

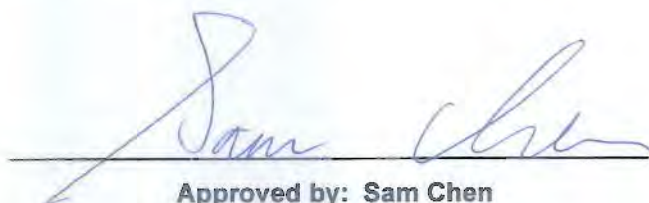


FCC RADIO TEST REPORT

FCC ID : TLZ-CU429
Equipment : Bluetooth 5.1 (LE ONLY) Stamp Module + Cortex M33 + Flash + Antenna
Brand Name : AzureWave
Model Name : AW-CU429
Applicant : AzureWave Technologies, Inc.
8F., No.94, Baozhong Rd. , Xindian Dist., New Taipei City , Taiwan 231
Standard : 47 CFR FCC Part 15.247

The product was received on Jun. 12, 2020, and testing was started from Jun. 12, 2020 and completed on Jun. 30, 2020. 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 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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TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A10_6 Ver1.2



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: Sandy Chuang



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
2.4G	BT-LE(1Mbps)	1	1
2.4G	BT-LE(2Mbps)	2	1

Note:

- ♦ Bluetooth LE uses a GFSK modulation.
- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	LYNwave	ALX20M-052AA1	PIFA Antenna	N/A	2.8

Note: The above information was declared by manufacturer.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	1	0	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
BT-LE(2Mbps)	1	0	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)

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	SmartSnippets Toolbox v5.0.14.3080			
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

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	TH03-CB	Benson Su	27.7-29.2°C / 51-55%	Jun. 22, 2020
Radiated (Below 1GHz)	03CH06-CB	Eason Chen	27.1-29.8°C / 48-54%	Jun. 23, 2020~ Jun. 24, 2020
Radiated (Above 1GHz)	03CH03-CB	Eason Chen	28.3-29.6°C / 50-56%	Jun. 12, 2020~ Jun. 17, 2020
AC Conduction	CO01-CB	Peter Wu	23~24°C / 57~58%	Jun. 30, 2020

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
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	Power Setting
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
1	Normal Link: EUT

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	Normal Link: EUT in Y axis
2	Normal Link: EUT in Z axis
For operating mode 2 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
The EUT can be placed in X-axis, Y-axis and Z-axis. After evaluating, Z-axis was the worst case, so the test will follow this same test configuration.	

2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

N/A



2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Fixture	Azurewave	2429-I4	N/A
B	NB	DELL	E6430	N/A
C	Earphone	e-Power	S90W	N/A
D	Mouse	HP	FM100	N/A
E	iPad	Apple	A1430	N/A

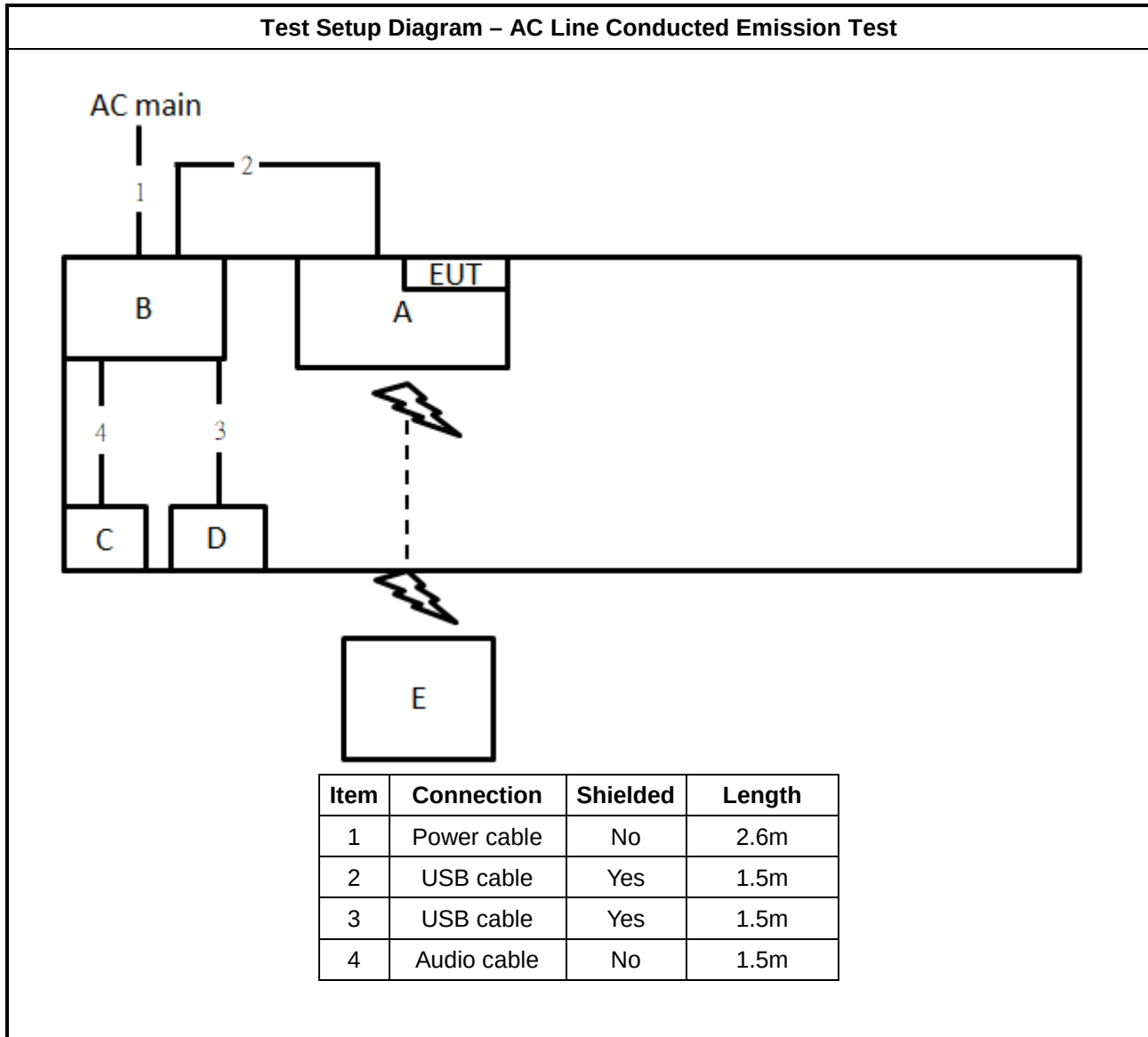
For Radiated (below 1GHz):

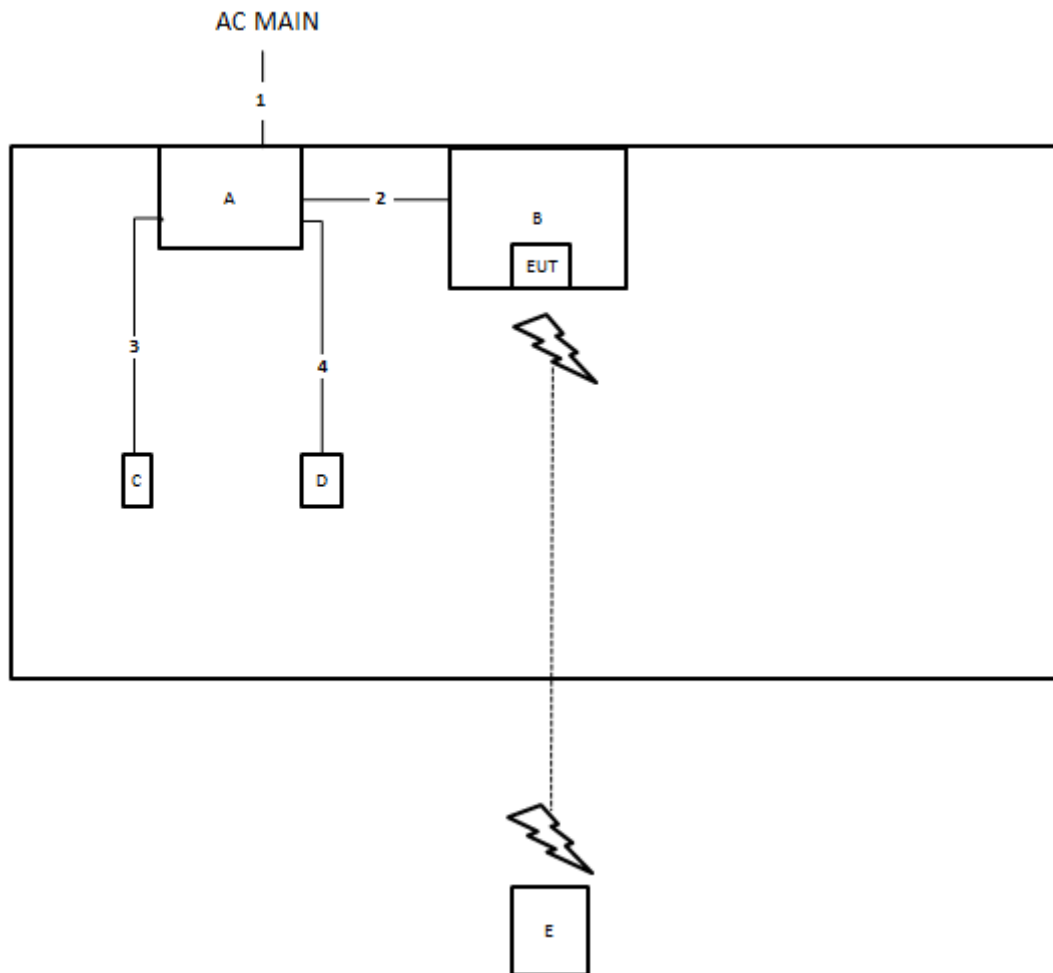
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	Fixture	Azurewave	2429-I4	N/A
C	Earphone	e-Power	S90W	N/A
D	Mouse	Logitech	M-U0026	N/A
E	iPad	Apple	A1430	N/A

For Radiated (above 1GHz) and RF Conducted:

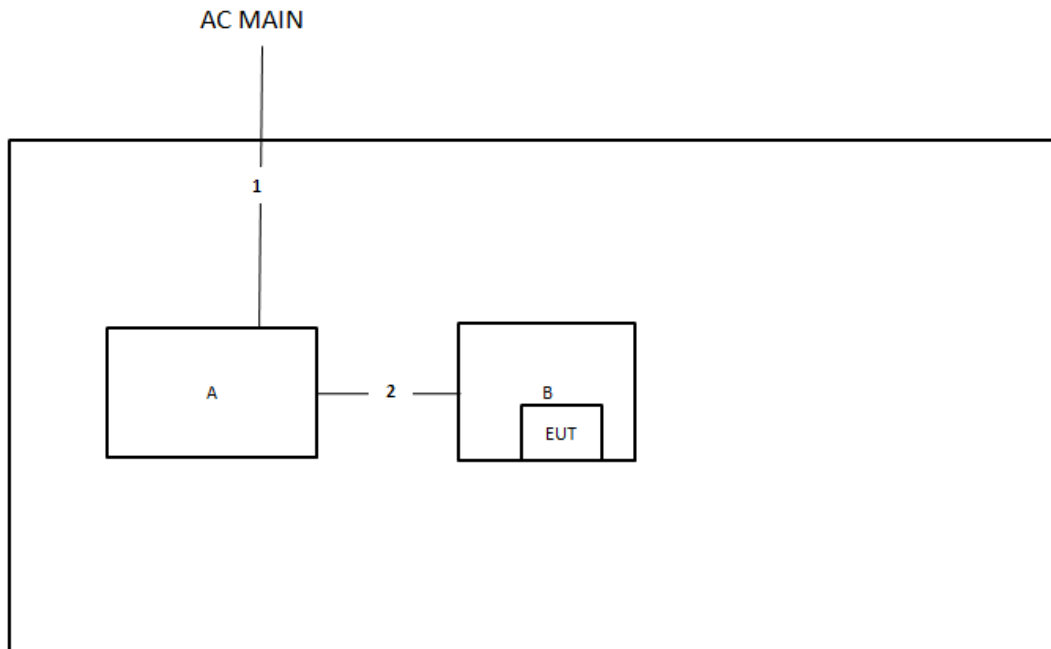
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	Fixture	Azurewave	2429-I4	N/A

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test < 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	USB cable	Yes	1.5m
3	Audio cable	No	1.5m
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	1.5m



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

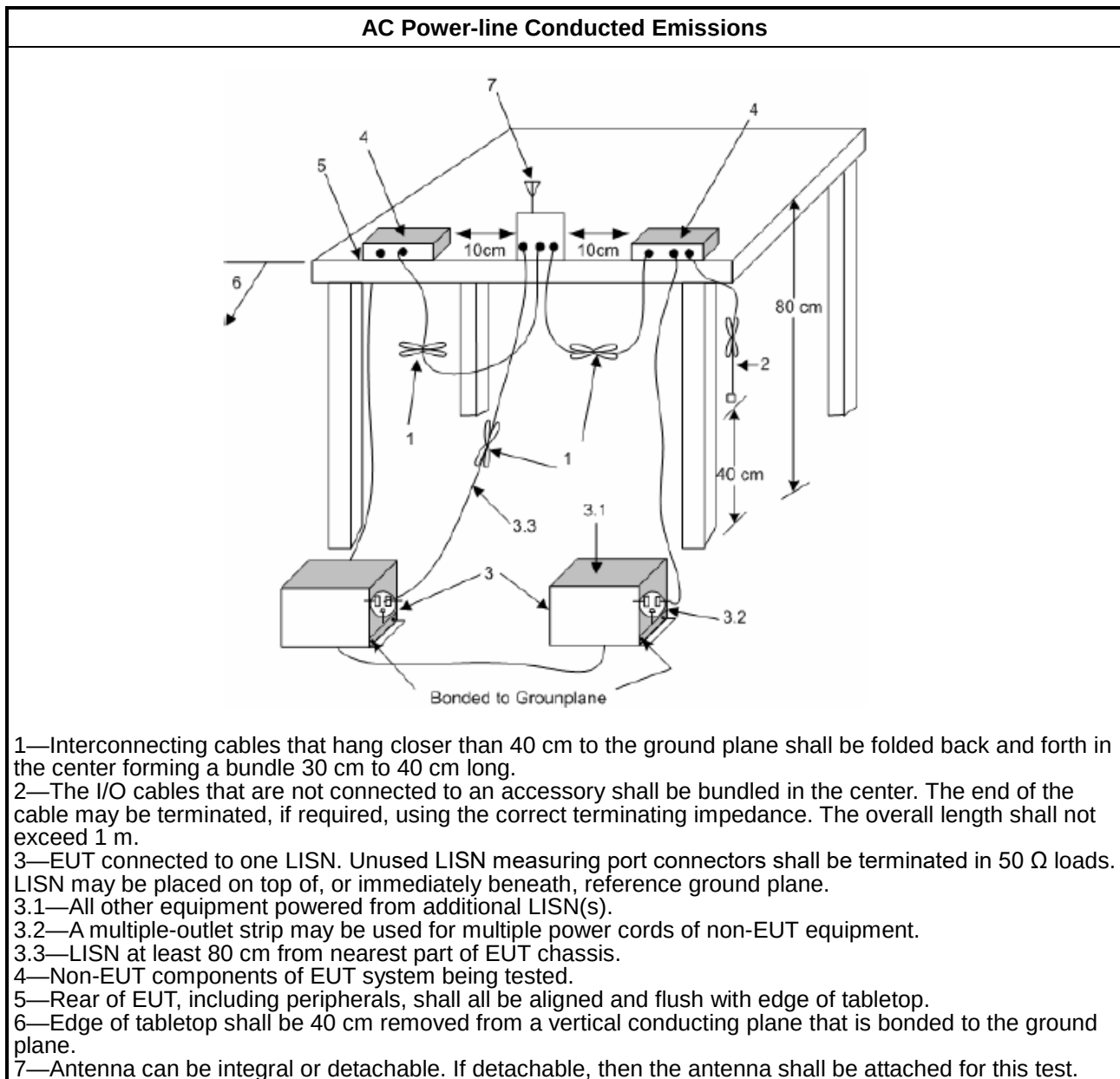
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup



1.1.1. Measurement Results Calculation

The measured Level is calculated using:

- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)

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 $\geq$ 500 kHz.

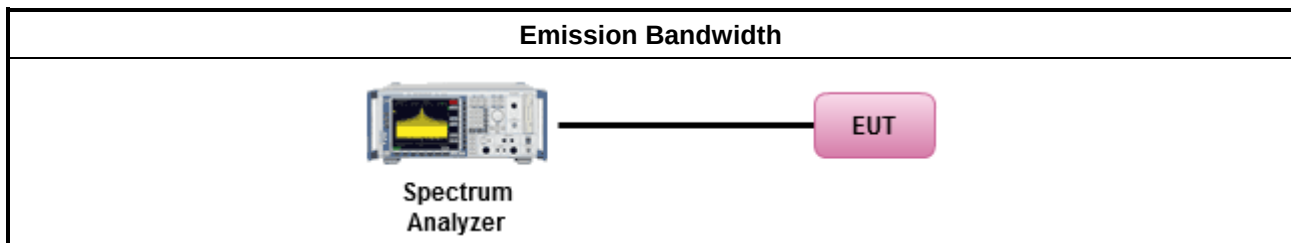
3.2.2 Measuring Instruments

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



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.	

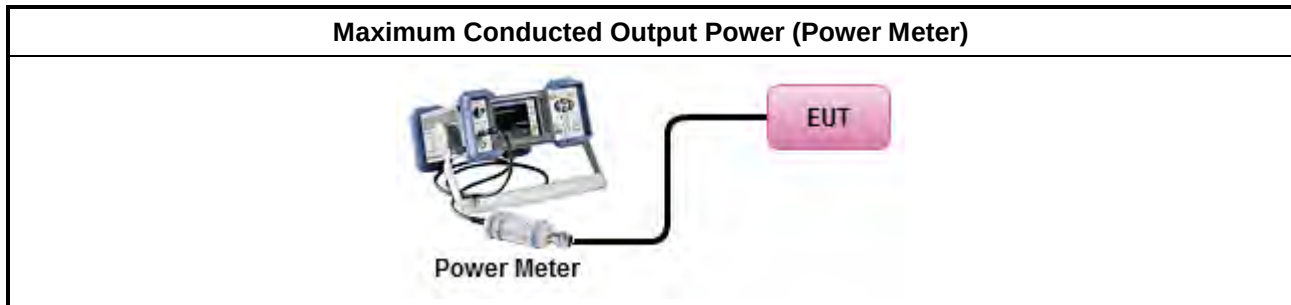
3.3.2 Measuring Instruments

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: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.3.4 Test Setup



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

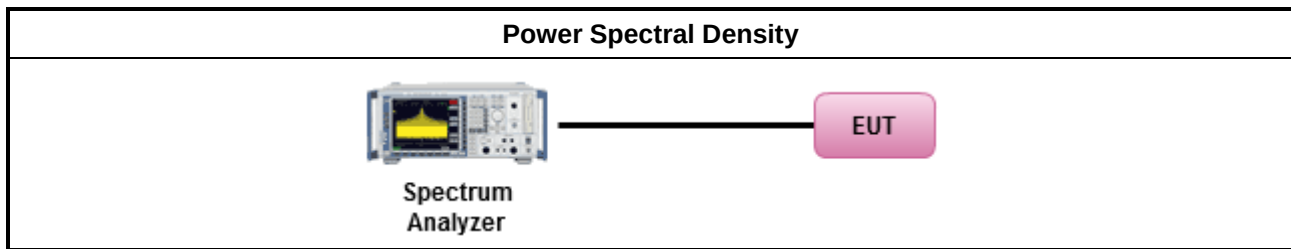
3.4.2 Measuring Instruments

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 Method Max. PSD. [duty cycle $\geq 98\%$ or external video / power trigger]
▪ 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



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.	

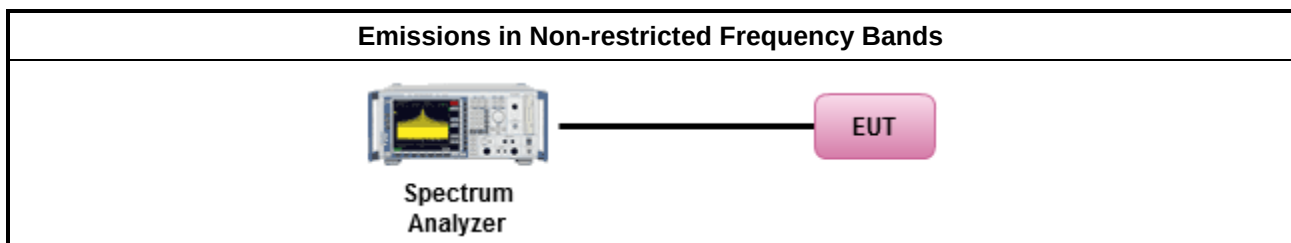
3.5.2 Measuring Instruments

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



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 below 30 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.

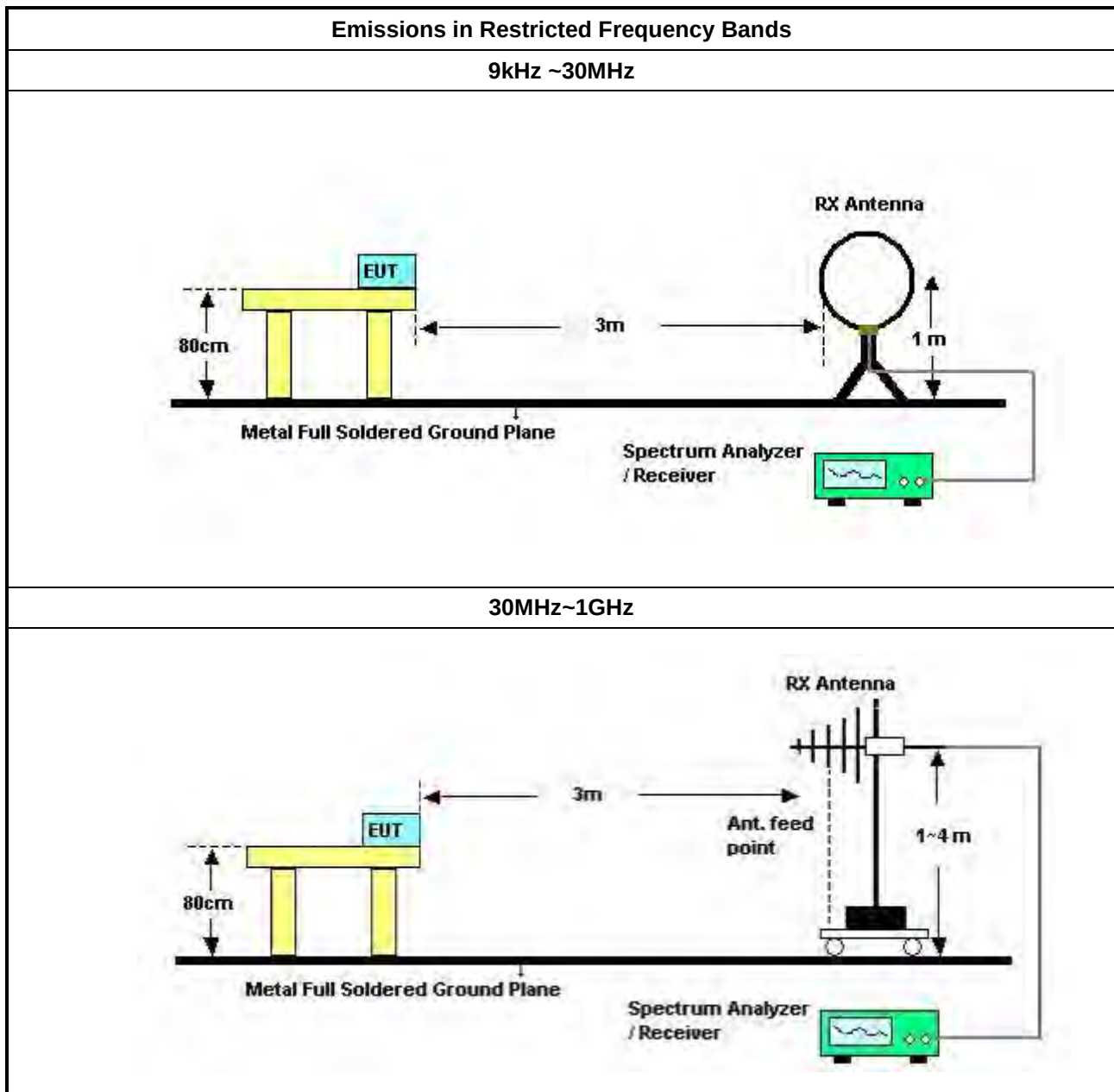
3.6.2 Measuring Instruments

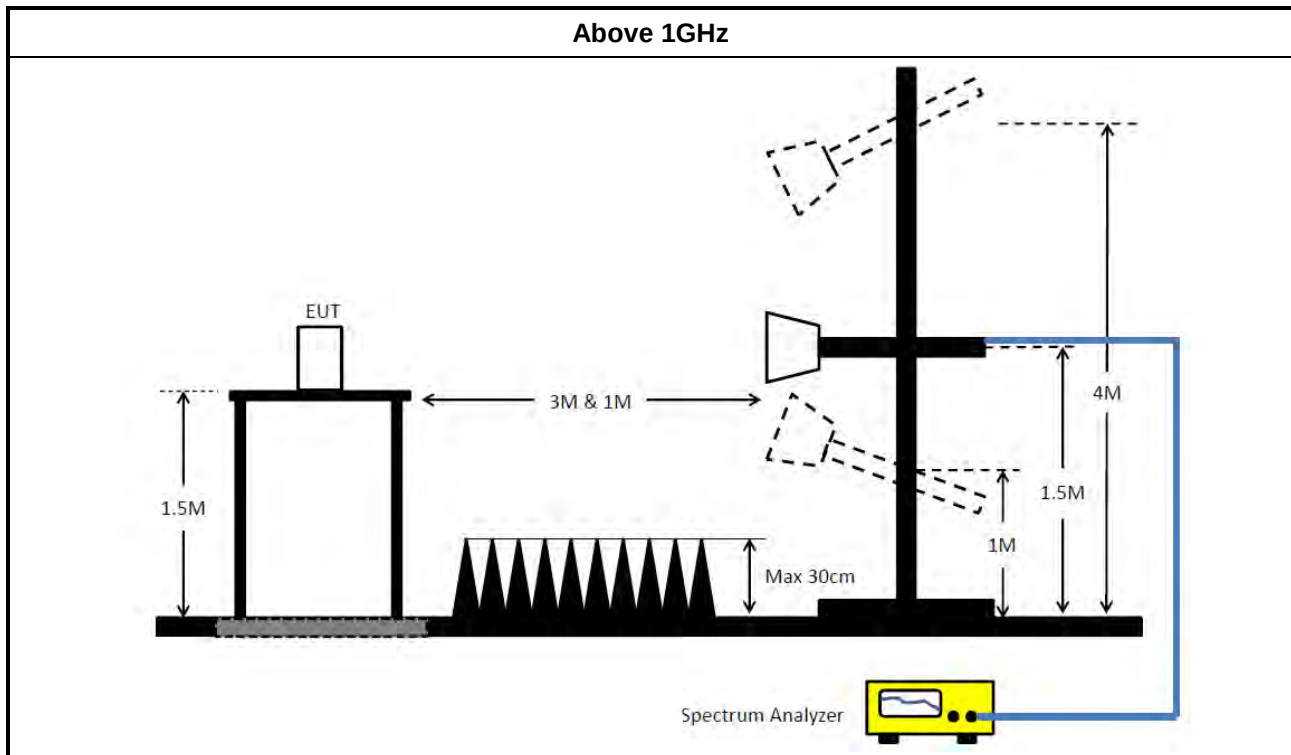
Refer a test equipment and calibration data table in this test report.

**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 $\geq 98\%$).
	☐ 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 $\geq 1/T$).
	☐ Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW $\geq 1/T$, 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





3.6.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor (if applicable) = 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	Feb. 26, 2020	Feb. 25, 2021	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 25, 2019	Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Feb. 25, 2020	Feb. 24, 2021	Conduction (CO01-CB)
Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Jan. 31, 2020	Jan. 30, 2021	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 20, 2020	May 19, 2021	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Bilog Antenna with 6 dB attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Aug. 03, 2019	Aug. 02, 2020	Radiation (03CH06-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	Apr. 28, 2020	Apr. 27, 2021	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 07, 2020	May 06, 2021	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 21, 2019	Oct. 20, 2020	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 13, 2020	May 12, 2021	Radiation (03CH06-CB)
RF Cable-low	HUBER+SUHNER	RG402	Low Cable-05+24	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
Horn Antenna	ETS • Lindgren	3115	6821	750MHz~18GHz	Jan. 20, 2020	Jan. 19, 2021	Radiation (03CH03-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH03-CB)
Pre-Amplifier	Agilent	8449B	3008A02097	1GHz ~ 26.5GHz	Dec. 19, 2019	Dec.18, 2020	Radiation (03CH03-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP40	100019	9kHz ~ 40GHz	Jun. 09, 2020	Jun. 08, 2021	Radiation (03CH03-CB)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-20+27	1GHz ~ 18GHz	Feb. 01, 2020	Jan. 31, 2021	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-27	1GHz ~ 18GHz	Feb. 01, 2020	Jan. 31, 2021	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH03-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Nov. 01, 2019	Oct. 31, 2020	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1726195	300MHz~40GHz	Aug. 13, 2019	Aug. 12, 2020	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Aug. 13, 2019	Aug. 12, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)

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

NCR means Non-Calibration required.



AC Power Port Conducted Emission Result

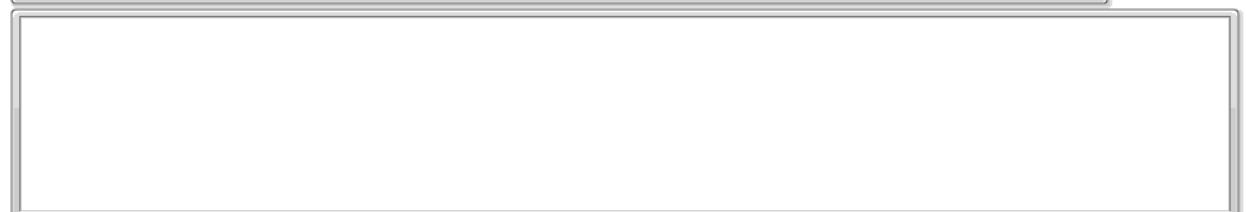
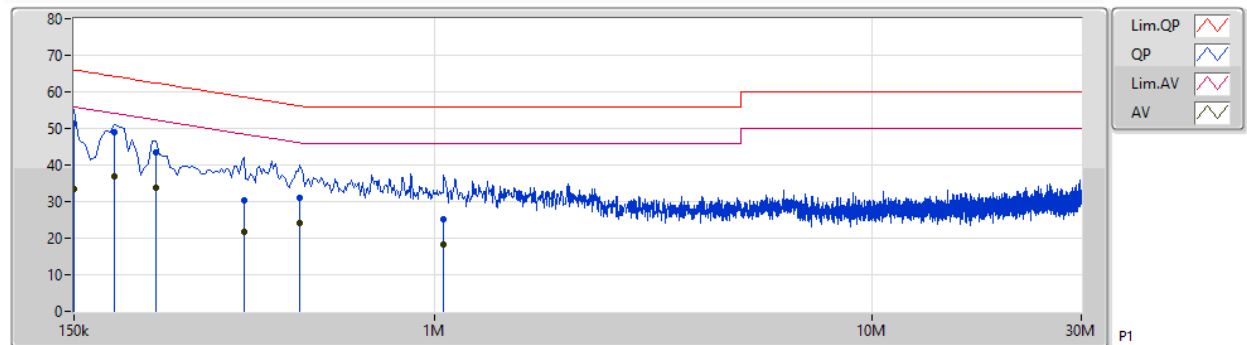
Appendix A

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition
Mode 1	Pass	QP	181.5k	50.16	64.41	-14.25	9.86	Neutral

Mode 1

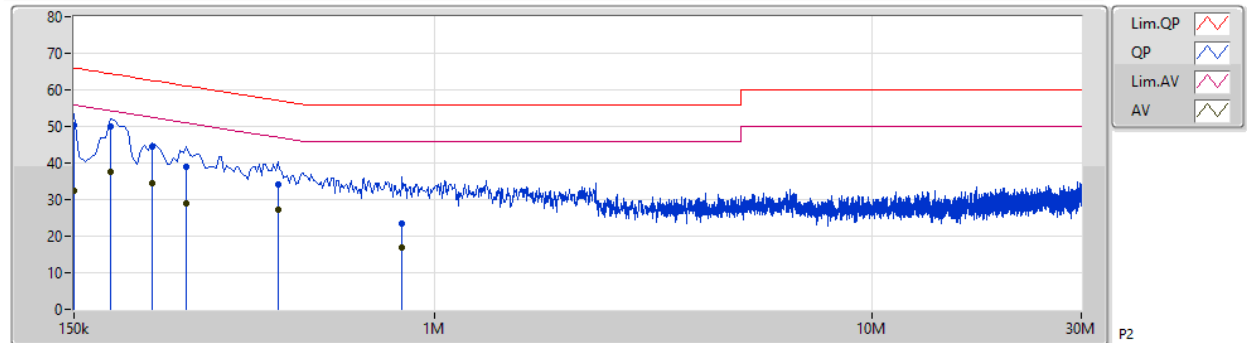
30/06/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	150k	51.36	66.00	-14.64	9.87	Line	"Worst"	41.49	0.05	0.03	9.79			
AV	150k	33.43	56.00	-22.57	9.87	Line	-	23.56	0.05	0.03	9.79			
QP	186k	49.01	64.20	-15.19	9.86	Line	-	39.15	0.04	0.03	9.79			
AV	186k	36.83	54.20	-17.37	9.86	Line	-	26.97	0.04	0.03	9.79			
QP	231k	43.36	62.41	-19.05	9.86	Line	-	33.50	0.04	0.03	9.79			
AV	231k	33.85	52.41	-18.56	9.86	Line	-	23.99	0.04	0.03	9.79			
QP	366k	30.51	58.60	-28.09	9.88	Line	-	20.63	0.04	0.03	9.81			
AV	366k	21.87	48.60	-26.73	9.88	Line	-	11.99	0.04	0.03	9.81			
QP	492k	31.19	56.13	-24.94	9.88	Line	-	21.31	0.04	0.03	9.81			
AV	492k	24.01	46.13	-22.12	9.88	Line	-	14.13	0.04	0.03	9.81			
QP	1.05M	25.17	56.00	-30.83	9.91	Line	-	15.26	0.05	0.04	9.82			
AV	1.05M	18.36	46.00	-27.64	9.91	Line	-	8.45	0.05	0.04	9.82			

Mode 1

30/06/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	150k	50.33	66.00	-15.67	9.86	Neutral	-	40.47	0.04	0.03	9.79			
AV	150k	32.28	56.00	-23.72	9.86	Neutral	-	22.42	0.04	0.03	9.79			
QP	181.5k	50.16	64.41	-14.25	9.86	Neutral	"Worst"	40.30	0.04	0.03	9.79			
AV	181.5k	37.60	54.41	-16.81	9.86	Neutral	-	27.74	0.04	0.03	9.79			
QP	226.5k	44.49	62.58	-18.09	9.86	Neutral	-	34.63	0.04	0.03	9.79			
AV	226.5k	34.59	52.58	-17.99	9.86	Neutral	-	24.73	0.04	0.03	9.79			
QP	271.5k	38.80	61.07	-22.27	9.87	Neutral	-	28.93	0.04	0.03	9.80			
AV	271.5k	29.05	51.07	-22.02	9.87	Neutral	-	19.18	0.04	0.03	9.80			
QP	438k	34.10	57.11	-23.01	9.88	Neutral	-	24.22	0.04	0.03	9.81			
AV	438k	27.33	47.11	-19.78	9.88	Neutral	-	17.45	0.04	0.03	9.81			
QP	843k	23.57	56.00	-32.43	9.92	Neutral	-	13.65	0.06	0.04	9.82			
AV	843k	16.82	46.00	-29.18	9.92	Neutral	-	6.90	0.06	0.04	9.82			

**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)	672.5k	1.033M	1M03F1D	667.5k	1.029M
BT-LE(2Mbps)	1.27M	2.069M	2M07F1D	1.263M	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;

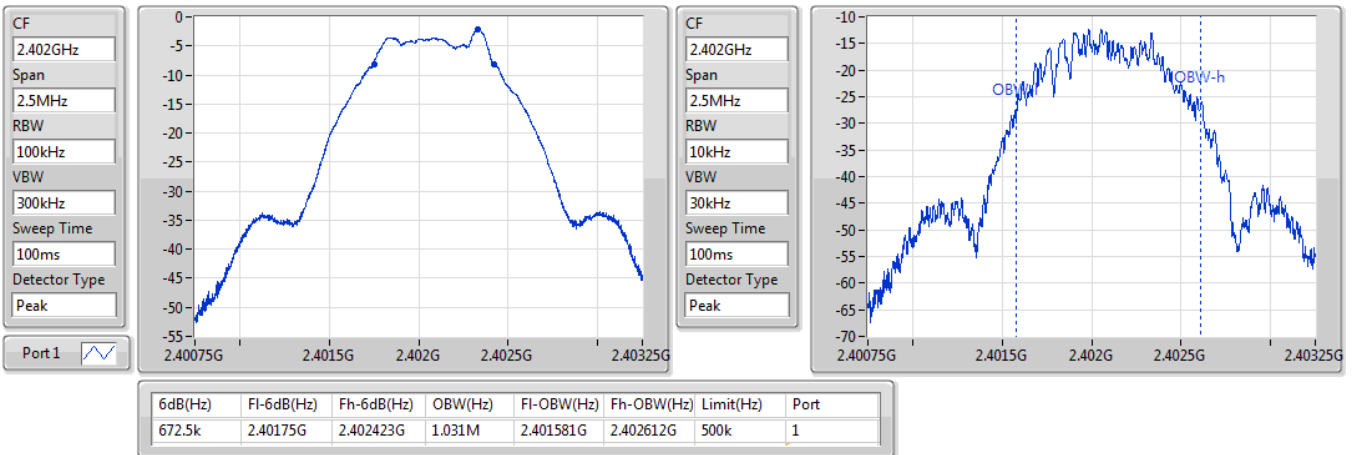
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	672.5k	1.031M
2440MHz	Pass	500k	672.5k	1.029M
2480MHz	Pass	500k	667.5k	1.033M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.27M	2.066M
2440MHz	Pass	500k	1.268M	2.069M
2480MHz	Pass	500k	1.263M	2.069M

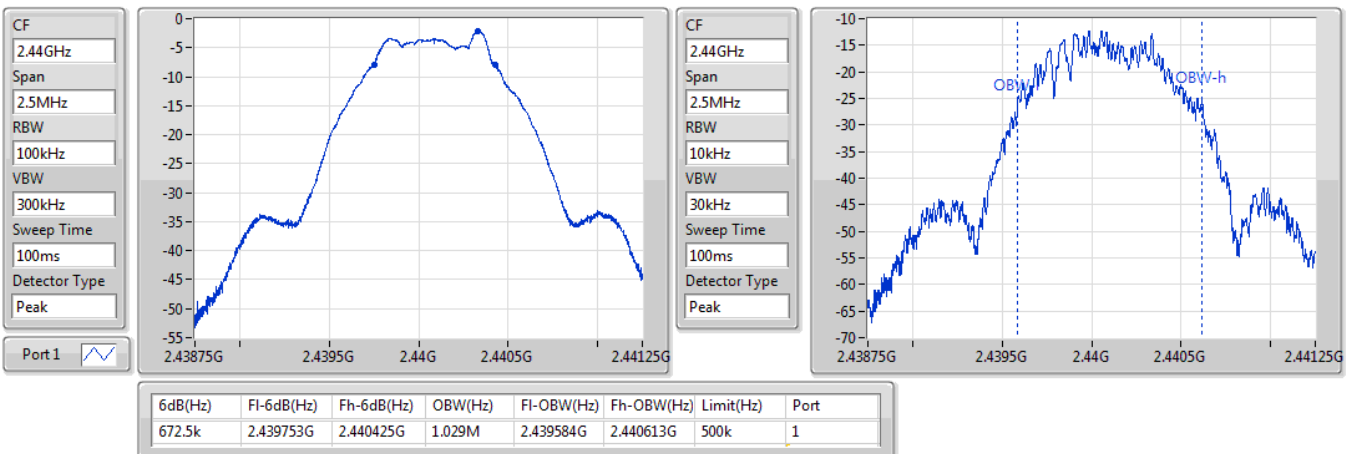
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

BT-LE(1Mbps)
2402MHz
EBW

22/06/2020

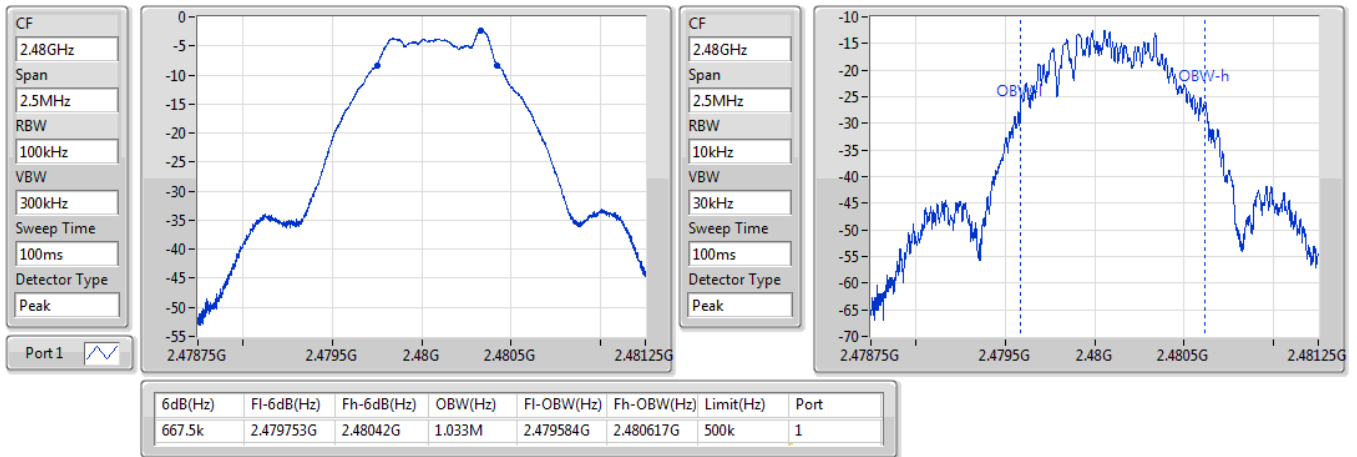

BT-LE(1Mbps)
2440MHz
EBW

22/06/2020

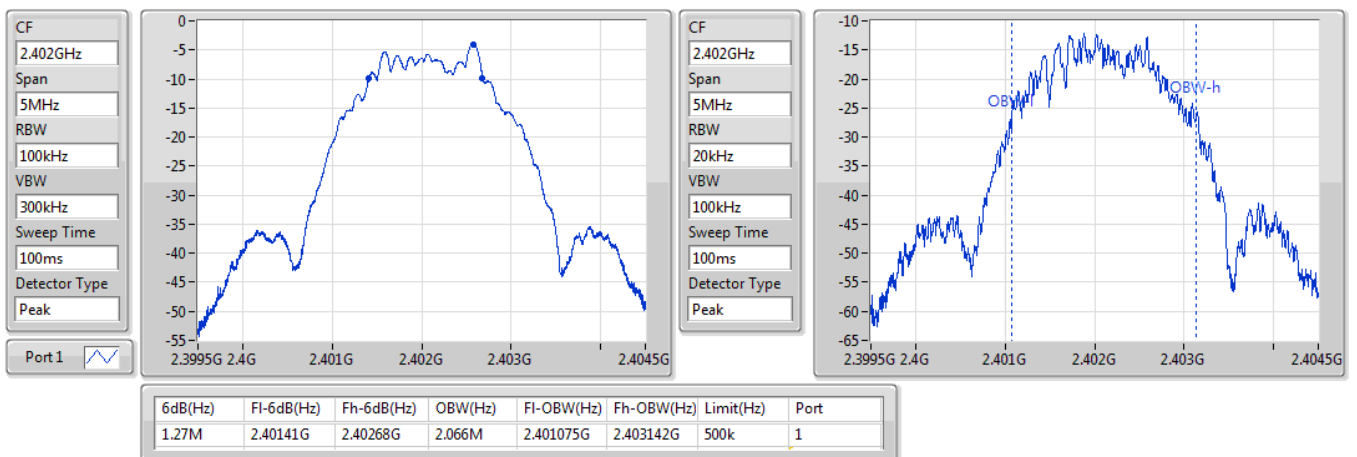


BT-LE(1Mbps)
EBW
2480MHz

22/06/2020

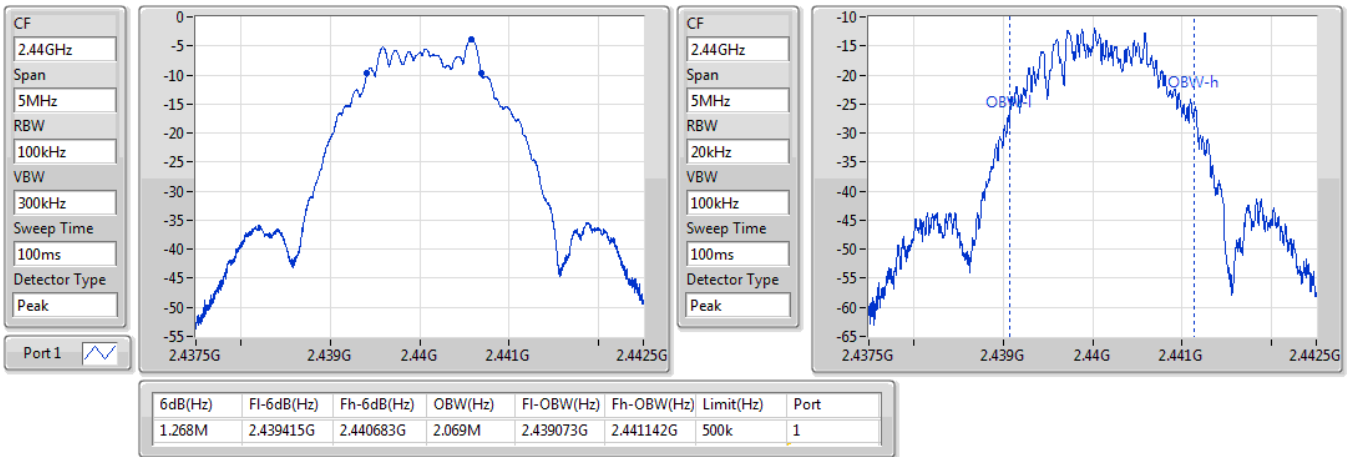

BT-LE(2Mbps)
EBW
2402MHz

22/06/2020

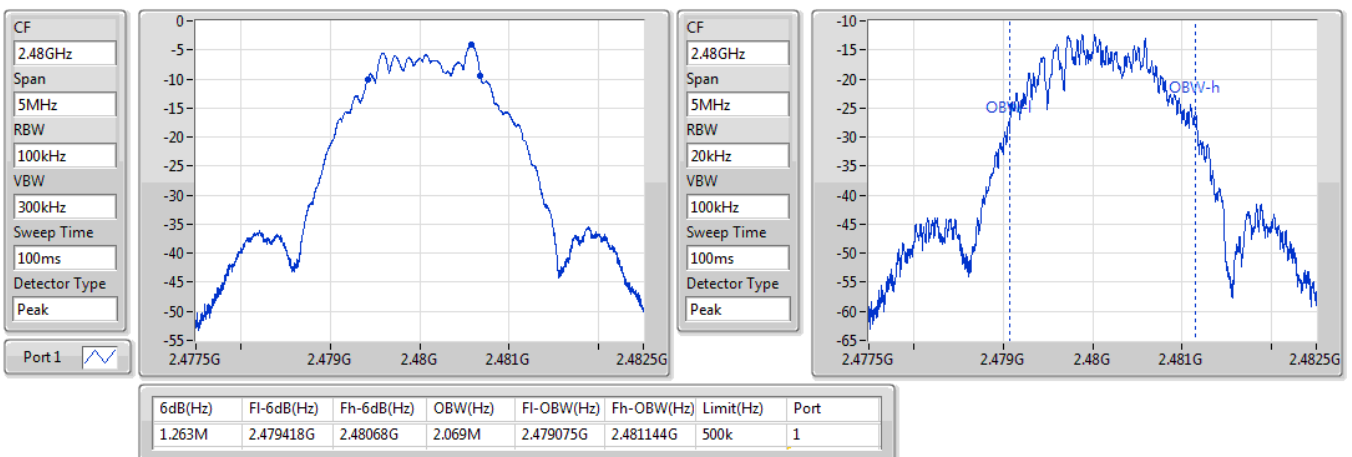


BT-LE(2Mbps)
EBW
2440MHz

22/06/2020


BT-LE(2Mbps)
EBW
2480MHz

22/06/2020





Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	-1.99	0.00063
BT-LE(2Mbps)	-1.98	0.00063



Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	2.80	-2.17	30.00
2440MHz	Pass	2.80	-1.99	30.00
2480MHz	Pass	2.80	-2.32	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	2.80	-2.15	30.00
2440MHz	Pass	2.80	-1.98	30.00
2480MHz	Pass	2.80	-2.31	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-18.58
BT-LE(2Mbps)	-20.23

RBW=3 kHz.

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	2.80	-18.74	8.00
2440MHz	Pass	2.80	-18.58	8.00
2480MHz	Pass	2.80	-19.01	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	2.80	-20.40	8.00
2440MHz	Pass	2.80	-20.23	8.00
2480MHz	Pass	2.80	-20.52	8.00

DG = Directional Gain; RBW=3 kHz;

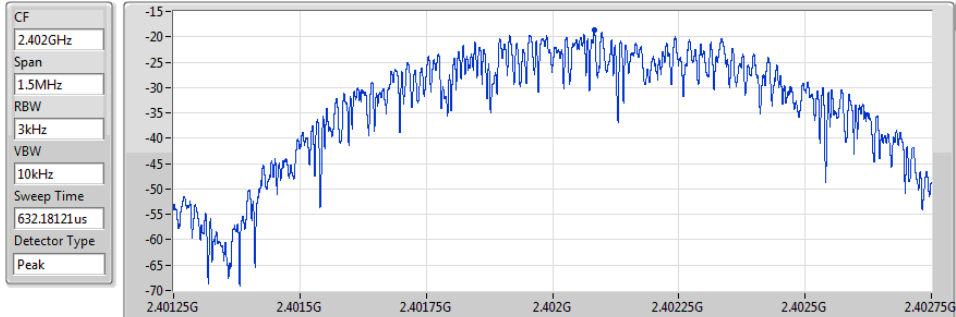
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

BT-LE(1Mbps)

PSD

2402MHz

22/06/2020



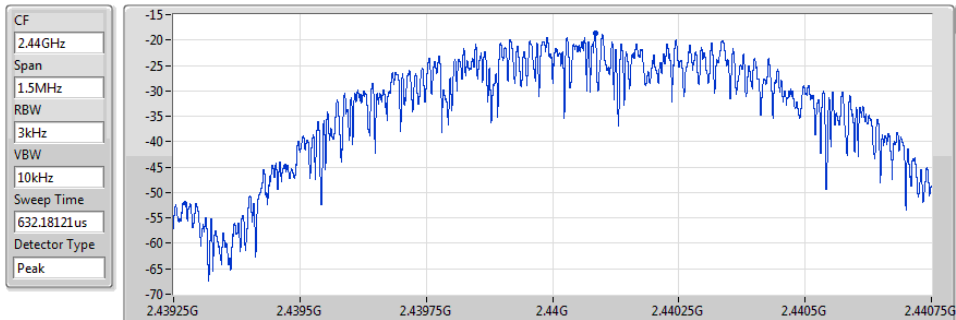
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-18.74	-18.74	-18.74

BT-LE(1Mbps)

PSD

2440MHz

22/06/2020



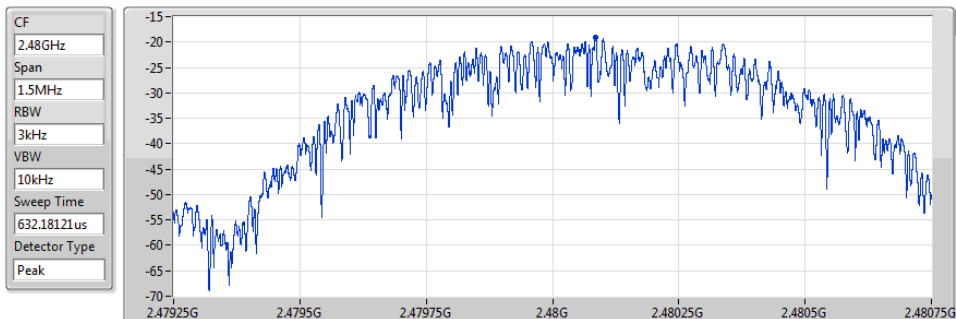
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-18.58	-18.58	-18.58

BT-LE(1Mbps)

PSD

2480MHz

22/06/2020



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-19.01	-19.01	-19.01

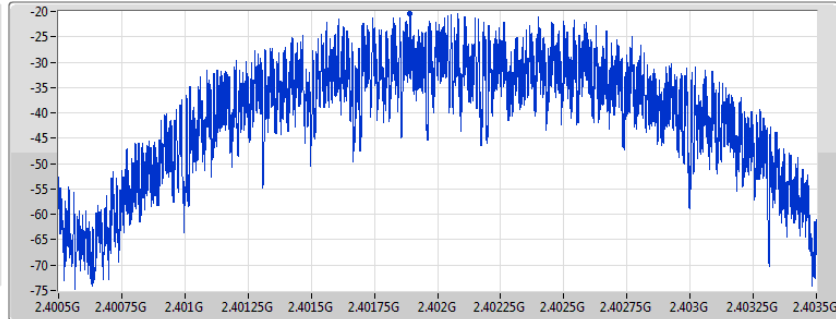
BT-LE(2Mbps)

PSD

2402MHz

22/06/2020

CF
2.402GHz
Span
3MHz
RBW
3kHz
VBW
10kHz
Sweep Time
632.01845us
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-20.40	-20.40	-20.40

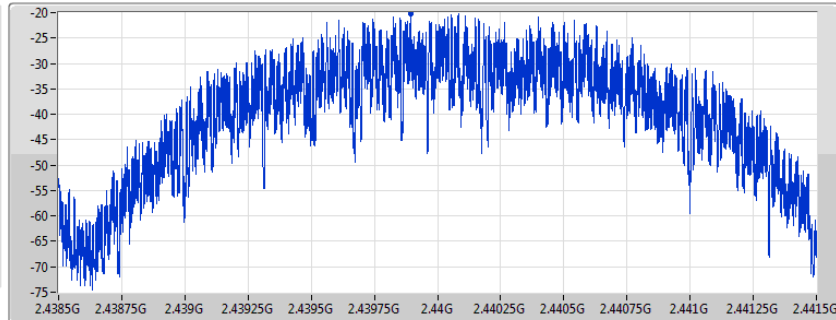
BT-LE(2Mbps)

PSD

2440MHz

22/06/2020

CF
2.44GHz
Span
3MHz
RBW
3kHz
VBW
10kHz
Sweep Time
632.01845us
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-20.23	-20.23	-20.23

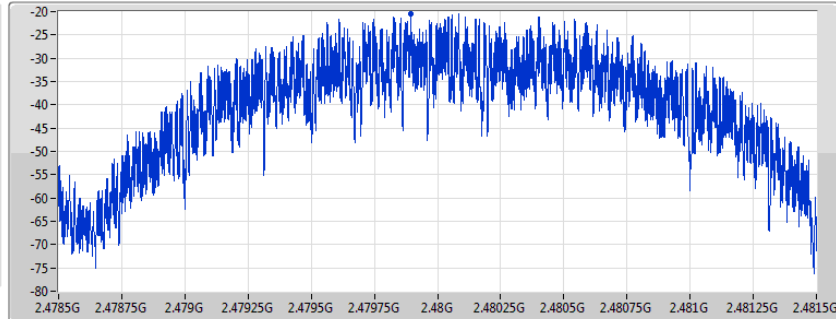
BT-LE(2Mbps)

PSD

2480MHz

22/06/2020

CF
2.48GHz
Span
3MHz
RBW
3kHz
VBW
10kHz
Sweep Time
632.01845us
Detector Type
Peak



Port 1

Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-20.52	-20.52	-20.52

**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)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.44033G	-2.01	-32.01	623.38M	-62.77	2.39985G	-60.80	2.4G	-62.61	2.50205G	-61.26	7.20527G	-55.18	1
BT-LE(2Mbps)	Pass	2.44058G	-3.79	-33.79	908.02M	-62.33	2.4G	-40.29	2.4G	-38.87	2.48607G	-61.38	7.20527G	-56.12	1

Result

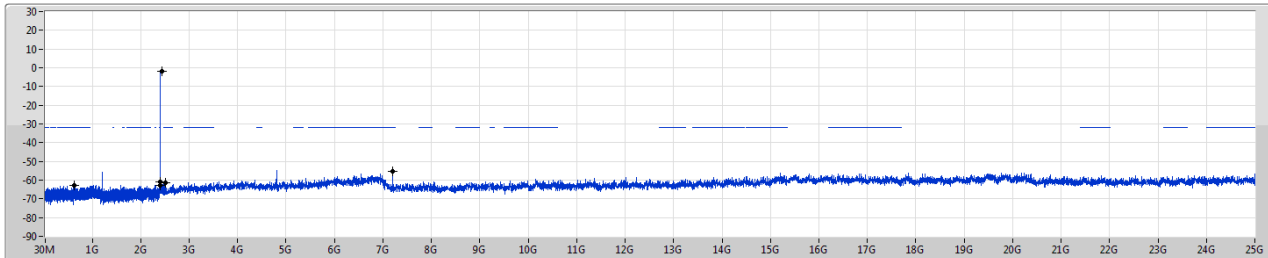
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.44033G	-2.01	-32.01	623.38M	-62.77	2.39985G	-60.80	2.4G	-62.61	2.50205G	-61.26	7.20527G	-55.18	1
2440MHz	Pass	2.44033G	-2.01	-32.01	658.33M	-62.14	2.39599G	-61.14	2.4835G	-64.12	2.49046G	-61.39	6.94093G	-55.70	1
2480MHz	Pass	2.44033G	-2.01	-32.01	841.63M	-62.13	2.39893G	-62.38	2.4835G	-62.75	2.48648G	-61.16	16.54132G	-56.24	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.44058G	-3.79	-33.79	908.02M	-62.33	2.4G	-40.29	2.4G	-38.87	2.48607G	-61.38	7.20527G	-56.12	1
2440MHz	Pass	2.44058G	-3.79	-33.79	891.86M	-61.02	2.39318G	-62.42	2.4835G	-65.68	2.49112G	-62.04	16.74097G	-55.66	1
2480MHz	Pass	2.44058G	-3.79	-33.79	947.68M	-62.68	2.3948G	-62.23	2.4835G	-61.53	2.48395G	-60.97	6.98874G	-56.40	1

BT-LE(1Mbps)

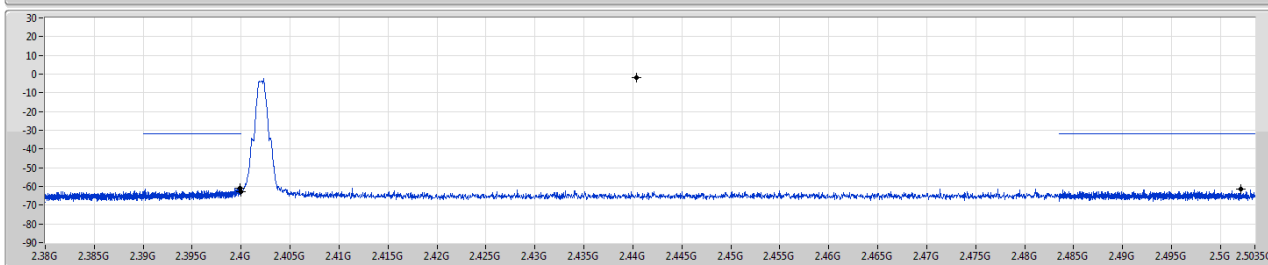
2402MHz

CSE NdB

22/06/2020



Port1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

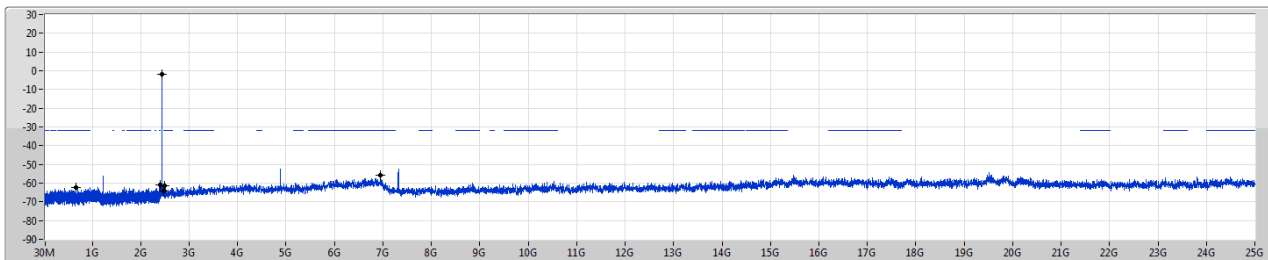
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44033G	-2.01	-32.01	623.38M	-62.77	2.39985G	-60.80	2.4G	-62.61	2.50205G	-61.26	7.20527G	-55.18	1

BT-LE(1Mbps)

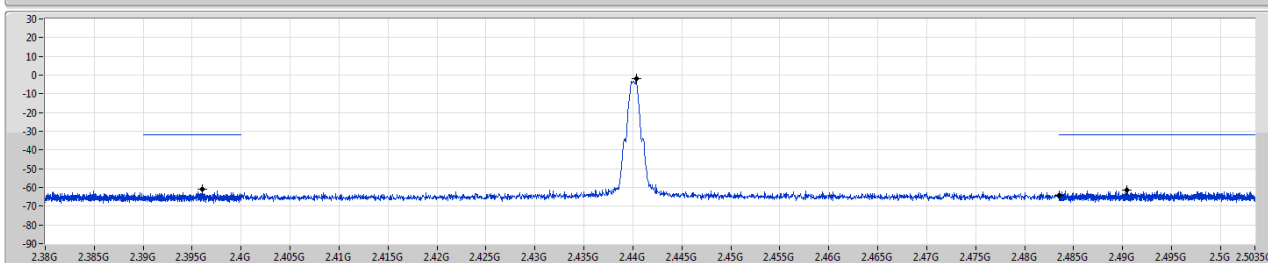
2440MHz

CSE NdB

22/06/2020



Port1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

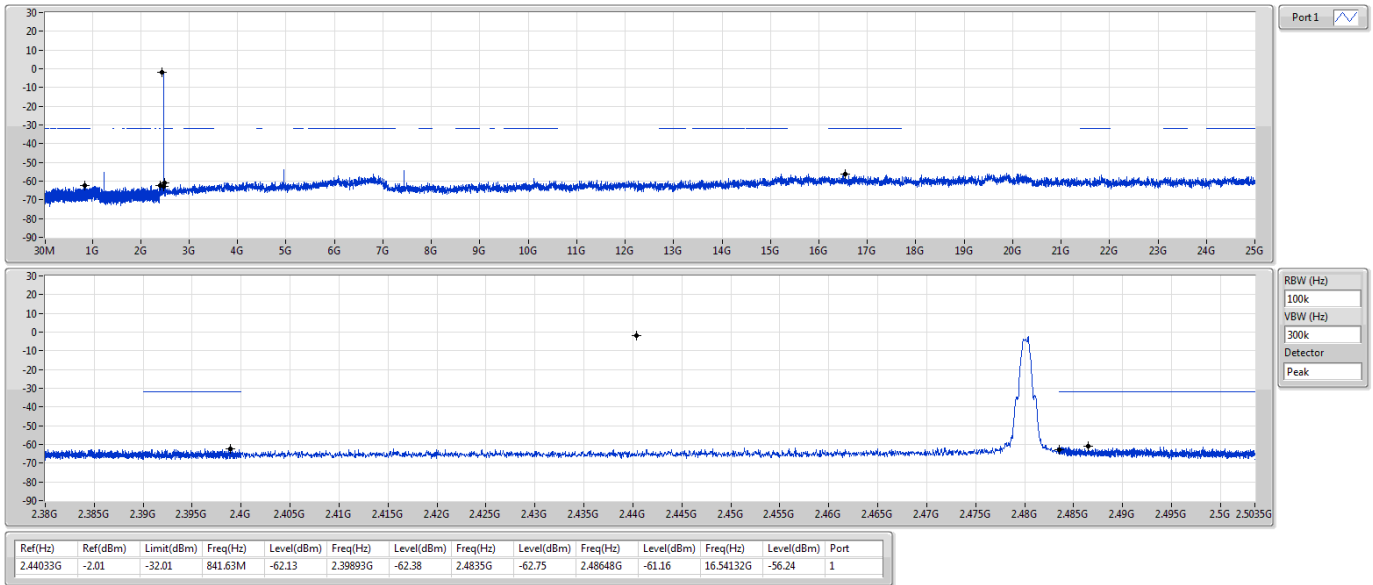
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44033G	-2.01	-32.01	658.33M	-62.14	2.39999G	-61.14	2.4835G	-64.12	2.49046G	-61.39	6.94093G	-55.70	1

BT-LE(1Mbps)

2480MHz

CSE NdB

22/06/2020

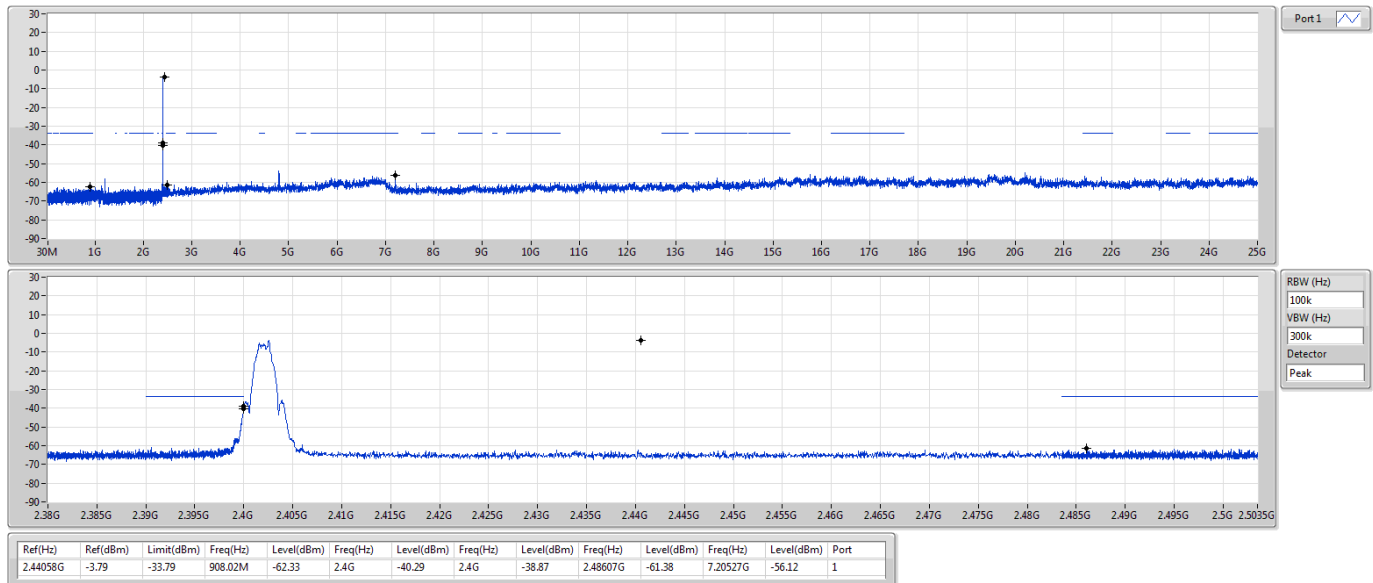


BT-LE(2Mbps)

2402MHz

CSE NdB

22/06/2020

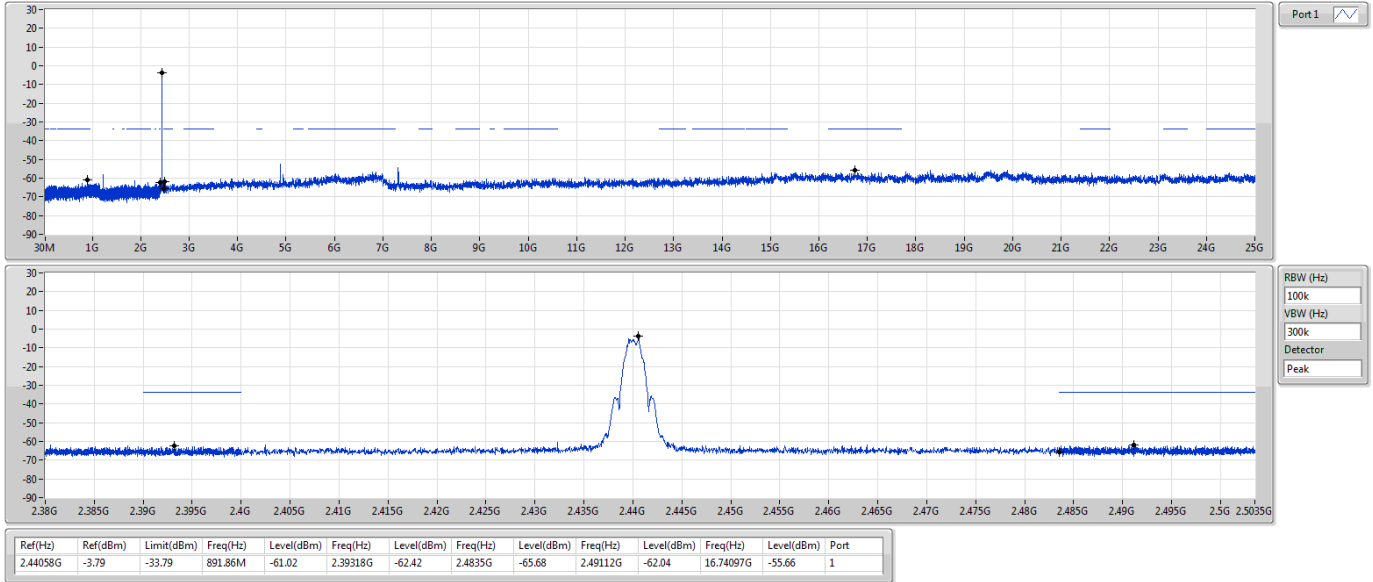


BT-LE(2Mbps)

2440MHz

CSE NdB

22/06/2020

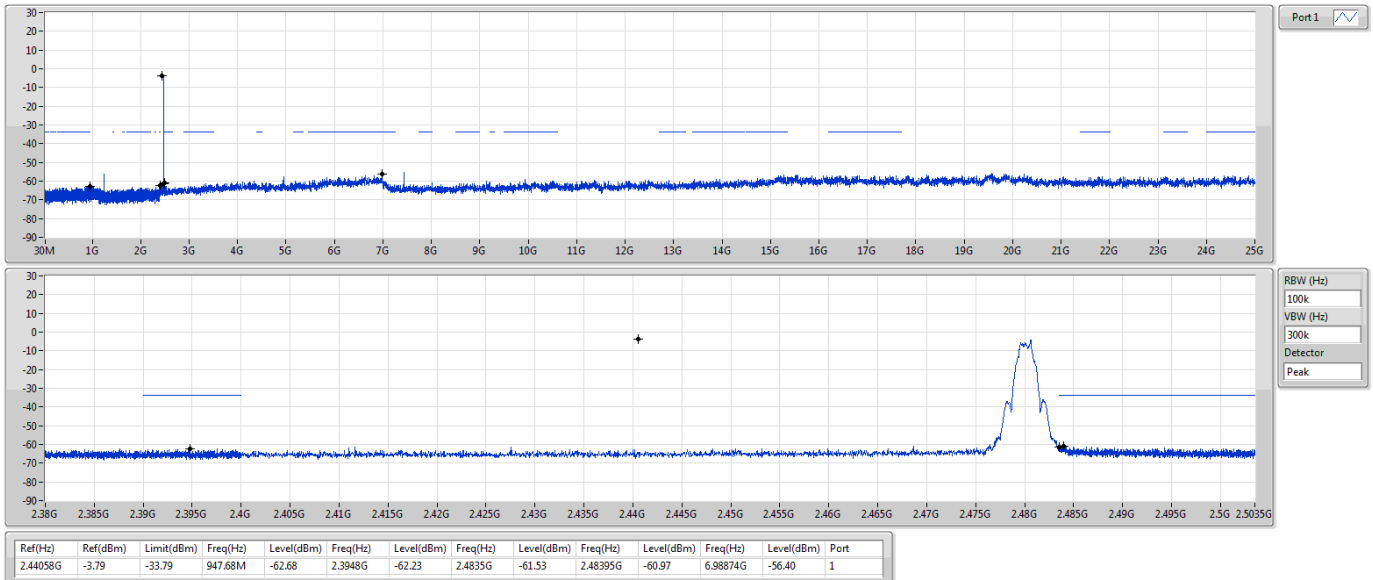


BT-LE(2Mbps)

2480MHz

CSE NdB

22/06/2020





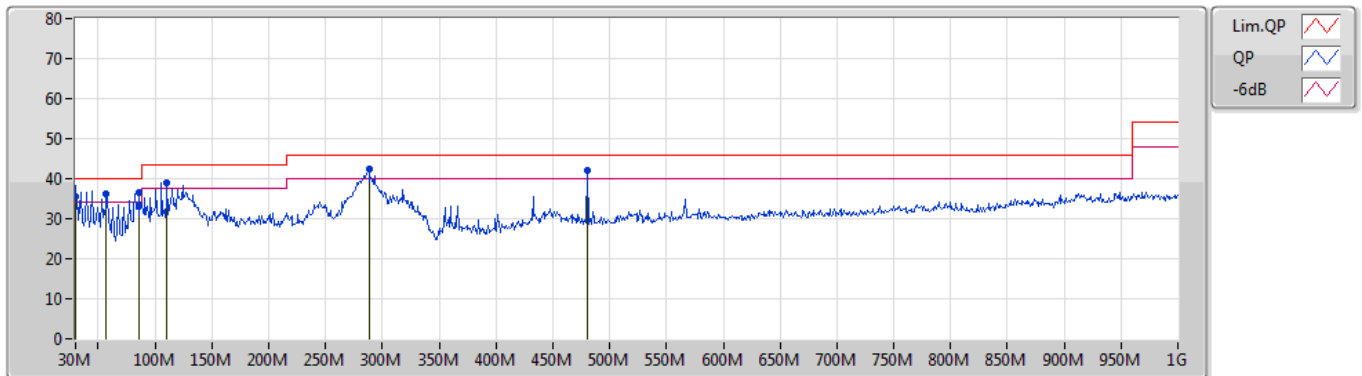
Radiated Emissions below 1GHz

Appendix F.1

Summary

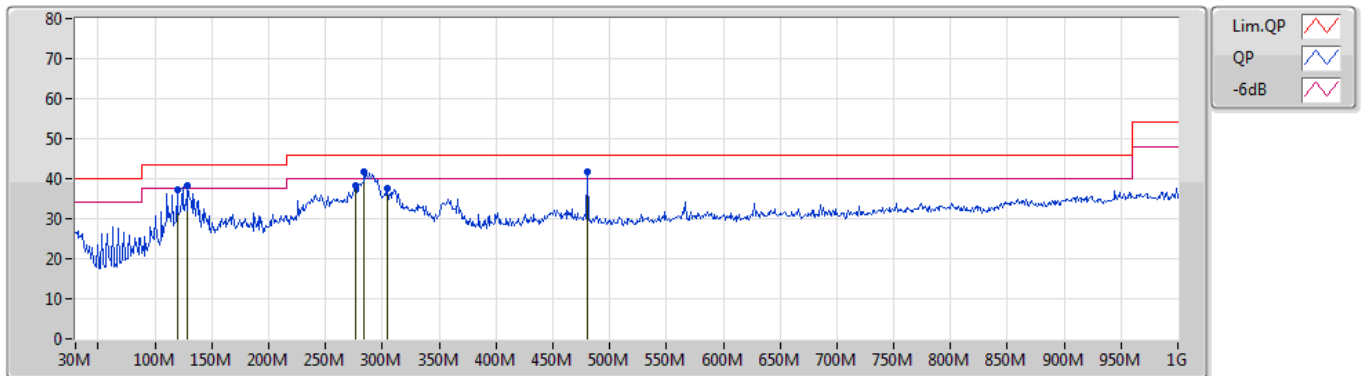
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 2	Pass	PK	86.26M	36.39	40.00	-3.61	Vertical

23/06/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)
QP	30M	35.68	40.00	-4.32	-6.72	3	Vertical	213	1.00	-	42.40	24.21	1.50	32.43
PK	57.16M	36.09	40.00	-3.91	-18.71	3	Vertical	179	1.00	-	54.80	12.37	1.54	32.62
PK	86.26M	36.39	40.00	-3.61	-16.75	3	Vertical	255	1.00	"Worst"	53.14	13.94	1.93	32.62
PK	110.51M	39.03	43.50	-4.47	-12.81	3	Vertical	264	1.00	-	51.84	17.56	2.21	32.58
PK	288.02M	42.29	46.00	-3.71	-10.03	3	Vertical	177	1.00	-	52.32	18.96	3.50	32.49
PK	480.08M	41.96	46.00	-4.04	-4.56	3	Vertical	15	1.25	-	46.52	23.28	4.48	32.32

23/06/2020



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	119.24M	37.20	43.50	-6.30	-12.39	3	Horizontal	269	3.00	-	49.59	17.99	2.29	32.67
PK	128.94M	38.32	43.50	-5.18	-12.36	3	Horizontal	239	1.50	-	50.68	17.85	2.34	32.55
PK	276.38M	38.28	46.00	-7.72	-10.19	3	Horizontal	103	1.00	-	48.47	18.90	3.41	32.50
PK	284.14M	41.62	46.00	-4.38	-10.14	3	Horizontal	0	1.25	-	51.76	18.89	3.47	32.50
PK	304.51M	37.57	46.00	-8.43	-9.57	3	Horizontal	256	1.25	-	47.14	19.29	3.62	32.48
PK	480.08M	41.83	46.00	-4.17	-4.56	3	Horizontal	231	3.00	"Worst"	46.39	23.28	4.48	32.32



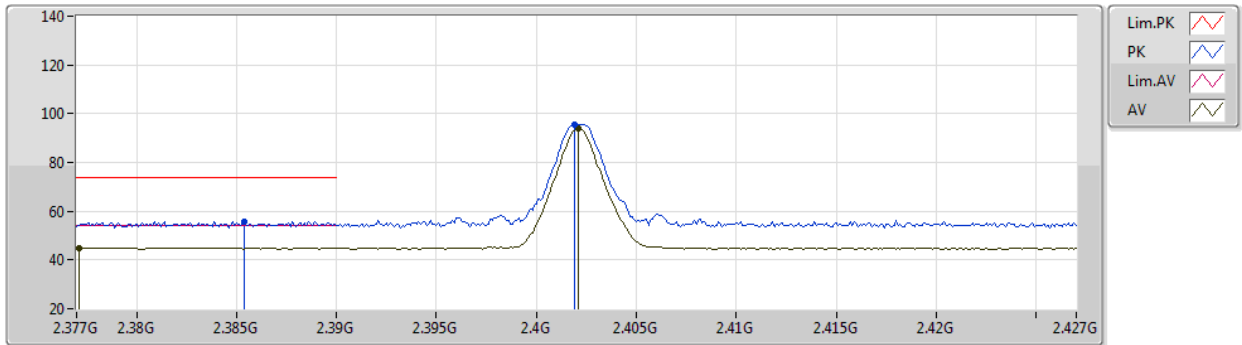
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	12.00942G	47.91	54.00	-6.09	3	Horizontal	58	1.05	-

BT-LE(1Mbps)

2402MHz_TX

11/06/2020



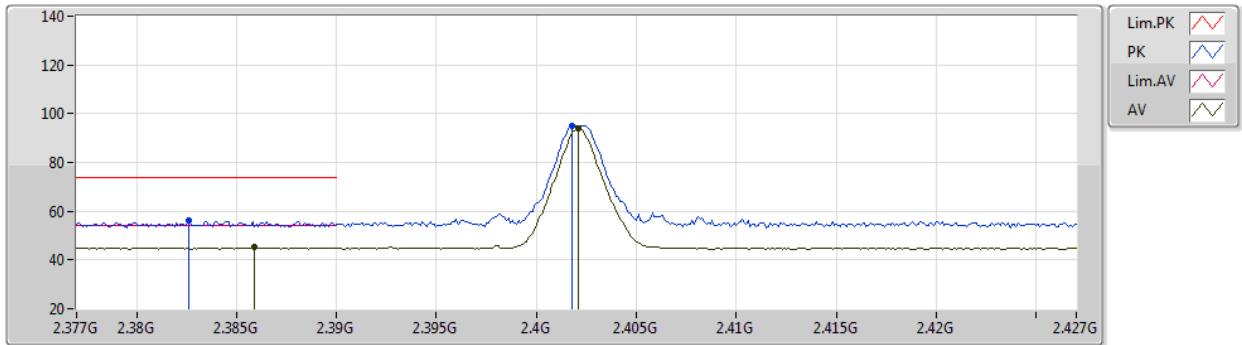
EUT Z_1TX
Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3854G	55.88	74.00	-18.12	24.25	3	Vertical	135	3.00	-	27.64	3.99	-
AV	2.3771G	44.98	54.00	-9.02	13.32	3	Vertical	135	3.00	-	27.67	3.99	-
PK	2.4019G	95.39	Inf	-Inf	63.80	3	Vertical	135	3.00	-	27.59	4.00	-
AV	2.4021G	94.07	Inf	-Inf	62.48	3	Vertical	135	3.00	-	27.59	4.00	-

BT-LE(1Mbps)

2402MHz_TX

11/06/2020



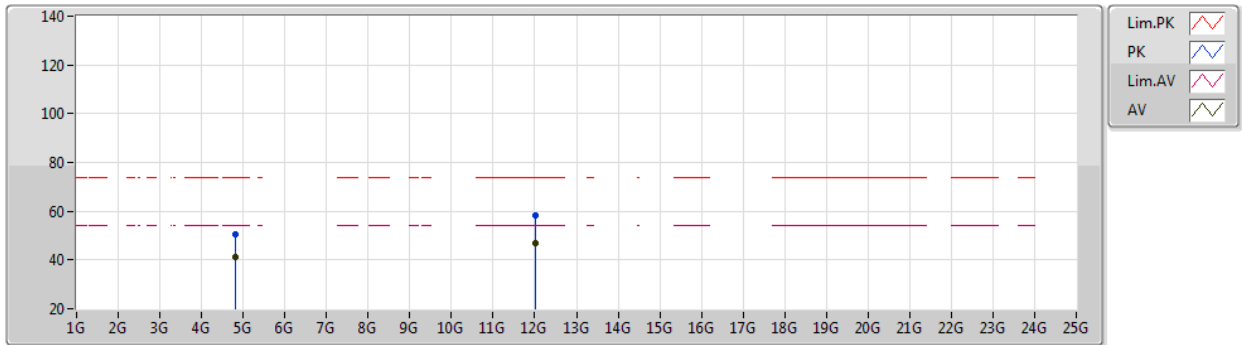
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3826G	56.11	74.00	-17.89	24.47	3	Horizontal	69	1.29	-	27.65	3.99	-
AV	2.3859G	45.12	54.00	-8.88	13.49	3	Horizontal	69	1.29	-	27.64	3.99	-
PK	2.4018G	95.23	Inf	-Inf	63.64	3	Horizontal	69	1.29	-	27.59	4.00	-
AV	2.4021G	93.87	Inf	-Inf	62.28	3	Horizontal	69	1.29	-	27.59	4.00	-

BT-LE(1Mbps)

2402MHz_TX

11/06/2020



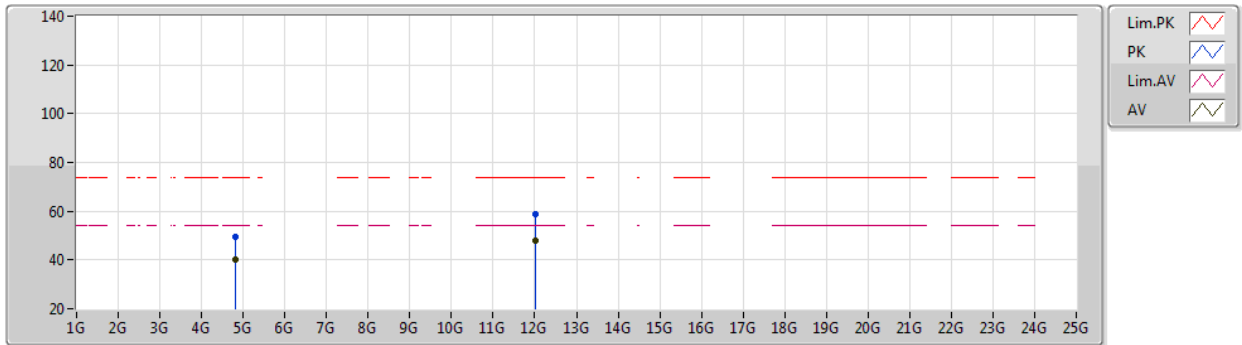
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80374G	50.52	74.00	-23.48	45.89	3	Vertical	162	3.00	-	31.00	5.31	31.68
AV	4.80408G	41.33	54.00	-12.67	36.70	3	Vertical	162	3.00	-	31.00	5.31	31.68
PK	12.01188G	58.29	74.00	-15.71	45.00	3	Vertical	60	1.13	-	38.91	8.30	33.92
AV	12.00938G	46.66	54.00	-7.34	33.37	3	Vertical	60	1.13	-	38.91	8.30	33.92

BT-LE(1Mbps)

11/06/2020

2402MHz_TX



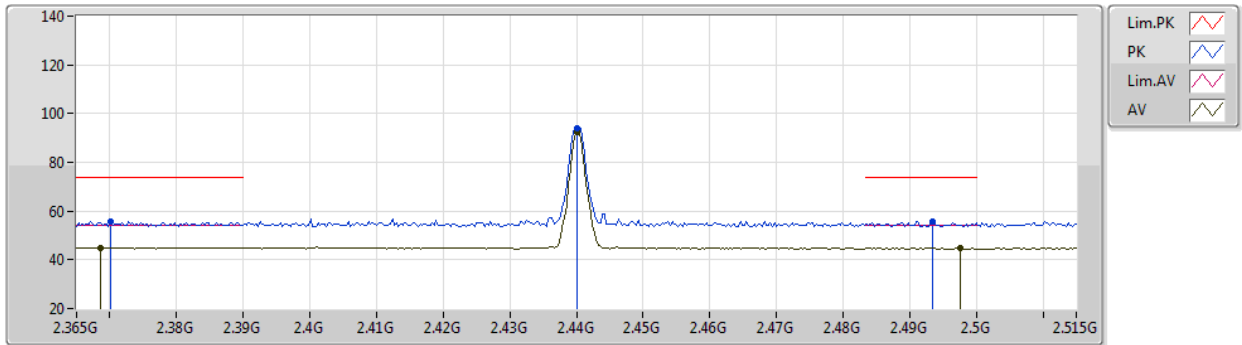
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80371G	49.40	74.00	-24.60	44.77	3	Horizontal	354	1.04	-	31.00	5.31	31.68
AV	4.80395G	39.98	54.00	-14.02	35.35	3	Horizontal	354	1.04	-	31.00	5.31	31.68
PK	12.01166G	58.83	74.00	-15.17	45.54	3	Horizontal	58	1.05	-	38.91	8.30	33.92
AV	12.00942G	47.91	54.00	-6.09	34.62	3	Horizontal	58	1.05	-	38.91	8.30	33.92

BT-LE(1Mbps)

2440MHz_TX

11/06/2020



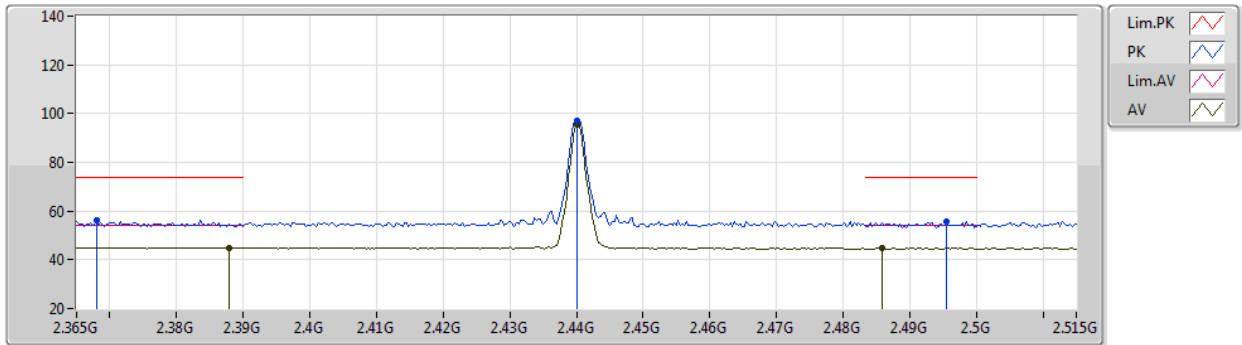
EUT Z_1TX
Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3701G	55.76	74.00	-18.24	24.08	3	Vertical	48	2.08	-	27.69	3.99	-
AV	2.3686G	45.08	54.00	-8.92	13.41	3	Vertical	48	2.08	-	27.69	3.98	-
PK	2.44G	93.95	Inf	-Inf	62.45	3	Vertical	48	2.08	-	27.48	4.02	-
AV	2.44G	92.59	Inf	-Inf	61.09	3	Vertical	48	2.08	-	27.48	4.02	-
PK	2.4934G	55.92	74.00	-18.08	24.55	3	Vertical	48	2.08	-	27.32	4.05	-
AV	2.4976G	44.81	54.00	-9.19	13.45	3	Vertical	48	2.08	-	27.31	4.05	-

BT-LE(1Mbps)

2440MHz_TX

11/06/2020



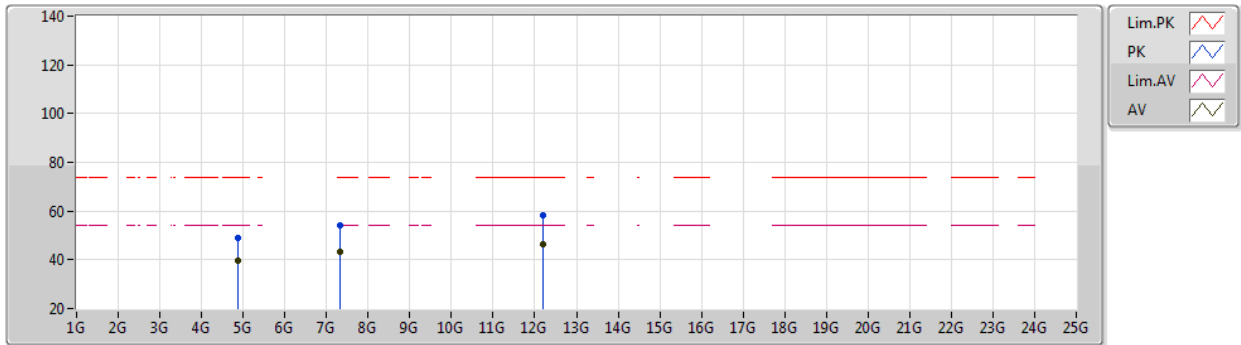
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.368G	56.28	74.00	-17.72	24.60	3	Horizontal	341	1.11	-	27.70	3.98	-
AV	2.3878G	45.03	54.00	-8.97	13.40	3	Horizontal	341	1.11	-	27.64	3.99	-
PK	2.44G	96.96	Inf	-Inf	65.46	3	Horizontal	341	1.11	-	27.48	4.02	-
AV	2.44G	95.61	Inf	-Inf	64.11	3	Horizontal	341	1.11	-	27.48	4.02	-
PK	2.4955G	55.82	74.00	-18.18	24.46	3	Horizontal	341	1.11	-	27.31	4.05	-
AV	2.4859G	44.84	54.00	-9.16	13.46	3	Horizontal	341	1.11	-	27.34	4.04	-

BT-LE(1Mbps)

2440MHz_TX

11/06/2020



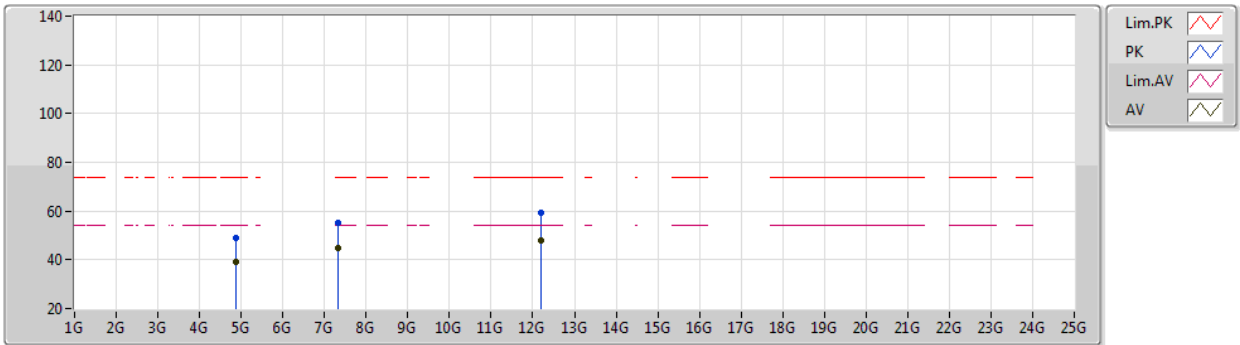
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88061G	49.15	74.00	-24.85	44.29	3	Vertical	54	2.06	-	31.08	5.41	31.63
AV	4.87985G	39.67	54.00	-14.33	34.81	3	Vertical	54	2.06	-	31.08	5.41	31.63
PK	7.32109G	54.19	74.00	-19.81	43.75	3	Vertical	37	2.78	-	36.40	6.96	32.92
AV	7.31949G	43.02	54.00	-10.98	32.58	3	Vertical	37	2.78	-	36.40	6.96	32.92
PK	12.20179G	58.04	74.00	-15.96	44.52	3	Vertical	57	2.30	-	39.02	8.36	33.86
AV	12.19931G	46.14	54.00	-7.86	32.62	3	Vertical	57	2.30	-	39.02	8.36	33.86

BT-LE(1Mbps)

2440MHz_TX

11/06/2020



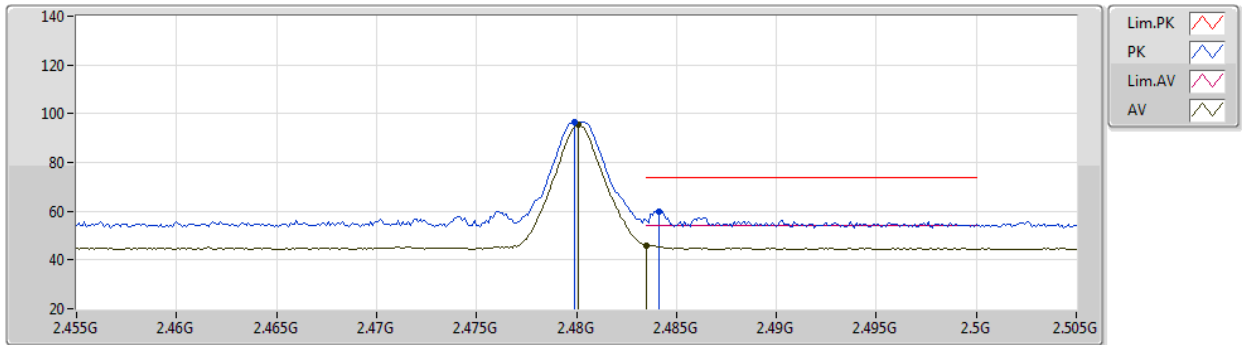
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88006G	48.90	74.00	-25.10	44.04	3	Horizontal	5	1.00	-	31.08	5.41	31.63
AV	4.88008G	39.06	54.00	-14.94	34.20	3	Horizontal	5	1.00	-	31.08	5.41	31.63
PK	7.32101G	55.36	74.00	-18.64	44.92	3	Horizontal	312	1.01	-	36.40	6.96	32.92
AV	7.31961G	44.66	54.00	-9.34	34.22	3	Horizontal	312	1.01	-	36.40	6.96	32.92
PK	12.19938G	59.41	74.00	-14.59	45.89	3	Horizontal	33	1.03	-	39.02	8.36	33.86
AV	12.19932G	47.88	54.00	-6.12	34.36	3	Horizontal	33	1.03	-	39.02	8.36	33.86

BT-LE(1Mbps)

2480MHz_TX

11/06/2020



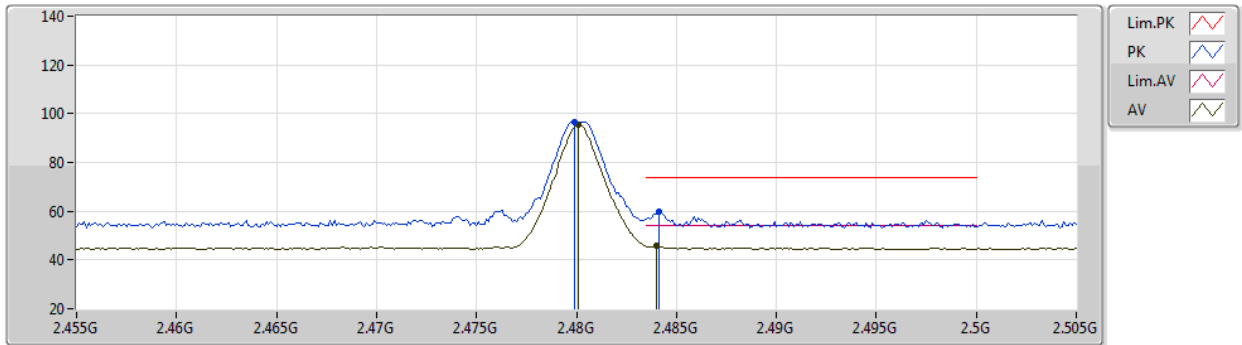
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4799G	96.67	Inf	-Inf	65.27	3	Vertical	203	2.91	-	27.36	4.04	-
AV	2.4801G	95.29	Inf	-Inf	63.89	3	Vertical	203	2.91	-	27.36	4.04	-
PK	2.4841G	60.03	74.00	-13.97	28.64	3	Vertical	203	2.91	-	27.35	4.04	-
AV	2.4835G	45.88	54.00	-8.12	14.49	3	Vertical	203	2.91	-	27.35	4.04	-

BT-LE(1Mbps)

2480MHz_TX

11/06/2020



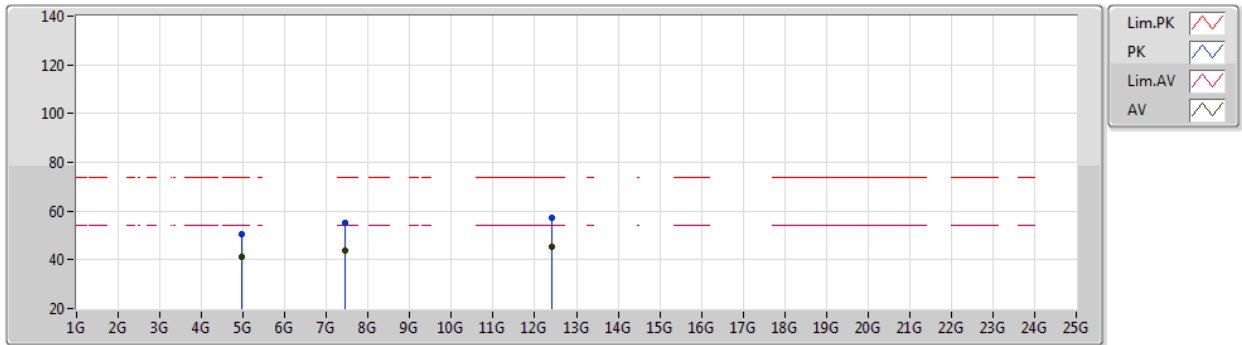
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4799G	96.73	Inf	-Inf	65.33	3	Horizontal	203	2.91	-	27.36	4.04	-
AV	2.4801G	95.40	Inf	-Inf	64.00	3	Horizontal	203	2.91	-	27.36	4.04	-
PK	2.4841G	59.76	74.00	-14.24	28.37	3	Horizontal	203	2.91	-	27.35	4.04	-
AV	2.484G	45.63	54.00	-8.37	14.24	3	Horizontal	203	2.91	-	27.35	4.04	-

BT-LE(1Mbps)

2480MHz_TX

11/06/2020



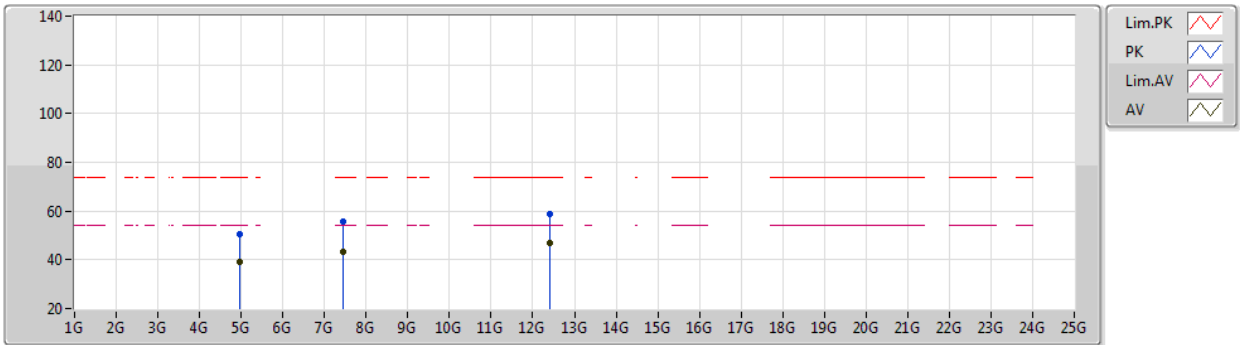
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Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95963G	50.30	74.00	-23.70	45.00	3	Vertical	155	2.69	-	31.34	5.54	31.58
AV	4.95988G	41.46	54.00	-12.54	36.16	3	Vertical	155	2.69	-	31.34	5.54	31.58
PK	7.44058G	54.92	74.00	-19.08	44.43	3	Vertical	196	2.93	-	36.48	7.00	32.99
AV	7.43953G	43.92	54.00	-10.08	33.43	3	Vertical	196	2.93	-	36.48	7.00	32.99
PK	12.39756G	56.99	74.00	-17.01	43.23	3	Vertical	131	2.68	-	39.14	8.42	33.80
AV	12.39922G	45.19	54.00	-8.81	31.43	3	Vertical	131	2.68	-	39.14	8.42	33.80

BT-LE(1Mbps)

2480MHz_TX

11/06/2020



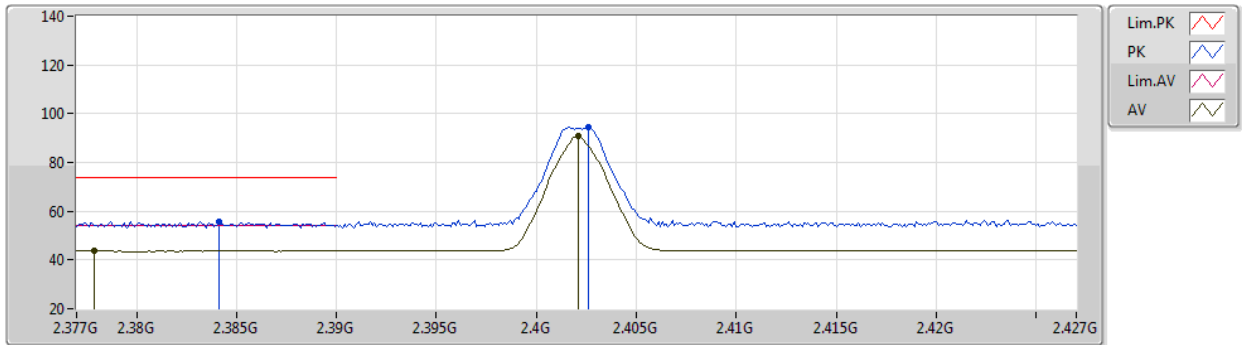
EUT Z_1TX
Setting default
06-F-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95982G	50.30	74.00	-23.70	45.00	3	Horizontal	229	1.96	-	31.34	5.54	31.58
AV	4.96045G	38.92	54.00	-15.08	33.62	3	Horizontal	229	1.96	-	31.34	5.54	31.58
PK	7.43949G	55.60	74.00	-18.40	45.11	3	Horizontal	337	2.86	-	36.48	7.00	32.99
AV	7.4417G	43.09	54.00	-10.91	32.61	3	Horizontal	337	2.86	-	36.48	7.00	33.00
PK	12.39918G	58.76	74.00	-15.24	45.00	3	Horizontal	329	1.01	-	39.14	8.42	33.80
AV	12.39942G	47.02	54.00	-6.98	33.26	3	Horizontal	329	1.01	-	39.14	8.42	33.80

BT-LE(2Mbps)

2402MHz_TX

11/06/2020



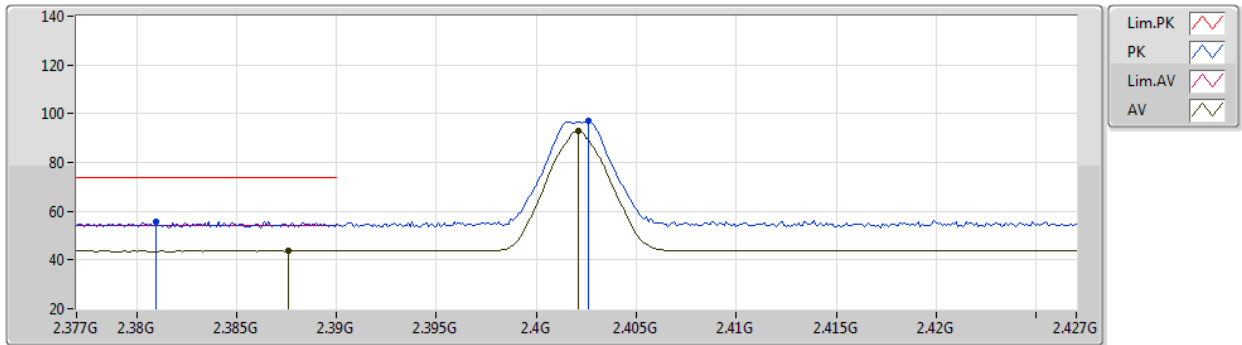
EUT Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3841G	55.92	74.00	-18.08	23.92	3	Vertical	321	2.32	-	28.27	3.73	-
AV	2.3779G	43.58	54.00	-10.42	11.59	3	Vertical	321	2.32	-	28.26	3.73	-
PK	2.4026G	94.40	Inf	-Inf	62.35	3	Vertical	321	2.32	-	28.31	3.74	-
AV	2.4021G	90.64	Inf	-Inf	58.59	3	Vertical	321	2.32	-	28.31	3.74	-

BT-LE(2Mbps)

2402MHz_TX

11/06/2020



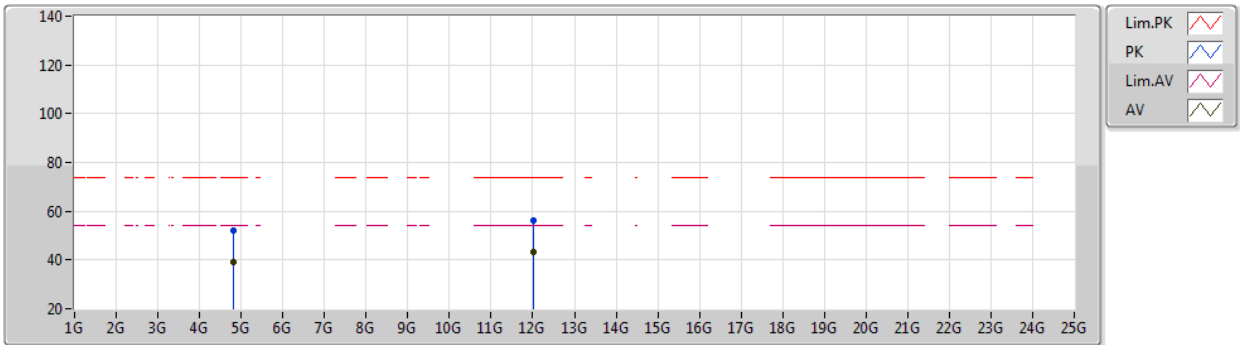
EUT Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.381G	55.84	74.00	-18.16	23.85	3	Horizontal	164	1.68	-	28.26	3.73	-
AV	2.3876G	43.59	54.00	-10.41	11.58	3	Horizontal	164	1.68	-	28.28	3.73	-
PK	2.4026G	96.83	Inf	-Inf	64.78	3	Horizontal	164	1.68	-	28.31	3.74	-
AV	2.4021G	93.06	Inf	-Inf	61.01	3	Horizontal	164	1.68	-	28.31	3.74	-

BT-LE(2Mbps)

11/06/2020

2402MHz_TX



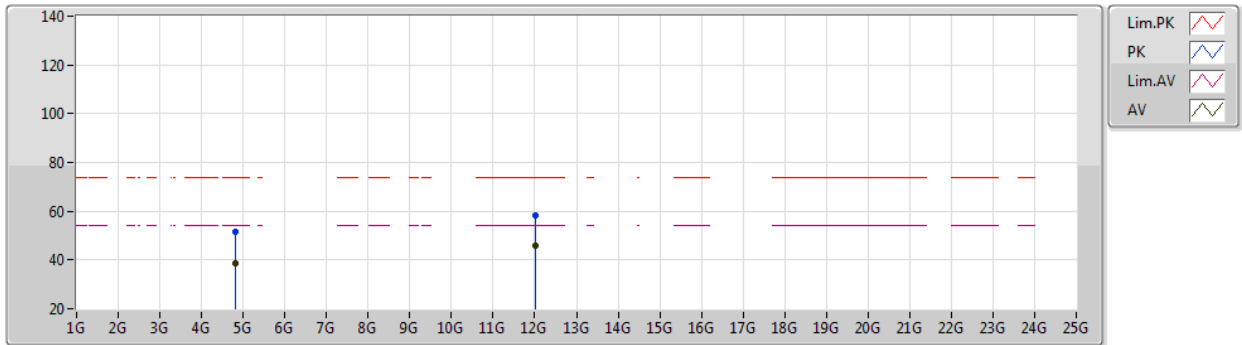
EUT Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.8052G	52.10	74.00	-21.90	46.87	3	Vertical	241	2.92	-	33.51	6.56	34.84
AV	4.80318G	39.15	54.00	-14.85	33.92	3	Vertical	241	2.92	-	33.51	6.56	34.84
PK	12.0079G	56.39	74.00	-17.61	41.72	3	Vertical	322	2.81	-	39.20	10.23	34.76
AV	12.00814G	43.48	54.00	-10.52	28.81	3	Vertical	322	2.81	-	39.20	10.23	34.76

BT-LE(2Mbps)

2402MHz_TX

11/06/2020



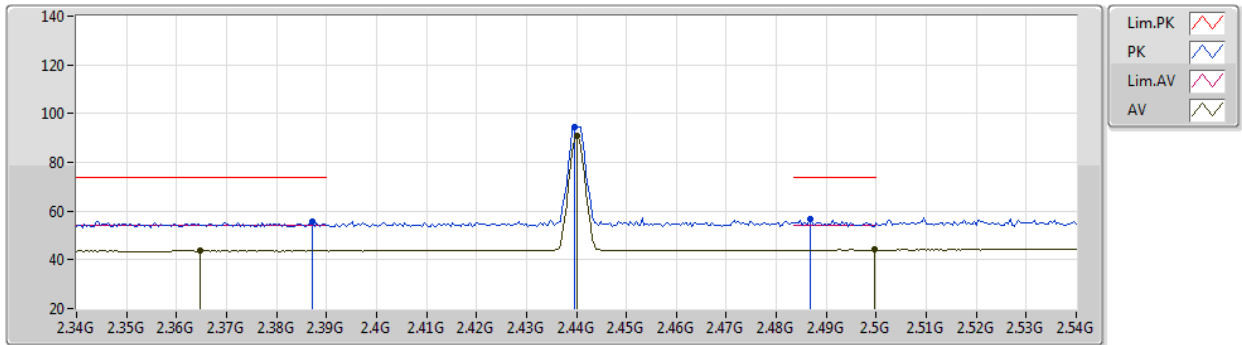
EUT_Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.8031G	51.49	74.00	-22.51	46.26	3	Horizontal	77	1.03	-	33.51	6.56	34.84
AV	4.80322G	38.62	54.00	-15.38	33.39	3	Horizontal	77	1.03	-	33.51	6.56	34.84
PK	12.0079G	58.34	74.00	-15.66	43.67	3	Horizontal	140	1.09	-	39.20	10.23	34.76
AV	12.00814G	45.85	54.00	-8.15	31.18	3	Horizontal	140	1.09	-	39.20	10.23	34.76

BT-LE(2Mbps)

2440MHz_TX

11/06/2020



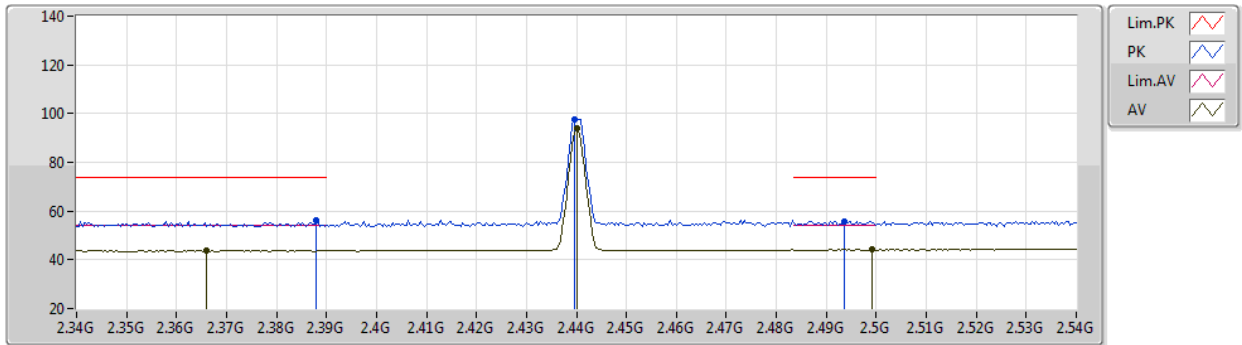
EUT Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3872G	55.79	74.00	-18.21	23.79	3	Vertical	295	2.86	-	28.27	3.73	-
AV	2.3648G	43.65	54.00	-10.35	11.70	3	Vertical	295	2.86	-	28.23	3.72	-
PK	2.4396G	94.70	Inf	-Inf	62.52	3	Vertical	295	2.86	-	28.42	3.76	-
AV	2.44G	90.98	Inf	-Inf	58.80	3	Vertical	295	2.86	-	28.42	3.76	-
PK	2.4868G	56.70	74.00	-17.30	24.35	3	Vertical	295	2.86	-	28.56	3.79	-
AV	2.4996G	44.15	54.00	-9.85	11.75	3	Vertical	295	2.86	-	28.60	3.80	-

BT-LE(2Mbps)

2440MHz_TX

11/06/2020



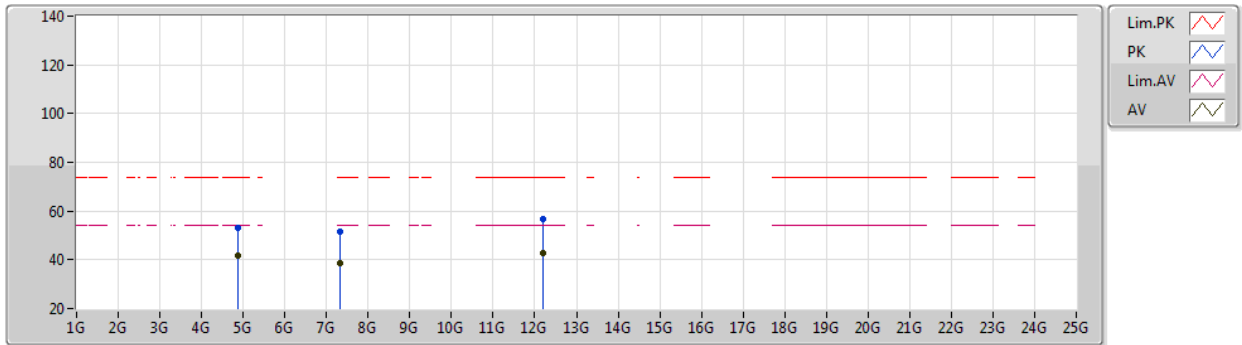
EUT Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.388G	56.05	74.00	-17.95	24.04	3	Horizontal	51	1.00	-	28.28	3.73	-
AV	2.366G	43.66	54.00	-10.34	11.71	3	Horizontal	51	1.00	-	28.23	3.72	-
PK	2.4396G	97.53	Inf	-Inf	65.35	3	Horizontal	51	1.00	-	28.42	3.76	-
AV	2.44G	93.81	Inf	-Inf	61.63	3	Horizontal	51	1.00	-	28.42	3.76	-
PK	2.4936G	55.81	74.00	-18.19	23.43	3	Horizontal	51	1.00	-	28.58	3.80	-
AV	2.4992G	44.16	54.00	-9.84	11.76	3	Horizontal	51	1.00	-	28.60	3.80	-

BT-LE(2Mbps)

2440MHz_TX

11/06/2020



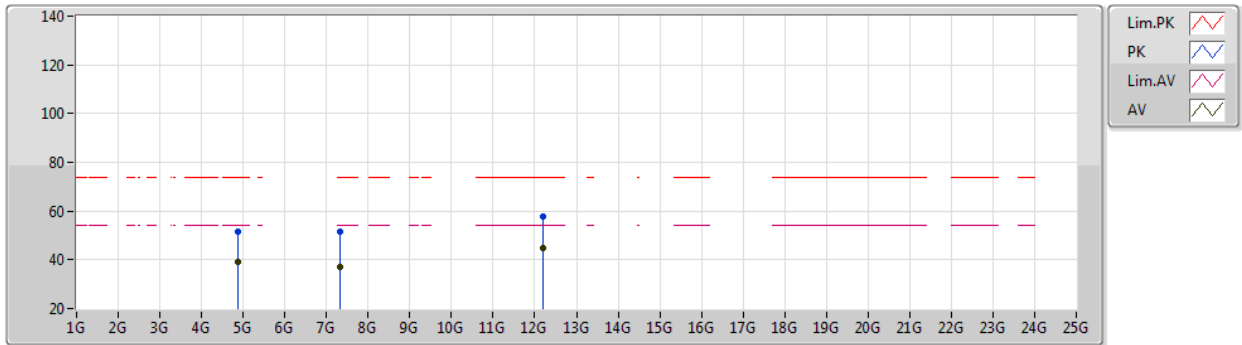
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Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88117G	53.00	74.00	-21.00	47.54	3	Vertical	239	2.82	-	33.66	6.58	34.78
AV	4.87918G	41.52	54.00	-12.48	36.06	3	Vertical	239	2.82	-	33.66	6.58	34.78
PK	7.32168G	51.69	74.00	-22.31	42.06	3	Vertical	193	3.00	-	36.82	7.87	35.06
AV	7.3191G	38.46	54.00	-15.54	28.83	3	Vertical	193	3.00	-	36.82	7.87	35.06
PK	12.20084G	56.81	74.00	-17.19	41.78	3	Vertical	360	2.53	-	39.24	10.31	34.52
AV	12.20288G	42.56	54.00	-11.44	27.53	3	Vertical	360	2.53	-	39.24	10.31	34.52

BT-LE(2Mbps)

2440MHz_TX

11/06/2020



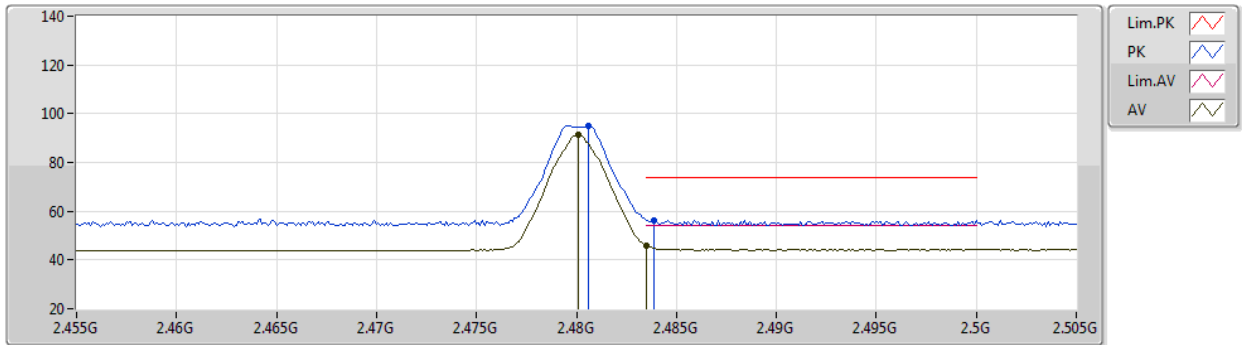
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03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88126G	51.54	74.00	-22.46	46.07	3	Horizontal	89	1.10	-	33.66	6.58	34.77
AV	4.88114G	39.37	54.00	-14.63	33.91	3	Horizontal	89	1.10	-	33.66	6.58	34.78
PK	7.32834G	51.37	74.00	-22.63	41.72	3	Horizontal	305	2.92	-	36.83	7.88	35.06
AV	7.33344G	37.28	54.00	-16.72	27.63	3	Horizontal	305	2.92	-	36.83	7.88	35.06
PK	12.19778G	57.72	74.00	-16.28	42.70	3	Horizontal	45	1.01	-	39.24	10.31	34.53
AV	12.20282G	44.83	54.00	-9.17	29.80	3	Horizontal	45	1.01	-	39.24	10.31	34.52

BT-LE(2Mbps)

2480MHz_TX

11/06/2020



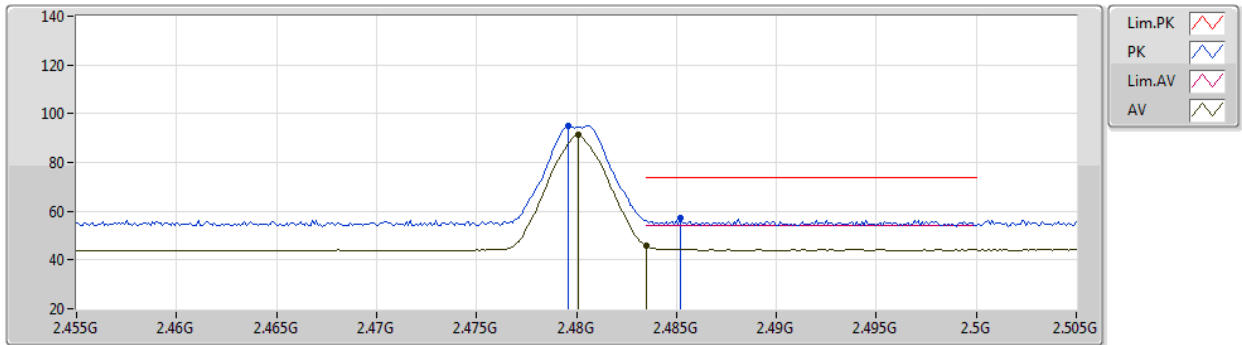
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Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4806G	95.12	Inf	-Inf	62.79	3	Vertical	294	2.80	-	28.54	3.79	-
AV	2.4801G	91.34	Inf	-Inf	59.01	3	Vertical	294	2.80	-	28.54	3.79	-
PK	2.4839G	56.39	74.00	-17.61	24.05	3	Vertical	294	2.80	-	28.55	3.79	-
AV	2.4835G	45.74	54.00	-8.26	13.40	3	Vertical	294	2.80	-	28.55	3.79	-

BT-LE(2Mbps)

2480MHz_TX

11/06/2020



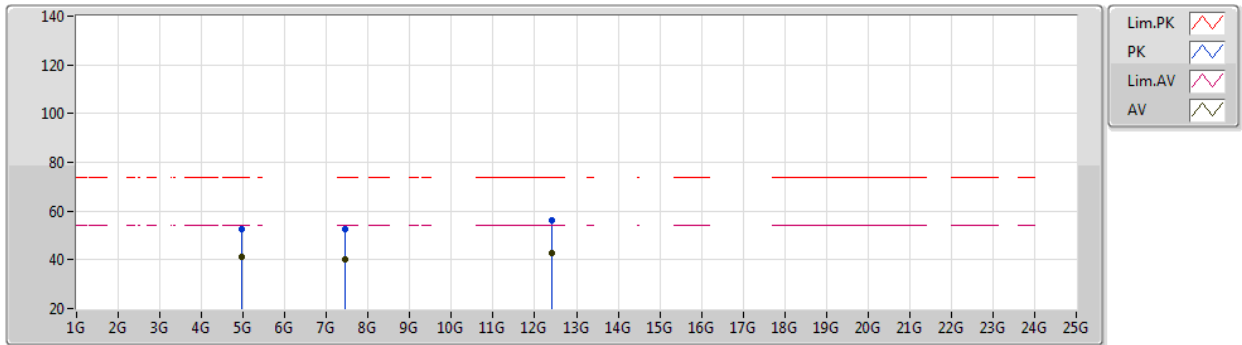
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Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4796G	94.87	Inf	-Inf	62.54	3	Horizontal	156	1.61	-	28.54	3.79	-
AV	2.4801G	91.16	Inf	-Inf	58.83	3	Horizontal	156	1.61	-	28.54	3.79	-
PK	2.4852G	57.04	74.00	-16.96	24.69	3	Horizontal	156	1.61	-	28.56	3.79	-
AV	2.4835G	45.74	54.00	-8.26	13.40	3	Horizontal	156	1.61	-	28.55	3.79	-

BT-LE(2Mbps)

2480MHz_TX

11/06/2020



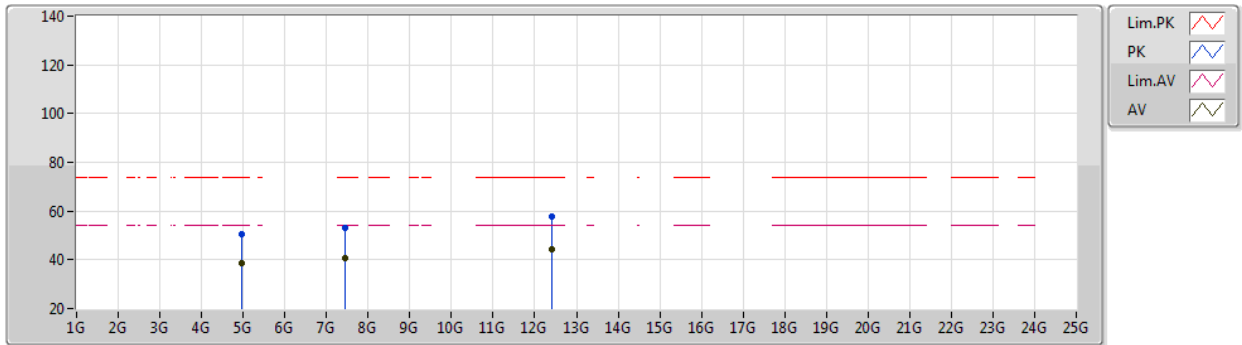
EUT Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.96126G	52.37	74.00	-21.63	46.64	3	Vertical	240	2.89	-	33.82	6.61	34.70
AV	4.95922G	41.34	54.00	-12.66	35.62	3	Vertical	240	2.89	-	33.82	6.61	34.71
PK	7.44162G	52.65	74.00	-21.35	42.95	3	Vertical	272	2.82	-	36.86	7.89	35.05
AV	7.43904G	39.94	54.00	-14.06	30.24	3	Vertical	272	2.82	-	36.86	7.89	35.05
PK	12.4021G	56.17	74.00	-17.83	40.78	3	Vertical	67	2.63	-	39.28	10.39	34.28
AV	12.39814G	42.84	54.00	-11.16	27.45	3	Vertical	67	2.63	-	39.28	10.39	34.28

BT-LE(2Mbps)

2480MHz_TX

11/06/2020



EUT Z_1TX
Setting default
03-A-E-2

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.9591G	50.33	74.00	-23.67	44.61	3	Horizontal	86	1.11	-	33.82	6.61	34.71
AV	4.95916G	38.60	54.00	-15.40	32.88	3	Horizontal	86	1.11	-	33.82	6.61	34.71
PK	7.4388G	52.93	74.00	-21.07	43.23	3	Horizontal	34	1.12	-	36.86	7.89	35.05
AV	7.43904G	40.77	54.00	-13.23	31.07	3	Horizontal	34	1.12	-	36.86	7.89	35.05
PK	12.39814G	57.71	74.00	-16.29	42.32	3	Horizontal	46	1.04	-	39.28	10.39	34.28
AV	12.39814G	44.34	54.00	-9.66	28.95	3	Horizontal	46	1.04	-	39.28	10.39	34.28