FCC RF TEST REPORT

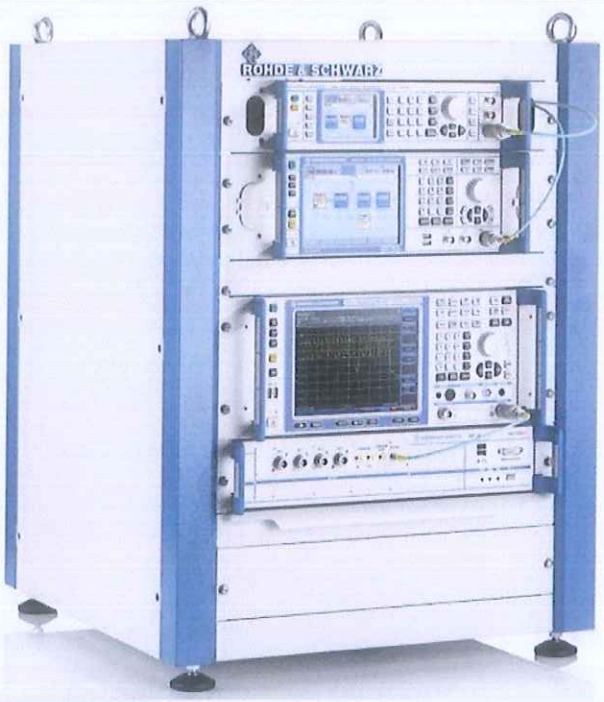
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Smart Projector

ISSUED TO
Guizhou CVIM Technology Co., Ltd

4th Floor, 5th R&D Building, Zunyi Software Park, Xiazi Town, Xinpu New District, Zunyi, Guizhou



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Date Nov. 02, 2017

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Date Nov. 02, 2017

Report No.:	BL-SZ1790192-604
EUT Name:	Smart Projector
Model Name:	H8
Brand Name:	WOWOTO
Test Standard:	47 CFR Part 15 Subpart E
FCC ID:	2AKWS-HDSERIES
Test conclusion:	Pass
Test Date:	Sep. 14, 2017 ~ Oct. 29, 2017
Date of Issue:	Nov. 02, 2017

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Oct. 12, 2017	Initial Issue
Rev. 02	Oct. 25, 2017	Update the test of 26dB BW,modify the page on 8 and 20,update the test value of item PSD
Rev. 03	Oct. 30, 2017	Revise the title of the PSD data,add the remark of Radiated Spurious on page 38
Rev. 04	Nov. 02, 2017	Change the software version on page 6

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation(A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20 to 25℃
Ambient Relative Humidity	45% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

(1) The test report reference to the report template version v4.1.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant

Applicant	Guizhou CVIM Technology Co., Ltd
Address	4th Floor, 5th R&D Building, Zunyi Software Park, Xiazi Town, Xinpu New District, Zunyi, Guizhou

2.2 Manufacturer

Manufacturer	Guizhou CVIM Technology Co., Ltd
Address	4th Floor, 5th R&D Building, Zunyi Software Park, Xiazi Town, Xinpu New District, Zunyi, Guizhou

2.3 Factory

Factory	Huizhou Goldenchip Electronics Co., Ltd
Address	Factory workshop, No.12, Songyang Road, Zhongkai High-tech Zone, Huizhou City, Guangdong

2.4 General Description for Equipment under Test (EUT)

EUT Type	Smart Projector
Model Name Under Test	H8
Series Model Name	H8,H1,H2,H9,H10,D6,D8,D9,D10
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only different on model name.
Hardware Version	TDB
Software Version	CVIM-WWT-D900E-v1.05-7632
Network and Wireless connectivity	Bluetooth 3.0, Bluetooth 4.0 Low Energy (BLE), WIFI 802.11a,802.11b, 802.11g and 802.11n (HT20/40)

2.5 Ancillary Equipment

Ancillary Equipment 1	Adapter 1	
	Brand Name	DELTA
	Model No.	ADP-40KD AB
	Serial No.	N/A
	Rated Input	100-240 V~, 1.2 A, 50/60 Hz
	Rated Output	19 V⎓, 2.1 A
Ancillary Equipment 2	Adapter 2	
	Brand Name	Huntkey
	Model No.	HKA04019021-6D
	Serial No.	N/A
	Rated Input	100-240 V~, 1 A, 50/60 Hz
	Rated Output	19 V⎓, 2.1 A
Ancillary Equipment 3	Adapter 3	
	Brand Name	DELTA
	Model No.	ADP65JH AB

	Serial No.	N/A
	Rated Input	100-240 V~, 1.5 A, 50/60 Hz
	Rated Output	19 V⎓, 3.42 A
Ancillary Equipment 4	Adapter 4	
	Brand Name	Huntkey
	Model No.	HKA06519034-6J
	Serial No.	N/A
	Rated Input	100-240 V~, 1.5 A, 50/60 Hz
	Rated Output	19 V⎓, 3.42 A
Ancillary Equipment 5	HDMI Cable	
	Length (Approx.)	1.0 m
Ancillary Equipment 6	Remote Control	
Note: All adapter were be tested, but only HKA06519034-6J was shown in this report.		

2.6 Technical Information

Frequency Range		Band I: 5150 MHz to 5250 MHz, Band IV: 5725 MHz to 5850 MHz
Product Type		☒ Mobile ☐ Portable ☐ Fix Location
Modulation technology		OFDM
Modulation Type		64QAM, 16QAM, BPSK, QPSK
Product Type		Indoor for IC standard Mobile and portable for FCC standard
Transfer Rate (Mbps) (Single RF path)		802.11a: 54/ 48/ 36 / 24 / 18/12 / 9/ 6 Mbps 802.11n: up to 150 Mbps
Channel Bandwidth		802.11a: 20 MHz 802.11n: 20 MHz, 40 MHz
Maximum Output Power		Band I: 23.04 dBm Band IV: 19.0 dBm
Antenna System (eg., MIMO, Smart Antenna)		Cyclic Delay Diversity (CDD)
Categorization as Correlated or Completely Uncorrelated		Correlated
Antenna Type	Antenna 0 (ANT 0)	PIFA Antenna
	Antenna 1 (ANT 1)	
Antenna Gain	Antenna 0 (ANT 0)	Band I: 5150 MHz to 5250 MHz: 0 dBi Band IV: 5725 MHz to 5850 MHz: 0 dBi
	Antenna 1 (ANT 1)	Band I: 5150 MHz to 5250 MHz: 0 dBi Band IV: 5725 MHz to 5850 MHz: 0 dBi
Total directional gain	For power spectral density(PSD) measurements	Band I: 5150 MHz to 5250 MHz: 3 dBi Band IV: 5725 MHz to 5850 MHz: 3 dBi Formulas: Directional gain = GANT + Array Gain, *Array Gain = 10 log(NANT/NSS) dB*. *NSS* =1, GANT set equal to the gain of the antenna having the highest gain.
	For power	Band I: 5150 MHz to 5250 MHz: 0 dBi

	measurements	Band IV: 5725 MHz to 5850 MHz: 0 dBi Formulas: Directional gain = GANT + Array Gain, *Array Gain* = 0.
About the Product		The equipment is Smart Projetor, intended for used with information technology equipment.

Mode	Antenna		
	Antenna 0	Antenna 1	Antenna 0 + Antenna1
802.11a	√	√	--
11n (HT20)	√	√	√
11n (HT40)	√	√	√
Note：All the configurations were tested, but only the Antenna 0 + Antenna1 was reported in this report.			

2.7 Additional Instructions

Mode	☒ Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

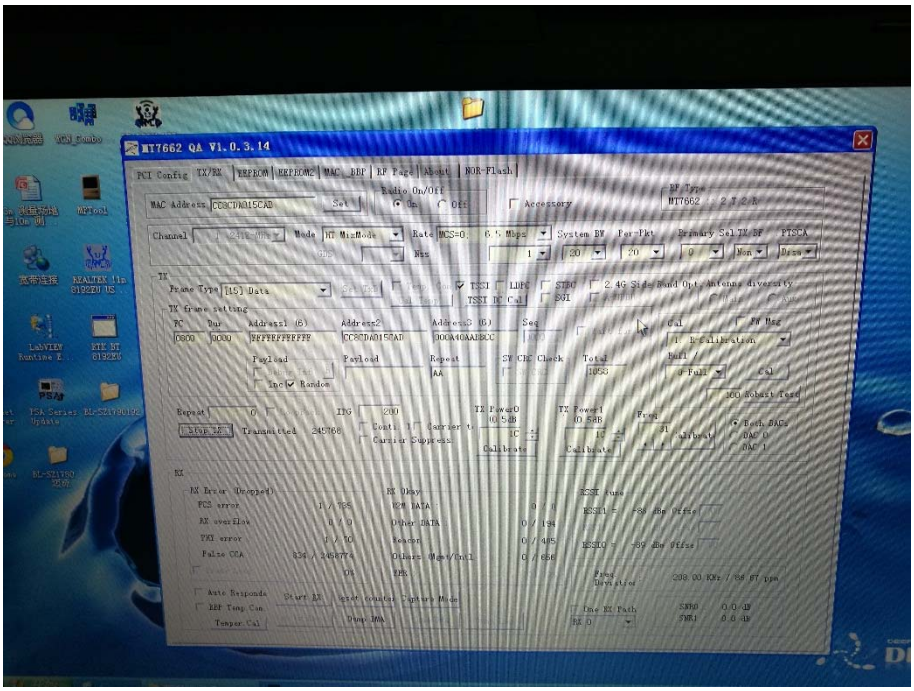
EUT Software Settings:

Test Software Version	MT7662UQA		
Support Units (Software installation media)	Description	Manufacturer	Model
	Notebook	Lenovo	X220

Band I (5150 - 5250 MHz) Power level setup in software				
Mode	Channel	Frequency (MHz)	Soft Set	
11a	CH36	5180	18	19
11a	CH44	5220	18	19
11a	CH48	5240	18	19
11n (HT20)	CH36	5180	18	19
11n (HT20)	CH44	5220	18	19
11n (HT20)	CH48	5240	18	19
11n (HT40)	CH38	5190	18	19
11n (HT40)	CH46	5230	18	19

Band IV (5725 - 5850 MHz) Power level setup in software				
Mode	Channel	Frequency (MHz)	Soft Set	
11a	CH149	5745	19	19
11a	CH157	5785	17	16
11a	CH165	5825	19	19
11n (HT20)	CH149	5745	15	15
11n (HT20)	CH157	5785	12	12
11n (HT20)	CH165	5825	15	15
11n (HT40)	CH151	5755	13	12
11n (HT40)	CH159	5795	12	11

Run Software



2.8 Channel List

20 MHz		40 MHz	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
36	**5180**	**38**	**5190**
40	5200	**46**	**5230**
44	**5220**	**151**	**5755**
48	**5240**	**159**	**5795**
149	**5745**		
153	5765		
157	**5785**		
161	5805		
165	**5825**		

Note: Until further notice, devices subject to this section shall not be capable of transmitting in the band 5600-5650 MHz. This restriction is for the protection of weather radars operating in this band.

The Lowest frequency, the middle frequency and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11a/n(HT20)

Band I (5150 - 5250 MHz)			Band IV (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
36	Low	5180	149	Low	5745
44	Mid	5220	157	Mid	5785
48	High	5240	165	High	5825

For 802.11n (HT40)

Band I (5150 - 5250 MHz)			Band IV (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
38	Low	5190	151	Low	5755
46	High	5230	159	High	5795

Note: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Modulation Type	Band I Channel	Band IV Channel
RF Output Power	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
Emission Bandwidth & 99% Occupied Bandwidth	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
6 dB bandwidth	11a	6	BPSK	N/A	165/157/149
	11n(20 MHz)	6.5		N/A	165/157/149
	11n(40 MHz)	13.5		N/A	159/151
Power Spectral Density	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
Conducted Spurious Emission and Band Edge (Authorized-band)	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
Radiated Spurious Emissions	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
Band Edge (Restricted-band)	11a	6	BPSK	48/36	165/149
	11n(20 MHz)	6.5		48/36	165/149
	11n(40 MHz)	13.5		46/38	159/151
Frequency Stability	Unmodulated	N/A	N/A	N/A	N/A

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15 Subpart E (10-1-15 Edition)	Unlicensed National Information Infrastructure Devices
2	KDB Publication 789033 D02v01r04	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
3	KDB Publication 662911 D01v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
4	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	Test Result	Verdict
1	Antenna Requirement	15.203	--	Pass[Note1]
2	RF Output Power	15.407(a)	ANNEX A.1	Pass
3	Emission Bandwidth & 99% Occupied Bandwidth	15.407(a)	ANNEX A.2	Pass
4	6 dB bandwidth	15.407(e)	ANNEX A.3	Pass
5	Power Spectral Density	15.407(a)	ANNEX A.4	Pass
6	Conducted Emission	15.207	ANNEX A.5	Pass
7	Conducted Spurious Emission and Band Edge (Authorized-band)	15.407(b) 15.209	ANNEX A.6	Pass
8	Radiated Spurious Emissions and Band Edge (Restricted-band)	15.407(b)	ANNEX A.7	Pass
9	Frequency Stability	15.407(g)	ANNEX A.8	Pass
10	Receiver Spurious Emissions	--	--	N/A[Note2]

Note [1]: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.

Note [2]: Only radio communication receivers operating in stand-alone mode within the band 30-960 MHz, as well as scanner receivers, are subject to Industry Canada requirements, so this test is not applicable

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	45% - 55%	
Atmospheric Pressure	100 kPa - 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
	LT (Low Temperature)	0℃
	HT (High Temperature)	+35℃
Working Voltage of the EUT	NV (Normal Voltage)	19 V
	LV (Low Voltage)	12 V
	HV (High Voltage)	19 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2017.06.22	2018.06.21
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2017.06.22	2018.06.21
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2017.09.07	2018.09.06
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2017.06.22	2018.06.21
LISN	SCHWARZBECK	NSLK 8127	8127-687	2017.06.22	2018.06.21
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2017.06.22	2018.06.21
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2017.06.22	2018.06.21
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2017.06.22	2018.06.21
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2017.06.22	2018.06.21
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2017.06.22	2018.06.21
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2017.06.22	2018.06.21
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2017.06.22	2018.06.21
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2017.06.22	2018.06.21
Test Antenna-Horn (18-40 GHz)	A-INFO	LB-180400KF	J211060273	N/A	2018.01.06
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.24	2019.02.23
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	N/A	2016.08.09	2018.08.08
Shielded Enclosure	ChangNing	CN-130701	130703	--	--
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2017.06.22	2018.06.21

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Power Amplifier	OPHIR RF	5225F	1037	2017.02.17	2018.02.16
Power Amplifier	OPHIR RF	5273F	1016	2017.02.17	2018.02.16
Directional Coupler	Werlantone	C5982-10	109275	N/A	N/A
Directional Coupler	Werlantone	CHP-273E	S00801z-01	N/A	N/A
Feld Strength Meter	Narda	EP601	511WX51129	2017.02.23	2018.02.22
Mouth Simulator	B&K	4227	2423931	2016.11.15	2017.11.14
Sound Calibrator	B&K	4231	2430337	2016.11.09	2017.11.08
Sound Level Meter	B&K	NL-20	00844023	2016.11.11	2017.11.10
Ear Simulator	B&K	4185	2409449	2016.11.15	2017.11.14
Ear Simulator	B&K	4195	2418189	2016.11.15	2017.11.14
Audio analyzer	B&K	UPL 16	100129	2016.11.08	2017.11.07

4.3 Measurement Uncertainty

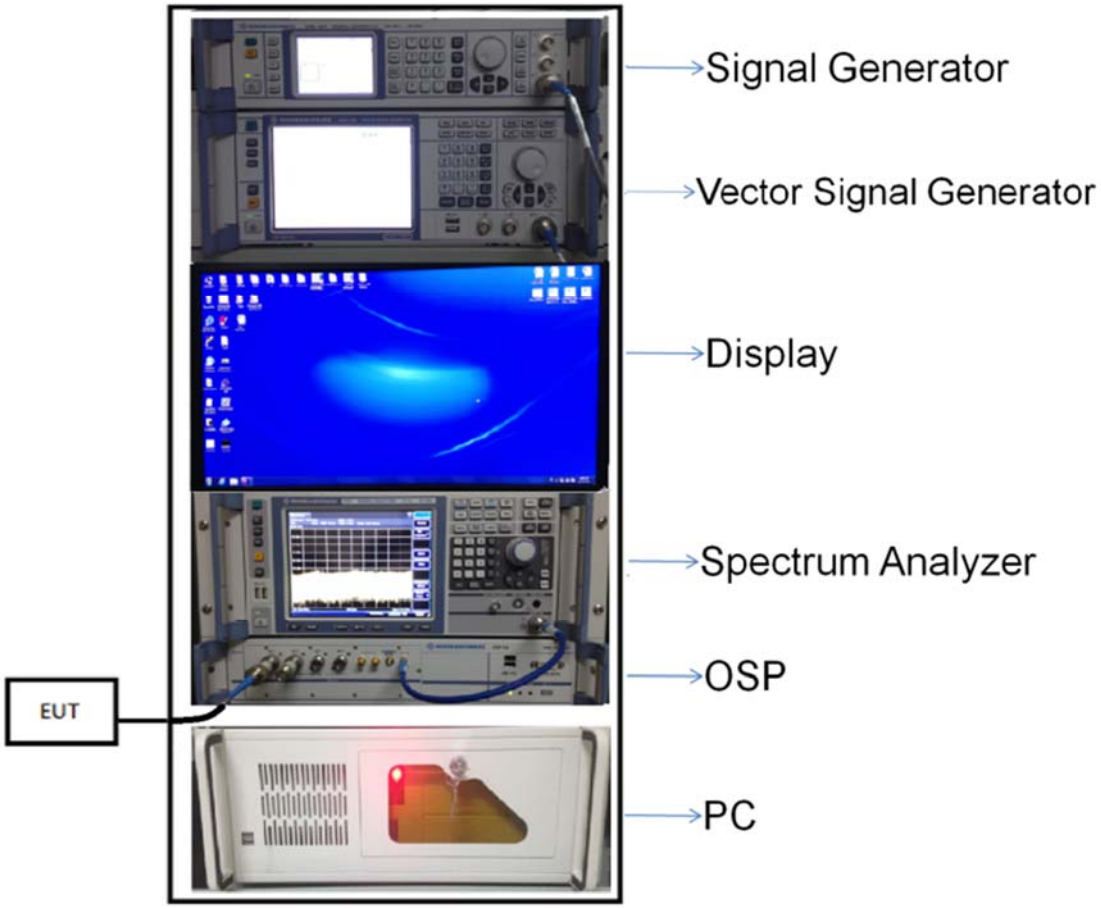
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Occupied Channel Bandwidth	±4%
RF output power, conducted	±1.4 dB
Power Spectral Density, conducted	±2.5 dB
Unwanted Emissions, conducted	±2.8 dB
All emissions, radiated	±5.4 dB
Temperature	±1°C
Humidity	±4%

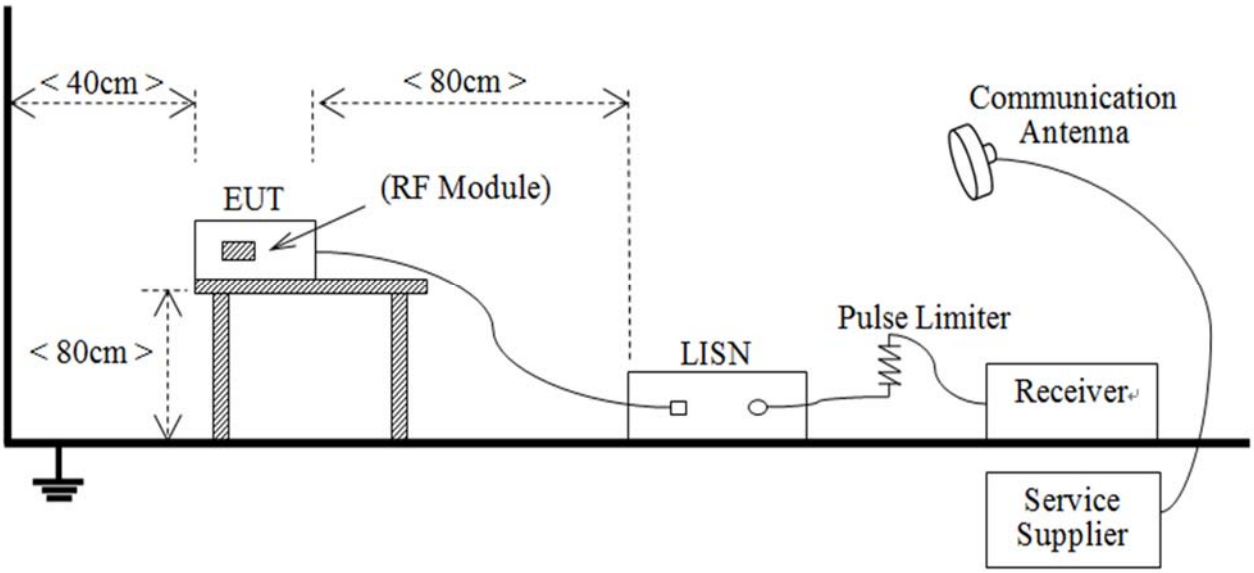
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



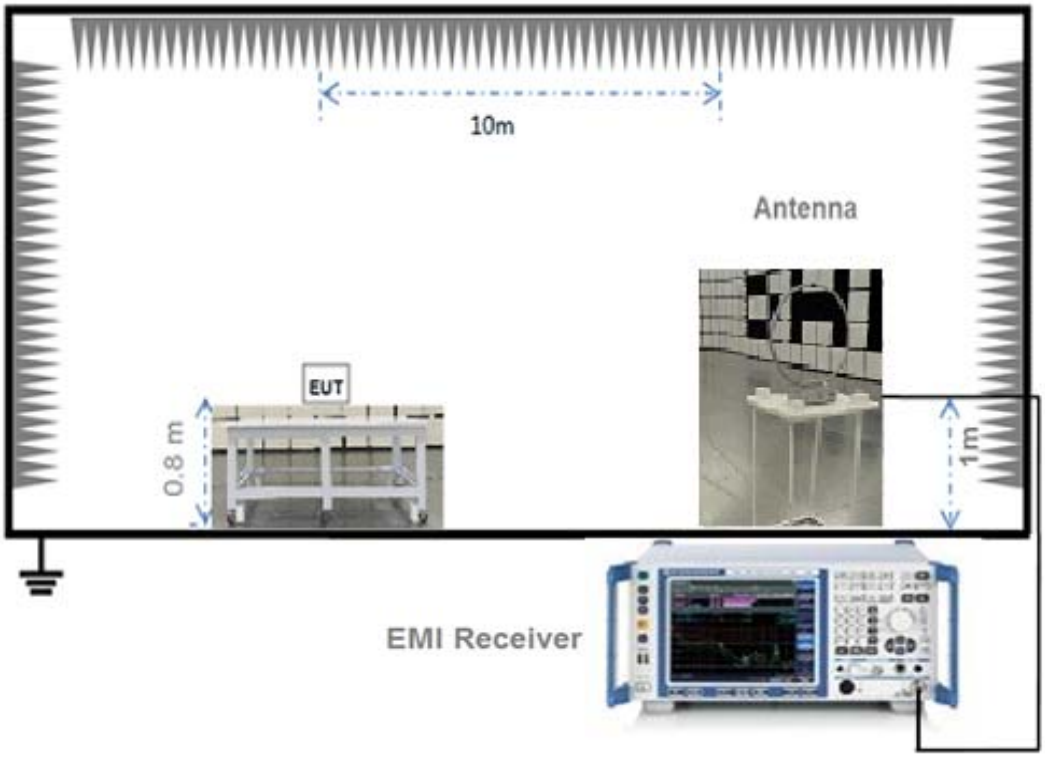
(Diagram 1)

4.4.2 For AC Power Supply Port Test



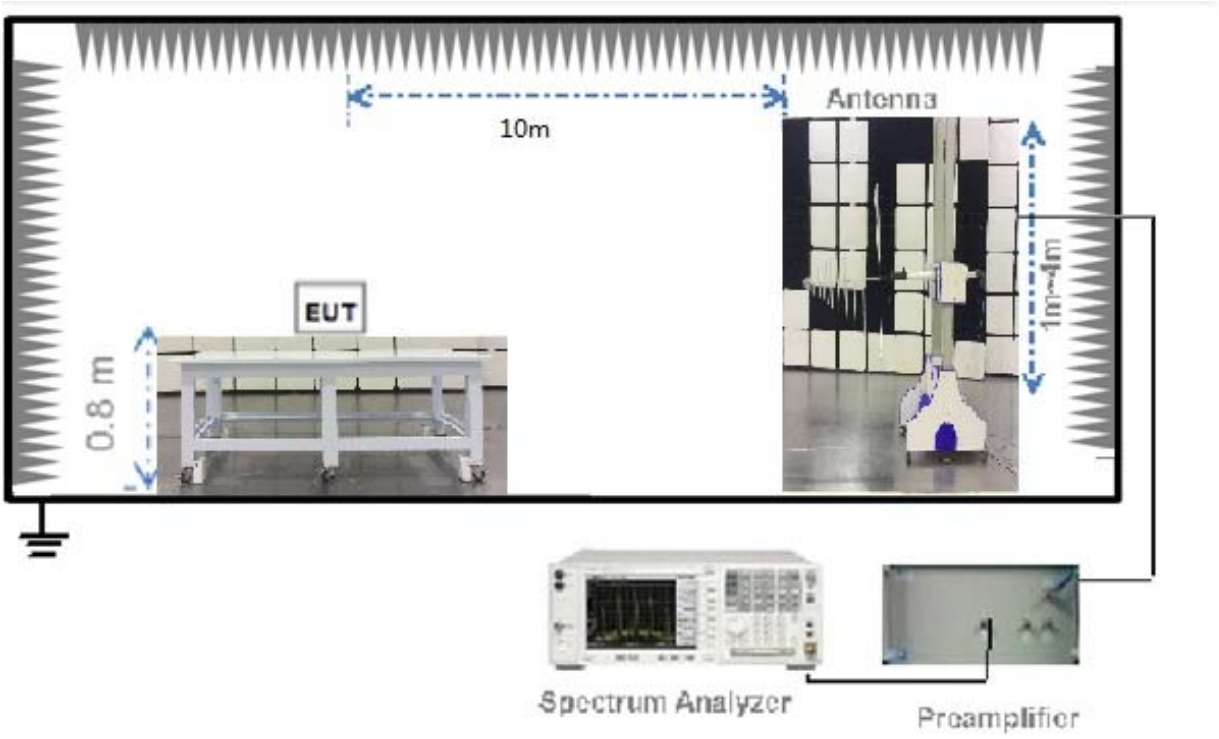
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



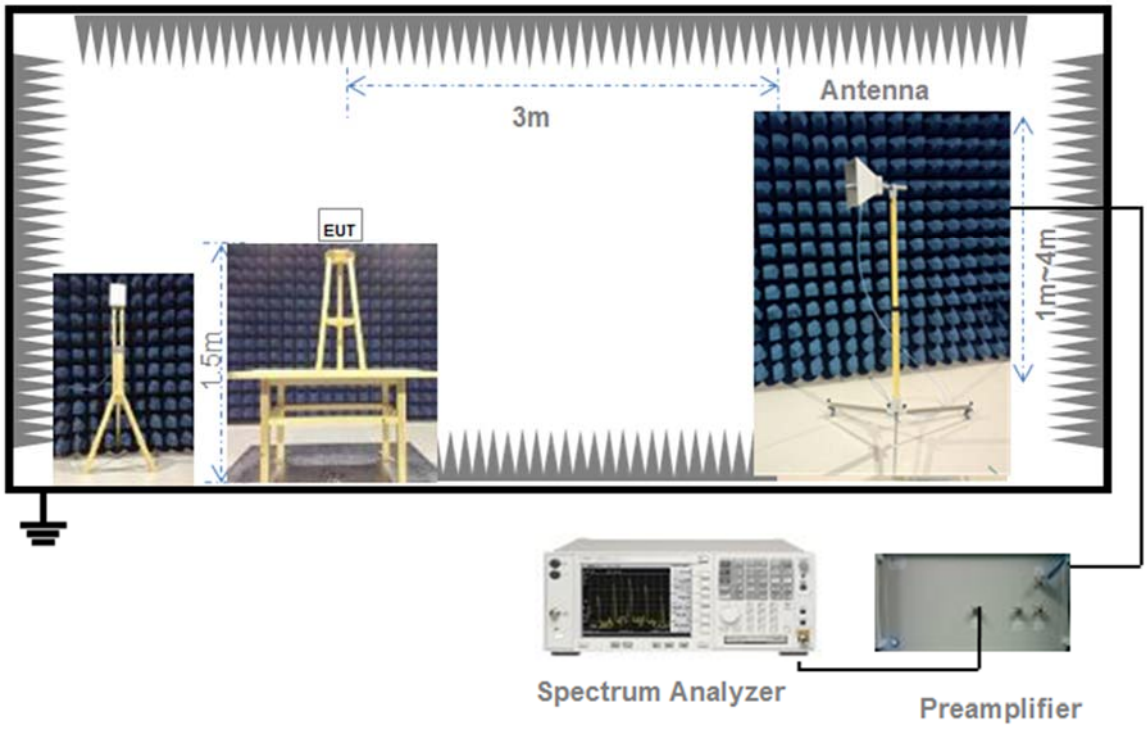
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



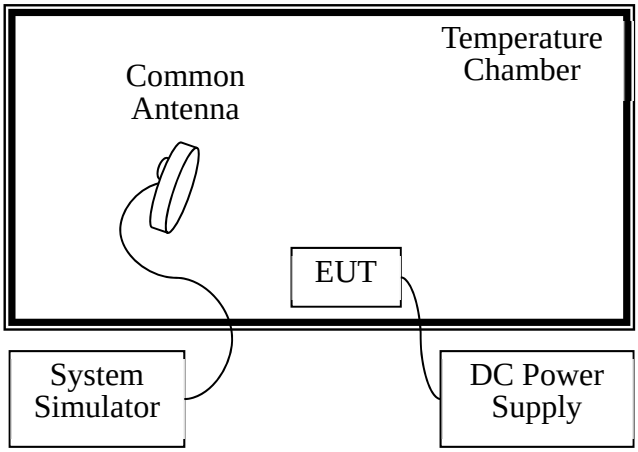
(Diagram 4)

4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

4.4.6 For Frequency Stability Test



(Diagram 6)

5 TEST ITEMS

5.1 RF Output Power

5.1.1 Test Limit

FCC §15.407(a)

The maximum conducted output power should not exceed:

Frequency Band (MHz)	Limit
5150-5250	250 mW
5250-5350	250 mW or 11 dBm + 10log B, whichever is less.
5470-5725	250 mW or 11 dBm + 10log B, whichever is less.
5725-5850	1 W
Note: Where “B” is the 26 dB emissions bandwidth in MHz.	

RSS-247, 6.2

The maximum conducted output power shall not exceed:

Frequency Band (MHz)	Limit
5150-5250	N/A
5250-5350	250 mW or 11 dBm + 10log B, whichever is less.
5470-5725	250 mW or 11 dBm + 10log B, whichever is less.
5725-5850	1 W
Note: Where “B” is the 99% emissions bandwidth in MHz.	

The maximum e.i.r.p. shall not exceed:

Frequency Band (MHz)	Limit
5150-5250	200 mW or 10 dBm + 10log B, whichever is less.
5250-5350	1W or 17 dBm + 10log B, whichever is less.
5470-5725	1W or 17 dBm + 10log B, whichever is less.
5725-5850	N/A
Note: Where “B” is the 99% emissions bandwidth in MHz.	

5.1.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.3 Test Procedure

The maximum peak conducted output power may be measured using a broadband Average RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector.

The E.I.R.P used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.

5.1.4 Test Result

Please refer to ANNEX A.1.

5.2 Emission Bandwidth and 6 dB Bandwidth

5.2.1 Limit

FCC §15.407(a), RSS-247, 6.2

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

5.2.2 Test Setup

The test setup photo please refer to 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Emission bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.

2. Set VBW ≥ 3*RBW,

3. Detector = Peak.

4. Trace mode = Max hold.

5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

Occupied Bandwidth

1. Set Span = 1.5 times to 5.0 times the OBW

2. Set RBW = 1% to 5% of the OBW.

3. Set VBW ≥ 3*RBW, Detector = Peak.

4. Trace mode = Max hold.

5. Use the 99% power bandwidth function of the instrument.

6 dB bandwidth

1. Set RBW = 100 kHz, VBW = 300 kHz.

2. Detector = Peak.Trace mode = Max hold.

3. Allow the trace to stabilize.

4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.2.4 Test Result

Please refer to ANNEX A.2 and ANNEX A.3.

5.3 Power Spectral density (PSD)

5.3.1 Limit

FCC §15.407(a)

The maximum power spectral density should not exceed:

Frequency Band (MHz)	Limit
5150-5250	11 dBm/MHz
5250-5350	11 dBm/MHz
5470-5725	11 dBm/MHz
5725-5850	30 dBm/500kHz

RSS-247, 6.2

The maximum power spectral density should not exceed:

Frequency Band (MHz)	Limit
5150-5250	N/A
5250-5350	11 dBm/MHz
5470-5725	11 dBm/MHz
5725-5850	30 dBm/500kHz

The e.i.r.p. spectral density should not exceed:

Frequency Band (MHz)	Limit
5150-5250	10 dBm/MHz
5250-5350	N/A
5470-5725	N/A
5725-5850	N/A

5.3.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth.

1. Set RBW = 500 kHz/1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS.
2. Allow the sweeps to continue until the trace stabilizes.
3. Use the peak marker function to determine the maximum amplitude level.
4. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.

5.3.4 Test Result

Please refer to ANNEX A.4.

5.4 Conducted Emission

5.4.1 Limit

FCC §15.207, RSS-GEN, 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.4.2 Test Setup

The section 4.4.2 (Diagram 2) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

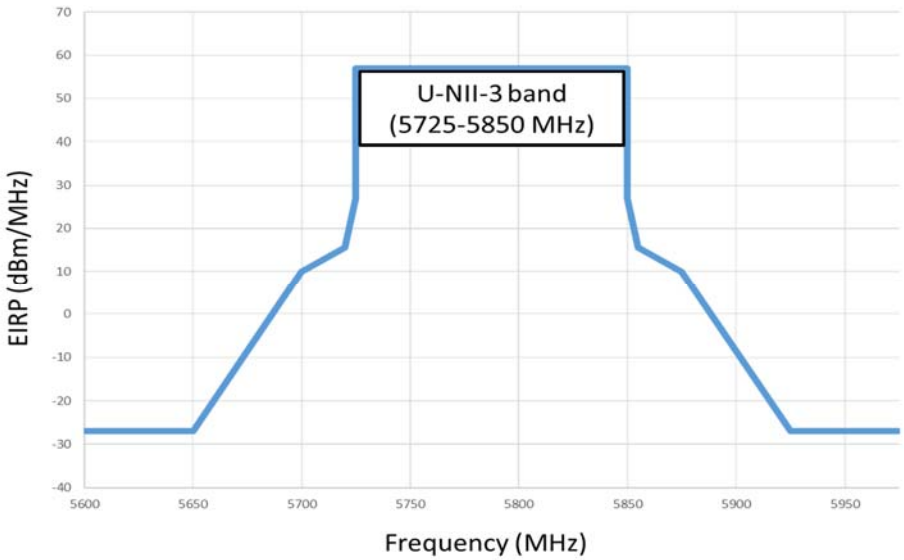
5.4.4 Test Result

Please refer to ANNEX A.5.

5.5 Conducted Spurious Emission and Band Edge (Authorized-band)

5.5.1 Limit

FCC §15.407(b)

Un-restricted band emissions	
Frequency Band (MHz)	Limit
5150 - 5250	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5250 - 5350	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5470 - 5725	Outside of the 5.47-5.725 GHz band: e.i.r.p. -27 dBm
5725 - 5850	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. 

RSS-247, 6.2

Un-restricted band emissions	
Frequency Band (MHz)	Limit
5150 - 5250	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm, However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz.
5250 - 5350	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm. And any emissions within the band 5150-5250 MHz shall meet the power spectral density limits of 10 dBm/MHz, The device shall be labelled “for indoor use only.”
5470 - 5725	Outside of the 5.47-5.725 GHz band: e.i.r.p. -27 dBm
5725 - 5850	5715 -5725 MHz: e.i.r.p. -17 dBm 5850 -5860 MHz: e.i.r.p. -17 dBm Other un-restricted band: e.i.r.p .-27 dBm

5.5.2 Test Setup

See section 4.4.2 (Diagram 2) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize

5.5.4 Test Result

Please refer to ANNEX A.6.

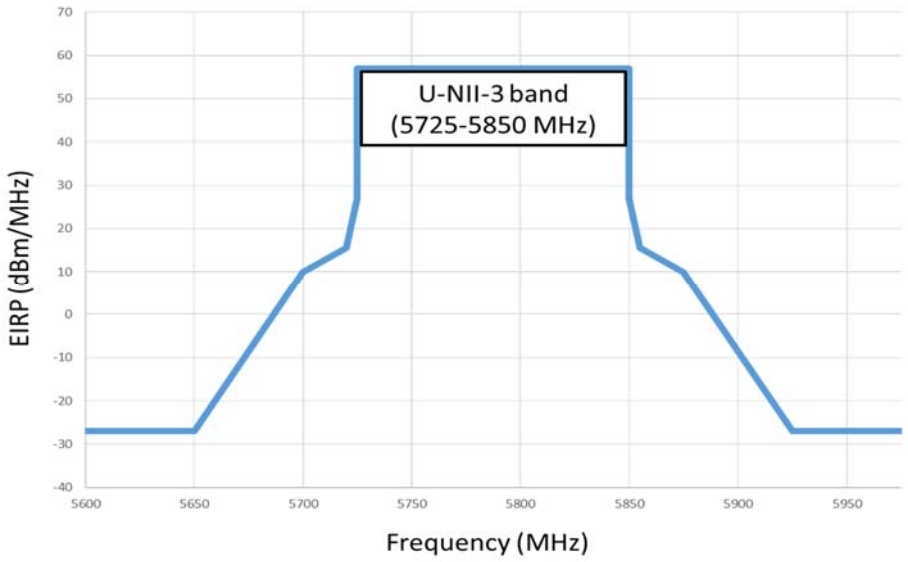
5.6 Radiated Spurious Emissions and Band Edge (Restricted-band)

5.6.1 Limit

FCC §15.209 & 15.407(b), RSS-247, 6.2

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note [1]: The Limit for radiated test was performed according to FCC Part 15C
Note [2]: The tighter limit applies at the band edge.

Un-restricted band emissions	
Out Operating Band (MHz)	Limit
5150 - 5250	e.i.r.p. -27 dBm (68.2 dBuV/m@3m)
5250 - 5350	e.i.r.p. -27 dBm (68.2 dBuV/m@3m)
5470 - 5725	e.i.r.p. -27 dBm (68.2 dBuV/m@3m)
5725 - 5850	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. 

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength.

5.6.2 Test Setup

The section 4.4.3-4.4.5 (Diagram 3 - Diagram 5) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

Since the emission limits are specified in terms of radiated field strength levels, measurements performed to demonstrate compliance have traditionally relied on a radiated test configuration. Radiated measurements remain the principal method for demonstrating compliance to the specified limits; however antenna-port conducted measurements are also now acceptable to demonstrate compliance (see below for details). When radiated measurements are utilized, test site requirements and procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 shall be followed.

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

General Procedure for conducted measurements in restricted bands

a) Measure the conducted output power (in dBm) using the detector specified (see guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).

b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see guidance on determining the applicable antenna gain)

c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).

d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).

e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$E = EIRP – 20\log D + 104.8$

where:

E = electric field strength in dBμV/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

f) Compare the resultant electric field strength level to the applicable limit.

g) Perform radiated spurious emission test.

Quasi-Peak measurement procedure

The specifications for measurements using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Frequency Interference (CISPR) of the International Electrotechnical Commission.

As an alternative to CISPR quasi-peak measurement, compliance can be demonstrated to the applicable emission limits using a peak detector.

Peak power measurement procedure

Peak emission levels are measured by setting the instrument as follows:

a) RBW = as specified in Table 1.

b) VBW ≥ 3 x RBW.

c) Detector = Peak.

d) Sweep time = auto.

e) Trace mode = max hold.

f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be longer for low duty cycle applications).

Table 1—RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Trace averaging across on and off times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT (i.e., duty cycle ≥ 98 percent) cannot be achieved and the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent), then the following procedure shall be used:

a) The EUT shall be configured to operate at the maximum achievable duty cycle.

b) Measure the duty cycle, x, of the transmitter output signal as described in section 6.0.

c) RBW = 1 MHz (unless otherwise specified).

d) VBW ≥ 3 x RBW.

e) Detector = RMS, if span/(# of points in sweep) ≤ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

f) Averaging type = power (i.e., RMS).

1) As an alternative, the detector and averaging type may be set for linear voltage averaging.

2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

g) Sweep time = auto.

h) Perform a trace average of at least 100 traces.

i) A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:

1) If power averaging (RMS) mode was used in step f), then the applicable correction factor is 10 log(1/x), where x is the duty cycle.

2) If linear voltage averaging mode was used in step f), then the applicable correction factor is 20 log(1/x), where x is the duty cycle.

3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

NOTE: Reduction of the measured emission amplitude levels to account for operational duty factor is not permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.

Determining the applicable transmit antenna gain

A conducted power measurement will determine the maximum output power associated with a restricted band emission; however, in order to determine the associated EIRP level, the gain of the transmitting antenna (in dBi) must be added to the measured output power (in dBm).

Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.

See KDB 662911 for guidance on calculating the additional array gain term when determining the effective antenna gain for a EUT with multiple outputs occupying the same or overlapping frequency ranges in the same band.

Radiated spurious emission test

An additional consideration when performing conducted measurements of restricted band emissions is that unwanted emissions radiating from the EUT cabinet, control circuits, power leads, or intermediate circuit elements will likely go undetected in a conducted measurement configuration. To address this concern, a radiated test shall be performed to ensure that emissions emanating from the EUT cabinet (rather than the antenna port) also comply with the applicable limits.

For these cabinet radiated spurious emission measurements the EUT transmit antenna may be replaced with a termination matching the nominal impedance of the antenna. Procedures for performing radiated measurements are specified in ANSI C63.10. All detected emissions shall comply with the applicable limits.

The measurement frequency range is from 30 MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

5.6.4 Test Result

Please refer to ANNEX A.7 and Please refer to ANNEX A.9

5.7 Frequency Stability

5.7.1 Limit

FCC §15.407(g)

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

5.7.2 Test Setup

The section 4.4.6 (Diagram 6) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

The EUT is installed in an environment test chamber with external power source.
Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT.
A sufficient stabilization period at each temperatures is used prior to each frequency measurement.
When temperature is stabled, measure the frequency stability.
The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage.
Change setting of chamber and external power source to complete all conditions.

5.7.4 Test Result

Please refer to ANNEX A.8.

ANNEX A TEST RESULT

A.1 RF Output Power

Note [1]: For FCC standard, if transmitting antennas of directional gain greater than 6 dBi are used, all band maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Data

Conducted Power

Band I (5150 - 5250 MHz)									
Mode	Channel	Frequency (MHz)	Conducted Power 0 (dBm)	Conducted Power 1 (dBm)	Conducted Power Total (dBm)	Conducted Power Total (mW)	FCC Limit (dBm)	FCC Limit (mW)	Verdict
11a	CH36	5180	20.34	21.01	/	/	24	250	Pass
11a	CH44	5220	18.84	18.80	/	/	24	250	Pass
11a	CH48	5240	19.28	20.19	/	/	24	250	Pass
11n (HT20)	CH36	5180	19.76	19.96	22.87	193.71	24	250	Pass
11n (HT20)	CH44	5220	18.19	18.43	21.32	135.58	24	250	Pass
11n (HT20)	CH48	5240	18.76	19.74	22.29	169.35	24	250	Pass
11n (HT40)	CH38	5190	20.13	19.92	23.04	201.21	24	250	Pass
11n (HT40)	CH46	5230	19.06	19.58	22.34	171.32	24	250	Pass

Band IV (5725 - 5850 MHz)									
Mode	Channel	Frequency (MHz)	Conducted Power 0 (dBm)	Conducted Power 1 (dBm)	Conducted Power Total (dBm)	Conducted Power Total (mW)	FCC Limit (dBm)	FCC/IC Limit (W)	Verdict
11a	CH149	5745	19.19	18.17	/	/	30	1.00	Pass
11a	CH157	5785	18.90	17.58	/	/	30	1.00	Pass
11a	CH165	5825	18.90	17.30	/	/	30	1.00	Pass
11n (HT20)	CH149	5745	16.70	15.27	19.05	80.42	30	1.00	Pass
11n (HT20)	CH157	5785	16.12	15.13	18.66	73.51	30	1.00	Pass
11n (HT20)	CH165	5825	16.20	14.56	18.47	70.26	30	1.00	Pass
11n (HT40)	CH151	5755	16.43	14.64	18.64	73.06	30	1.00	Pass
11n (HT40)	CH159	5795	16.27	14.33	18.42	69.47	30	1.00	Pass

A.2 Emission Bandwidth & 99% Bandwidth

Note: Test plots please refer to the document “Annex No.: BL-SZ1790192-604 Data Part 1.pdf”.

Test Data

Band I (5150 - 5250 MHz)						
Mode	Channel	Frequency	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
		(MHz)	ANT0	ANT1	ANT0	ANT1
11a	CH36	5180	19.24	19.52	16.85	16.85
11a	CH44	5220	19.64	19.84	16.96	17.02
11a	CH48	5240	19.36	19.80	16.96	16.96
11n (HT20)	CH36	5180	20.08	20.00	17.89	17.83
11n (HT20)	CH44	5220	19.88	20.16	18.00	17.89
11n (HT20)	CH48	5240	19.88	19.80	17.89	17.89
11n (HT40)	CH38	5190	41.00	40.50	36.10	36.00
11n (HT40)	CH46	5230	41.56	40.80	36.40	36.00

Band IV (5725 - 5850 MHz)						
Mode	Channel	Frequency	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
		(MHz)	ANT0	ANT1	ANT0	ANT1
11a	CH149	5745	20.26	20.43	16.96	17.02
11a	CH157	5785	20.09	20.32	16.90	16.85
11a	CH165	5825	20.32	20.20	16.79	16.96
11n (HT20)	CH149	5745	20.84	20.61	17.89	17.95
11n (HT20)	CH157	5785	20.61	20.55	17.95	17.95
11n (HT20)	CH165	5825	20.67	20.78	17.83	18.00
11n (HT40)	CH151	5755	40.50	41.10	36.20	36.20
11n (HT40)	CH159	5795	40.20	41.50	36.10	36.10

A.3 6 dB Bandwidth

Note: Test plots please refer to the document “Annex No.: BL-SZ1790192-604 Data Part 2.pdf”.

Test Data

Band IV (5725 - 5850 MHz)						
Mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Limit (kHz)	Verdict
			ANT0	ANT1		
11a	CH149	5745	16.57	15.82	500	Pass
11a	CH157	5785	16.42	16.17	500	Pass
11a	CH165	5825	16.57	16.57	500	Pass
11n (HT20)	CH149	5745	17.72	17.17	500	Pass
11n (HT20)	CH157	5785	17.72	17.72	500	Pass
11n (HT20)	CH165	5825	17.72	16.82	500	Pass
11n (HT40)	CH151	5755	34.17	35.82	500	Pass
11n (HT40)	CH159	5795	36.22	35.37	500	Pass

A.4 Power Spectral Density

Note: Test plots please refer to the document “Annex No.: BL-SZ1790192-604 Data Part 3.pdf”.

Test Data

Note [1]: The RBW used in Band IV is 0.5MHz, and the PSD factor is: 10*log (500 kHz/RBW) =0dBm.

Band I (5150 - 5250 MHz)							
Mode	Channel	Frequency (MHz)	PSD at ant 0 (dBm/MHz)	PSD at ant 1 (dBm/MHz)	Total PSD (dBm/MHz)	FCC Limit(dBm/MHz)	Verdict
11a	CH36	5180	2.36	2.28	/	11	Pass
11a	CH44	5220	-0.09	-0.23	/	11	Pass
11a	CH48	5240	2.33	1.96	/	11	Pass
11n (HT20)	CH36	5180	1.31	1.54	4.44	11	Pass
11n (HT20)	CH44	5220	0.30	-0.19	3.07	11	Pass
11n (HT20)	CH48	5240	1.05	1.36	4.22	11	Pass
11n (HT40)	CH38	5190	-1.03	-0.54	2.23	11	Pass
11n (HT40)	CH46	5230	-2.92	-2.36	0.38	11	Pass

Band IV (5725 - 5850 MHz)							
Mode	Channel	Frequency (MHz)	PSD at ant 0 (dBm/500KHz)	PSD at ant 1 (dBm/500KHz)	Total PSD (dBm/500KHz)	FCC/IC Limit(dBm/500 kHz)	Verdict
11a	CH149	5745	-5.55	-6.22	/	30	Pass
11a	CH157	5785	-4.69	-6.07	/	30	Pass
11a	CH165	5825	-5.14	-6.39	/	30	Pass
11n (HT20)	CH149	5745	-7.73	-9.24	-5.41	30	Pass
11n (HT20)	CH157	5785	-8.27	-9.15	-5.68	30	Pass
11n (HT20)	CH165	5825	-8.06	-9.53	-5.72	30	Pass
11n (HT40)	CH151	5755	-8.79	-12.04	-7.11	30	Pass
11n (HT40)	CH159	5795	-8.23	-11.34	-6.50	30	Pass

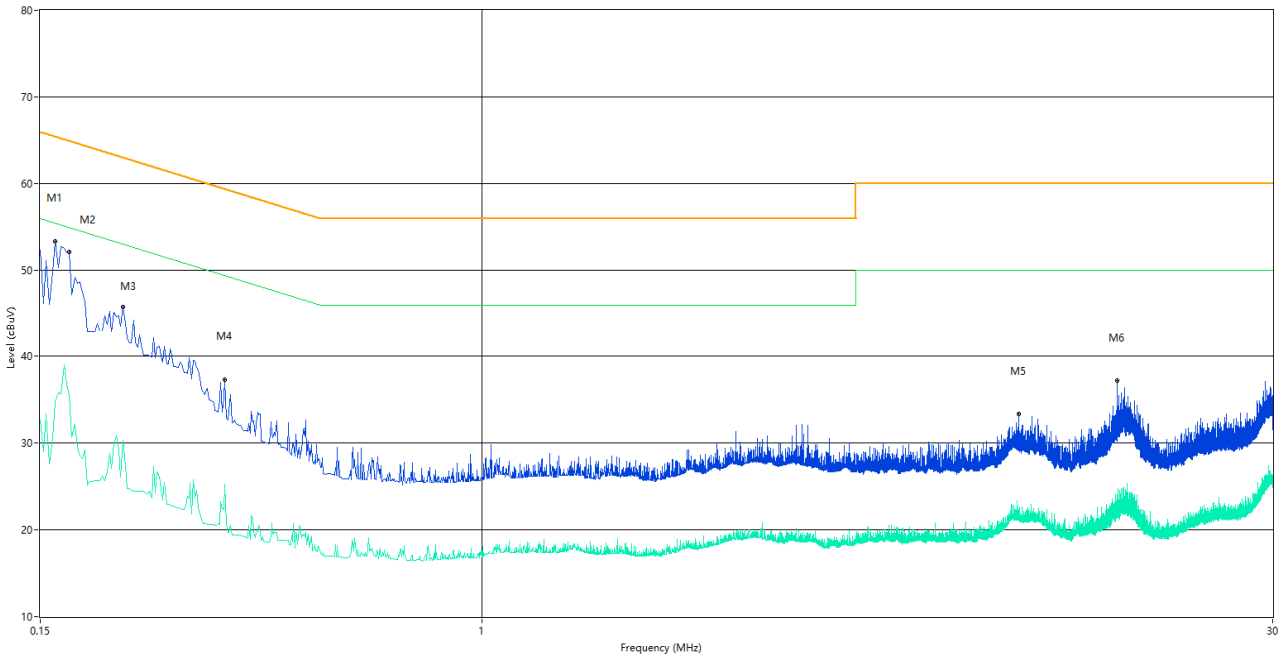
A.5 Conducted Emissions

Note [1]: The EUT is working in the Normal link mode.

Note [2]: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

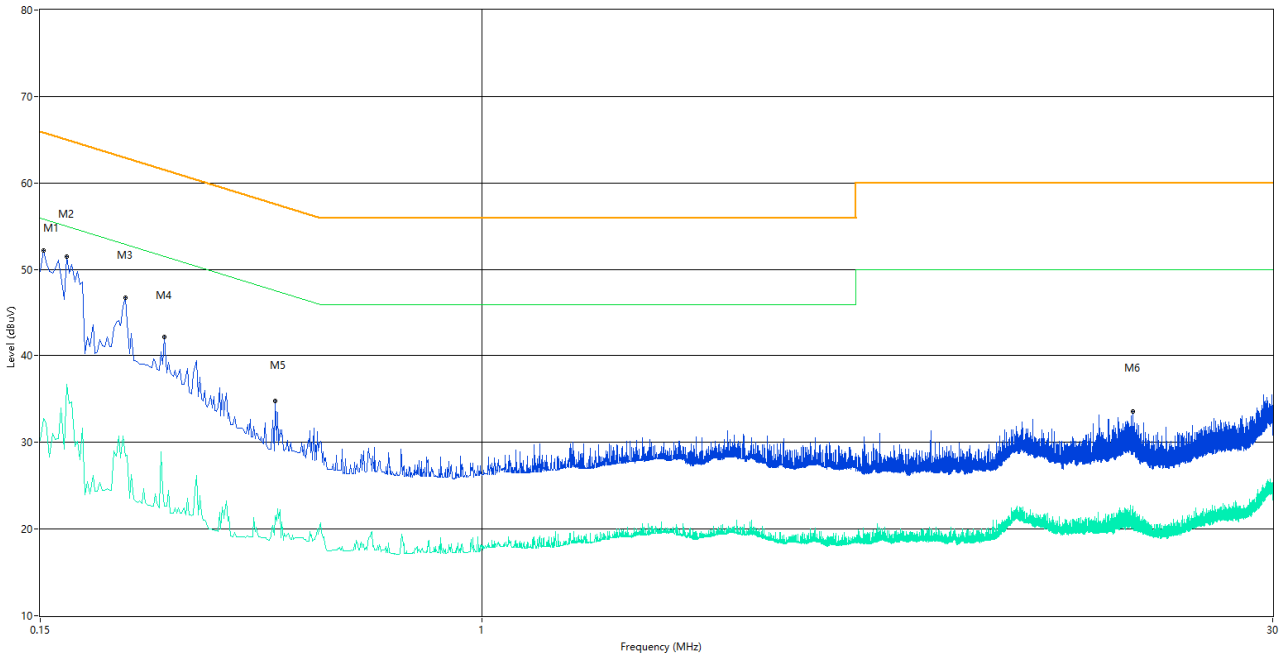
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.160	53.3	10.29	65.5	12.20	Peak	L Line	Pass
1**	0.160	34.8	10.29	55.5	20.70	AV	L Line	Pass
2	0.170	52.1	9.24	65.0	12.90	Peak	L Line	Pass
2**	0.170	35.4	9.24	55.0	19.60	AV	L Line	Pass
3	0.214	45.7	10.30	63.0	17.30	Peak	L Line	Pass
3**	0.214	30.3	10.30	53.0	22.70	AV	L Line	Pass
4	0.332	37.3	10.79	59.4	22.10	Peak	L Line	Pass
4**	0.332	25.3	10.79	49.4	24.10	AV	L Line	Pass
5	10.080	33.4	10.35	60.0	26.60	Peak	L Line	Pass
5**	10.080	22.0	10.35	50.0	28.00	AV	L Line	Pass
6	15.400	37.2	11.36	60.0	22.80	Peak	L Line	Pass
6**	15.400	21.8	11.36	50.0	28.20	AV	L Line	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.152	52.2	9.78	65.9	13.70	Peak	N Line	Pass
1**	0.152	32.8	9.78	55.9	23.10	AV	N Line	Pass
2	0.168	51.5	9.10	65.1	13.60	Peak	N Line	Pass
2**	0.168	36.7	9.10	55.1	18.40	AV	N Line	Pass
3	0.216	46.7	10.82	63.0	16.30	Peak	N Line	Pass
3**	0.216	28.4	10.82	53.0	24.60	AV	N Line	Pass
4	0.256	42.1	9.57	61.6	19.50	Peak	N Line	Pass
4**	0.256	22.6	9.57	51.6	29.00	AV	N Line	Pass
5	0.412	34.8	10.07	57.6	22.80	Peak	N Line	Pass
5**	0.412	21.5	10.07	47.6	26.10	AV	N Line	Pass
6	16.422	33.5	11.37	60.0	26.50	Peak	N Line	Pass
6**	16.422	22.4	11.37	50.0	27.60	AV	N Line	Pass

A.6 Conducted Spurious Emission and Band Edge (Authorized-band)

Note [1]: Test plots please refer to the document “Annex No.: BL-SZ17901792-604 Data Part 4.pdf”.
Note 2: The margin of all individual chains in the report is greater than 3 db, so the total value meets the limit requirement.

ANT 0

Test Band	Mode	Channel	Verdict
Band I	802.11a	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT20)	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT40)	Low	Pass
		High	Pass
Band IV	802.11a	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT20)	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT40)	Low	Pass
		High	Pass

ANT 1

Test Band	Mode	Channel	Verdict
Band I	802.11a	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT20)	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT40)	Low	Pass
		High	Pass
Band IV	802.11a	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT20)	Low	Pass
		Middle	Pass
		High	Pass
	802.11n(HT40)	Low	Pass
		High	Pass

A.7 Radiated Spurious Emissions and Band Edge (Restricted-band)

Test Data

Cabinet Radiated spurious emission test

Note [1]: The symbol of "--" in the table which means not application.

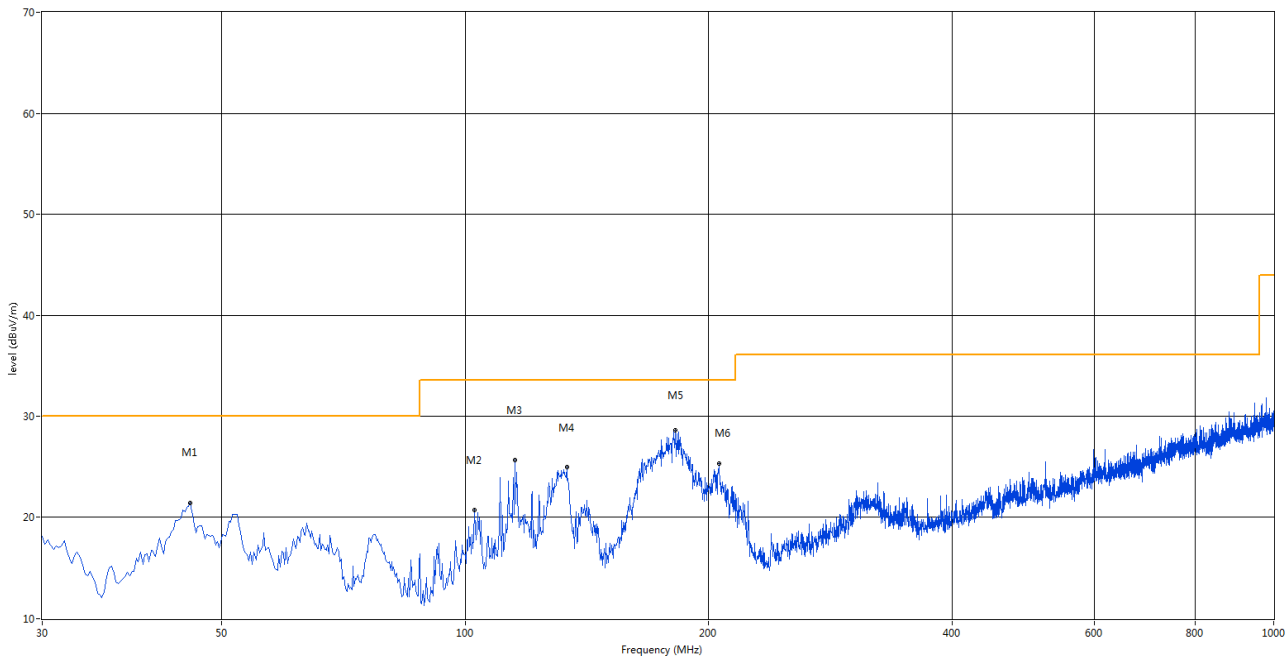
Note [2]: For the test data above 1 GHz，According the ANSI C63.4, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note [3]: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note [4]: The EUT is working in the Normal link mode below 1 GHz.

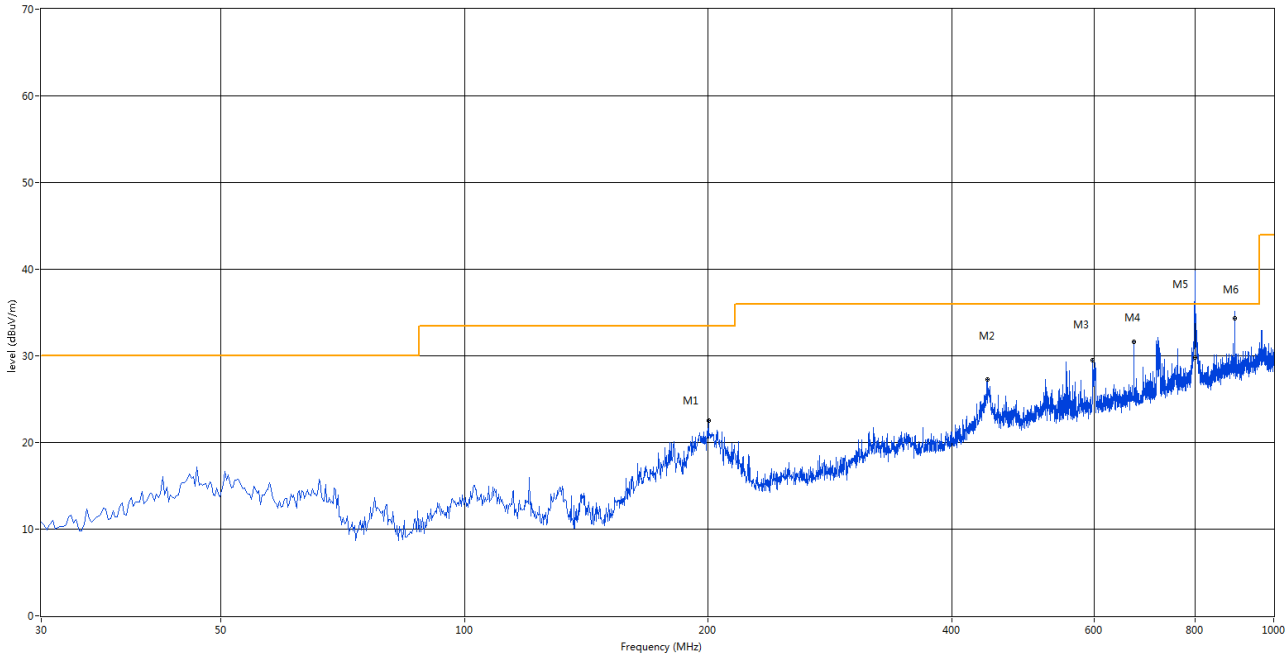
Note [5]: For Multiple transmitter output, the quantity *10 log (NANT)* dB is added to each spectrum value before comparing to the emission limit. When testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding *10 log(NANT)* if the measurements are made relative to the in-band emissions on the individual outputs.

30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	45.763	21.43	-19.27	30.0	8.57	Peak	145.00	100	Vertical	Pass
2	102.750	20.68	-20.04	33.5	12.82	Peak	227.00	100	Vertical	Pass
3	115.360	25.61	-21.02	33.5	7.89	Peak	193.00	100	Vertical	Pass
4	133.548	25.00	-23.37	33.5	8.50	Peak	227.00	100	Vertical	Pass
5	181.805	28.57	-21.31	33.5	4.93	Peak	162.00	100	Vertical	Pass
6	206.055	25.32	-19.55	33.5	8.18	Peak	203.00	100	Vertical	Pass

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	200.235	22.46	-19.37	33.5	11.04	Peak	217.00	100	Horizontal	Pass
2	442.735	27.27	-12.84	36.0	8.73	Peak	42.00	100	Horizontal	Pass
3	597.450	29.41	-9.19	36.0	6.59	Peak	107.00	100	Horizontal	Pass
4	672.140	31.58	-8.24	36.0	4.42	Peak	240.00	100	Horizontal	Pass
5	799.621	39.39	-6.40	36.0	-3.39	Peak	165.00	136	Horizontal	N/A
5*	799.621	29.79	-6.40	36.0	6.21	QP	165.00	136	Horizontal	Pass
6	896.024	36.90	-4.73	36.0	-0.90	Peak	220.00	112	Horizontal	N/A
6*	896.024	34.37	-4.73	36.0	1.63	QP	220.00	112	Horizontal	Pass

Note [1]: The device was evaluated/tested in XYZ orientation for radiated spurious emissions. And only the worst orientation of EUT was reported, which is the horizontal orientation.

Note[2]:18G-40G data are tested, but these data are at the end of noise, it is not put into the report

1 GHz to 18 GHz, ANT V Band I 802.11a Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2407.86	44.75	-1.81	68.2	23.45	Peak	316.9	150	Vertical	Pass
2	5000.62	51.99	12.63	74	22.01	Peak	222.8	150	Vertical	Pass
3	5180.29	106.56	13.04	68.2	-38.36	Peak	105.8	150	Vertical	N/A
4	7042.49	47.25	14.62	68.2	20.95	Peak	111.3	150	Vertical	Pass
5	13041.75	48.17	18.58	68.2	20.03	Peak	55.7	150	Vertical	Pass
6	15395.75	52.44	25.79	74	21.56	Peak	132.9	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11a Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2395.26	43.77	-1.71	68.2	24.43	Peak	264.2	150	Horizontal	Pass
2	4991.75	52.69	12.57	74	21.31	Peak	126.5	150	Horizontal	Pass
3	5180.01	107.86	13.09	68.2	-39.66	Peak	123.5	150	Horizontal	N/A
4	7050.24	46.38	14.55	68.2	21.82	Peak	71.4	150	Horizontal	Pass
5	11180.00	49.98	22.94	74	24.02	Peak	201.8	150	Horizontal	Pass
6	15046.50	43.57	23.46	68.2	24.63	Peak	221.7	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11a Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2407.16	44.45	-1.81	68.2	23.75	Peak	182.7	150	Vertical	Pass
2	4995.42	52.71	12.64	74	21.29	Peak	107.5	150	Vertical	Pass
3	5220.98	106.26	13.04	68.2	-38.06	Peak	223.1	150	Vertical	N/A
4	7045.39	46.61	14.28	68.2	21.59	Peak	150.3	150	Vertical	Pass
5	12205.75	52.84	18.54	74	21.16	Peak	281.7	150	Vertical	Pass
6	15090.50	47.72	22.43	68.2	20.48	Peak	208.1	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11a Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2393.91	44.17	-1.72	68.2	24.03	Peak	74.8	150	Horizontal	Pass
2	4989.37	52.24	12.62	74	21.76	Peak	217.1	150	Horizontal	Pass
3	5220.28	107.58	13.15	68.2	-39.38	Peak	189.3	150	Horizontal	N/A
4	7059.84	46.33	14.79	68.2	21.87	Peak	173	150	Horizontal	Pass
5	9323.75	47.67	18.99	74	26.33	Peak	300.6	150	Horizontal	Pass
6	10190.00	47.32	18.88	68.2	20.88	Peak	325.2	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11a High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2406.86	45.65	-1.81	68.2	22.55	Peak	12	150	Vertical	Pass
2	5000.25	52.87	12.63	74	21.13	Peak	36.7	150	Vertical	Pass
3	5240.46	106.06	13.15	68.2	-37.86	Peak	280.3	150	Vertical	N/A
4	7047.35	46.38	14.48	68.2	21.82	Peak	196.4	150	Vertical	Pass
5	13160.00	47.68	20.24	68.2	20.52	Peak	282.4	150	Vertical	Pass
6	16435.25	44.49	22.81	68.2	23.71	Peak	317.3	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11a High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2396.46	43.67	-1.72	68.2	24.53	Peak	253.5	150	Horizontal	Pass
2	4993.45	51.83	12.63	74	22.17	Peak	320	150	Horizontal	Pass
3	5240.94	108.59	13.14	68.2	-40.39	Peak	113.2	150	Horizontal	N/A
4	7056.07	47.05	14.79	68.2	21.15	Peak	162.4	150	Horizontal	Pass
5	9714.25	48.07	18.54	68.2	20.13	Peak	141.3	150	Horizontal	Pass
6	11207.50	50.02	18.32	74	23.98	Peak	180.6	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n20 Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2406.49	44.55	-1.81	68.2	23.65	Peak	96.3	150	Vertical	Pass
2	4998.11	51.68	12.67	74	22.32	Peak	32.4	150	Vertical	Pass
3	5180.71	106.03	13.15	68.2	-37.83	Peak	221.9	150	Vertical	N/A
4	7042.51	46.52	14.48	68.2	21.68	Peak	292.2	150	Vertical	Pass
5	13476.25	47.97	20.28	68.2	20.23	Peak	253.6	150	Vertical	Pass
6	17997.25	52.42	25.87	74	21.58	Peak	164.6	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11n20 Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2398.36	44.09	-1.80	68.2	24.11	Peak	51.4	150	Horizontal	Pass
2	4990.54	51.01	12.62	74	22.99	Peak	283.1	150	Horizontal	Pass
3	5180.35	108.03	13.14	68.2	-39.83	Peak	155.4	150	Horizontal	N/A
4	7056.26	47.06	14.73	68.2	21.14	Peak	276.3	150	Horizontal	Pass
5	12524.75	53.20	19.44	74	20.80	Peak	302.6	150	Horizontal	Pass
6	16055.75	48.96	22.55	74	25.04	Peak	226.3	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n20 Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2406.65	45.05	-1.81	68.2	23.15	Peak	304.9	150	Vertical	Pass
2	4998.10	52.12	12.66	74	21.88	Peak	147.4	150	Vertical	Pass
3	5220.25	105.52	13.15	68.2	-37.32	Peak	229.1	150	Vertical	N/A
4	7052.06	47.62	14.48	68.2	20.58	Peak	290.3	150	Vertical	Pass
5	12181.00	50.16	19.75	74	23.84	Peak	242.8	150	Vertical	Pass
6	15736.75	47.87	22.73	74	26.13	Peak	158	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11n20 Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2395.57	43.78	-1.74	68.2	24.42	Peak	271.6	150	Horizontal	Pass
2	4989.55	52.34	12.58	74	21.66	Peak	100.3	150	Horizontal	Pass
3	5220.97	107.93	13.06	68.2	-39.73	Peak	176.9	150	Horizontal	N/A
4	7056.17	46.30	14.55	68.2	21.90	Peak	35.1	150	Horizontal	Pass
5	9868.25	46.83	19.01	68.2	21.37	Peak	181.4	150	Horizontal	Pass
6	11529.25	46.69	17.23	74	27.31	Peak	127.4	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n20 High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2405.09	45.66	-1.79	68.2	22.54	Peak	125.3	150	Vertical	Pass
2	4998.69	52.24	12.67	74	21.76	Peak	203.9	150	Vertical	Pass
3	5240.95	104.82	13.14	68.2	-36.62	Peak	70.8	150	Vertical	N/A
4	7040.56	47.88	14.55	68.2	20.32	Peak	67.9	150	Vertical	Pass
5	12654.00	52.56	19.68	74	21.45	Peak	90.5	150	Vertical	Pass
6	16993.50	47.04	26.03	68.2	21.16	Peak	63.8	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11n20 High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2393.06	54.86	-1.74	68.2	13.34	Peak	143.8	150	Horizontal	Pass
2	4988.86	52.62	12.57	74	21.38	Peak	10.6	150	Horizontal	Pass
3	5240.11	107.85	13.09	68.2	-39.65	Peak	199.8	150	Horizontal	N/A
4	7058.69	45.79	14.79	68.2	22.41	Peak	46.9	150	Horizontal	Pass
5	9153.25	46.66	18.05	74	27.34	Peak	324	150	Horizontal	Pass
6	10949.00	48.13	19.46	74	25.87	Peak	318.5	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n40 Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2405.90	45.18	-1.77	68.2	23.02	Peak	336.2	150	Vertical	Pass
2	5001.59	53.18	12.63	74	20.82	Peak	125.8	150	Vertical	Pass
3	5190.82	105.45	13.14	68.2	-37.25	Peak	185.7	150	Vertical	N/A
4	7037.56	45.99	14.12	68.2	22.21	Peak	229.4	150	Vertical	Pass
5	9648.25	47.98	17.70	68.2	20.22	Peak	57.4	150	Vertical	Pass
6	10366.00	46.54	18.37	68.2	21.66	Peak	306.1	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11n40 Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2397.42	44.30	-1.74	68.2	23.90	Peak	212.9	150	Horizontal	Pass
2	4990.59	52.79	12.60	74	21.21	Peak	259.5	150	Horizontal	Pass
3	5190.10	108.25	13.15	68.2	-40.05	Peak	326.6	150	Horizontal	N/A
4	7054.03	46.63	14.55	68.2	21.57	Peak	107.6	150	Horizontal	Pass
5	9279.75	45.52	16.98	68.2	22.68	Peak	38.1	150	Horizontal	Pass
6	11655.75	49.50	19.12	74	24.50	Peak	191.8	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n40 High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2404.88	44.51	-1.81	68.2	23.69	Peak	148.5	150	Vertical	Pass
2	4998.40	52.80	12.64	74	21.20	Peak	207.5	150	Vertical	Pass
3	5230.14	106.19	13.15	68.2	-37.99	Peak	317.4	150	Vertical	N/A
4	7047.85	46.76	14.62	68.2	21.44	Peak	107.8	150	Vertical	Pass
5	9524.50	47.34	18.79	68.2	20.86	Peak	67	150	Vertical	Pass
6	10712.50	45.38	17.85	74	28.62	Peak	242	150	Vertical	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n40 High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2397.43	44.91	-1.80	68.2	23.29	Peak	311	150	Horizontal	Pass
2	4995.64	52.23	12.57	74	21.77	Peak	75.8	150	Horizontal	Pass
3	5230.24	107.74	13.04	68.2	-39.54	Peak	118	150	Horizontal	N/A
4	7042.80	45.62	14.48	68.2	22.58	Peak	307.5	150	Horizontal	Pass
5	8735.25	46.25	17.87	68.2	21.95	Peak	302.3	150	Horizontal	Pass
6	10465.00	49.22	17.05	68.2	18.98	Peak	346.5	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band IV 802.11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2403.66	46.10	-1.77	68.2	22.1	Peak	300.3	150	Vertical	Pass
2	4965.09	51.28	12.74	74	22.72	Peak	262.4	150	Vertical	Pass
3	5745.76	102.70	12.69	68.2	-34.50	Peak	300.9	150	Vertical	N/A
4	7036.93	46.34	13.98	68.2	21.86	Peak	212.1	150	Vertical	Pass
5	11034.25	52.12	17.31	74	21.88	Peak	169.4	150	Vertical	Pass
6	16171.25	53.40	21.36	74	20.6	Peak	114.4	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band IV 802.11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2395.39	51.87	-1.77	68.2	16.33	Peak	280	150	Horizontal	Pass
2	4995.21	51.12	12.67	74	22.88	Peak	328.1	150	Horizontal	Pass
3	5745.56	105.42	12.72	68.2	-37.22	Peak	68.6	150	Horizontal	N/A
4	7045.45	46.12	14.55	68.2	22.08	Peak	324.3	150	Horizontal	Pass
5	11006.75	50.98	18.96	74	23.02	Peak	32.9	150	Horizontal	Pass
6	15151.00	43.87	27.27	68.2	24.33	Peak	169.7	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band IV 802.11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2402.08	45.60	-1.79	68.2	22.60	Peak	293.7	150	Vertical	Pass
2	4963.76	51.49	12.76	74	22.51	Peak	259.8	150	Vertical	Pass
3	5785.21	102.30	12.71	68.2	-34.10	Peak	27	150	Vertical	N/A
4	7031.44	45.73	13.98	68.2	22.47	Peak	109.9	150	Vertical	Pass
5	14873.25	42.23	19.24	68.2	25.97	Peak	267.8	150	Vertical	Pass
6	17813.00	53.96	23.68	74	20.04	Peak	90	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band IV 802.11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2393.28	41.39	-1.86	68.2	26.81	Peak	95	150	Horizontal	Pass
2	5000.26	52.05	12.63	74	21.95	Peak	72.3	150	Horizontal	Pass
3	5785.82	105.74	12.70	68.2	-37.54	Peak	55.3	150	Horizontal	N/A
4	7051.42	45.47	14.48	68.2	22.73	Peak	14.7	150	Horizontal	Pass
5	9442.00	45.99	17.22	74	28.01	Peak	178.6	150	Horizontal	Pass
6	10946.25	46.02	18.52	74	27.98	Peak	342.3	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band IV 802.11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2403.87	45.28	-1.74	68.2	26.92	Peak	295.9	150	Vertical	Pass
2	4962.11	51.21	12.75	74	22.79	Peak	32.4	150	Vertical	Pass
3	5825.33	102.75	12.70	68.2	-34.55	Peak	331.3	150	Vertical	N/A
4	7035.18	46.78	13.98	68.2	21.42	Peak	21.2	150	Vertical	Pass
5	13751.25	47.68	22.08	68.2	20.52	Peak	235.4	150	Vertical	Pass
6	15327.00	48.19	28.63	68.2	20.01	Peak	25	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band IV 802.11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2392.52	47.80	-1.77	68.2	20.40	Peak	333.4	150	Horizontal	Pass
2	4996.43	52.90	12.63	74	21.10	Peak	334.8	150	Horizontal	Pass
3	5825.60	105.58	12.70	68.2	-37.38	Peak	51.8	150	Horizontal	N/A
4	7050.98	46.27	14.55	68.2	21.93	Peak	178.8	150	Horizontal	Pass
5	8663.75	47.42	17.78	68.2	20.78	Peak	264.3	150	Horizontal	Pass
6	11804.25	47.96	18.25	74	26.04	Peak	137.6	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n20 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2406.90	46.00	-1.81	68.2	22.20	Peak	259.8	150	Vertical	Pass
2	4997.78	52.74	12.62	74	21.26	Peak	130.2	150	Vertical	Pass
3	5180.72	106.43	13.14	68.2	-38.23	Peak	144.7	150	Vertical	N/A
4	7021.16	42.56	12.96	68.2	25.64	Peak	222	150	Vertical	Pass
5	13699.00	47.67	20.78	68.2	20.53	Peak	172.1	150	Vertical	Pass
6	17455.50	44.63	22.76	68.2	23.57	Peak	311.4	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11n20 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2395.08	44.59	-1.71	68.2	23.61	Peak	20.6	150	Horizontal	Pass
2	4992.52	51.59	12.60	74	22.41	Peak	270.7	150	Horizontal	Pass
3	5180.36	107.62	13.15	68.2	-39.42	Peak	243.8	150	Horizontal	N/A
4	7015.35	45.20	12.63	68.2	23.00	Peak	182.2	150	Horizontal	Pass
5	14570.75	47.82	17.57	68.2	20.38	Peak	254.1	150	Horizontal	Pass
6	17755.25	53.29	20.68	74	20.71	Peak	252.9	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n20 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2404.42	46.15	-1.81	68.2	22.05	Peak	340.6	150	Vertical	Pass
2	4998.82	52.21	12.65	74	21.79	Peak	308.1	150	Vertical	Pass
3	5220.76	104.96	13.14	68.2	-36.76	Peak	288.7	150	Vertical	N/A
4	7024.35	42.65	12.92	68.2	25.55	Peak	336.2	150	Vertical	Pass
5	14821.00	50.96	18.47	68.2	17.24	Peak	281.8	150	Vertical	Pass
6	17766.25	51.77	20.39	74	22.23	Peak	316.1	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11n20 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2398.32	44.01	-1.71	68.2	24.19	Peak	213.2	150	Horizontal	Pass
2	4992.68	52.23	12.62	74	21.77	Peak	111.9	150	Horizontal	Pass
3	5220.69	107.37	13.14	68.2	-39.17	Peak	340.9	150	Horizontal	N/A
4	7020.34	44.83	12.63	68.2	23.37	Peak	299.4	150	Horizontal	Pass
5	9180.75	43.66	14.69	74	30.34	Peak	203.6	150	Horizontal	Pass
6	10649.25	43.73	14.72	74	30.27	Peak	13.6	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band I 802.11n20 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2403.89	46.17	-1.81	68.2	22.03	Peak	236.8	150	Vertical	Pass
2	5002.04	52.63	12.65	74	21.37	Peak	213.6	150	Vertical	Pass
3	5240.24	104.97	13.14	68.2	-36.77	Peak	316.8	150	Vertical	N/A
4	7030.35	43.89	12.65	68.2	24.31	Peak	228.5	150	Vertical	Pass
5	11521.00	46.19	20.42	74	27.81	Peak	103.9	150	Vertical	Pass
6	17155.75	53.28	21.21	68.2	14.92	Peak	121.3	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band I 802.11n20 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2397.21	43.19	-1.73	68.2	25.01	Peak	33.6	150	Horizontal	Pass
2	4991.72	51.80	12.59	74	22.20	Peak	343.1	150	Horizontal	Pass
3	5240.12	107.04	13.09	68.2	-38.84	Peak	173.2	150	Horizontal	N/A
4	7029.41	44.05	12.92	68.2	24.15	Peak	132.2	150	Horizontal	Pass
5	9986.50	41.44	14.86	68.2	26.76	Peak	29.1	150	Horizontal	Pass
6	11622.75	46.40	17.60	74	27.60	Peak	115.9	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band IV 802.11n40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2405.23	45.36	-1.80	68.2	22.84	Peak	294.2	150	Vertical	Pass
2	4999.69	51.96	12.66	74	22.04	Peak	11.9	150	Vertical	Pass
3	5755.97	105.94	13.15	68.2	-37.74	Peak	296.3	150	Vertical	N/A
4	7034.85	43.97	12.96	68.2	24.23	Peak	324.6	150	Vertical	Pass
5	9560.25	40.72	14.01	68.2	27.48	Peak	127.5	150	Vertical	Pass
6	11092.00	45.49	16.00	74	28.51	Peak	83.2	150	Vertical	Pass

1 GHz to 18 GHz, ANT H Band IV 802.11n40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2393.92	43.09	-1.72	68.2	25.11	Peak	75.8	150	Horizontal	Pass
2	4991.62	52.50	12.57	74	21.50	Peak	15.7	150	Horizontal	Pass
3	5775.45	107.11	13.14	68.2	-38.91	Peak	299.1	150	Horizontal	N/A
4	7028.97	45.00	12.65	68.2	23.20	Peak	131.5	150	Horizontal	Pass
5	9244.00	41.90	14.63	68.2	26.30	Peak	261.4	150	Horizontal	Pass
6	10635.50	45.34	16.69	74	28.66	Peak	20.8	150	Horizontal	Pass

1 GHz to 18 GHz, ANT V Band IV 802.11n40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2406.18	45.73	-1.81	68.2	22.47	Peak	251.4	150	Vertical	Pass
2	4998.12	52.10	12.67	74	21.90	Peak	224	150	Vertical	Pass
3	5795.86	105.41	13.14	68.2	-37.21	Peak	315.9	150	Vertical	N/A
4	7020.52	42.56	12.91	68.2	25.64	Peak	122	150	Vertical	Pass
5	8947.00	42.13	15.13	68.2	26.07	Peak	30.3	150	Vertical	Pass
6	10423.75	44.52	15.77	68.2	23.68	Peak	227.2	150	Vertical	Pass

1 GHz to 18 GHz, ANT V Band IV 802.11n40 High Channel

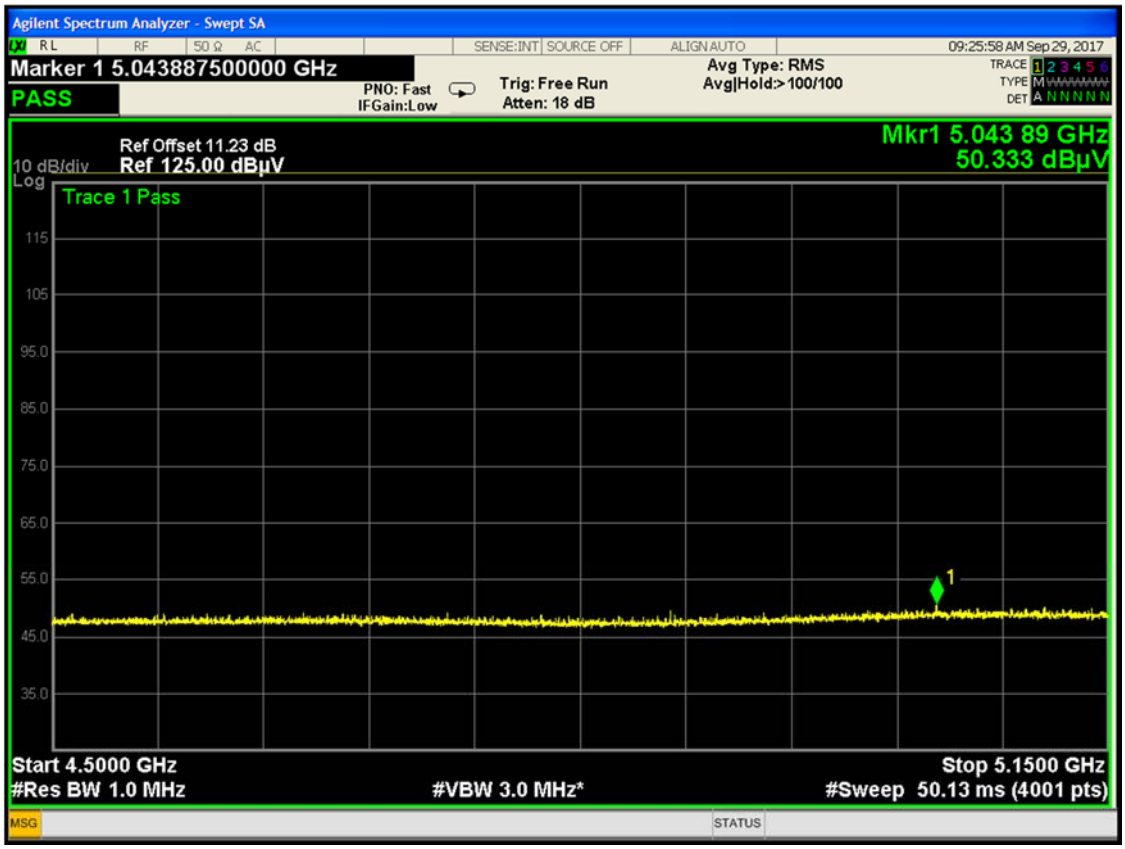
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2397.53	43.94	-1.73	68.2	24.26	Peak	117.7	150	Horizontal	Pass
2	4992.39	52.35	12.62	74	21.65	Peak	335.9	150	Horizontal	Pass
3	5795.25	107.89	13.14	68.2	-39.69	Peak	259.1	150	Horizontal	N/A
4	7023.42	44.58	12.65	68.2	23.62	Peak	208.9	150	Horizontal	Pass
5	9224.75	44.78	14.63	68.2	23.42	Peak	358	150	Horizontal	Pass
6	10396.25	46.35	16.23	68.2	21.86	Peak	108.7	150	Horizontal	Pass

A.7.2 Band Edge (Restricted-band)

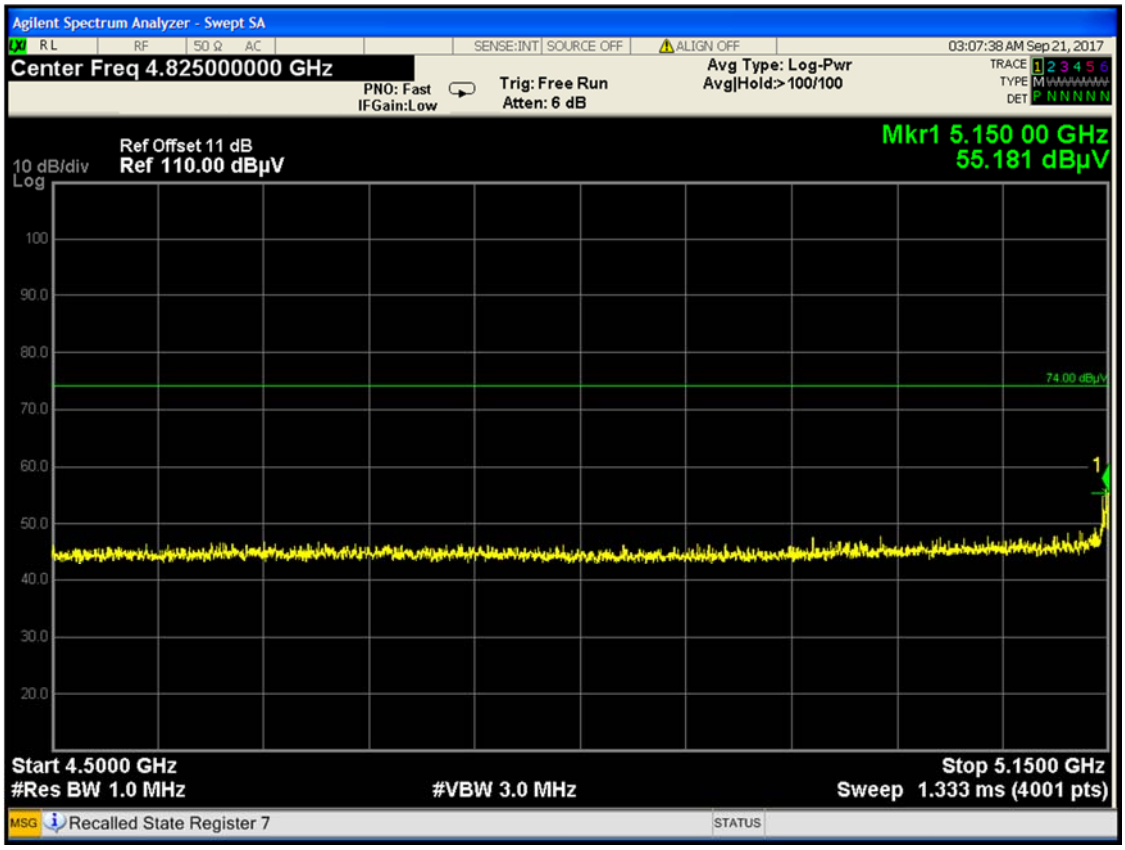
Test Band	Mode	Channel	Verdict
Band I	802.11a	Low	Pass
		High	Pass
	802.11n(HT20)	Low	Pass
		High	Pass
	802.11n(HT40)	Low	Pass
		High	Pass
Band IV	802.11a	Low	Pass
		High	Pass
	802.11n(HT20)	Low	Pass
		High	Pass
	802.11n(HT40)	Low	Pass
		High	Pass

Test Plots

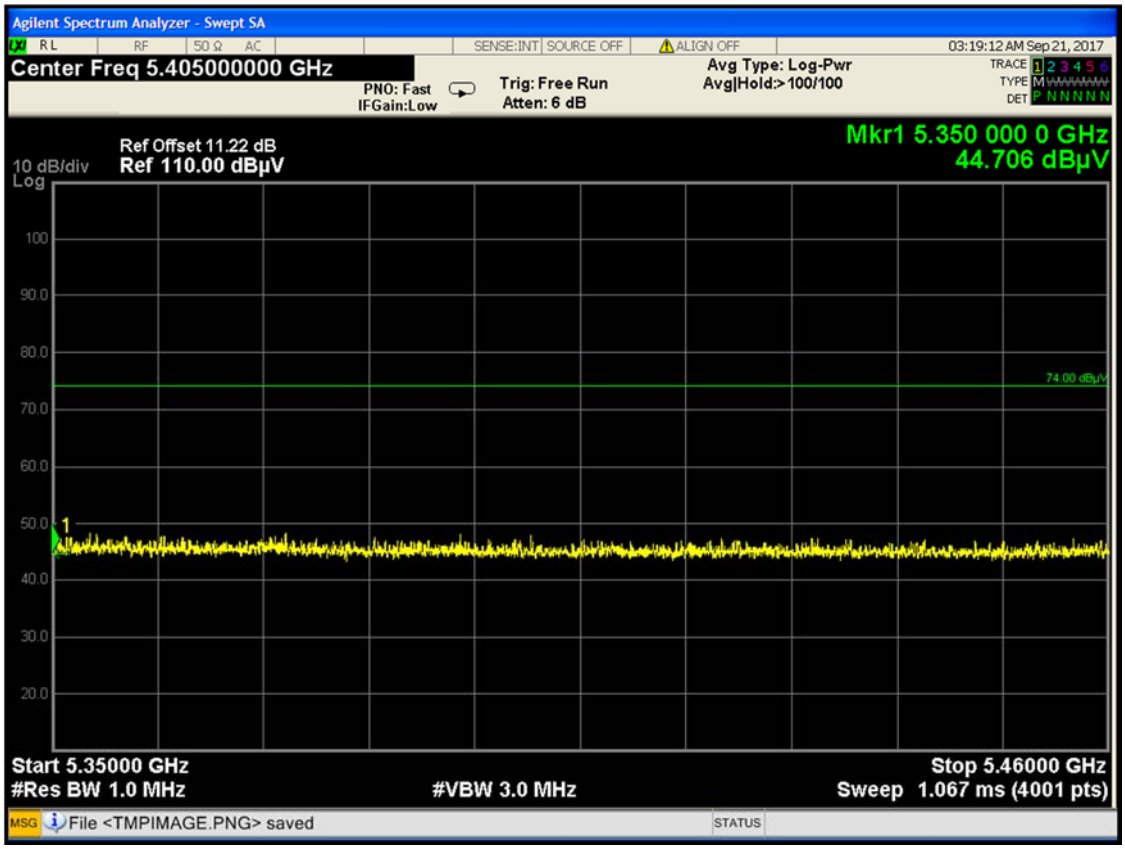
Band I 11a CH36 AV



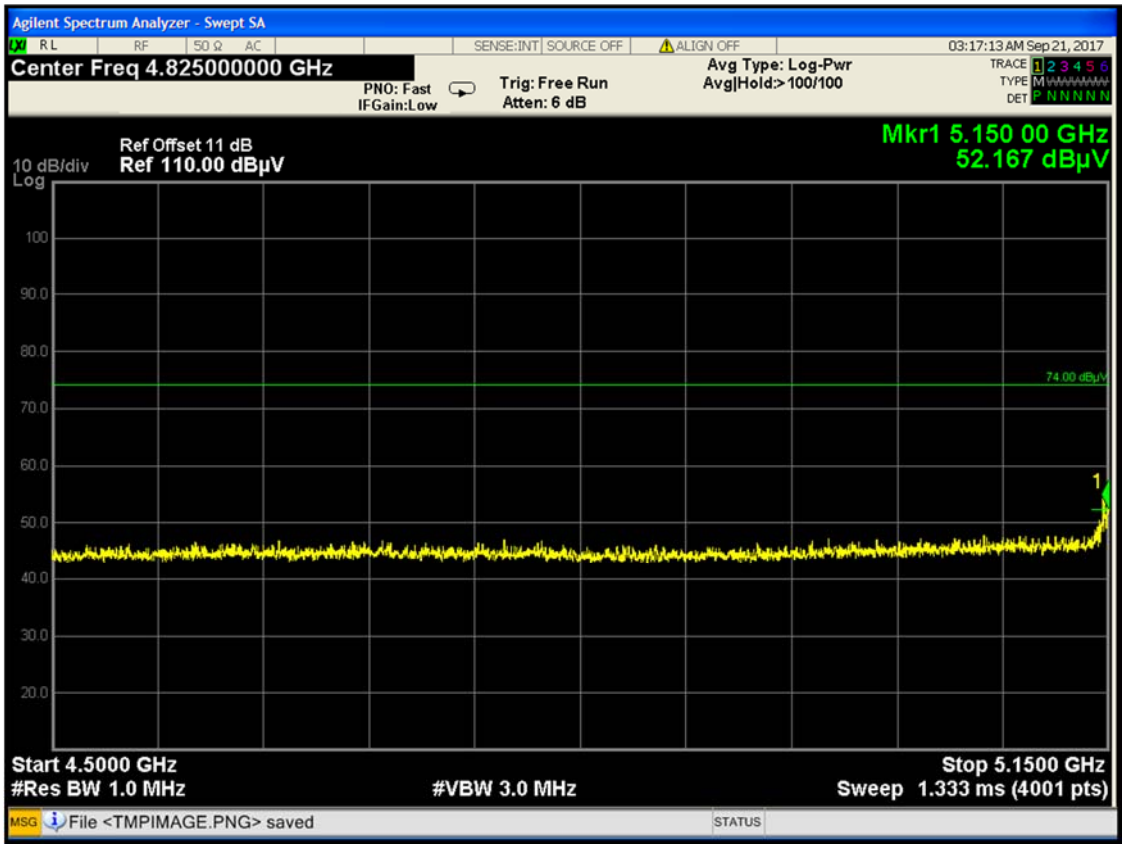
Band I 11a CH36 Peak



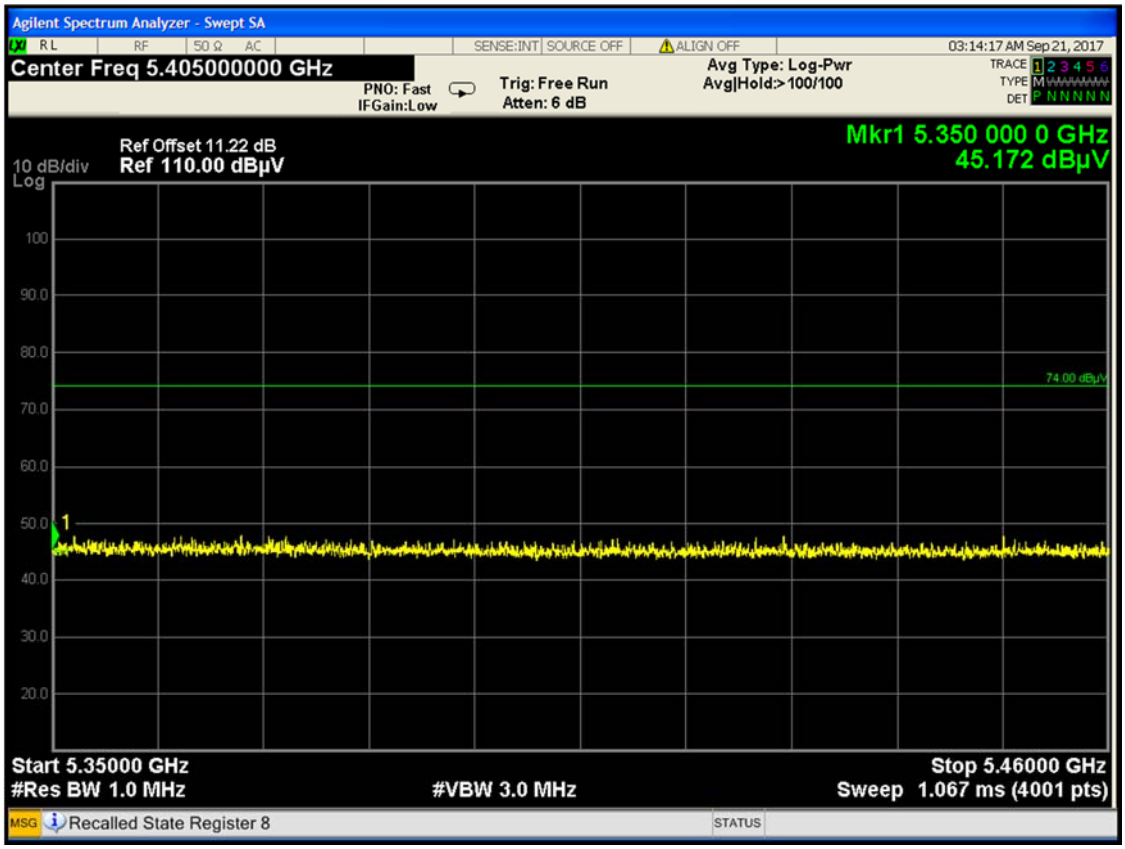
Band I 11a CH48 Peak



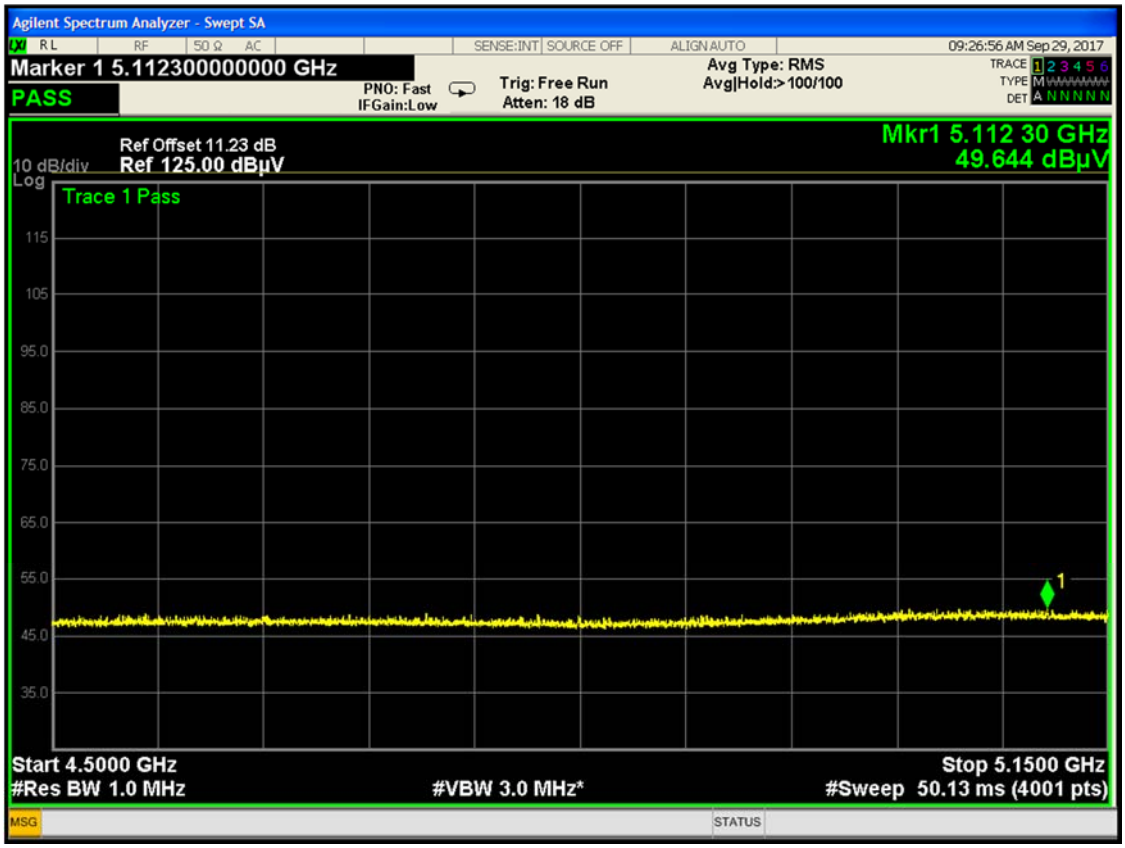
Band I 11n(HT20) CH36 Peak



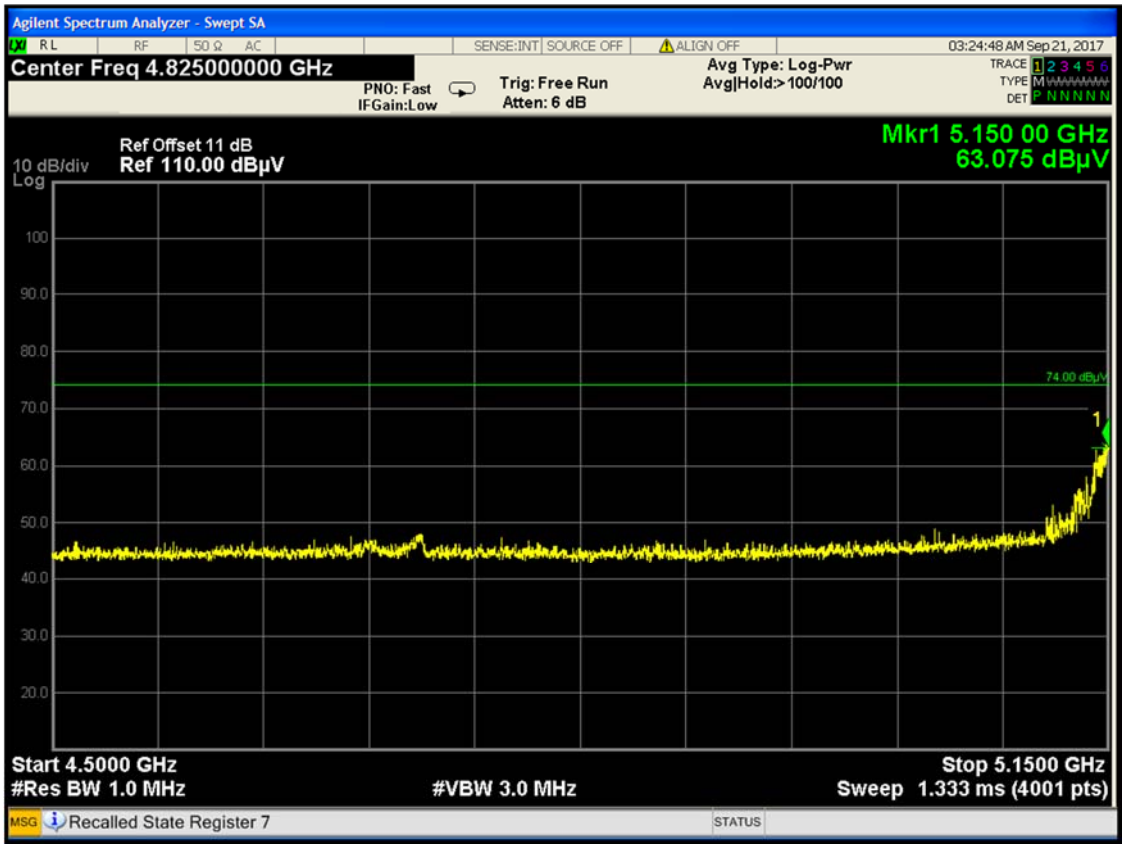
Band I 11n(HT20) CH48 Peak



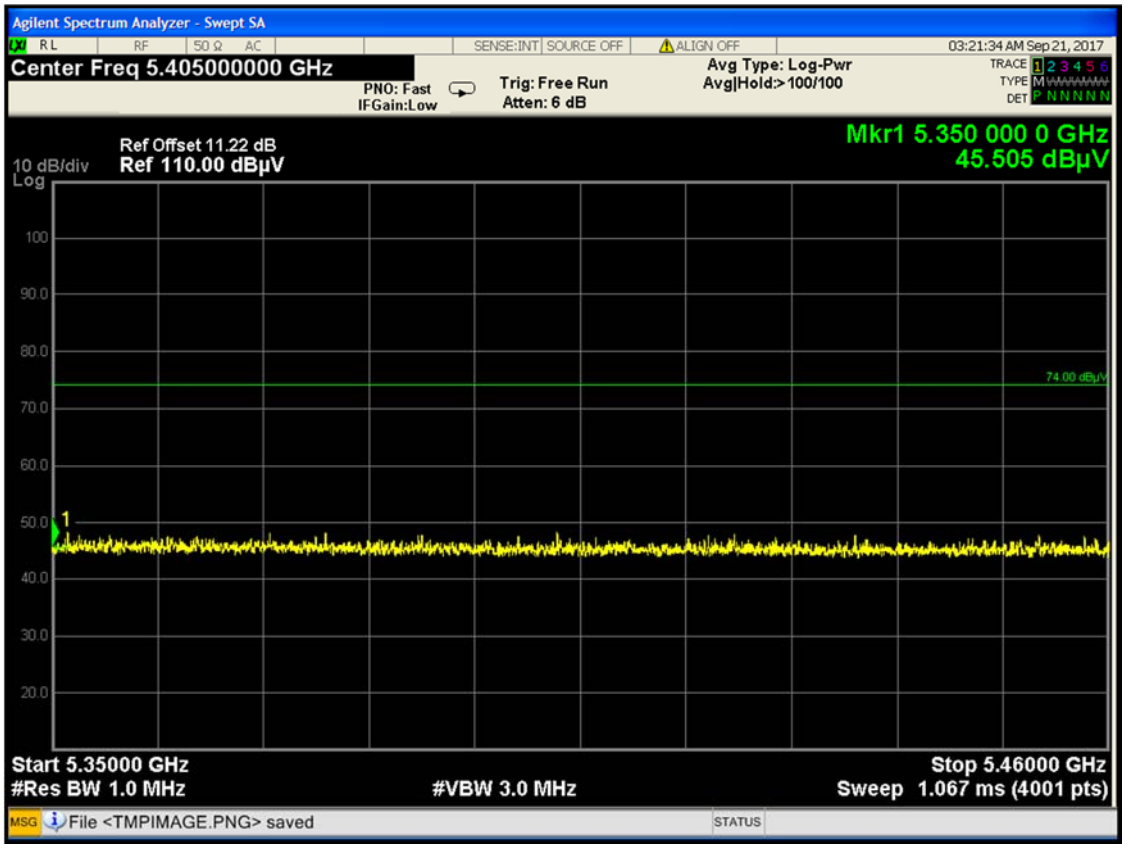
Band I 11n(HT40) CH38 AV



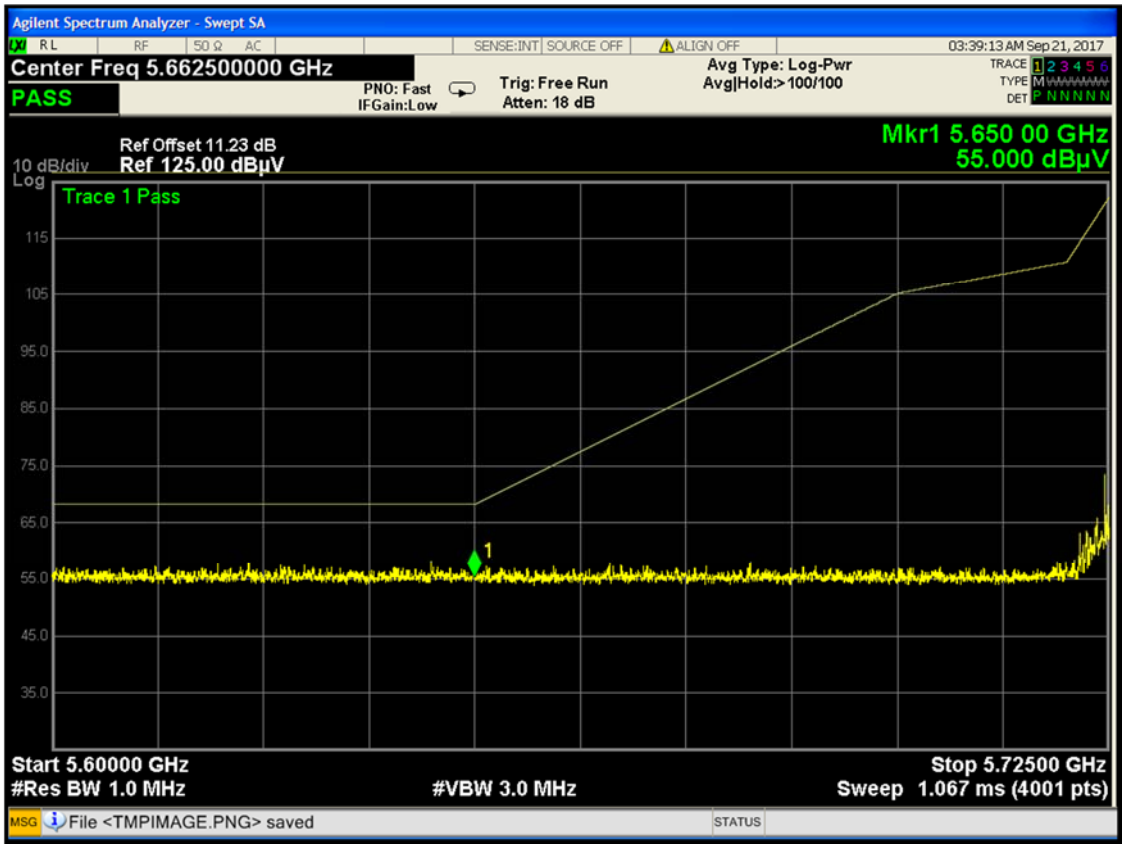
Band I 11n(HT40) CH38 Peak



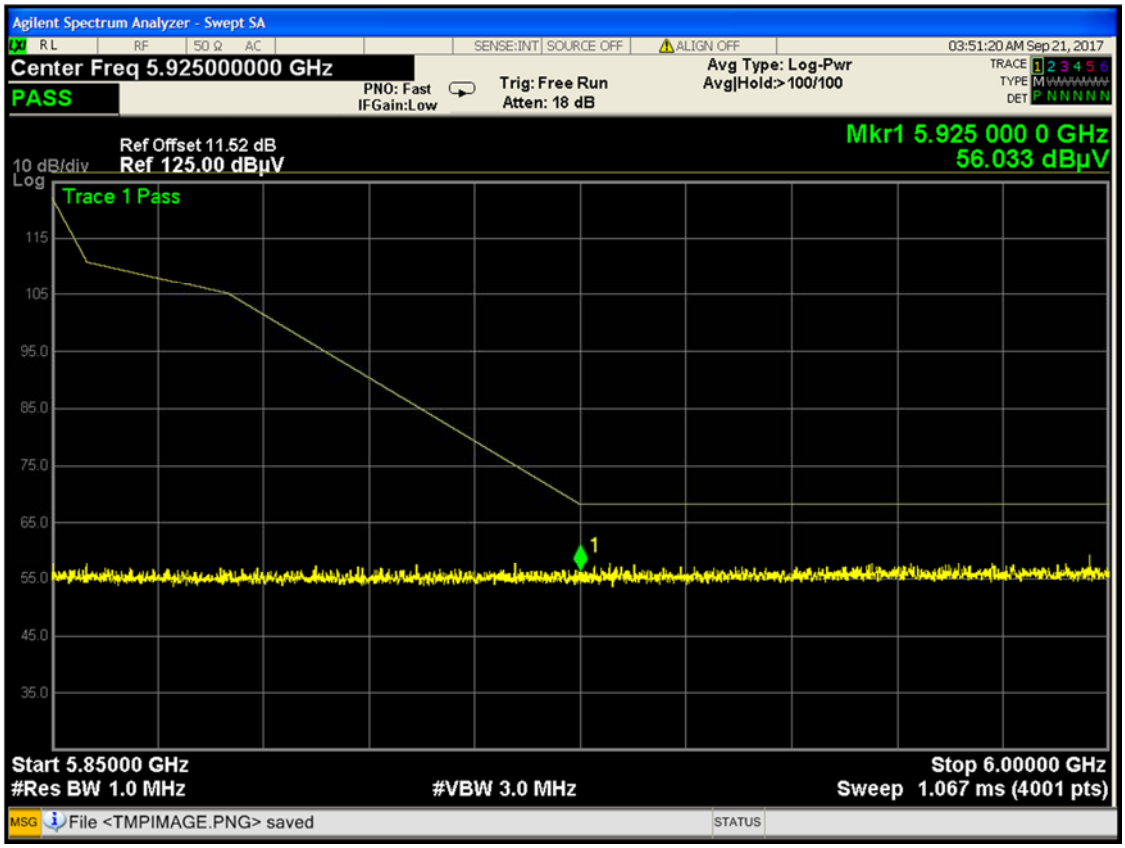
Band I 11n(HT40) CH46 Peak



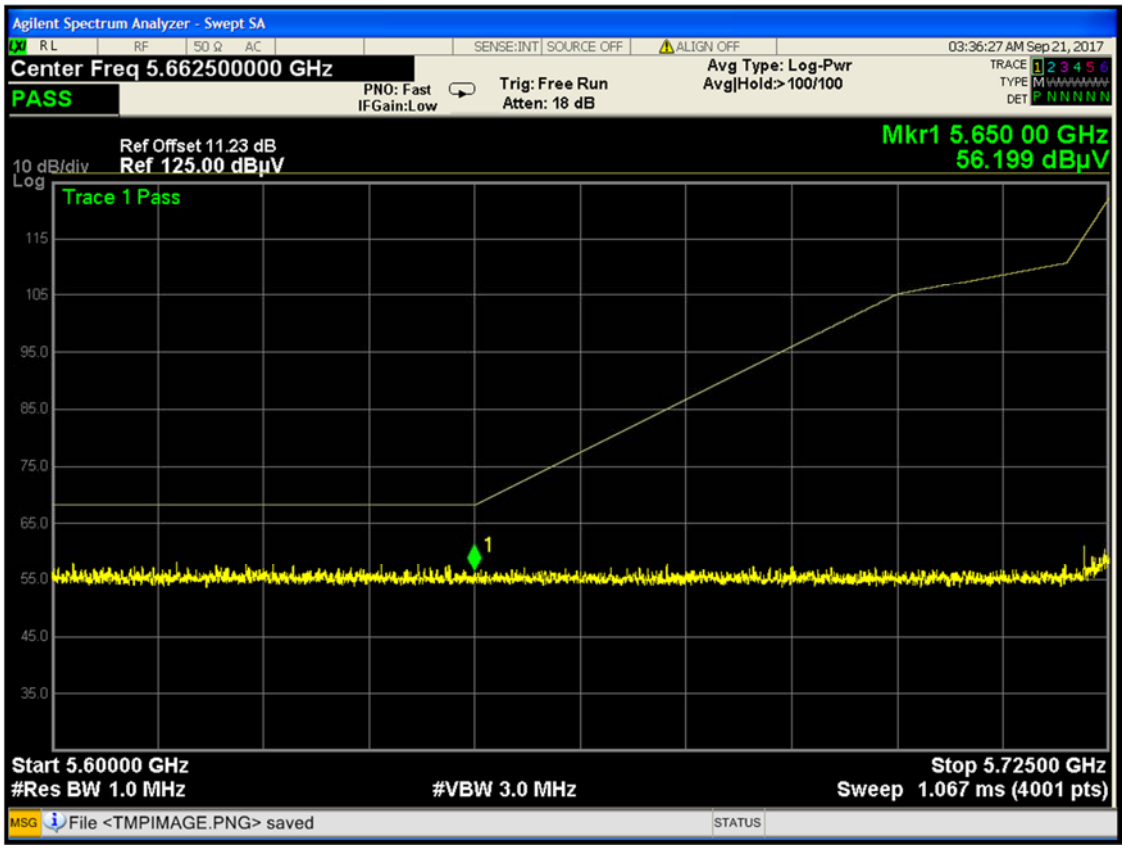
Band IV 11a CH149 Peak



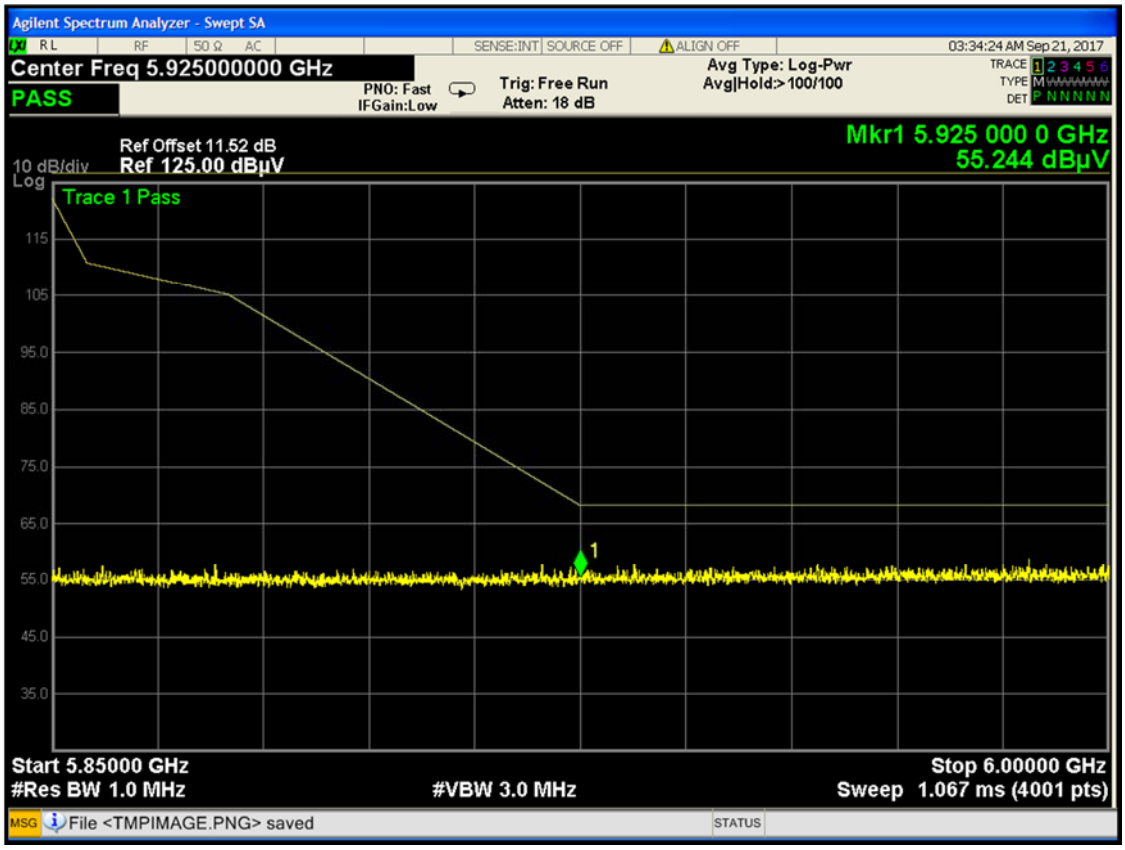
Band IV 11a CH165 Peak



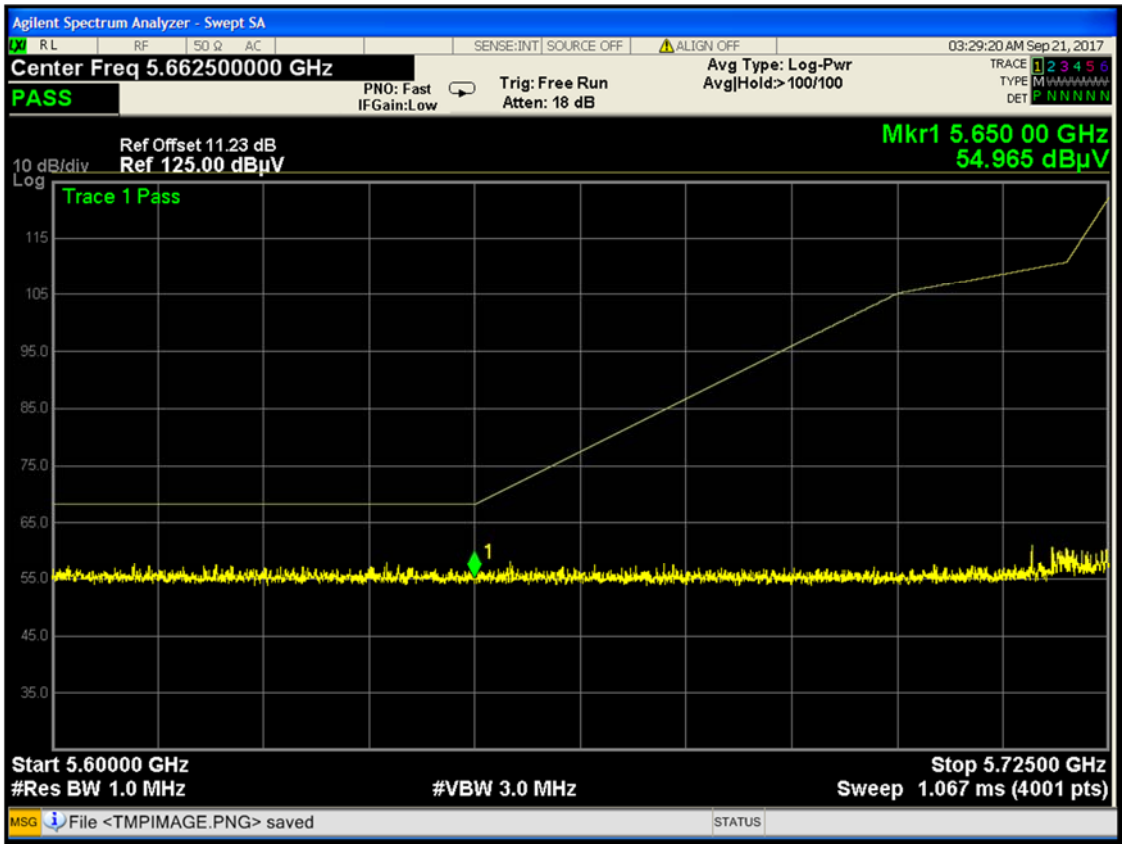
Band IV 11n(HT20) CH149 Peak



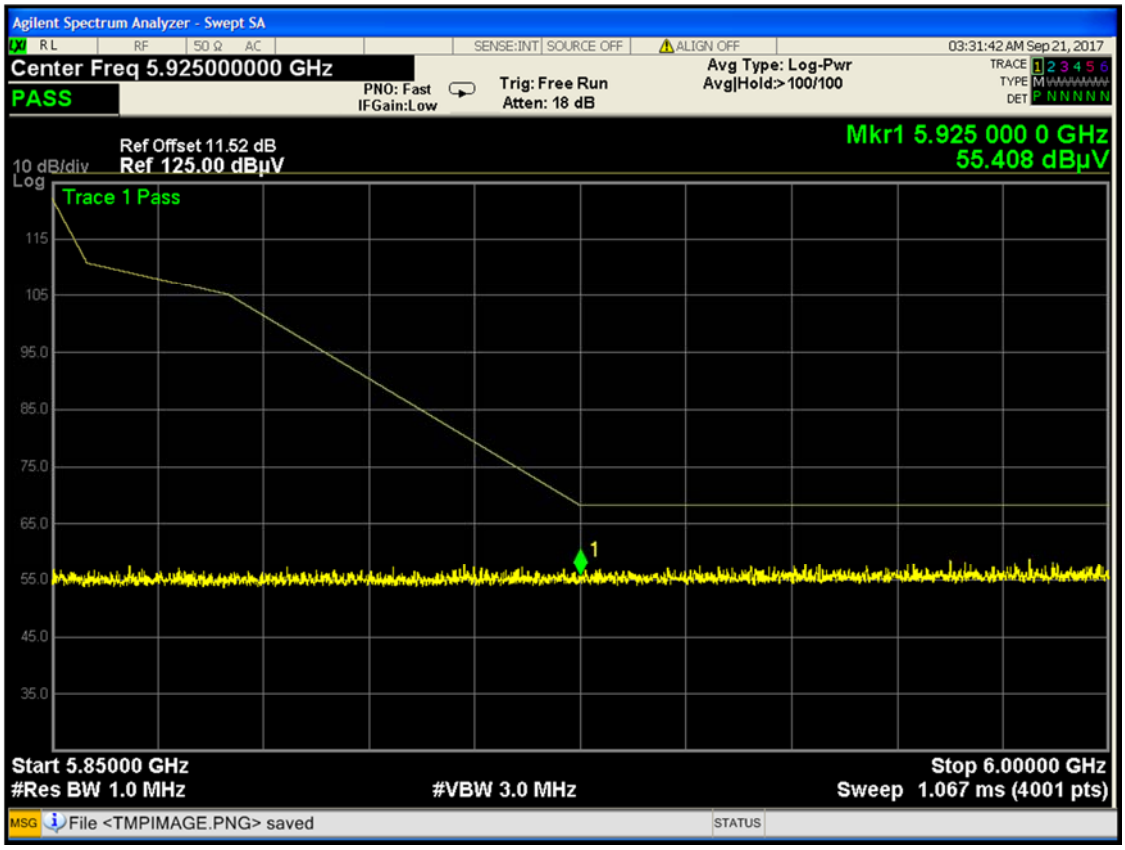
Band IV 11n(HT20) CH165 Peak



Band IV 11n(HT40) CH151 Peak



Band IV 11n(HT40) CH159 Peak



ata and Plot

A.8 Frequency Stability

Measurement Data (the worst channel)

ANT 0

Voltage vs. Frequency Stability (5180 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
TEMP. (°C)	Voltage (VDC)		Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)
20	12	5180	5179.982201	-3.44	5179.992116	-1.52	5180.025843	4.99	5180.014383	2.78
	19	5180	5180.004694	0.91	5180.028659	5.53	5179.993557	-1.24	5180.01761	3.40
	19	5180	5180.034844	6.73	5180.015446	2.98	5180.007476	1.44	5180.042556	8.22

Temperature vs. Frequency Stability (5180 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
Voltage (VDC)	TEMP. (°C)		Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)
19	0	5180	5179.967476	-6.28	5179.968392	-6.10	5180.04455	8.60	5179.972953	-5.22
	5	5180	5180.018265	3.53	5180.048227	9.31	5180.032586	6.29	5180.042416	8.19
	10	5180	5180.00221	0.43	5180.017381	3.36	5180.018977	3.66	5180.040313	7.78
	15	5180	5180.003249	0.63	5180.044601	8.61	5179.976648	-4.51	5180.024181	4.67
	20	5180	5179.993594	-1.24	5179.954295	-8.82	5180.038626	7.46	5179.991897	-1.56
	25	5180	5180.029535	5.70	5180.039012	7.53	5180.038635	7.46	5180.004035	0.78
	30	5180	5180.028656	5.53	5180.038888	7.51	5179.976918	-4.46	5180.042157	8.14
	35	5180	5180.009583	1.85	5180.016366	3.16	5180.019693	3.80	5180.038311	7.40

ANT 1

Voltage vs. Frequency Stability (5180 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
TEMP. (°C)	Voltage (VDC)		Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)
20	12	5180	5179.961026	-7.52	5180.007332	1.42	5180.02977	5.75	5180.036427	7.03
	19	5180	5180.040778	7.87	5180.036577	7.06	5180.033385	6.44	5179.972199	-5.37
	19	5180	5180.030712	5.93	5179.95664	-8.37	5180.032079	6.19	5180.001997	0.39

Temperature vs. Frequency Stability (5180 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
Voltage (VDC)	TEMP. (°C)		Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Measurement Frequency (MHz)	Max. Deviation (ppm)
19	0	5180	5179.999513	-0.09	5179.969468	-5.89	5180.00465	0.90	5180.044832	8.65
	5	5180	5180.042922	8.29	5180.009053	1.75	5180.009848	1.90	5180.034149	6.59
	10	5180	5180.045801	8.84	5180.00418	0.81	5180.049294	9.52	5180.035157	6.79
	15	5180	5180.047852	9.24	5180.012677	2.45	5179.959657	-7.79	5179.955888	-8.52
	20	5180	5179.963389	-7.07	5179.955669	-8.56	5180.032933	6.36	5180.038793	7.49
	25	5180	5180.036589	7.06	5180.005155	1.00	5180.001425	0.28	5180.002982	0.58
	30	5180	5179.965088	-6.74	5180.044005	8.50	5180.024828	4.79	5179.98942	-2.04
	35	5180	5180.026403	5.10	5179.99319	-1.31	5180.009991	1.93	5180.041661	8.04

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1790192-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL- SZ1790192-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL- SZ1790192-AI.PDF”.

--END OF REPORT--