FCC RADIO TEST REPORT

FCC ID	:	2AHKM-HIVE2200
Equipment	:	2x2 DBCC WiFi Extender
Brand Name	:	hitron
Model Name	:	HIXE12AWR
Applicant	:	Hitron Technologies Inc. No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 30078, Taiwan
Manufacturer	:	Hitron Technologies Inc. No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 30078, Taiwan
Standard	:	47 CFR FCC Part 15.247

The product was received on Jan. 04, 2019, and testing was started from Jan. 08, 2019 and completed on Jan. 23, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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

Approved by: Cliff Chang

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

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR862827-02AA	01	Initial issue of report	Mar. 05, 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(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. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40)	2422-2452	3-9 [7]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	2TX
2.4-2.4835GHz	802.11g	20	2TX
2.4-2.4835GHz	802.11n HT20	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX

Note:
- 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	P/N	Antenna Type	Connector	Gain (dBi)
1	1	Ethertronics	XE1v2	-	PCB Antenna	I-PEX	Note
2	2	Ethertronics	XE1v2	-	PCB Antenna	I-PEX	
3	1	PSA	-	RFECA3216060A1T	CERAMIC Antenna	N/A	

Note 1:

Ant.	Port	Gain (dBi)					
		WLAN 2.4G	WLAN 5G Band 1	WLAN 5G Band 2	WLAN 5G Band 3	WLAN 5G Band 4	BT
1	1	4.4	4.8	4.8	5.4	5.5	-
2	2	3.1	3.8	4.0	4.9	3.8	-
3	1	-		-	-		2.09

Note 2: The EUT has three antennas.

Note 3: The above information was declared by manufacturer.

<For 2.4GHz Band>

For IEEE 802.11b/g/n mode (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 Band>

For IEEE 802.11a/n/ac mode (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>

For BT 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
802.11b	0.997	0.013	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11g	0.963	0.164	2.018m	1k
802.11n HT20	0.961	0.173	1.881m	1k
802.11n HT40	0.944	0.25	921.875u	3k

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

1.1.4 EUT Operational Condition

EUT Power Type	Internal power supply			
Beamforming Function	☐	With beamforming	☒	Without beamforming
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	artgui (ART2-GUI v2.3)			

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT Function

Function
AP Router
Extender
Mesh

Note: The EUT supports AP Router、Extender and Mesh mode, only AP Router mode was tested and recorded in this test report for customer's request.

1.1.6 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR862827AA

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

Modifications	Performance Checking
1. Updating the hardware version to “SR3” from “SR2”. The detail differences as below. a) Updating the design for antenna. b) Change LED to DIP lamp from SMD chip c) Removing the absorber of the device. d) Adding U4 and U4 related components on the mother board. e) Change the opening size for pin header on the main frame.	1. AC Power-line Conducted Emissions 2. Emissions in Restricted Frequency Bands For items 2 after evaluating, the worst case is found at 802.11b/g/11n HT20/11n HT40 CH6 (2437Hz) and retest these channels only and for above 1GHz will be based on original output power to retest.
2. Adding beamforming for Band 1 ~ Band 4. 3. Adding 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz) for this device.	There's no influence on this test report.

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
- FCC KDB 662911 D01 v02r01

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
Radiated	03CH01-CB	RJ Huang	22°C / 54%	Jan. 08, 2019 ~ Jan. 23, 2019
AC Conduction	CO02-CB	Wei Li	25°C / 65%	Jan. 14, 2019

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

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
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%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	PowerSetting
802.11b_Nss1,(1Mbps)_2TX	-
2437MHz	22.5
802.11g_Nss1,(6Mbps)_2TX	-
2437MHz	21
802.11n HT20_Nss1,(MCS0)_2TX	-
2437MHz	22
802.11n HT40_Nss1,(MCS0)_2TX	-
2437MHz	17

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	AP Router mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	Normal Link
1	AP Router mode - EUT in Z axis
2	AP Router mode - EUT in Y axis
For operating mode 1 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 for Emissions in Restricted Frequency Bands test, 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 + WLAN 5GHz
Refer to Sporton Test Report No.: FA862827-02 for Co-location RF Exposure Evaluation.	

Note: For normal link mode, the bluetooth function doesn't work.

2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

N/A

2.5 Support Equipment

For Test Site No: CO02-CB

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E6430	N/A
B	NB	DELL	E6430	N/A
C	NB	DELL	E6430	N/A

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

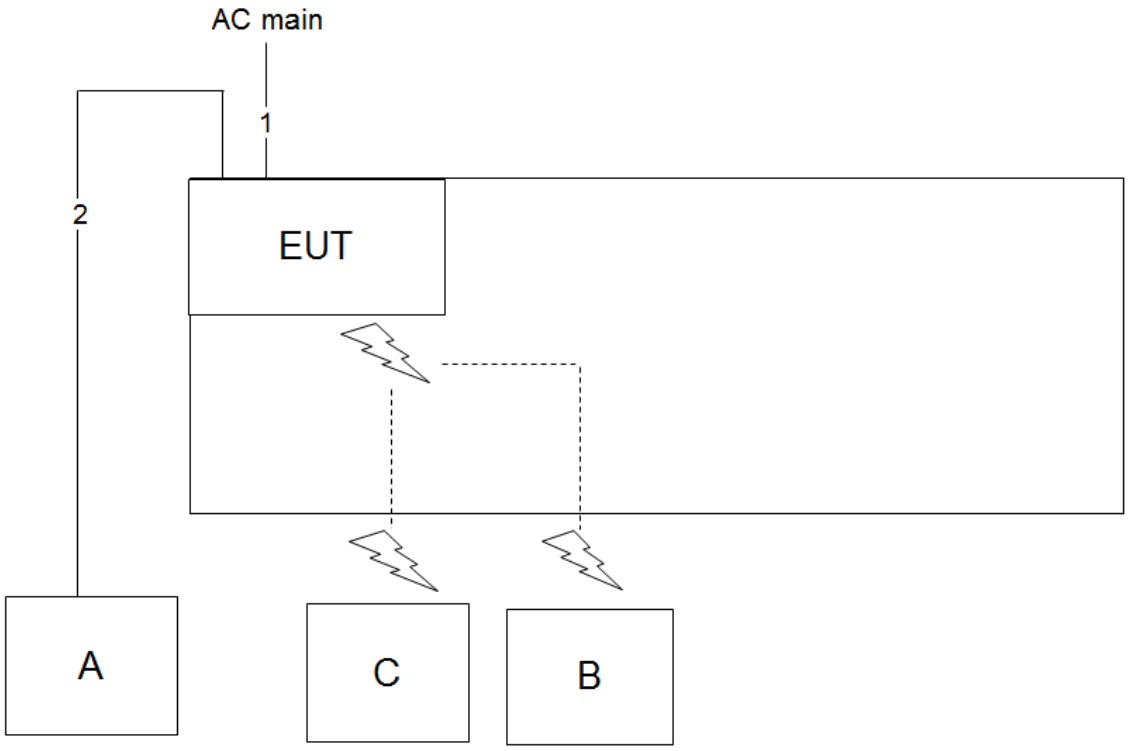
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	NB	DELL	E4300	N/A
C	NB	DELL	E4300	N/A

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

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

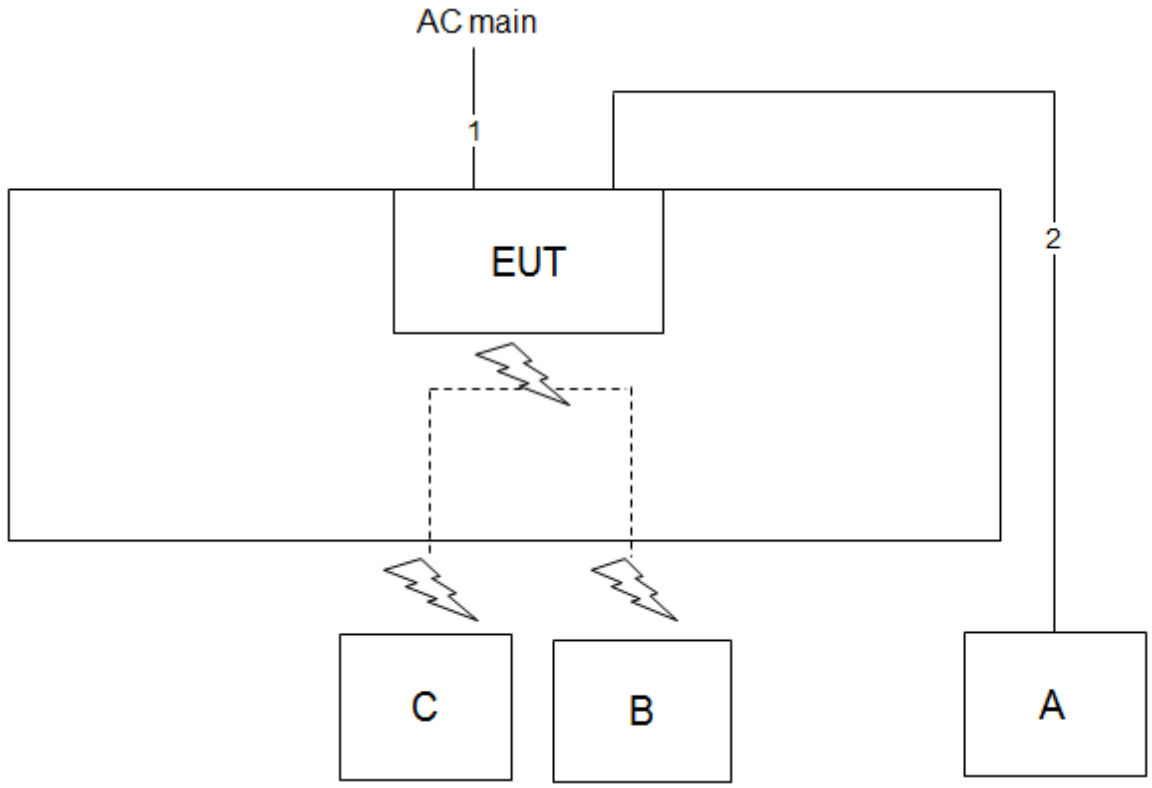
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



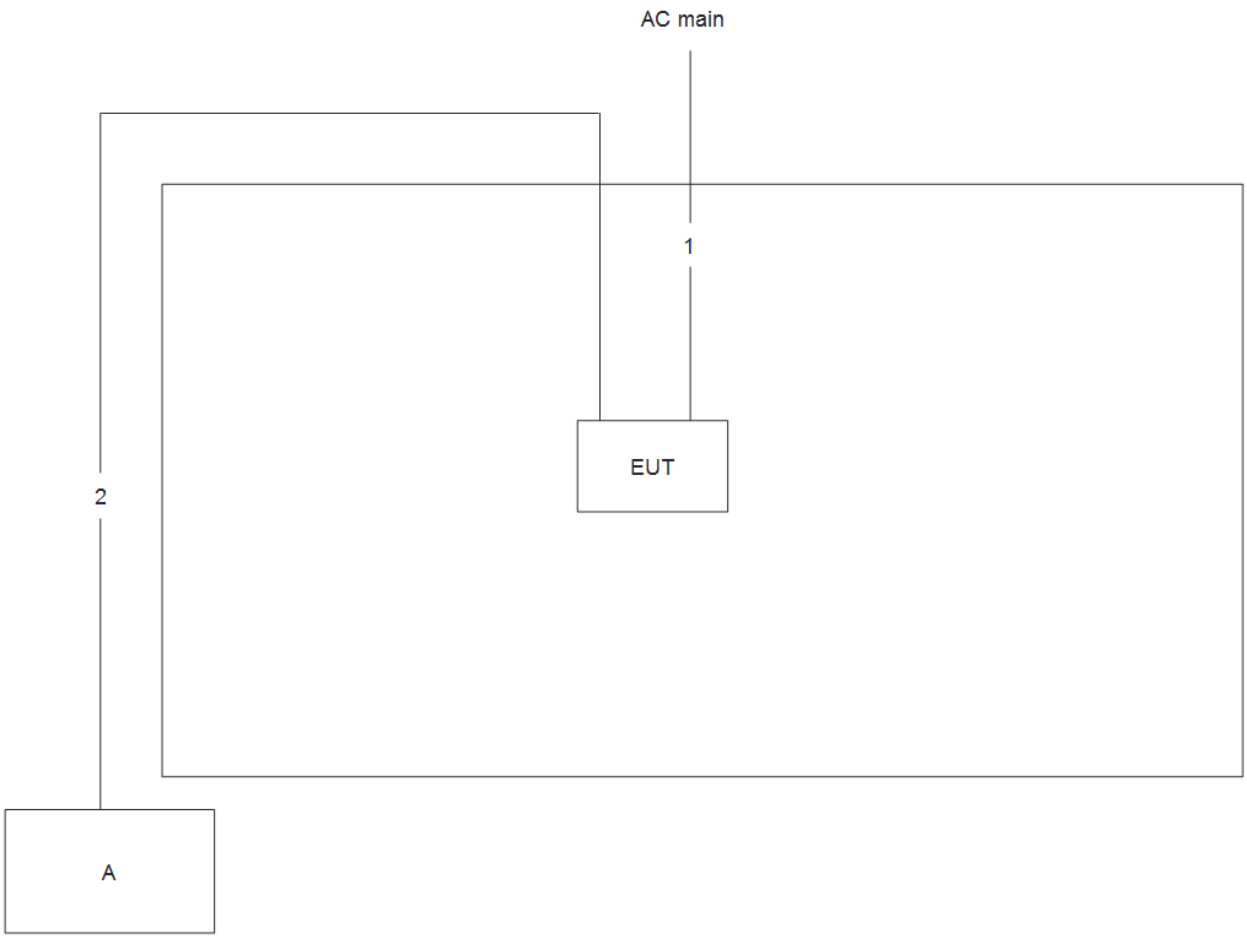
Item	Connection	Shielded	Length
1	Power cable	No	0.8m
2	RJ-45 cable	No	10m

Test Setup Diagram - Radiated Test < 1GHz



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

Test Setup Diagram - Radiated Test > 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	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

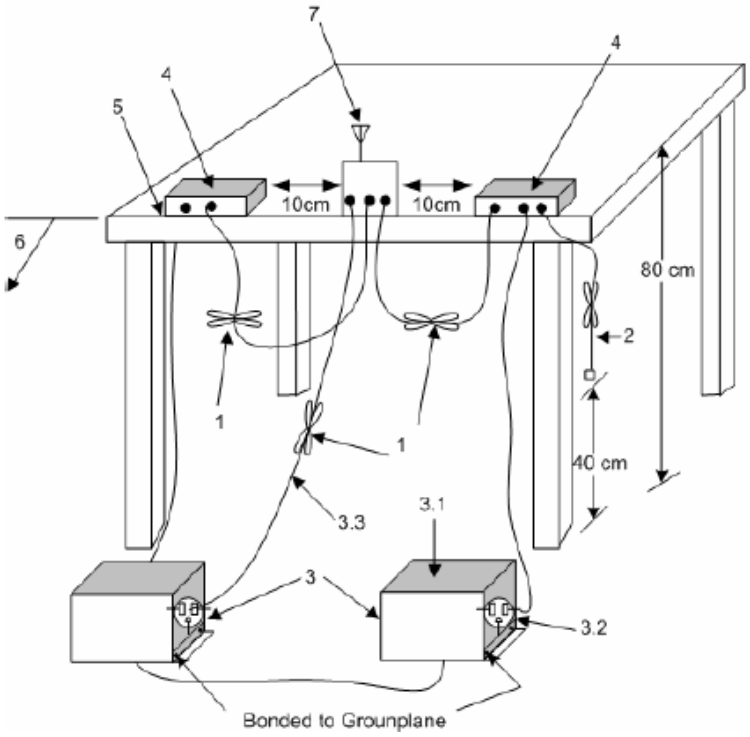
Refer a test equipment and calibration data table in this test report.

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.

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emissions in Restricted Frequency Bands

3.2.1 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.

3.2.2 Measuring Instruments

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

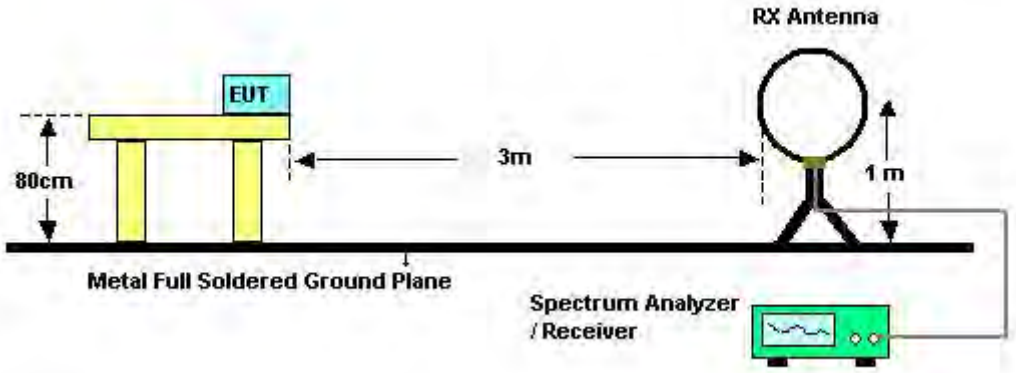
3.2.3 Test Procedures

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.		

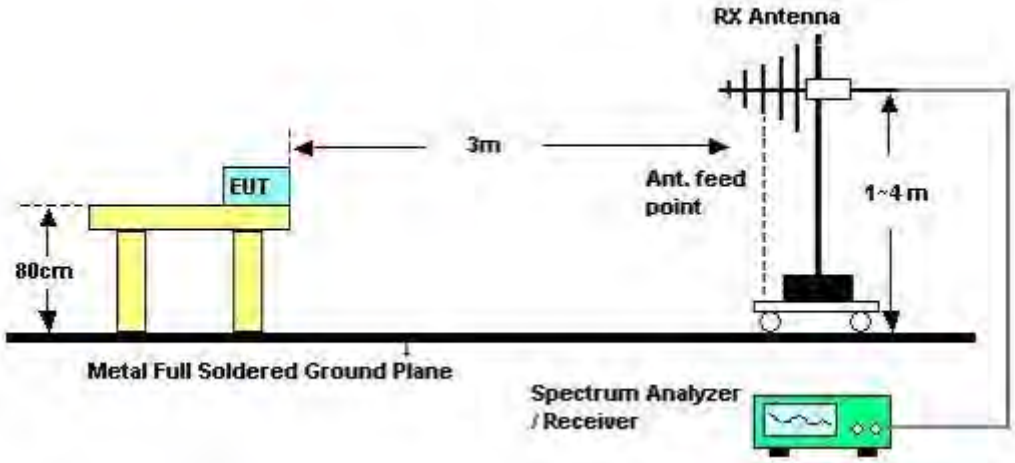
3.2.4 Test Setup

Radiated - Emissions in Restricted Frequency Bands

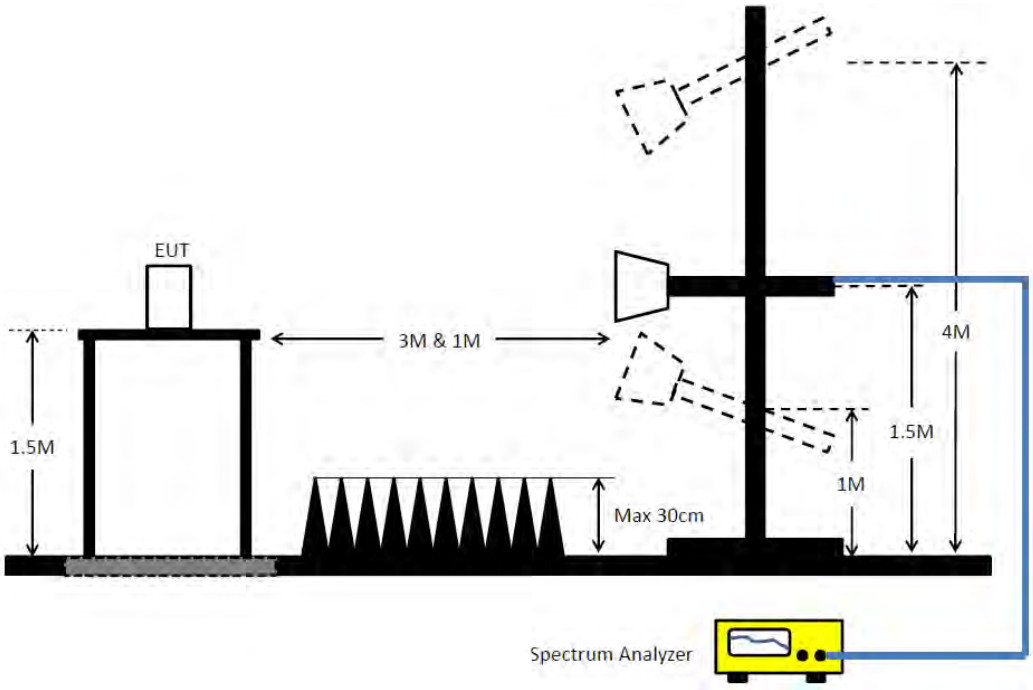
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.2.5 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.

3.2.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix B

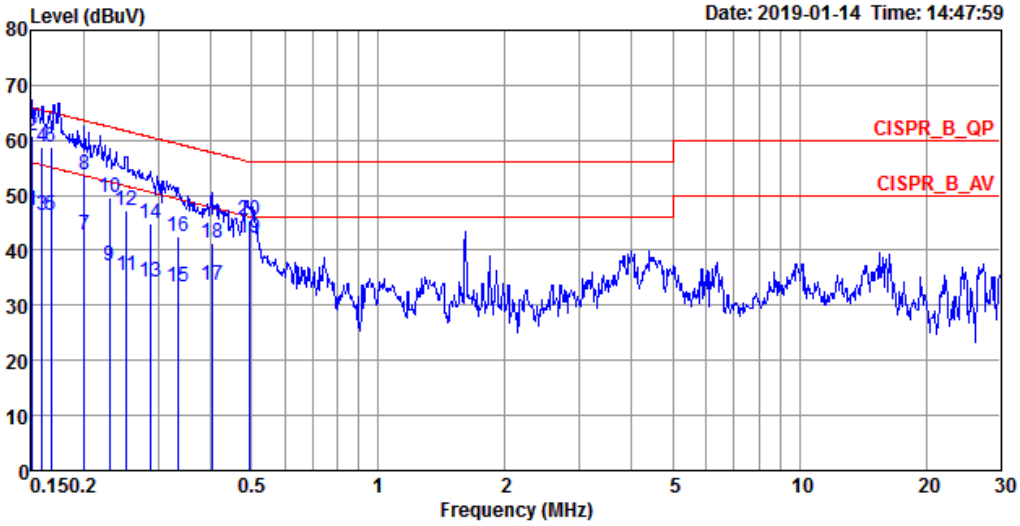
4 Test Equipment and Calibration Data

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	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2019	Jan. 07, 2020	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH01-CB)
Spectrum analyzer	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 ~ 1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)

Note: Calibration Interval of instruments listed above is one year.
N.C.R. means Non-Calibration required.

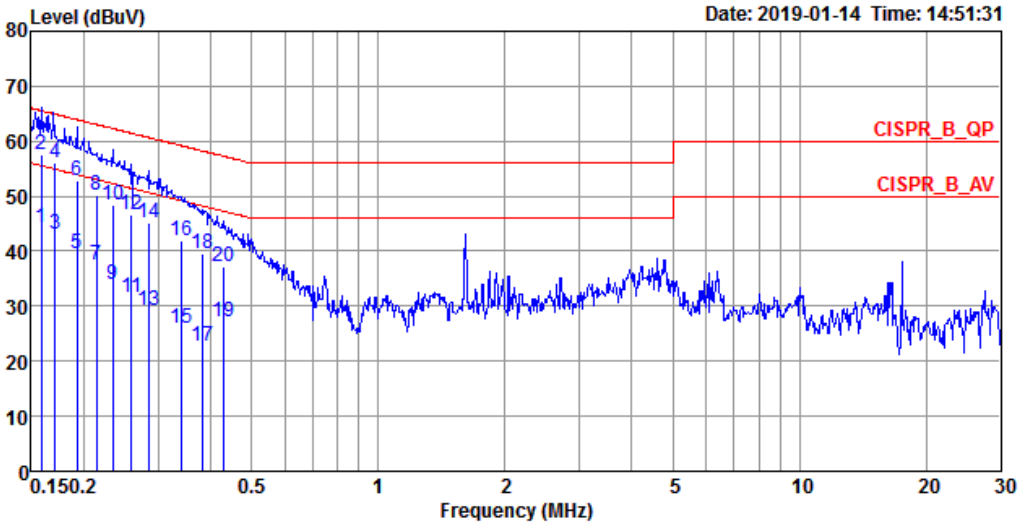
Test Mode	Mode 1	Frequency Range	0.15 MHz to 30 MHz

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1508	47.27	-8.69	55.96	37.10	10.15	0.02	Average	LINE
2	0.1508	60.69	-5.27	65.96	50.52	10.15	0.02	QP	LINE
3	0.1590	46.28	-9.24	55.52	36.11	10.15	0.02	Average	LINE
4	0.1590	58.70	-6.82	65.52	48.53	10.15	0.02	QP	LINE
5	0.1668	46.35	-8.77	55.12	36.18	10.15	0.02	Average	LINE
6	0.1668	58.62	-6.50	65.12	48.45	10.15	0.02	QP	LINE
7	0.2007	42.72	-10.86	53.58	32.55	10.15	0.02	Average	LINE
8	0.2007	53.66	-9.92	63.58	43.49	10.15	0.02	QP	LINE
9	0.2297	37.27	-15.19	52.46	27.10	10.15	0.02	Average	LINE
10	0.2297	49.65	-12.81	62.46	39.48	10.15	0.02	QP	LINE
11	0.2521	35.28	-16.41	51.69	25.11	10.15	0.02	Average	LINE
12	0.2521	47.35	-14.34	61.69	37.18	10.15	0.02	QP	LINE
13	0.2878	34.24	-16.35	50.59	24.06	10.16	0.02	Average	LINE
14	0.2878	44.90	-15.69	60.59	34.72	10.16	0.02	QP	LINE
15	0.3338	33.31	-16.04	49.35	23.13	10.16	0.02	Average	LINE
16	0.3338	42.65	-16.70	59.35	32.47	10.16	0.02	QP	LINE
17	0.4019	33.77	-14.04	47.81	23.59	10.16	0.02	Average	LINE
18	0.4019	41.31	-16.50	57.81	31.13	10.16	0.02	QP	LINE
19	0.4954	42.20	-3.88	46.08	32.02	10.16	0.02	Average	LINE
20	0.4954	45.37	-10.71	56.08	35.19	10.16	0.02	QP	LINE

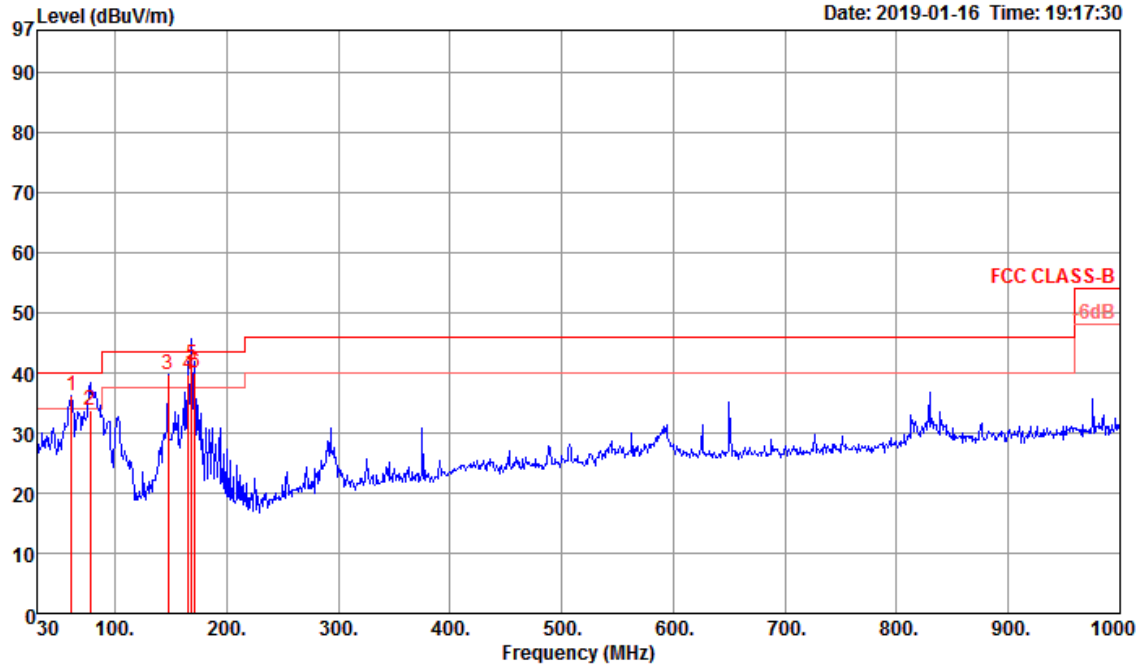
Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1582	44.26	-11.30	55.56	34.11	10.13	0.02	Average	NEUTRAL
2	0.1582	57.46	-8.10	65.56	47.31	10.13	0.02	QP	NEUTRAL
3	0.1707	43.18	-11.75	54.93	33.03	10.13	0.02	Average	NEUTRAL
4	0.1707	56.10	-8.83	64.93	45.95	10.13	0.02	QP	NEUTRAL
5	0.1924	39.57	-14.36	53.93	29.42	10.13	0.02	Average	NEUTRAL
6	0.1924	52.84	-11.09	63.93	42.69	10.13	0.02	QP	NEUTRAL
7	0.2139	37.41	-15.64	53.05	27.26	10.13	0.02	Average	NEUTRAL
8	0.2139	50.08	-12.97	63.05	39.93	10.13	0.02	QP	NEUTRAL
9	0.2341	33.90	-18.40	52.30	23.75	10.13	0.02	Average	NEUTRAL
10	0.2341	48.46	-13.84	62.30	38.31	10.13	0.02	QP	NEUTRAL
11	0.2589	31.52	-19.95	51.47	21.37	10.13	0.02	Average	NEUTRAL
12	0.2589	46.77	-14.70	61.47	36.62	10.13	0.02	QP	NEUTRAL
13	0.2848	29.11	-21.57	50.68	18.95	10.14	0.02	Average	NEUTRAL
14	0.2848	45.13	-15.55	60.68	34.97	10.14	0.02	QP	NEUTRAL
15	0.3392	25.85	-23.37	49.22	15.69	10.14	0.02	Average	NEUTRAL
16	0.3392	41.93	-17.29	59.22	31.77	10.14	0.02	QP	NEUTRAL
17	0.3832	22.85	-25.36	48.21	12.69	10.14	0.02	Average	NEUTRAL
18	0.3832	39.52	-18.69	58.21	29.36	10.14	0.02	QP	NEUTRAL
19	0.4282	27.15	-20.14	47.29	16.99	10.14	0.02	Average	NEUTRAL
20	0.4282	37.30	-19.99	57.29	27.14	10.14	0.02	QP	NEUTRAL

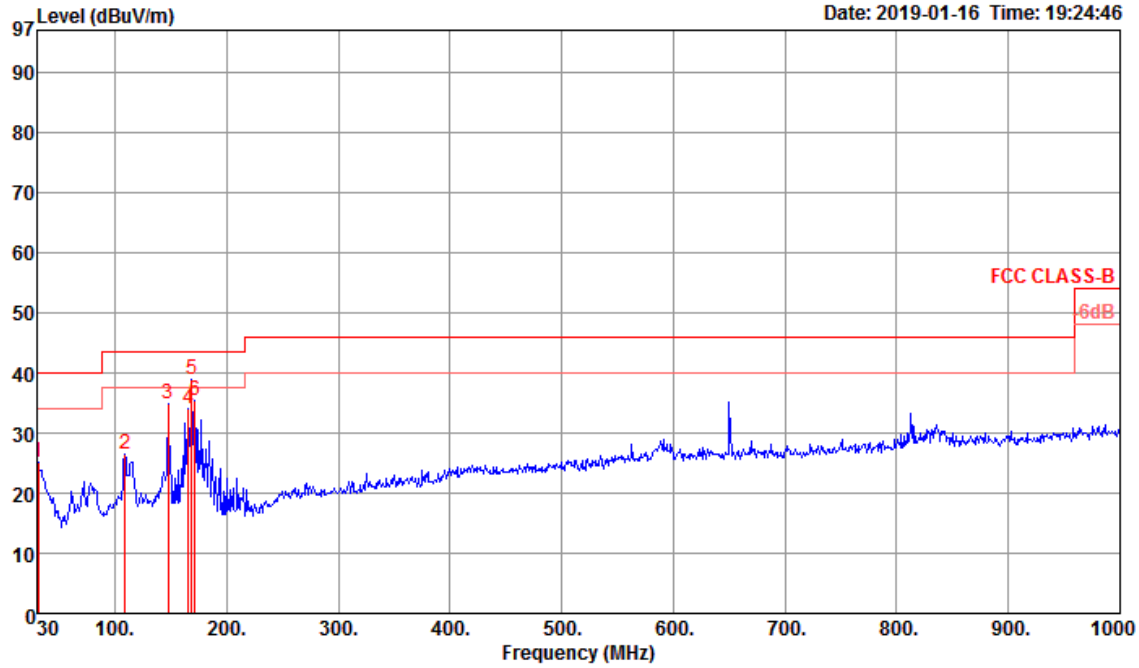
Test Mode	Mode 1	Frequency Range	30 MHz to 1,000 MHz

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	61.04	36.14	40.00	-3.86	54.31	0.99	12.50	31.66	300	0	Peak	VERTICAL
2	77.53	33.68	40.00	-6.32	50.79	1.12	13.47	31.70	100	131	QP	VERTICAL
3	147.37	39.83	43.50	-3.67	52.99	1.50	17.10	31.76	300	0	Peak	VERTICAL
4	165.80	39.77	43.50	-3.73	53.70	1.62	16.20	31.75	100	300	QP	VERTICAL
5	168.71	41.45	43.50	-2.05	55.46	1.64	16.10	31.75	100	308	QP	VERTICAL
6	171.62	40.09	43.50	-3.41	54.20	1.64	16.00	31.75	100	301	QP	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	30.97	25.02	40.00	-14.98	30.18	0.76	25.40	31.32	100	360	Peak	HORIZONTAL
2	108.57	26.51	43.50	-16.99	38.61	1.29	18.33	31.72	100	360	Peak	HORIZONTAL
3	147.37	34.83	43.50	-8.67	47.99	1.50	17.10	31.76	100	360	Peak	HORIZONTAL
4	165.80	34.06	43.50	-9.44	47.99	1.62	16.20	31.75	100	360	Peak	HORIZONTAL
5	168.71	38.92	43.50	-4.58	52.93	1.64	16.10	31.75	100	360	Peak	HORIZONTAL
6	171.62	35.32	43.50	-8.18	49.43	1.64	16.00	31.75	100	360	Peak	HORIZONTAL

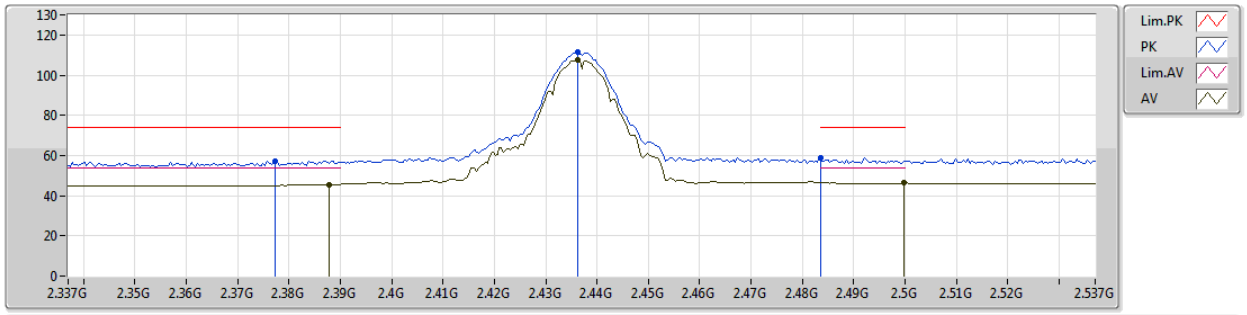
Summary

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	-	-	-	-	-	-	-	-	-	-	-	-
802.11n HT40_Nss1,(MCS0)_2TX	Pass	AV	2.4835G	53.75	54.00	-0.25	33.36	3	Horizontal	241	2.51	-

802.11b_Nss1,(1Mbps)_2TX

2437MHz_TX

14/01/2019



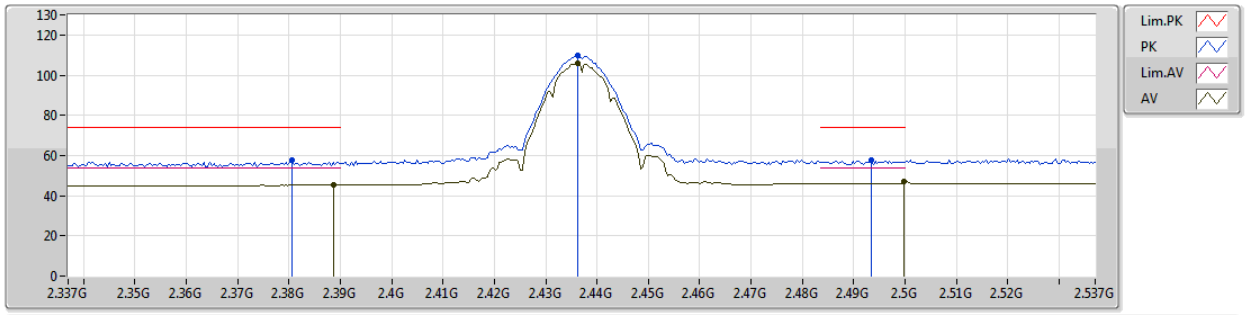
EUT Y_2TX
Setting 22.5
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3774G	57.43	74.00	-16.57	33.06	3	Vertical	157	1.50	-
AV	2.3878G	45.64	54.00	-8.36	33.08	3	Vertical	157	1.50	-
PK	2.4362G	111.35	Inf	-Inf	33.20	3	Vertical	157	1.50	-
AV	2.4362G	107.71	Inf	-Inf	33.20	3	Vertical	157	1.50	-
PK	2.4835G	58.72	74.00	-15.28	33.36	3	Vertical	157	1.50	-
AV	2.4998G	46.37	54.00	-7.63	33.41	3	Vertical	157	1.50	-

802.11b_Nss1,(1Mbps)_2TX

2437MHz_TX

14/01/2019



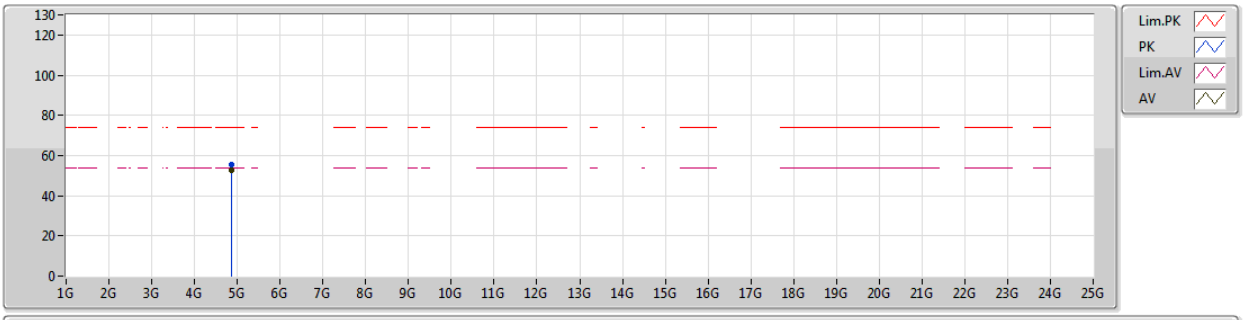
EUT Y_2TX
Setting 22.5
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3806G	57.74	74.00	-16.26	33.07	3	Horizontal	175	1.01	-
AV	2.3886G	45.32	54.00	-8.68	33.08	3	Horizontal	175	1.01	-
PK	2.4362G	109.58	Inf	-Inf	33.20	3	Horizontal	175	1.01	-
AV	2.4362G	105.88	Inf	-Inf	33.20	3	Horizontal	175	1.01	-
PK	2.4934G	57.64	74.00	-16.36	33.39	3	Horizontal	175	1.01	-
AV	2.4998G	46.81	54.00	-7.19	33.41	3	Horizontal	175	1.01	-

802.11b_Nss1,(1Mbps)_2TX

2437MHz_TX

14/01/2019



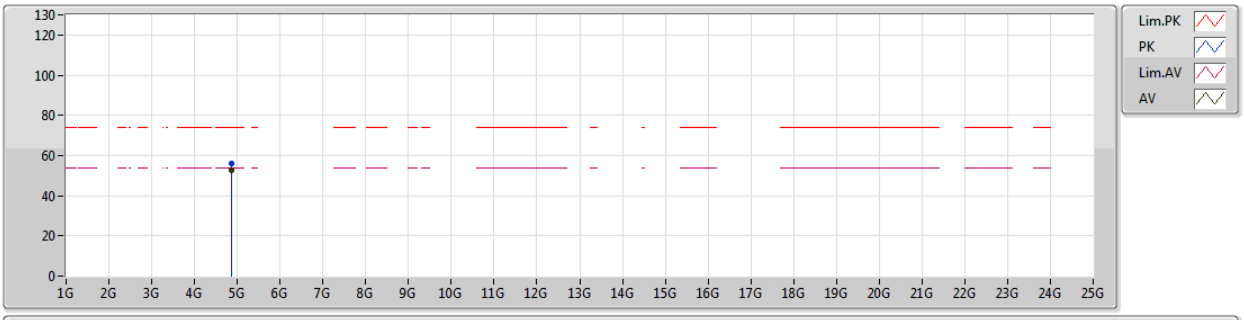
EUT Y_2TX
Setting 22.5
04-B-1
FSP(100304)
Sample 1

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.87392G	55.75	74.00	-18.25	7.37	3	Vertical	119	1.50	-
AV	4.874G	52.48	54.00	-1.52	7.37	3	Vertical	119	1.50	-

802.11b_Nss1,(1Mbps)_2TX

2437MHz_TX

14/01/2019



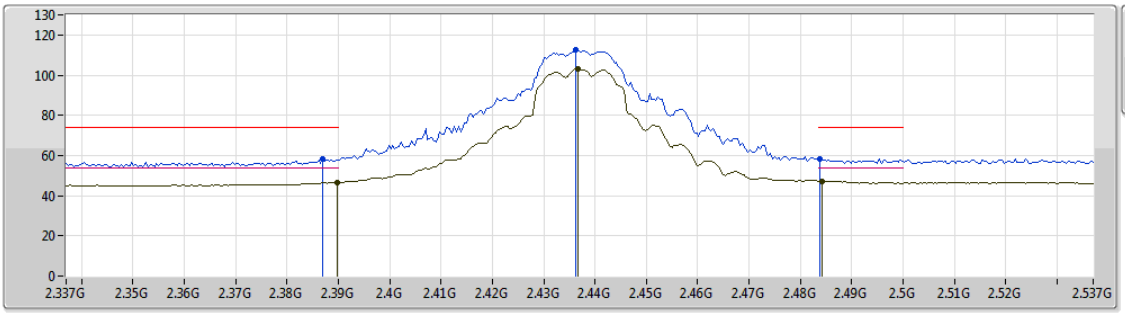
EUT Y_2TX
Setting 22.5
04-B-1
FSP(100304)
Sample 1

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.87404G	56.07	74.00	-17.93	7.37	3	Horizontal	86	1.02	-
AV	4.87398G	52.43	54.00	-1.57	7.37	3	Horizontal	86	1.02	-

802.11g_Nss1,(6Mbps)_2TX

2437MHz_TX

14/01/2019



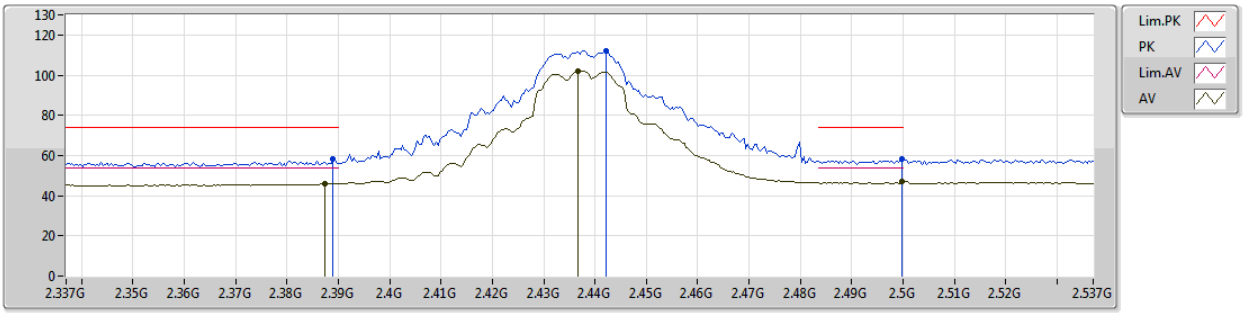
EUT Y_2TX
Setting 21
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.387G	58.32	74.00	-15.68	33.07	3	Vertical	224	1.50	-
AV	2.3898G	46.45	54.00	-7.55	33.08	3	Vertical	224	1.50	-
PK	2.4362G	112.42	Inf	-Inf	33.20	3	Vertical	224	1.50	-
AV	2.4366G	103.26	Inf	-Inf	33.20	3	Vertical	224	1.50	-
PK	2.4838G	58.29	74.00	-15.71	33.36	3	Vertical	224	1.50	-
AV	2.4842G	47.27	54.00	-6.73	33.36	3	Vertical	224	1.50	-

802.11g_Nss1,(6Mbps)_2TX

2437MHz_TX

14/01/2019



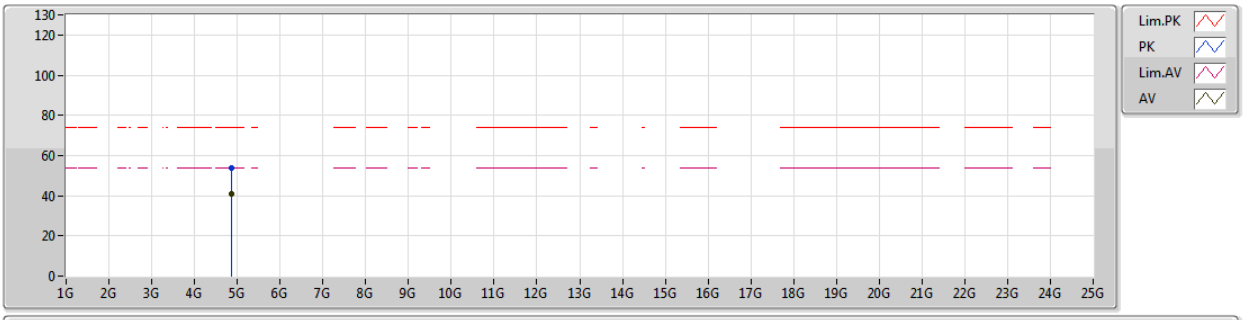
EUT Y_2TX
Setting 21
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.389G	58.06	74.00	-15.94	33.08	3	Horizontal	232	1.25	-
AV	2.3874G	45.98	54.00	-8.02	33.07	3	Horizontal	232	1.25	-
PK	2.4422G	111.97	Inf	-Inf	33.22	3	Horizontal	232	1.25	-
AV	2.4366G	101.93	Inf	-Inf	33.20	3	Horizontal	232	1.25	-
PK	2.4998G	58.34	74.00	-15.66	33.41	3	Horizontal	232	1.25	-
AV	2.4998G	46.98	54.00	-7.02	33.41	3	Horizontal	232	1.25	-

802.11g_Nss1,(6Mbps)_2TX

2437MHz_TX

14/01/2019



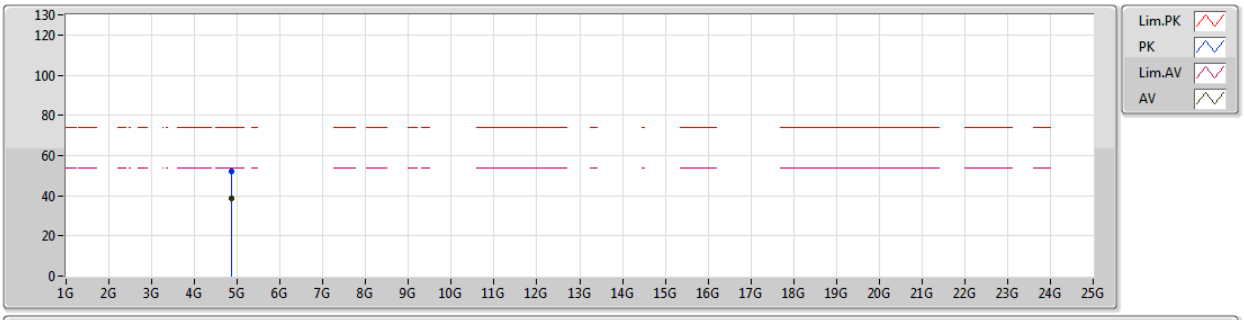
EUT Y_2TX
Setting 21
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.8741G	53.98	74.00	-20.02	7.37	3	Vertical	118	2.34	-
AV	4.87388G	40.96	54.00	-13.04	7.37	3	Vertical	118	2.34	-

802.11g_Nss1,(6Mbps)_2TX

2437MHz_TX

14/01/2019



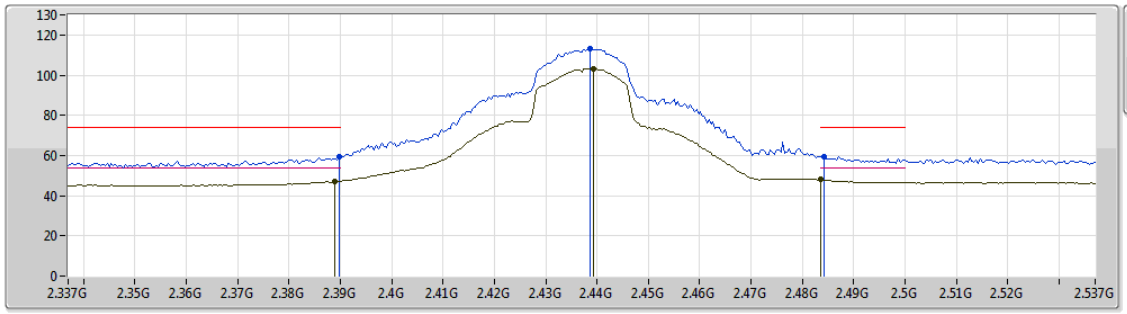
EUT Y_2TX
Setting 21
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.87456G	52.14	74.00	-21.86	7.37	3	Horizontal	82	1.01	-
AV	4.87376G	38.82	54.00	-15.18	7.37	3	Horizontal	82	1.01	-

802.11n HT20_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



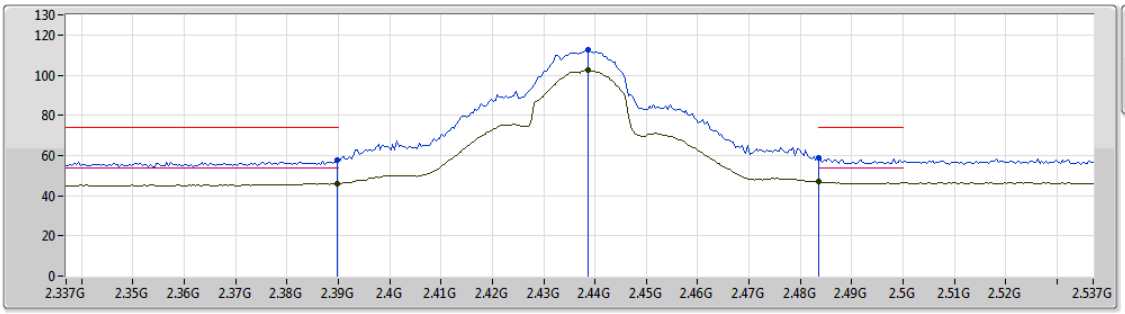
EUT Y_2TX
Setting 22
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3898G	59.31	74.00	-14.69	33.08	3	Vertical	158	1.35	-
AV	2.389G	47.29	54.00	-6.71	33.08	3	Vertical	158	1.35	-
PK	2.4386G	113.16	Inf	-Inf	33.22	3	Vertical	158	1.35	-
AV	2.4394G	103.32	Inf	-Inf	33.22	3	Vertical	158	1.35	-
PK	2.4842G	59.58	74.00	-14.42	33.36	3	Vertical	158	1.35	-
AV	2.4835G	47.96	54.00	-6.04	33.36	3	Vertical	158	1.35	-

802.11n HT20_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



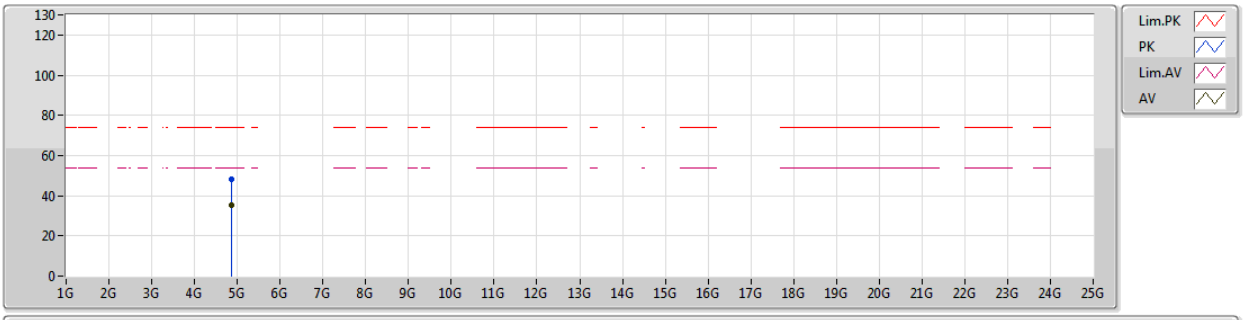
EUT Y_2TX
Setting 22
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3898G	57.82	74.00	-16.18	33.08	3	Horizontal	169	1.49	-
AV	2.3898G	46.06	54.00	-7.94	33.08	3	Horizontal	169	1.49	-
PK	2.4386G	112.38	Inf	-Inf	33.22	3	Horizontal	169	1.49	-
AV	2.4386G	102.62	Inf	-Inf	33.22	3	Horizontal	169	1.49	-
PK	2.4835G	58.82	74.00	-15.18	33.36	3	Horizontal	169	1.49	-
AV	2.4835G	46.87	54.00	-7.13	33.36	3	Horizontal	169	1.49	-

802.11n HT20_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



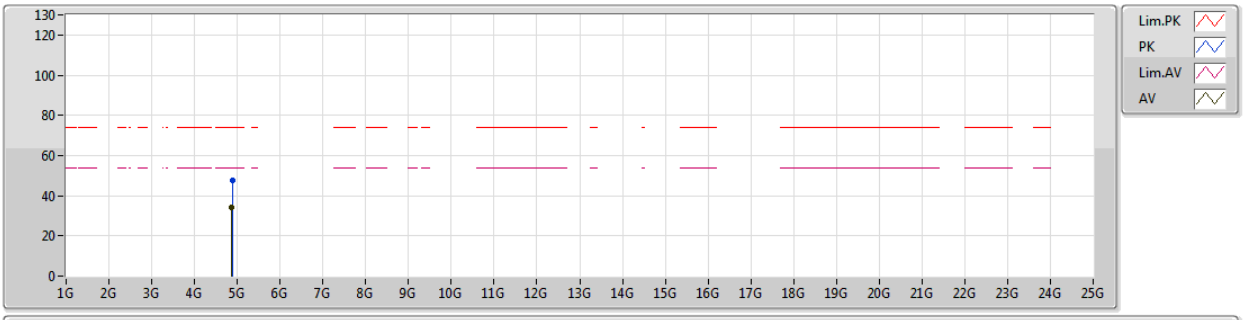
EUT Y_2TX
Setting 22
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.87584G	48.06	74.00	-25.94	7.38	3	Vertical	324	2.47	-
AV	4.8749G	35.23	54.00	-18.77	7.37	3	Vertical	324	2.47	-

802.11n HT20_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



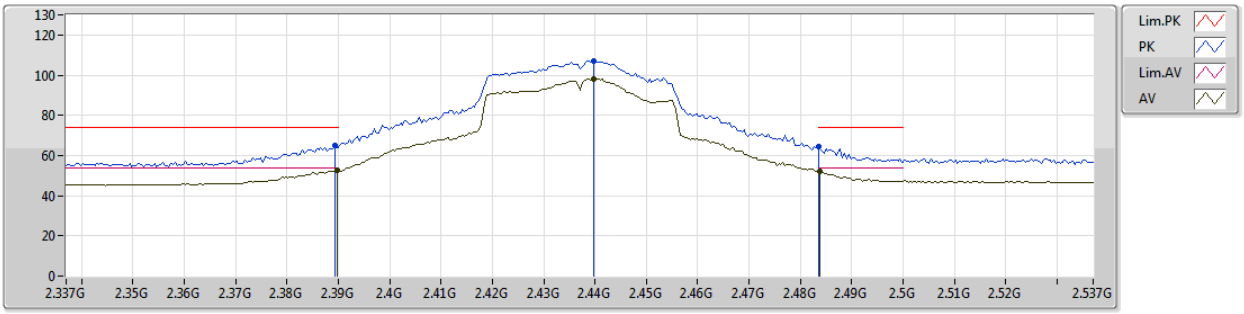
EUT Y_2TX
Setting 22
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.8781G	47.69	74.00	-26.31	7.39	3	Horizontal	33	1.50	-
AV	4.87198G	34.16	54.00	-19.84	7.37	3	Horizontal	33	1.50	-

802.11n HT40_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



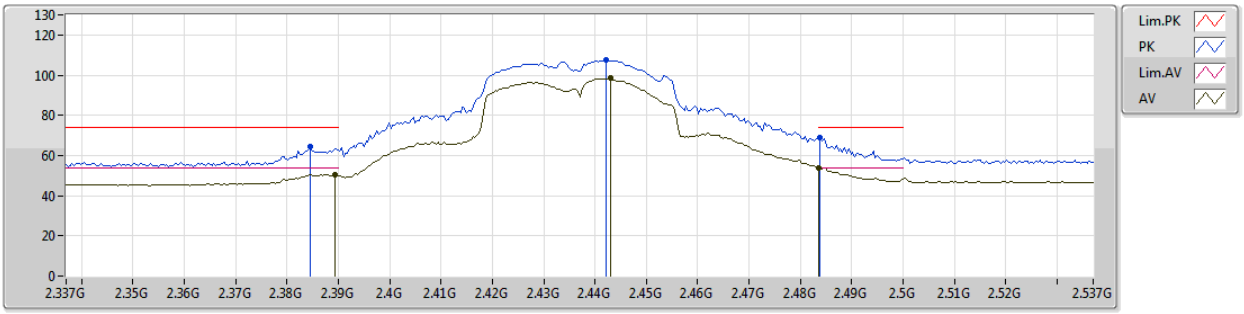
EUT Y_2TX
Setting 17
04-B-1
FSP(100304)
Sample1

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3894G	64.96	74.00	-9.04	33.08	3	Vertical	151	1.51	-
AV	2.3898G	52.51	54.00	-1.49	33.08	3	Vertical	151	1.51	-
PK	2.4398G	107.03	Inf	-Inf	33.22	3	Vertical	151	1.51	-
AV	2.4398G	98.19	Inf	-Inf	33.22	3	Vertical	151	1.51	-
PK	2.4835G	64.56	74.00	-9.44	33.36	3	Vertical	151	1.51	-
AV	2.4838G	52.33	54.00	-1.67	33.36	3	Vertical	151	1.51	-

802.11n HT40_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



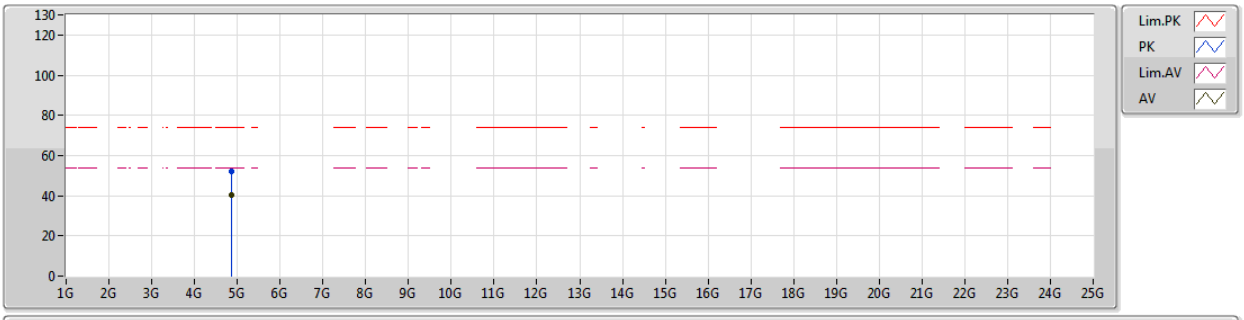
EUT Y_2TX
Setting 17
04-B-1
FSP(100304)
Sample1

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3846G	64.25	74.00	-9.75	33.08	3	Horizontal	241	2.51	-
AV	2.3894G	50.58	54.00	-3.42	33.08	3	Horizontal	241	2.51	-
PK	2.4422G	107.47	Inf	-Inf	33.22	3	Horizontal	241	2.51	-
AV	2.443G	98.44	Inf	-Inf	33.23	3	Horizontal	241	2.51	-
PK	2.4838G	68.97	74.00	-5.03	33.36	3	Horizontal	241	2.51	-
AV	2.4835G	53.75	54.00	-0.25	33.36	3	Horizontal	241	2.51	-

802.11n HT40_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



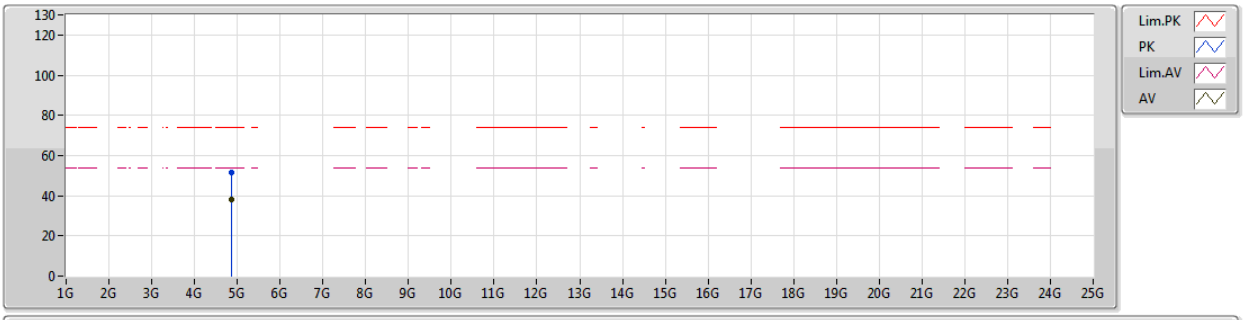
EUT Y_2TX
Setting 17
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.8758G	51.95	74.00	-22.05	7.38	3	Vertical	122	2.33	-
AV	4.8744G	40.14	54.00	-13.86	7.37	3	Vertical	122	2.33	-

802.11n HT40_Nss1,(MCS0)_2TX

2437MHz_TX

14/01/2019



EUT Y_2TX
Setting 17
04-B-1
FSP(100304)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.8752G	51.64	74.00	-22.36	7.38	3	Horizontal	81	1.06	-
AV	4.87462G	38.16	54.00	-15.84	7.37	3	Horizontal	81	1.06	-