Testing Laboratory
3787

RADIO TEST REPORT

FCC ID	:	MSQ-RTAX8300
Equipment	:	AX1800 + AV1300 Dual-band Powerline Mesh WiFi6 Router, ZenWiFi Hybrid Mesh Wi-Fi System
Brand Name	:	ASUS
Model Name	:	XP4, XP4R, XP4 Router
Applicant	:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan
Manufacturer	:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan
Standard	:	47 CFR FCC Part 15.247

The product was received on Dec. 16, 2020, and testing was started from Dec. 17, 2020 and completed on Mar. 08, 2021. We, Sporton International Inc. Hsinchu 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR042147AC	01	Initial issue of report	May 04, 2021

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	-
Reference to Sporton Project No.: 042147-01				

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: Viola Huang

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
2400-2483.5	BT-LE(1Mbps)	1	1

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

1.1.2 Antenna Information

Ant.	2.4GHz Port	5GHz Port	Bluetooth Port	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	2	-	-	Xinsheng	8000000031071341	PCB Antenna	I-PEX	Note 1
2	1	-	-	Xinsheng	8000000031081341	PCB Antenna	I-PEX	
3	-	2	-	Xinsheng	8000000031091341	PCB Antenna	I-PEX	
4	-	1	-	Xinsheng	8000000031101341	PCB Antenna	I-PEX	
5	-	-	1	Xinsheng	8000000031071341	PCB Antenna	I-PEX	

Note1:

Ant.	Gain (dBi)		
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth
1	3.25	-	-
2	3.27	-	-
3	-	3.48	-
4	-	3.41	-
5	-	-	3.25

Note 2: The above information was declared by manufacturer.

For 2.4GHz function:

IEEE 802.11b/g/n/VHT/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

IEEE 802.11a/n/ac/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.642	1.92	423.75u	3k

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

1.1.4 EUT Operational Condition

EUT Power Type	Internal power supply			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	QSPR (Version : 5.0-00195)			
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.

1.1.5 Table for EUT Supports Functions

Function	Support Type
AP Router	Master
Mesh	Master

Note: After evaluating, there is only AP Router was selected to test and record in the report.

1.1.6 Table for Multiple Listing

Equipment Name	Model Name	Description
AX1800 + AV1300 Dual-band Powerline Mesh WiFi6 Router, ZenWiFi Hybrid Mesh Wi-Fi System	XP4, XP4R, XP4 Router	The variation of equipment name/model name is for the strategy of marketing. The circuit of each equipment name/model name is identical.

Note 1: From the above models, model: XP4R was selected as representative model for the test and its data was recorded in this report.
Note 2: 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 Information	
Test Lab.：Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH03-CB	Jeff Wu	22.7~23.2 / 54~57	Jan. 13, 2021~Mar. 05, 2021
Radiated (For below 1GHz test)	03CH01-CB	KJ Chang	21.2~22.8 / 55~57	Dec. 26, 2020~Mar. 08, 2021
Radiated (For above 1GHz test)	03CH04-CB	KJ Chang	22.6~23.6 / 54~57	Dec. 26, 2020~Mar. 08, 2021
	03CH06-CB		21.1~22.5 / 55~57	
AC Conduction	CO02-CB	Wei Li	23~24 / 57~60	Dec. 17, 2020

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 (9kHz ~ 30MHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	5.0 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.9 dB	Confidence levels of 95%
Conducted Emission	2.8 dB	Confidence levels of 95%
Output Power Measurement	1.4 dB	Confidence levels of 95%
Power Density Measurement	2.8 dB	Confidence levels of 95%
Bandwidth Measurement	0.4%	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	8
2440MHz	8
2478MHz	8
2480MHz	4

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	EUT-AP Router + Power cord

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

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	CTX
1	EUT + Power cord_2.4GHz
2	EUT + Power cord_5GHz
3	EUT + Power cord_Bluetooth
For operating mode 1 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
1	EUT + Power cord_Bluetooth

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz + Bluetooth
Refer to Sporton Test Report No.: FA042147 for Co-location RF Exposure Evaluation.	

Note : The EUT can only use Y axis position.

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

Accessories
Power cord*1, non-shielded, 1.5m
RJ-45 cable*1, non-shielded, 1.5m

2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	LAN1 NB	DELL	E6430	N/A
B	2.4G NB	DELL	E6430	N/A
C	5G NB	DELL	E6430	N/A
D	WAN NB	DELL	E6430	N/A
E	Smart phone	Samsung	Galaxy J2	A3LSMJ200F
F	HDD3.0	Transcend	TS1TSJ25A3K	N/A
G	LAN2 NB	DELL	E6430	N/A

For Radiated:

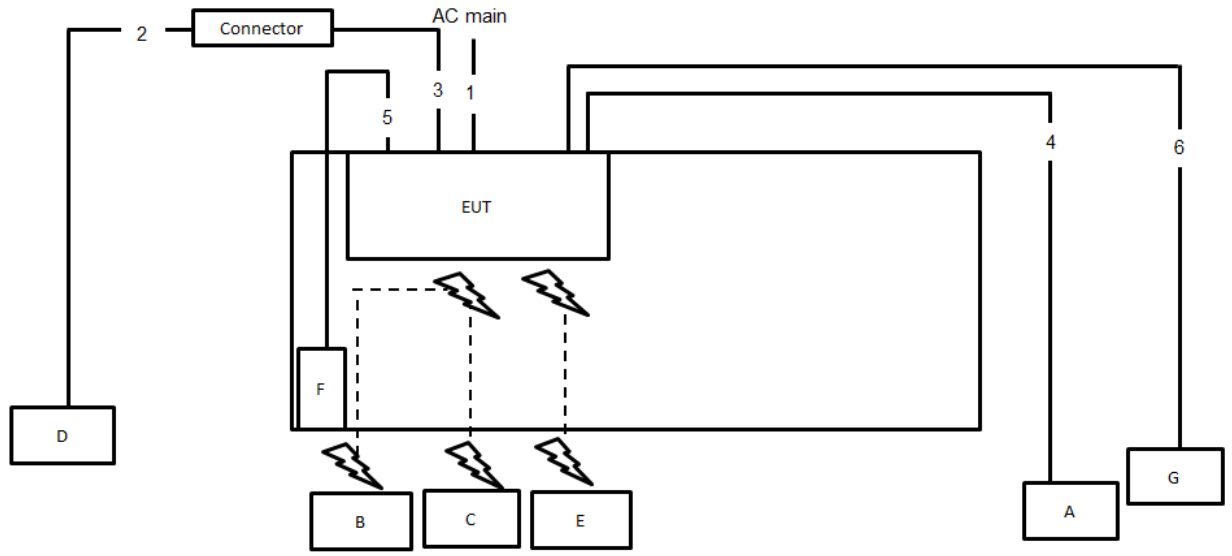
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Notebook	DELL	E4300	N/A

For RF Conducted:

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

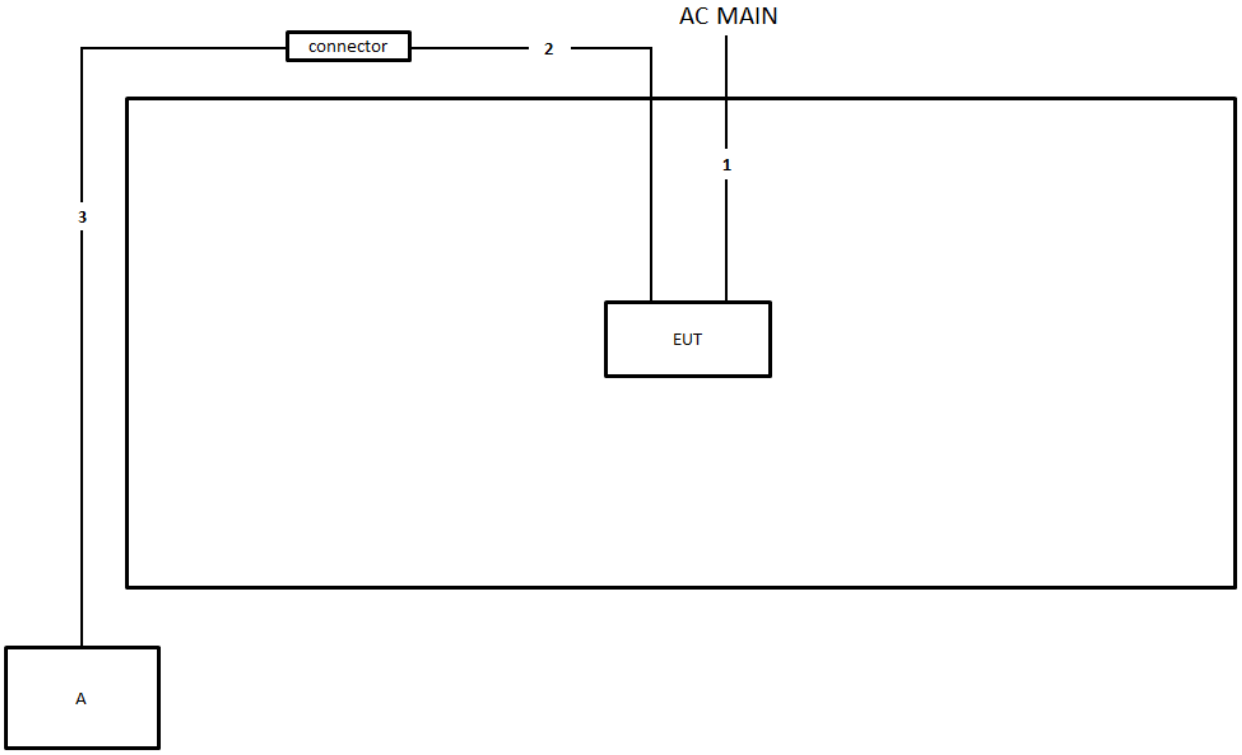
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1.5m
4	RJ-45 cable	No	10m
5	USB cable	Yes	1.8m
6	RJ-45 cable	No	10m

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	1.5m
3	RJ-45 cable	No	10m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

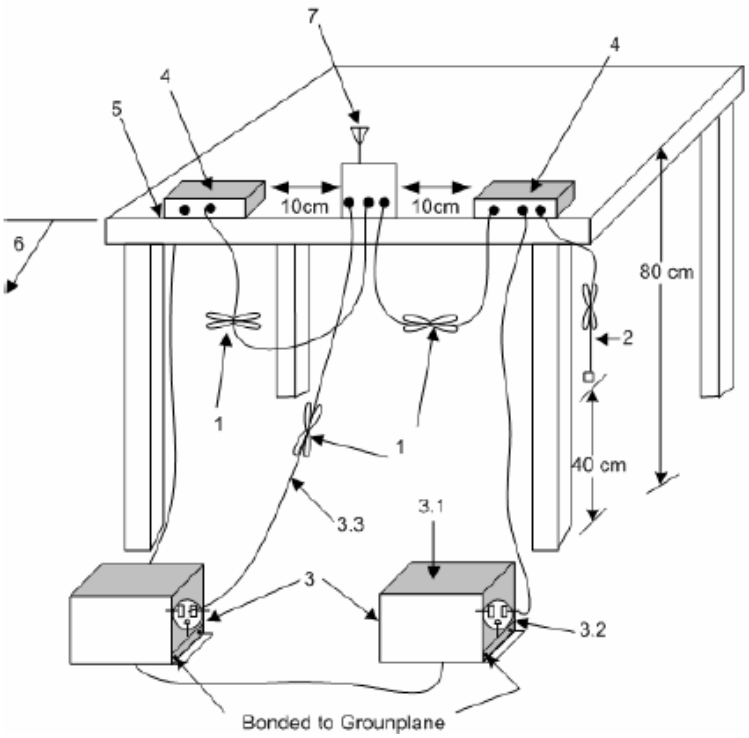
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



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

1.1.1. Measurement Results Calculation

The measured Level is calculated using:

a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level

b. Margin = -Limit + Level

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

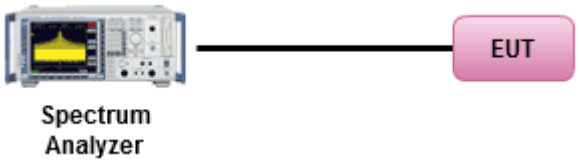
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
	☐ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
	☐ Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

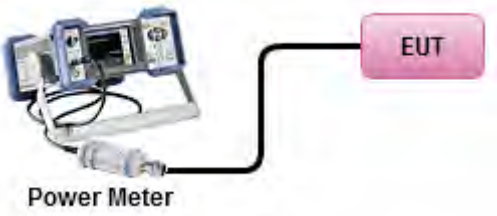
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	☐ Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
▪ Maximum Conducted Output Power	
	[duty cycle ≥ 98% or external video / power trigger]
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
	Measurement using a power meter (PM)
	☐ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
	☒ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)


3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

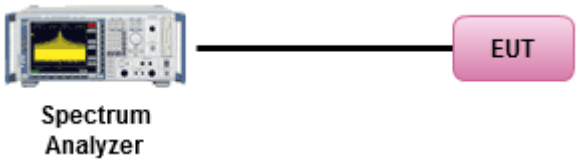
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.	
	[duty cycle ≥ 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

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dBc)**
Peak output power procedure	20
Average output power procedure	30

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

3.5.2 Measuring Instruments

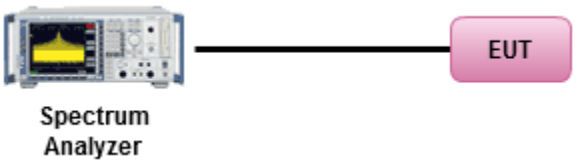
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

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

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.6.2 Measuring Instruments

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

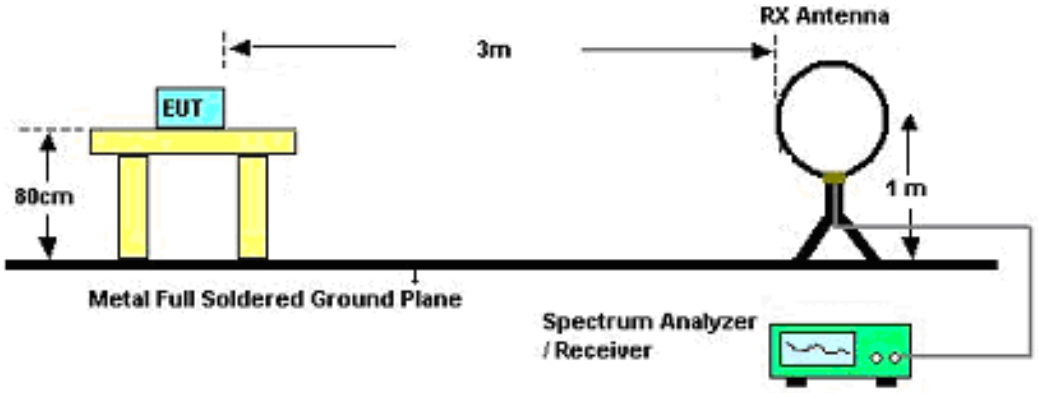
3.6.3 Test Procedures

Test Method
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
▪ For the transmitter unwanted emissions shall be measured using following options below:
▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.
☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).
☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).
☐ Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
☐ Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:
▪ Refer as FCC KDB 558074 clause 8.7 & c63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

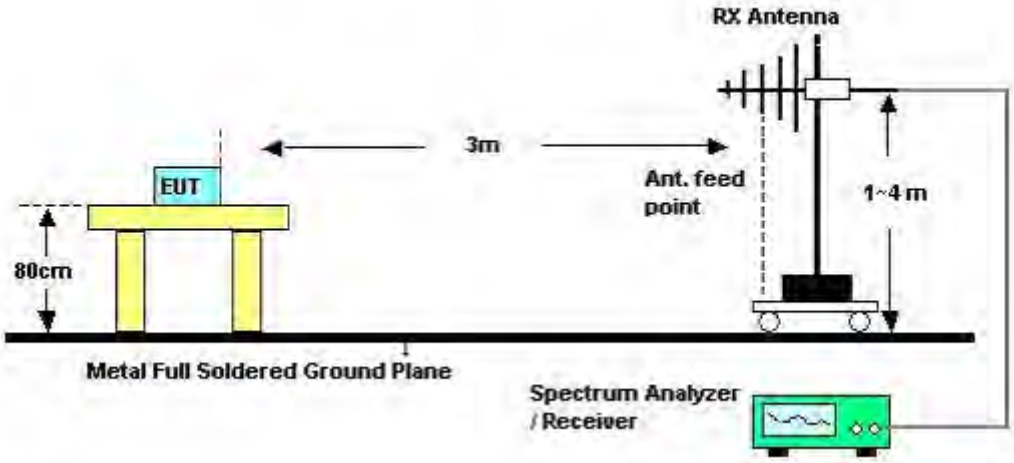
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

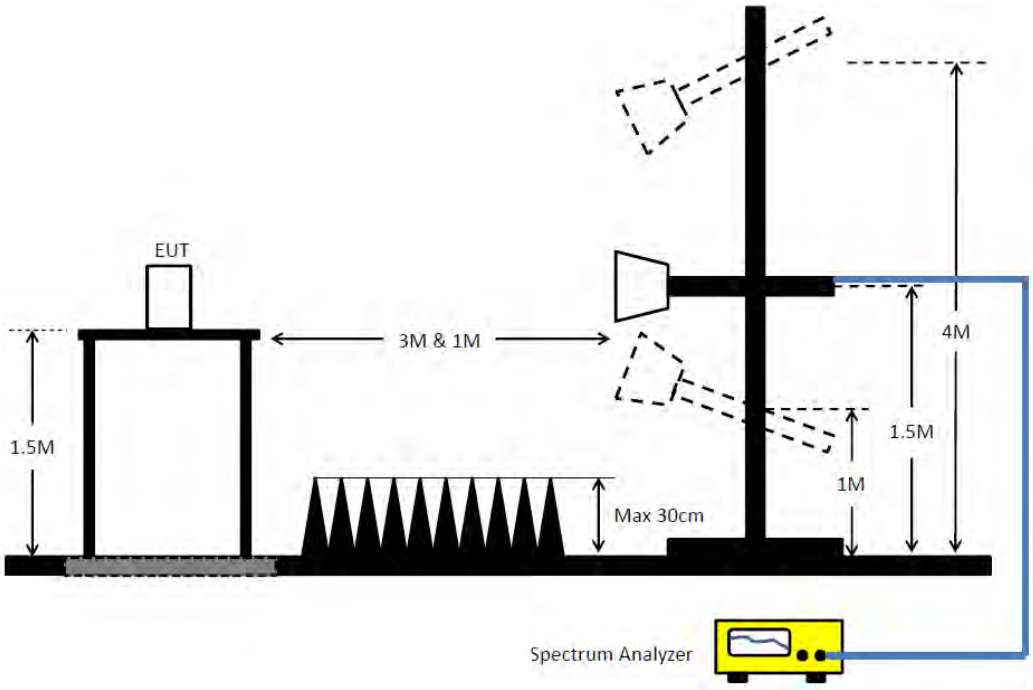
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(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 10th 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	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Dec. 04, 2020	Dec. 03, 2021	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 20, 2020	Nov. 19, 2021	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Mar. 10, 2020	Mar. 09, 2021	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 20, 2020	Oct. 19, 2021	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Mar. 19, 2020	Mar. 18, 2021	Conduction (CO02-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH01-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH01-CB	30 MHz ~ 1 GHz	Jan. 28, 2020	Jan. 27, 2021	Radiation (03CH01-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH01-CB	30 MHz ~ 1 GHz	Jan. 26, 2021	Jan. 25, 2022	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Feb. 28, 2020	Feb. 27, 2021	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Feb. 22, 2021	Feb. 21, 2022	Radiation (03CH01-CB)
Preamplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	Jul. 03, 2020	Jun. 02, 2021	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Apr. 16, 2020	Apr. 15, 2021	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 13, 2020	May 12, 2021	Radiation (03CH01-CB)
RF Cable-low	Woken	RG402	Low Cable-16+17	30 MHz ~ 1 GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH01-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH04-CB	1GHz ~18GHz 3m	Feb. 26, 2020	Feb. 25, 2021	Radiation (03CH04-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH04-CB	1GHz ~18GHz 3m	Feb. 25, 2021	Feb. 24, 2022	Radiation (03CH04-CB)

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Horn Antenna	ETS・Lindgren	3115	00143147	750MHz~18GHz	Oct. 23, 2020	Oct. 22, 2021	Radiation (03CH04-CB)
Horn Antenna	COM-POWER	AH-118	071028	1GHz ~ 18GHz	Jun. 09, 2020	Jun. 08, 2021	Radiation (03CH04-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2020	Jul. 20, 2021	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	83017A	MY53270063	0.5GHz ~ 26.5GHz	Jul. 14, 2020	Jul. 13, 2021	Radiation (03CH04-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 08, 2020	Jul. 07, 2021	Radiation (03CH04-CB)
Signal Analyzer	R&S	FSV40	101904	9kHz~40GHz	Mar 12, 2020	Mar 11, 2021	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Feb. 19, 2021	Feb. 18, 2022	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21	1GHz - 18GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21+67	1GHz - 18GHz	Nov. 05, 2020	Nov. 04, 2021	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH04-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH04-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH06-CB	1GHz ~18GHz 3m	Oct. 02, 2020	Oct. 01, 2021	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Jul. 22, 2020	Jul. 21, 2021	Radiation (03CH06-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2020	Jul. 20, 2021	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 07, 2020	May 06, 2021	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 08, 2020	Jul. 07, 2021	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Dec. 15, 2020	Dec. 14, 2021	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05	1GHz~18GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05+24	1GHz~18GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH06-CB)

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Dec. 31, 2020	Dec. 30, 2021	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1726195	300MHz~40GHz	Aug. 17, 2020	Aug. 16, 2021	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Aug. 17, 2020	Aug. 16, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH03-CB)

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

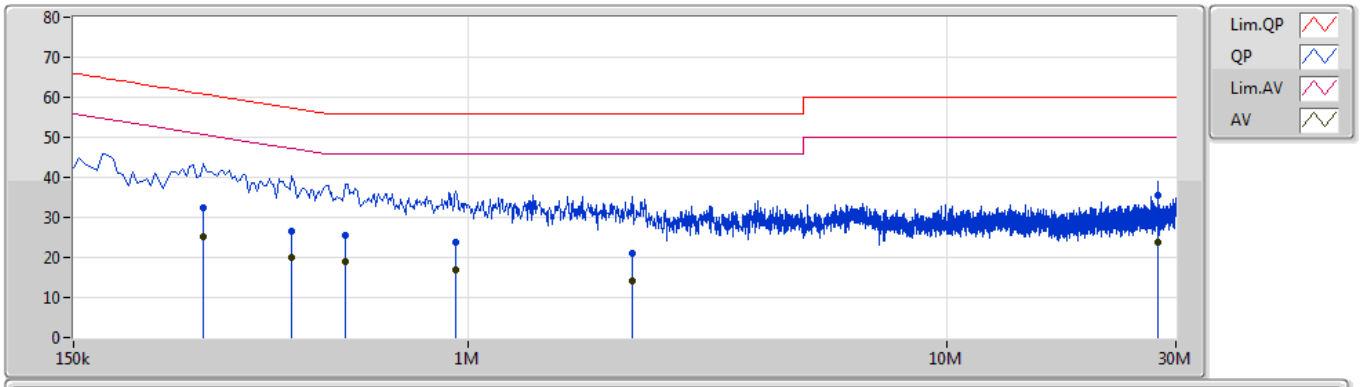
N.C.R. means Non-Calibration required.

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	4.052M	22.54	46.00	-23.46	Neutral

Mode 1

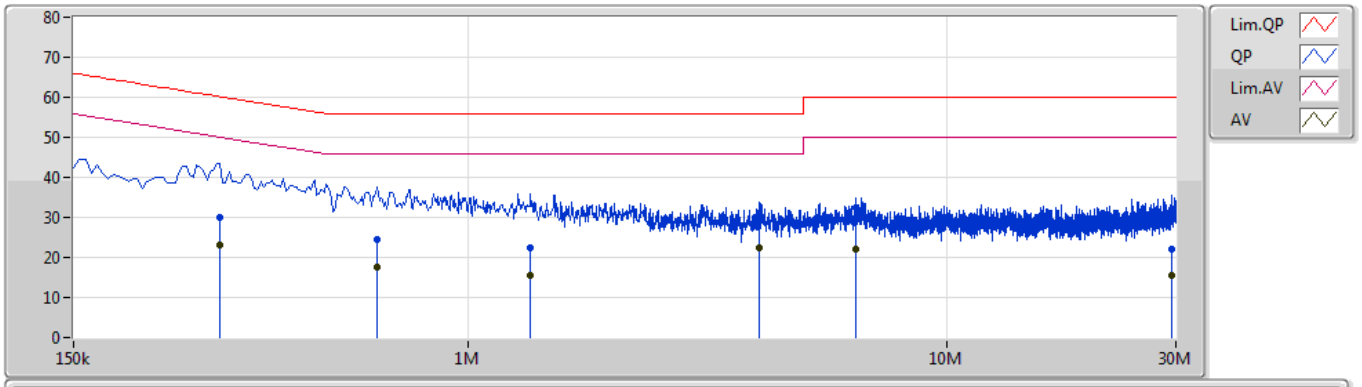
17/12/2020



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	280.5k	32.42	60.80	-28.38	10.24	Line	-	22.18	0.03	0.07	10.14
AV	280.5k	25.26	50.80	-25.54	10.24	Line	-	15.02	0.03	0.07	10.14
QP	429k	26.61	57.28	-30.67	10.19	Line	-	16.42	0.03	0.06	10.10
AV	429k	19.94	47.28	-27.34	10.19	Line	-	9.75	0.03	0.06	10.10
QP	555k	25.65	56.00	-30.35	10.20	Line	-	15.45	0.03	0.07	10.10
AV	555k	19.04	46.00	-26.96	10.20	Line	-	8.84	0.03	0.07	10.10
QP	942k	23.63	56.00	-32.37	10.23	Line	-	13.40	0.04	0.08	10.11
AV	942k	16.79	46.00	-29.21	10.23	Line	-	6.56	0.04	0.08	10.11
QP	2.193M	21.01	56.00	-34.99	10.30	Line	-	10.71	0.06	0.11	10.13
AV	2.193M	13.97	46.00	-32.03	10.30	Line	-	3.67	0.06	0.11	10.13
QP	27.578M	35.46	60.00	-24.54	10.89	Line	"Worst"	24.57	0.40	0.29	10.20
AV	27.578M	23.81	50.00	-26.19	10.89	Line	-	12.92	0.40	0.29	10.20

Mode 1

17/12/2020



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	303k	30.13	60.17	-30.04	10.24	Neutral	-	19.89	0.05	0.06	10.13
AV	303k	23.20	50.17	-26.97	10.24	Neutral	-	12.96	0.05	0.06	10.13
QP	645k	24.40	56.00	-31.60	10.24	Neutral	-	14.16	0.06	0.07	10.11
AV	645k	17.68	46.00	-28.32	10.24	Neutral	-	7.44	0.06	0.07	10.11
QP	1.347M	22.45	56.00	-33.55	10.28	Neutral	-	12.17	0.07	0.09	10.12
AV	1.347M	15.52	46.00	-30.48	10.28	Neutral	-	5.24	0.07	0.09	10.12
QP	4.052M	30.94	56.00	-25.06	10.39	Neutral	-	20.55	0.10	0.14	10.15
AV	4.052M	22.54	46.00	-23.46	10.39	Neutral	"Worst"	12.15	0.10	0.14	10.15
QP	6.432M	32.45	60.00	-27.55	10.48	Neutral	-	21.97	0.14	0.18	10.16
AV	6.432M	22.12	50.00	-27.88	10.48	Neutral	-	11.64	0.14	0.18	10.16
QP	29.391M	22.23	60.00	-37.77	10.80	Neutral	-	11.43	0.30	0.29	10.21
AV	29.391M	15.53	50.00	-34.47	10.80	Neutral	-	4.73	0.30	0.29	10.21

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)	750k	1.049M	1M05F1D	712.5k	1.036M

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;

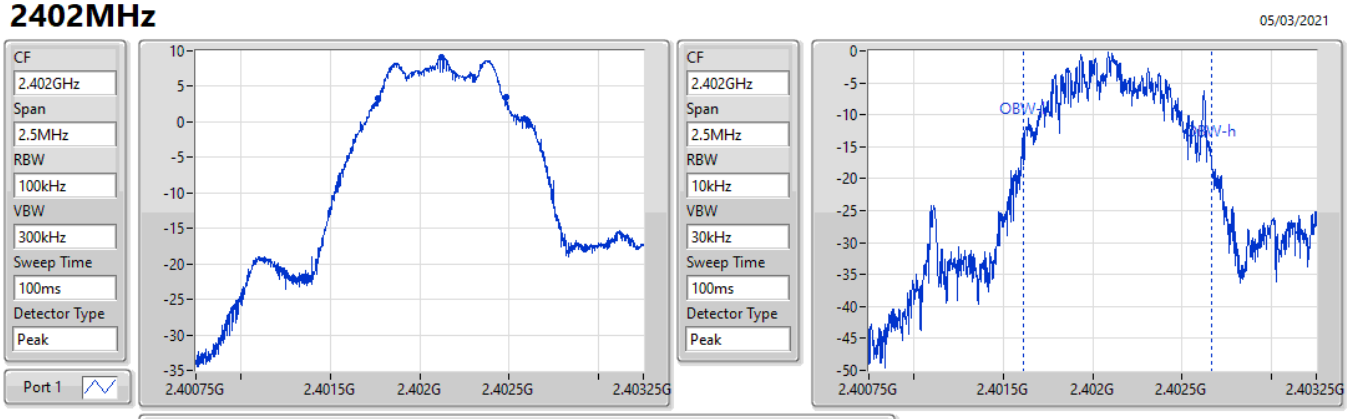
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	721.25k	1.049M
2440MHz	Pass	500k	712.5k	1.04M
2478MHz				
2480MHz	Pass	500k	750k	1.036M

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

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

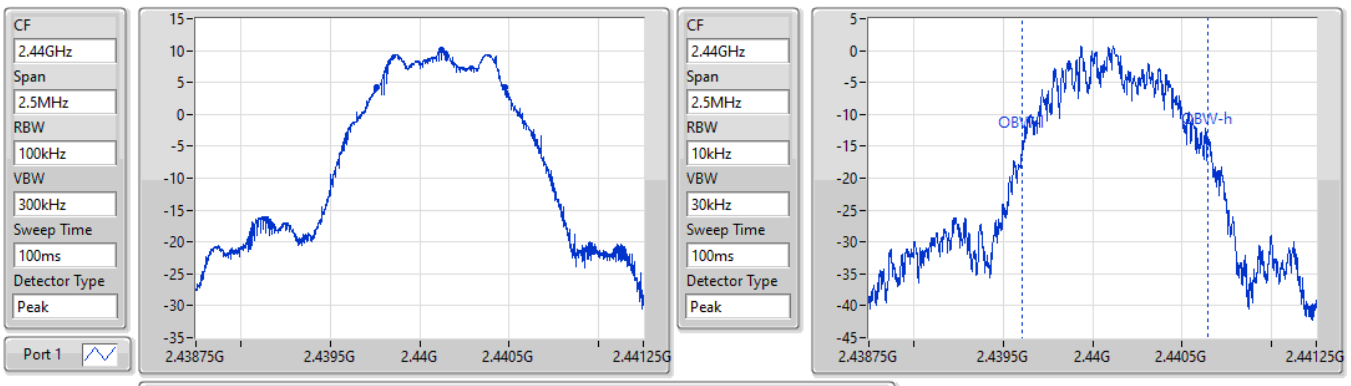
2402MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
721.25k	2.401764G	2.402485G	1.049M	2.401614G	2.402663G	500k	1

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

2440MHz

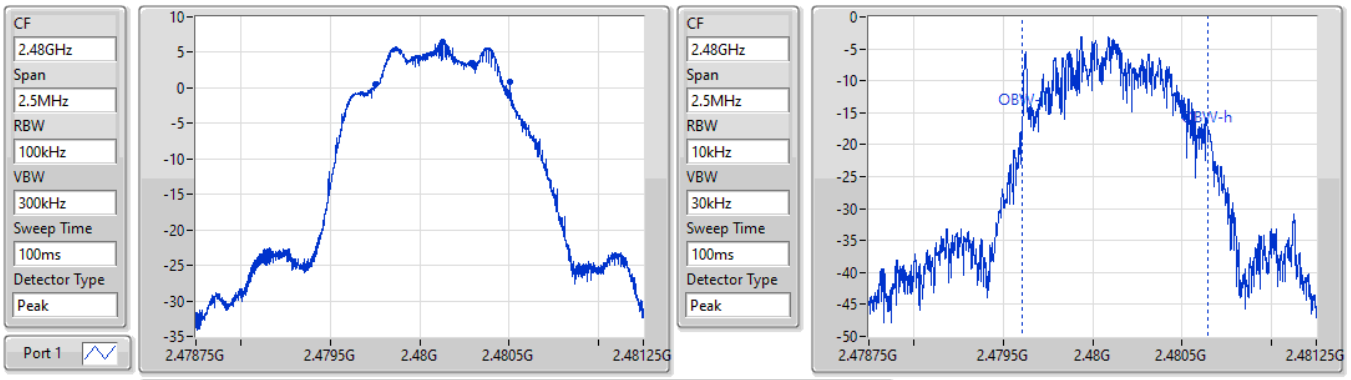


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
712.5k	2.439761G	2.440474G	1.04M	2.439606G	2.440646G	500k	1

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

2480MHz

05/03/2021



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
750k	2.479753G	2.480503G	1.036M	2.479609G	2.480645G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	9.32	0.00855

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.25	8.92	30.00
2440MHz	Pass	3.25	9.32	30.00
2478MHz	Pass	3.25	9.08	30.00
2480MHz	Pass	3.25	5.94	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-5.07

RBW=3 kHz.

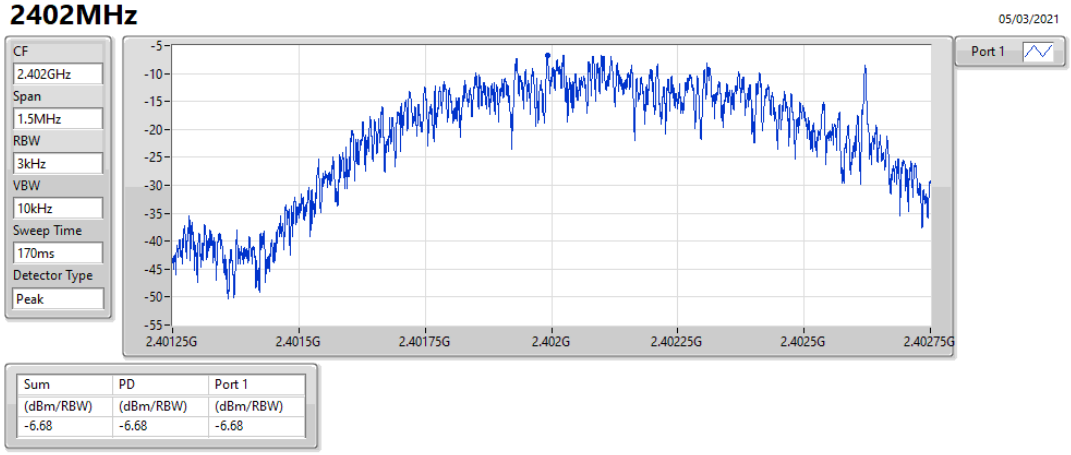
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.25	-6.68	8.00
2440MHz	Pass	3.25	-5.07	8.00
2480MHz	Pass	3.25	-7.70	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**

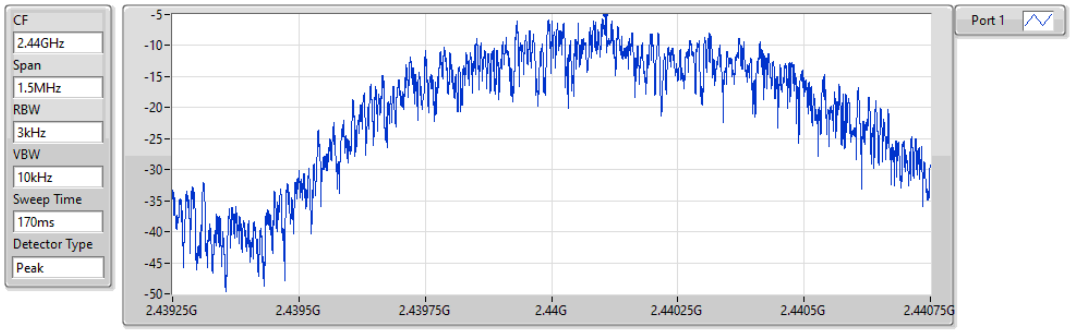
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.68	-6.68	-6.68

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

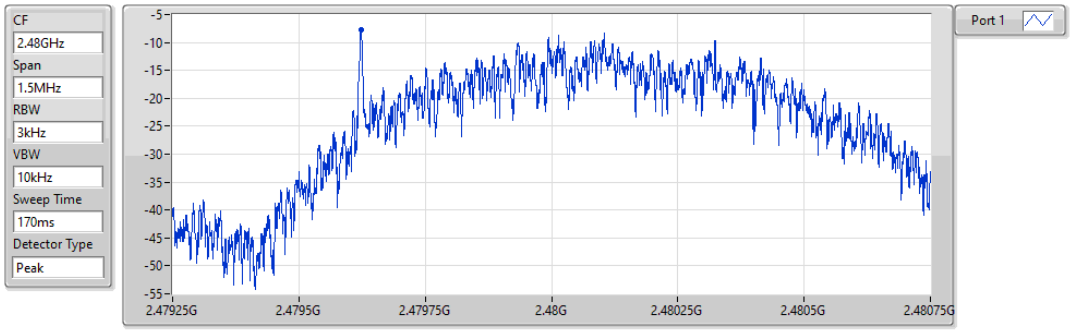
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.07	-5.07	-5.07

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

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.70	-7.70	-7.70

Summary

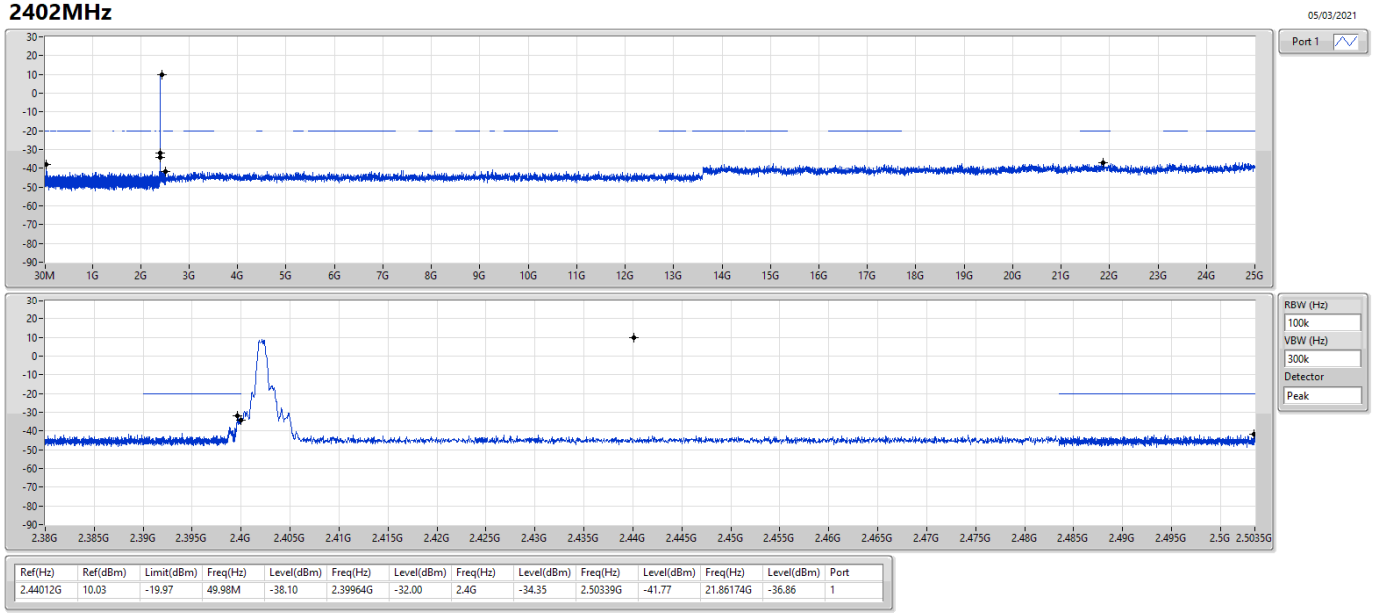
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.44012G	10.03	-19.97	49.98M	-38.10	2.39964G	-32.00	2.4G	-34.35	2.50339G	-41.77	21.86174G	-36.86	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	2.44012G	10.03	-19.97	49.98M	-38.10	2.39964G	-32.00	2.4G	-34.35	2.50339G	-41.77	21.86174G	-36.86	1
2440MHz	Pass	2.44012G	10.03	-19.97	49.98M	-38.69	2.39108G	-42.11	2.4835G	-44.88	2.49758G	-42.09	24.69911G	-36.69	1
2478MHz															
2480MHz	Pass	2.44012G	10.03	-19.97	49.98M	-38.19	2.39504G	-42.06	2.4835G	-44.61	2.48351G	-42.13	21.98547G	-36.77	1

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

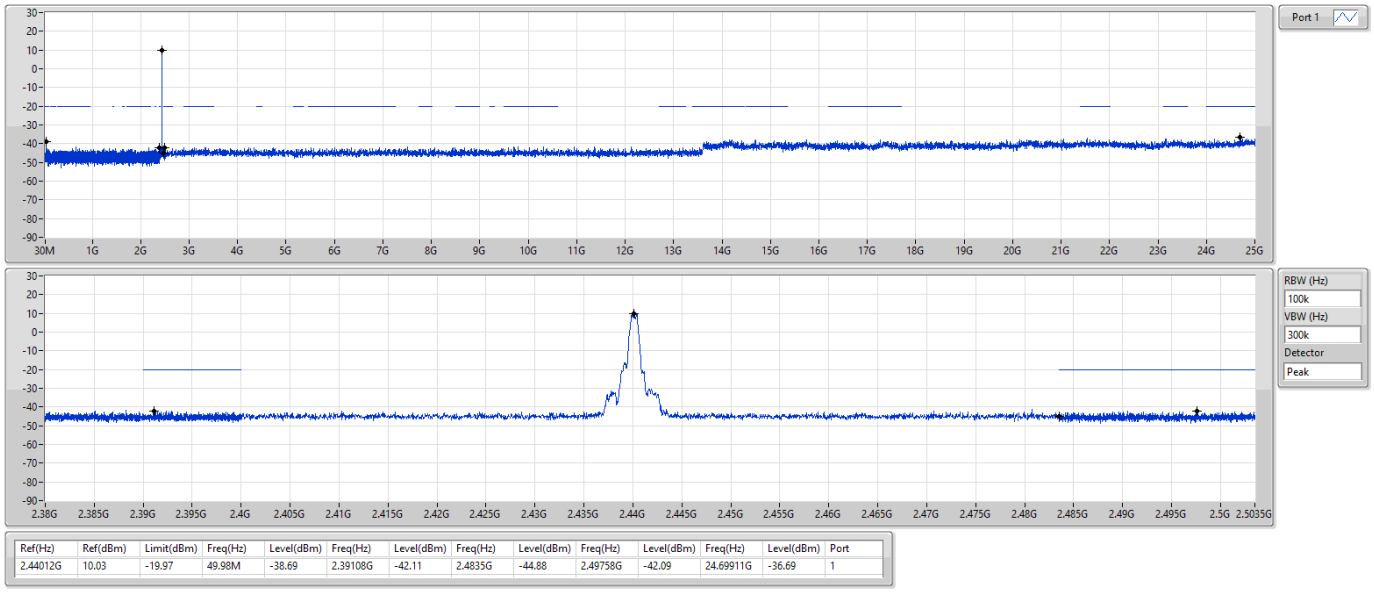
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44012G	10.03	-19.97	49.98M	-38.10	2.39964G	-32.00	2.4G	-34.35	2.50339G	-41.77	21.86174G	-36.86	1

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

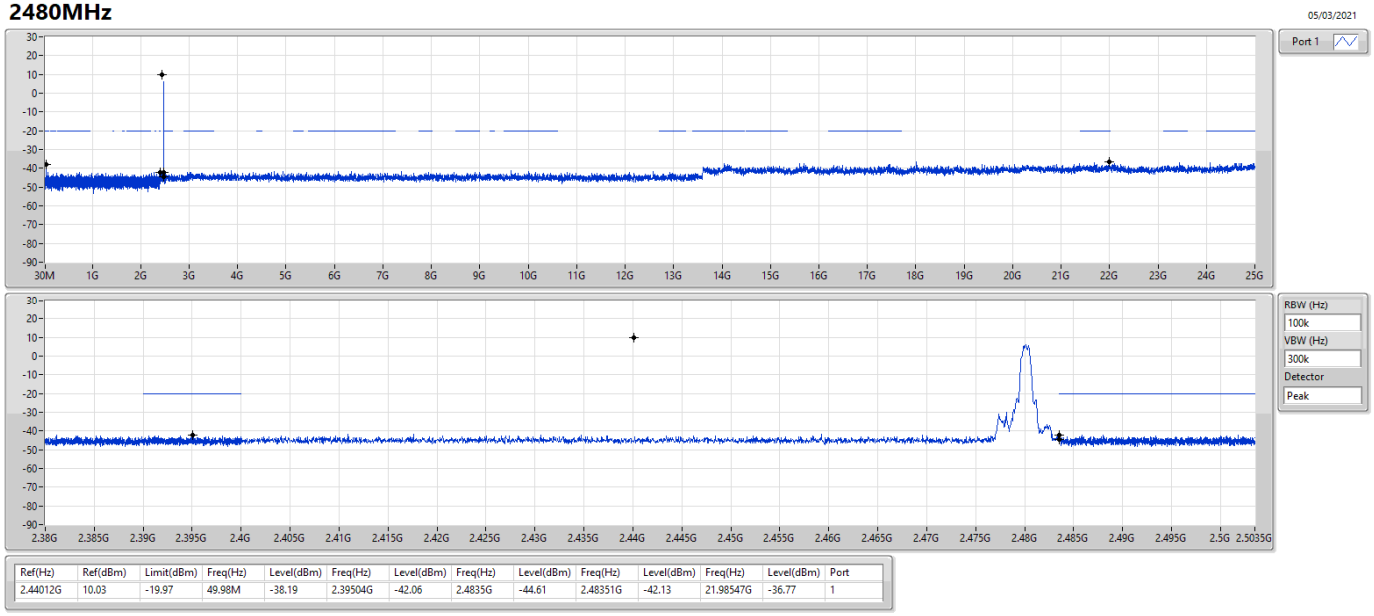
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44012G	10.03	-19.97	49.98M	-38.69	2.39108G	-42.11	2.4835G	-44.88	2.49758G	-42.09	24.69911G	-36.69	1

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

2480MHz



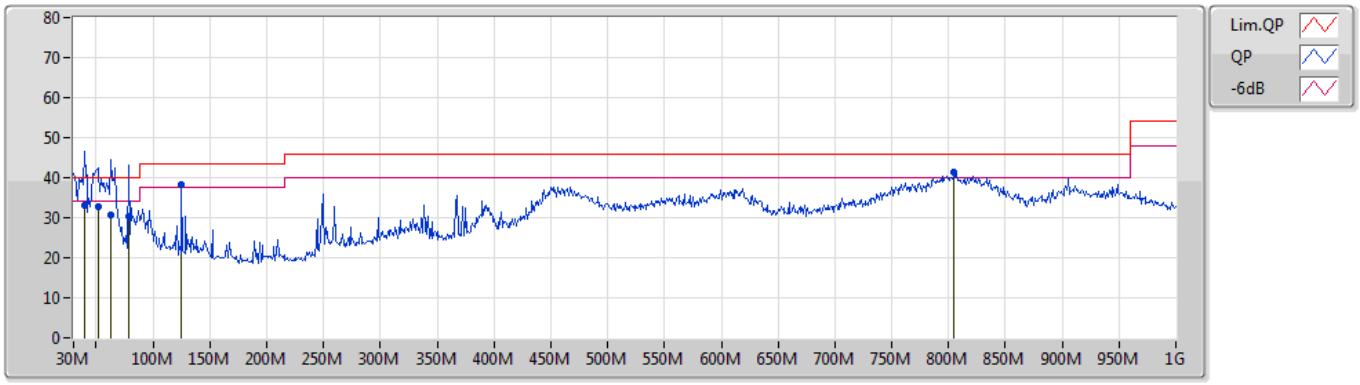
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44012G	10.03	-19.97	49.98M	-38.19	2.39504G	-42.06	2.4835G	-44.61	2.48351G	-42.13	21.98547G	-36.77	1

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	QP	30M	35.98	40.00	-4.02	Horizontal

Mode 1

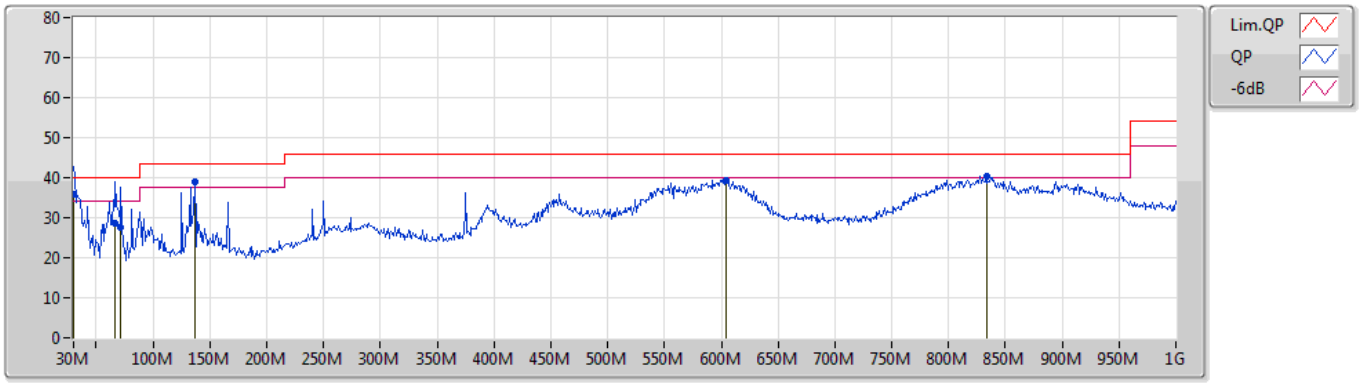
08/03/2021



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	39.7M	33.18	40.00	-6.82	-8.92	3	Vertical	119	1.25	-	42.10	19.27	0.29	28.48
QP	51.34M	32.71	40.00	-7.29	-14.49	3	Vertical	322	1.25	-	47.20	13.60	0.40	28.49
QP	62.98M	30.72	40.00	-9.28	-15.98	3	Vertical	111	1.25	-	46.70	12.00	0.50	28.48
QP	78.5M	30.34	40.00	-9.66	-15.26	3	Vertical	346	1.25	-	45.60	12.62	0.60	28.48
PK	125.06M	38.32	43.50	-5.18	-9.56	3	Vertical	175	1.00	-	47.88	17.83	0.95	28.34
PK	805.03M	41.34	46.00	-4.66	-0.68	3	Vertical	111	1.25	"Worst"	42.02	25.15	3.22	29.05

Mode 1

08/03/2021



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	35.98	40.00	-4.02	-4.62	3	Horizontal	109	1.00	"Worst"	40.60	23.67	0.20	28.49
QP	66.86M	28.52	40.00	-11.48	-15.98	3	Horizontal	199	3.00	-	44.50	11.96	0.54	28.48
QP	71.71M	27.50	40.00	-12.50	-15.70	3	Horizontal	84	3.00	-	43.20	12.18	0.60	28.48
PK	136.7M	38.96	43.50	-4.54	-10.02	3	Horizontal	231	2.00	-	48.98	17.21	1.07	28.30
PK	604.24M	39.47	46.00	-6.53	-2.59	3	Horizontal	360	1.50	-	42.06	24.01	2.72	29.32
PK	833.16M	40.47	46.00	-5.53	-0.14	3	Horizontal	225	1.00	-	40.61	25.50	3.33	28.97

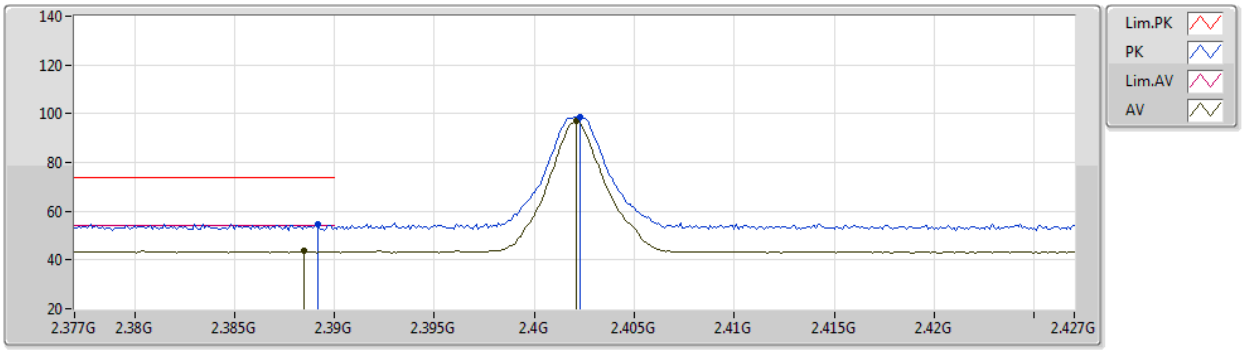
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4835G	50.97	54.00	-3.03	3	Horizontal	14	2.01	-

BT-LE(1Mbps)

08/02/2021

2402MHz_TX



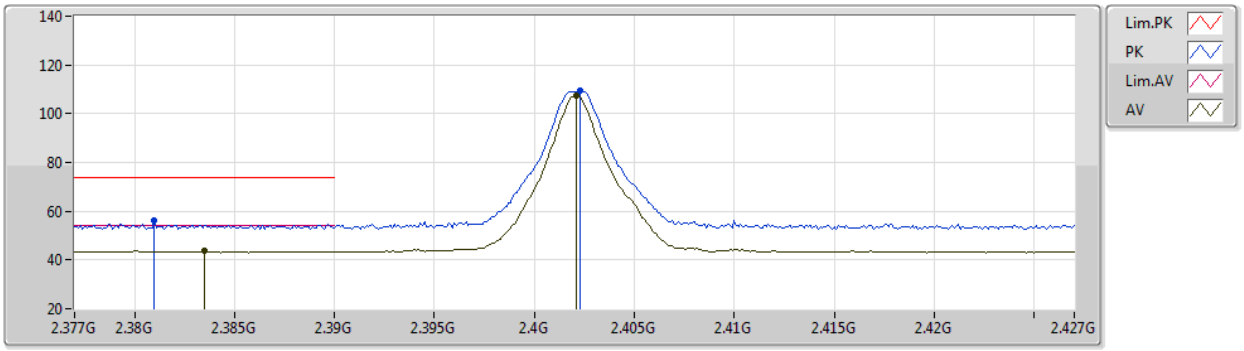
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3892G	54.88	74.00	-19.12	24.20	3	Vertical	360	1.93	-	27.60	3.08	-
AV	2.3885G	43.74	54.00	-10.26	13.06	3	Vertical	360	1.93	-	27.60	3.08	-
PK	2.4023G	98.75	Inf	-Inf	68.06	3	Vertical	360	1.93	-	27.59	3.10	-
AV	2.4021G	96.87	Inf	-Inf	66.18	3	Vertical	360	1.93	-	27.59	3.10	-

BT-LE(1Mbps)

08/02/2021

2402MHz_TX



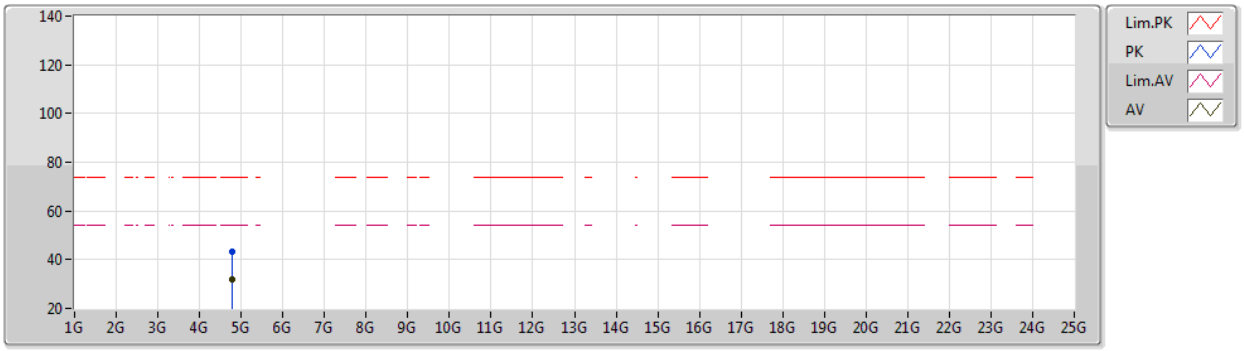
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.381G	55.97	74.00	-18.03	25.31	3	Horizontal	5	2.34	-	27.60	3.06	-
AV	2.3835G	43.60	54.00	-10.40	12.93	3	Horizontal	5	2.34	-	27.60	3.07	-
PK	2.4023G	109.35	Inf	-Inf	78.66	3	Horizontal	5	2.34	-	27.59	3.10	-
AV	2.4021G	107.45	Inf	-Inf	76.76	3	Horizontal	5	2.34	-	27.59	3.10	-

BT-LE(1Mbps)

2402MHz_TX

08/02/2021



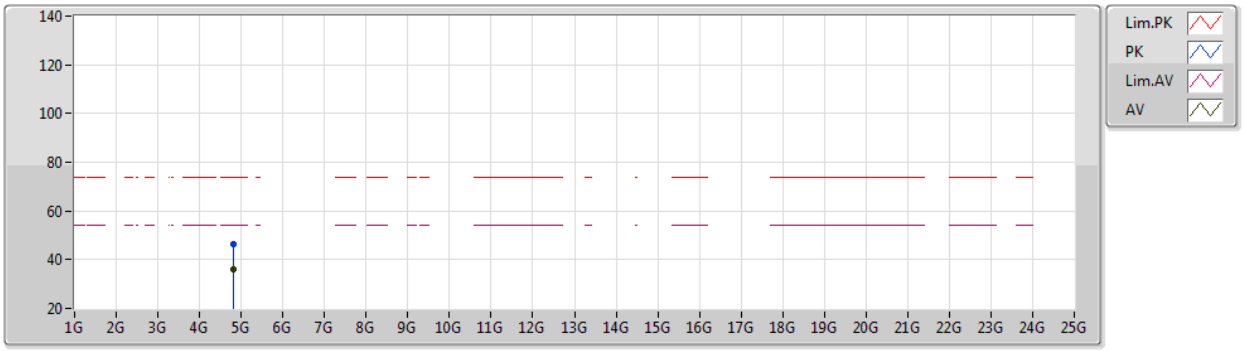
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.795G	43.43	74.00	-30.57	39.21	3	Vertical	74	2.06	-	31.01	4.99	31.78
AV	4.79784G	31.71	54.00	-22.29	27.49	3	Vertical	74	2.06	-	31.00	5.00	31.78

BT-LE(1Mbps)

2402MHz_TX

08/02/2021



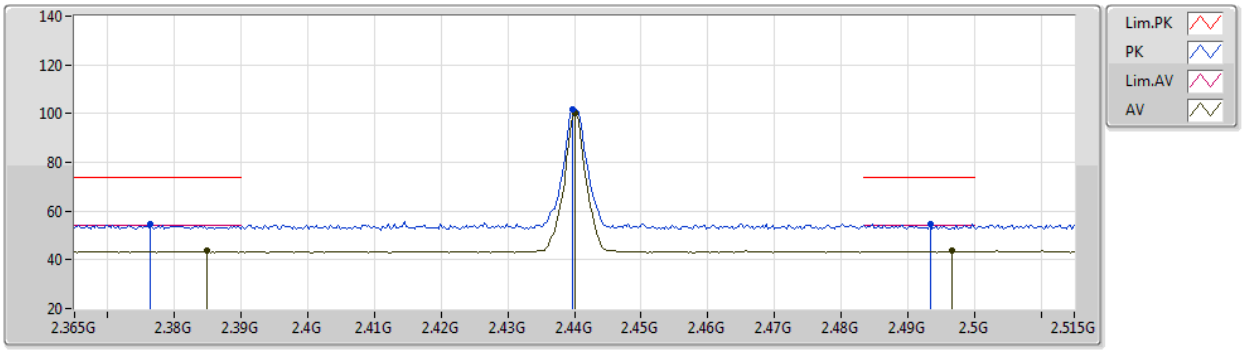
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.8038G	46.46	74.00	-27.54	42.21	3	Horizontal	32	1.72	-	31.02	5.00	31.77
AV	4.80384G	36.20	54.00	-17.80	31.95	3	Horizontal	32	1.72	-	31.02	5.00	31.77

BT-LE(1Mbps)

2440MHz_TX

08/02/2021



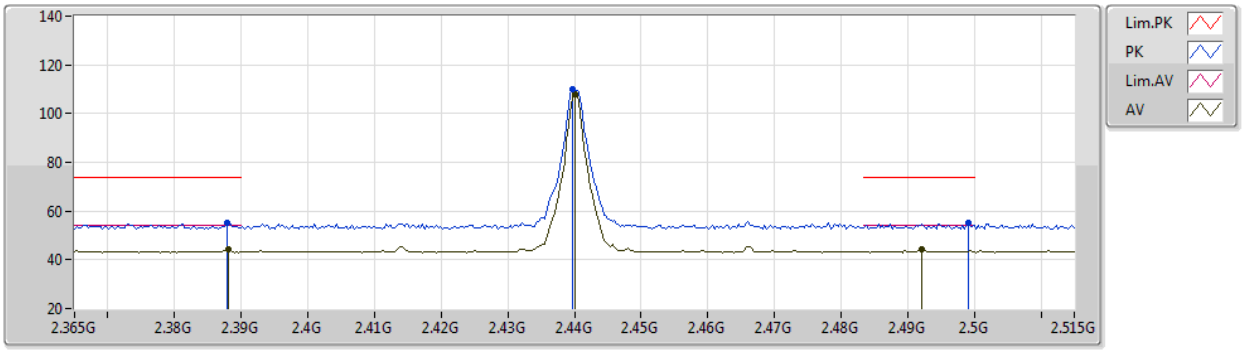
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3764G	54.57	74.00	-19.43	23.92	3	Vertical	341	2.27	-	27.60	3.05	-
AV	2.3848G	43.57	54.00	-10.43	12.90	3	Vertical	341	2.27	-	27.60	3.07	-
PK	2.4397G	101.94	Inf	-Inf	71.36	3	Vertical	341	2.27	-	27.44	3.14	-
AV	2.44G	100.00	Inf	-Inf	69.42	3	Vertical	341	2.27	-	27.44	3.14	-
PK	2.4934G	54.61	74.00	-19.39	24.02	3	Vertical	341	2.27	-	27.40	3.19	-
AV	2.4967G	43.55	54.00	-10.45	12.95	3	Vertical	341	2.27	-	27.40	3.20	-

BT-LE(1Mbps)

2440MHz_TX

08/02/2021



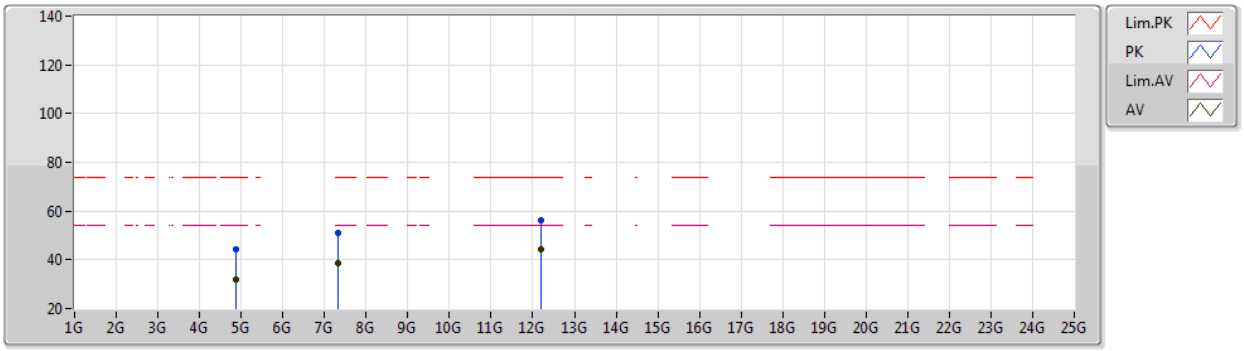
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3878G	55.01	74.00	-18.99	24.33	3	Horizontal	3	2.05	-	27.60	3.08	-
AV	2.3881G	44.41	54.00	-9.59	13.73	3	Horizontal	3	2.05	-	27.60	3.08	-
PK	2.4397G	110.01	Inf	-Inf	79.43	3	Horizontal	3	2.05	-	27.44	3.14	-
AV	2.44G	108.08	Inf	-Inf	77.50	3	Horizontal	3	2.05	-	27.44	3.14	-
PK	2.4991G	55.33	74.00	-18.67	24.73	3	Horizontal	3	2.05	-	27.40	3.20	-
AV	2.4922G	44.40	54.00	-9.60	13.81	3	Horizontal	3	2.05	-	27.40	3.19	-

BT-LE(1Mbps)

2440MHz_TX

08/02/2021



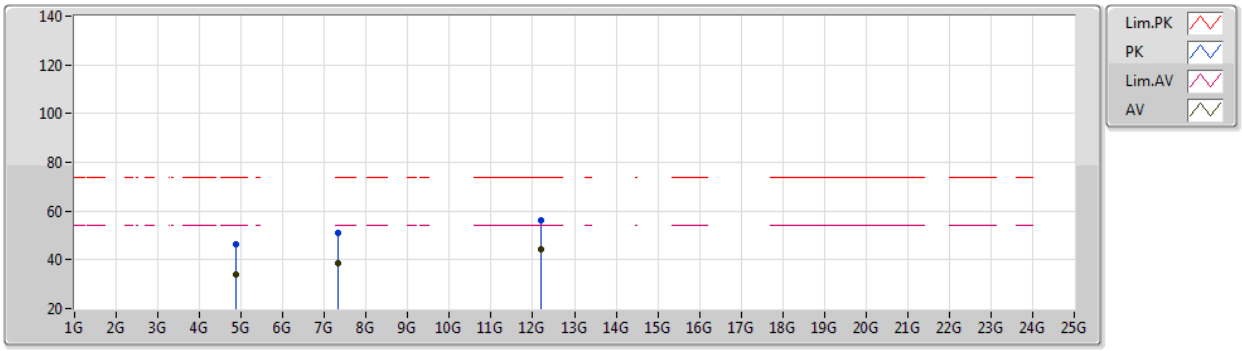
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87488G	44.33	74.00	-29.67	39.86	3	Vertical	5	1.05	-	31.15	5.00	31.68
AV	4.87684G	31.87	54.00	-22.13	27.40	3	Vertical	5	1.05	-	31.15	5.00	31.68
PK	7.32772G	50.95	74.00	-23.05	41.73	3	Vertical	29	1.38	-	36.29	6.10	33.17
AV	7.31984G	38.57	54.00	-15.43	29.31	3	Vertical	29	1.38	-	36.32	6.10	33.16
PK	12.2024G	56.03	74.00	-17.97	42.60	3	Vertical	28	2.84	-	38.90	8.61	34.08
AV	12.19548G	44.15	54.00	-9.85	30.72	3	Vertical	28	2.84	-	38.90	8.61	34.08

BT-LE(1Mbps)

08/02/2021

2440MHz_TX



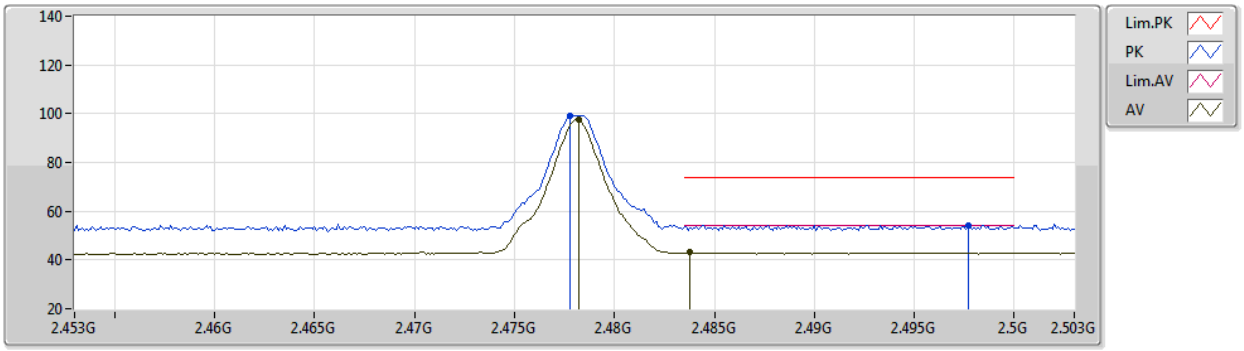
EUT Y_1TX
Setting 8dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87588G	46.48	74.00	-27.52	42.01	3	Horizontal	13	2.55	-	31.15	5.00	31.68
AV	4.87484G	33.96	54.00	-20.04	29.49	3	Horizontal	13	2.55	-	31.15	5.00	31.68
PK	7.31692G	50.81	74.00	-23.19	41.54	3	Horizontal	226	1.93	-	36.33	6.10	33.16
AV	7.31856G	38.57	54.00	-15.43	29.30	3	Horizontal	226	1.93	-	36.33	6.10	33.16
PK	12.1924G	56.20	74.00	-17.80	42.77	3	Horizontal	185	2.06	-	38.90	8.61	34.08
AV	12.19404G	44.11	54.00	-9.89	30.68	3	Horizontal	185	2.06	-	38.90	8.61	34.08

BT-LE(1Mbps)

2478MHz_TX

08/02/2021



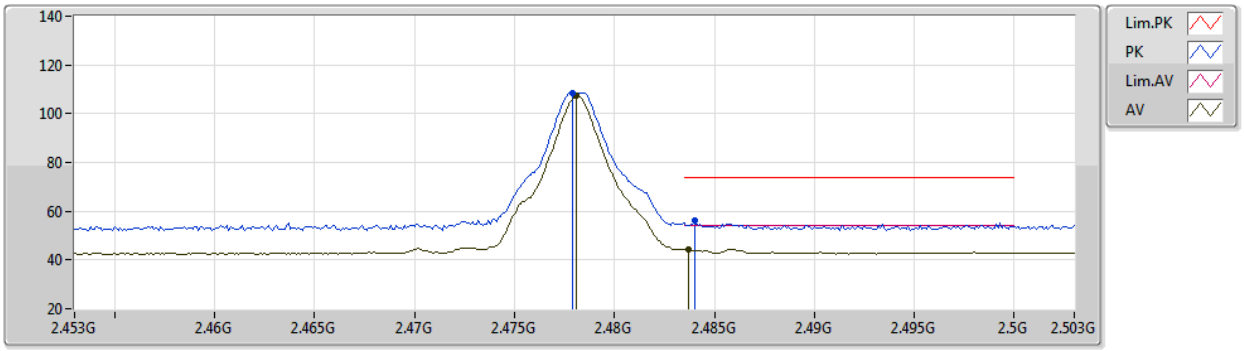
EUT Y_1TX
Setting 8dbm
04-A-B-2
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4778G	99.28	Inf	-Inf	68.29	3	Vertical	344	2.23	-	27.71	3.28	-
AV	2.4782G	97.77	Inf	-Inf	66.78	3	Vertical	344	2.23	-	27.71	3.28	-
PK	2.4977G	54.29	74.00	-19.71	23.20	3	Vertical	344	2.23	-	27.79	3.30	-
AV	2.4838G	43.06	54.00	-10.94	12.04	3	Vertical	344	2.23	-	27.74	3.28	-

BT-LE(1Mbps)

2478MHz_TX

08/02/2021



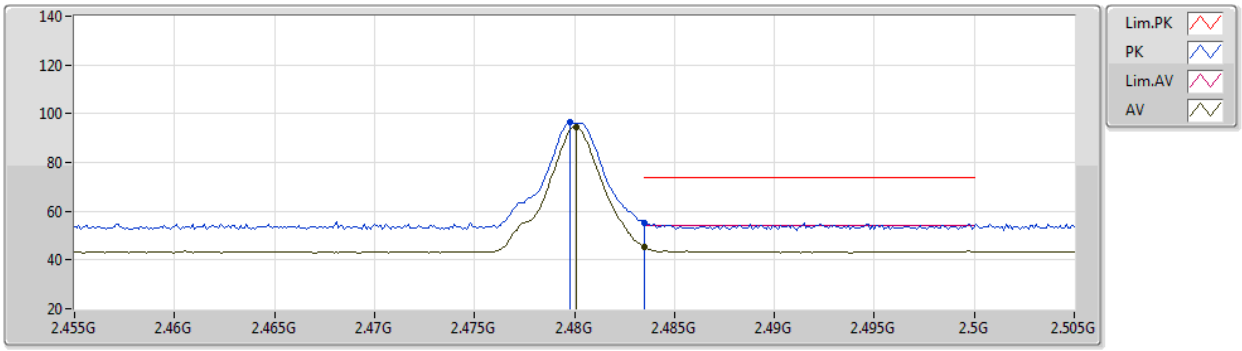
EUT Y_1TX
Setting 8dbm
04-A-B-2
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4779G	108.68	Inf	-Inf	77.69	3	Horizontal	3	2.18	-	27.71	3.28	-
AV	2.4781G	107.18	Inf	-Inf	76.19	3	Horizontal	3	2.18	-	27.71	3.28	-
PK	2.484G	56.32	74.00	-17.68	25.30	3	Horizontal	3	2.18	-	27.74	3.28	-
AV	2.4837G	44.29	54.00	-9.71	13.28	3	Horizontal	3	2.18	-	27.73	3.28	-

BT-LE(1Mbps)

2480MHz_TX

08/02/2021



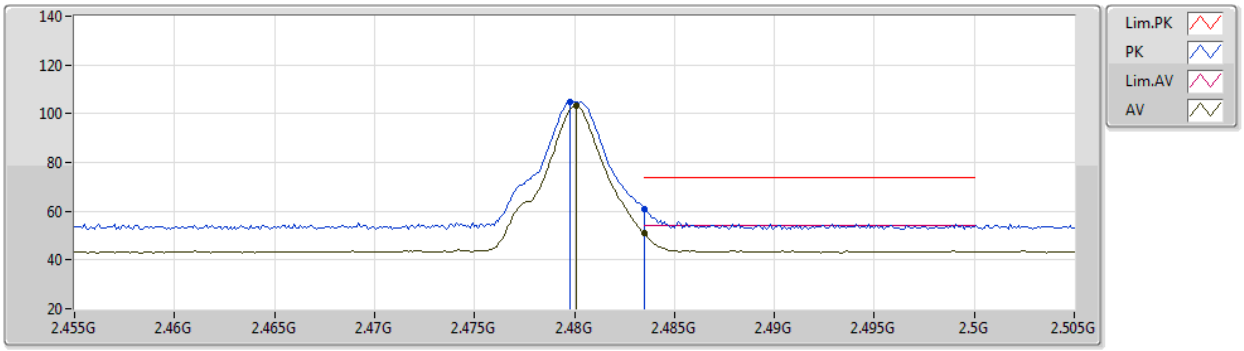
EUT Y_1TX
Setting 4dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4798G	96.31	Inf	-Inf	65.73	3	Vertical	347	2.49	-	27.40	3.18	-
AV	2.4801G	94.66	Inf	-Inf	64.08	3	Vertical	347	2.49	-	27.40	3.18	-
PK	2.4835G	55.17	74.00	-18.83	24.59	3	Vertical	347	2.49	-	27.40	3.18	-
AV	2.4835G	45.22	54.00	-8.78	14.64	3	Vertical	347	2.49	-	27.40	3.18	-

BT-LE(1Mbps)

2480MHz_TX

08/02/2021



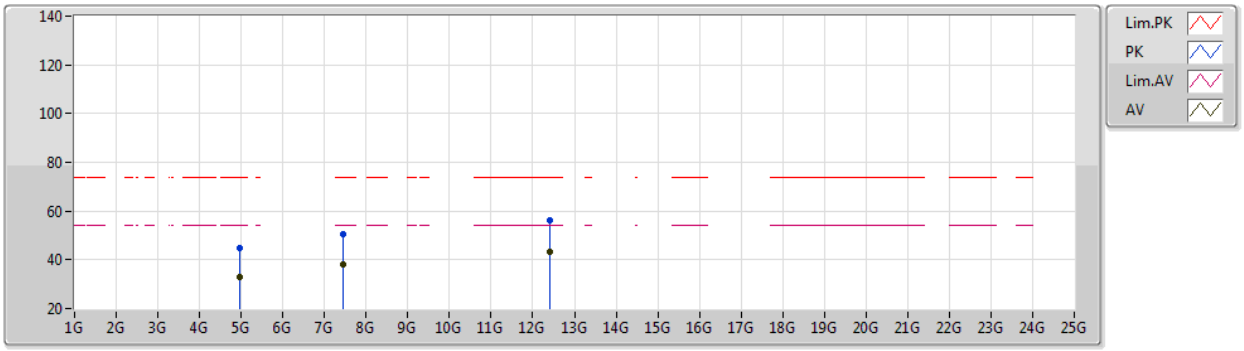
EUT Y_1TX
Setting 4dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4798G	104.76	Inf	-Inf	74.18	3	Horizontal	14	2.01	-	27.40	3.18	-
AV	2.4801G	103.25	Inf	-Inf	72.67	3	Horizontal	14	2.01	-	27.40	3.18	-
PK	2.4835G	61.01	74.00	-12.99	30.43	3	Horizontal	14	2.01	-	27.40	3.18	-
AV	2.4835G	50.97	54.00	-3.03	20.39	3	Horizontal	14	2.01	-	27.40	3.18	-

BT-LE(1Mbps)

2480MHz_TX

08/02/2021



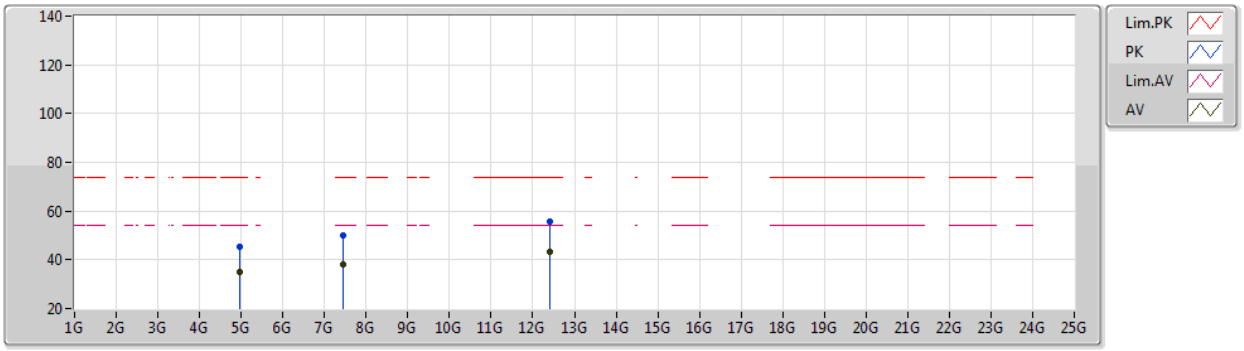
EUT Y_1TX
Setting 4dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.96308G	44.78	74.00	-29.22	40.01	3	Vertical	220	1.79	-	31.35	5.00	31.58
AV	4.9599G	32.69	54.00	-21.31	27.93	3	Vertical	220	1.79	-	31.34	5.00	31.58
PK	7.44396G	50.56	74.00	-23.44	41.28	3	Vertical	360	2.66	-	36.38	6.12	33.22
AV	7.44068G	38.23	54.00	-15.77	28.97	3	Vertical	360	2.66	-	36.36	6.12	33.22
PK	12.4016G	56.25	74.00	-17.75	43.02	3	Vertical	40	1.80	-	38.50	8.72	33.99
AV	12.40224G	43.24	54.00	-10.76	30.00	3	Vertical	40	1.80	-	38.50	8.72	33.98

BT-LE(1Mbps)

2480MHz_TX

08/02/2021



EUT Y_1TX
Setting 4dbm
06-F-S-5
新sample

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.95962G	45.51	74.00	-28.49	40.75	3	Horizontal	28	1.66	-	31.34	5.00	31.58
AV	4.95998G	34.91	54.00	-19.09	30.15	3	Horizontal	28	1.66	-	31.34	5.00	31.58
PK	7.43692G	49.84	74.00	-24.16	40.59	3	Horizontal	0	1.80	-	36.35	6.12	33.22
AV	7.44192G	37.87	54.00	-16.13	28.60	3	Horizontal	0	1.80	-	36.37	6.12	33.22
PK	12.39554G	55.51	74.00	-18.49	42.27	3	Horizontal	357	1.80	-	38.51	8.72	33.99
AV	12.40314G	43.11	54.00	-10.89	29.87	3	Horizontal	357	1.80	-	38.50	8.72	33.98