

FCC

RF

TEST REPORT

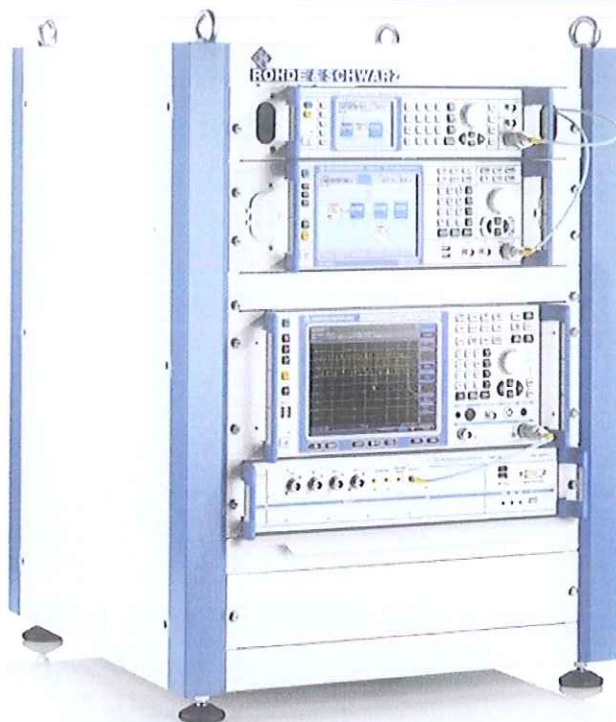
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
Tablet PC

ISSUED TO
Shenzhen Jingwah Information Technology Co., Ltd.

4F, Bldg 4, Jinghua Square, No.1 Huaafa North Road, Futian District,
Shenzhen, China



Prepared by:

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Date Oct. 26, 2016

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Liao Jiahming
(Technical Director)

Date Oct. 26, 2016

Report No.: BL-SZ1690235-604

EUT Type: Tablet PC

Model Name: BNTV450

Brand Name: nook

Test Standard: 47 CFR Part 15 Subpart E

FCC ID: RBD-BNTV450

Test conclusion: Pass

Test Date: Sep. 15, 2016 ~ Sep. 30, 2016

Date of Issue: Oct. 26, 2016

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Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Oct. 17, 2016</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Oct. 26, 2016</u>	<u>Updating the channel list on page 8.</u>

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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
Fax Number	+86 755 6182 4271

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	<p>The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1.</p> <p>The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625.</p> <p>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.</p>
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°C
Ambient Relative Humidity	45% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

- (1) The test report reference to the report template version v1.7.
- (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	Shenzhen Jingwah Information Technology Co., Ltd.
Address	4F, Bldg 4, Jinghua Square, No.1 Huafa North Road, Futian District, Shenzhen, China

2.2 Manufacturer

Manufacturer	Shenzhen Jingwah Information Technology Co., Ltd.
Address	4F, Bldg 4, Jinghua Square, No.1 Huafa North Road, Futian District, Shenzhen, China

2.3 Factory

Factory	Shenzhen Jingwah Information Technology Co., Ltd.
Address	4F, Bldg 4, Jinghua Square, No.1 Huafa North Road, Futian District, Shenzhen, China

2.4 General Description for Equipment under Test (EUT)

EUT Type	Tablet PC	
Model Name Under Test	BNTV450	
Series Model Name	N/A	
Description of Model name differentiation	N/A	
Hardware Version	T8370-V6.1 M1	
Software Version	BNTV450	
Dimensions (Approx.)	N/A	
Weight (Approx.)	N/A	
Network and Wireless connectivity	Bluetooth 3.0, Bluetooth 4.0 Low Energy (BLE) WIFI 802.11a, 802.11b, 802.11g, 802.11n(HT20/40)	
EUT	Hardware	Manufacturer
Configuration A	LCD display	xingyuan
Configuration B	LCD display	xianchuang

Note: The EUT have two sample which Configuration A is xingyuan display and Configuration B is xianchuang display, the internal structure and circuit electrical parameters are the same; but the LCD display is different. All of them were tested in this report, the Configuration A sample as the main for tested and the Configuration B sample as confirmatory test. In this report, only the Configuration A was shown in this report.

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	N/A
	Model No.	PL3370100P
	Serial No.	N/A
	Capacitance	3000 mAh
	Rated Voltage	3.7 V

	Limit Charge Voltage	4.2 V
Ancillary Equipment 2	Charger 1	
	Brand Name	N/A
	Model Name	TPA-95A050100UU
	Rated Input	100-240 V ~, 50/60 Hz, 0.15 A
	Rated Output	5.0 V —, 1.0 A
Ancillary Equipment 3	USB Cable	
	Length(Approx.)	1.0 m

2.6 Technical Information

Frequency Range	Band I: 5150 MHz to 5250 MHz, Band II: 5250 MHz to 5350 MHz, Band III: 5470 MHz to 5725 MHz, Band IV: 5725 MHz to 5850 MHz
Modulation technology	OFDM
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK
Product Type	Mobile and portable for FCC standard
Transfer Rate (Mbps)	802.11a: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps
Channel Bandwidth	802.11a: 20 MHz
Maximum Output Power	Band I: 11.50 dBm Band II: 10.25 dBm Band III: 10.92 dBm Band IV: 11.31 dBm
Antenna Type	PIFA Antenna
Antenna Gain	Band I: 5150 MHz to 5250 MHz: 2.14 dBi Band II: 5250 MHz to 5350 MHz: 1.64 dBi Band III: 5470 MHz to 5725 MHz: 2.09 dBi Band IV: 5725 MHz to 5850 MHz: 2.16 dBi
About the Product	The equipment is Tablet PC, intended for used with information technology equipment.

2.7 Additional Instructions

Mode	<input checked="" type="checkbox"/> 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:

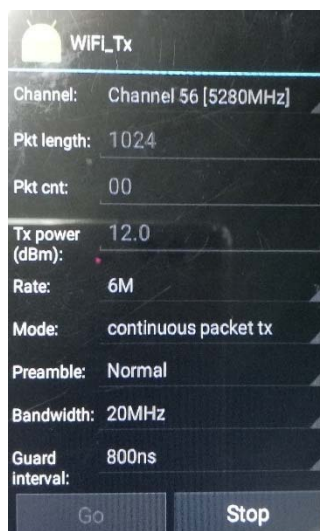
Band I (5150 - 5250 MHz) Power level setup in software			
Test Software Version	EngineerMode		
Mode	Channel	Frequency (MHz)	Soft Set
11a	CH36	5180	13
11a	CH44	5220	11
11a	CH48	5240	13

Band II (5250 - 5350 MHz) Power level setup in software			
Test Software Version	EngineerMode		
Mode	Channel	Frequency (MHz)	Soft Set
11a	CH52	5260	12
11a	CH60	5300	12
11a	CH64	5320	12

Band III (5470 - 5725 MHz) Power level setup in software			
Test Software Version	EngineerMode		
Mode	Channel	Frequency (MHz)	Soft Set
11a	CH100	5500	10
11a	CH116	5580	11
11a	CH140	5700	13

Band IV (5725 - 5850 MHz) Power level setup in software			
Test Software Version	EngineerMode		
Mode	Channel	Frequency (MHz)	Soft Set
11a	CH149	5745	14
11a	CH157	5785	14
11a	CH165	5825	14

Run Software



2.8 Channel List

20 MHz		40 MHz		80 MHz	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
36	5180	38	5190	/	/
40	5200	46	5230	/	/
44	5220	54	5270	/	/
48	5240	62	5310	/	/
52	5260	102	5510	/	/
56	5280	110	5550	/	/
60	5300	134	5670	/	/
64	5320	151	5755	/	/
100	5500	159	5790	/	/
104	5520	/	/	/	/
108	5540	/	/	/	/
112	5560	/	/	/	/
116	5580	/	/	/	/
132	5660	/	/	/	/
136	5680	/	/	/	/
140	5700	/	/	/	/
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

Band I (5150 - 5250 MHz)			Band II (5250 - 5350 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
36	Low	5180	52	Low	5260
44	Mid	5220	60	Mid	5300
48	High	5240	64	High	5320

Band III (5470 - 5725 MHz)			Band IV (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
100	Low	5500	149	Low	5745
116	Mid	5580	157	Mid	5785
140	High	5700	165	High	5825

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	Band II	Band III	Band IV
				Channel	Channel	Channel	Channel
RF Output Power	11a	6	BPSK	48/44/36	64/60/52	140/116/100	165/157/149
Emission Bandwidth & 99% Occupied Bandwidth	11a	6	BPSK	48/44/36	64/60/52	140/116/100	165/157/149
6 dB bandwidth	11a	6	BPSK	N/A	N/A	N/A	165/157/149
Power Spectral Density	11a	6	BPSK	48/44/36	64/60/52	140/116/100	165/157/149
Conducted Spurious Emission and Band Edge (Authorized-band)	11a	6	BPSK	48/44/36	64/60/52	140/116/100	165/157/149
Radiated Spurious Emissions	11a	6	BPSK	48/44/36	64/60/52	140/116/100	165/157/149
Band Edge (Restricted-band)	11a	6	BPSK	48/36	64/52	140/100	165/149
Frequency Stability	Unmodulated	N/A	N/A	N/A	64	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 D02v01r03	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
3	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 Emissions	15.407(b) 15.209	ANNEX A.6	Pass
8	Radiated Spurious Emissions and Band Edge	15.407(b)	ANNEX A.7	Pass
9	Frequency Stability	2.1055 90.213	ANNEX A.8	Pass

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

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°C to +25°C
	LT (Low Temperature)	-10°C
	HT (High Temperature)	+50°C
Working Voltage of the EUT	NV (Normal Voltage)	3.7 V
	LV (Low Voltage)	3.0 V
	HV (High Voltage)	4.2 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2016.07.13	2017.07.12
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	177746	2016.07.13	2017.07.12
Signal Generator	ROHDE&SCHWARZ	SMB100A	260592	2016.07.13	2017.07.12
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2016.07.13	2017.07.12
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2015.10.15	2016.10.14
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2016.07.05	2017.07.04
LISN	SCHWARZBECK	NSLK 8127	8127-687	2016.07.05	2017.07.04
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2016.07.13	2017.07.12
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2016.07.13	2017.07.12
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2016.07.13	2017.07.12
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2016.07.13	2017.07.12
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2015.07.22	2017.07.21
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2015.07.22	2017.07.21
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2015.07.22	2017.07.21
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2015.07.22	2017.07.21
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2015.02.28	2017.02.27
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

4.3 MEASUREMENT UNCERTAINTY

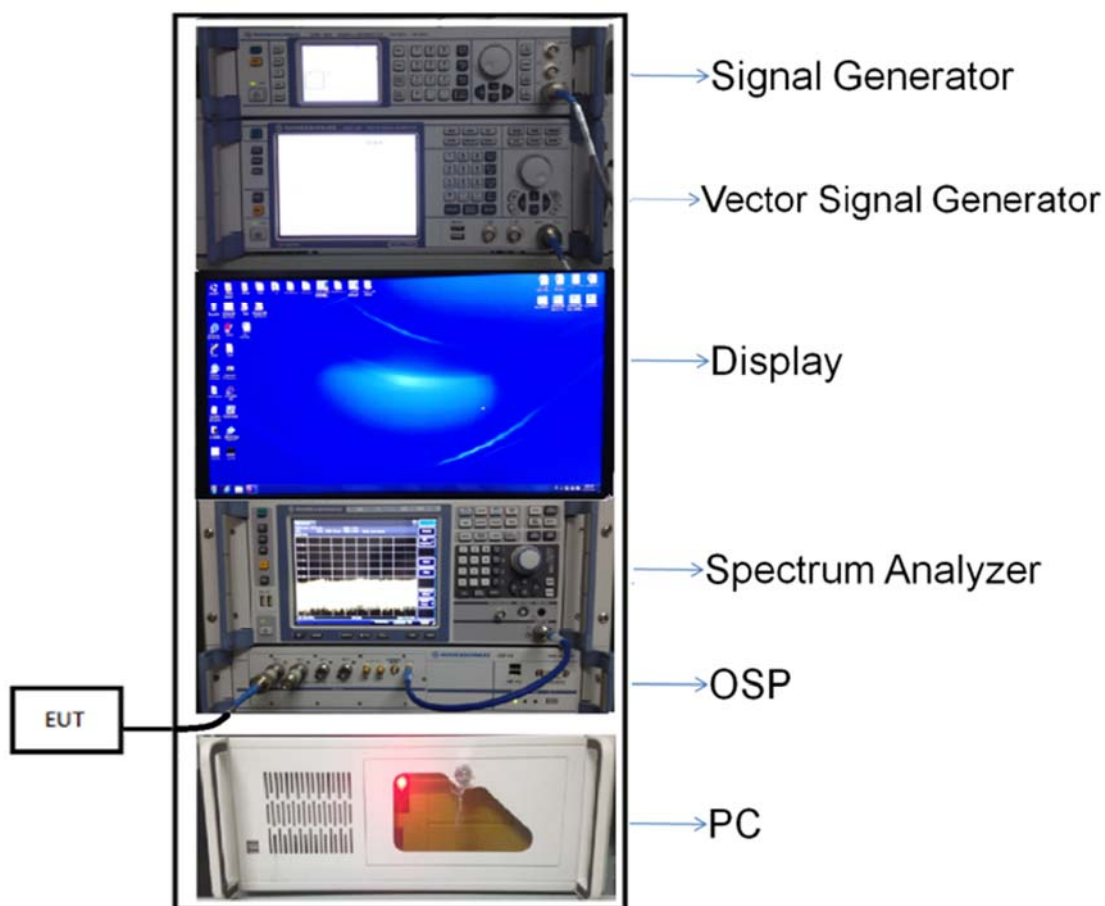
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

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	$\pm 4\%$
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	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 4\%$

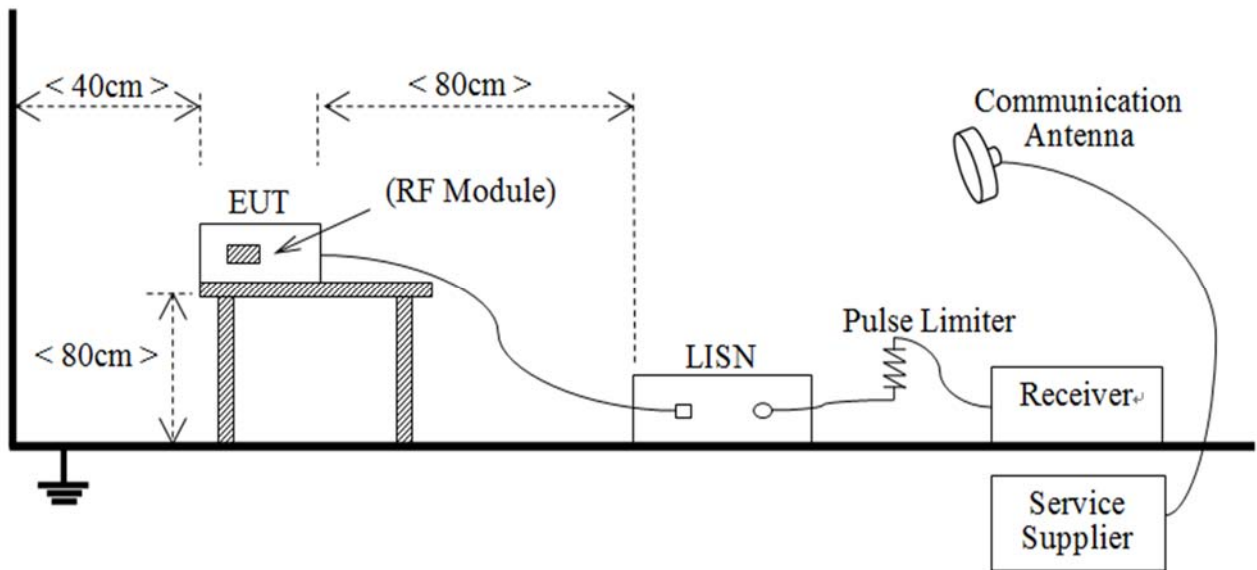
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



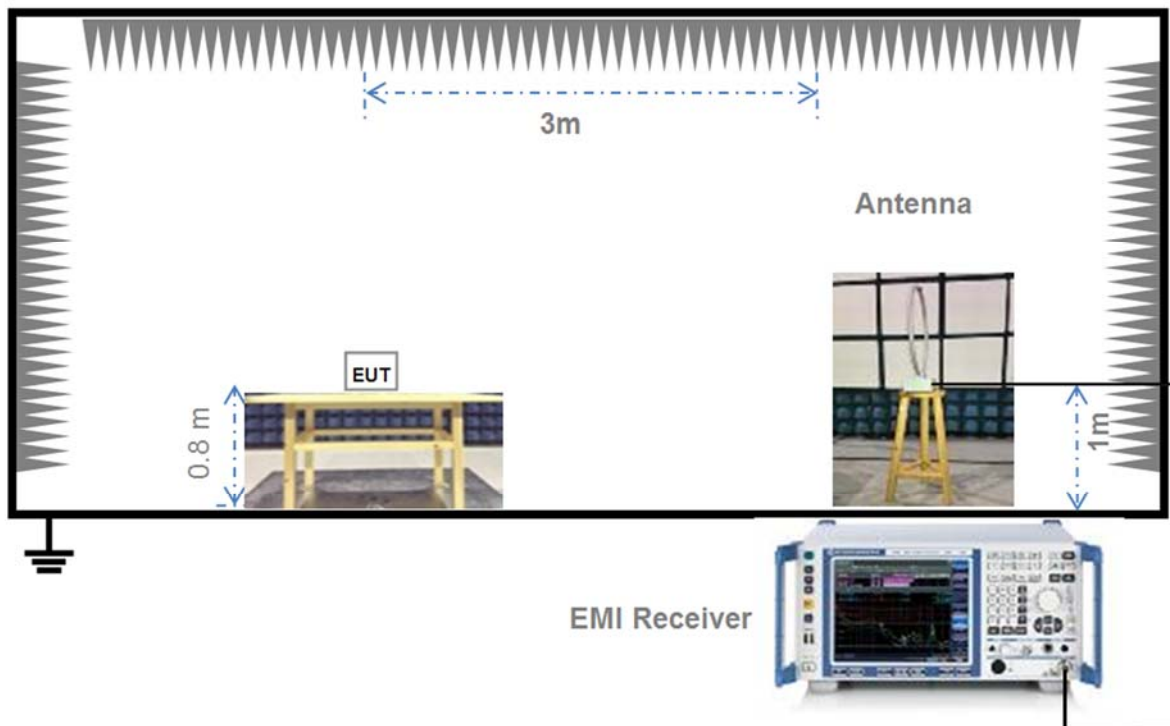
(Diagram 1)

4.4.2 For AC Power Supply Port Test



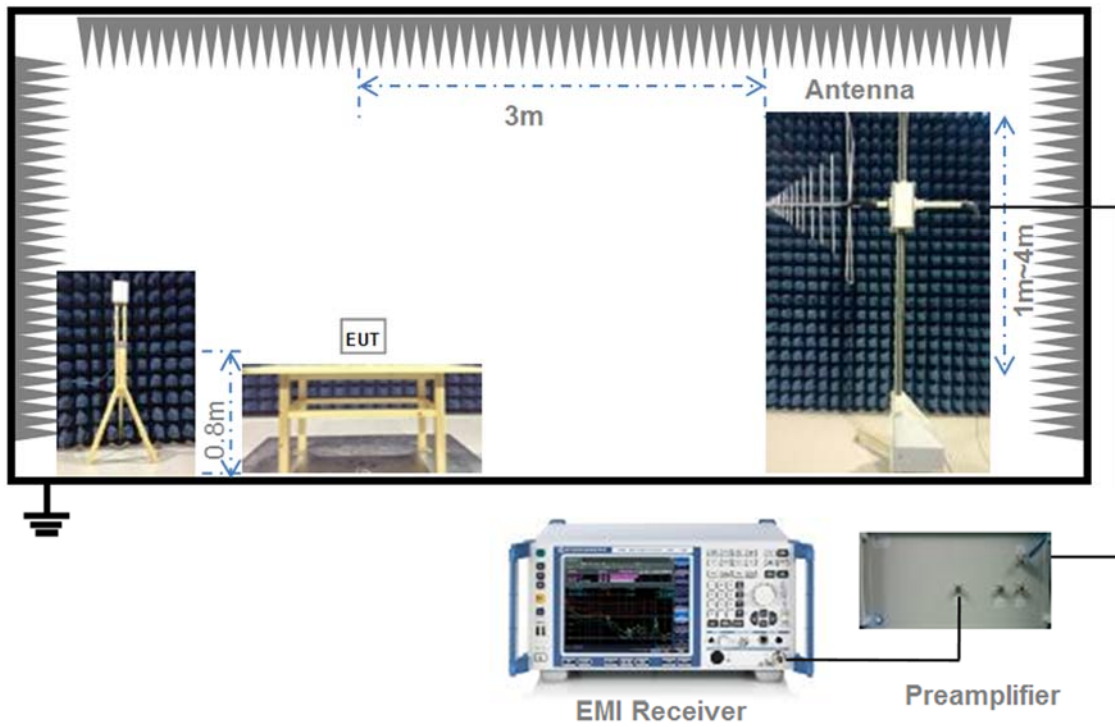
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



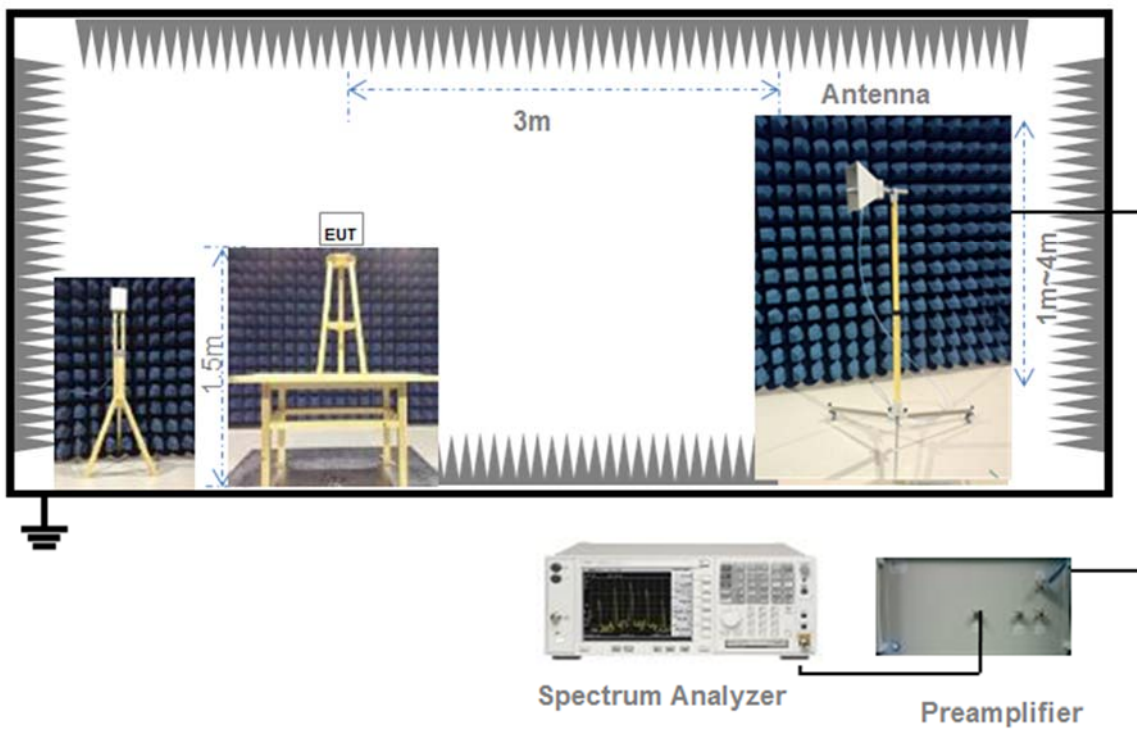
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



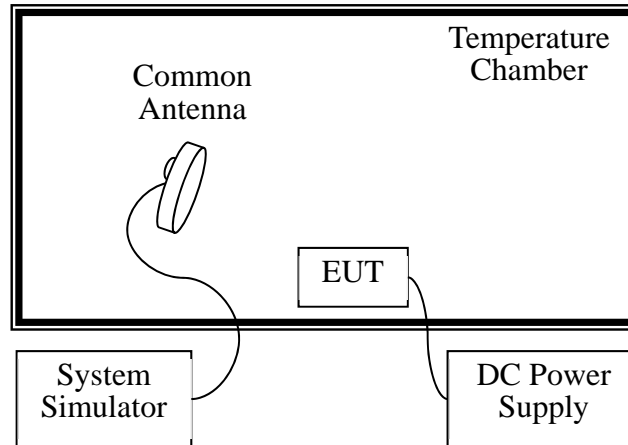
(Diagram 4)

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.	

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)

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 $\geq 3 \times$ 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 $\geq 3 \times$ 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

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 = 510 kHz/1 MHz, VBW $\geq 3 \times$ 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

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 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB μ V)	
	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.

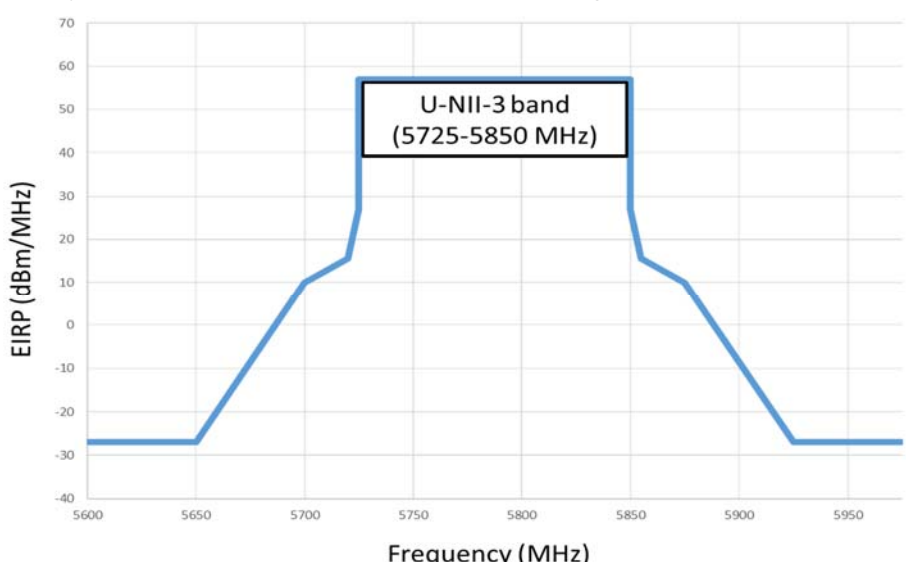
5.4.4 Test Result

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	<p>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.</p> 

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 $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW \geq 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)

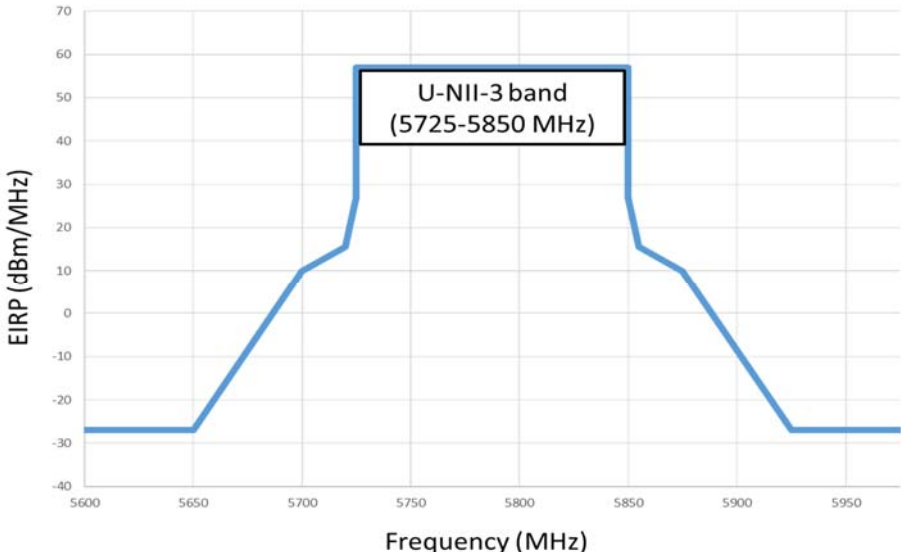
5.6.1 Limit

FCC §15.209 & 15.407(b)

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	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	<p>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.</p> 

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:

$$E = \text{EIRP} - 20 \log D + 104.8$$

where:

E = electric field strength in dB μ V/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 $\geq 3 \times$ 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 $\geq 3 \times$ RBW.
- e) Detector = RMS, if $\text{span}/(\# \text{ of points in sweep}) \leq (\text{RBW}/2)$. 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 $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW \geq 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 (dBm)	Conducted Power(mW)	Limit (mW)	Verdict
11a	CH36	5180	11.21	13.21	250.00	Pass
11a	CH44	5220	9.81	9.57	250.00	Pass
11a	CH48	5240	11.50	14.13	250.00	Pass

Band II (5250 - 5350 MHz,)						
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power(mW)	Limit (mW)	Verdict
11a	CH52	5260	10.25	10.59	250.00	Pass
11a	CH60	5280	10.21	10.50	250.00	Pass
11a	CH64	5320	9.51	8.93	250.00	Pass

Band III (5470 - 5725 MHz)						
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power(mW)	Limit (mW)	Verdict
11a	CH100	5500	10.92	12.36	250.00	Pass
11a	CH116	5580	11.50	14.13	250.00	Pass
11a	CH140	5700	10.82	12.08	250.00	Pass

Band IV (5725 - 5850 MHz)						
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power(mW)	Limit (W)	Verdict
11a	CH149	5745	10.21	10.50	1.00	Pass
11a	CH157	5785	10.83	12.11	1.00	Pass
11a	CH165	5825	11.31	13.52	1.00	Pass

A.2 Emission Bandwidth & 99% Bandwidth

Note: Test plots please refer to the document “Annex No.: BL-SZ1690235-604 Data Part 1.pdf”.

Test Data

Band I (5150 - 5250 MHz)				
Mode	Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	21.39	18.23
11a	CH44	5220	20.70	17.37
11a	CH48	5240	21.04	17.71

Band II (5250 - 5350 MHz)				
Mode	Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH52	5260	20.70	17.37
11a	CH60	5300	20.87	17.37
11a	CH64	5320	20.70	17.37

Band III (5470 - 5725 MHz)				
Mode	Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH100	5500	20.52	17.37
11a	CH116	5580	19.36	17.48
11a	CH140	5700	26.44	18.23

Band IV (5725 - 5850 MHz)				
Mode	Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	36.17	20.32
11a	CH157	5785	36.17	19.62
11a	CH165	5825	35.48	23.97

A.3 6 dB Bandwidth

Note: Test plots please refer to the document "Annex No.: BL-SZ1690235-604 Data Part 2.pdf".

Test Data

Band IV (5725 - 5850 MHz)					
Mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Verdict
11a	CH149	5745	17.85	0.5	Pass
11a	CH157	5785	16.35	0.5	Pass
11a	CH165	5825	16.37	0.5	Pass

A.4 Power Spectral Density

Note: Test plots please refer to the document “Annex No.: BL-SZ1690235-604 Data Part 3.pdf”.

Test Data

Band I (5150 - 5250 MHz)					
Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
11a	CH36	5180	-7.39	11.00	Pass
11a	CH44	5220	-8.59	11.00	Pass
11a	CH48	5240	-7.12	11.00	Pass

Band II (5250 - 5350 MHz)					
Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
11a	CH36	5260	-8.15	11.00	Pass
11a	CH44	5280	-9.09	11.00	Pass
11a	CH48	5320	-7.59	11.00	Pass

Band III (5470 - 5725 MHz)					
Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
11a	CH36	5500	-6.88	11.00	Pass
11a	CH44	5580	-2.92	11.00	Pass
11a	CH48	5700	-5.36	11.00	Pass

Band IV (5725 - 5850 MHz)					
Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/500kHz)	Verdict
11a	CH36	5745	-9.53	30.00	Pass
11a	CH44	5785	-10.75	30.00	Pass
11a	CH48	5825	-10.73	30.00	Pass

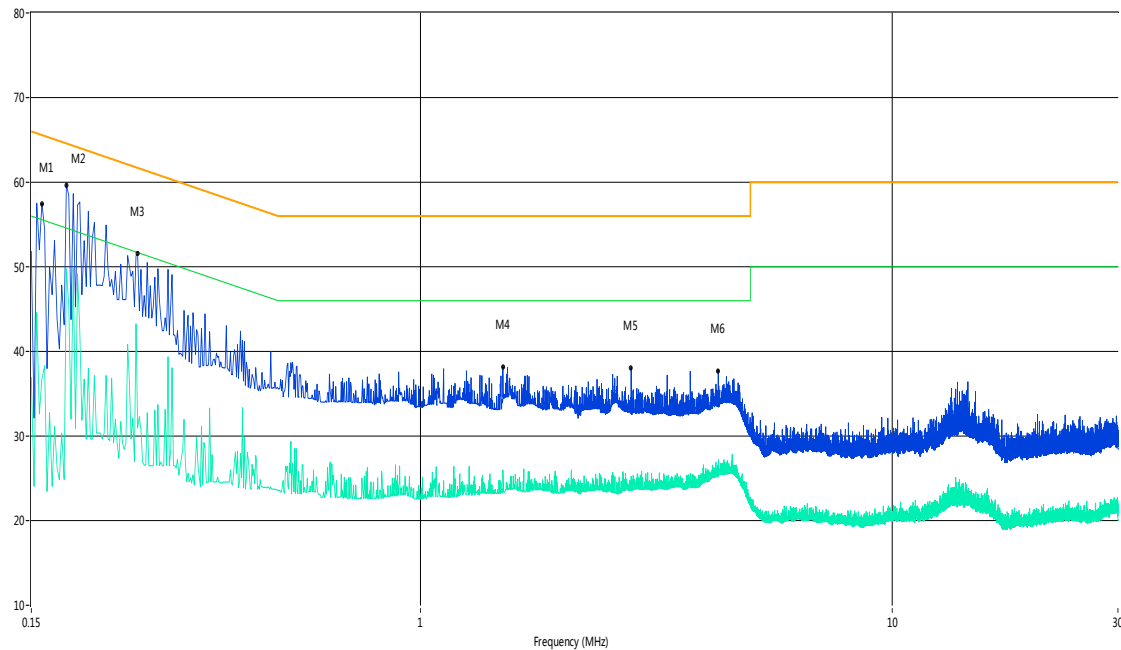
A.5 Conducted Emissions

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.

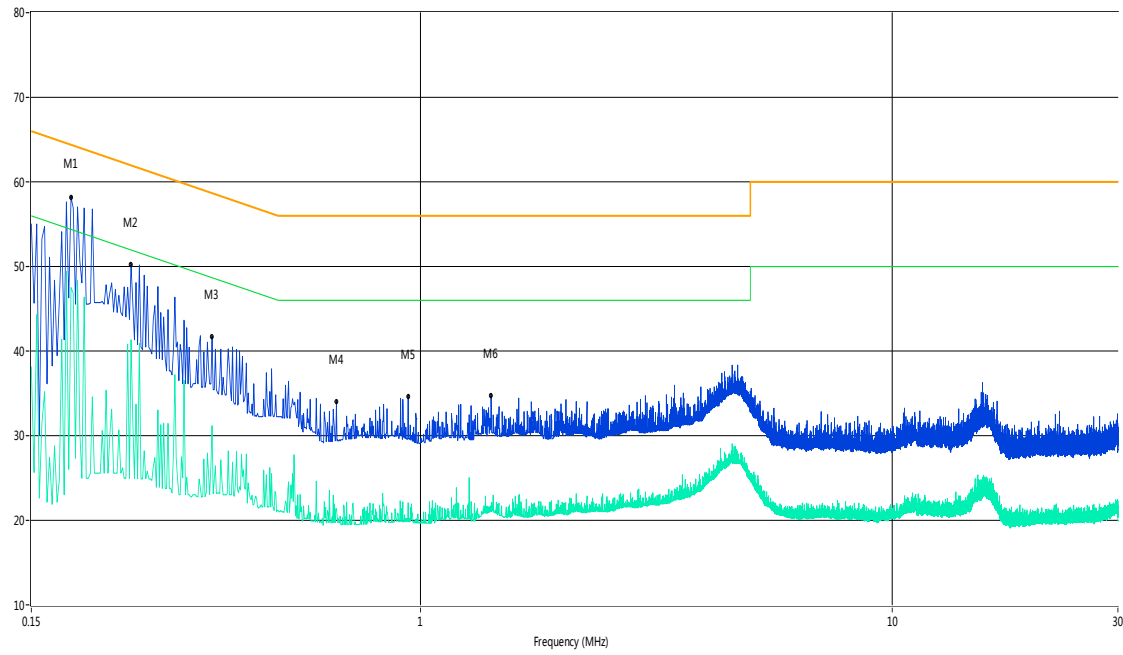
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.16	57.5	11.00	65.8	8.30	Peak	L Line	Pass
1**	0.16	36.7	11.00	55.8	19.10	AV	L Line	Pass
2	0.18	59.7	11.00	65.2	5.50	Peak	L Line	Pass
2**	0.18	49.8	11.00	55.2	5.40	AV	L Line	Pass
3	0.25	51.5	11.00	63.1	11.60	Peak	L Line	Pass
3**	0.25	31.0	11.00	53.1	22.10	AV	L Line	Pass
4	1.50	38.2	11.00	56.0	17.80	Peak	L Line	Pass
4**	1.50	26.0	11.00	46.0	20.00	AV	L Line	Pass
5	2.79	38.0	11.00	56.0	18.00	Peak	L Line	Pass
5**	2.79	25.2	11.00	46.0	20.80	AV	L Line	Pass
6	4.27	37.6	11.00	56.0	18.40	Peak	L Line	Pass
6**	4.27	26.0	11.00	46.0	20.00	AV	L Line	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.18	58.2	11.00	65.1	6.90	Peak	N Line	Pass
1**	0.18	47.5	11.00	55.1	7.60	AV	N Line	Pass
2	0.24	50.2	11.00	63.3	13.10	Peak	N Line	Pass
2**	0.24	41.3	11.00	53.3	12.00	AV	N Line	Pass
3	0.36	41.7	11.00	59.9	18.20	Peak	N Line	Pass
3**	0.36	31.2	11.00	49.9	18.70	AV	N Line	Pass
4	0.66	34.1	11.00	56.0	21.90	Peak	N Line	Pass
4**	0.66	21.4	11.00	46.0	24.60	AV	N Line	Pass
5	0.94	34.6	11.00	56.0	21.40	Peak	N Line	Pass
5**	0.94	22.1	11.00	46.0	23.90	AV	N Line	Pass
6	1.41	34.7	11.00	56.0	21.30	Peak	N Line	Pass
6**	1.41	21.7	11.00	46.0	24.30	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-SZ1690235-604 Data Part 4.pdf”.

Test Band	Mode	Channel	Verdict
Band 1	802.11a(HT20)	Low	Pass
		Middle	Pass
		High	Pass
Band 2	802.11a(HT20)	Low	Pass
		Middle	Pass
		High	Pass
Band 3	802.11a(HT20)	Low	Pass
		Middle	Pass
		High	Pass
Band 4	802.11a(HT20)	Low	Pass
		Middle	Pass
		High	Pass

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

Antenna-port Conducted test data

$$E = \text{EIRP} - 20\log D + 104.8$$

where:

E = electric field strength in dBμV/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

EIRP= Measure Conducted output power Value (dBm) + Maximum transmit antenna gain (dBi) + The appropriate maximum ground reflection factor (dB)

Test Data (Test frequency: 9 kHz - 25 GHz)

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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.14 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

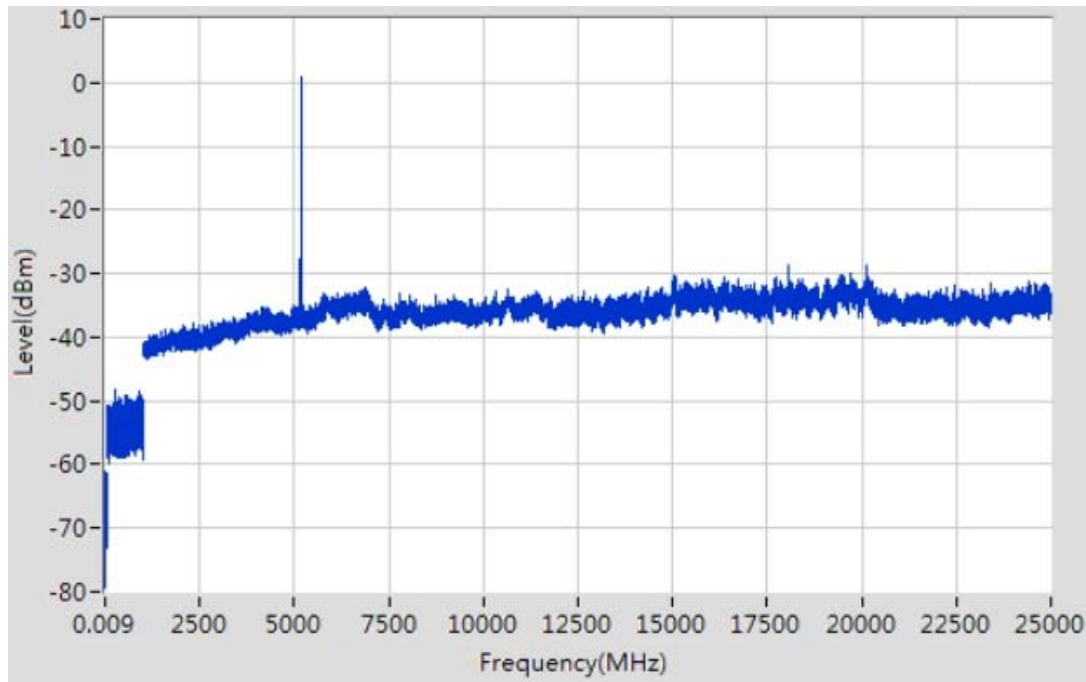
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band I 11a CH36

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.01	-69.13	6	3	2.14	QP	34.27	68.20	33.93	Note 2	Pass
22.768	-61.01	6	3	2.14	QP	42.39	68.20	25.81	Note 2	Pass
275.125	-56.37	4.7	3	2.14	QP	45.73	46.00	0.27	Note 2	Pass
5173.835	0.97	0	3	2.14	PK	98.37	N/A	N/A	Note 1	N/A
	0.77		3	2.14	AV	98.17	N/A	N/A		N/A
6887.206	-32.31	0	3	2.14	PK	65.09	68.20	3.11	Note 2	Pass
	N/A		3	2.14	AV	N/A	N/A	N/A		N/A
10635.239	-32.41	0	3	2.14	PK	64.99	74.00	9.01	--	Pass
	-50.18		3	2.14	AV	47.22	54.00	6.78	--	Pass
20107.632	-28.62	0	3	2.14	PK	68.78	74.00	5.22	--	Pass
	-49.78		3	2.14	AV	47.62	54.00	6.38		Pass

Test Plots

Band I 11a CH36, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.14 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

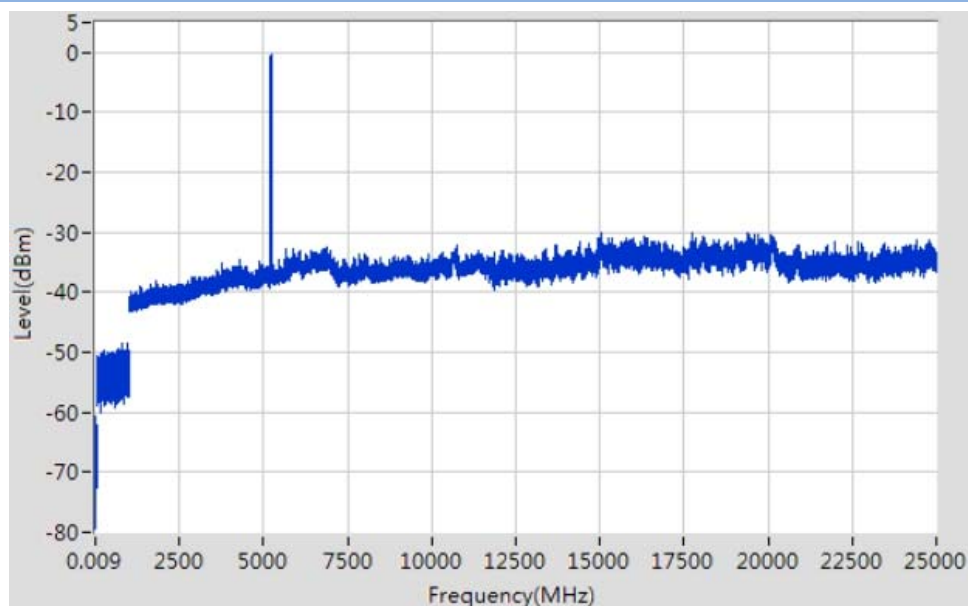
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band I 11ac CH44

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.011	-68.89	6	3	2.14	QP	34.51	68.20	33.69	Note 2	Pass
25.368	-60.69	6	3	2.14	QP	42.71	68.20	25.49	Note 2	Pass
949.795	-48.62	4.7	3	2.14	QP	53.48	68.20	14.72	Note 2	Pass
5221.844	-0.48	0	3	2.14	PK	96.92	N/A	N/A	Note 1	N/A
	-0.68		3	2.14	AV	96.72	N/A	N/A		N/A
6881.205	-32.55	0	3	2.14	PK	64.85	68.20	3.35	Note 2	Pass
	N/A		3	2.14	AV	N/A	N/A	N/A		N/A
10735.311	-32.2	0	3	2.14	PK	65.20	74.00	8.80	--	Pass
	-53.21		3	2.14	AV	44.19	54.00	9.81	--	Pass
17732.454	-30.06	0	3	2.14	PK	67.34	74.00	6.66	--	Pass
	-50.56		3	2.14	AV	46.84	54.00	7.16	--	Pass

Test Plots

Band I 11ac CH44, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.14 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

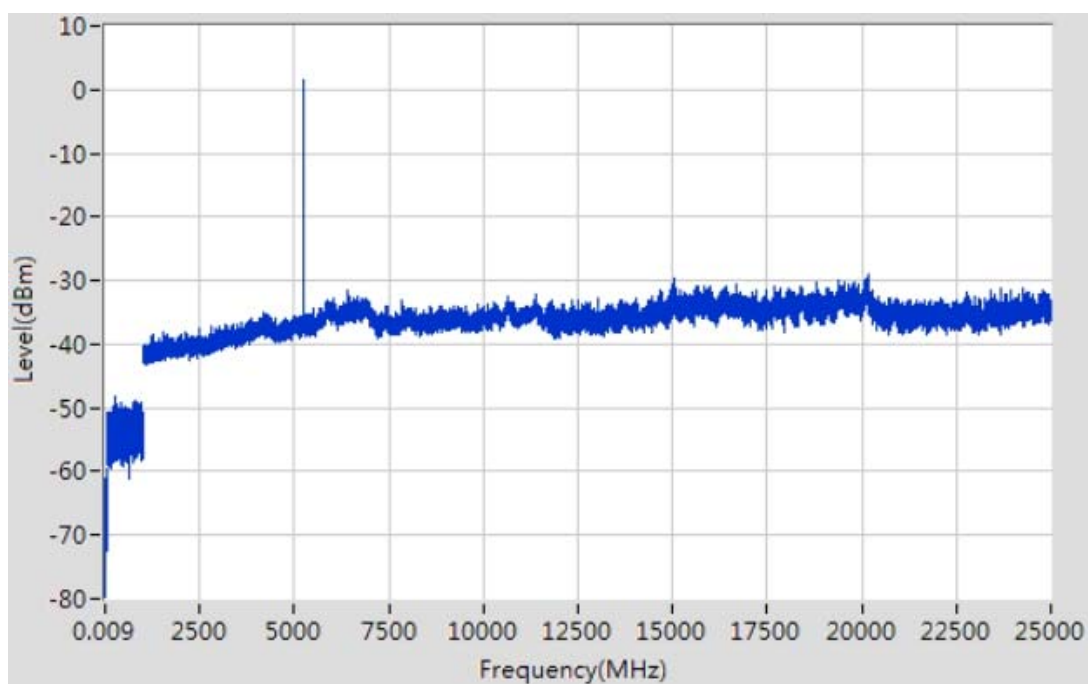
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band I 11ac CH48

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.009	-69.24	6	3	2.14	QP	34.16	68.20	34.04	Note 2	Pass
28.72	-59.68	6	3	2.14	QP	43.72	68.20	24.48	Note 2	Pass
243.422	-58.11	4.7	3	2.14	QP	43.99	46.00	2.01	Note 2	Pass
5243.849	1.4	0	3	2.14	PK	98.80	N/A	N/A	Note 1	N/A
	1.20		3	2.14	AV	98.60	N/A	N/A		N/A
6385.09	-31.6	0	3	2.14	PK	65.80	68.20	2.40	Note 2	Pass
	N/A		3	2.14	AV	N/A	N/A	N/A	--	N/A
11382.773	-32.29	0	3	2.14	PK	65.11	74.00	8.89	--	Pass
	-53.59		3	2.14	AV	43.81	54.00	10.19	--	Pass
20154.636	-29.14	0	3	2.14	PK	68.26	74.00	5.74	--	Pass
	-49.64		3	2.14	AV	47.76	54.00	6.24	--	Pass

Test Plots

Band I 11ac CH48, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 1.64 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

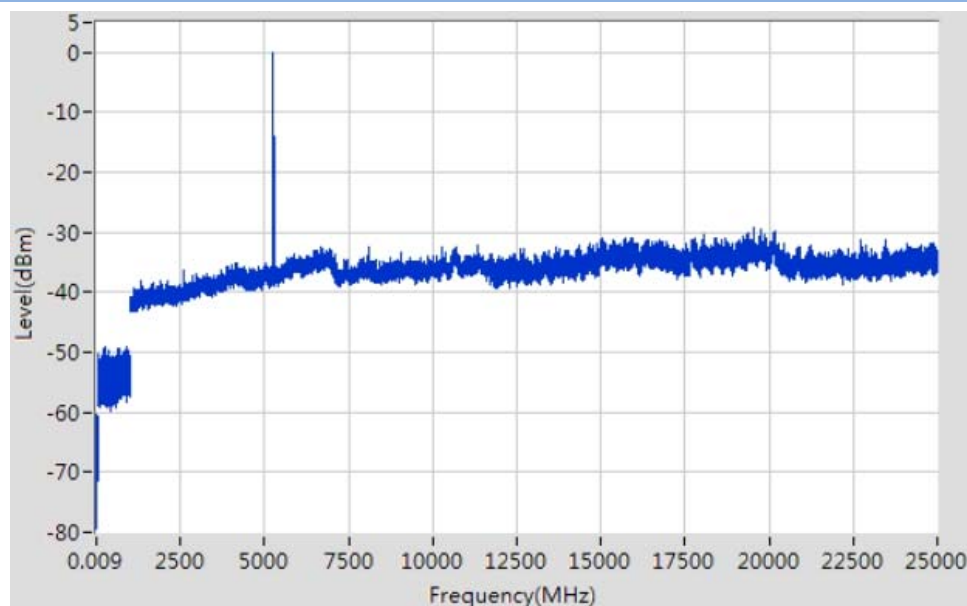
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band II 11ac CH52

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detect or	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.01	-69.07	6	3	2	QP	34.19	68.20	34.01	Note 2	Pass
22.127	-60.28	6	3	2	QP	42.98	68.20	25.22	Note 2	Pass
903.39	-49.06	4.7	3	2	QP	52.90	68.20	15.30	Note 2	Pass
5257.852	-0.05	0	3	2	PK	97.21	N/A	N/A	Note 1	N/A
	-0.25		3	2	AV	97.01	N/A	N/A		N/A
6695.162	-32.46	0	3	2	PK	64.80	68.20	3.40	Note 2	Pass
	N/A		3	2	AV	N/A	N/A	N/A	--	N/A
11353.753	-32.17	0	3	2	PK	65.09	74.00	8.91	--	Pass
	-51.10		3	2	AV	46.16	54.00	7.84	--	Pass
19544.59	-29.21	0	3	2	PK	68.05	74.00	5.95	--	Pass
	-49.56		3	2	AV	47.70	54.00	6.30	--	Pass

Test Plots

Band II 11ac CH52, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 1.64 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

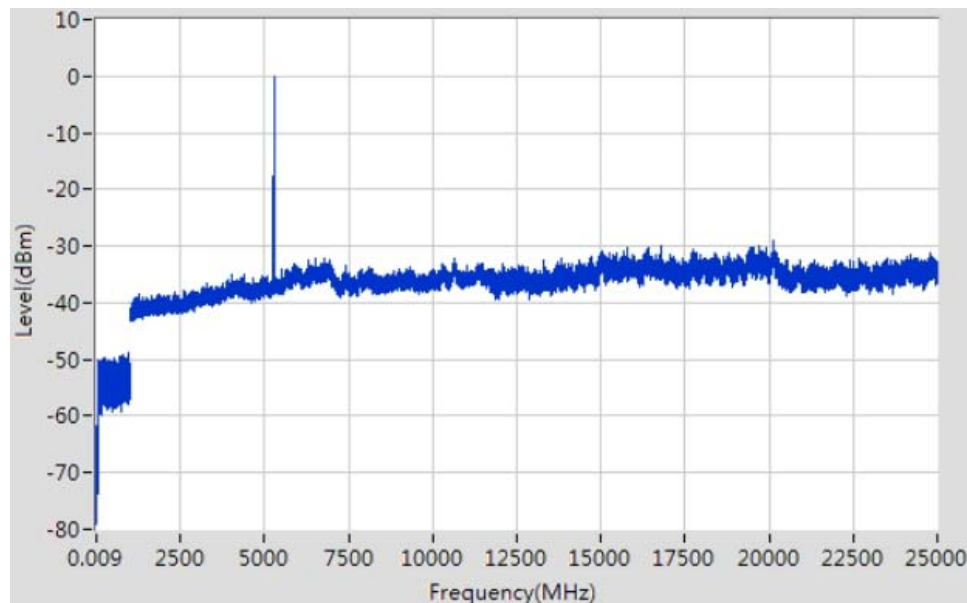
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band II 11ac CH60

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.012	-68.66	6	3	2	QP	34.60	68.20	33.60	Note 2	Pass
29.61	-59.5	6	3	2	QP	43.76	68.20	24.44	Note 2	Pass
937.994	-48.9	4.7	3	2	QP	53.06	68.20	15.14	Note 2	Pass
5281.856	0.08	0	3	2	PK	97.34	N/A	N/A	Note 1	N/A
	-0.12		3	2	AV	97.14	N/A	N/A		N/A
6495.115	-32.15	0	3	2	PK	65.11	68.20	3.09	Note 2	Pass
	N/A		3	2	AV	N/A	N/A	N/A	--	N/A
10662.259	-32.16	0	3	2	PK	65.10	74.00	8.90	--	Pass
	-51.26		3	2	AV	46.00	54.00	8.00	--	Pass
20116.633	-28.95	0	3	2	PK	68.31	74.00	5.69	--	Pass
	-47.55		3	2	AV	49.71	54.00	4.29	--	Pass

Test Plots

Band I 11ac CH60, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 1.64 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

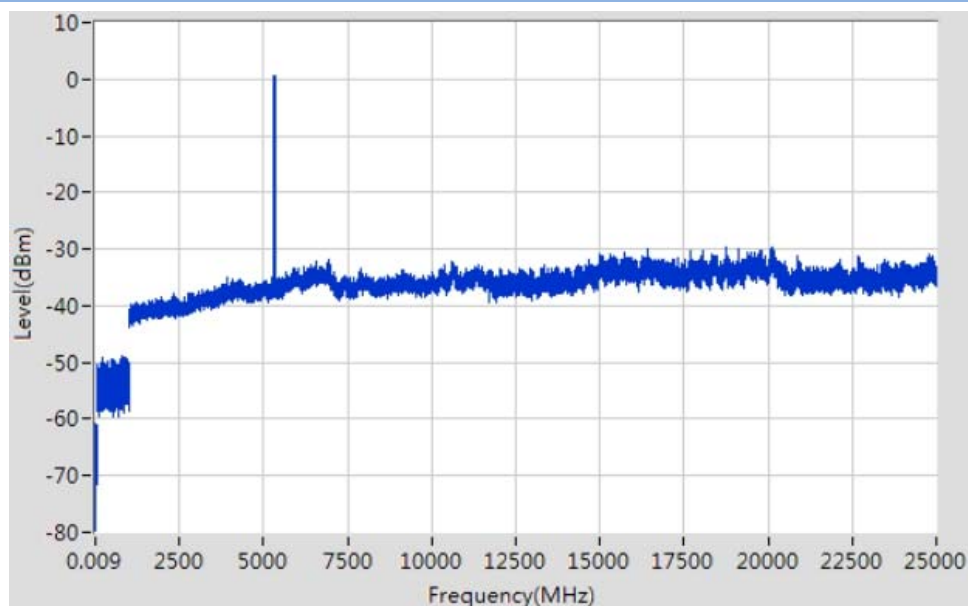
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band II 11ac CH64

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.016	-69.28	6	3	2	QP	33.98	68.20	34.22	Note 2	Pass
0.62	-60.71	6	3	2	QP	42.55	68.20	25.65	Note 2	Pass
773.677	-48.87	4.7	3	2	QP	53.09	68.20	15.11	Note 2	Pass
5322.865	0.62	0	3	2	PK	97.88	N/A	N/A	Note 1	N/A
	0.42		3	2	AV	97.68	N/A	N/A		N/A
6949.221	-31.98	0	3	2	PK	65.28	68.20	2.92	Note 2	Pass
	N/A		3	2	AV	N/A	N/A	N/A	--	N/A
10609.221	-32.17	0	3	2	PK	65.09	74.00	8.91	--	Pass
	-51.06		3	2	AV	46.20	54.00	7.80	--	Pass
20107.632	-29.59	0	3	2	PK	67.67	74.00	6.33	--	Pass
	-48.47		3	2	AV	48.79	54.00	5.21	--	Pass

Test Plots

Band II 11ac CH64, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.09 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

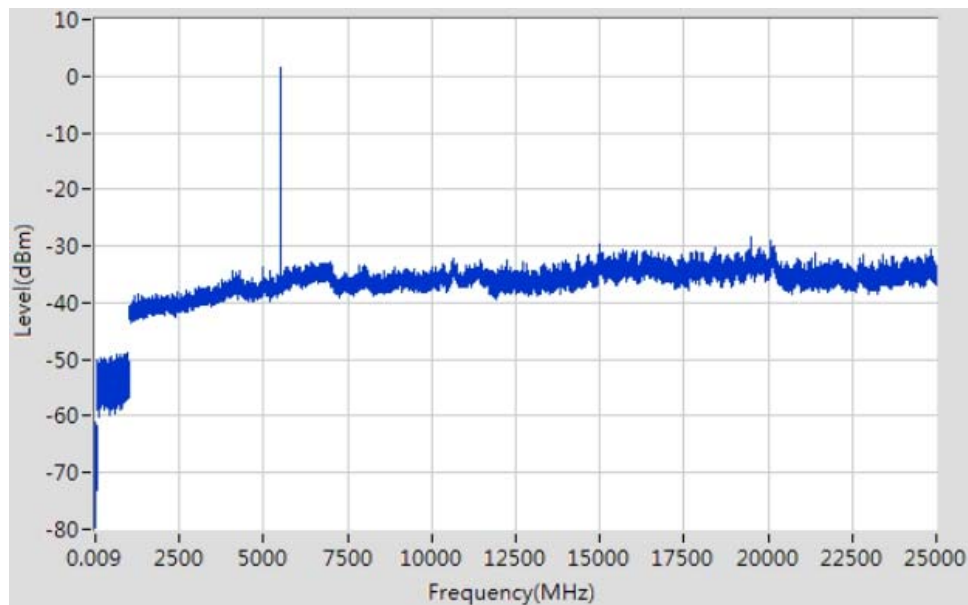
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band III 11ac CH100

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.009	-69.28	6	3	2.09	QP	34.07	68.20	34.13	Note 2	Pass
26.359	-60.97	6	3	2.09	QP	42.38	68.20	25.82	Note 2	Pass
962.996	-48.88	4.7	3	2.09	QP	53.17	74.00	20.83	Note 2	Pass
5503.901	1.42	0	3	2.09	PK	98.77	N/A	N/A	Note 1	N/A
	1.22		3	2.09	AV	98.57	N/A	N/A		N/A
6409.095	-32.77	0	3	2.09	PK	64.58	68.20	3.62	Note 2	Pass
	N/A		3	2.09	AV	N/A	N/A	N/A	--	N/A
10663.259	-32.32	0	3	2.09	PK	65.03	74.00	8.97	--	Pass
	-49.34		3	2.09	AV	48.01	54.00	5.99	--	Pass
19505.587	-28.25	0	3	2.09	PK	69.10	74.00	4.90	--	Pass
	-50.19		3	2.09	AV	47.16	54.00	6.84	--	Pass

Test Plots

Band III 11ac CH100, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.09 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

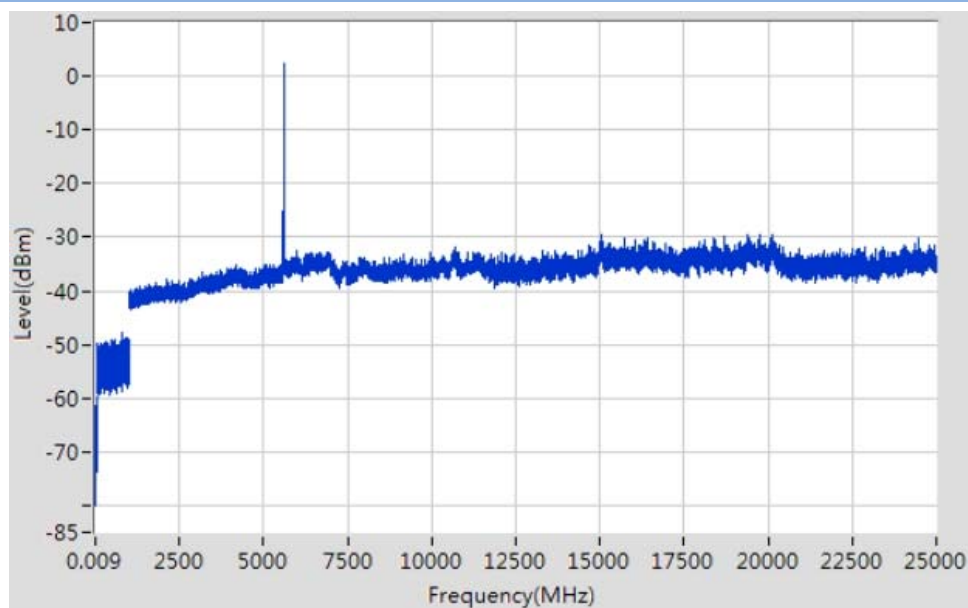
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band III 11ac CH116

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.012	-69.13	6	3	2.09	QP	34.22	68.20	33.98	Note 2	Pass
29.19	-59.82	6	3	2.09	QP	43.53	68.20	24.67	Note 2	Pass
818.981	-47.83	4.7	3	2.09	QP	54.22	68.20	13.98	Note 2	Pass
5580.92	2.49	0	3	2.09	PK	99.84	N/A	N/A	Note 1	N/A
	2.29		3	2.09	AV	99.64	N/A	N/A		N/A
6878.204	-32.76	0	3	2.09	PK	64.59	68.20	3.61	Note 2	Pass
	N/A		3	2.09	AV	N/A	N/A	N/A	--	N/A
10677.269	-31.88	0	3	2.09	PK	65.47	74.00	8.53	--	Pass
	-50.64		3	2.09	AV	46.71	54.00	7.29	--	Pass
19378.577	-29.42	0	3	2.09	PK	67.93	74.00	6.07	--	Pass
	-48.26		3	2.09	AV	49.09	54.00	4.91	--	Pass

Test Plots

Band III 11ac CH116, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.09 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

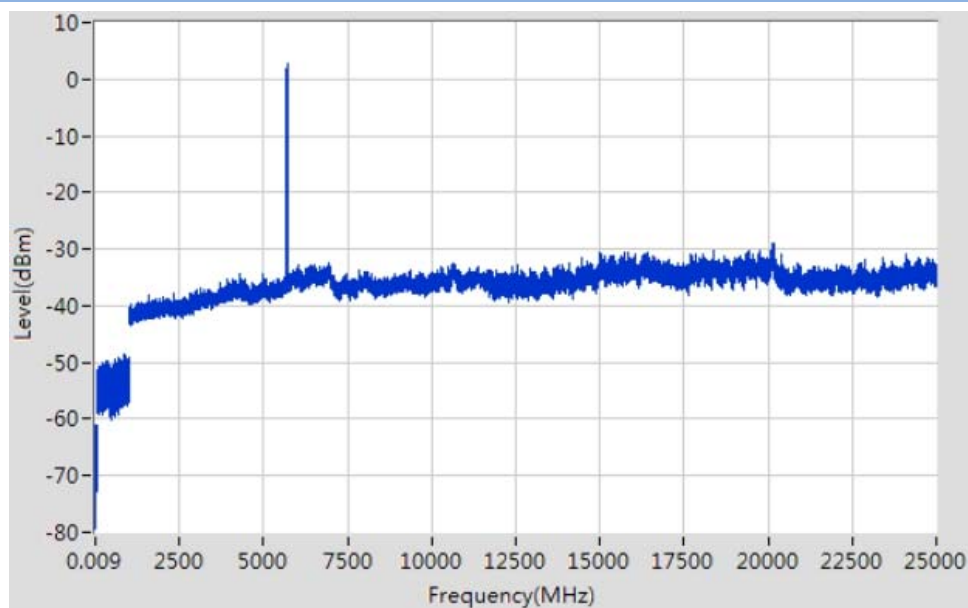
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band III 11ac CH140

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Remark	Verdict
0.009	-68.95	6	3	2.09	QP	34.40	68.20	33.80	Note 2	Pass
27.719	-61.24	6	3	2.09	QP	42.11	68.20	26.09	Note 2	Pass
860.286	-48.57	4.7	3	2.09	QP	53.48	68.20	14.72	Note 2	Pass
5698.94	2.81	0	3	2.09	PK	100.16	N/A	N/A	Note 1	N/A
	2.61		3	2.09	AV	99.96	N/A	N/A		N/A
6937.218	-32.38	0	3	2.09	PK	64.97	68.20	3.23	Note 2	Pass
	N/A		3	2.09	AV	N/A	N/A	N/A	--	N/A
10646.247	-32.45	0	3	2.09	PK	64.90	74.00	9.10	--	Pass
	-48.73		3	2.09	AV	48.62	54.00	5.38	--	Pass
20158.636	-28.87	0	3	2.09	PK	68.48	74.00	5.52	--	Pass
	-46.48		3	2.09	AV	50.87	54.00	3.13	--	Pass

Test Plots

Band III 11ac CH140, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.16 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

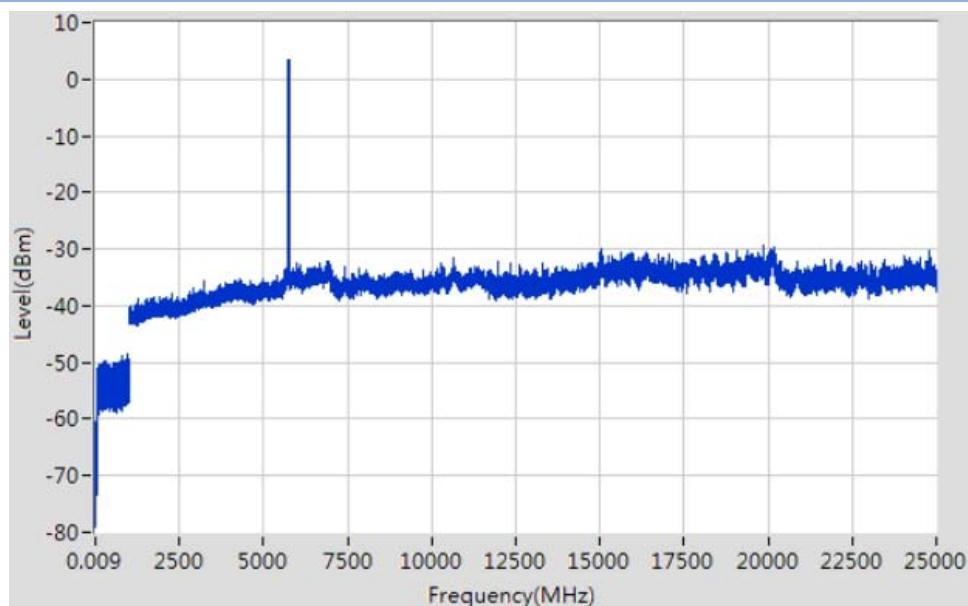
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band IV 11ac CH149

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.011	-68.45	6	3	2.16	QP	34.97	68.20	33.23	Note 2	Pass
0.66	-60.47	6	3	2.16	QP	42.95	68.20	25.25	Note 2	Pass
941.694	-48.43	4.7	3	2.16	QP	53.69	68.20	14.51	Note 2	Pass
5744.949	3.55	0	3	2.16	PK	100.97	N/A	N/A	Note 1	N/A
	3.35		3	2.16	AV	100.77	N/A	N/A		N/A
6936.218	-32.06	0	3	2.16	PK	65.36	68.20	2.84	Note 2	Pass
	N/A		3	2.16	AV	N/A	N/A	N/A	--	N/A
10642.244	-31.52	0	3	2.16	PK	65.90	74.00	8.10	--	Pass
	-50.35		3	2.16	AV	47.07	54.00	6.93	--	Pass
19873.615	-29.23	0	3	2.16	PK	68.19	74.00	5.81	--	Pass
	-48.16		3	2.16	AV	49.26	54.00	4.74	--	Pass

Test Plots

Band IV11ac CH149, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.16 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

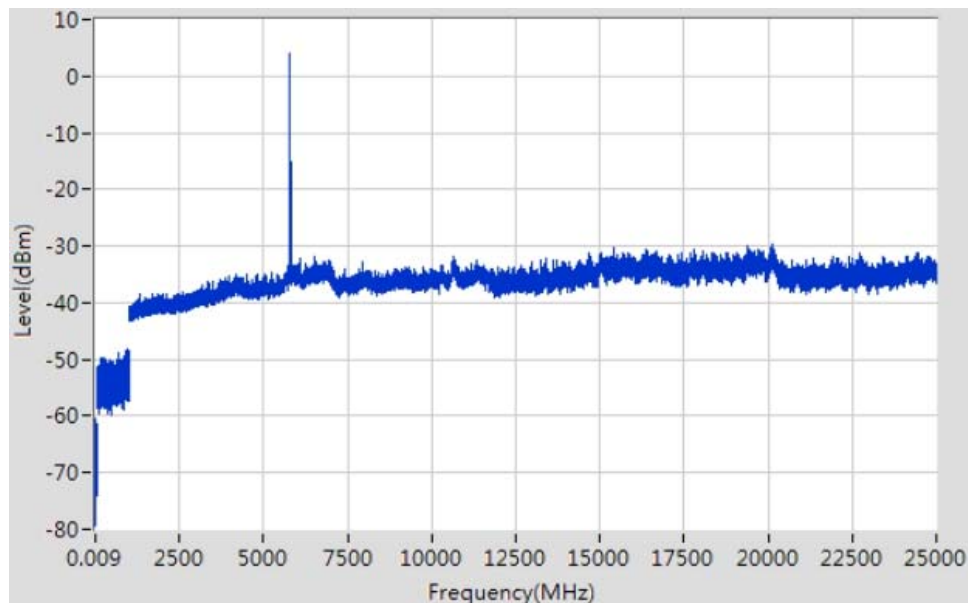
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band IV 11ac CH157

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.01	-68.59	6	3	2.16	QP	34.83	68.20	33.37	Note 2	Pass
22.538	-60.6	6	3	2.16	QP	42.82	68.20	25.38	Note 2	Pass
965.796	-48.16	4.7	3	2.16	QP	53.96	74.00	20.04	Note 2	Pass
5785.957	3.99	0	3	2.16	PK	101.41	N/A	N/A	Note 1	N/A
	3.79		3	2.16	AV	101.21	N/A	N/A		N/A
6527.123	-31.76	0	3	2.16	PK	65.66	68.20	2.54	Note 2	Pass
	N/A		3	2.16	AV	N/A	N/A	N/A	--	N/A
10641.244	-31.76	0	3	2.16	PK	65.66	74.00	8.34	--	Pass
	-50.24		3	2.16	AV	47.18	54.00	6.82	--	Pass
20108.632	-29.67	0	3	2.16	PK	67.75	74.00	6.25	--	Pass
	-47.61		3	2.16	AV	49.81	54.00	4.19	--	Pass

Test Plots

Band IV 11ac CH157, SPURIOUS 9 kHz ~ 25 GHz



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 2dBi, whichever is greater.

And the maximum in-band gain of the antenna is 2.16 dBi.

Note 1: The frequency is fundamental signal which can be ignored.

Note 2: Which frequency is not within a restricted band, and its limit line is resolved to 15.407b)

Note 3: Average measurement was not performed if peak level went lower than the average limit.

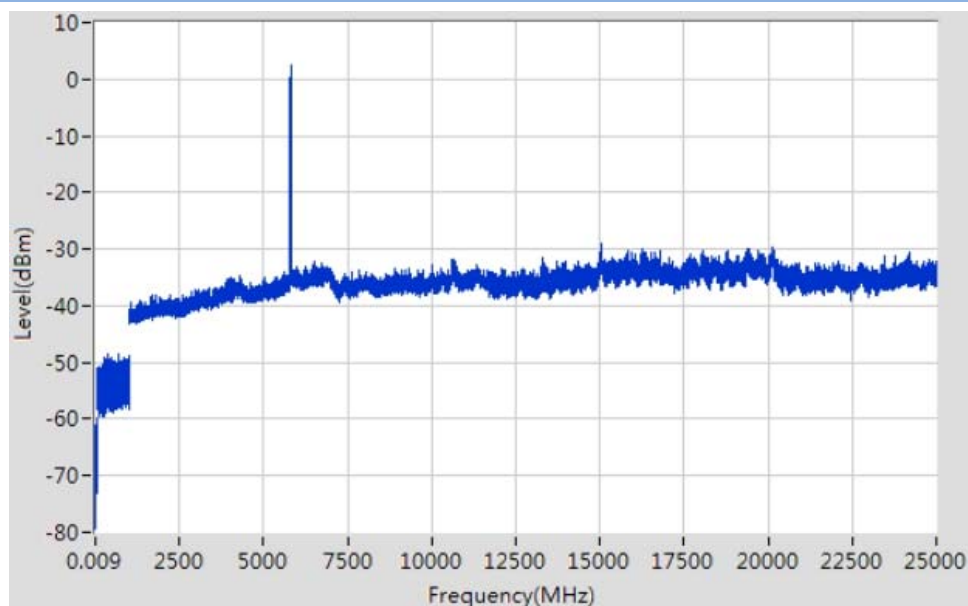
Note 4: The harmonic (2th ,3th , 4th,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise

Band IV 11ac CH165

Frequency (MHz)	Value (dBm)	Ground Reflection Factor (dB)	D(m)	Max gain(dBi)	Detector	E (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Verdict
0.009	-67.13	6	3	2.16	QP	36.29	68.20	31.91	Note 2	Pass
28.009	-59.94	6	3	2.16	QP	43.48	68.20	24.72	Note 2	Pass
703.469	-48.55	4.7	3	2.16	QP	53.57	68.20	14.63	Note 2	Pass
5806.961	2.34	0	3	2.16	PK	99.76	N/A	N/A	Note 1	N/A
	2.14		3	2.16	AV	99.56	N/A	N/A		N/A
6506.118	-32.04	0	3	2.16	PK	65.38	68.20	2.82	Note 2	Pass
	N/A		3	2.16	AV	N/A	N/A	N/A	--	N/A
10624.232	-31.71	0	3	2.16	PK	65.71	74.00	8.29	--	Pass
	-48.86		3	2.16	AV	48.56	54.00	5.44	--	Pass
15057.252	-39.14	0	3	2.16	PK	58.28	68.20	9.92	Note 2	Pass
	N/A		3	2.16	AV	N/A	N/A	N/A	--	N/A

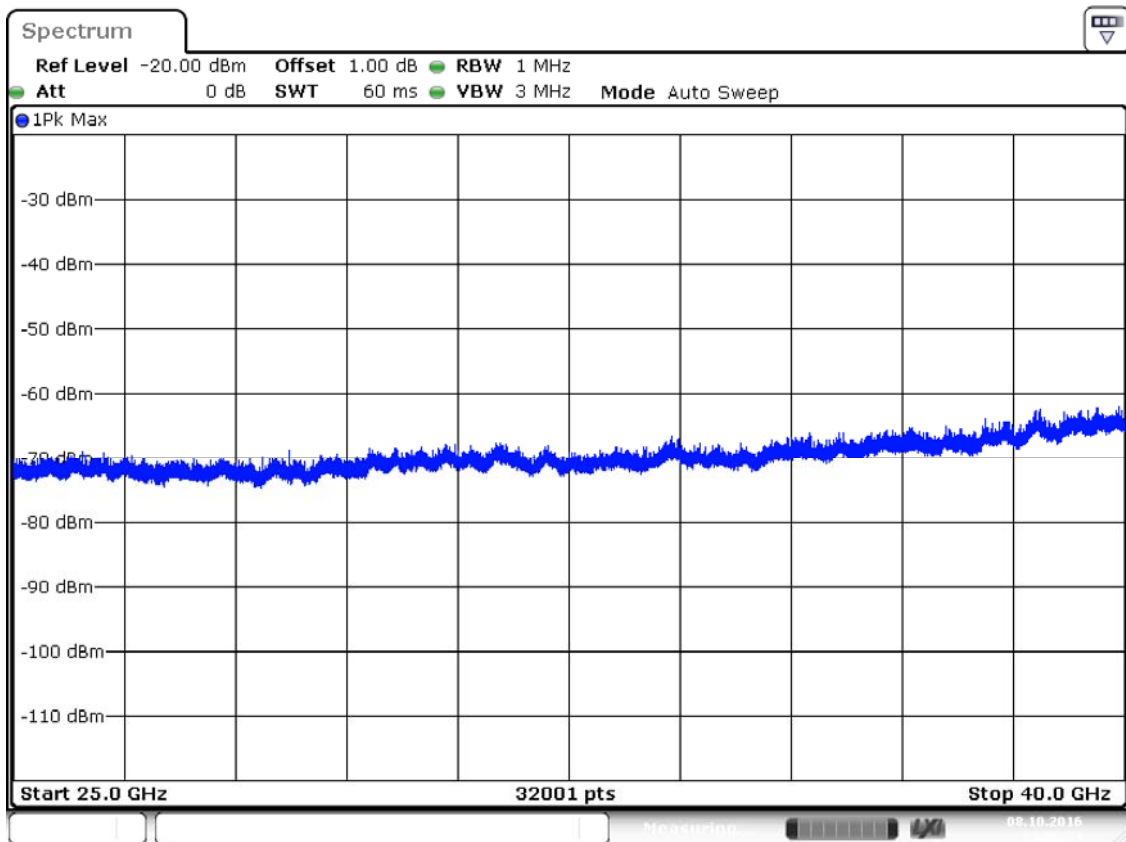
Test Plots

Band IV11ac CH165, SPURIOUS 9 kHz ~ 25 GHz



Test Frequency: 25 GHz ~ 40 GHz

Note: Only noise floor was seen.



Date: 8.OCT.2016 14:26:24

Cabinet Radiated spurious emission test

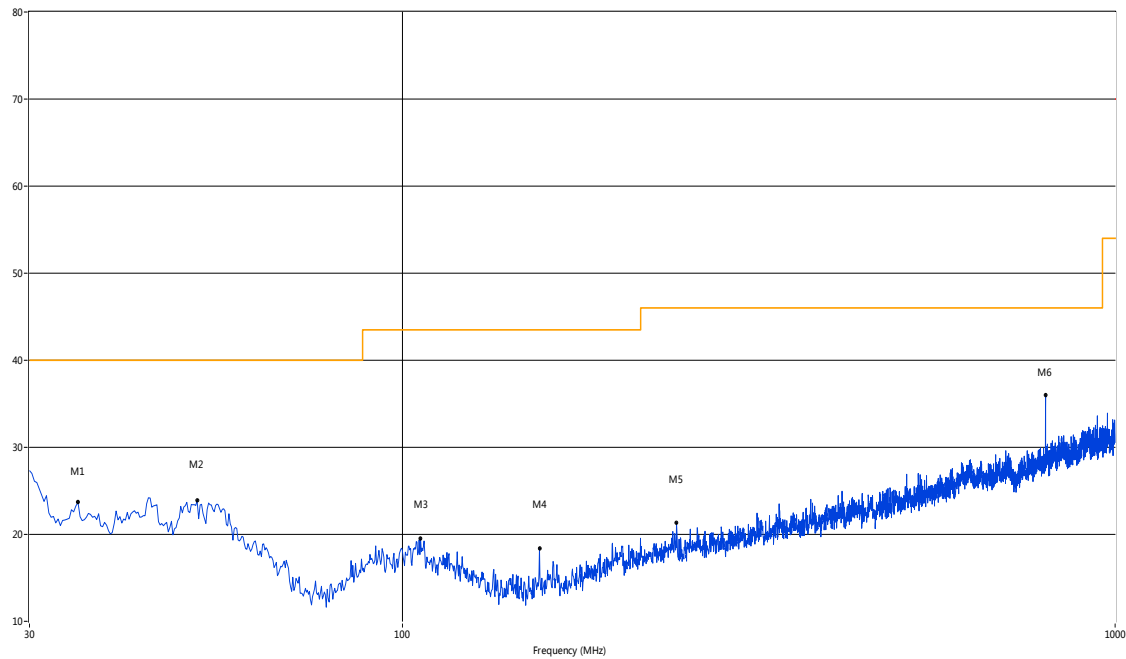
Note 1: The symbol of "--" in the table which means not application.

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.

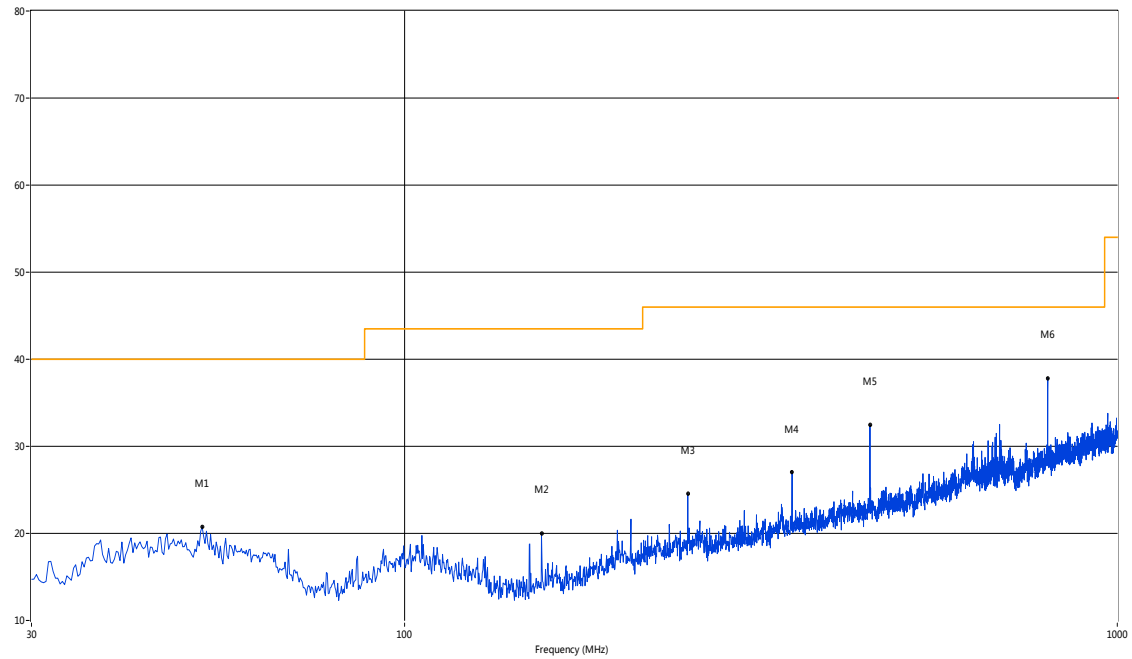
Not 4: The EUT is working in the Normal link mode below 1 GHz.

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	35.09	23.67	-21.20	40.0	16.33	Peak	12.00	100	Vertical	Pass
2	51.58	23.91	-18.74	40.0	16.09	Peak	52.50	100	Vertical	Pass
3	106.13	19.53	-20.18	43.5	23.97	Peak	240.50	100	Vertical	Pass
4	155.83	18.43	-23.23	43.5	25.07	Peak	240.50	100	Vertical	Pass
5	242.62	21.37	-19.01	46.0	24.63	Peak	280.70	100	Vertical	Pass
6	799.02	36.00	-7.36	46.0	10.00	Peak	245.30	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	52.06	20.76	-18.62	40.0	19.24	Peak	12.00	100	Horizontal	Pass
2	155.83	20.02	-23.23	43.5	23.48	Peak	48.00	100	Horizontal	Pass
3	249.89	24.54	-18.94	46.0	21.46	Peak	234.70	100	Horizontal	Pass
4	349.78	27.01	-16.24	46.0	18.99	Peak	264.80	100	Horizontal	Pass
5	449.91	32.44	-14.47	46.0	13.56	Peak	264.80	100	Horizontal	Pass
6	799.02	37.82	-7.36	46.0	8.18	Peak	48.00	100	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band I 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1369.41	41.37	-4.74	74	32.64	Peak	188.7	150	Vertical	Pass
2	1439.89	40.88	-4.46	74	33.12	Peak	12.6	150	Vertical	Pass
3	1612.35	42.40	-3.05	74	31.75	Peak	218.2	150	Vertical	Pass
4	11458.40	50.00	20.03	74	24.01	Peak	232.4	150	Vertical	Pass
5	12457.99	44.76	19.96	74	29.24	Peak	35.2	150	Vertical	Pass
6	23901.83	46.39	11.81	74	27.61	Peak	316.5	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band I 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1293.71	42.17	-4.36	74	31.83	Peak	52.8	150	Horizontal	Pass
2	2960.04	43.30	1.84	74	30.70	Peak	204.7	150	Horizontal	Pass
3	3806.19	48.57	15.43	74	40.43	Peak	203	150	Horizontal	Pass
4	7145.59	45.13	14.50	74	28.87	Peak	297.6	150	Horizontal	Pass
5	14601.08	44.90	9.76	74	29.10	Peak	110.6	150	Horizontal	Pass
6	24241.27	46.03	12.13	74	27.98	Peak	50	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band I 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1199.45	40.79	-5.90	74	33.22	Peak	274	150	Vertical	Pass
2	1438.39	42.57	-4.46	74	31.43	Peak	105.8	150	Vertical	Pass
3	1756.81	42.37	-4.14	74	31.63	Peak	13.7	150	Vertical	Pass
4	9122.30	43.31	16.74	74	30.69	Peak	104.1	150	Vertical	Pass
5	13717.14	45.86	11.87	74	28.14	Peak	114.1	150	Vertical	Pass
6	24970.05	43.23	12.68	74	30.77	Peak	300.9	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band I 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1283.72	44.88	-3.66	74	29.12	Peak	105.6	150	Horizontal	Pass
2	4018.48	48.57	1.73	74	40.43	Peak	199.3	150	Horizontal	Pass
3	5424.58	44.38	14.45	74	29.62	Peak	105.2	150	Horizontal	Pass
4	7504.99	46.35	18.59	74	27.65	Peak	301.7	150	Horizontal	Pass
5	13779.53	46.00	9.05	74	28.00	Peak	97.4	150	Horizontal	Pass
6	19239.60	46.17	12.99	74	27.83	Peak	75.2	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band I 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1326.42	41.36	-6.26	74	32.64	Peak	55.5	150	Vertical	Pass
2	1387.40	43.13	-4.28	74	30.87	Peak	154.7	150	Vertical	Pass
3	1855.79	42.48	-2.43	74	31.52	Peak	402.7	150	Vertical	Pass
4	10806.99	50.97	13.93	74	23.03	Peak	101.2	150	Vertical	Pass
5	14798.67	45.37	12.65	74	28.63	Peak	87.8	150	Vertical	Pass
6	20567.39	46.83	11.23	74	27.17	Peak	73.7	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band I 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2114.89	40.45	-2.86	74	33.55	Peak	210.1	150	Horizontal	Pass
2	2736.26	44.42	9.26	74	29.59	Peak	55.6	150	Horizontal	Pass
3	3962.04	50.88	12.93	74	23.12	Peak	132.9	150	Horizontal	Pass
4	9440.54	46.00	18.91	74	28.00	Peak	34.3	150	Horizontal	Pass
5	17679.29	45.00	9.33	74	29.00	Peak	107.9	150	Horizontal	Pass
6	20956.74	44.20	12.61	74	29.81	Peak	213.7	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band II 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1335.92	43.39	-5.21	74	30.61	Peak	16.7	150	Vertical	Pass
2	1437.89	40.23	-4.47	74	33.77	Peak	7.3	150	Vertical	Pass
3	1988.75	41.23	-4.32	74	32.77	Peak	101.1	150	Vertical	Pass
4	11772.88	45.20	14.44	74	28.81	Peak	135.6	150	Vertical	Pass
5	13197.17	48.72	10.00	74	40.28	Peak	275.3	150	Vertical	Pass
6	21855.24	47.06	11.91	74	26.94	Peak	342.5	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band II 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2068.93	41.83	-4.44	74	32.17	Peak	288.8	150	Horizontal	Pass
2	2772.23	46.32	9.51	74	27.69	Peak	235.3	150	Horizontal	Pass
3	4705.30	50.29	13.08	74	23.71	Peak	344.4	150	Horizontal	Pass
4	6381.86	50.04	18.17	74	23.96	Peak	227.9	150	Horizontal	Pass
5	15141.85	42.93	9.73	74	31.07	Peak	135	150	Horizontal	Pass
6	18667.22	43.99	10.66	74	30.01	Peak	333.6	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band II 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1295.93	43.06	-5.24	74	30.94	Peak	158.1	150	Vertical	Pass
2	1463.38	42.94	-4.12	74	31.06	Peak	291.4	150	Vertical	Pass
3	1989.75	43.77	-2.60	74	30.23	Peak	216.8	150	Vertical	Pass
4	10851.91	46.49	14.76	74	27.51	Peak	77.1	150	Vertical	Pass
5	16404.58	45.59	9.15	74	28.41	Peak	195.9	150	Vertical	Pass
6	19059.90	47.08	13.04	74	26.92	Peak	20.7	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band II 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1453.55	44.41	-4.70	74	29.59	Peak	172.5	150	Horizontal	Pass
2	2846.15	45.08	2.33	74	28.93	Peak	86.7	150	Horizontal	Pass
3	4198.80	43.39	11.12	74	30.61	Peak	65.4	150	Horizontal	Pass
4	10908.07	43.29	20.52	74	30.71	Peak	152.3	150	Horizontal	Pass
5	16992.93	47.42	9.56	74	26.58	Peak	53.6	150	Horizontal	Pass
6	24490.85	50.40	12.29	74	23.60	Peak	127.8	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band II 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1341.92	41.20	-5.95	74	32.80	Peak	287.7	150	Vertical	Pass
2	1539.87	43.07	-4.47	74	30.93	Peak	86.3	150	Vertical	Pass
3	1813.30	40.32	-4.15	74	33.68	Peak	217	150	Vertical	Pass
4	9728.79	47.67	20.20	74	26.33	Peak	290.2	150	Vertical	Pass
5	15110.65	44.70	10.84	74	29.30	Peak	341.5	150	Vertical	Pass
6	20836.94	46.40	11.24	74	27.60	Peak	169.4	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band II 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2464.54	43.12	-1.00	74	30.88	Peak	330.8	150	Horizontal	Pass
2	4094.41	43.87	2.37	74	30.13	Peak	210	150	Horizontal	Pass
3	4612.39	49.97	10.81	74	24.03	Peak	292.2	150	Horizontal	Pass
4	10346.51	44.16	16.24	74	29.84	Peak	268.7	150	Horizontal	Pass
5	12648.92	43.94	9.82	74	30.06	Peak	269	150	Horizontal	Pass
6	21066.56	46.08	11.21	74	27.92	Peak	191.3	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band III 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1299.93	42.89	-5.22	74	31.11	Peak	61.5	150	Vertical	Pass
2	1526.87	42.50	-4.61	74	31.50	Peak	210.6	150	Vertical	Pass
3	1624.34	43.21	-3.18	74	30.79	Peak	338	150	Vertical	Pass
4	7078.20	47.16	14.44	74	26.84	Peak	31.2	150	Vertical	Pass
5	14289.10	42.08	8.87	74	31.92	Peak	9	150	Vertical	Pass
6	22084.86	43.20	10.90	74	30.80	Peak	183.9	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band III 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2314.69	44.10	-5.84	74	29.91	Peak	85.5	150	Horizontal	Pass
2	2844.16	45.60	1.21	74	28.40	Peak	163.6	150	Horizontal	Pass
3	5043.96	47.48	10.74	74	26.52	Peak	179.1	150	Horizontal	Pass
4	7100.67	45.20	14.51	74	28.80	Peak	159.8	150	Horizontal	Pass
5	15890.60	42.89	9.86	74	31.11	Peak	223.2	150	Horizontal	Pass
6	18781.61	47.06	9.85	74	26.94	Peak	264.8	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band III 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1245.94	42.01	-4.99	74	31.99	Peak	34.5	150	Vertical	Pass
2	1413.40	41.40	-4.57	74	32.60	Peak	36.2	150	Vertical	Pass
3	1914.27	44.38	-2.47	74	29.62	Peak	406	150	Vertical	Pass
4	11784.11	47.84	14.26	74	26.16	Peak	159.7	150	Vertical	Pass
5	17065.72	43.80	8.73	74	30.20	Peak	80.7	150	Vertical	Pass
6	20227.95	48.00	11.94	74	26.00	Peak	92.2	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band III 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1223.78	43.20	-4.83	74	30.80	Peak	302.6	150	Horizontal	Pass
2	3365.63	48.20	0.03	74	40.80	Peak	167	150	Horizontal	Pass
3	4078.92	48.14	11.96	74	40.86	Peak	92	150	Horizontal	Pass
4	7976.71	41.80	16.80	74	32.20	Peak	352	150	Horizontal	Pass
5	12853.99	47.46	19.77	74	26.54	Peak	304.9	150	Horizontal	Pass
6	21116.47	46.64	11.60	74	27.36	Peak	6.7	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band III 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1333.42	42.85	-5.58	74	31.15	Peak	238	150	Vertical	Pass
2	1498.88	42.32	-4.29	74	31.69	Peak	123.8	150	Vertical	Pass
3	1806.30	40.94	-3.99	74	33.06	Peak	207.6	150	Vertical	Pass
4	7920.55	44.89	19.71	74	29.11	Peak	8.7	150	Vertical	Pass
5	15578.62	50.89	9.44	74	23.11	Peak	275.8	150	Vertical	Pass
6	23123.13	45.19	10.28	74	28.81	Peak	61.6	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band III 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2082.92	43.02	-2.17	74	30.98	Peak	181.6	150	Horizontal	Pass
2	2986.01	44.57	9.29	74	29.43	Peak	327.1	150	Horizontal	Pass
3	3509.49	48.03	12.57	74	40.97	Peak	40	150	Horizontal	Pass
4	11166.39	50.85	17.10	74	23.15	Peak	348.1	150	Horizontal	Pass
5	16223.38	42.13	19.46	74	31.87	Peak	335.2	150	Horizontal	Pass
6	18365.64	43.17	10.19	74	30.83	Peak	8.9	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band IV 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1122.97	43.45	-5.18	74	30.56	Peak	162.2	150	Vertical	Pass
2	1385.90	42.72	-4.49	74	31.28	Peak	90.9	150	Vertical	Pass
3	1937.27	43.91	-4.11	74	30.09	Peak	334.3	150	Vertical	Pass
4	9440.54	47.13	14.81	74	26.87	Peak	340.7	150	Vertical	Pass
5	17200.92	44.66	19.36	74	29.35	Peak	313.1	150	Vertical	Pass
6	22953.41	49.04	11.21	74	24.96	Peak	211.7	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band IV 11a Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2466.53	42.40	-4.07	74	31.60	Peak	176.6	150	Horizontal	Pass
2	2732.27	44.48	0.62	74	29.52	Peak	40.6	150	Horizontal	Pass
3	4111.89	46.81	15.45	74	27.19	Peak	281	150	Horizontal	Pass
4	10717.14	47.74	14.38	74	26.26	Peak	116.3	150	Horizontal	Pass
5	16618.55	50.20	9.70	74	23.80	Peak	138.9	150	Horizontal	Pass
6	18656.82	44.26	8.48	74	29.74	Peak	351.2	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band IV 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1012.50	40.67	-4.78	74	33.33	Peak	46.4	150	Vertical	Pass
2	1409.90	43.90	-4.67	74	30.10	Peak	82.5	150	Vertical	Pass
3	1935.77	42.63	-3.77	74	31.37	Peak	20.1	150	Vertical	Pass
4	6213.39	47.71	14.35	74	26.29	Peak	15.7	150	Vertical	Pass
5	13696.34	44.99	9.08	74	29.01	Peak	164.8	150	Vertical	Pass
6	18916.81	46.61	9.41	74	27.39	Peak	146	150	Vertical	Pass

1 GHz to 40 GHz, ANT H Band IV 11a Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2494.51	41.54	-2.98	74	32.46	Peak	162.7	150	Horizontal	Pass
2	2896.10	44.54	2.46	74	29.47	Peak	242.1	150	Horizontal	Pass
3	5886.11	49.23	14.45	74	24.77	Peak	183	150	Horizontal	Pass
4	9088.60	47.81	15.09	74	26.19	Peak	110.9	150	Horizontal	Pass
5	17024.13	44.74	11.17	74	29.26	Peak	349.9	150	Horizontal	Pass
6	23772.05	45.69	12.87	74	28.31	Peak	30.1	150	Horizontal	Pass

1 GHz to 40 GHz, ANT V Band IV 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1400.94	43.30	-5.14	74	30.70	Peak	92.2	150	Vertical	Pass
2	1489.88	40.42	-4.47	74	33.58	Peak	297.9	150	Vertical	Pass
3	1701.33	43.41	-3.01	74	30.59	Peak	206	150	Vertical	Pass
4	9919.72	48.55	19.67	74	40.45	Peak	133.8	150	Vertical	Pass
5	15406.24	43.16	20.86	74	30.84	Peak	214.6	150	Vertical	Pass
6	19878.54	44.80	9.10	74	29.20	Peak	3.1	150	Vertical	Pass

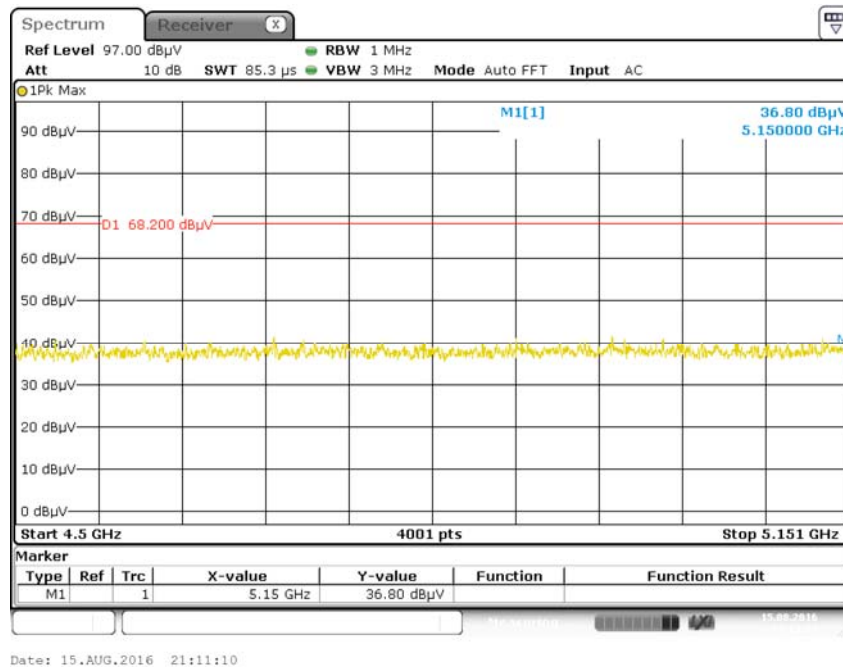
1 GHz to 40 GHz, ANT H Band IV 11a High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1047.95	45.63	-0.40	74	28.37	Peak	210.2	150	Horizontal	Pass
2	3383.62	46.23	8.94	74	27.77	Peak	236	150	Horizontal	Pass
3	3908.09	50.71	10.09	74	23.29	Peak	142.2	150	Horizontal	Pass
4	11503.33	48.53	14.82	74	40.47	Peak	126.8	150	Horizontal	Pass
5	16743.34	47.04	11.01	74	26.96	Peak	144.8	150	Horizontal	Pass
6	20467.55	44.91	9.75	74	29.09	Peak	343.5	150	Horizontal	Pass

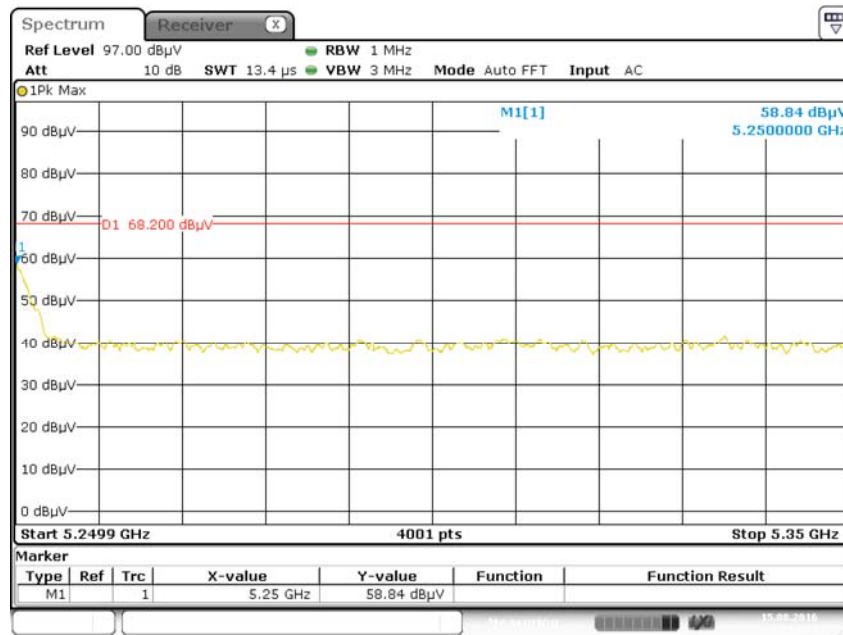
Band Edge

Band	Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
Band I	11a	36	5180	36.80	68.2	31.4	PEAK	Pass
		48	5240	58.84	68.2	9.36	PEAK	Pass
Band II	11a	52	5260	62.59	68.2	5.61	PEAK	Pass
		64	5320	39.51	68.2	28.69	PEAK	Pass
Band III	11a	100	5500	40.02	68.2	28.18	PEAK	Pass
		140	5700	40.04	68.2	28.16	PEAK	Pass
Band IV	11a	149	5745	87.38	Refer to Plot		PEAK	Pass
		165	5825	74.24	Refer to Plot		PEAK	Pass

Band I 11a CH36

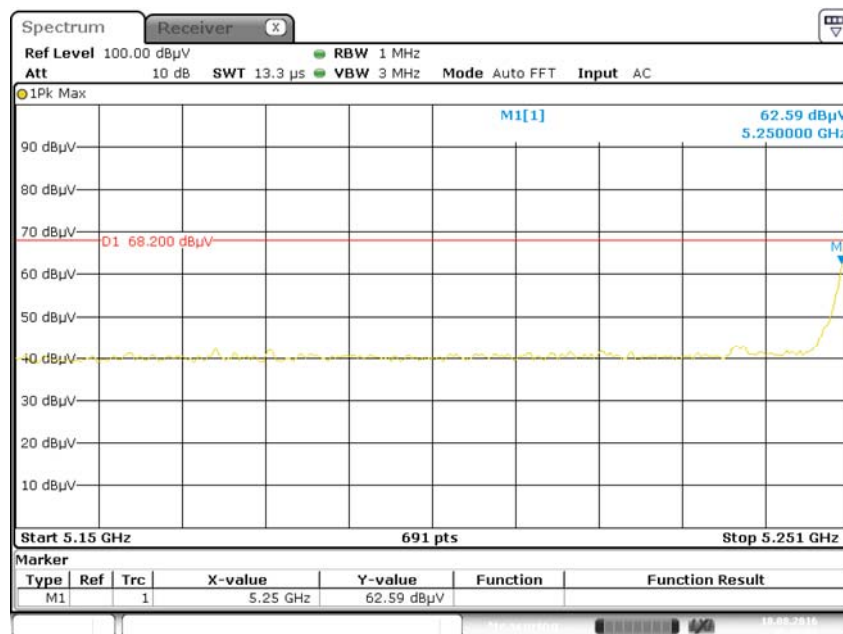


Band I 11a CH48



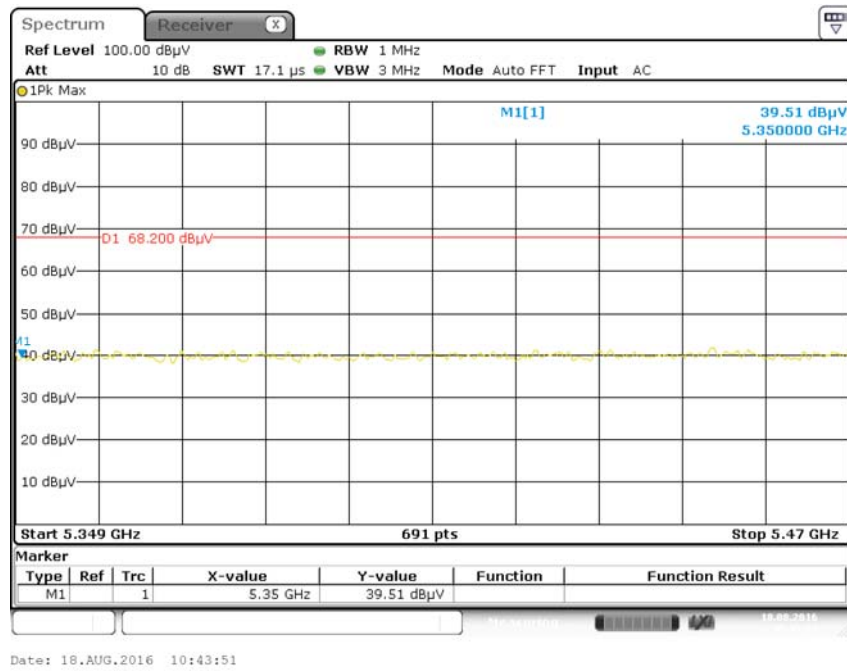
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Band II 11a CH52

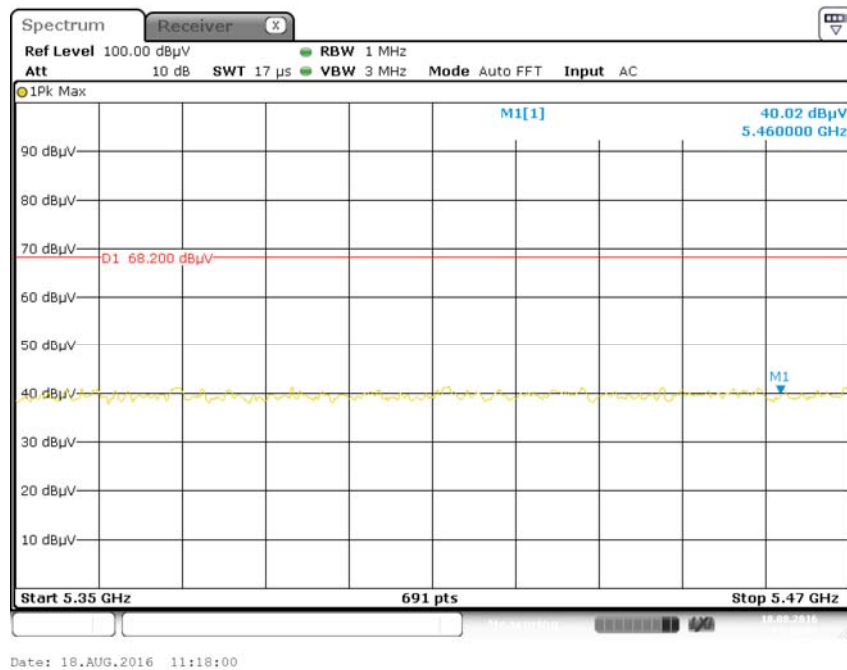


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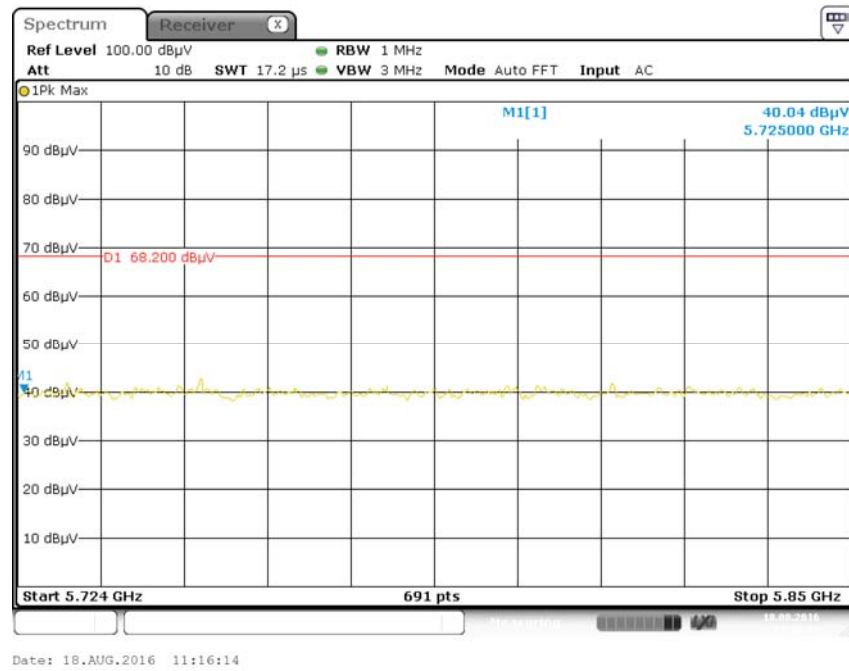
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Band III 11a CH100



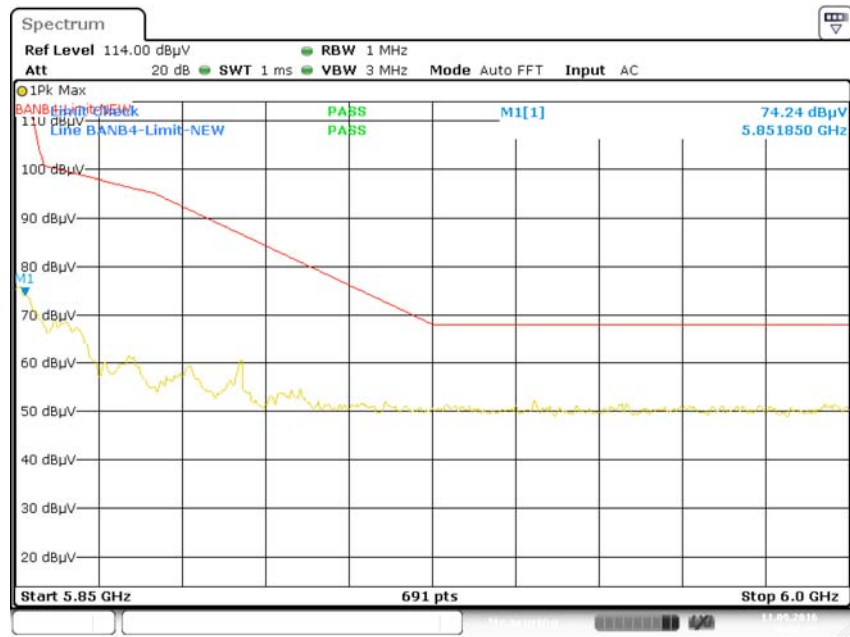
Band III 11a CH140



Band IV 11a CH149



Band IV 11a CH165



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A.8 Frequency Stability

Voltage vs. Frequency Stability (5320 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	3.0	5320	5320.1246	23.41	5320.1335	25.09	5320.0845	15.87	5320.0842	15.83
	3.7	5320	5320.1472	27.67	5320.0984	18.49	5320.0950	17.87	5320.1045	19.63
	4.2	5320	5320.1254	23.58	5320.0968	18.18	5320.097	18.20	5320.0988	18.57

Temperature vs. Frequency Stability (5320 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)
3.7	-10	5320	5319.9607	-7.38	5320.0591	11.11	5319.9782	-4.09	5319.9546	-8.53
	-5	5320	5320.0167	3.14	5320.0293	5.52	5320.1144	21.51	5320.0815	15.33
	0	5320	5320.1038	19.51	5320.0916	17.21	5320.1077	20.25	5320.0156	2.93
	10	5320	5320.0128	2.41	5320.1001	18.81	5320.0754	14.18	5320.0453	8.52
	20	5320	5319.9505	-9.30	5319.9512	-9.17	5319.9694	-5.76	5319.9565	-8.18
	30	5320	5320.0365	6.85	5320.0790	14.85	5320.0320	6.02	5320.0904	16.98
	35	5320	5320.0149	2.80	5320.0843	15.84	5320.0760	14.29	5320.0847	15.92
	40	5320	5319.9728	-5.12	5319.9565	-8.18	5320.0889	16.71	5319.9757	-4.57
	50	5320	5320.1199	22.53	5320.0932	17.52	5320.0039	0.74	5320.0342	6.42

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1690235-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL- SZ1690235-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL- SZ1690235-AI.PDF”.

--END OF REPORT--