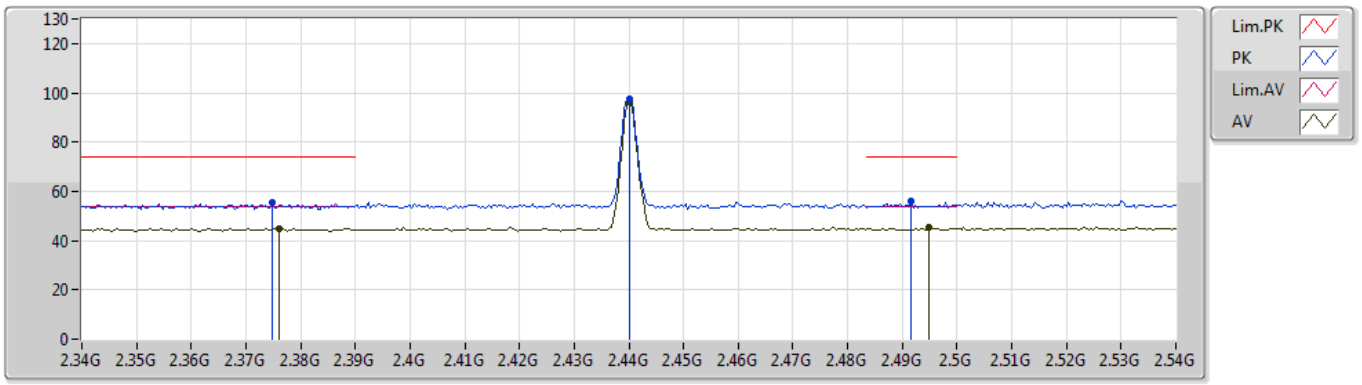
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3464G	55.92	74.00	-18.08	30.64	3	Vertical	137	1.91	-	25.28
AV	2.3808G	44.85	54.00	-9.15	30.76	3	Vertical	137	1.91	-	14.09
PK	2.44G	91.12	Inf	-Inf	30.90	3	Vertical	137	1.91	-	60.22
AV	2.44G	89.91	Inf	-Inf	30.90	3	Vertical	137	1.91	-	59.01
PK	2.4916G	55.71	74.00	-18.29	30.98	3	Vertical	137	1.91	-	24.73
AV	2.4908G	45.04	54.00	-8.96	30.98	3	Vertical	137	1.91	-	14.06

BT-LE(1Mbps)

2440MHz_TX

22/08/2019



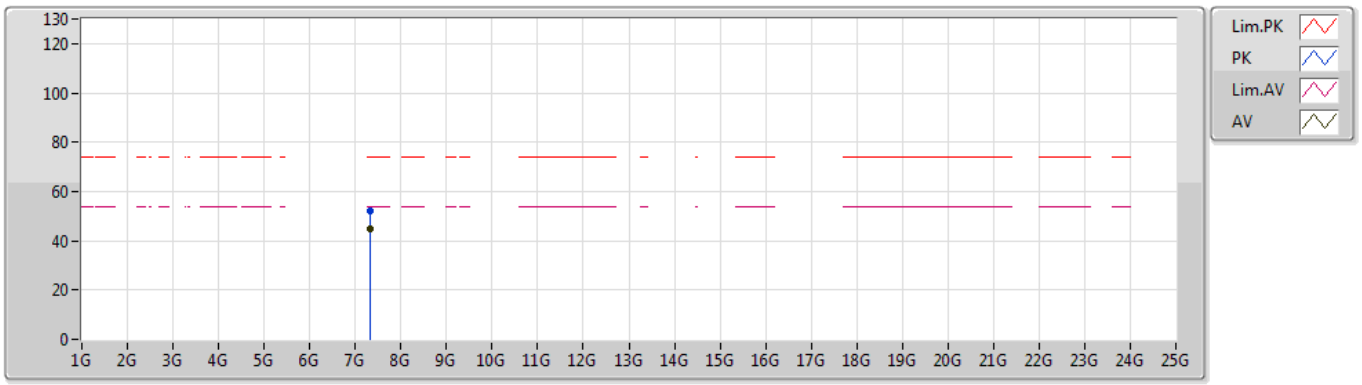
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3748G	55.35	74.00	-18.65	30.74	3	Horizontal	338	1.23	-	24.61
AV	2.376G	45.00	54.00	-9.00	30.75	3	Horizontal	338	1.23	-	14.25
PK	2.44G	97.43	Inf	-Inf	30.90	3	Horizontal	338	1.23	-	66.53
AV	2.44G	96.24	Inf	-Inf	30.90	3	Horizontal	338	1.23	-	65.34
PK	2.4916G	55.85	74.00	-18.15	30.98	3	Horizontal	338	1.23	-	24.87
AV	2.4948G	45.33	54.00	-8.67	30.98	3	Horizontal	338	1.23	-	14.35

BT-LE(1Mbps)

2440MHz_TX

22/08/2019



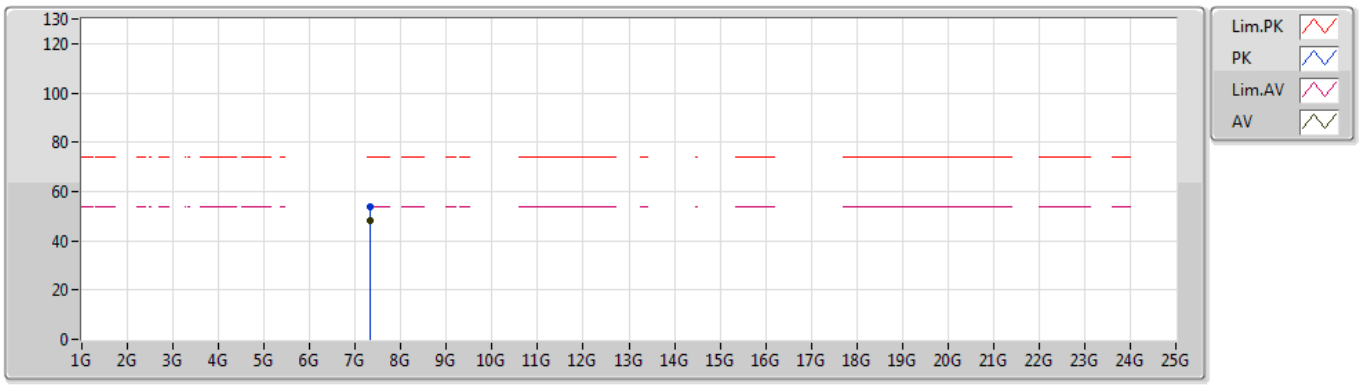
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.31924G	52.31	74.00	-21.69	9.25	3	Vertical	262	2.55	-	43.06
AV	7.32008G	44.92	54.00	-9.08	9.25	3	Vertical	262	2.55	-	35.67

BT-LE(1Mbps)

2440MHz_TX

22/08/2019



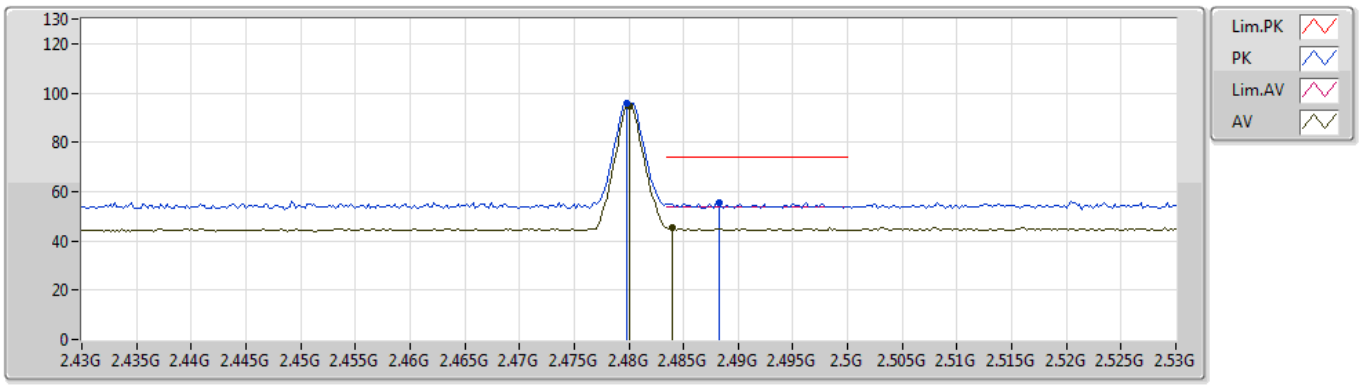
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.3193G	54.03	74.00	-19.97	9.25	3	Horizontal	180	1.03	-	44.78
AV	7.31994G	48.40	54.00	-5.60	9.25	3	Horizontal	180	1.03	-	39.15

BT-LE(1Mbps)

2480MHz_TX

22/08/2019



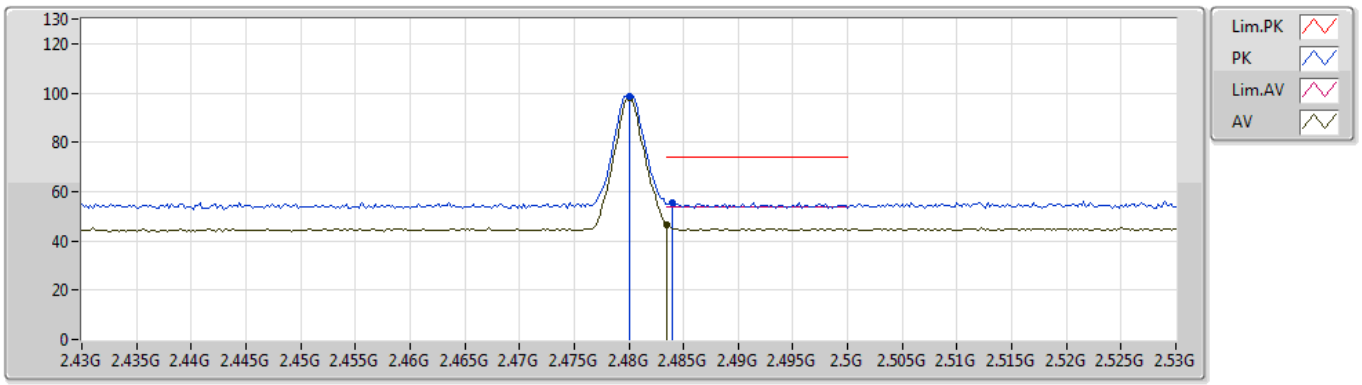
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.4798G	96.03	Inf	-Inf	30.96	3	Vertical	165	2.87	-	65.07
AV	2.48G	94.96	Inf	-Inf	30.96	3	Vertical	165	2.87	-	64.00
PK	2.4882G	55.62	74.00	-18.38	30.97	3	Vertical	165	2.87	-	24.65
AV	2.484G	45.46	54.00	-8.54	30.96	3	Vertical	165	2.87	-	14.50

BT-LE(1Mbps)

2480MHz_TX

22/08/2019



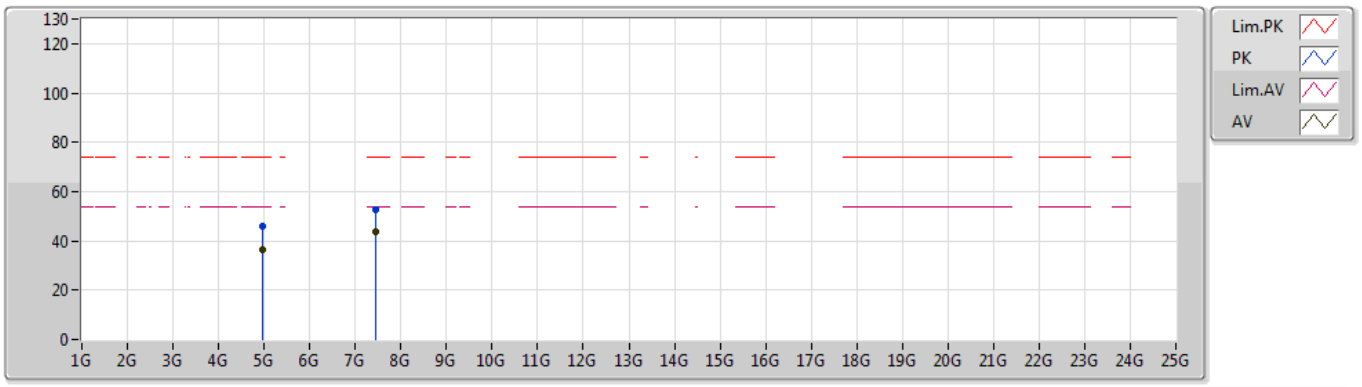
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.48G	98.85	Inf	-Inf	30.96	3	Horizontal	359	1.50	-	67.89
AV	2.48G	97.79	Inf	-Inf	30.96	3	Horizontal	359	1.50	-	66.83
PK	2.484G	55.55	74.00	-18.45	30.96	3	Horizontal	359	1.50	-	24.59
AV	2.4835G	46.78	54.00	-7.22	30.96	3	Horizontal	359	1.50	-	15.82

BT-LE(1Mbps)

2480MHz_TX

22/08/2019



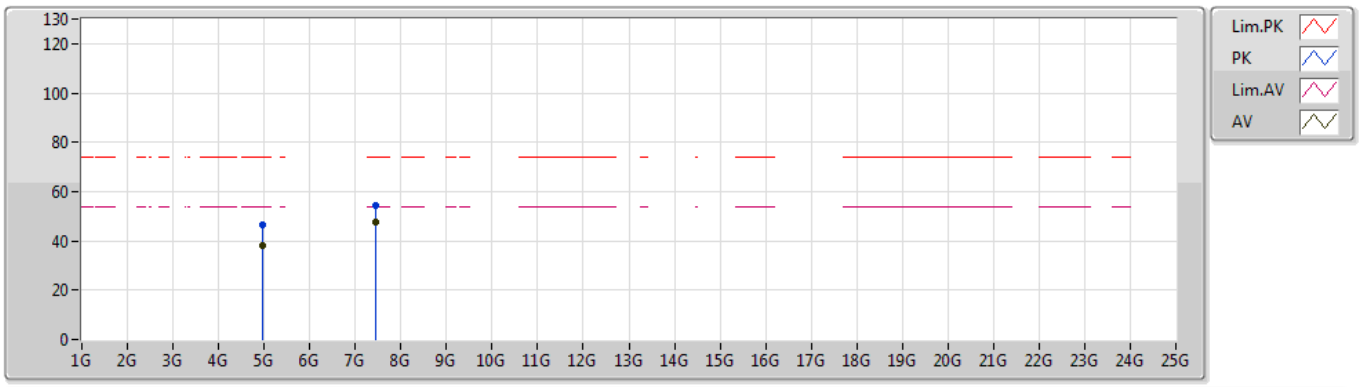
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.95986G	46.22	74.00	-27.78	4.20	3	Vertical	274	2.99	-	42.02
AV	4.95998G	36.44	54.00	-17.56	4.20	3	Vertical	274	2.99	-	32.24
PK	7.43947G	52.62	74.00	-21.38	9.46	3	Vertical	173	2.86	-	43.16
AV	7.44007G	43.72	54.00	-10.28	9.47	3	Vertical	173	2.86	-	34.25

BT-LE(1Mbps)

2480MHz_TX

22/08/2019



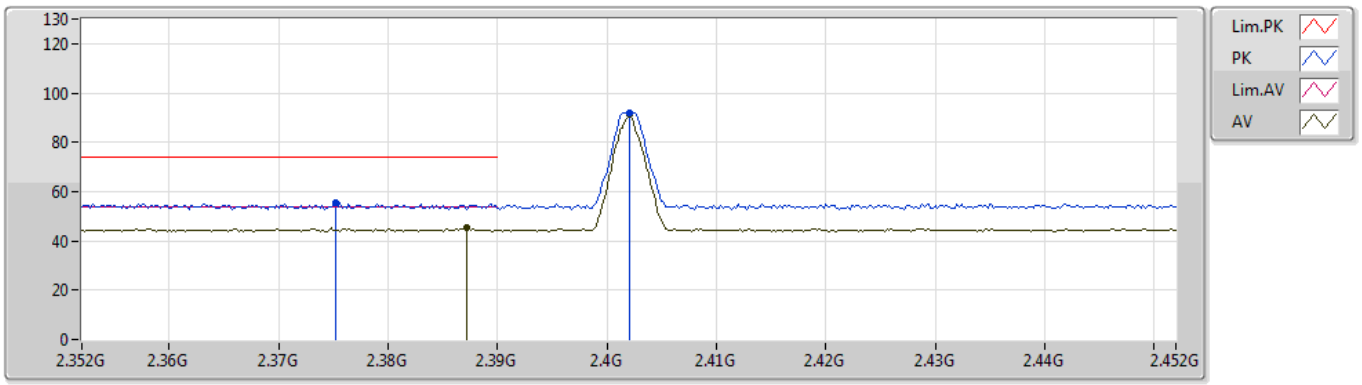
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.9598G	46.62	74.00	-27.38	4.20	3	Horizontal	333	1.07	-	42.42
AV	4.96002G	38.32	54.00	-15.68	4.20	3	Horizontal	333	1.07	-	34.12
PK	7.44002G	54.48	74.00	-19.52	9.47	3	Horizontal	89	1.00	-	45.01
AV	7.44002G	47.73	54.00	-6.27	9.47	3	Horizontal	89	1.00	-	38.26

BT-LE(2Mbps)

2402MHz_TX

22/08/2019



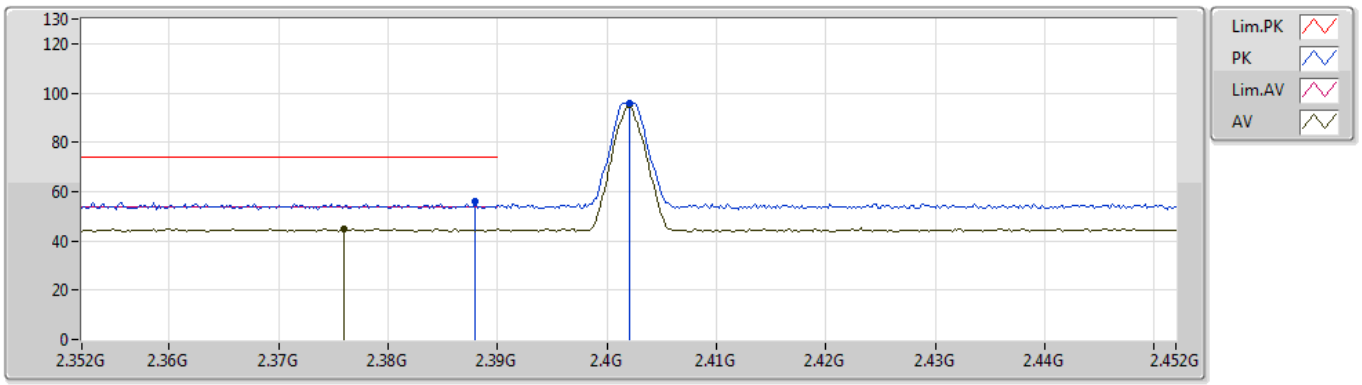
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3752G	55.31	74.00	-18.69	30.75	3	Vertical	122	2.68	-	24.56
AV	2.3872G	45.14	54.00	-8.86	30.79	3	Vertical	122	2.68	-	14.35
PK	2.402G	92.13	Inf	-Inf	30.84	3	Vertical	122	2.68	-	61.29
AV	2.402G	91.38	Inf	-Inf	30.84	3	Vertical	122	2.68	-	60.54

BT-LE(2Mbps)

2402MHz_TX

22/08/2019



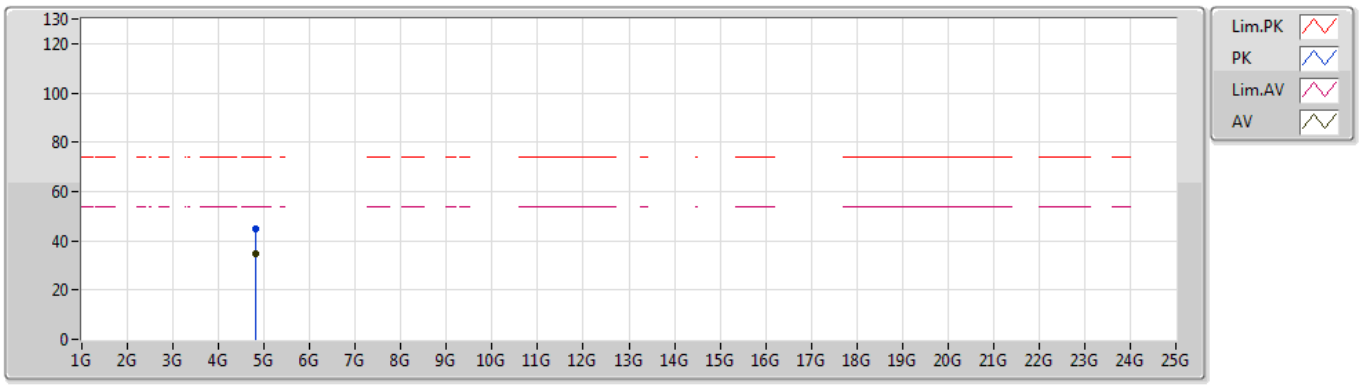
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.388G	55.79	74.00	-18.21	30.79	3	Horizontal	340	1.02	-	25.00
AV	2.376G	44.90	54.00	-9.10	30.75	3	Horizontal	340	1.02	-	14.15
PK	2.402G	95.99	Inf	-Inf	30.84	3	Horizontal	340	1.02	-	65.15
AV	2.402G	95.02	Inf	-Inf	30.84	3	Horizontal	340	1.02	-	64.18

BT-LE(2Mbps)

2402MHz_TX

22/08/2019



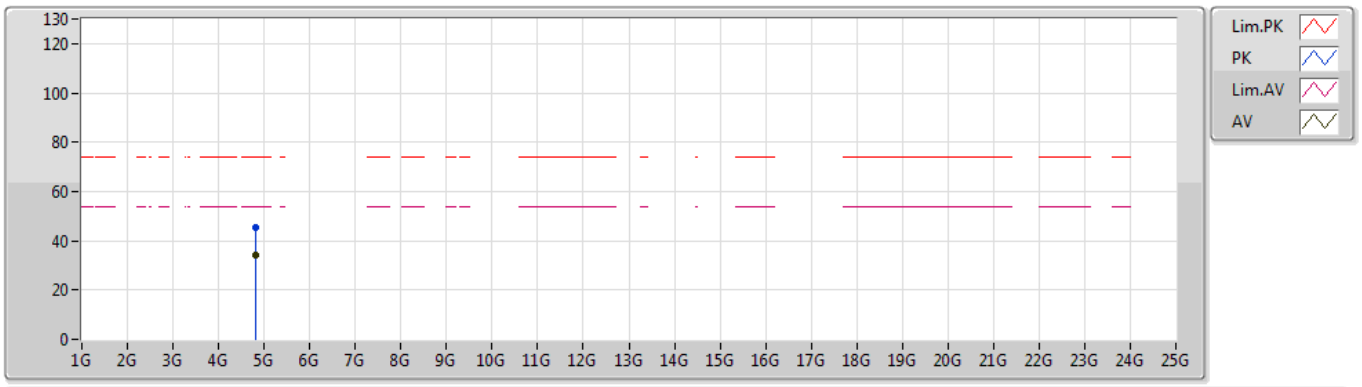
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80178G	45.04	74.00	-28.96	3.49	3	Vertical	218	1.59	-	41.55
AV	4.8019G	34.53	54.00	-19.47	3.49	3	Vertical	218	1.59	-	31.04

BT-LE(2Mbps)

2402MHz_TX

22/08/2019



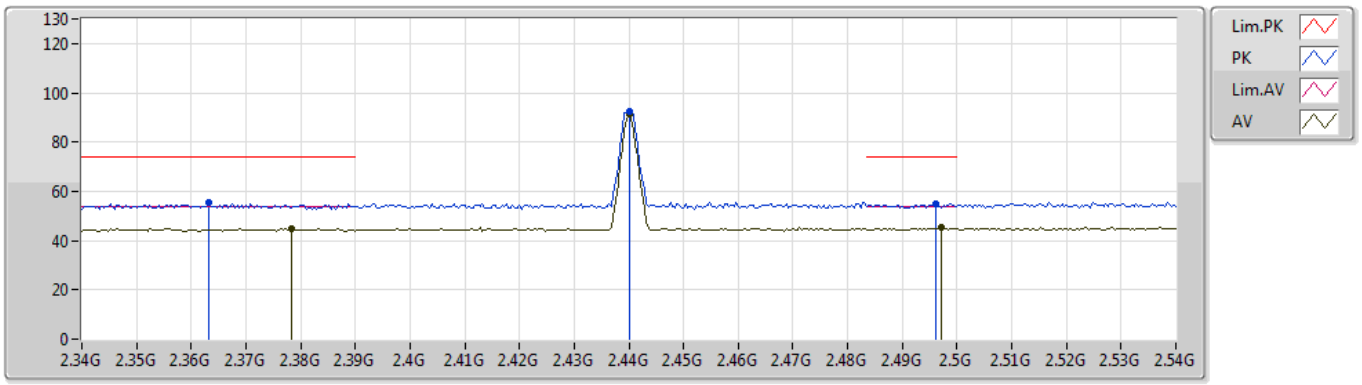
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80048G	45.12	74.00	-28.88	3.48	3	Horizontal	148	1.80	-	41.64
AV	4.80834G	34.27	54.00	-19.73	3.52	3	Horizontal	148	1.80	-	30.75

BT-LE(2Mbps)

2440MHz_TX

22/08/2019



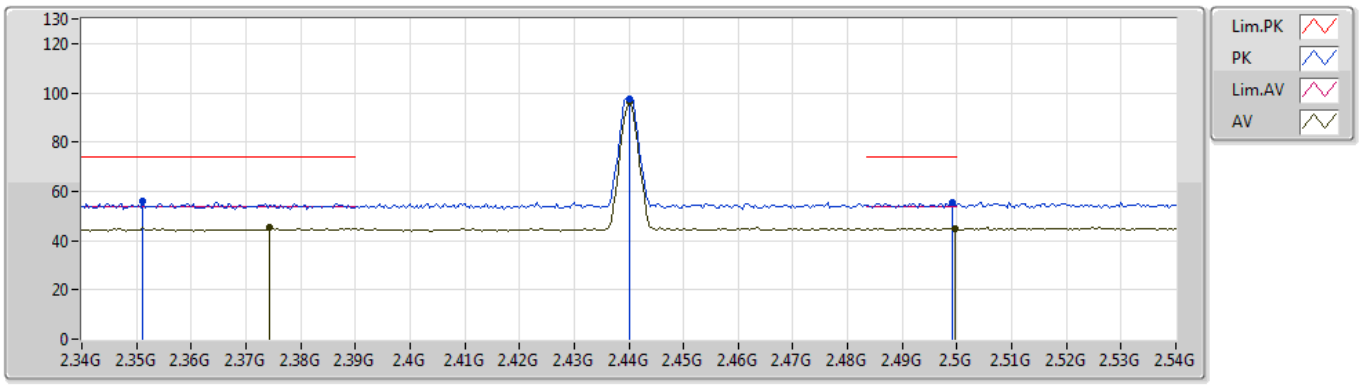
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3632G	55.58	74.00	-18.42	30.70	3	Vertical	149	2.96	-	24.88
AV	2.3784G	45.07	54.00	-8.93	30.76	3	Vertical	149	2.96	-	14.31
PK	2.44G	92.29	Inf	-Inf	30.90	3	Vertical	149	2.96	-	61.39
AV	2.44G	91.51	Inf	-Inf	30.90	3	Vertical	149	2.96	-	60.61
PK	2.496G	54.83	74.00	-19.17	30.99	3	Vertical	149	2.96	-	23.84
AV	2.4972G	45.23	54.00	-8.77	30.99	3	Vertical	149	2.96	-	14.24

BT-LE(2Mbps)

2440MHz_TX

22/08/2019



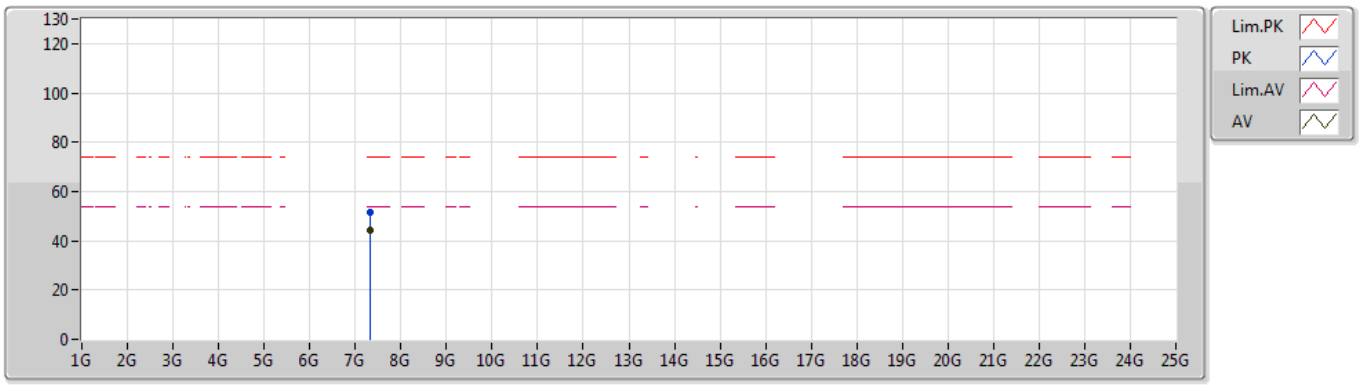
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3512G	55.84	74.00	-18.16	30.65	3	Horizontal	339	1.21	-	25.19
AV	2.3744G	45.32	54.00	-8.68	30.74	3	Horizontal	339	1.21	-	14.58
PK	2.44G	97.47	Inf	-Inf	30.90	3	Horizontal	339	1.21	-	66.57
AV	2.44G	96.60	Inf	-Inf	30.90	3	Horizontal	339	1.21	-	65.70
PK	2.4992G	55.30	74.00	-18.70	30.99	3	Horizontal	339	1.21	-	24.31
AV	2.4996G	45.04	54.00	-8.96	30.99	3	Horizontal	339	1.21	-	14.05

BT-LE(2Mbps)

2440MHz_TX

22/08/2019



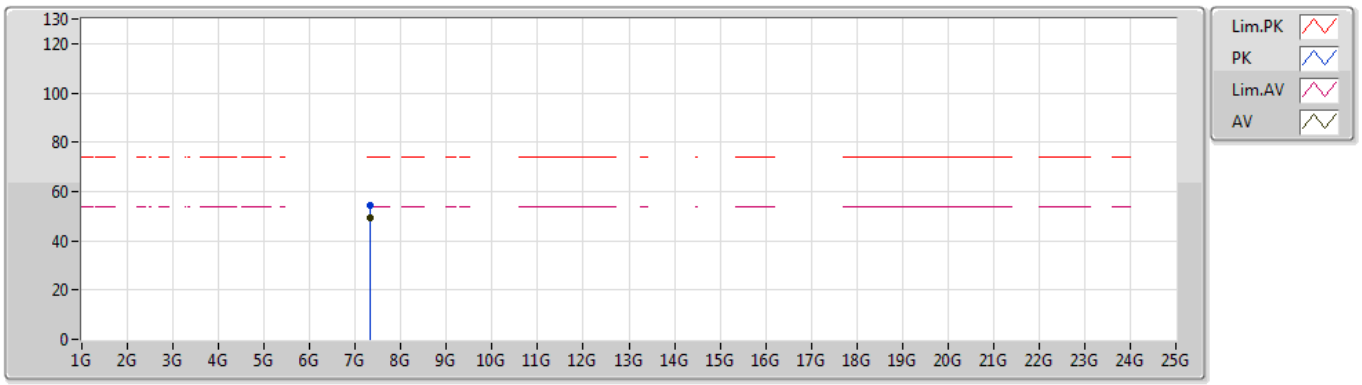
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.32016G	51.42	74.00	-22.58	9.25	3	Vertical	273	2.64	-	42.17
AV	7.3199G	44.20	54.00	-9.80	9.25	3	Vertical	273	2.64	-	34.95

BT-LE(2Mbps)

2440MHz_TX

22/08/2019



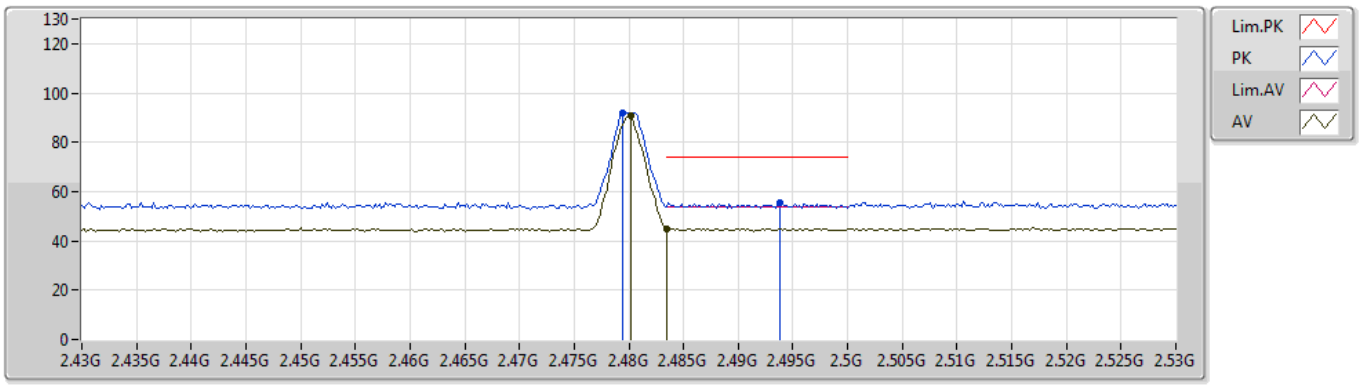
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.31856G	54.26	74.00	-19.74	9.25	3	Horizontal	178	1.01	-	45.01
AV	7.32004G	49.55	54.00	-4.45	9.25	3	Horizontal	178	1.01	-	40.30

BT-LE(2Mbps)

2480MHz_TX

22/08/2019



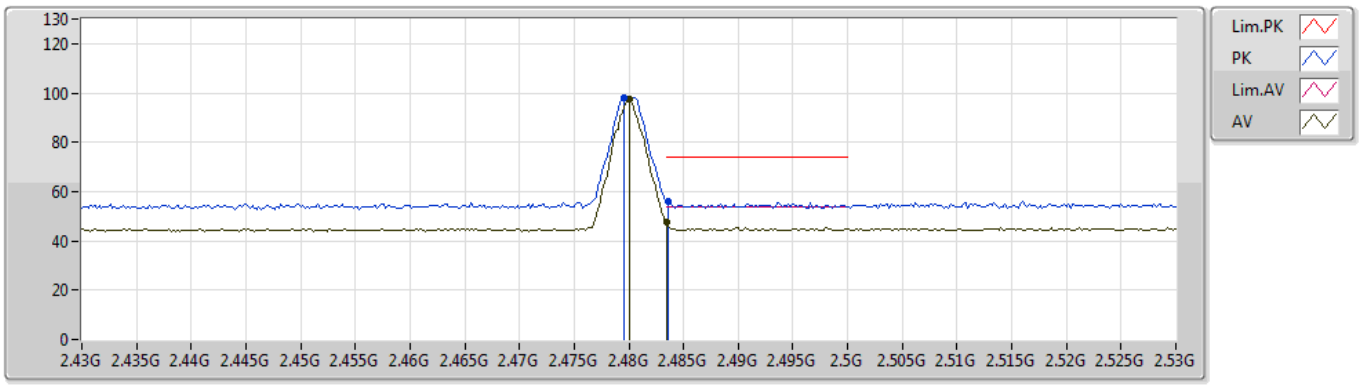
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.4794G	92.10	Inf	-Inf	30.96	3	Vertical	134	2.06	-	61.14
AV	2.4802G	90.60	Inf	-Inf	30.96	3	Vertical	134	2.06	-	59.64
PK	2.4938G	55.45	74.00	-18.55	30.98	3	Vertical	134	2.06	-	24.47
AV	2.4835G	45.09	54.00	-8.91	30.96	3	Vertical	134	2.06	-	14.13

BT-LE(2Mbps)

2480MHz_TX

22/08/2019



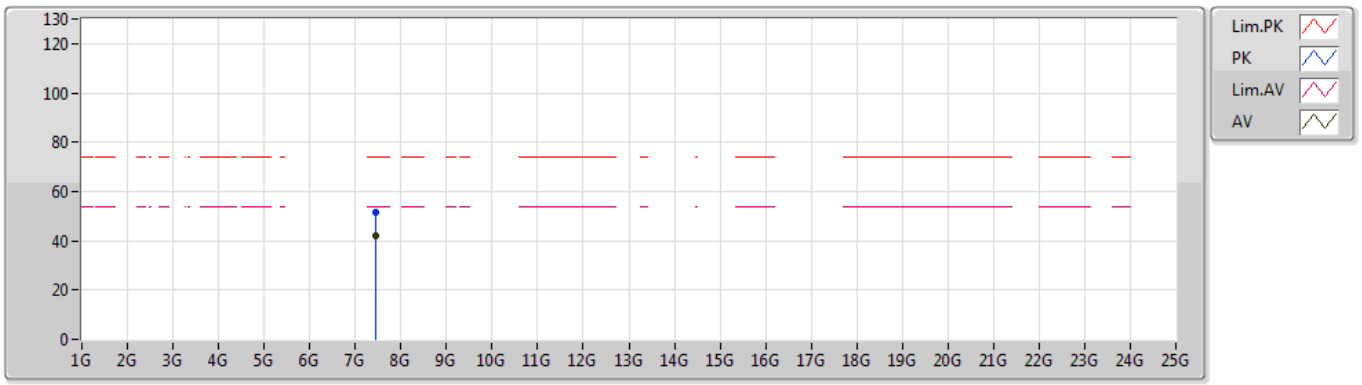
EUT Z_1TX
Setting Default
01-W-3
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.4796G	98.04	Inf	-Inf	30.96	3	Horizontal	345	1.37	-	67.08
AV	2.48G	97.24	Inf	-Inf	30.96	3	Horizontal	345	1.37	-	66.28
PK	2.4836G	55.85	74.00	-18.15	30.96	3	Horizontal	345	1.37	-	24.89
AV	2.4835G	47.71	54.00	-6.29	30.96	3	Horizontal	345	1.37	-	16.75

BT-LE(2Mbps)

2480MHz_TX

22/08/2019



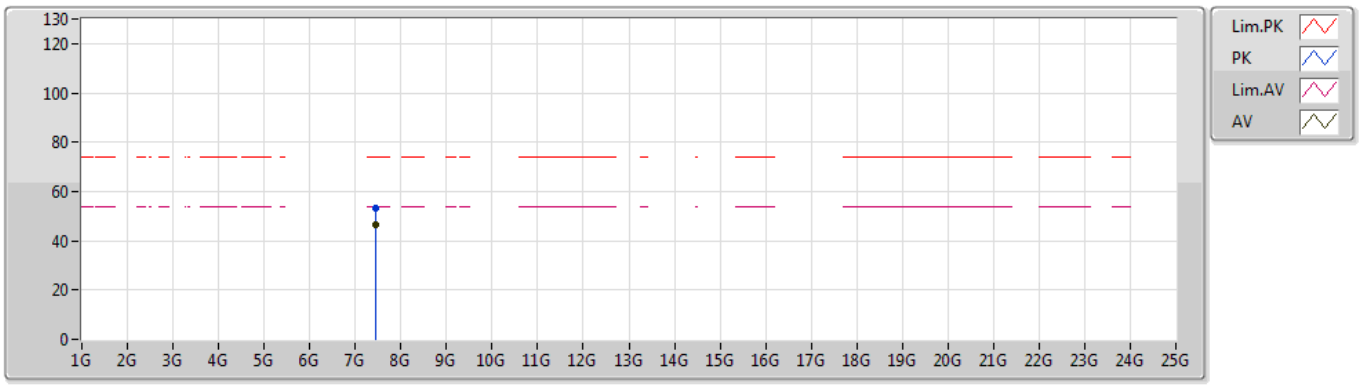
EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.4367G	51.72	74.00	-22.28	9.45	3	Vertical	266	1.50	-	42.27
AV	7.43992G	42.17	54.00	-11.83	9.47	3	Vertical	266	1.50	-	32.70

BT-LE(2Mbps)

2480MHz_TX

22/08/2019



EUT Z_1TX
Setting Default
01-J-5
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	7.4383G	53.01	74.00	-20.99	9.45	3	Horizontal	178	1.01	-	43.56
AV	7.44002G	46.30	54.00	-7.70	9.47	3	Horizontal	178	1.01	-	36.83