FCC RADIO TEST REPORT

FCC ID	:	UIDW31
Equipment	:	Wireless Router
Brand Name	:	ARRIS
Model Name	:	W31, W30
Applicant	:	ARRIS 3871 Lakefield Drive Suite 300,Suwanee, Georgia, 30024 United States
Manufacturer	:	ARRIS 3871 Lakefield Drive Suite 300,Suwanee, Georgia, 30024 United States
Standard	:	47 CFR FCC Part 15.247

The product was received on Sep. 03, 2019, and testing was started from Sep. 26, 2019 and completed on Nov. 09, 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 variant 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.)

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A10_6 Ver1.1

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR842742-05AD	01	Initial issue of report	May 29, 2020

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	15.247(a)	DTS Bandwidth	PASS	-
3.2	15.247(b)	Maximum Conducted Output Power	PASS	-
3.3	15.247(e)	Power Spectral Density	PASS	-
3.4	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.5	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: Emily Chen

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 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.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	PEGATRON	1415-07GT000	Dual band PCB dipole antenna	I-PEX	Note
2	PEGATRON	1415-07GS000	Dual band PCB dipole antenna	I-PEX	
3	PEGATRON	1415-06WH000	Dual band PCB dipole antenna	I-PEX	
4	PEGATRON	1415-07GW000	Dual band PCB dipole antenna	I-PEX	
5	PEGATRON	1415-07GU000	PCB dipole antenna	I-PEX	
6	PEGATRON	1415-07JP000	PCB dipole antenna	I-PEX	
7	PEGATRON	1415-07JN000	PCB dipole antenna	I-PEX	
8	PEGATRON	1415-07GX000	PCB dipole antenna	I-PEX	
9	PEGATRON	1415-07JQ000	PCB antenna	I-PEX	
10	PEGATRON	1415-06MM000	PCB dipole antenna	I-PEX	

Note:

Ant.	Port	Uncorrelated (dBi)			Correlated (dBi)			(dBi)
		2.4GHz	5GHz Band 1~2	5GHz Band 3~4	2.4GHz	5GHz Band 1~2	5GHz Band 3~4	Bluetooth
1	1	4.73	4.35	-	6.55	6.83		-
2	2	4.73	4.35	-	6.55	6.83		-
3	3	4.73	4.35	-	6.55	6.83		-

Ant.	Port	Uncorrelated (dBi)			Correlated (dBi)			(dBi)
		2.4GHz	5GHz Band 1~2	5GHz Band 3~4	2.4GHz	5GHz Band 1~2	5GHz Band 3~4	Bluetooth
1	1	4.73	4.35	-	6.55	6.83		-
4	4	4.73	4.35	-	6.55	6.83		-
5	1	-	-	5.11	-	-	7.15	-
6	2	-	-	5.11	-	-	7.15	-
7	3	-	-	5.11	-	-	7.15	-
8	4	-	-	5.11	-	-	7.15	-
9	1	-	-	-	-	-	-	4.03
10	-	-	5.00	5.00	-	-	-	-

Note 1: The above information was declared by manufacturer.
Note 2: The EUT has ten antennas.

For Radio 1

WLAN 2.4GHz Functions

For IEEE 802.11b/g/n/ac/ax mode (4TX, 4RX):

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

WLAN 5GHz Functions (1RX):

Ant. 10 only supports the antenna receive function.

For Radio 3

WLAN 5GHz Band 1~2 Functions

For IEEE 802.11a/n/ac/ax mode (4TX, 4RX):

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For Radio 2

WLAN 5GHz Band 3~4 Functions

For IEEE 802.11a/n/ac/ax mode (4TX, 4RX):

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For Radio 4

Bluetooth Functions (1TX, 1RX):

Only Port 1 could transmit/receive simultaneously.

1.1.3 Table for Radio Type

Radio No.	2.4GHz	5GHz Band 1~2	5GHz Band 3~4	Bluetooth
Radio 1	V	Only RX function	Only RX function	-
Radio 2	-	-	V	-
Radio 3	-	V	-	-
Radio 4	-	-	-	V

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.632	1.993	395.625u	3k
BT-LE(2Mbps)	0.351	4.547	219.375u	10k

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

1.1.5 EUT Operational Condition

EUT Power Type	From Power Adapter			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	Telnet v1.27.2			
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.

1.1.6 Table for EUT Functions

Type of Function	2.4GHz	5GHz Band 1~2	5GHz Band 3~4
Master (AP Router)	V	V	V
Master (Extender)	-	-	V
Bridge (Client without radar detection)	-	-	V
Client without radar detection	-	-	V

1.1.7 Table for Multiple Listing

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

Model Name	Color of Device's Bottom
W31	Matte Black
W30	Silver

From the above models, model name "W30" was selected as representative model for the test and its data was recorded in this report.

1.1.8 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR842742-01AD

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Change the antenna and antenna models (all internal). 2. Changing the antenna location: antenna 2/5/6/7/8/9/10. For the detail antenna information please refer to the section 1.1.2.	1. DTS Bandwidth 2. Maximum Conducted Output Power 3. Power Spectral Density 4. Emissions in Non-restricted Frequency Bands 5. Emissions in Restricted Frequency Bands

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

The following reference test guidance is not within the scope of accreditation of TAF.

- 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	Owen Hsu	24.7~25.9°C / 59~64%	Sep. 26, 2019~ Nov. 09, 2019
Radiated below 1GHz	03CH05-CB	KJ Chang	23.9~24.7°C / 57~59%	Oct. 17, 2019~ Oct. 29, 2019
Radiated Above 1GHz	03CH05-CB	KJ Chang	23.8~25.7°C / 55~58%	Oct. 17, 2019~ Oct. 29, 2019

Test site Designation No. TW0006 with FCC.
Test site registered number IC 4086D 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
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	Power Setting
BT-LE(1Mbps)	-
2402MHz	default
2440MHz	default
2480MHz	default

Mode	Power Setting
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	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
	There are two adapters (adapter 1 and adapter 2) The worst case was found as Adapter 1 from testing result of previously. So the measurement will follow this same test configuration.
1	EUT - Radio 1 (WLAN 2.4GHz) + Adapter 1
2	EUT - Radio 3 (WLAN 5GHz Band 1~2) + Adapter 1
3	EUT - Radio 2 (WLAN 5GHz Band 3~4) + Adapter 1
4	EUT - Radio 4 (Bluetooth) + Adapter 1
For operating mode 2 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	Radio 1 (WLAN 2.4GHz) + Radio 3 (WLAN 5GHz Band 1~2) + Radio 2 (WLAN 5GHz Band 3~4) + Radio 4 (Bluetooth)
Refer to Sporton Test Report No.: FA842742-05 for Co-location RF Exposure Evaluation.	

Note: The EUT can only be use in Y axis position

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

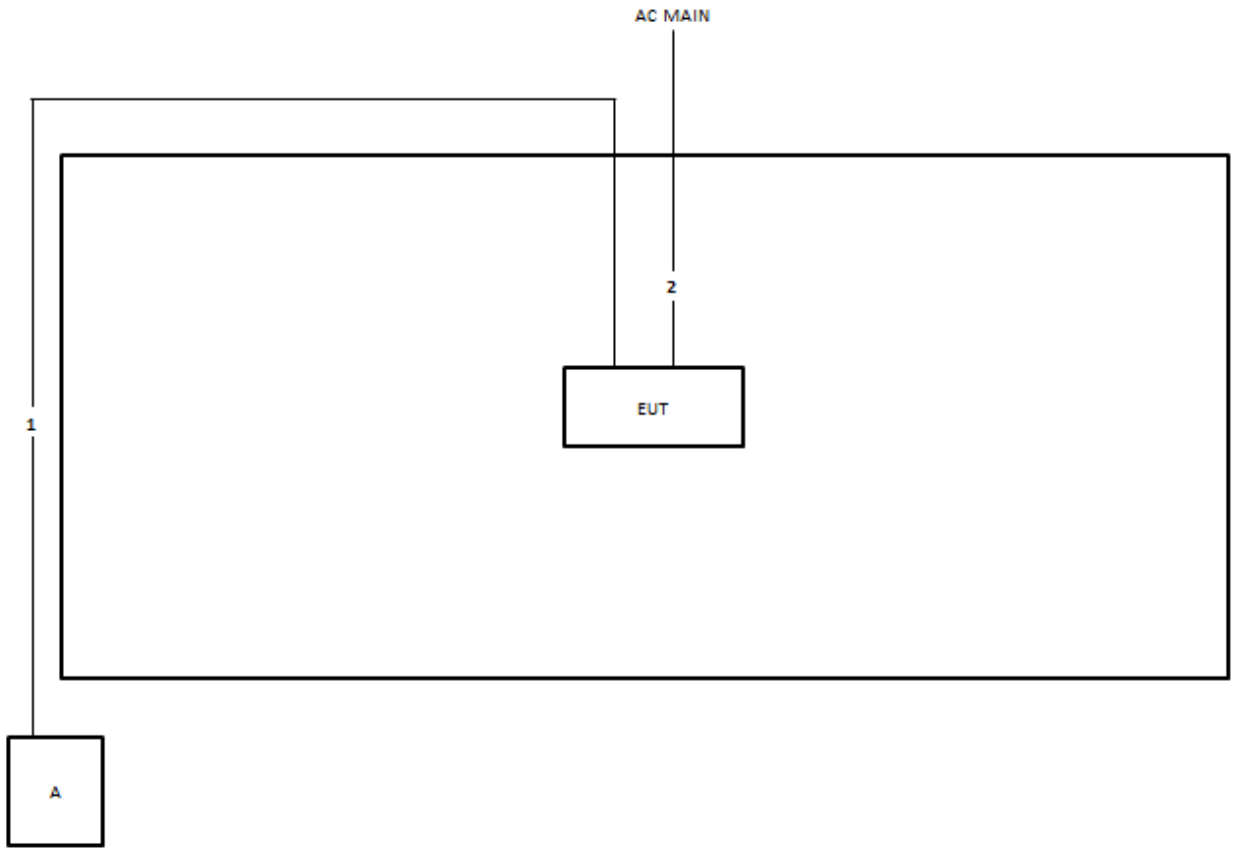
Accessories					
No.	**Equipment Name**	**Brand Name**	**Model Name**	**P/N**	**Rating**
1	Adapter 1	APD	WA-36L12FU	AREP05681	INPUT: 100-120V ~, 60Hz, 0.9A Max OUTPUT: 12V, 3A
2	Adapter 2	NetBit	NBS42D120 350VU	AREP05751	INPUT: 100-120V ~, 50/60Hz, 1.0A OUTPUT: 12.0V, 3.5A

2.5 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A

2.6 Test Setup Diagram

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.8m

3 Transmitter Test Result

3.1 DTS Bandwidth

3.1.1 6dB Bandwidth Limit

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

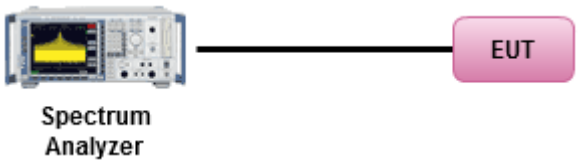
3.1.2 Measuring Instruments

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

3.1.3 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.

3.1.4 Test Setup

Emission Bandwidth


3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 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.		

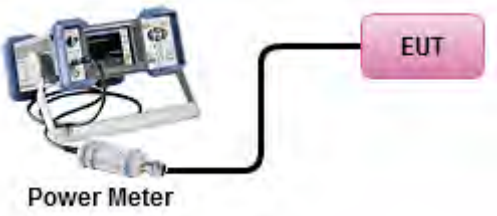
3.2.2 Measuring Instruments

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

3.2.3 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]) $EIRP_{total} = P_{total} + DG$

3.2.4 Test Setup

Maximum Conducted Output Power (Power Meter)


3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Power Spectral Density

3.3.1 Power Spectral Density Limit

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

3.3.2 Measuring Instruments

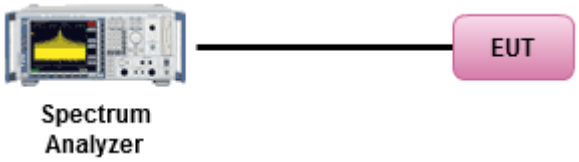
Refer a test equipment and calibration data table in this test report.

3.3.3 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.

3.3.4 Test Setup

Power Spectral Density


3.3.5 Test Result of Power Spectral Density

Refer as Appendix C

3.4 Emissions in Non-restricted Frequency Bands

3.4.1 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.	

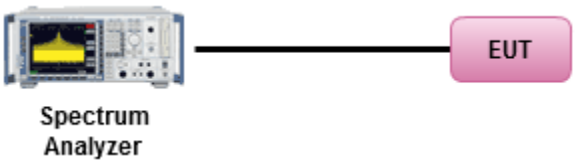
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method
▪ Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands.

3.4.4 Test Setup

Emissions in Non-restricted Frequency Bands


3.4.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

3.5 Emissions in Restricted Frequency Bands

3.5.1 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.

3.5.2 Measuring Instruments

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

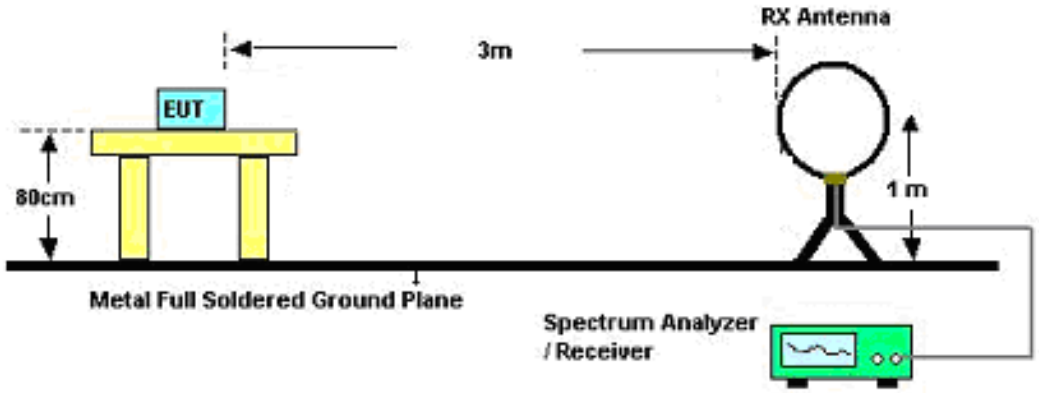
3.5.3 Test Procedures

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.		

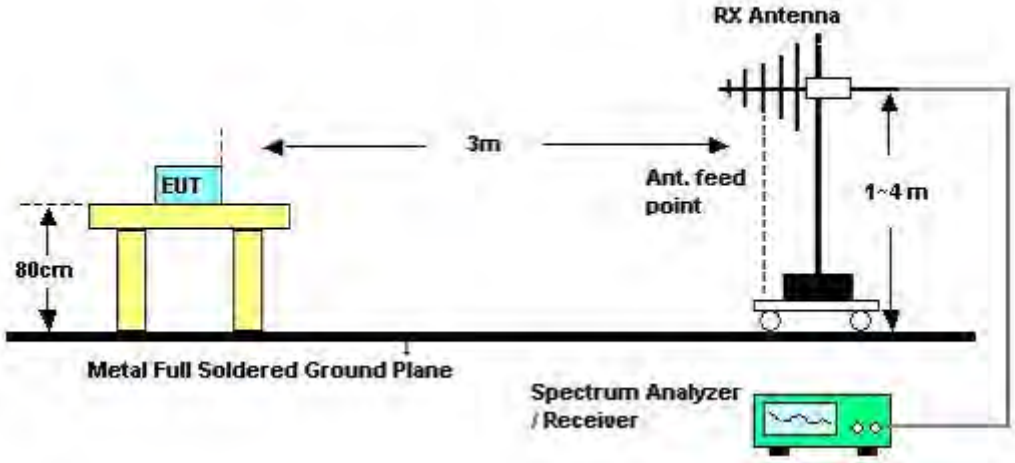
3.5.4 Test Setup

Emissions in Restricted Frequency Bands

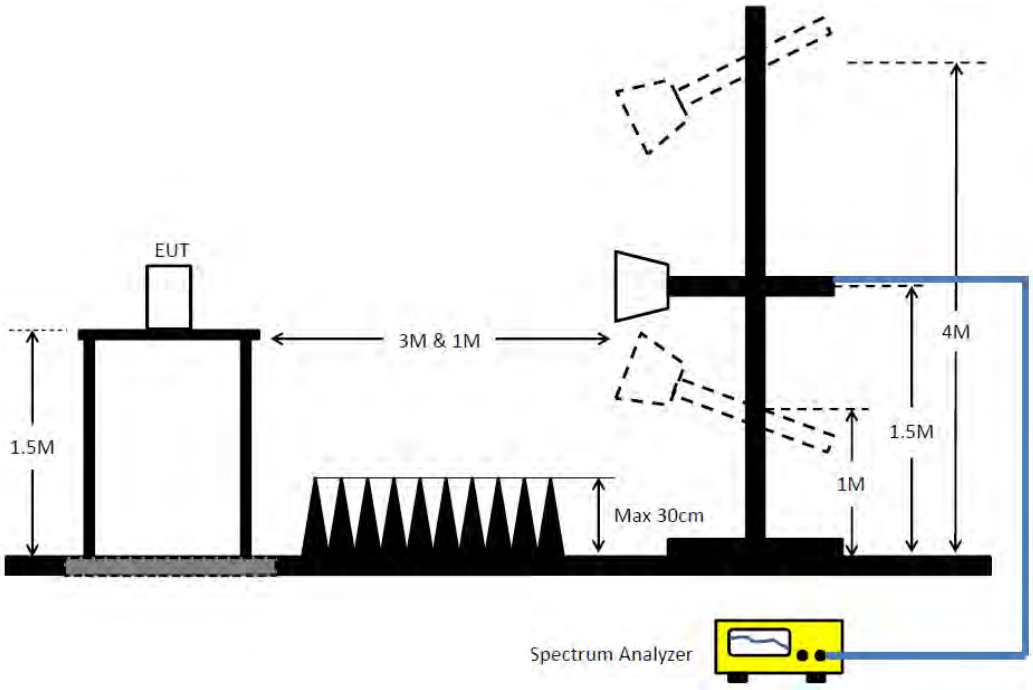
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.5.5 Measurement Results Calculation

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

3.5.6 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.

3.5.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix E

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Bilog Antenna with 6dB Attenuator	TESE & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1291	1GHz~18GHz	Oct. 05, 2019	Oct. 04, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC12630SE	980287	1GHz – 26.5GHz	Apr. 16, 2019	Apr. 15, 2020	Radiation (03CH05-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Aug. 15, 2019	Aug. 14, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-28	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04+28	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jul. 02, 2019	Jul. 01, 2020	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 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-01	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	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-02	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	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)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-3	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	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-04	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	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)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)

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

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)	782.5k	1.107M	1M11F1D	772.5k	1.094M
BT-LE(2Mbps)	1.103M	2.074M	2M07F1D	1.098M	2.066M

Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

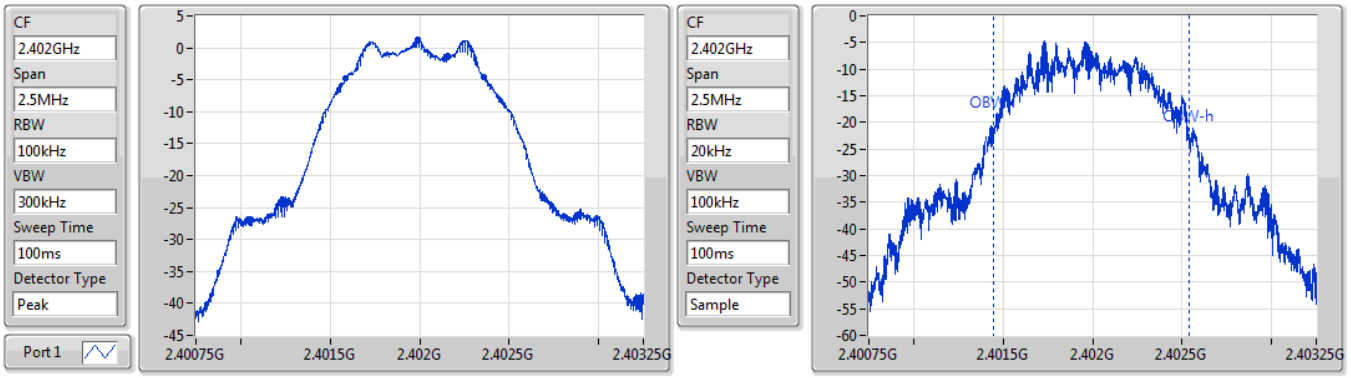
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	772.5k	1.094M
2440MHz	Pass	500k	782.5k	1.107M
2480MHz	Pass	500k	782.5k	1.103M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.103M	2.066M
2440MHz	Pass	500k	1.103M	2.074M
2480MHz	Pass	500k	1.098M	2.069M

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

BT-LE(1Mbps) EBW

2402MHz

28/10/2019

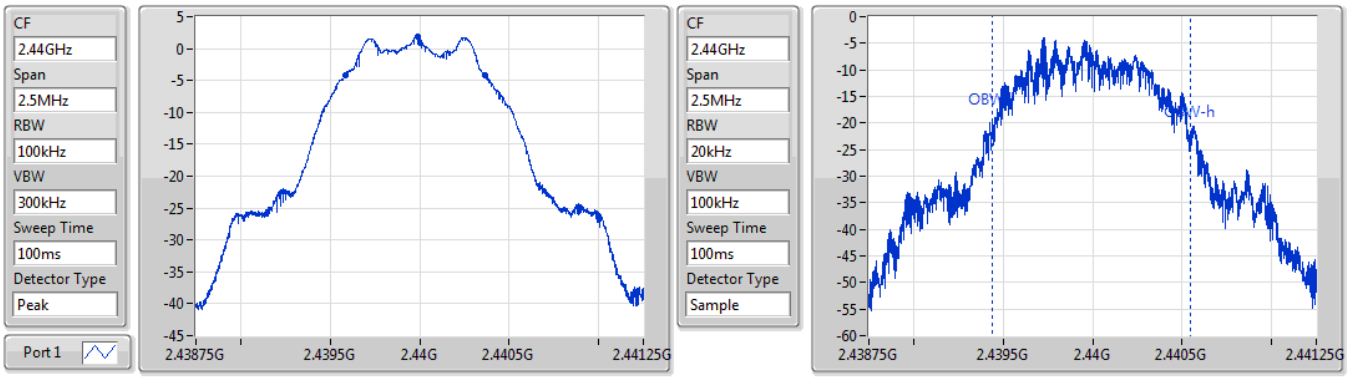


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
772.5k	2.401589G	2.402361G	1.094M	2.401444G	2.402538G	500k	1

BT-LE(1Mbps) EBW

2440MHz

28/10/2019



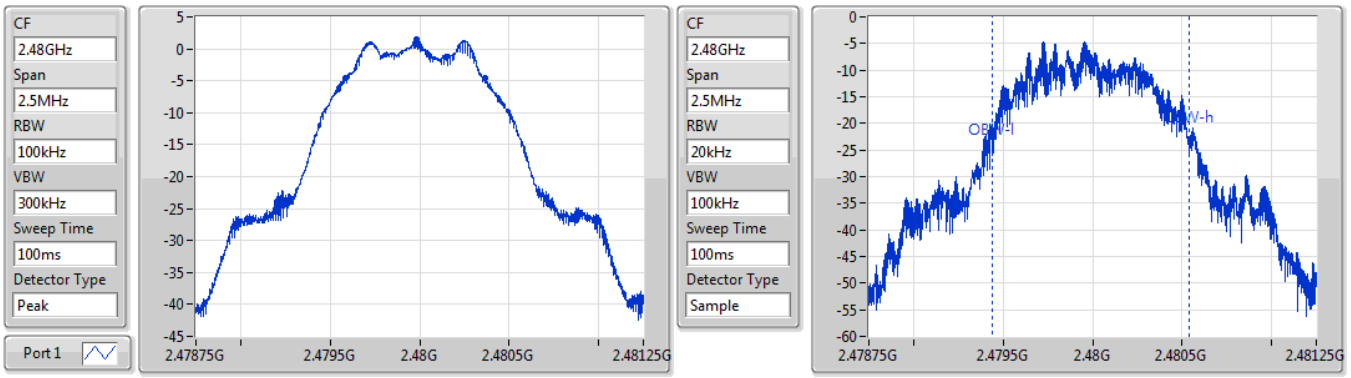
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
782.5k	2.439584G	2.440366G	1.107M	2.439438G	2.440545G	500k	1

BT-LE(1Mbps)

EBW

2480MHz

28/10/2019



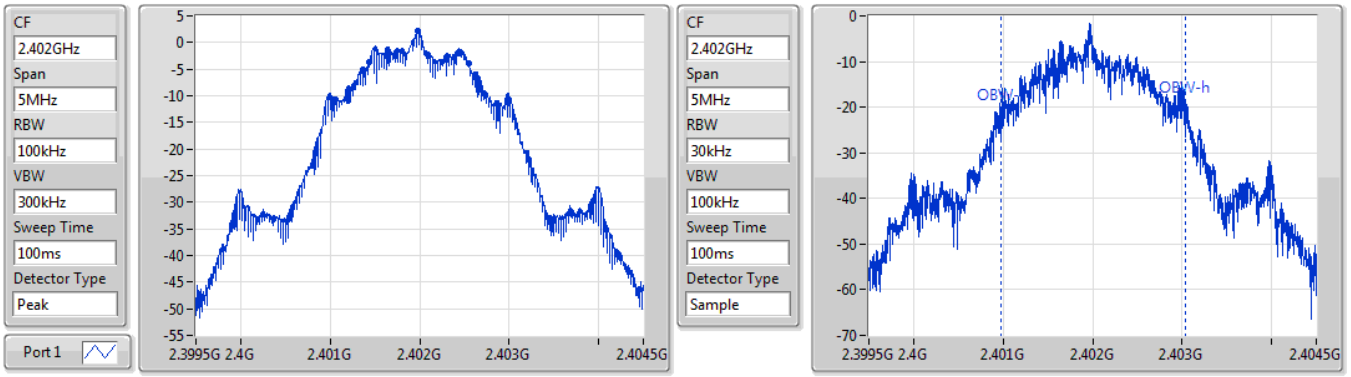
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
782.5k	2.479583G	2.480365G	1.103M	2.479438G	2.480541G	500k	1

BT-LE(2Mbps)

EBW

2402MHz

28/10/2019

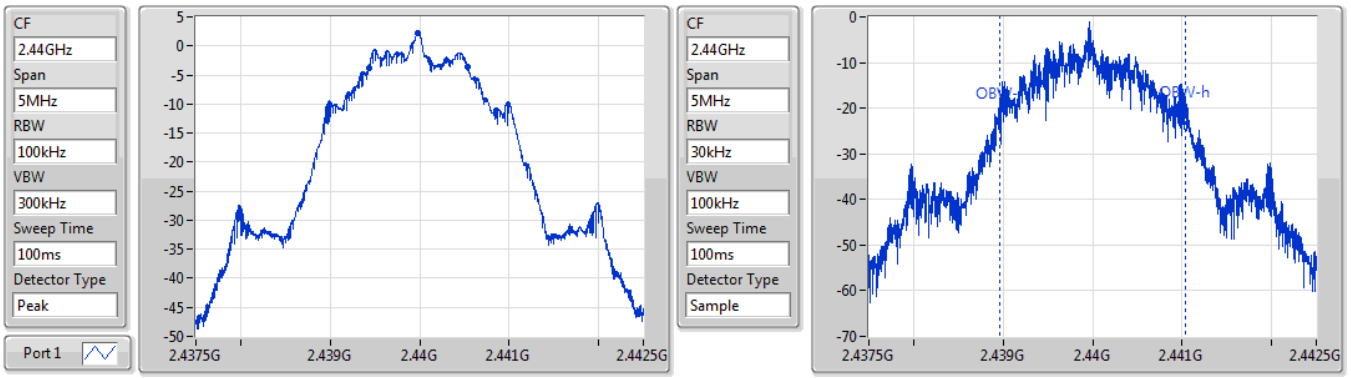


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.103M	2.401443G	2.402545G	2.066M	2.400973G	2.403039G	500k	1

BT-LE(2Mbps) EBW

2440MHz

28/10/2019

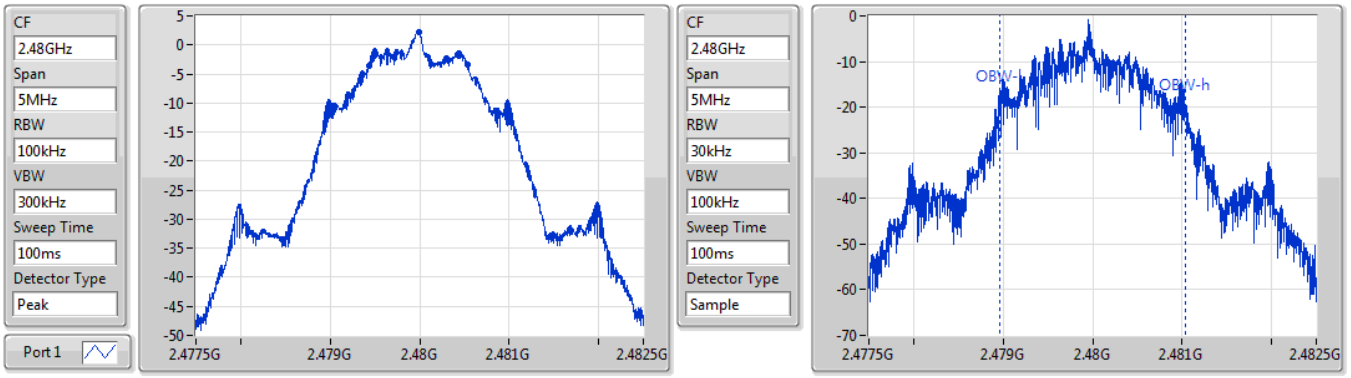


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.103M	2.439438G	2.44054G	2.074M	2.438963G	2.441037G	500k	1

BT-LE(2Mbps) EBW

2480MHz

28/10/2019



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.098M	2.479435G	2.480533G	2.069M	2.478963G	2.481032G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	1.85	0.00153
BT-LE(2Mbps)	1.65	0.00146

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.03	1.35	30.00
2440MHz	Pass	4.03	1.85	30.00
2480MHz	Pass	4.03	1.39	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	4.03	1.57	30.00
2440MHz	Pass	4.03	1.48	30.00
2480MHz	Pass	4.03	1.65	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-12.55
BT-LE(2Mbps)	-14.90

RBW=3 kHz.

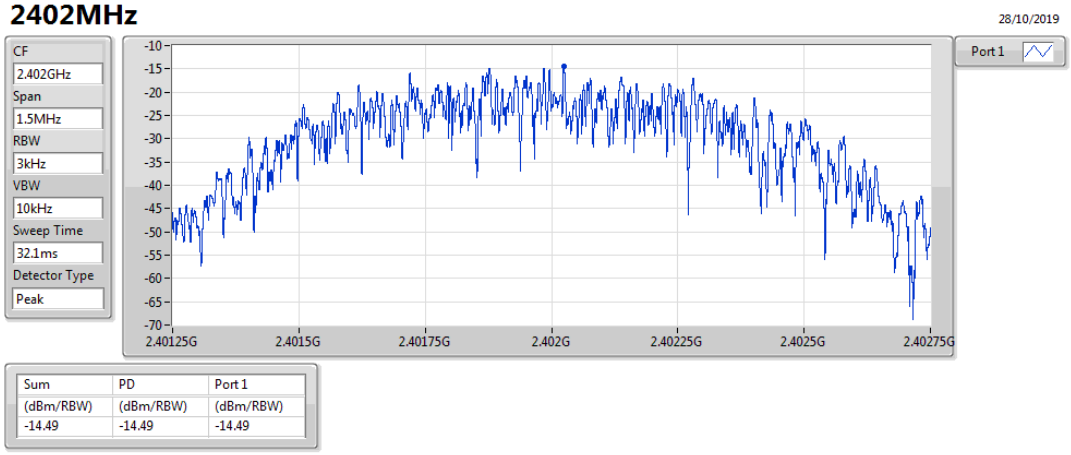
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.03	-14.49	8.00
2440MHz	Pass	4.03	-12.55	8.00
2480MHz	Pass	4.03	-13.20	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	4.03	-14.90	8.00
2440MHz	Pass	4.03	-16.34	8.00
2480MHz	Pass	4.03	-16.56	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**

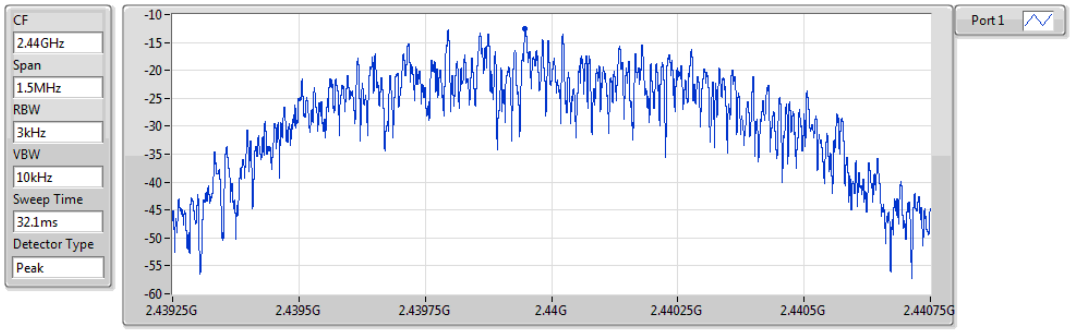
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.49	-14.49	-14.49

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

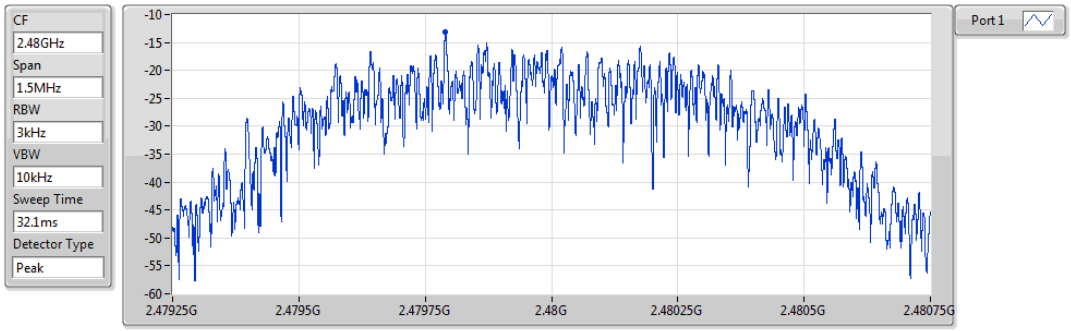
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.55	-12.55	-12.55

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

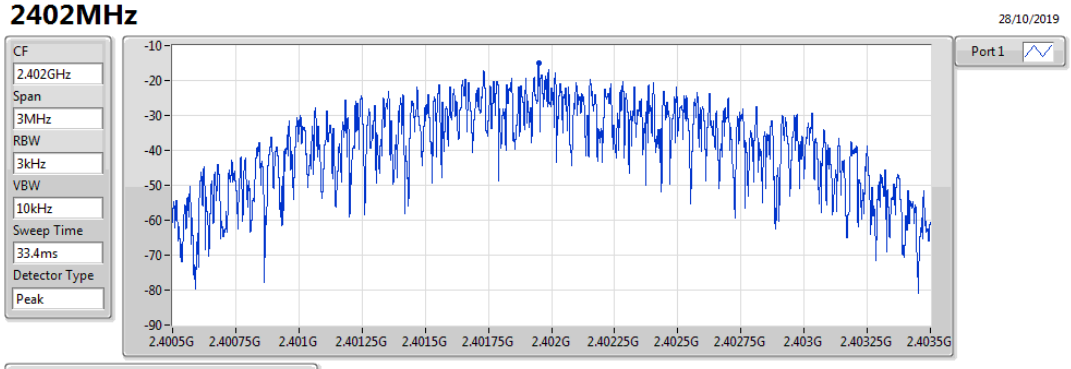
2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-13.20	-13.20	-13.20

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

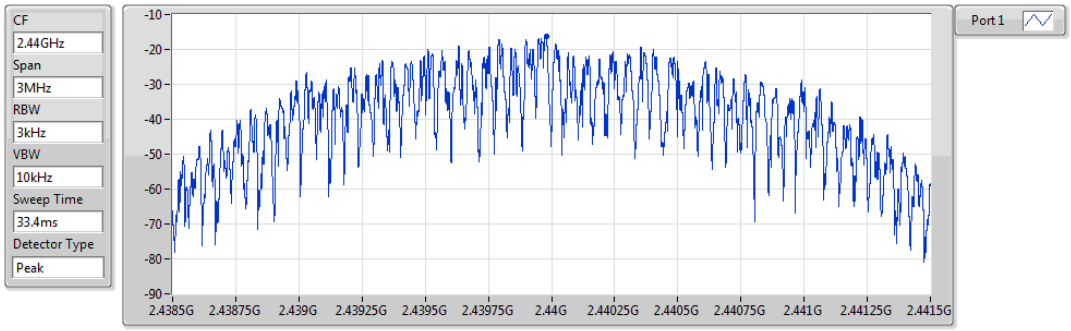
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.90	-14.90	-14.90

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

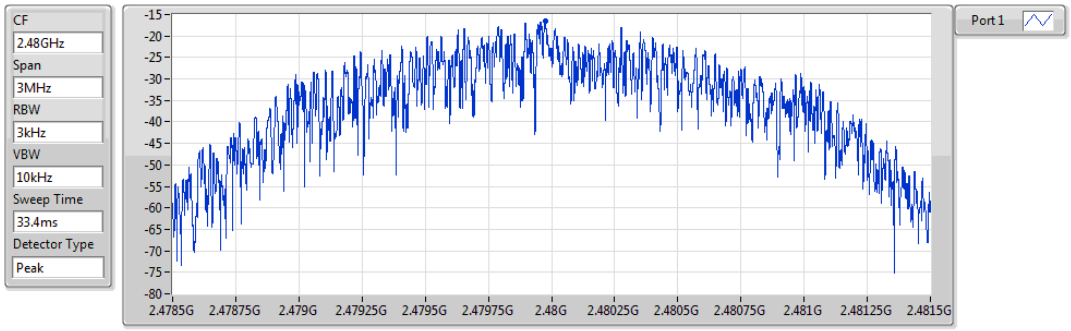
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-16.34	-16.34	-16.34

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

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-16.56	-16.56	-16.56

Summary

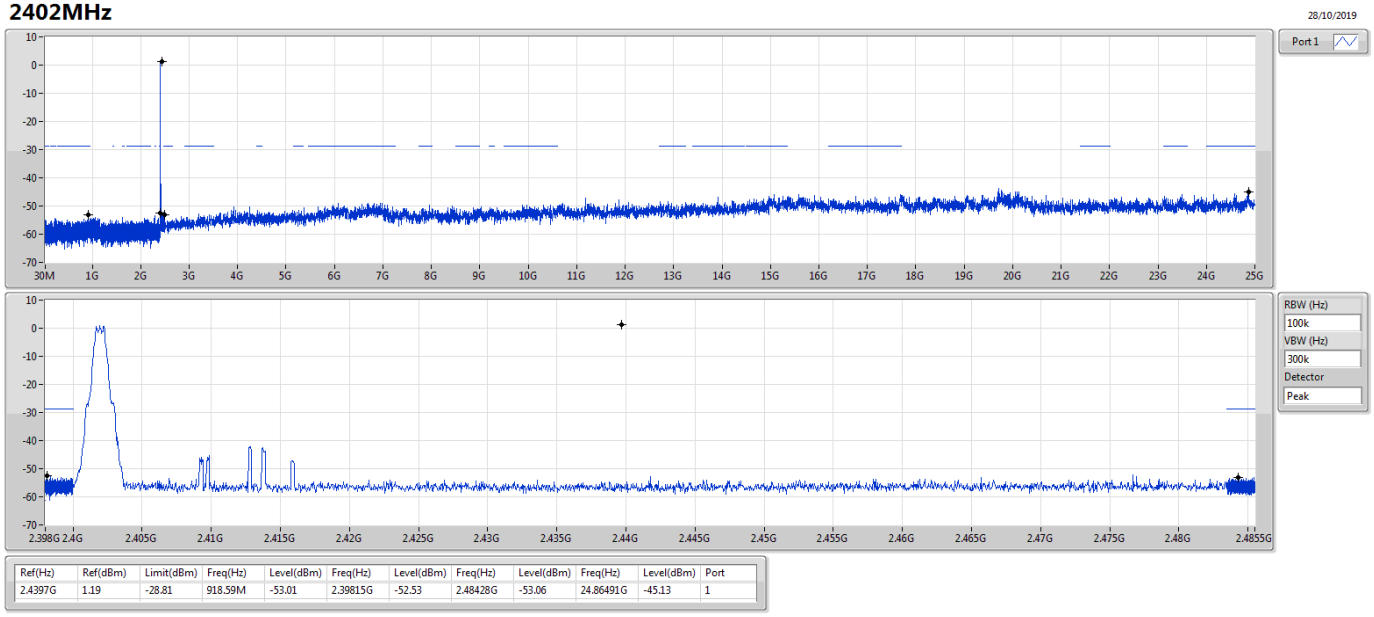
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.4397G	1.19	-28.81	2.06322G	-52.59	2.39826G	-53.09	2.48526G	-53.12	5.50526G	-34.55	1
BT-LE(2Mbps)	Pass	2.47999G	1.95	-28.05	2.11859G	-53.36	2.39998G	-28.09	2.48458G	-52.59	23.54232G	-44.97	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.4397G	1.19	-28.81	918.59M	-53.01	2.39815G	-52.53	2.48428G	-53.06	24.86491G	-45.13	1
2440MHz	Pass	2.4397G	1.19	-28.81	1.80245G	-53.38	2.39937G	-53.00	2.4838G	-52.84	17.4689G	-46.13	1
2480MHz	Pass	2.4397G	1.19	-28.81	2.06322G	-52.59	2.39826G	-53.09	2.48526G	-53.12	5.50526G	-34.55	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.47999G	1.95	-28.05	2.11859G	-53.36	2.39998G	-28.09	2.48458G	-52.59	23.54232G	-44.97	1
2440MHz	Pass	2.47999G	1.95	-28.05	940.32M	-53.99	2.39897G	-53.44	2.48567G	-52.61	24.13045G	-45.29	1
2480MHz	Pass	2.47999G	1.95	-28.05	953.04M	-53.46	2.39749G	-52.75	2.48594G	-52.80	17.69469G	-45.17	1

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

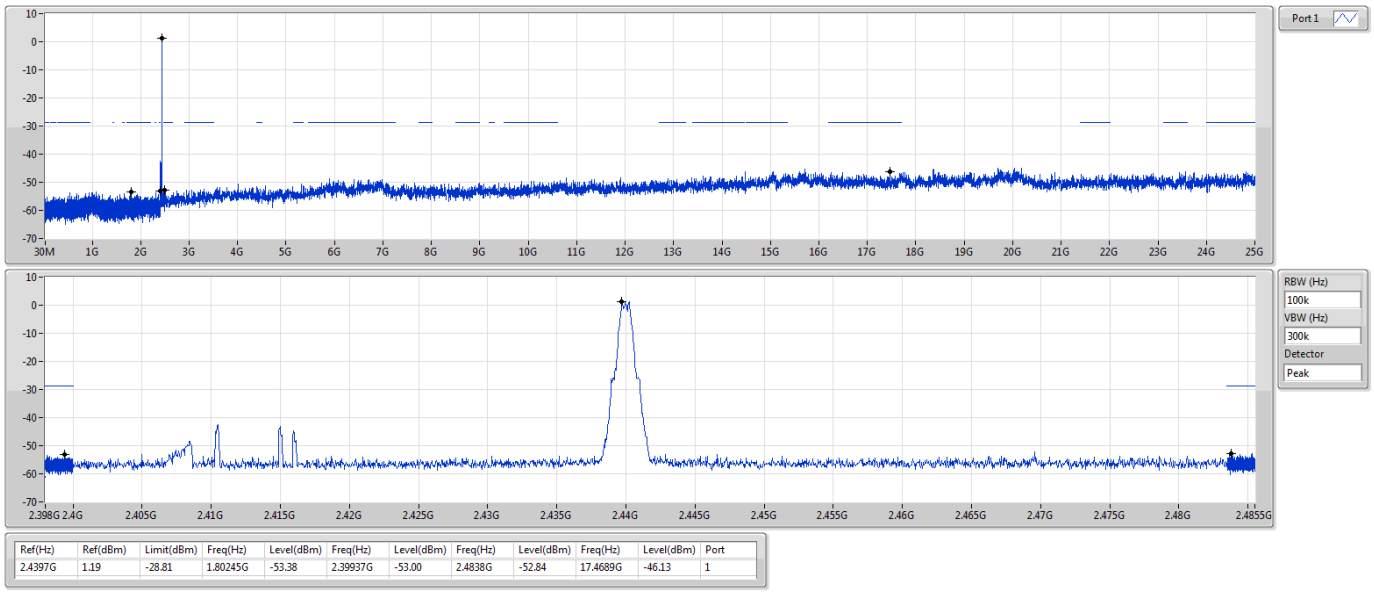
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.4397G	1.19	-28.81	918.59M	-53.01	2.39815G	-52.53	2.48428G	-53.06	24.86491G	-45.13	1

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

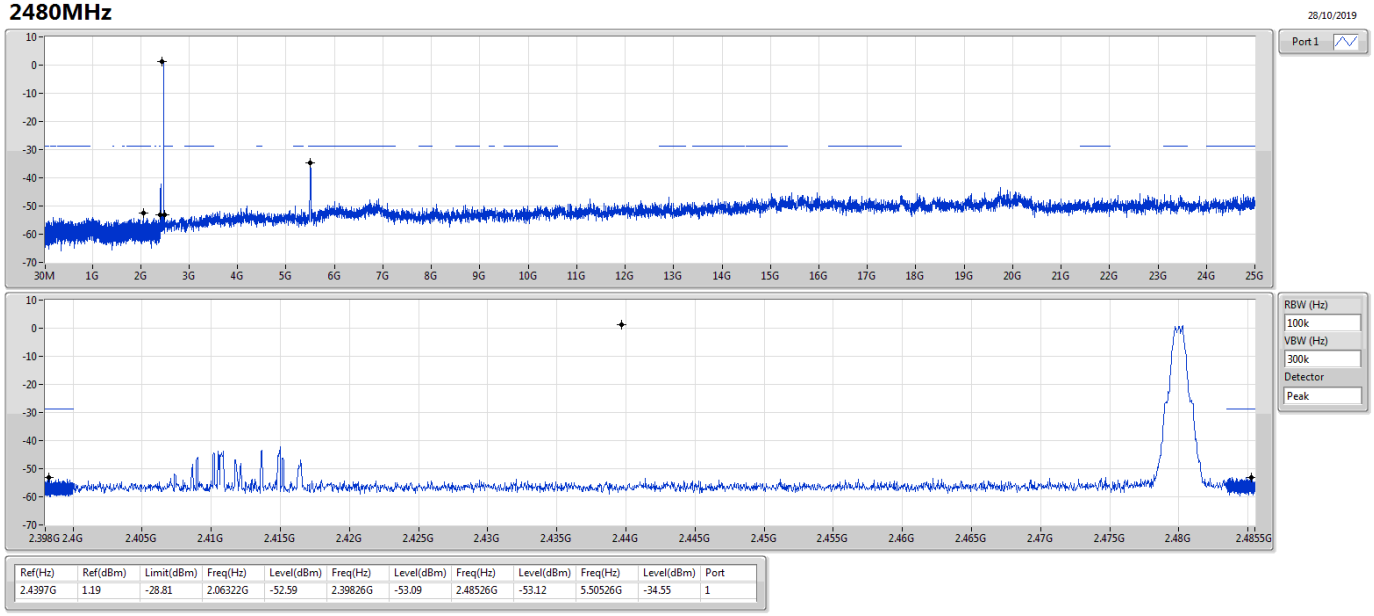
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.4397G	1.19	-28.81	1.80245G	-53.38	2.39937G	-53.00	2.4838G	-52.84	17.4689G	-46.13	1

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

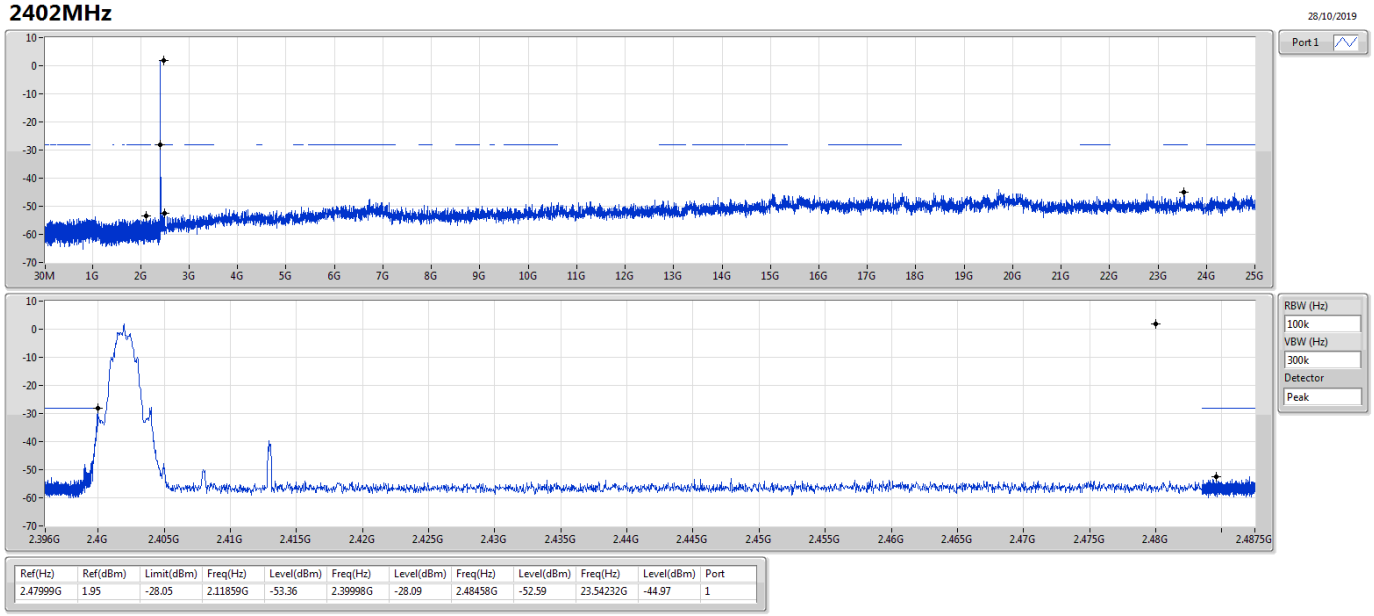
2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.4397G	1.19	-28.81	2.06322G	-52.59	2.39826G	-53.09	2.48526G	-53.12	5.50526G	-34.55	1

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

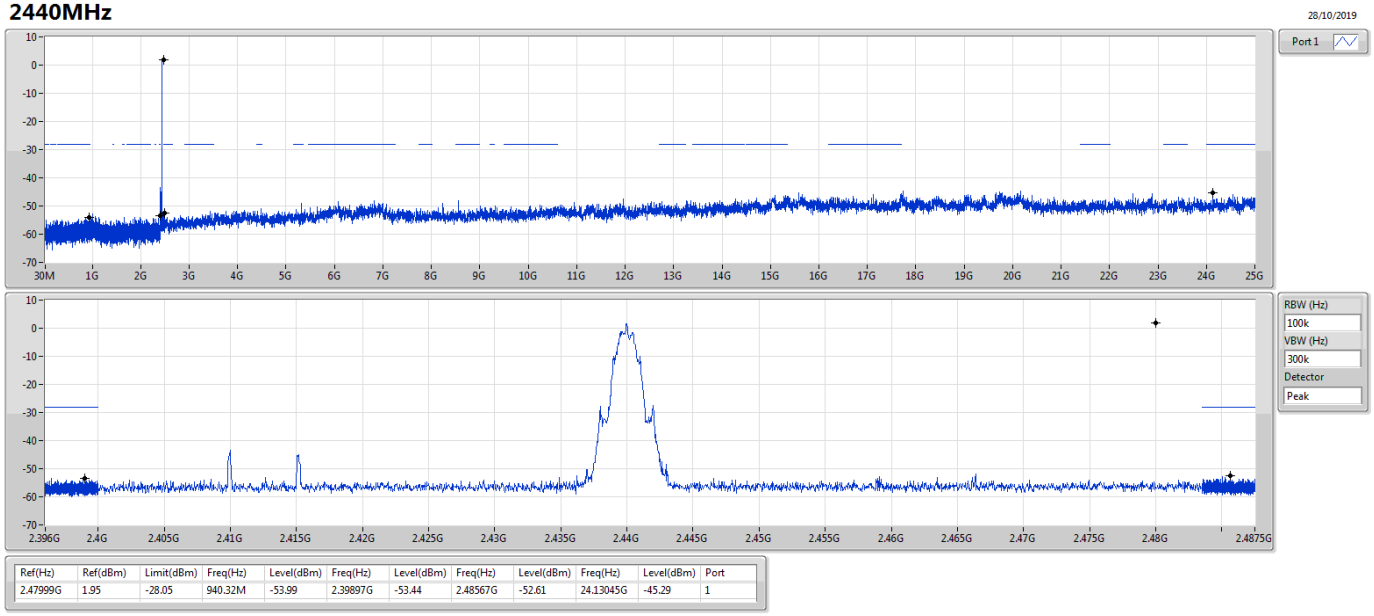
2402MHz



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	1.95	-28.05	2.11859G	-53.36	2.39998G	-28.09	2.48458G	-52.59	23.54232G	-44.97	1

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

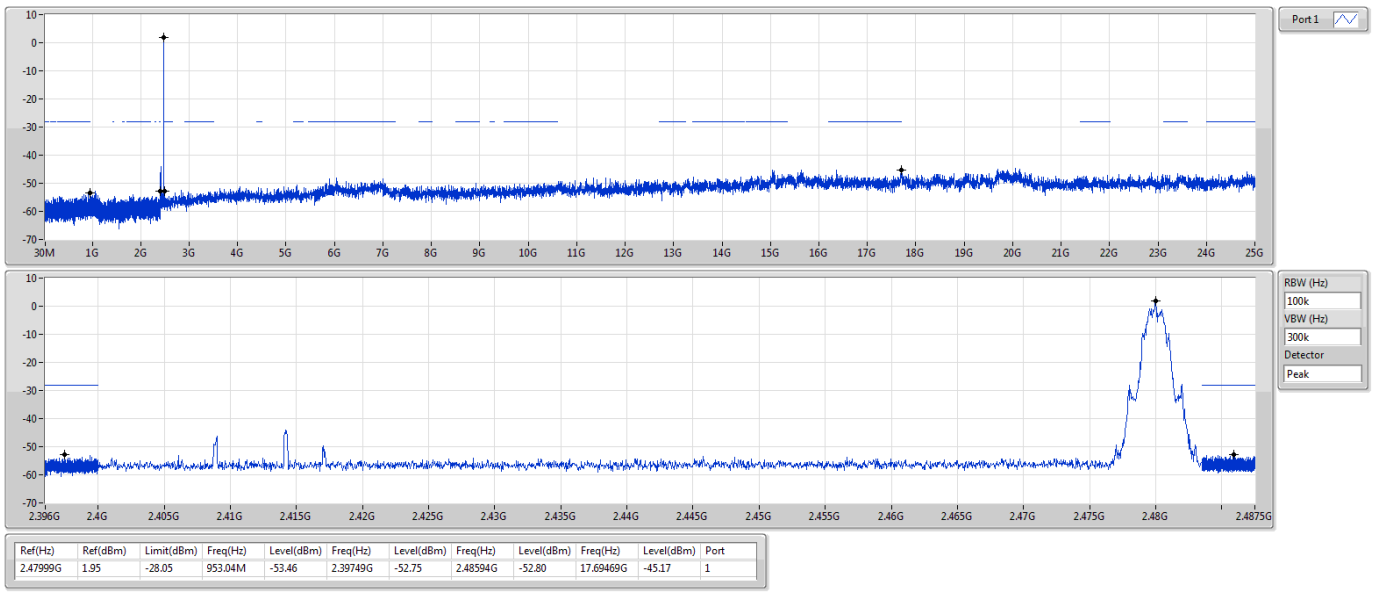
2440MHz



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	1.95	-28.05	940.32M	-53.99	2.39897G	-53.44	2.48567G	-52.61	24.13045G	-45.29	1

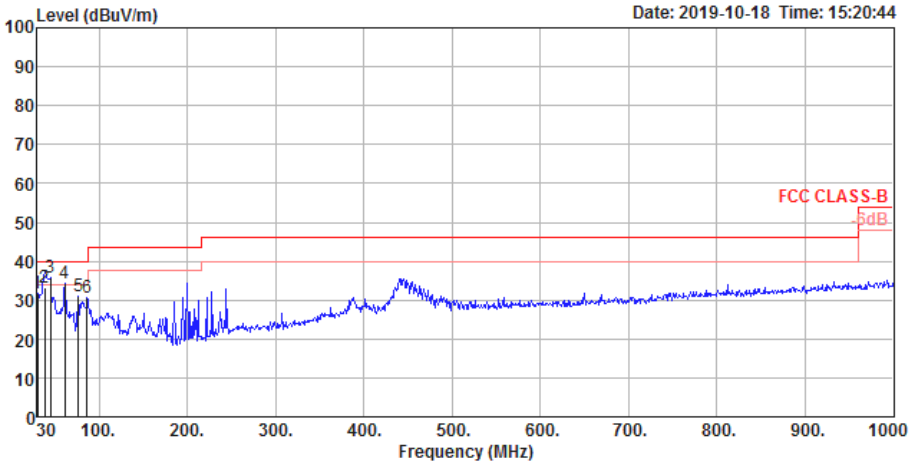
BT-LE(2Mbps) **CSE NdB**

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	1.95	-28.05	953.04M	-53.46	2.39749G	-52.75	2.48594G	-52.80	17.69469G	-45.17	1

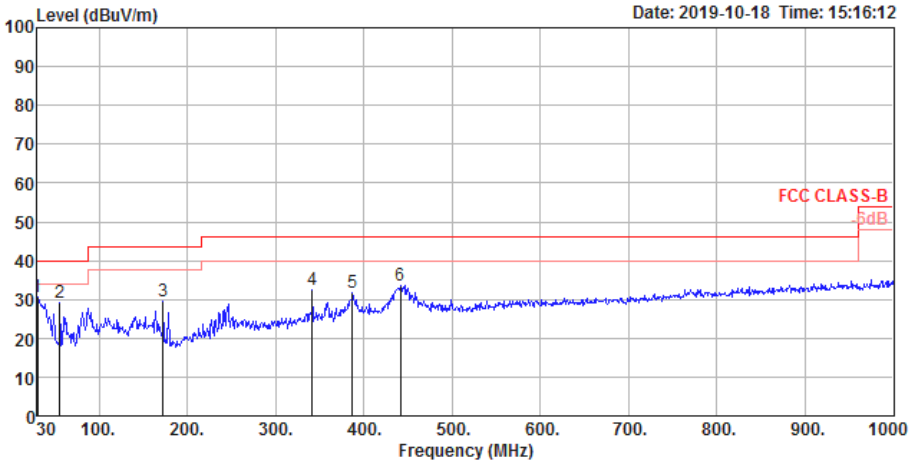
RSE below 1GHz Result			
Operating Mode	2	**Polarization**	Vertical
Operating Function	CTX		



	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	30.00	31.63	40.00	-8.37	36.84	0.67	25.70	31.58	125	312	Peak	VERTICAL
2	38.73	33.10	40.00	-6.90	43.28	0.81	20.51	31.50	100	124	QP	VERTICAL
3	44.55	35.77	40.00	-4.23	49.22	0.89	17.25	31.59	125	265	Peak	VERTICAL
4	61.04	34.33	40.00	-5.67	52.58	1.00	12.60	31.85	100	0	Peak	VERTICAL
5	76.56	31.06	40.00	-8.94	48.73	1.14	13.06	31.87	125	260	Peak	VERTICAL
6	86.26	30.64	40.00	-9.36	46.84	1.16	14.51	31.87	125	265	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	CTX		



	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	30.00	30.80	40.00	-9.20	36.01	0.67	25.70	31.58	125	306	Peak	HORIZONTAL
2	55.22	29.26	40.00	-10.74	46.52	0.92	13.62	31.80	100	224	Peak	HORIZONTAL
3	172.59	29.34	43.50	-14.16	43.71	1.68	15.88	31.93	100	323	Peak	HORIZONTAL
4	341.37	32.35	46.00	-13.65	41.11	2.42	20.95	32.13	300	360	Peak	HORIZONTAL
5	386.96	31.66	46.00	-14.34	39.15	2.53	22.16	32.18	100	204	Peak	HORIZONTAL
6	441.28	33.58	46.00	-12.42	40.18	2.75	22.92	32.27	200	306	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.)

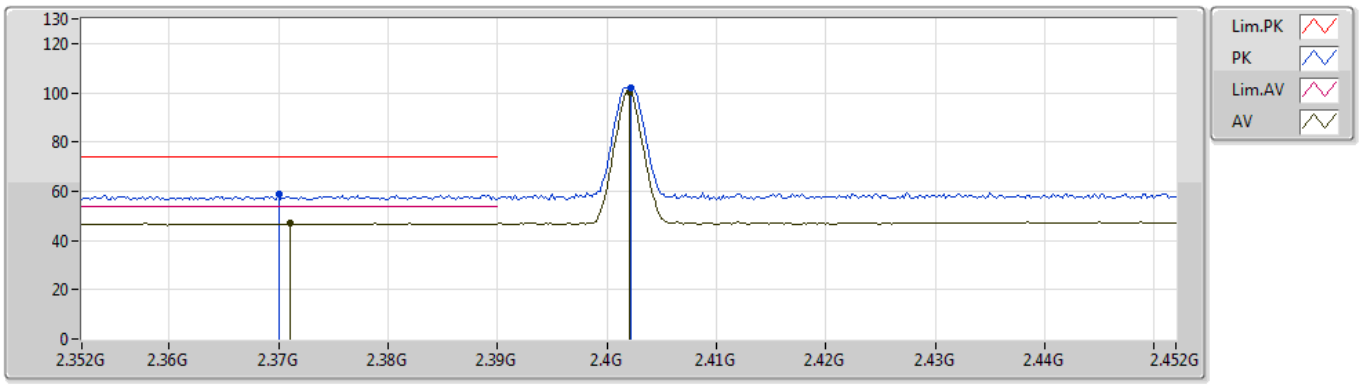
Summary

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	2.4835G	49.15	54.00	-4.85	31.39	3	Vertical	3	1.08	-

BT-LE(1Mbps)

18/10/2019

2402MHz_TX



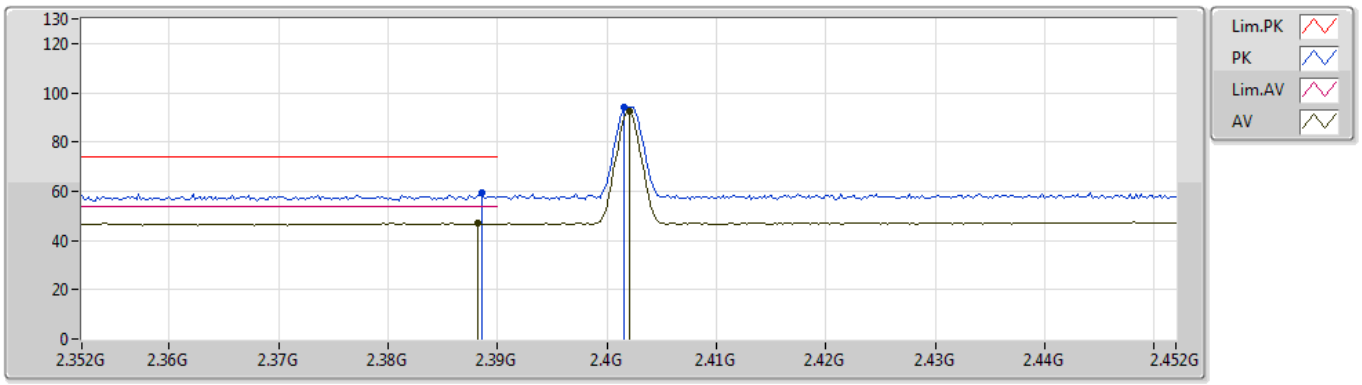
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.37G	58.69	74.00	-15.31	31.16	3	Vertical	49	1.28	-	27.53
AV	2.371G	46.91	54.00	-7.09	31.16	3	Vertical	49	1.28	-	15.75
PK	2.4022G	102.18	Inf	-Inf	31.23	3	Vertical	49	1.28	-	70.95
AV	2.402G	100.56	Inf	-Inf	31.23	3	Vertical	49	1.28	-	69.33

BT-LE(1Mbps)

18/10/2019

2402MHz_TX



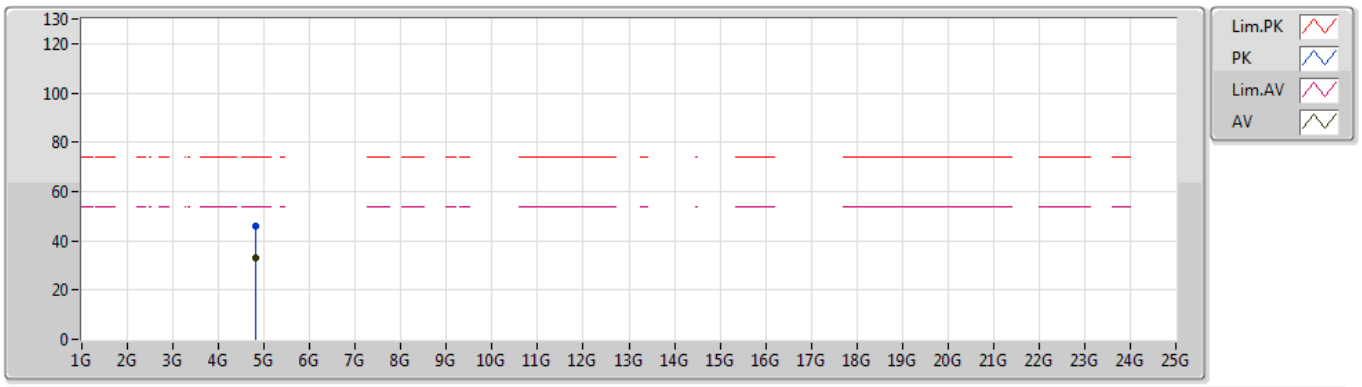
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3886G	59.39	74.00	-14.61	31.20	3	Horizontal	54	3.00	-	28.19
AV	2.3882G	47.00	54.00	-7.00	31.20	3	Horizontal	54	3.00	-	15.80
PK	2.4016G	94.03	Inf	-Inf	31.23	3	Horizontal	54	3.00	-	62.80
AV	2.402G	92.35	Inf	-Inf	31.23	3	Horizontal	54	3.00	-	61.12

BT-LE(1Mbps)

18/10/2019

2402MHz_TX



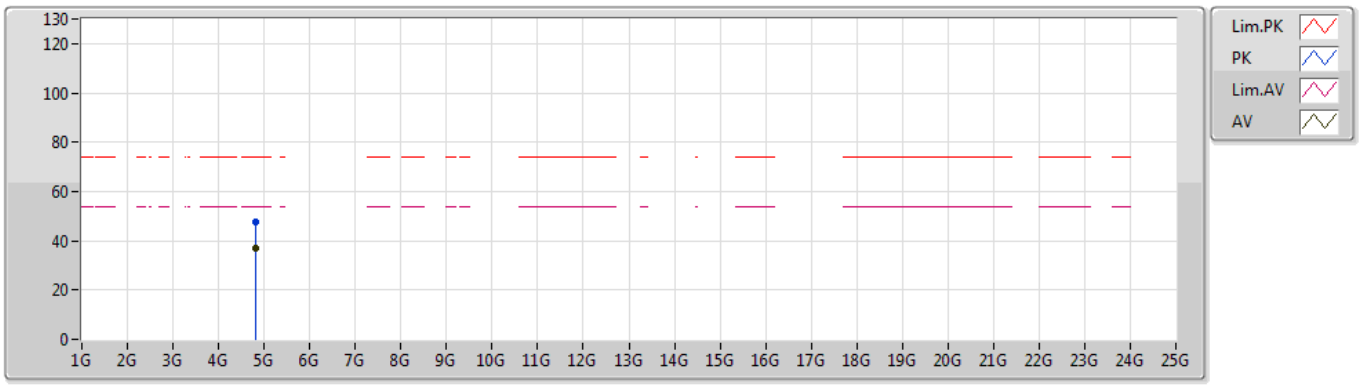
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.8033G	45.76	74.00	-28.24	7.12	3	Vertical	52	1.52	-	38.64
AV	4.80453G	33.34	54.00	-20.66	7.12	3	Vertical	52	1.52	-	26.22

BT-LE(1Mbps)

18/10/2019

2402MHz_TX



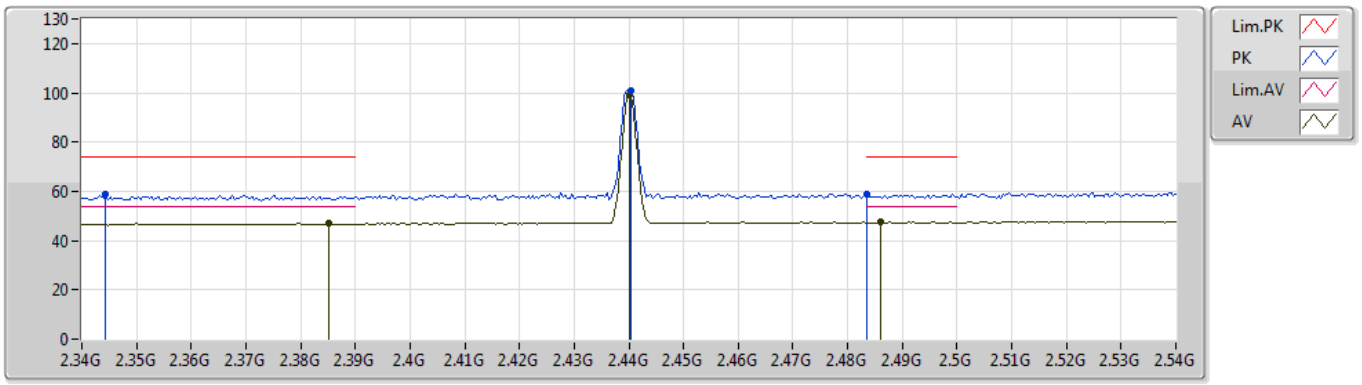
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80457G	47.81	74.00	-26.19	7.12	3	Horizontal	342	1.64	-	40.69
AV	4.80357G	37.13	54.00	-16.87	7.12	3	Horizontal	342	1.64	-	30.01

BT-LE(1Mbps)

18/10/2019

2440MHz_TX



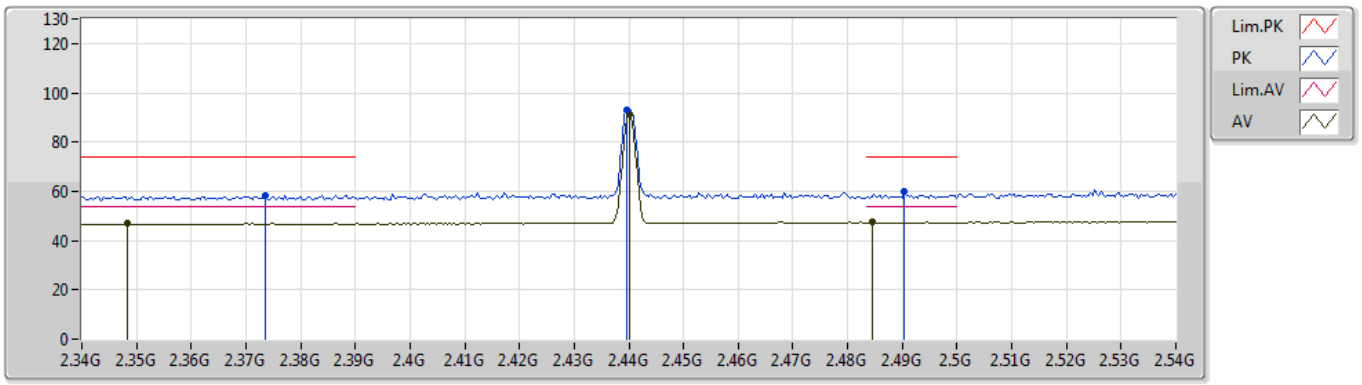
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3444G	58.87	74.00	-15.13	31.09	3	Vertical	38	1.13	-	27.78
AV	2.3852G	46.92	54.00	-7.08	31.19	3	Vertical	38	1.13	-	15.73
PK	2.4404G	101.08	Inf	-Inf	31.31	3	Vertical	38	1.13	-	69.77
AV	2.44G	99.44	Inf	-Inf	31.31	3	Vertical	38	1.13	-	68.13
PK	2.4835G	58.69	74.00	-15.31	31.39	3	Vertical	38	1.13	-	27.30
AV	2.486G	47.63	54.00	-6.37	31.40	3	Vertical	38	1.13	-	16.23

BT-LE(1Mbps)

18/10/2019

2440MHz_TX



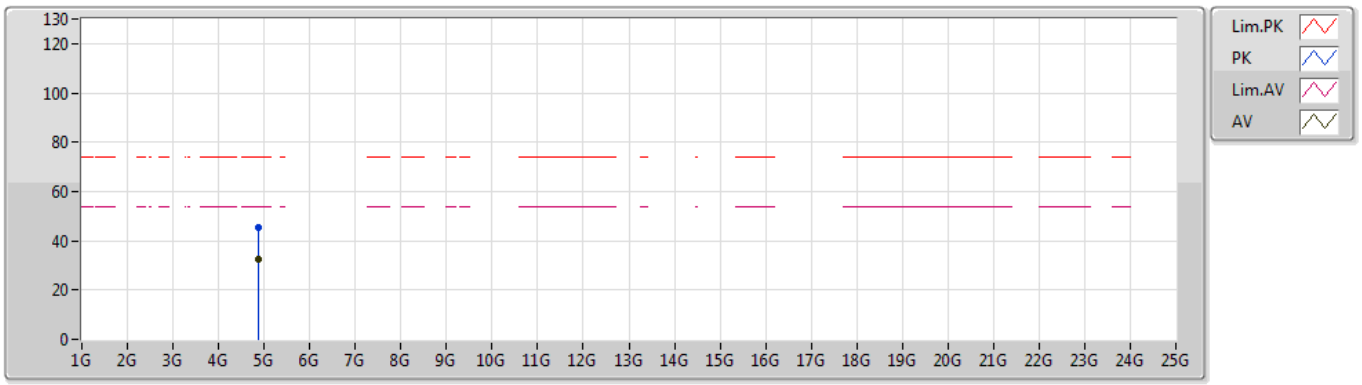
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3736G	58.22	74.00	-15.78	31.16	3	Horizontal	30	2.97	-	27.06
AV	2.3484G	46.92	54.00	-7.08	31.10	3	Horizontal	30	2.97	-	15.82
PK	2.4396G	92.88	Inf	-Inf	31.31	3	Horizontal	30	2.97	-	61.57
AV	2.44G	91.16	Inf	-Inf	31.31	3	Horizontal	30	2.97	-	59.85
PK	2.4904G	59.72	74.00	-14.28	31.41	3	Horizontal	30	2.97	-	28.31
AV	2.4844G	47.43	54.00	-6.57	31.40	3	Horizontal	30	2.97	-	16.03

BT-LE(1Mbps)

18/10/2019

2440MHz_TX



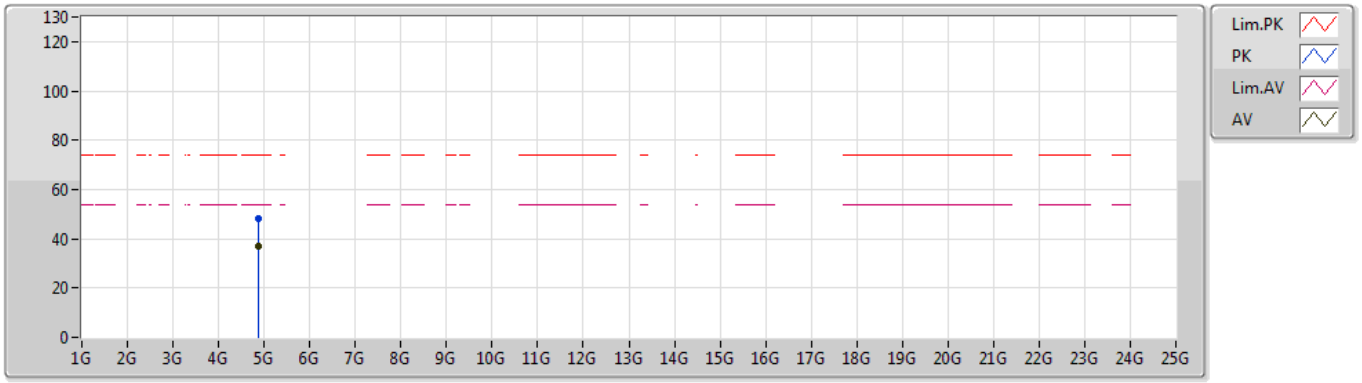
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.88047G	45.58	74.00	-28.42	7.30	3	Vertical	72	1.00	-	38.28
AV	4.87894G	32.66	54.00	-21.34	7.30	3	Vertical	72	1.00	-	25.36

BT-LE(1Mbps)

2440MHz_TX

18/10/2019



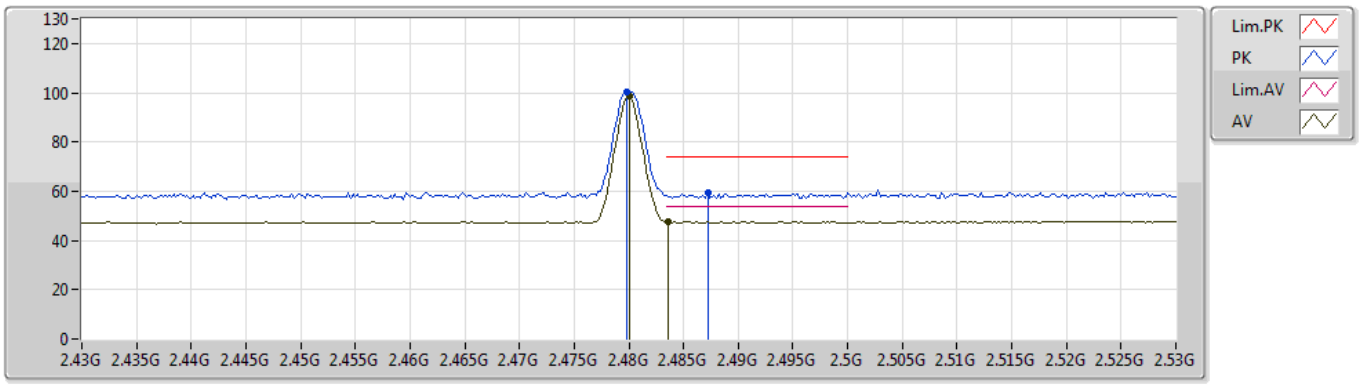
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.88021G	48.20	74.00	-25.80	7.30	3	Horizontal	4	1.58	-	40.90
AV	4.87956G	37.05	54.00	-16.95	7.30	3	Horizontal	4	1.58	-	29.75

BT-LE(1Mbps)

18/10/2019

2480MHz_TX



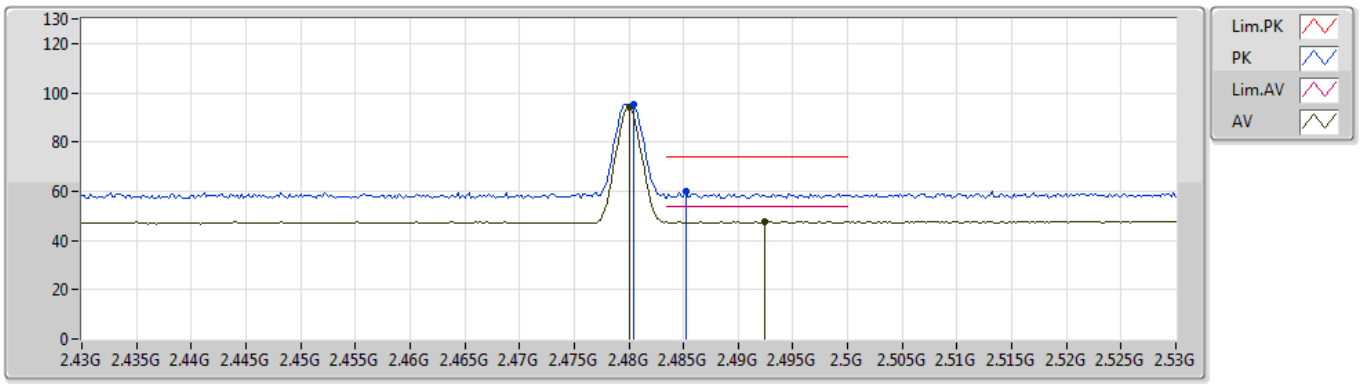
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.4798G	100.05	Inf	-Inf	31.39	3	Vertical	49	1.24	-	68.66
AV	2.48G	98.39	Inf	-Inf	31.39	3	Vertical	49	1.24	-	67.00
PK	2.4872G	59.26	74.00	-14.74	31.40	3	Vertical	49	1.24	-	27.86
AV	2.4836G	47.77	54.00	-6.23	31.39	3	Vertical	49	1.24	-	16.38

BT-LE(1Mbps)

18/10/2019

2480MHz_TX



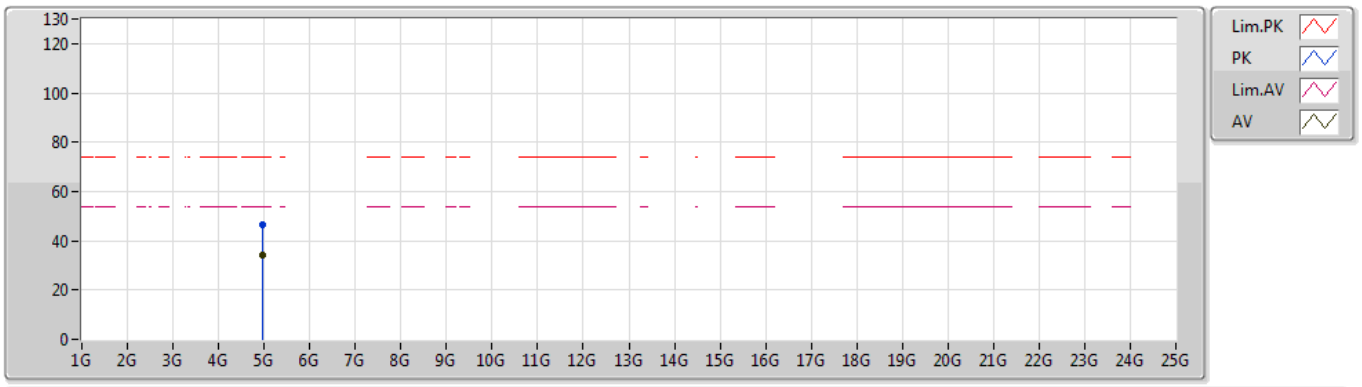
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.4804G	95.49	Inf	-Inf	31.39	3	Horizontal	57	2.07	-	64.10
AV	2.48G	93.86	Inf	-Inf	31.39	3	Horizontal	57	2.07	-	62.47
PK	2.4852G	59.80	74.00	-14.20	31.40	3	Horizontal	57	2.07	-	28.40
AV	2.4924G	47.70	54.00	-6.30	31.42	3	Horizontal	57	2.07	-	16.28

BT-LE(1Mbps)

18/10/2019

2480MHz_TX



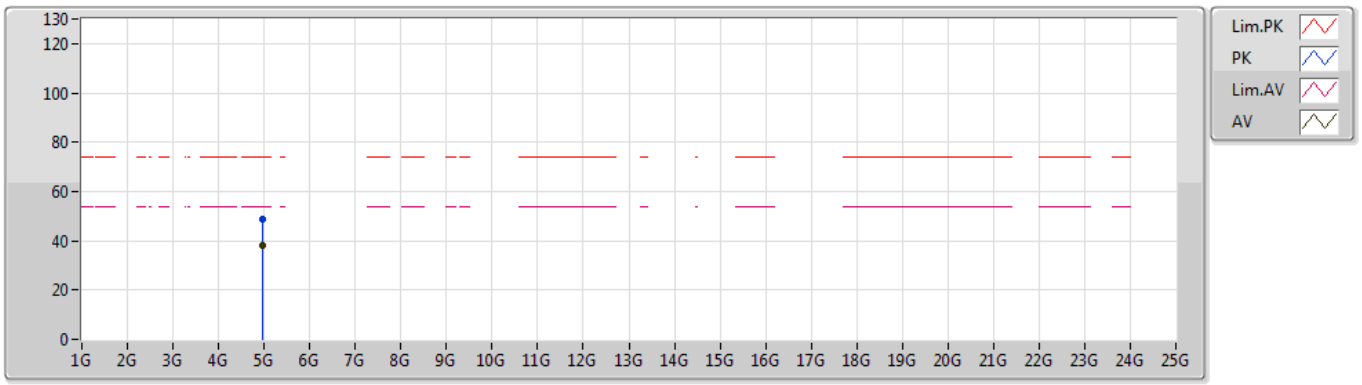
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.96047G	46.40	74.00	-27.60	7.48	3	Vertical	329	2.65	-	38.92
AV	4.9604G	33.95	54.00	-20.05	7.48	3	Vertical	329	2.65	-	26.47

BT-LE(1Mbps)

18/10/2019

2480MHz_TX



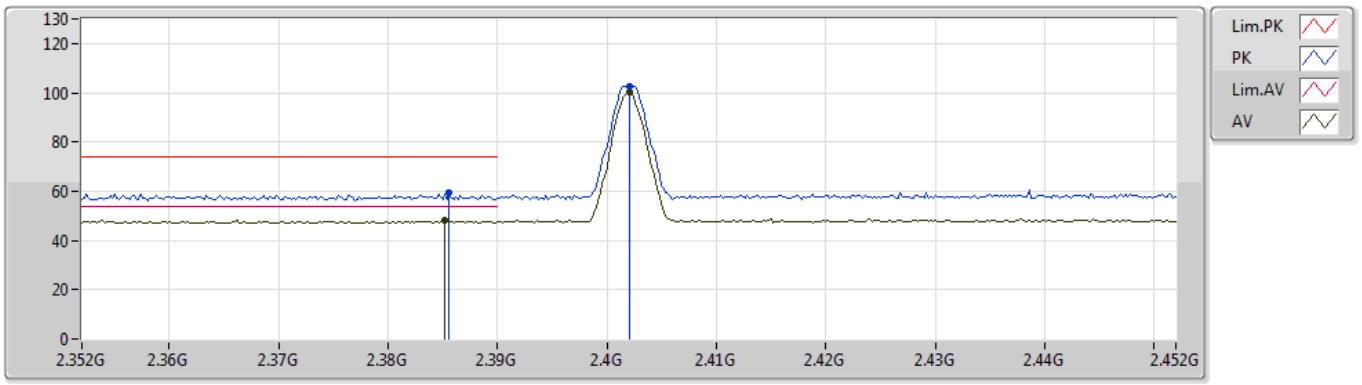
EUT Y_1TX
Setting Default
02-W-3
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.95945G	48.79	74.00	-25.21	7.48	3	Horizontal	6	1.95	-	41.31
AV	4.95958G	38.08	54.00	-15.92	7.48	3	Horizontal	6	1.95	-	30.60

BT-LE(2Mbps)

18/10/2019

2402MHz_TX



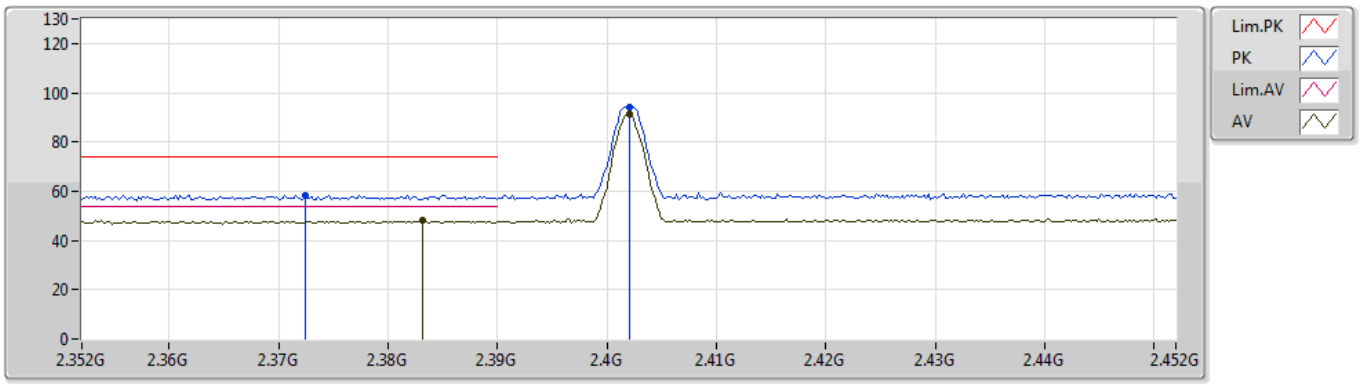
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3856G	59.18	74.00	-14.82	31.19	3	Vertical	36	1.24	-	27.99
AV	2.3852G	47.98	54.00	-6.02	31.19	3	Vertical	36	1.24	-	16.79
PK	2.402G	102.66	Inf	-Inf	31.23	3	Vertical	36	1.24	-	71.43
AV	2.402G	100.14	Inf	-Inf	31.23	3	Vertical	36	1.24	-	68.91

BT-LE(2Mbps)

18/10/2019

2402MHz_TX



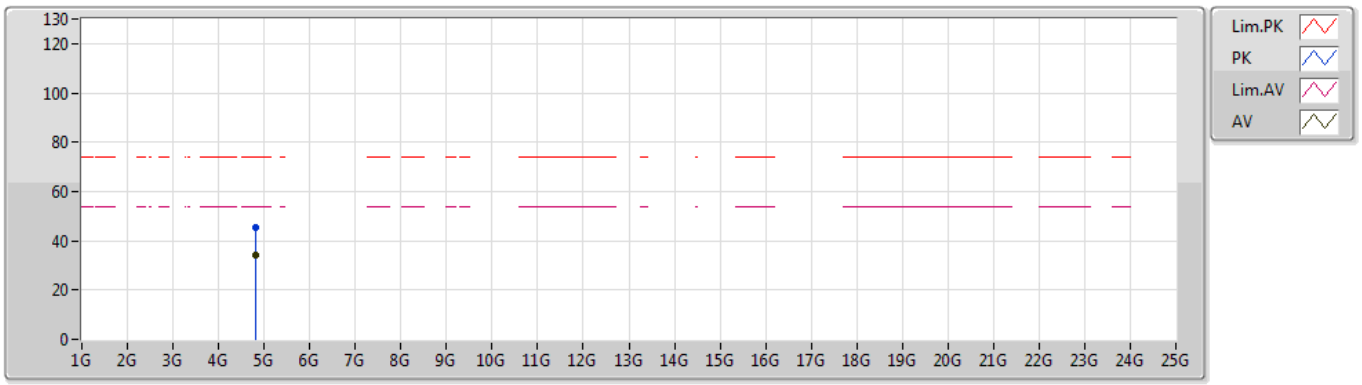
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3724G	58.42	74.00	-15.58	31.16	3	Horizontal	37	3.00	-	27.26
AV	2.3832G	48.11	54.00	-5.89	31.19	3	Horizontal	37	3.00	-	16.92
PK	2.402G	93.98	Inf	-Inf	31.23	3	Horizontal	37	3.00	-	62.75
AV	2.402G	91.49	Inf	-Inf	31.23	3	Horizontal	37	3.00	-	60.26

BT-LE(2Mbps)

18/10/2019

2402MHz_TX



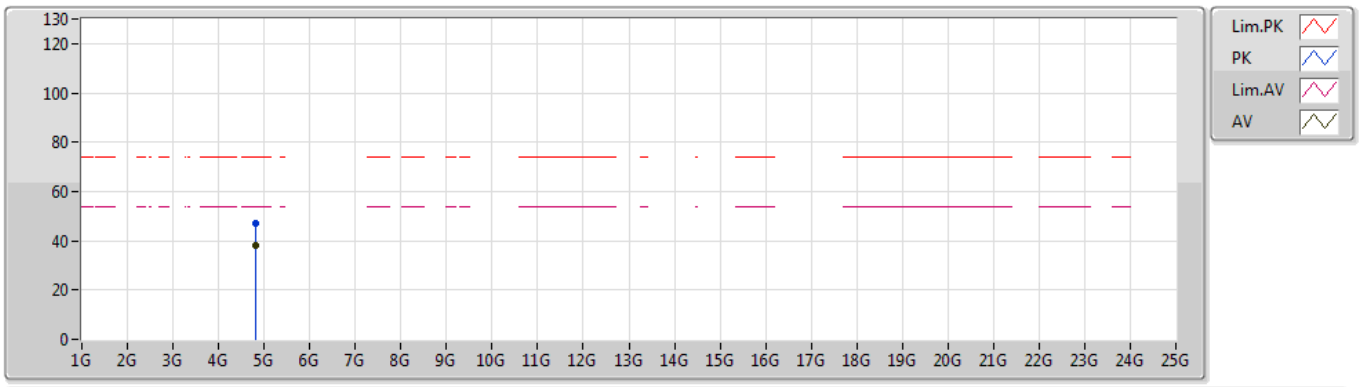
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80379G	45.17	74.00	-28.83	7.12	3	Vertical	260	1.55	-	38.05
AV	4.80499G	34.27	54.00	-19.73	7.12	3	Vertical	260	1.55	-	27.15

BT-LE(2Mbps)

2402MHz_TX

18/10/2019



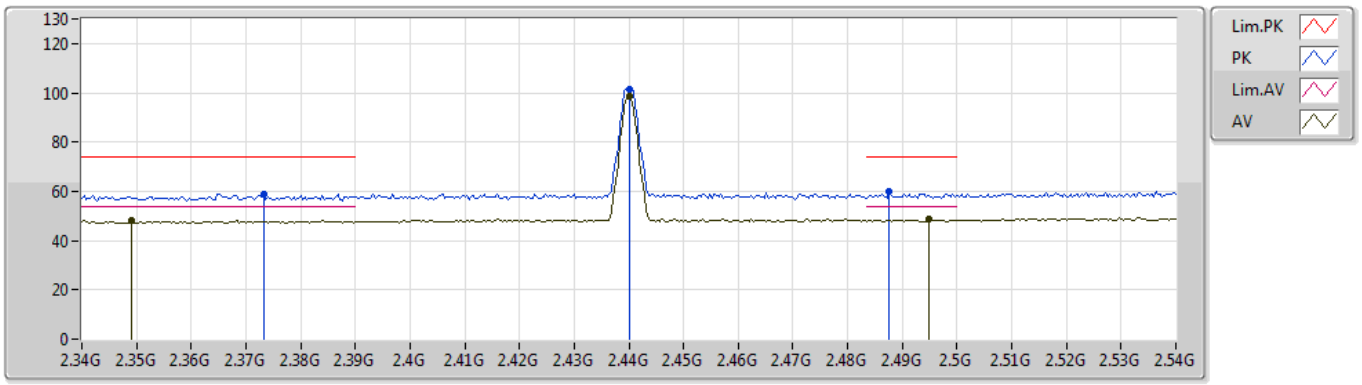
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.80485G	47.15	74.00	-26.85	7.12	3	Horizontal	262	2.01	-	40.03
AV	4.80298G	38.20	54.00	-15.80	7.12	3	Horizontal	262	2.01	-	31.08

BT-LE(2Mbps)

18/10/2019

2440MHz_TX



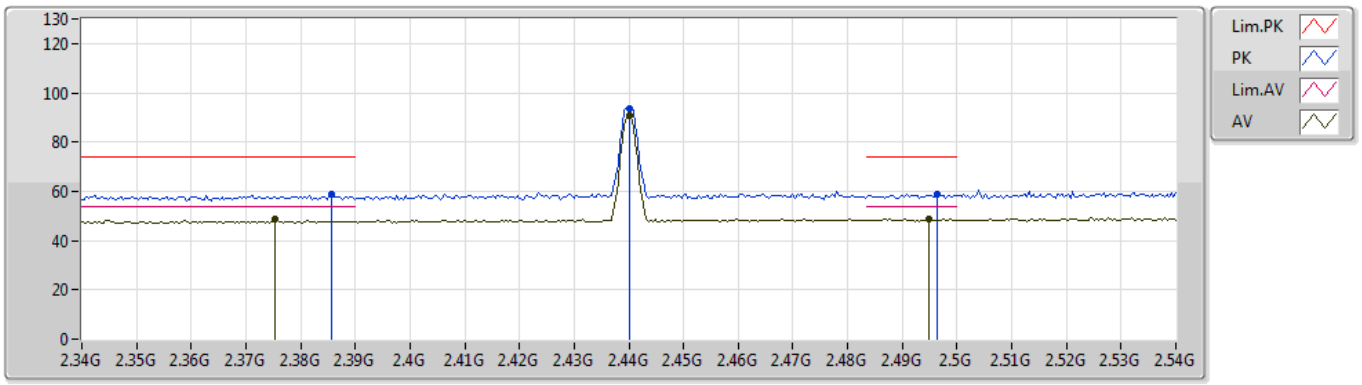
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3732G	58.87	74.00	-15.13	31.16	3	Vertical	8	1.19	-	27.71
AV	2.3492G	48.28	54.00	-5.72	31.10	3	Vertical	8	1.19	-	17.18
PK	2.44G	101.49	Inf	-Inf	31.31	3	Vertical	8	1.19	-	70.18
AV	2.44G	98.82	Inf	-Inf	31.31	3	Vertical	8	1.19	-	67.51
PK	2.4876G	59.78	74.00	-14.22	31.41	3	Vertical	8	1.19	-	28.37
AV	2.4948G	48.52	54.00	-5.48	31.42	3	Vertical	8	1.19	-	17.10

BT-LE(2Mbps)

18/10/2019

2440MHz_TX



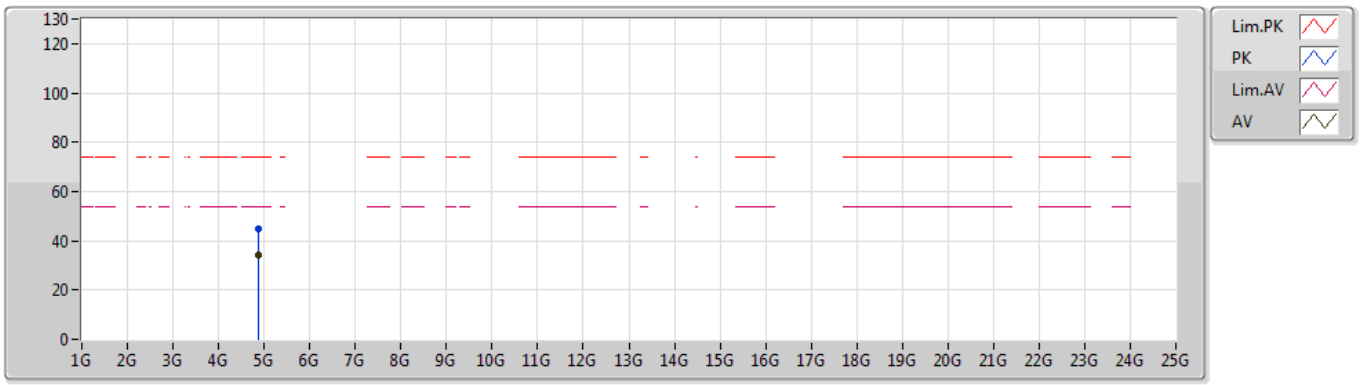
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	2.3856G	58.60	74.00	-15.40	31.19	3	Horizontal	27	2.67	-	27.41
AV	2.3752G	48.53	54.00	-5.47	31.17	3	Horizontal	27	2.67	-	17.36
PK	2.44G	93.72	Inf	-Inf	31.31	3	Horizontal	27	2.67	-	62.41
AV	2.44G	91.03	Inf	-Inf	31.31	3	Horizontal	27	2.67	-	59.72
PK	2.4964G	59.04	74.00	-14.96	31.42	3	Horizontal	27	2.67	-	27.62
AV	2.4948G	48.69	54.00	-5.31	31.42	3	Horizontal	27	2.67	-	17.27

BT-LE(2Mbps)

18/10/2019

2440MHz_TX



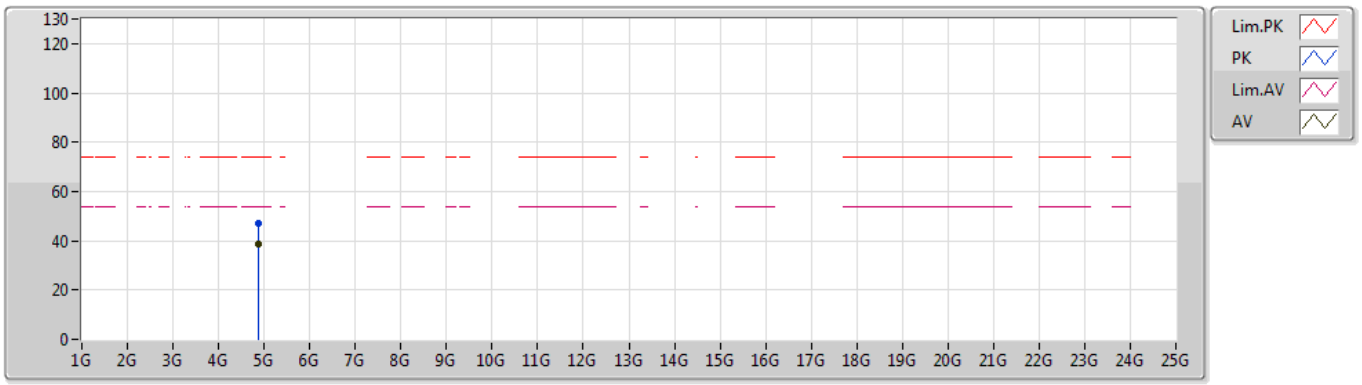
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.86578G	44.78	74.00	-29.22	7.26	3	Vertical	113	2.57	-	37.52
AV	4.86524G	34.06	54.00	-19.94	7.26	3	Vertical	113	2.57	-	26.80

BT-LE(2Mbps)

2440MHz_TX

18/10/2019



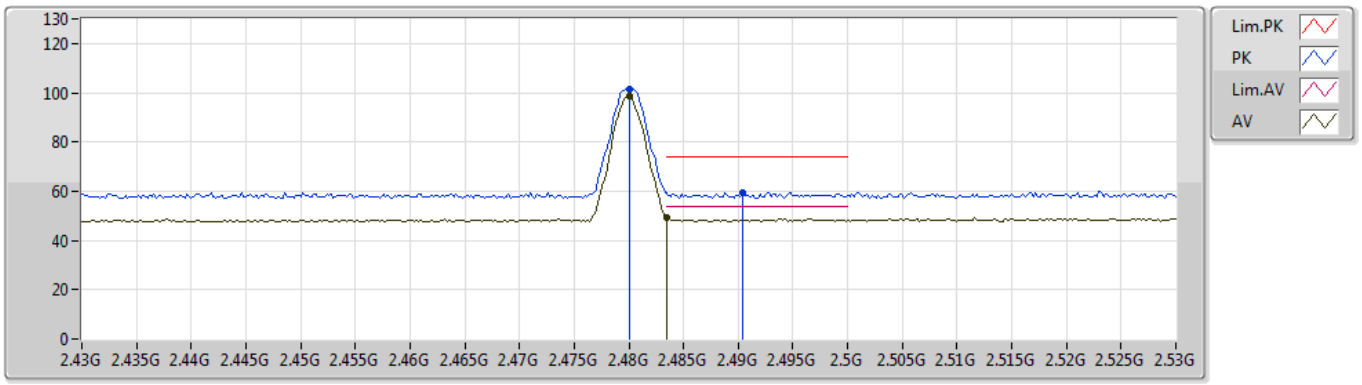
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.88068G	47.25	74.00	-26.75	7.30	3	Horizontal	269	1.69	-	39.95
AV	4.87894G	38.53	54.00	-15.47	7.30	3	Horizontal	269	1.69	-	31.23

BT-LE(2Mbps)

18/10/2019

2480MHz_TX



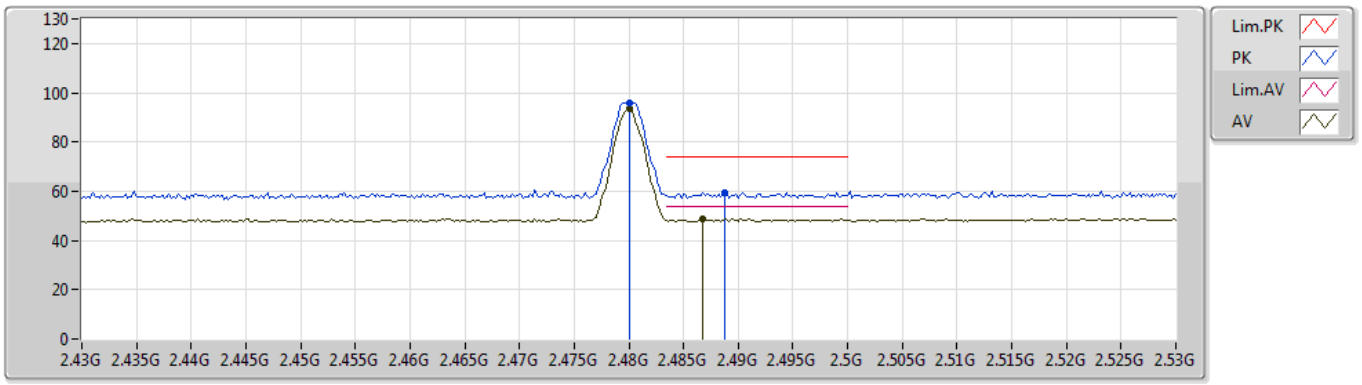
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

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	101.35	Inf	-Inf	31.39	3	Vertical	3	1.08	-	69.96
AV	2.48G	98.69	Inf	-Inf	31.39	3	Vertical	3	1.08	-	67.30
PK	2.4904G	59.49	74.00	-14.51	31.41	3	Vertical	3	1.08	-	28.08
AV	2.4835G	49.15	54.00	-4.85	31.39	3	Vertical	3	1.08	-	17.76

BT-LE(2Mbps)

18/10/2019

2480MHz_TX



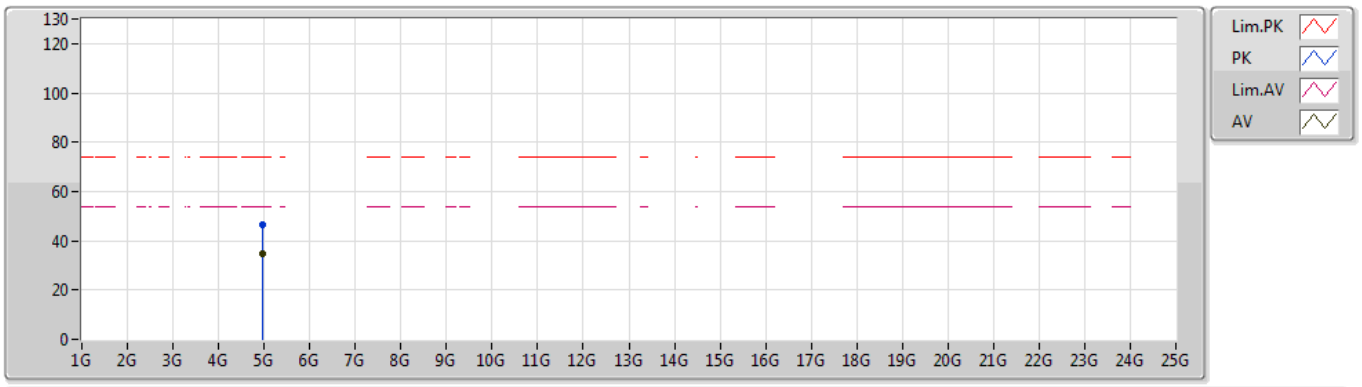
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

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	95.93	Inf	-Inf	31.39	3	Horizontal	8	2.05	-	64.54
AV	2.48G	93.30	Inf	-Inf	31.39	3	Horizontal	8	2.05	-	61.91
PK	2.4888G	59.41	74.00	-14.59	31.41	3	Horizontal	8	2.05	-	28.00
AV	2.4868G	48.63	54.00	-5.37	31.40	3	Horizontal	8	2.05	-	17.23

BT-LE(2Mbps)

18/10/2019

2480MHz_TX



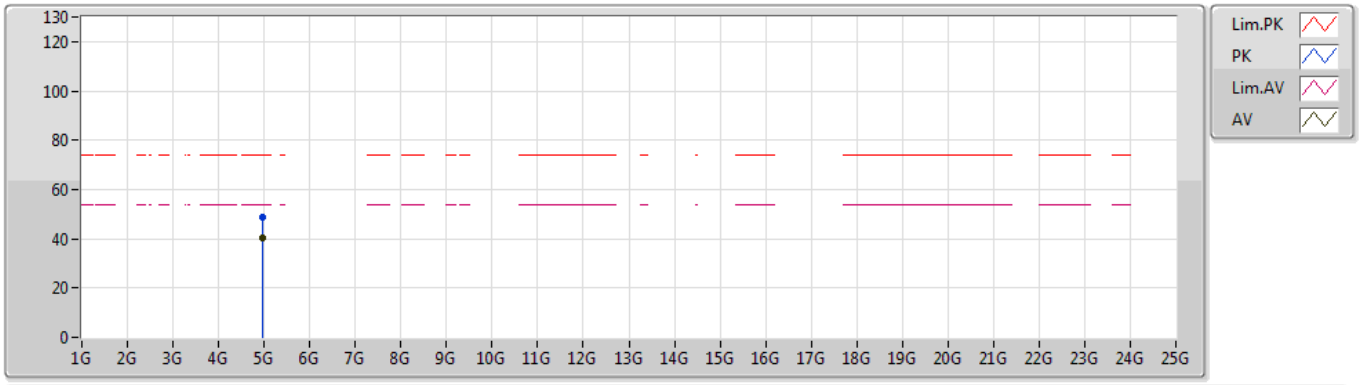
EUT Y_1TX
Setting Default
02-B-2
FSU(100015)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)
PK	4.96046G	46.72	74.00	-27.28	7.48	3	Vertical	58	1.36	-	39.24
AV	4.95938G	34.69	54.00	-19.31	7.48	3	Vertical	58	1.36	-	27.21

BT-LE(2Mbps)

2480MHz_TX

18/10/2019



EUT Y_1TX
Setting Default
02-B-2
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	4.95989G	48.64	74.00	-25.36	7.48	3	Horizontal	313	2.04	-	41.16
AV	4.95901G	40.14	54.00	-13.86	7.48	3	Horizontal	313	2.04	-	32.66