FCC RADIO TEST REPORT

FCC ID	:	QXO-AP510I
Equipment	:	802.11ax Access Point
Brand Name	:	Extreme Networks
Model Name	:	AP510i
Applicant	:	Extreme Networks, Inc. 6480 Via Del Oro, San Jose, CA 95119
Manufacturer	:	Extreme Networks, Inc. 6480 Via Del Oro, San Jose, CA 95119
Standard	:	47 CFR FCC Part 15.247

The product was received on Nov. 03, 2018, and testing was started from Nov. 14, 2018 and completed on Dec. 18, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR8O1739-01AB	01	Initial issue of report	Jan. 22, 2019

Summary of Test Result

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

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
2. 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: Cliff Chang
Report Producer: Wendy Pan

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std.	Ch. Frequency (MHz)	Channel Number
2400-2483.5	802.15.4	2405-2480	11-26 [16]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	Thread	3	1TX

Note:
- Thread uses a O-QPSK (250kbps) modulation for DSSS.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Radio	Antenna Gain(dBi)
	1TX	2TX	4TX						
1	1	1	1	WNC	Starlord 510i	PIFA	I-PEX	R1-5GHz	Note 1
2	-	2	2	WNC	Starlord 510i	PIFA	I-PEX	R1-5GHz	Note 1
3	-	-	3	WNC	Starlord 510i	PIFA	I-PEX	R1-5GHz	Note 1
4	-	-	4	WNC	Starlord 510i	PIFA	I-PEX	R1-5GHz	Note 1
5	R2-1	R2-1	R1-4 R2-1	WNC	Starlord 510i	PIFA	I-PEX	R1-2.4GHz R2-5GHz	Note 1
6	-	R2-2	R1-3 R2-2	WNC	Starlord 510i	PIFA	I-PEX	R1-2.4GHz R2-5GHz	Note 1
7	-	R1-2	R1-2 R2-3	WNC	Starlord 510i	PIFA	I-PEX	R1-2.4GHz R2-5GHz	Note 1
8	R1-1	R1-1	R1-1 R2-4	WNC	Starlord 510i	PIFA	I-PEX	R1-2.4GHz R2-5GHz	Note 1
9	1	-	-	WNC	Starlord 510i	PIFA	I-PEX	R3	Note 1

Note1:

Ant.	Antenna Gain(dBi)			
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth	Thread
1	-	5.89	-	-
2	-	5.36	-	-
3	-	5.67	-	-
4	-	5.36	-	-
5	3.48	4.57	-	-
6	3.80	4.40	-	-
7	3.84	4.98	-	-
8	3.90	5.18	-	-
9	-	-	4.40	4.40

Note2: The above information was declared by manufacturer.

Note3:

For 2.4GHz function:

For IEEE 802.11b/g/n/ax mode (1TX, 2TX, 4TX/4RX):

For 1TX

Only Port 1 can be use as transmitting antenna.

For 2TX

Port 1 and Port 2 can be use as transmitting antenna.

Port 1 and Port 2 could transmit simultaneously.

For 4TX

Port 1, Port 2, Port 3 and Port 4 can be use as transmitting antenna.

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

For 4RX

Port 1, Port 2, Port 3 and Port 4 can be used as receiving antennas.

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

For 5GHz function:

For IEEE 802.11a/n/ac/ax mode (1TX, 2TX, 4TX/4RX):
For 1TX
Only Port 1 can be use as transmitting antenna.
For 2TX
Port 1 and Port 2 can be use as transmitting antenna.
Port 1 and Port 2 could transmit simultaneously.
For 4TX
Port 1, Port 2, Port 3 and Port 4 can be use as transmitting antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit simultaneously.
For 4RX
Port 1, Port 2, Port 3 and Port 4 can be used as receiving antennas.
Port 1, Port 2, Port 3 and Port 4 could receive simultaneously.
For Bluetooth and Thread mode (1TX/1RX):
Only Port 1 can be use as transmitting/receiving antenna.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
Thread	1	0	n/a (DC>=0.98)	n/a (DC>=0.98)

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

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter or PoE			
Beamforming Function	☐	With beamforming	☒	Without beamforming
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	Tftpd32、Telnet			

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

The EUT has three radios, the information as following table:

Radio	Function		
	WLAN 2.4GHz	**WLAN 5GHz**	**Bluetooth/Thread**
1	V	V	-
2	-	V	-
3	-	-	V

1.1.6 Table for EUT support function

Function	Support Type	Support Band
AP	Master	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1~4
Client	Slave without Radar Detection (Sensor Mode)	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1+4
Bridge	Master	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1+4
Mesh	Master	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1+4

Note: The above information was declared by manufacturer.

1.2 Testing Applied Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 558074 D01 v05

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	TH01-CB	Eddie Weng	23°C / 61%	Nov. 14, 2018 ~ Dec. 17, 2018
Radiated (Below 1GHz)	03CH01-CB	Paul Chen	22°C / 54%	Nov. 22, 2018 ~ Nov. 23, 2018
Radiated (Above 1GHz)	03CH01-CB	Stim Sung	22°C / 54%	Nov. 22, 2018 ~ Dec. 18, 2018
AC Conduction	CO02-CB	Deven Huang	23°C / 60%	Nov. 26, 2018

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)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74×10^{-8}	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	PowerSetting
Thread_1TX	-
2405MHz	32
2440MHz	32
2480MHz	16

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									
	Radio 1 with 2.4GHz function	Radio 1 with 5GHz function	Radio 2 with 5GHz function	Radio 3 with Bluetooth	Radio 3 with Thread	EUT GE1	EUT GE2	Adapter	PoE connect with EUT GE1	PoE connect with EUT GE2
1	●	-	●	●	-	●	●	●	-	-
2	-	●	●	●	-	●	●	●	-	-
3	●	-	●	-	●	●	●	●	-	-
4	-	●	●	-	●	●	●	●	-	-
Mode 4 has been evaluated to be the worst case among Mode 1~4, thus measurement for Mode 5 ~ 6 will follow this same test mode.										
5	-	●	●	-	●	●	●	-	●	-
6	-	●	●	-	●	●	●	-	-	●
For operating mode 5 is the worst case and it was record in this test report.										

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											
	EUT at Z-axis	EUT at Y-axis	Radio 1 with 2.4GHz function	Radio 1 with 5GHz function	Radio 2 with 5GHz function	Radio 3 with Bluetooth	Radio 3 with Thread	EUT GE1	EUT GE2	Adapter	PoE connect with EUT GE1	PoE connect with EUT GE2
1	●	-	●	-	●	●	-	●	●	●	-	-
2	-	●	●	-	●	●	-	●	●	●	-	-
Mode 2 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 ~ 5 will follow this same test mode.												
3	-	●	-	●	●	●	-	●	●	●	-	-
4	-	●	●	-	●	-	●	●	●	●	-	-
5	-	●	-	●	●	-	●	●	●	●	-	-
Mode 5 has been evaluated to be the worst case between Mode 1~5, thus measurement for Mode 6 ~ 7 will follow this same test mode.												
6	-	●	-	●	●	-	●	●	●	-	●	-
7	-	●	-	●	●	-	●	●	●	-	-	●
For operating mode 6 is the worst case and it was record in this test report.												
Operating Mode > 1GHz	CTX											
The EUT was performed at Y axis and Z axis position and the worst case was found at Y axis. So the measurement will follow this same test configuration.												
1	EUT in Y axis											

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + Bluetooth (Radio 3)
2	WLAN 5GHz (Radio 1) + WLAN 5GHz (Radio 2) + Bluetooth (Radio 3)
3	WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + Thread (Radio 3)
4	WLAN 5GHz (Radio 1) + WLAN 5GHz (Radio 2) + Thread (Radio 3)
Refer to Sporton Test Report No.: FA8O1739-01 for Co-location RF Exposure Evaluation.	

Note:1.The PoE is for measurement only, would not be marketed.

PoE information as below:

Power	Brand	Model
PoE	Microsemi	PD-9001GR/AT/AC

2.3 EUT Operation during Test

For Normal Link:

During the test, the EUT operation to normal function.

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

Accessories			
Equipment Name	**Brand Holder**	**Model Name**	**Rating**
Adapter	Powertron Electronics Corp.	PA1045-120HIB300	Intput:100-240V~50-60Hz, 1.0A Output: 12V, 3.0A 36W Max
Others			
Plug*6 (US*1, EU*1, UK*1, AU*1, China*1, BZ*1)			
Bracket*1			

2.5 Support Equipment

For Test Site No: CO02-CB

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Flash disk3.0	Transcend	JetFlash-700	N/A
B	PoE	Microsemi	PD-9001GR/AT/AC	N/A
C	GE1 PC	DELL	T3400	N/A
D	GE2 NB	DELL	E6430	N/A
E	2.4G/5G NB	DELL	E6430	N/A
F	5G NB	DELL	E6430	N/A
G	802.11ax Access Point (Device)	Extreme Networks	AP510i	QXO-AP510I
H	Device NB	DELL	E6430	N/A

For Test Site No: 03CH01-CB (below 1GHz)

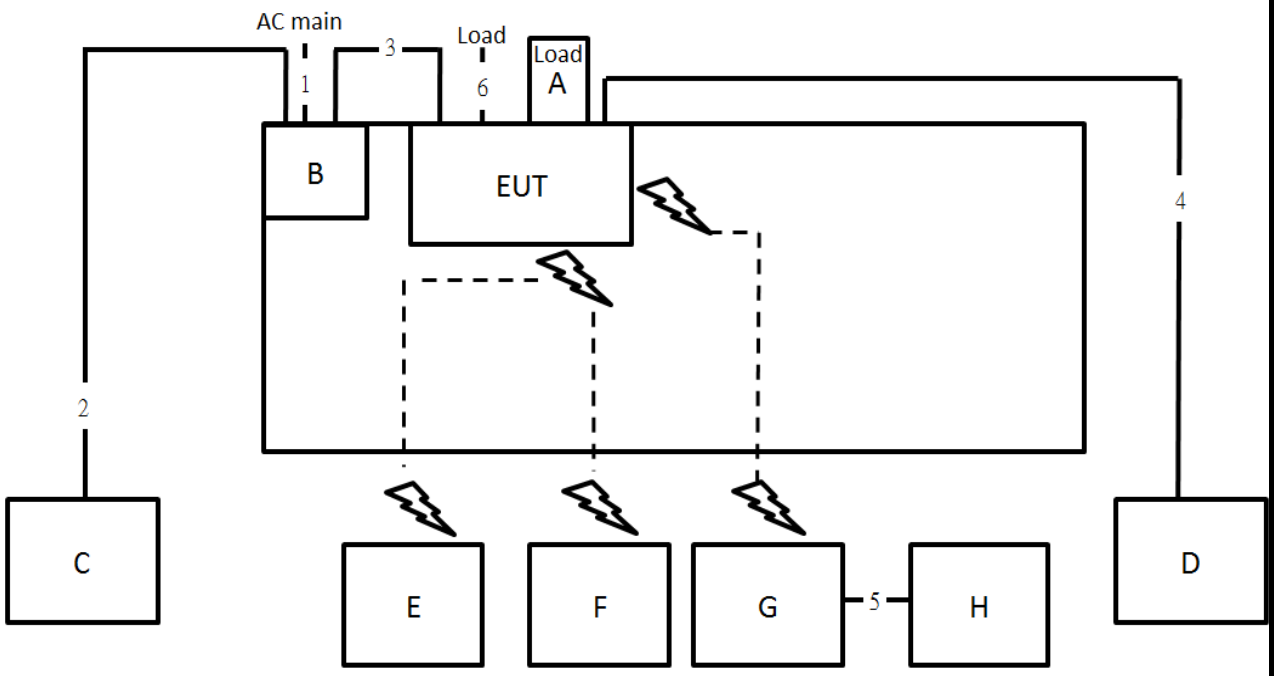
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	PC	ASUS	N/A	N/A
B	LAN NB	DELL	E4300	N/A
C	2.4G/5G NB	DELL	E4300	N/A
D	5G NB	DELL	E4300	N/A
E	802.11ax Access Point (Device)	Extreme Networks	AP510i	QXO-AP510I
F	Device NB	DELL	E4300	N/A
G	Flash disk3.0	Transcend	JetFlash-700	N/A
H	PoE	Microsemi	PD-9001GR/AT/AC	N/A

For Test Site No: 03CH01-CB (above 1GHz) and TH01-CB

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

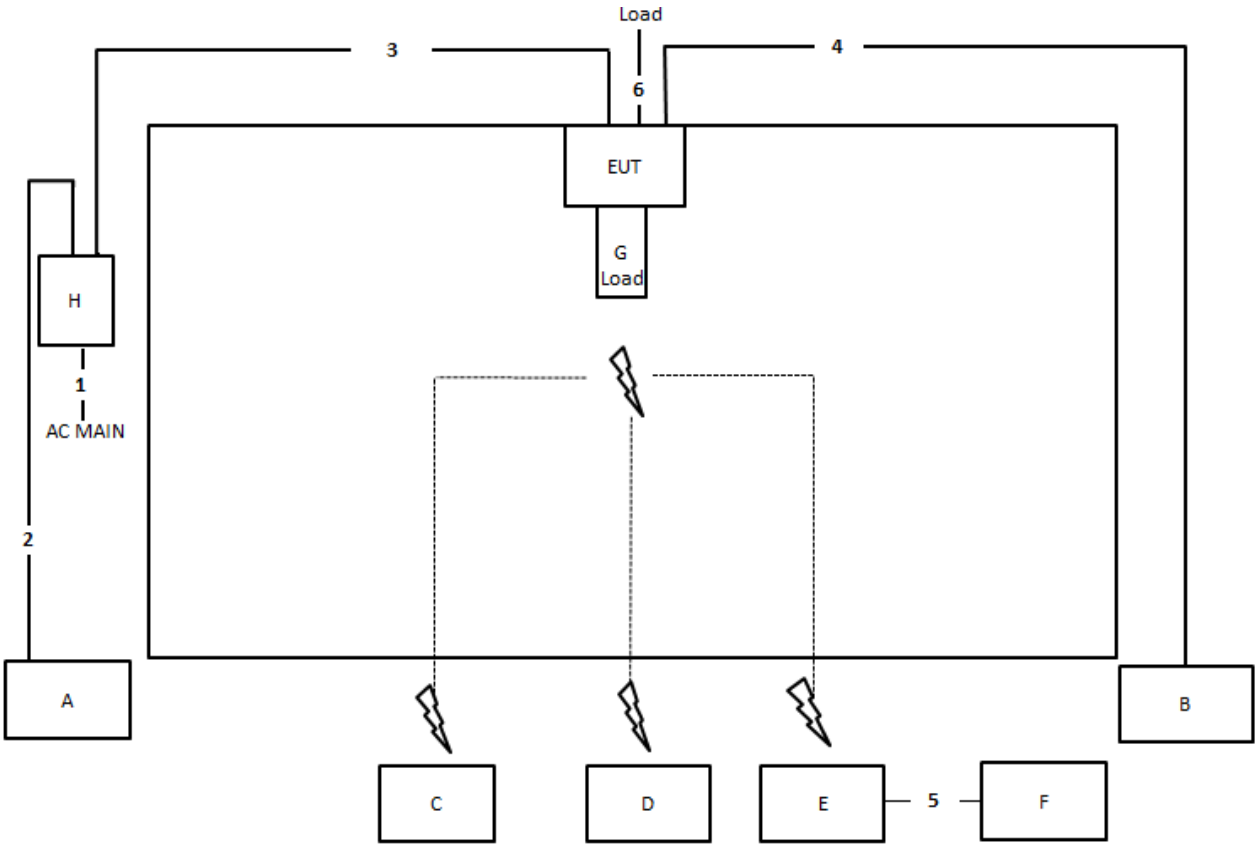
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



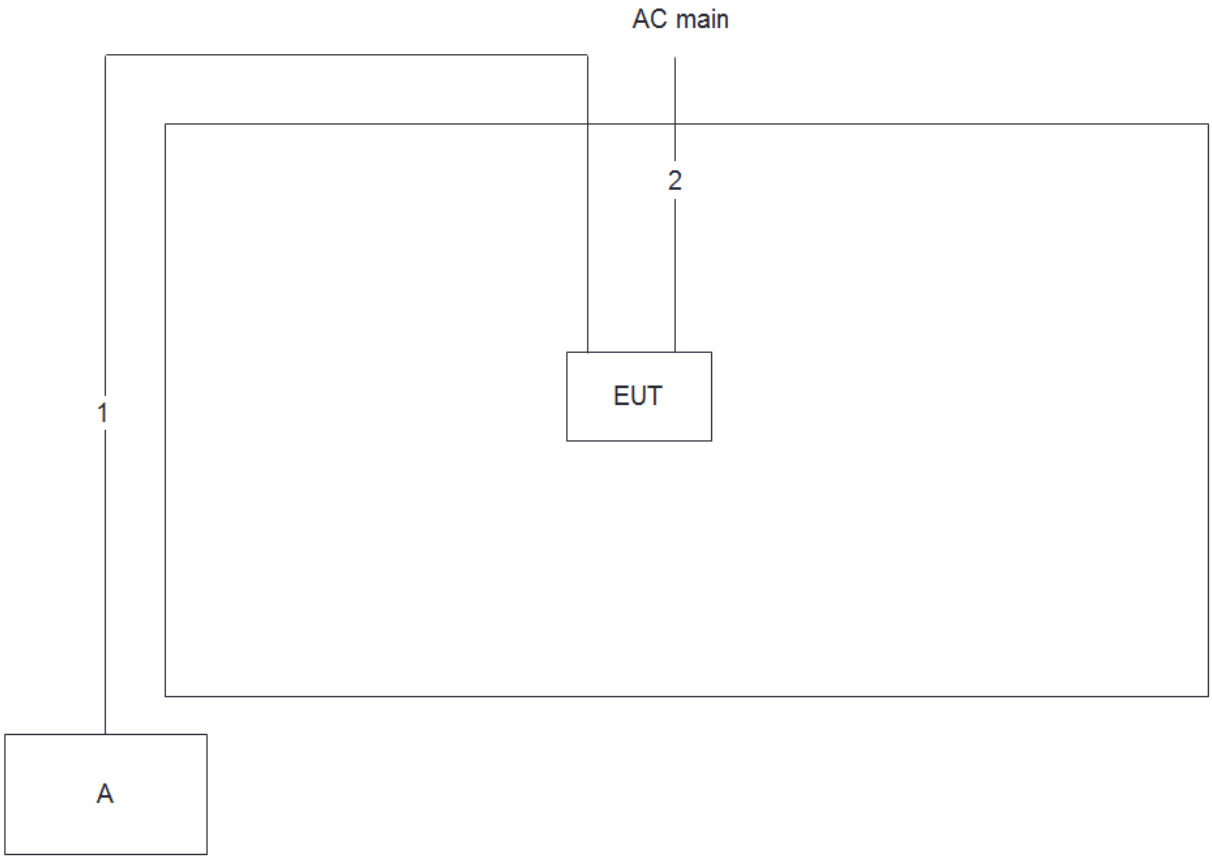
Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1m
4	RJ-45 cable	No	10m
5	RJ-45 cable	No	1m
6	Console cable	No	1.8m

Test Setup Diagram - Radiated Test < 1GHz



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

Test Setup Diagram - Radiated Test > 1GHz



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

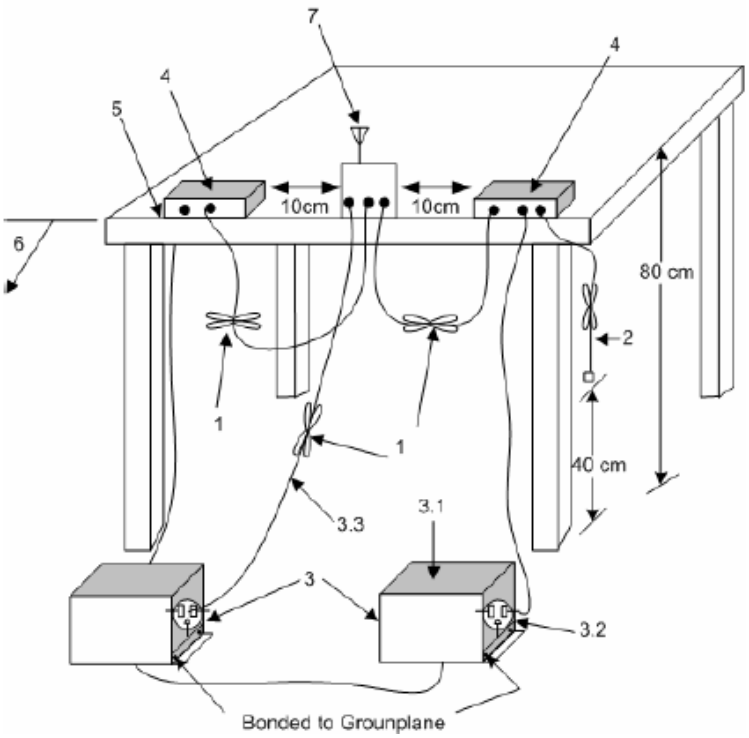
Refer a test equipment and calibration data table in this test report.

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

AC Power-line Conducted Emissions



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

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

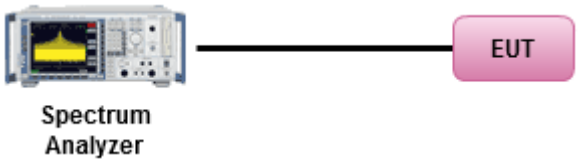
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)

3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

3.4.2 Measuring Instruments

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

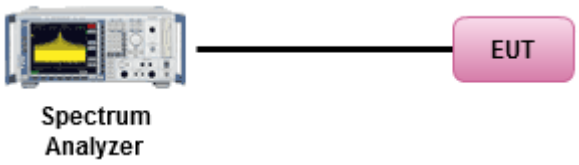
3.4.3 Test Procedures

Test Method	
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).	
	☒ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD.
	[duty cycle ≥ 98% or external video / power trigger]
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPSD-1.
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPSD-2.
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPSD-3.
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPSD-1A. (alternative).
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPSD-2A. (alternative)
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPSD-3A. (alternative)
▪ For conducted measurement.	
	▪ If The EUT supports multiple transmit chains using options given below:
	☒ Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
	☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,

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

3.4.4 Test Setup

Power Spectral Density



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

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

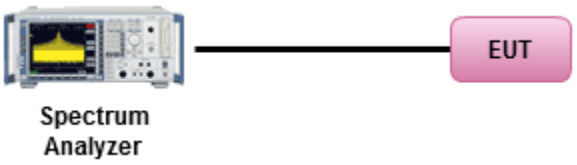
3.5.2 Measuring Instruments

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 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.

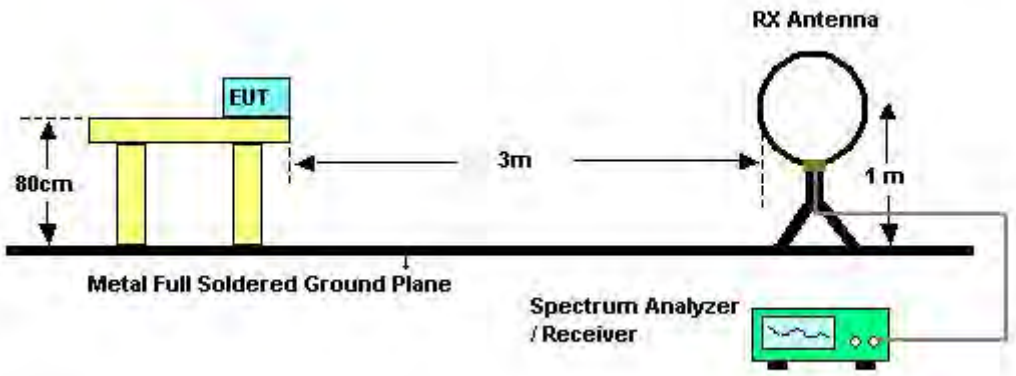
3.6.3 Test Procedures

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 ≥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.	

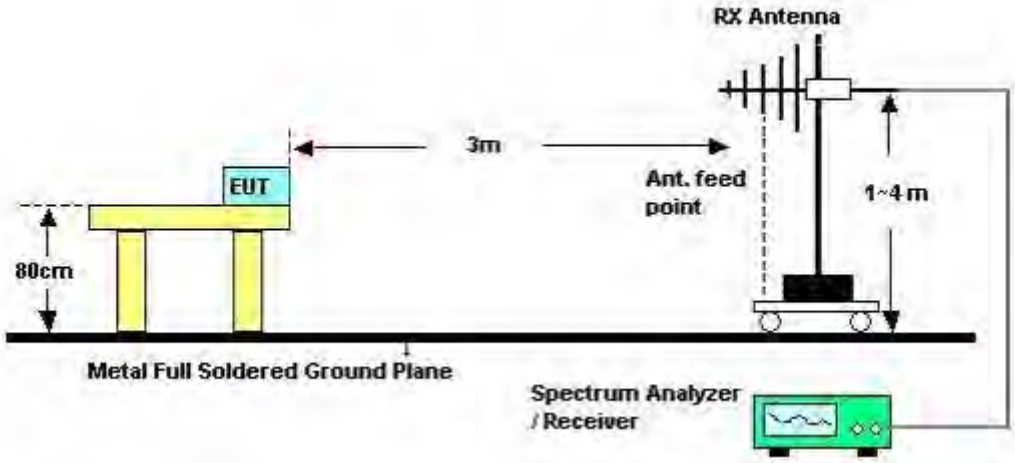
3.6.4 Test Setup

Radiated - Emissions in Restricted Frequency Bands

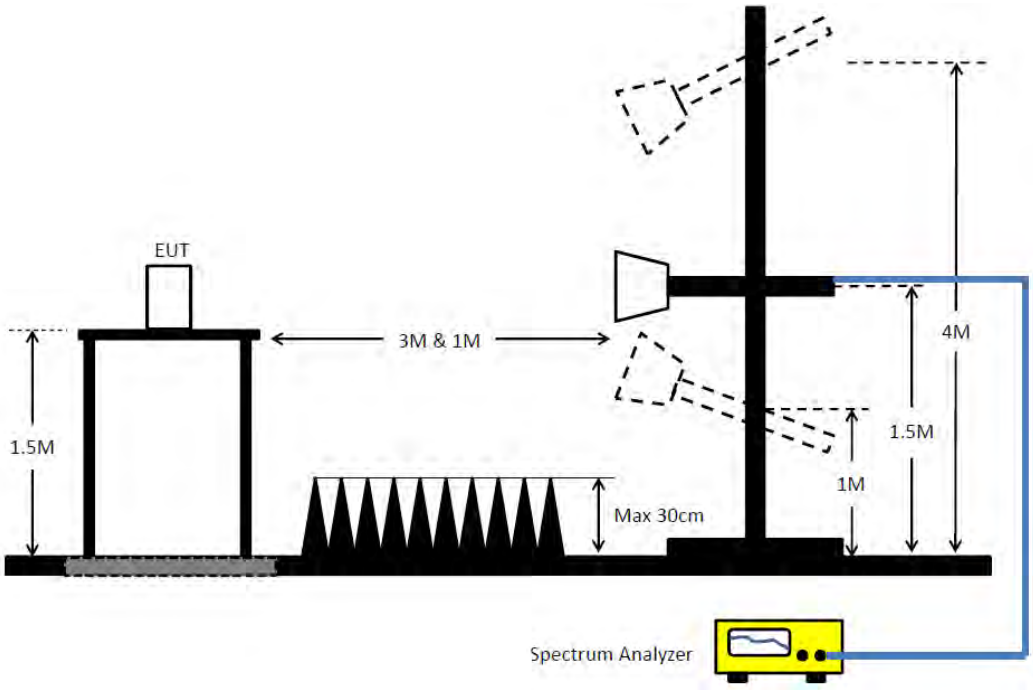
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 Emissions in Restricted Frequency Bands (Below 30MHz)

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.

3.6.6 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
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2018	Nov. 20, 2019	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 05, 2018	Nov. 04, 2019	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 17, 2018	Jan. 16, 2019	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Nov. 06, 2018	Nov. 05, 2019	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 27, 2018	Aug. 26, 2019	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2018	Mar. 15, 2019	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 13, 2018	Nov. 12, 2019	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 28, 2018	Jun. 27, 2019	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2018	May 01, 2019	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 09, 2018	Jan. 08, 2019	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH01-CB)
Spectrum anal yzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 03, 2018	Oct. 02, 2019	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS	100359	9kHz ~ 2.75GHz	Jul. 03, 2018	Jul. 02, 2019	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 21, 2017	Dec. 20, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)

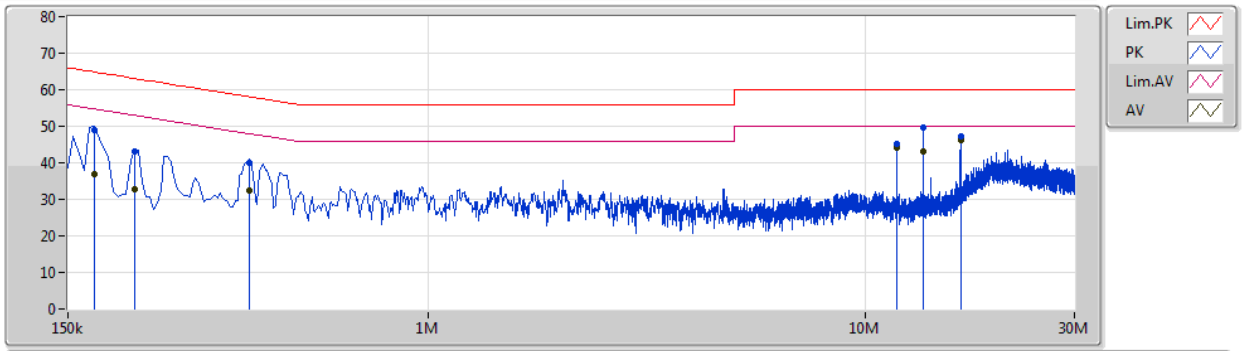
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 05, 2018	Nov. 04, 2019	Conducted (TH01-CB)

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

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

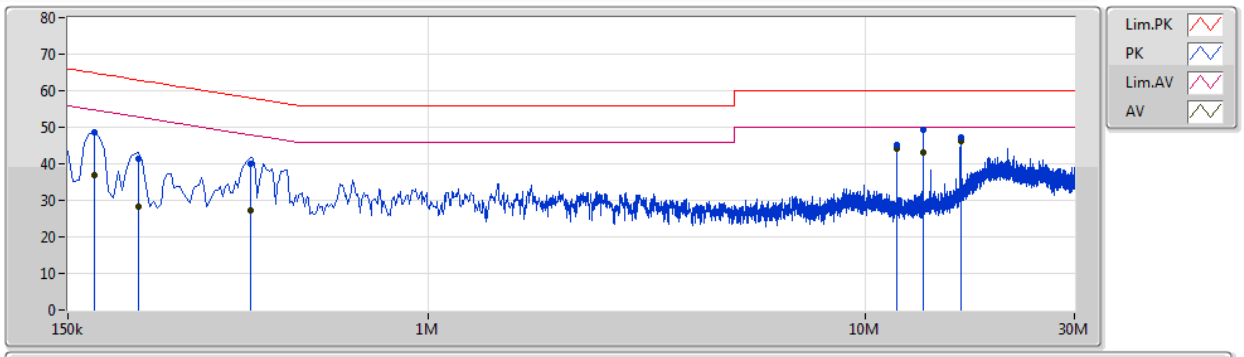
Test Mode	Mode 5	Frequency Range	0.15 MHz to 30 MHz

Line



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	172.5k	48.90	64.83	-15.93	10.18	Line	-	38.72	10.16	0.02	-
AV	172.5k	37.04	54.83	-17.79	10.18	Line	-	26.86	10.16	0.02	-
QP	213k	43.14	63.09	-19.95	10.18	Line	-	32.96	10.16	0.02	-
AV	213k	32.76	53.09	-20.33	10.18	Line	-	22.58	10.16	0.02	-
QP	388.5k	40.05	58.10	-18.05	10.18	Line	-	29.87	10.16	0.02	-
AV	388.5k	32.54	48.10	-15.56	10.18	Line	-	22.36	10.16	0.02	-
QP	11.76M	45.05	60.00	-14.95	10.43	Line	-	34.62	10.34	0.09	-
AV	11.76M	44.21	50.00	-5.79	10.43	Line	-	33.78	10.34	0.09	-
QP	13.56M	49.51	60.00	-10.49	10.46	Line	-	39.05	10.36	0.10	-
AV	13.56M	42.95	50.00	-7.05	10.46	Line	-	32.49	10.36	0.10	-
QP	16.463M	47.26	60.00	-12.74	10.49	Line	-	36.77	10.38	0.11	-
AV	16.463M	46.29	50.00	-3.71	10.49	Line	"Worst"	35.80	10.38	0.11	-

Neutral



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	172.5k	48.56	64.83	-16.27	10.19	Neutral	-	38.37	10.17	0.02	-
AV	172.5k	36.90	54.83	-17.93	10.19	Neutral	-	26.71	10.17	0.02	-
QP	217.5k	41.54	62.92	-21.38	10.19	Neutral	-	31.35	10.17	0.02	-
AV	217.5k	28.33	52.92	-24.59	10.19	Neutral	-	18.14	10.17	0.02	-
QP	393k	39.88	58.01	-18.13	10.19	Neutral	-	29.69	10.17	0.02	-
AV	393k	27.12	48.01	-20.89	10.19	Neutral	-	16.93	10.17	0.02	-
QP	11.76M	45.02	60.00	-14.98	10.43	Neutral	-	34.59	10.34	0.09	-
AV	11.76M	44.20	50.00	-5.80	10.43	Neutral	-	33.77	10.34	0.09	-
QP	13.56M	49.19	60.00	-10.81	10.46	Neutral	-	38.73	10.36	0.10	-
AV	13.56M	43.03	50.00	-6.97	10.46	Neutral	-	32.57	10.36	0.10	-
QP	16.467M	47.21	60.00	-12.79	10.48	Neutral	-	36.73	10.37	0.11	-
AV	16.467M	46.25	50.00	-3.75	10.48	Neutral	"Worst"	35.77	10.37	0.11	-

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Thread_1TX	1.61M	2.304M	2M30G1D	1.6M	2.284M

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

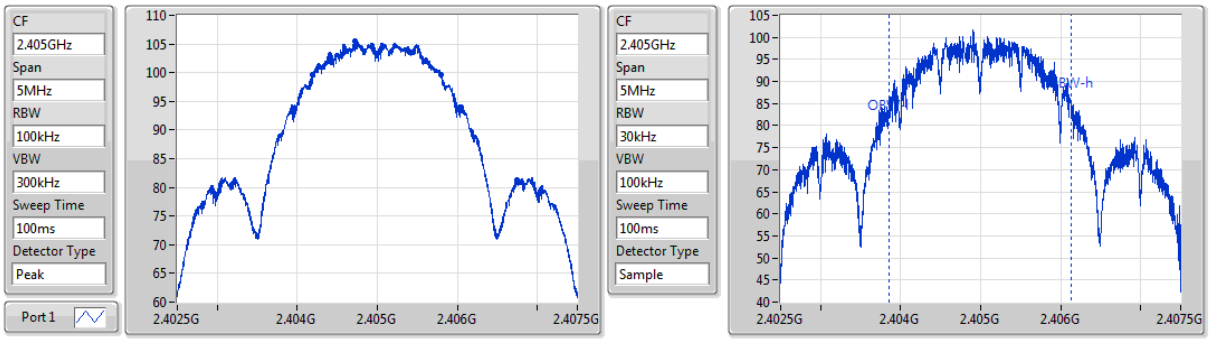
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Thread_1TX	-	-	-	-
2405MHz	Pass	500k	1.603M	2.284M
2440MHz	Pass	500k	1.6M	2.299M
2480MHz	Pass	500k	1.61M	2.304M

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

Thread_1TX **EBW**

2405MHz

03/12/2018

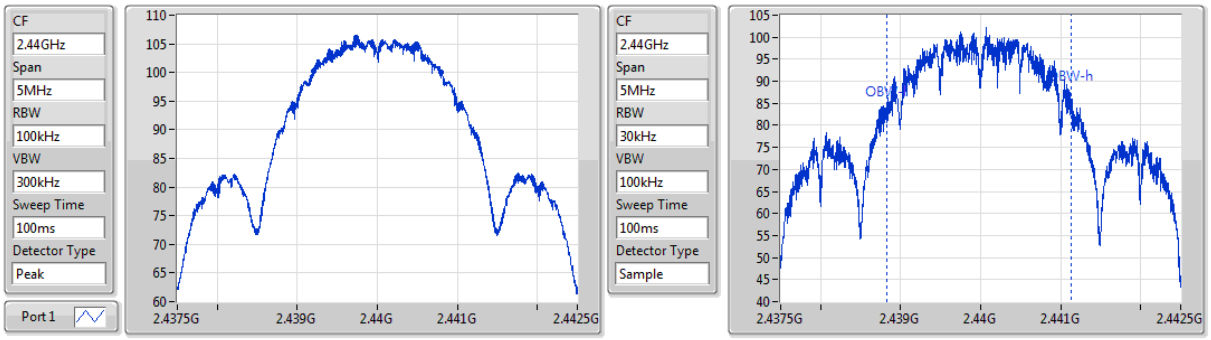


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.603M	2.404195G	2.405798G	2.284M	2.403848G	2.406132G	500k	1

Thread_1TX **EBW**

2440MHz

03/12/2018

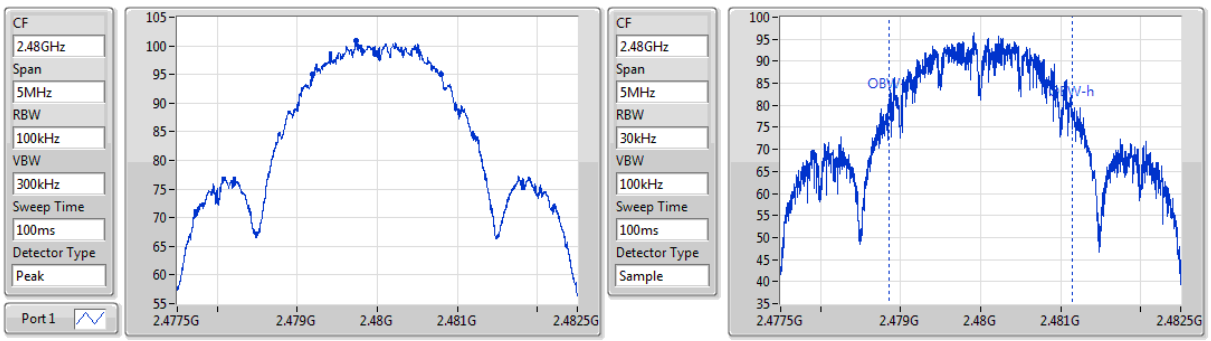


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.6M	2.4392G	2.4408G	2.299M	2.438833G	2.441132G	500k	1

Thread_1TX **EBW**

2480MHz

03/12/2018



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.61M	2.479193G	2.480803G	2.304M	2.478848G	2.481152G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Thread_1TX	1.92	0.00156

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Thread_1TX	-	-	-	-	-
2405MHz	Pass	4.40	1.57	1.57	30.00
2440MHz	Pass	4.40	1.92	1.92	30.00
2480MHz	Pass	4.40	-3.15	-3.15	30.00

DG = Directional Gain; **Port X** = Port X output power
Note : Conducted average output power is for reference only

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Thread_1TX	-13.28

RBW=3kHz.

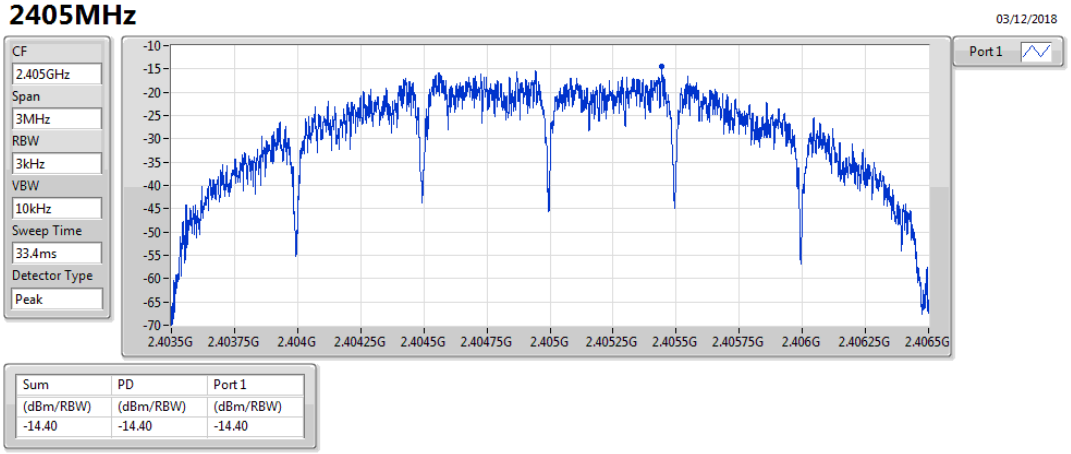
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Thread_1TX	-	-	-	-	-
2405MHz	Pass	4.40	-14.40	-14.40	8.00
2440MHz	Pass	4.40	-13.28	-13.28	8.00
2480MHz	Pass	4.40	-18.88	-18.88	8.00

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

Thread_1TX **PSD**

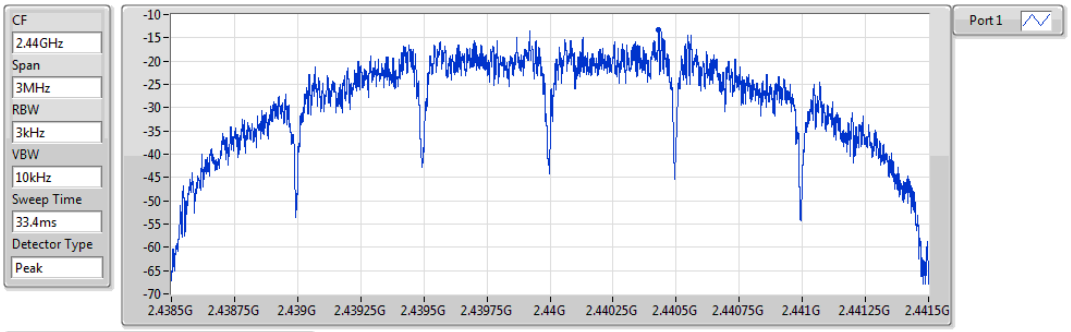
2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.40	-14.40	-14.40

Thread_1TX **PSD**

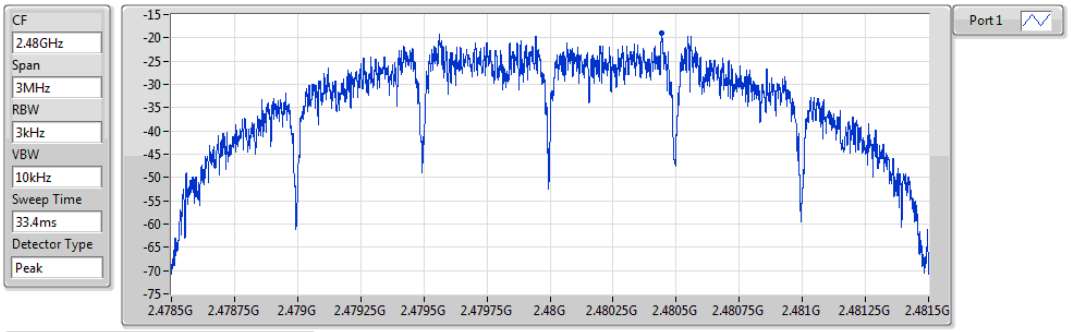
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-13.28	-13.28	-13.28

Thread_1TX **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-18.88	-18.88	-18.88

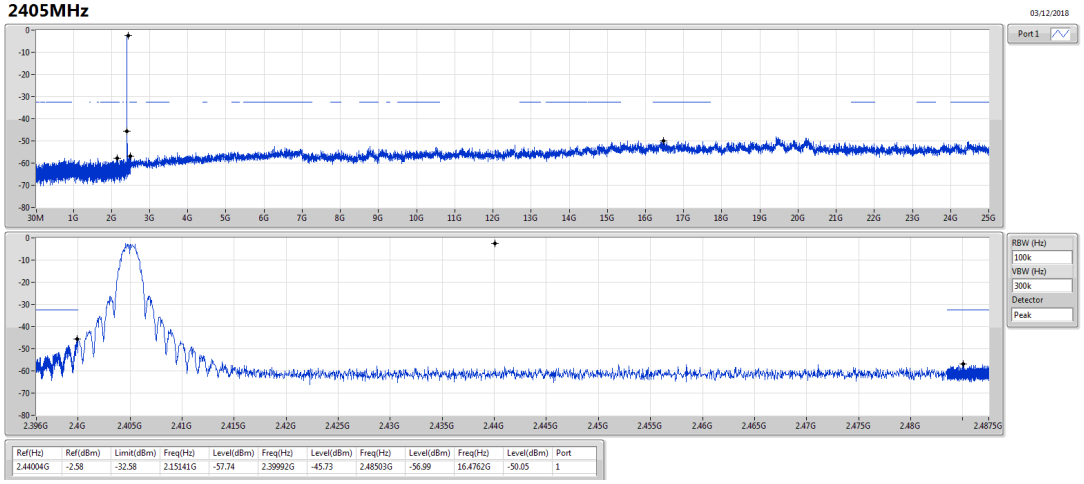
Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
Thread_1TX	Pass	2.44004G	-2.58	-32.58	2.14461G	-57.11	2.39761G	-57.41	2.48394G	-44.82	24.47096G	-49.97	1

Result

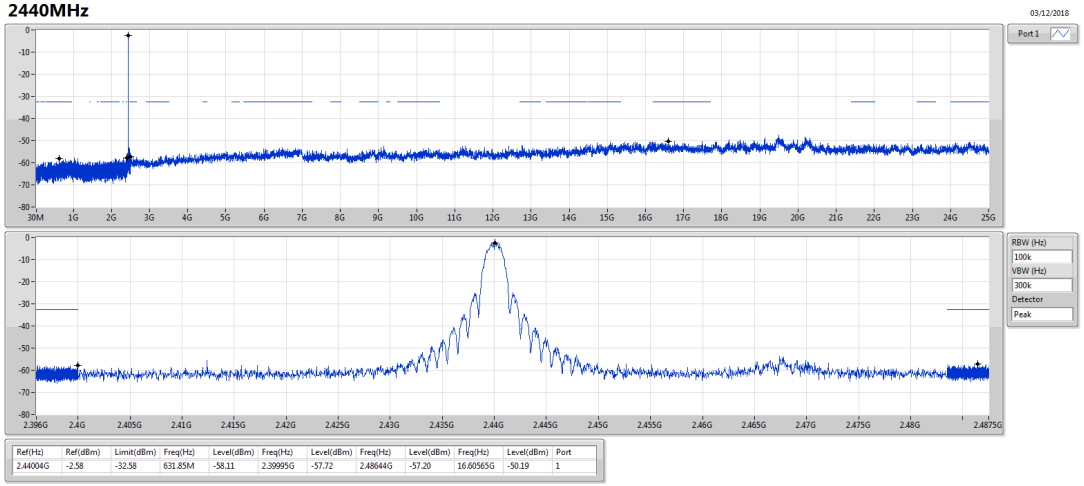
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
Thread_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.44004G	-2.58	-32.58	2.15141G	-57.74	2.39992G	-45.73	2.48503G	-56.99	16.4762G	-50.05	1
2440MHz	Pass	2.44004G	-2.58	-32.58	631.85M	-58.11	2.39995G	-57.72	2.48644G	-57.20	16.60565G	-50.19	1
2480MHz	Pass	2.44004G	-2.58	-32.58	2.14461G	-57.11	2.39761G	-57.41	2.48394G	-44.82	24.47096G	-49.97	1

Thread_1TX
2405MHz
CSE NdB



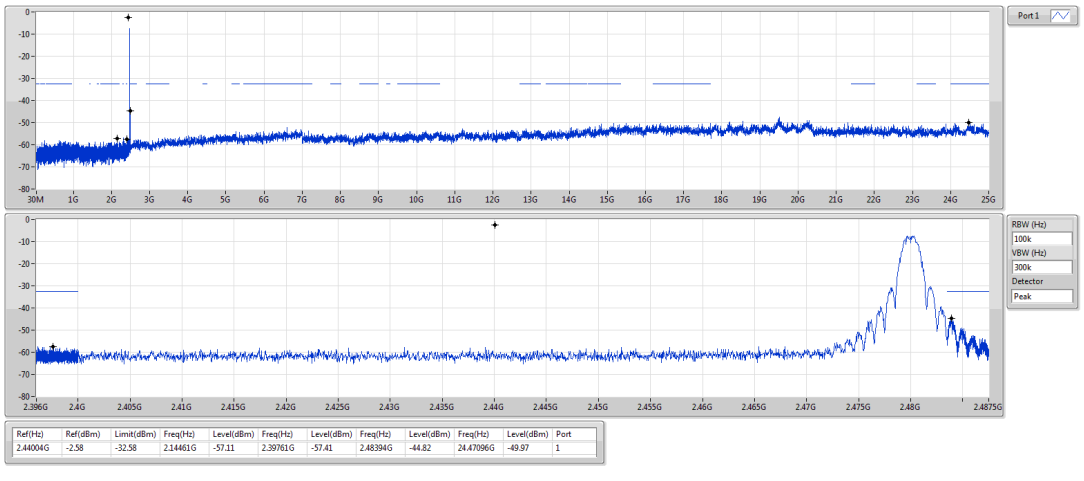
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44004G	-2.58	-32.58	2.15141G	-57.74	2.39992G	-45.73	2.48503G	-56.99	16.4762G	-50.05	1

Thread_1TX
2440MHz
CSE NdB



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44004G	-2.58	-32.58	631.85M	-58.11	2.39995G	-57.72	2.48644G	-57.20	16.60565G	-50.19	1

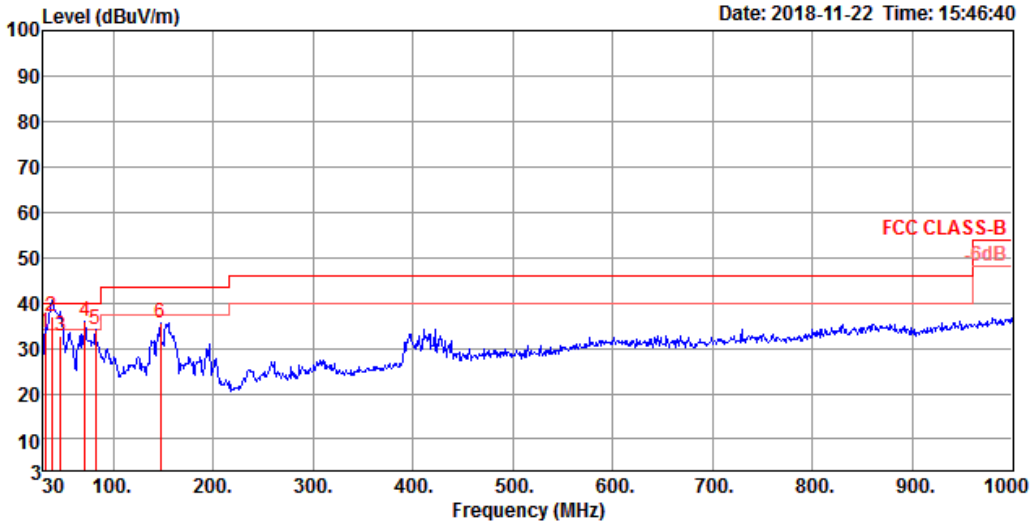
Thread_1TX
2480MHz
CSE NdB



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44004G	-2.58	-32.58	2.14461G	-57.11	2.39761G	-57.41	2.48394G	-44.82	24.47096G	-49.97	1

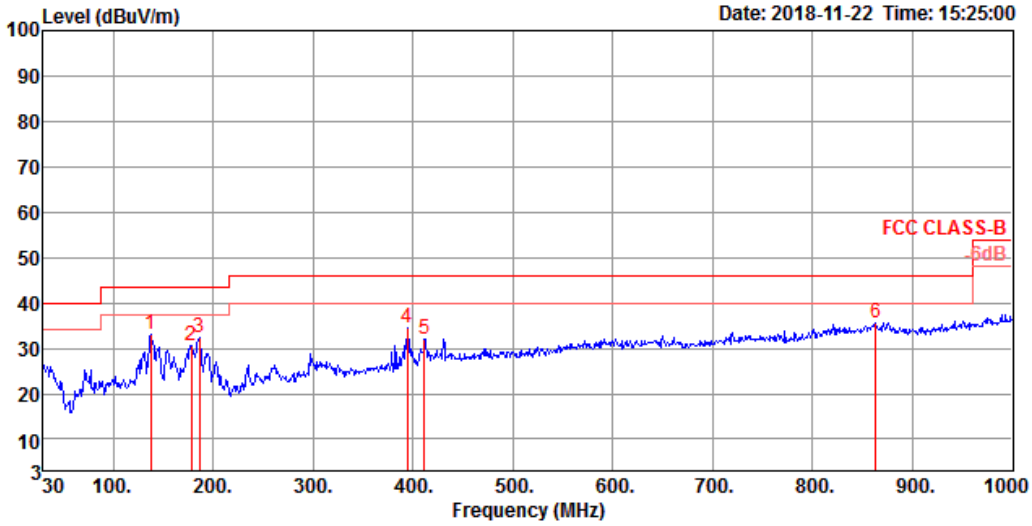
Test Mode	Mode 6	Frequency Range	30 MHz to 1,000 MHz

Vertical 30 MHz to 1,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	31.94	33.45	40.00	-6.55	42.29	0.67	23.09	32.60	100	53	QP	VERTICAL
2	38.73	36.93	40.00	-3.07	49.50	0.88	19.15	32.60	100	2	QP	VERTICAL
3	47.46	32.60	40.00	-7.40	49.20	0.98	15.01	32.59	112	21	QP	VERTICAL
4	71.71	35.89	40.00	-4.11	55.23	1.18	12.05	32.57	200	71	Peak	VERTICAL
5	82.38	34.00	40.00	-6.00	52.20	1.30	13.06	32.56	125	144	Peak	VERTICAL
6	147.37	35.60	43.50	-7.90	49.68	1.89	16.54	32.51	125	218	Peak	VERTICAL

Horizontal 30 MHz to 1,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	137.67	33.10	43.50	-10.40	46.51	1.87	17.24	32.52	300	272	Peak	HORIZONTAL
2	178.41	30.71	43.50	-12.79	46.07	2.04	15.09	32.49	200	210	Peak	HORIZONTAL
3	186.17	32.24	43.50	-11.26	47.76	2.11	14.86	32.49	200	193	Peak	HORIZONTAL
4	394.72	34.53	46.00	-11.47	42.23	3.51	21.23	32.44	125	287	Peak	HORIZONTAL
5	411.21	32.09	46.00	-13.91	38.97	3.59	21.97	32.44	125	271	Peak	HORIZONTAL
6	863.23	35.74	46.00	-10.26	35.73	5.95	26.07	32.01	100	34	Peak	HORIZONTAL

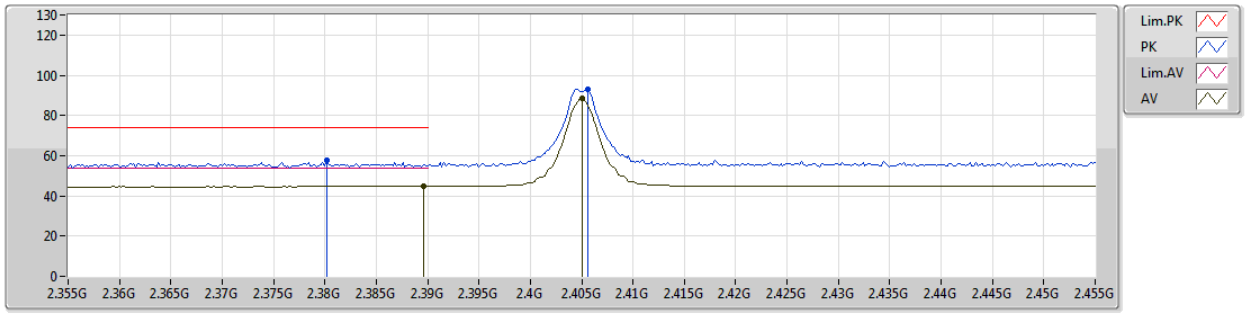
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
Thread_Nss1_1TX	Pass	AV	2.4835G	53.78	54.00	-0.22	33.36	3	Horizontal	304	2.54	-

Thread_Nss1_1TX

2405MHz_TX

03/12/2018



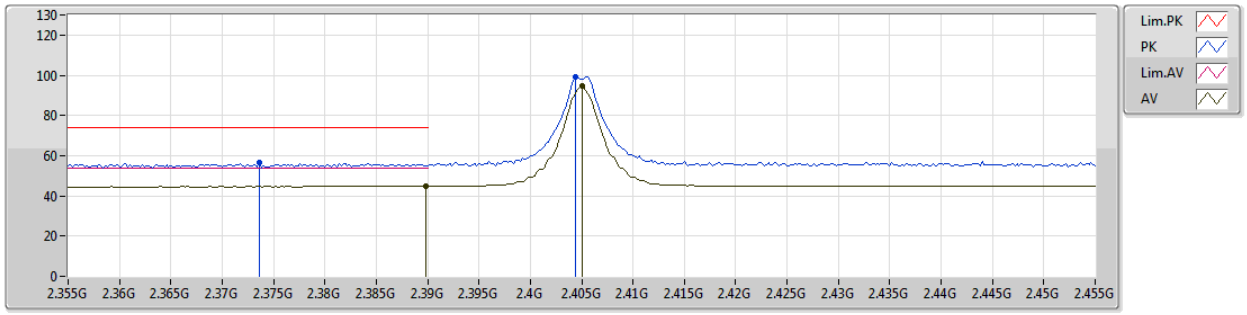
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3802G	57.69	74.00	-16.31	33.07	3	Vertical	158	2.99	-
AV	2.3896G	44.81	54.00	-9.19	33.08	3	Vertical	158	2.99	-
PK	2.4056G	92.99	Inf	-Inf	33.11	3	Vertical	158	2.99	-
AV	2.405G	88.56	Inf	-Inf	33.11	3	Vertical	158	2.99	-

Thread_Nss1_1TX

2405MHz_TX

03/12/2018



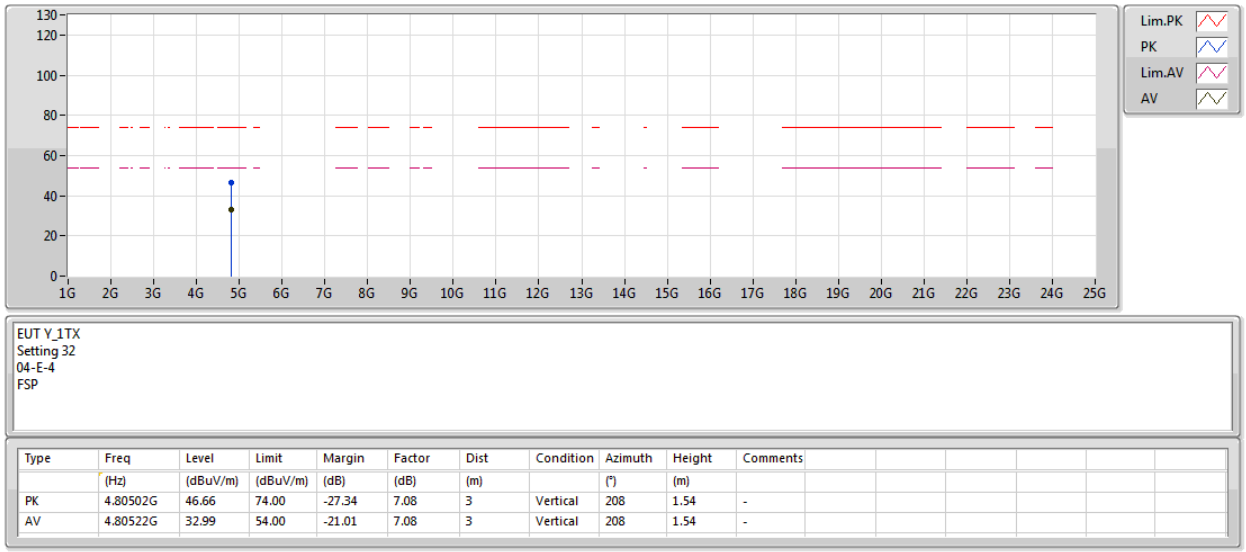
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3736G	56.59	74.00	-17.41	33.07	3	Horizontal	137	1.96	-
AV	2.3898G	44.80	54.00	-9.20	33.08	3	Horizontal	137	1.96	-
PK	2.4044G	99.00	Inf	-Inf	33.11	3	Horizontal	137	1.96	-
AV	2.405G	94.58	Inf	-Inf	33.11	3	Horizontal	137	1.96	-

Thread_Nss1_1TX

2405MHz_TX

03/12/2018



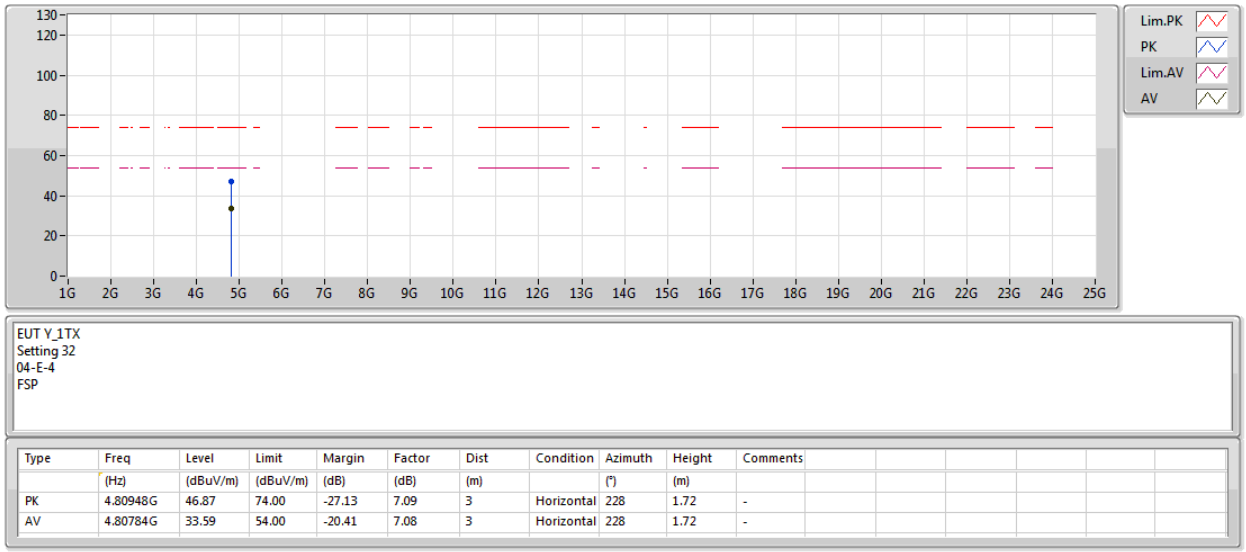
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.80502G	46.66	74.00	-27.34	7.08	3	Vertical	208	1.54	-
AV	4.80522G	32.99	54.00	-21.01	7.08	3	Vertical	208	1.54	-

Thread_Nss1_1TX

2405MHz_TX

03/12/2018



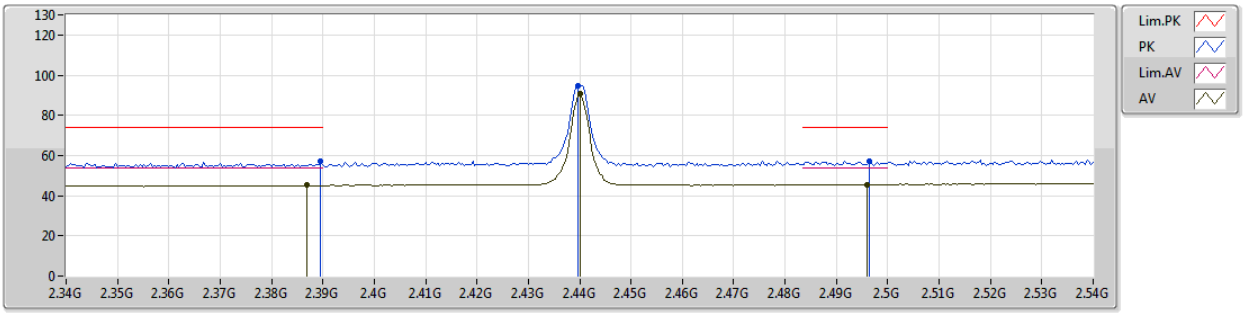
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.80948G	46.87	74.00	-27.13	7.09	3	Horizontal	228	1.72	-
AV	4.80784G	33.59	54.00	-20.41	7.08	3	Horizontal	228	1.72	-

Thread_Nss1_1TX

2440MHz_TX

03/12/2018



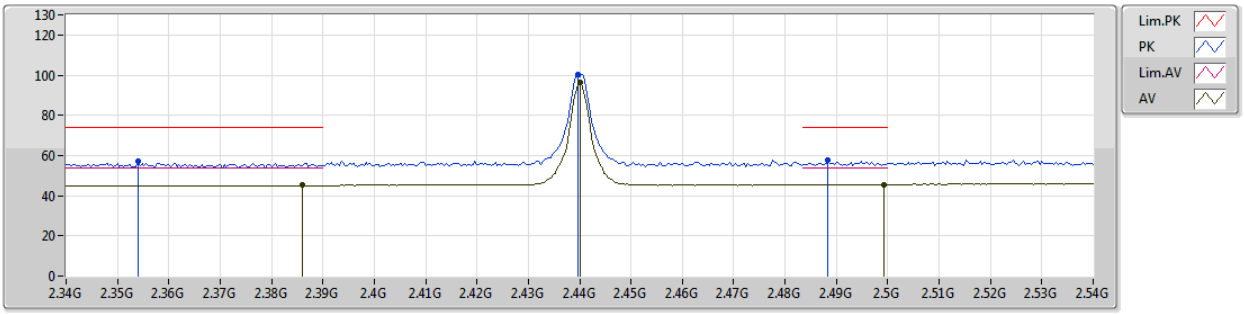
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3896G	56.97	74.00	-17.03	33.08	3	Vertical	184	2.97	-
AV	2.3868G	45.11	54.00	-8.89	33.07	3	Vertical	184	2.97	-
PK	2.4396G	94.81	Inf	-Inf	33.22	3	Vertical	184	2.97	-
AV	2.44G	90.60	Inf	-Inf	33.22	3	Vertical	184	2.97	-
PK	2.4964G	57.34	74.00	-16.66	33.40	3	Vertical	184	2.97	-
AV	2.496G	45.62	54.00	-8.38	33.40	3	Vertical	184	2.97	-

Thread_Nss1_1TX

2440MHz_TX

03/12/2018



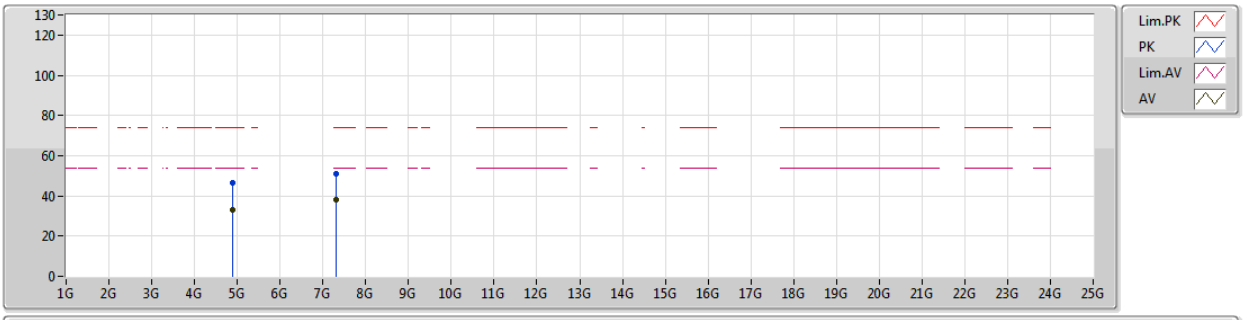
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.354G	56.94	74.00	-17.06	33.05	3	Horizontal	238	2.34	-
AV	2.386G	45.11	54.00	-8.89	33.07	3	Horizontal	238	2.34	-
PK	2.4396G	100.30	Inf	-Inf	33.22	3	Horizontal	238	2.34	-
AV	2.44G	96.13	Inf	-Inf	33.22	3	Horizontal	238	2.34	-
PK	2.4884G	57.64	74.00	-16.36	33.38	3	Horizontal	238	2.34	-
AV	2.4992G	45.64	54.00	-8.36	33.41	3	Horizontal	238	2.34	-

Thread_Nss1_1TX

2440MHz_TX

03/12/2018



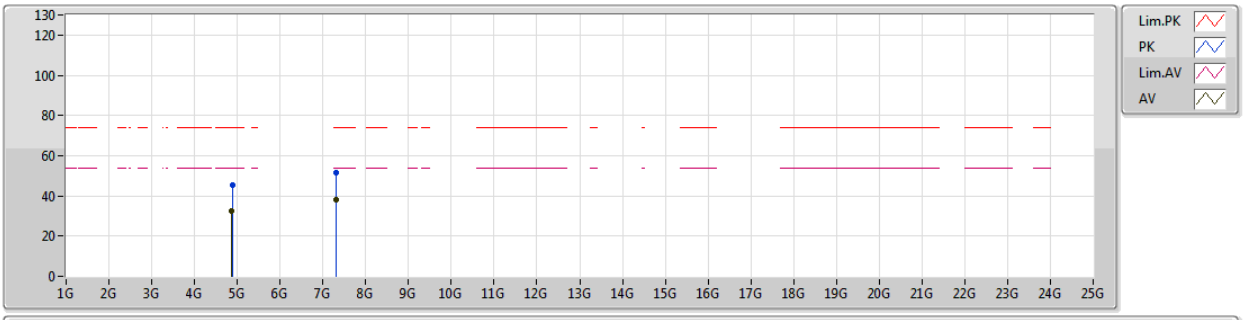
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.88104G	46.24	74.00	-27.76	5.12	3	Vertical	299	1.50	-
AV	4.88232G	32.79	54.00	-21.21	5.12	3	Vertical	299	1.50	-
PK	7.32122G	51.16	74.00	-22.84	9.73	3	Vertical	137	1.39	-
AV	7.3215G	38.11	54.00	-15.89	9.74	3	Vertical	137	1.39	-

Thread_Nss1_1TX

2440MHz_TX

03/12/2018



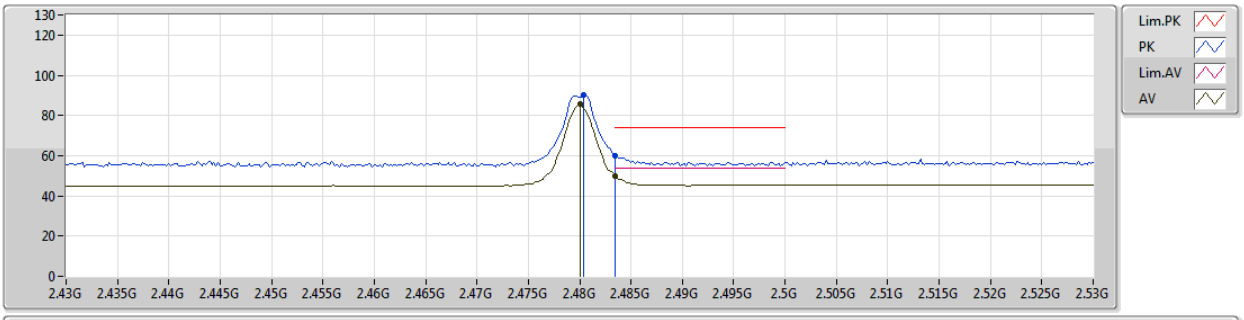
EUT Y_1TX
Setting 32
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.88458G	45.30	74.00	-28.70	5.13	3	Horizontal	354	1.50	-
AV	4.87528G	32.44	54.00	-21.56	5.11	3	Horizontal	354	1.50	-
PK	7.31748G	51.47	74.00	-22.53	9.74	3	Horizontal	308	2.07	-
AV	7.31692G	37.95	54.00	-16.05	9.74	3	Horizontal	308	2.07	-

Thread_Nss1_1TX

2480MHz_TX

03/12/2018



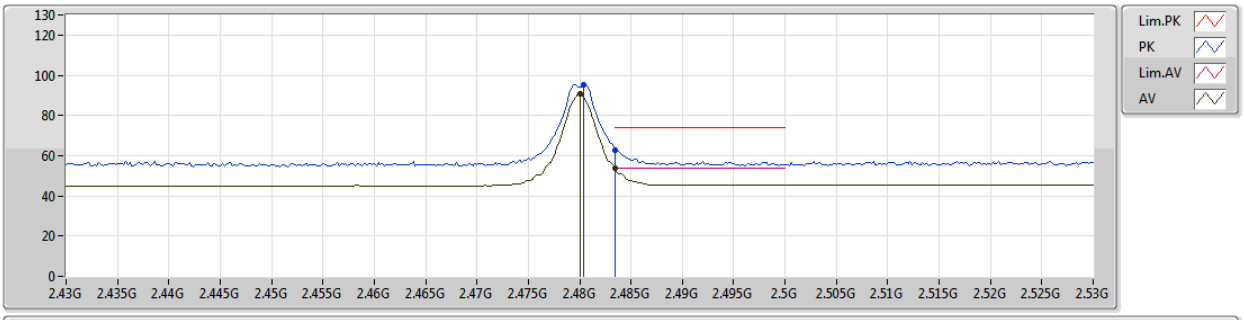
EUT Y_1TX
Setting 16
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.4804G	90.09	Inf	-Inf	33.35	3	Vertical	3	2.84	-
AV	2.48G	85.64	Inf	-Inf	33.35	3	Vertical	3	2.84	-
PK	2.4835G	60.09	74.00	-13.91	33.36	3	Vertical	3	2.84	-
AV	2.4835G	50.09	54.00	-3.91	33.36	3	Vertical	3	2.84	-

Thread_Nss1_1TX

2480MHz_TX

03/12/2018



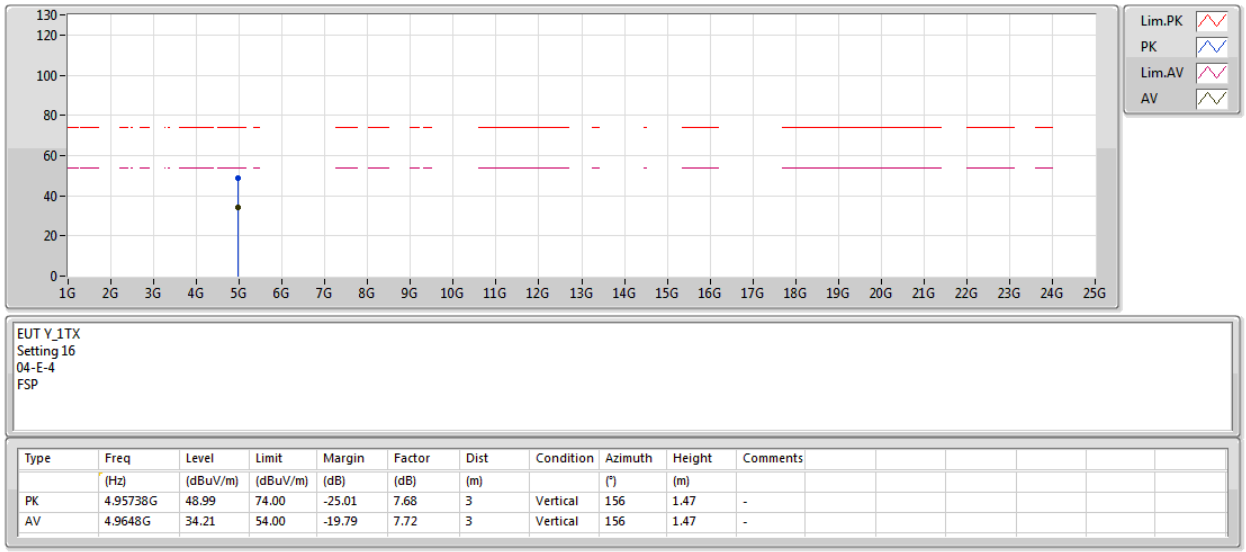
EUT Y_1TX
Setting 16
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.4804G	95.29	Inf	-Inf	33.35	3	Horizontal	304	2.54	-
AV	2.48G	90.87	Inf	-Inf	33.35	3	Horizontal	304	2.54	-
PK	2.4835G	62.99	74.00	-11.01	33.36	3	Horizontal	304	2.54	-
AV	2.4835G	53.78	54.00	-0.22	33.36	3	Horizontal	304	2.54	-

Thread_Nss1_1TX

2480MHz_TX

03/12/2018



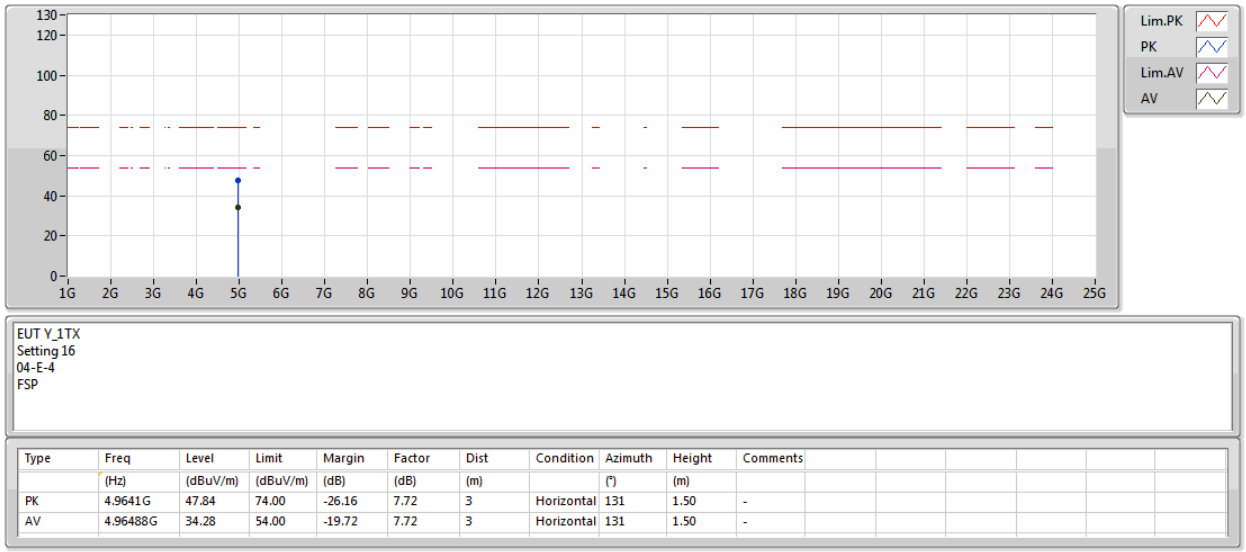
EUT Y_1TX
Setting 16
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.95738G	48.99	74.00	-25.01	7.68	3	Vertical	156	1.47	-
AV	4.9648G	34.21	54.00	-19.79	7.72	3	Vertical	156	1.47	-

Thread_Nss1_1TX

2480MHz_TX

03/12/2018



EUT Y_1TX
Setting 16
04-E-4
FSP

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.9641G	47.84	74.00	-26.16	7.72	3	Horizontal	131	1.50	-
AV	4.96488G	34.28	54.00	-19.72	7.72	3	Horizontal	131	1.50	-