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
FR862827-02AD	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(b)	Maximum Conducted Output Power	PASS	-
3.3	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Cliff Chang
Report Producer: Wendy Pan

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX

Note:
- Bluetooth LE uses a GFSK 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	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
BT-LE(1Mbps)	0.575	2.403	362.319u	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	Telnet(v.25.1)			
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		

1.1.5 Table for EUT support type

Function	support type
AP Router	Master
Extender	Master + Slave
Mesh	Master + Slave

1.1.6 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR862827AD

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. Maximum Conducted Output Power 3. Emissions in Restricted Frequency Bands For above 1GHz after evaluating, the worst case is found at BT-LE(1Mbps) CH0 (2402Hz) and retest this channel only.
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

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	Owen Hsu	25°C / 65%	Jan. 15, 2019 ~ Jan. 23, 2019
Radiated (Above 1GHz)	03CH01-CB	RJ Huang	22°C / 54%	Jan. 08, 2019 ~ Jan. 23, 2019
Radiated (Below 1GHz)	03CH01-CB	RJ Huang	22°C / 54%	Jan. 22, 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%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	PowerSetting
BT-LE(1Mbps)	-
2402MHz	Default

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests		
Tests Item	AC power-line conducted emissions	
Condition	AC power-line conducted measurement for line and neutral	
Operating Mode	1	CTX-BT

The Worst Case Mode for Following Conformance Tests	
Tests Item	Maximum Conducted Output Power
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	The EUT was performed at Y axis and Z axis position for Emissions in Restricted Frequency Bands above 1GHz test, and the worst case was found at Y axis. So the measurement will follow this same test configuration.
1	CTX - EUT in Y axis-BT
Operating Mode > 1GHz	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

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

N/A

2.5 Support Equipment

For Test Site No: CO02-CB

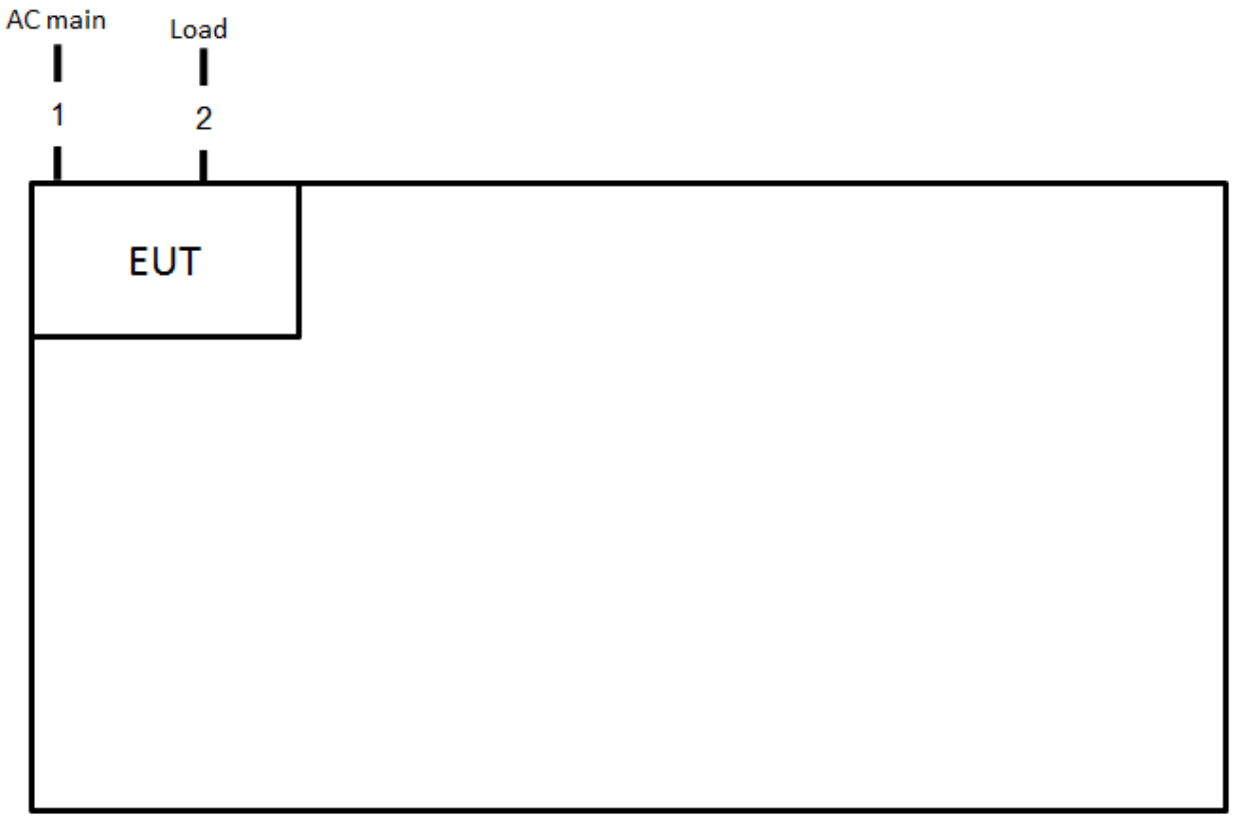
N/A

For Test Site No: 03CH01-CB and TH01-CB

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

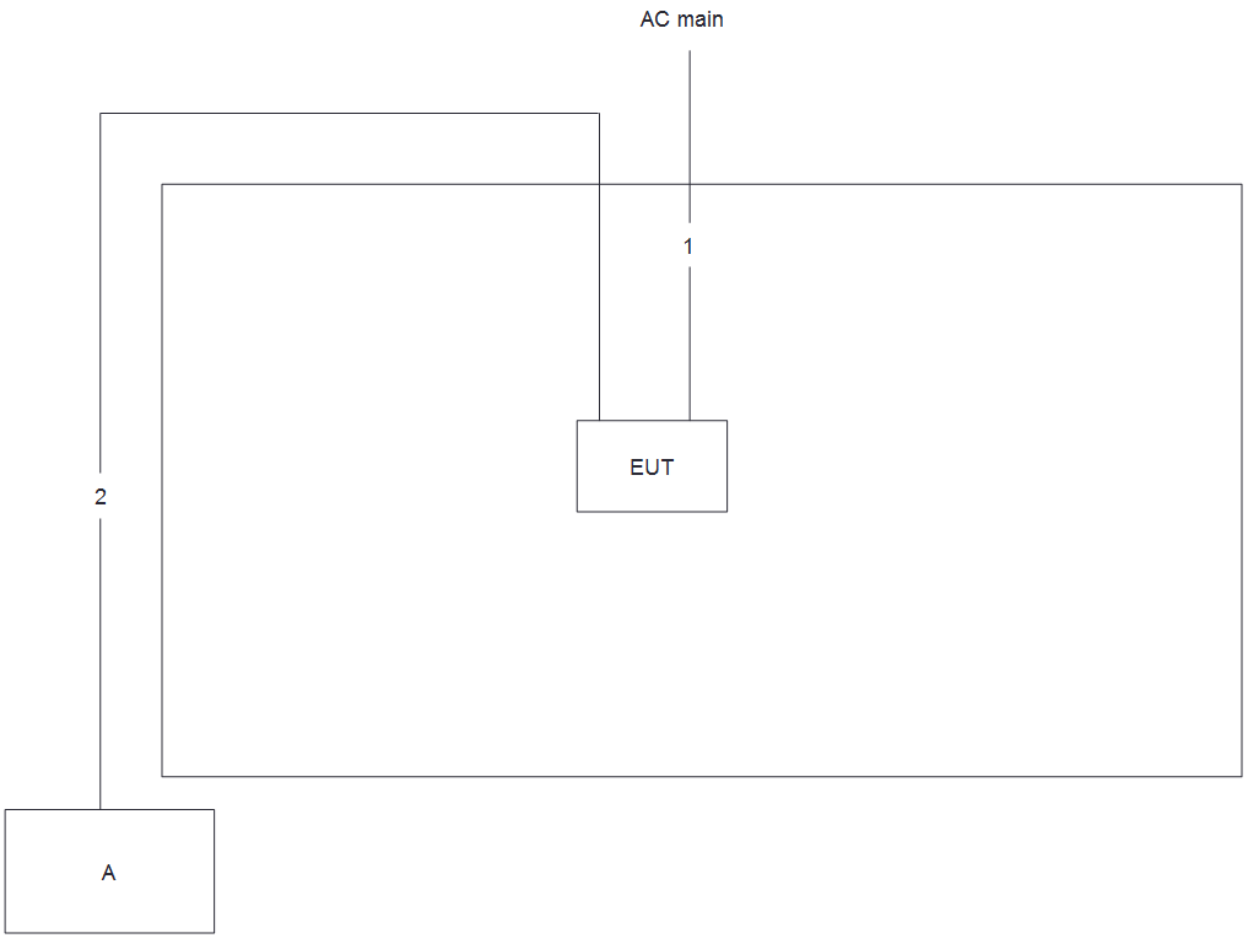
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	Power cable	No	0.8m
2	RJ-45 cable	No	1.5m

Test Setup Diagram - Radiated Test



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

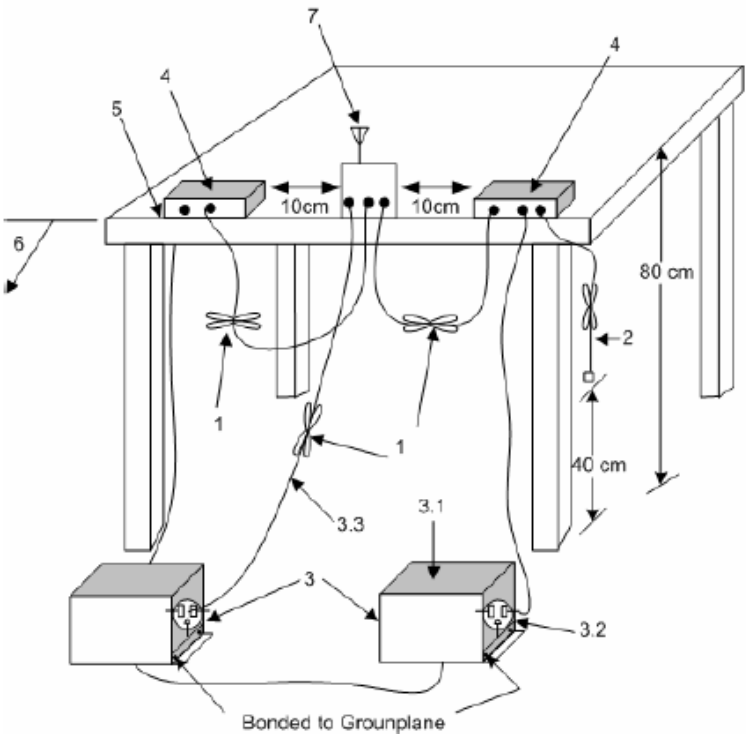
Refer a test equipment and calibration data table in this test report.

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 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

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

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup

Maximum Conducted Output Power (Power Meter)


3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Emissions in Restricted Frequency Bands

3.3.1 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.

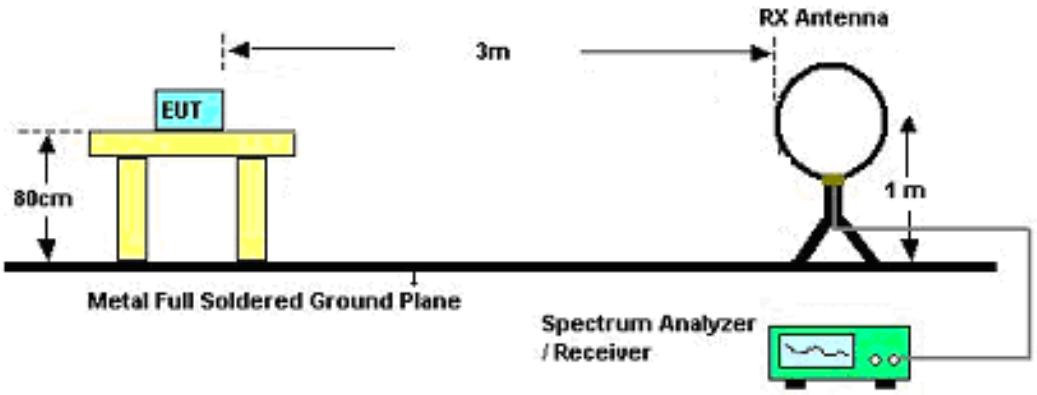
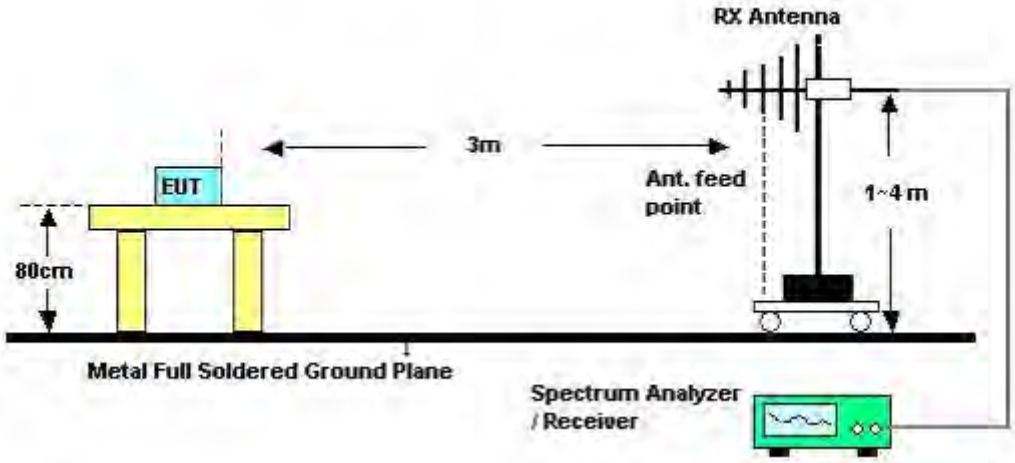
3.3.2 Measuring Instruments

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

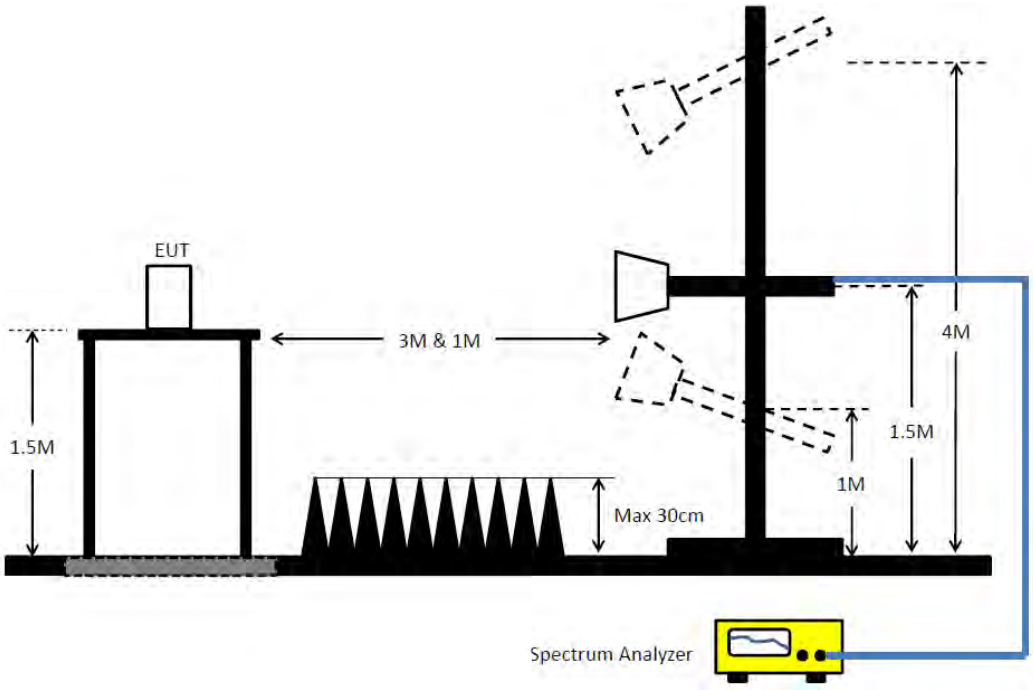
3.3.3 Test Procedures

Test Method		
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
▪ Refer as ANSI C63.10, clause 6.9.2.2 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 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐ Refer as ANSI C63.10, clause 4.2.3.2.4 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.	

3.3.4 Test Setup

Transmitter Radiated Emissions
9kHz ~30MHz

30MHz~1GHz


Above 1GHz



3.3.5 Transmitter Radiated Unwanted Emissions (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.

3.3.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix C

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-HG	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)

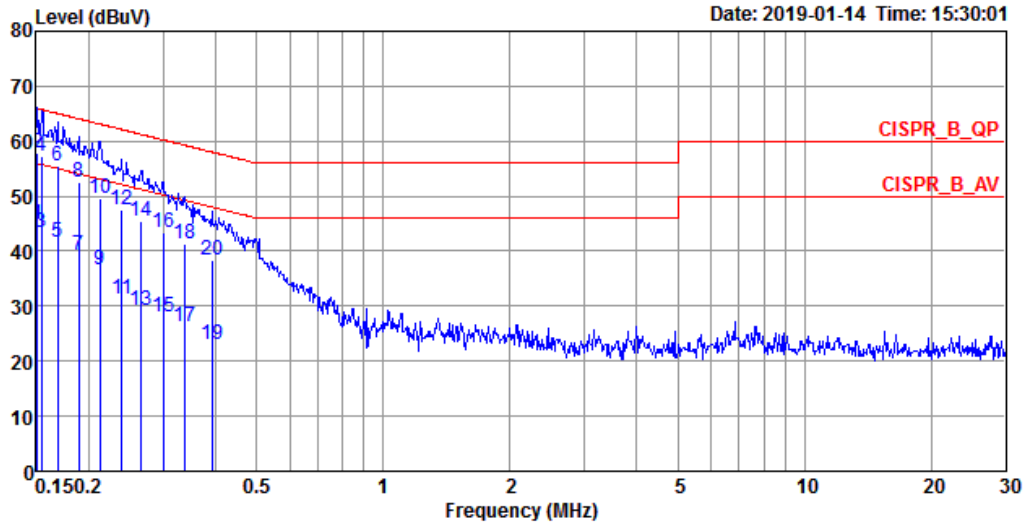
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jun. 22, 2018	Jun. 21, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
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.

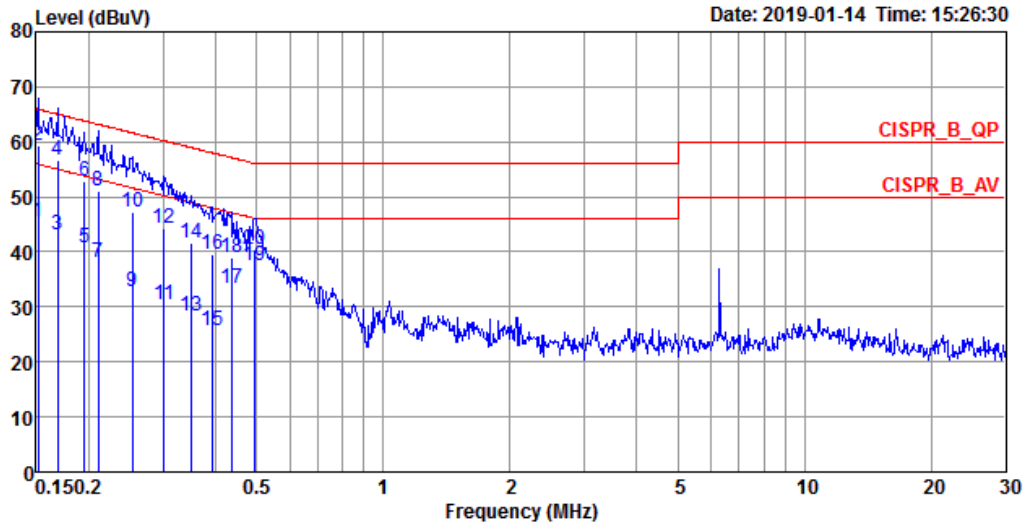
Test Mode	Mode 1	Frequency Range	0.15 MHz to 30 MHz

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	44.77	-11.19	55.96	34.60	10.15	0.02	Average	LINE
2	0.1508	58.00	-7.96	65.96	47.83	10.15	0.02	QP	LINE
3	0.1540	43.41	-12.37	55.78	33.24	10.15	0.02	Average	LINE
4	0.1540	57.37	-8.41	65.78	47.20	10.15	0.02	QP	LINE
5	0.1685	41.50	-13.53	55.03	31.33	10.15	0.02	Average	LINE
6	0.1685	55.48	-9.55	65.03	45.31	10.15	0.02	QP	LINE
7	0.1894	39.27	-14.79	54.06	29.10	10.15	0.02	Average	LINE
8	0.1894	52.63	-11.43	64.06	42.46	10.15	0.02	QP	LINE
9	0.2128	36.65	-16.45	53.10	26.48	10.15	0.02	Average	LINE
10	0.2128	49.70	-13.40	63.10	39.53	10.15	0.02	QP	LINE
11	0.2391	31.21	-20.92	52.13	21.04	10.15	0.02	Average	LINE
12	0.2391	47.38	-14.75	62.13	37.21	10.15	0.02	QP	LINE
13	0.2658	29.33	-21.92	51.25	19.16	10.15	0.02	Average	LINE
14	0.2658	45.48	-15.77	61.25	35.31	10.15	0.02	QP	LINE
15	0.3003	28.01	-22.23	50.24	17.83	10.16	0.02	Average	LINE
16	0.3003	43.44	-16.80	60.24	33.26	10.16	0.02	QP	LINE
17	0.3374	26.27	-23.00	49.27	16.09	10.16	0.02	Average	LINE
18	0.3374	41.34	-17.93	59.27	31.16	10.16	0.02	QP	LINE
19	0.3914	22.93	-25.10	48.03	12.75	10.16	0.02	Average	LINE
20	0.3914	38.24	-19.79	58.03	28.06	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	0.1516	45.46	-10.45	55.91	35.31	10.13	0.02	Average	NEUTRAL
2	0.1516	59.22	-6.69	65.91	49.07	10.13	0.02	QP	NEUTRAL
3	0.1685	42.99	-12.04	55.03	32.84	10.13	0.02	Average	NEUTRAL
4	0.1685	56.75	-8.28	65.03	46.60	10.13	0.02	QP	NEUTRAL
5	0.1955	40.66	-13.14	53.80	30.51	10.13	0.02	Average	NEUTRAL
6	0.1955	52.80	-11.00	63.80	42.65	10.13	0.02	QP	NEUTRAL
7	0.2106	38.13	-15.05	53.18	27.98	10.13	0.02	Average	NEUTRAL
8	0.2106	51.05	-12.13	63.18	40.90	10.13	0.02	QP	NEUTRAL
9	0.2535	32.78	-18.86	51.64	22.63	10.13	0.02	Average	NEUTRAL
10	0.2535	47.21	-14.43	61.64	37.06	10.13	0.02	QP	NEUTRAL
11	0.3019	30.43	-19.76	50.19	20.27	10.14	0.02	Average	NEUTRAL
12	0.3019	44.26	-15.93	60.19	34.10	10.14	0.02	QP	NEUTRAL
13	0.3502	28.35	-20.61	48.96	18.19	10.14	0.02	Average	NEUTRAL
14	0.3502	41.56	-17.40	58.96	31.40	10.14	0.02	QP	NEUTRAL
15	0.3914	25.83	-22.20	48.03	15.67	10.14	0.02	Average	NEUTRAL
16	0.3914	39.48	-18.55	58.03	29.32	10.14	0.02	QP	NEUTRAL
17	0.4351	33.47	-13.68	47.15	23.31	10.14	0.02	Average	NEUTRAL
18	0.4351	38.89	-18.26	57.15	28.73	10.14	0.02	QP	NEUTRAL
19	0.4941	37.63	-8.47	46.10	27.47	10.14	0.02	Average	NEUTRAL
20	0.4941	40.53	-15.57	56.10	30.37	10.14	0.02	QP	NEUTRAL

Summary

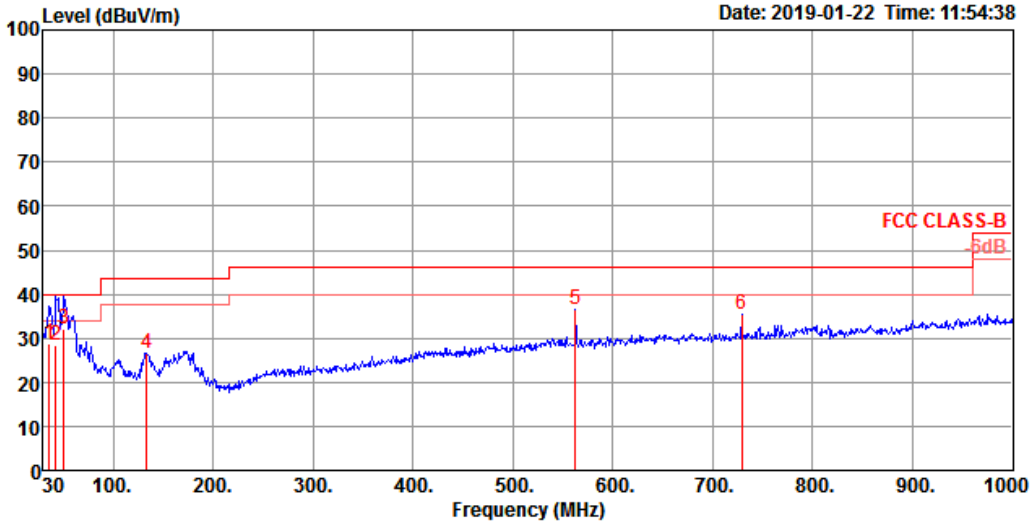
Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	-6.92	0.00020

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	2.09	-6.92	30.00

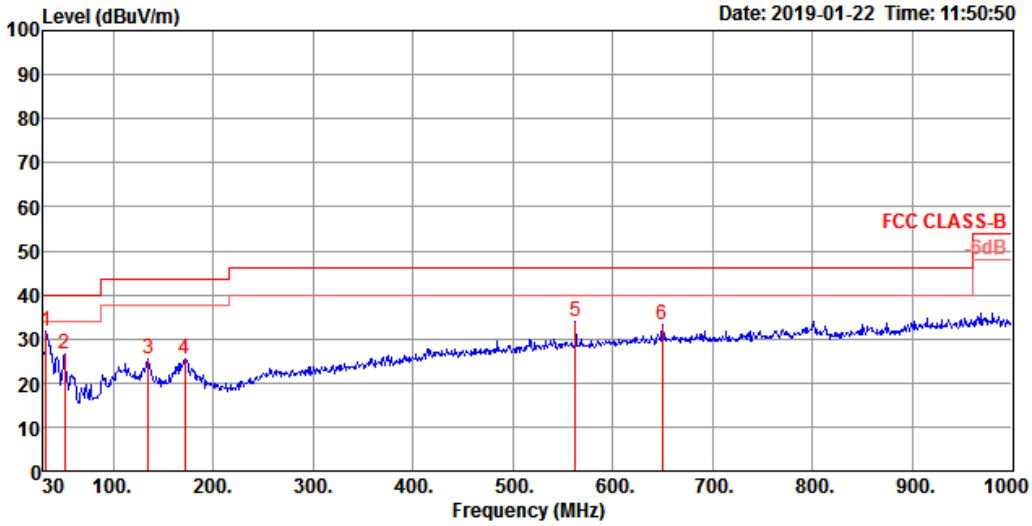
Test Mode	Mode 1	Frequency Range	30 MHz to 1,000 MHz

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	35.82	28.64	40.00	-11.36	39.80	0.58	20.68	32.42	150	114	QP	VERTICAL
2	42.61	28.30	40.00	-11.70	43.10	0.64	16.98	32.42	100	16	QP	VERTICAL
3	50.37	32.12	40.00	-7.88	50.31	0.73	13.50	32.42	100	41	QP	VERTICAL
4	133.79	26.64	43.50	-16.86	40.06	1.19	17.73	32.34	100	131	Peak	VERTICAL
5	562.53	36.38	46.00	-9.62	41.83	2.51	24.41	32.37	100	213	Peak	VERTICAL
6	729.37	35.46	46.00	-10.54	39.31	2.89	25.53	32.27	100	47	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	32.91	31.67	40.00	-8.33	41.16	0.54	22.40	32.43	100	28	Peak	HORIZONTAL
2	51.34	26.66	40.00	-13.34	45.03	0.74	13.31	32.42	300	91	Peak	HORIZONTAL
3	134.76	25.45	43.50	-18.05	38.93	1.20	17.66	32.34	200	81	Peak	HORIZONTAL
4	171.62	25.54	43.50	-17.96	40.84	1.35	15.66	32.31	125	219	Peak	HORIZONTAL
5	562.53	33.79	46.00	-12.21	39.24	2.51	24.41	32.37	150	99	Peak	HORIZONTAL
6	649.83	33.07	46.00	-12.93	37.55	2.73	25.16	32.37	125	357	Peak	HORIZONTAL

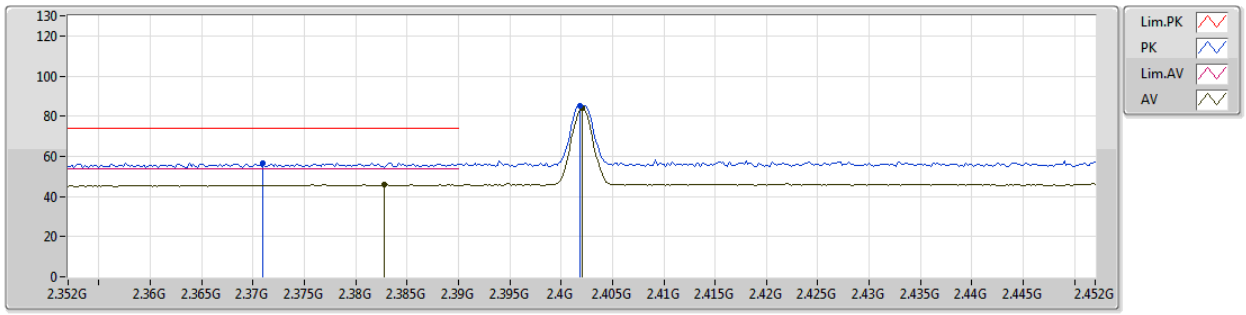
Summary

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	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.3828G	45.80	54.00	-8.20	33.08	3	Vertical	146	2.98	-

BT-LE(1Mbps)

2402MHz_TX

14/01/2019



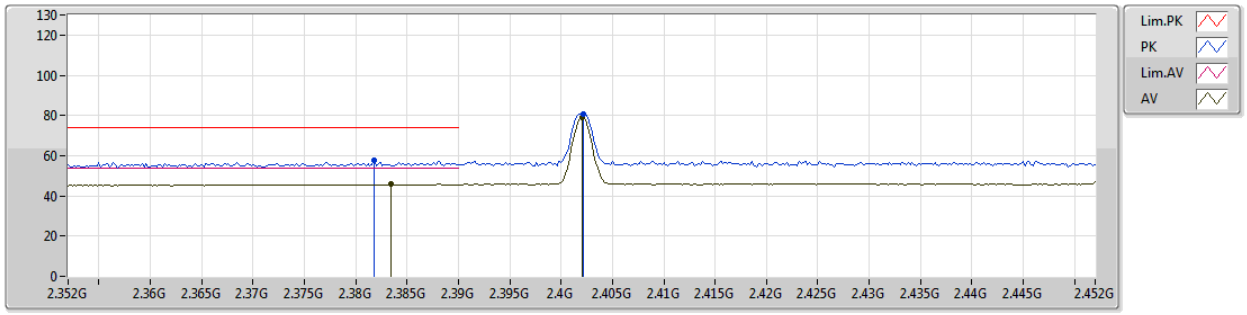
EUT Y_1TX
Setting Default
04-B-1
FSP(100142)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.371G	56.78	74.00	-17.22	33.06	3	Vertical	146	2.98	-
AV	2.3828G	45.80	54.00	-8.20	33.08	3	Vertical	146	2.98	-
PK	2.4018G	85.40	Inf	-Inf	33.09	3	Vertical	146	2.98	-
AV	2.402G	83.86	Inf	-Inf	33.09	3	Vertical	146	2.98	-

BT-LE(1Mbps)

2402MHz_TX

14/01/2019



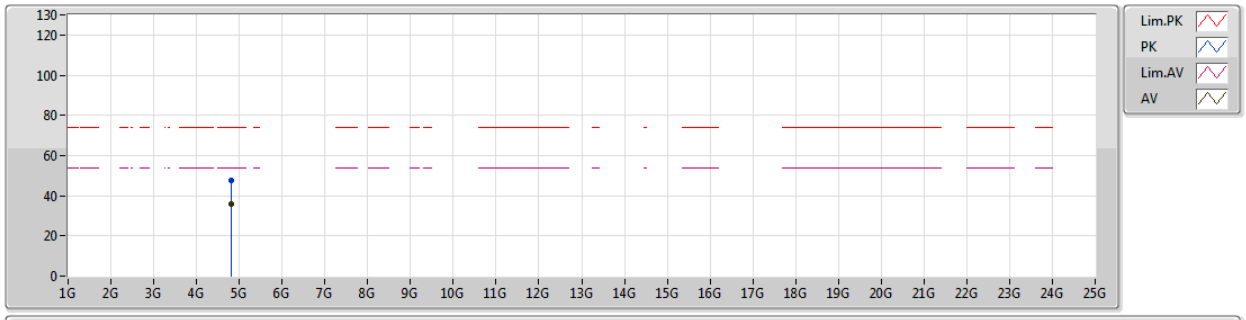
EUT Y_1TX
Setting Default
04-B-1
FSP(100142)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3818G	57.60	74.00	-16.40	33.07	3	Horizontal	155	2.25	-
AV	2.3834G	45.79	54.00	-8.21	33.08	3	Horizontal	155	2.25	-
PK	2.4022G	80.84	Inf	-Inf	33.09	3	Horizontal	155	2.25	-
AV	2.402G	79.03	Inf	-Inf	33.09	3	Horizontal	155	2.25	-

BT-LE(1Mbps)

2402MHz_TX

14/01/2019



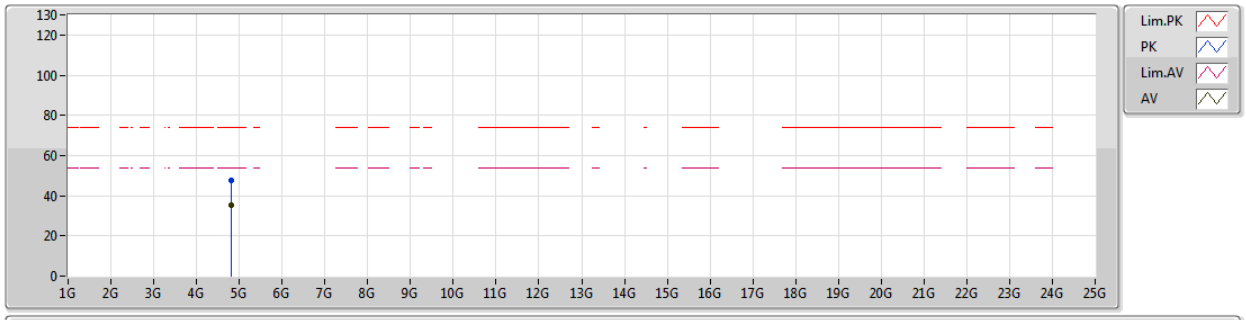
EUT Y_1TX
Setting Default
04-B-1
FSP(100142)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.80407G	47.80	74.00	-26.20	7.06	3	Vertical	197	2.11	-
AV	4.804G	35.86	54.00	-18.14	7.06	3	Vertical	197	2.11	-

BT-LE(1Mbps)

2402MHz_TX

14/01/2019



EUT Y_1TX
Setting Default
04-B-1
FSP(100142)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.80473G	47.41	74.00	-26.59	7.07	3	Horizontal	357	1.07	-
AV	4.80448G	35.32	54.00	-18.68	7.06	3	Horizontal	357	1.07	-