

FCC

RF

TEST REPORT

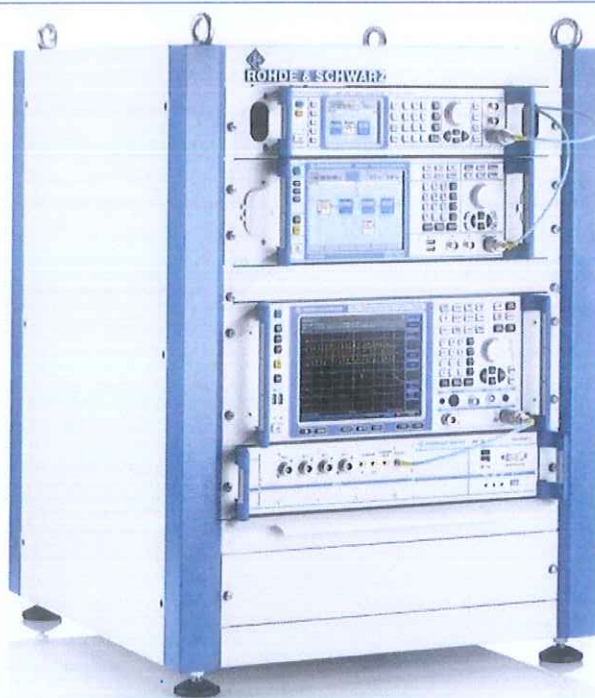
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
AC750 Wi-Fi Travel Router

ISSUED TO
TP-Link Technologies Co., Ltd.

Building 24 (floors 1,3,4,5) and 28 (floors 1-4) Central Science and
Technology Park, Shennan Rd, Nanshan, Shenzhen, China



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Date

Aug. 24, 2017

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(Laboratory Manager)

Date

Aug. 24, 2017

Report No.: BL-SZ1760138-603

EUT Name: AC750 Wi-Fi Travel Router

Model Name: TL-WR902AC

Brand Name: TP-Link

Test Standard: 47 CFR Part 15 Subpart E

FCC ID: TE7WR902ACV3

Test conclusion: Pass

Test Date: Aug. 05, 2017 ~ Aug. 09, 2017

Date of Issue: Aug. 24, 2017

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Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Aug. 09, 2017</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Aug. 23, 2017</u>	<u>Add the test data of duty cycle 99% and 99% bandwidth on page 29/30; update the KDB version and other information.</u>
<u>Rev. 03</u>	<u>Aug. 24, 2017</u>	<u>Update the 99% bandwidth</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

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°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 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	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.2 Manufacturer

Manufacturer	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.3 Factory

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Type	AC750 Wi-Fi Travel Router
Model Name Under Test	TL-WR902AC
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Network and Wireless connectivity	WIFI 802.11a,802.11b, 802.11g and 802.11n (HT20/40), 802.11ac(VHT20/ VHT40/ VHT80)

2.5 Ancillary Equipment

Ancillary Equipment1	Charger 1	
	Brand Name	N/A
	Model Name	AMS135-0502000FU
	Rated Input	100-240 V ~, 50/60 Hz, 0.5 A
	Rated Output	5.0 V $\overline{\text{---}}$, 2.0 A

2.6 Technical Information

Frequency Range	Band I: 5150 MHz to 5250 MHz, Band IV: 5725 MHz to 5850 MHz
Product Type	☒ Indoor Access Point
Modulation technology	OFDM
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK
Transfer Rate (Mbps) (Single RF path)	802.11a: 54/ 48/ 36 / 24 / 18/12 / 9/ 6 Mbps 802.11n: up to 150 Mbps 802.11ac: up to VHT-MCS9
Channel Bandwidth	802.11a: 20 MHz 802.11n: 20 MHz, 40 MHz 802.11ac: 20 MHz, 40 MHz, 80 MHz
Maximum Output Power	Band I: 22.06 dBm Band IV: 21.14 dBm
Antenna Type	Omni-Directional Antenna
Antenna Gain	Band I: 5150 MHz to 5250 MHz: 5.07 dBi Band IV: 5725 MHz to 5850 MHz: 4.46 dBi
About the Product	The equipment is AC750 Wi-Fi Travel Router, intended for used with information technology equipment.

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	N/A				
Support Units (Software installation media)	Description	Manufacturer	Model		
	Notebook	Lenovo	X220		
Band I (5150 - 5250 MHz) Power level setup in software					
Mode	Channel		Soft Set		
11a	All	29	42	42	
11ac (HT20)	All	31	42	42	
11ac (HT40)	All	20	/	36	
11ac (HT80)	All	15	/	/	

Test Software Version	N/A				
Support Units (Software installation media)	Description	Manufacturer	Model		
	Notebook	Lenovo	X220		
Band IV (5725 - 5850 MHz) Power level setup in software					
Mode	Channel		Soft Set		
11a	All		32	32	32
11ac (HT20)	All		32	32	32
11ac (HT40)	All		35	/	35
11ac (HT80)	All		24	/	/

Run Software

```
Telnet 192.168.0.1
Welcome To Use TP-Link COMMAND-LINE Interface Model.
-----
TP-Link#sh
[ util_execSystem ] 139: doFshell cmd is "sh"

~ # iupriv raio set ATE=ATESTART;\
> iupriv raio set ATEXFREQOFFSET=125;\
> iupriv raio set ATECHANNEL=36;\
> iupriv raio set ATEXMCS=1;\
> iupriv raio set AETXMCS=0;\
> iupriv raio set AETXBW=0;\
> iupriv raio set AETXGI=0;\
> iupriv raio set AETXLEN=1024;\
> iupriv raio set AETXANT=1;\
> iupriv raio set AETXPOW0=29;\
> iupriv raio set AETXCNT=0;\
> iupriv raio set ATE=TXCONT
~ #
~ #
~ #
~ #
~ #
~ #
~ #
```


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	42	5210
40	5200	46	5230	155	5775
44	5220	151	5755	/	/
48	5240	159	5795	/	/
149	5745	/	/	/	/
153	5765	/	/	/	/
157	5785	/	/	/	/
161	5805	/	/	/	/
165	5825	/	/	/	/

Note: 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/ac(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 802.11ac (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

For 802.11ac (HT80)

Band I (5150 - 5250 MHz)		Band IV (5725 - 5850 MHz)	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
42	5210	155	5775

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 IV
				Channel	Channel
RF Output Power	11a	6	BPSK	36/44/48	149/157/165
	11ac(20 MHz)	6.5		36/44/48	149/157/165
	11ac(40 MHz)	13.5		38/46	151/159
	11ac(80 MHz)	MCS0		42	155
Emission Bandwidth & 99% Occupied Bandwidth	11a	6	BPSK	36/44/48	149/157/165
	11ac(20 MHz)	6.5		36/44/48	149/157/165
	11a (40 MHz)	13.5		38/46	151/159
	11ac(80 MHz)	VHT-MCS0		42	155
6 dB bandwidth	11a	6	BPSK	N/A	149/157/165
	11ac(20 MHz)	6.5		N/A	149/157/165
	11a (40 MHz)	13.5		N/A	151/159
	11ac(80 MHz)	MCS0		N/A	155
Power Spectral Density	11a	6	BPSK	36/44/48	149/157/165
	11ac(20 MHz)	6.5		36/44/48	149/157/165
	11a (40 MHz)	13.5		38/46	151/159
	11ac(80 MHz)	MCS0		42	155
Conducted Spurious Emission and Band Edge (Authorized-band)	11a	6	BPSK	36/44/48	149/157/165
	11ac(20 MHz)	6.5		36/44/48	149/157/165
	11a (40 MHz)	13.5		38/46	151/159
	11ac(80 MHz)	MCS0		42	155
Radiated Spurious Emissions	11a	6	BPSK	36/44/48	149/157/165
	11ac(20 MHz)	6.5		36/44/48	149/157/165
	11a (40 MHz)	13.5		38/46	151/159
	11ac(80 MHz)	MCS0		42	155
Band Edge (Restricted-band)	11a	6	BPSK	36/48	149/165
	11ac(20 MHz)	6.5		36/48	149/165
	11a (40 MHz)	13.5		38/46	151/159
	11ac(80 MHz)	MCS0		42	155
Frequency Stability	Unmodulated	N/A	N/A	36	149
Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report.					

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	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

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)	0°C
	HT (High Temperature)	+40°C
Working Voltage of the EUT	NV (Normal Voltage)	120 V
	LV (Low Voltage)	110 V
	HV (High Voltage)	130 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	2016.09.09	2017.09.08
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
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
Power Amplifier	OPHIR RF	5225F	1037	2017.02.17	2018.02.16

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
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
Network Card	N/A	ZM30	N/A	N/A	N/A

4.3 Measurement Uncertainty

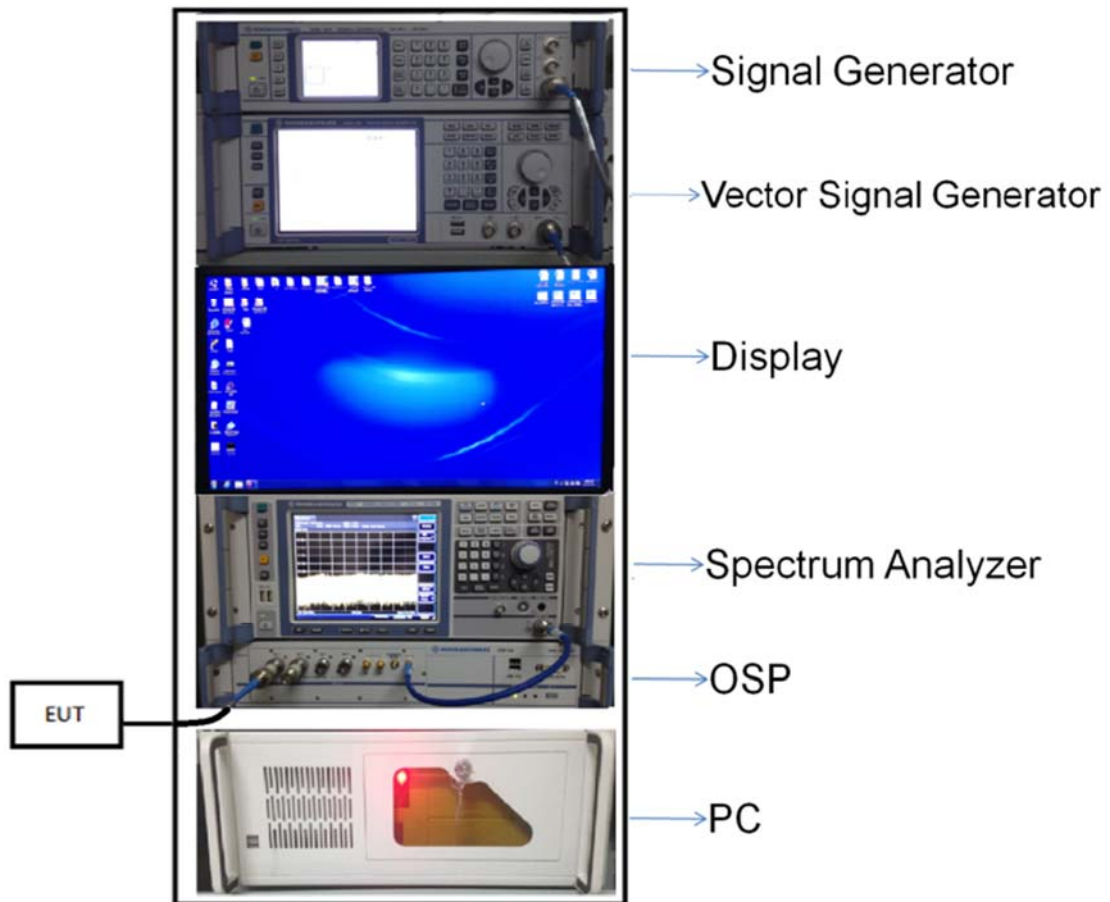
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

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%

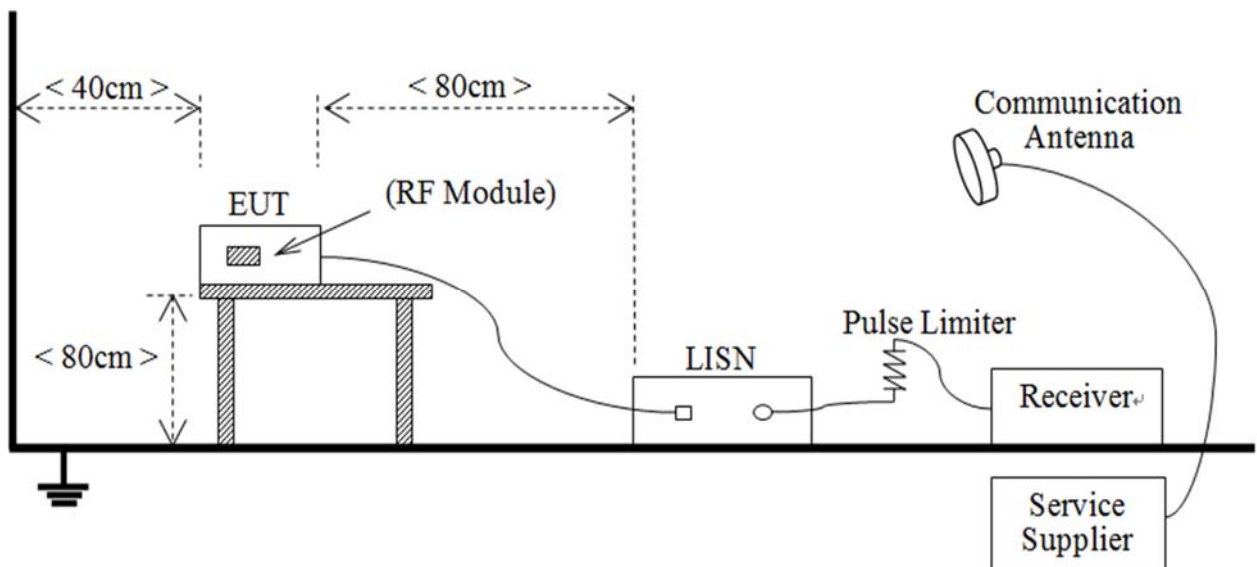
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



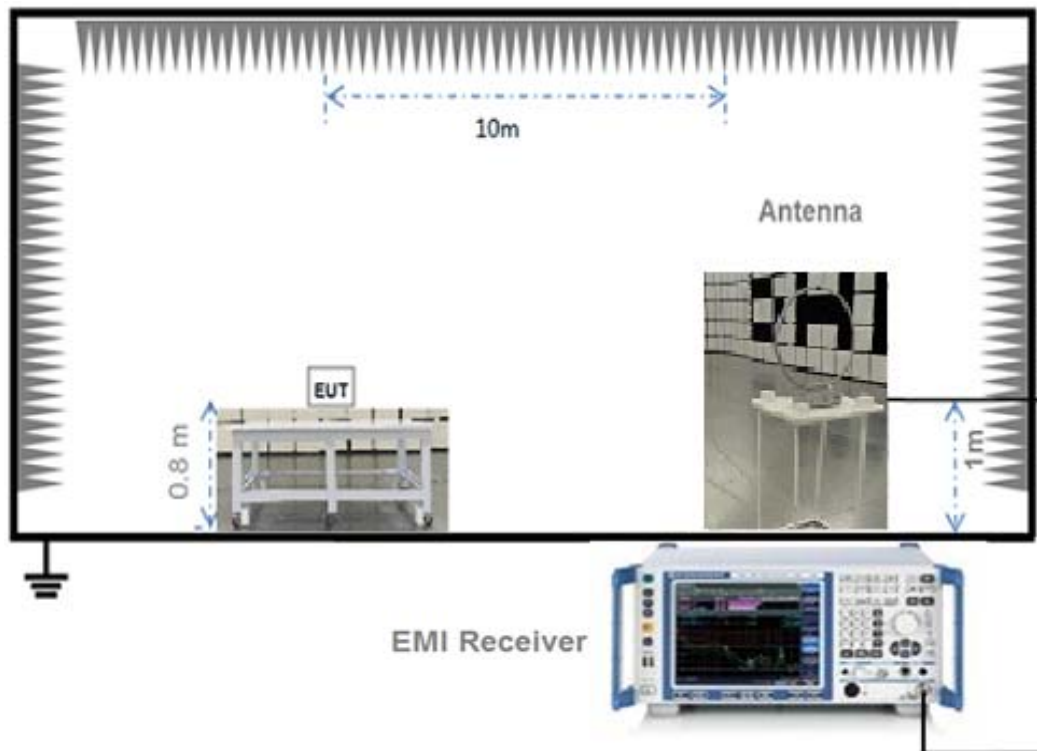
(Diagram 1)

4.4.2 For AC Power Supply Port Test



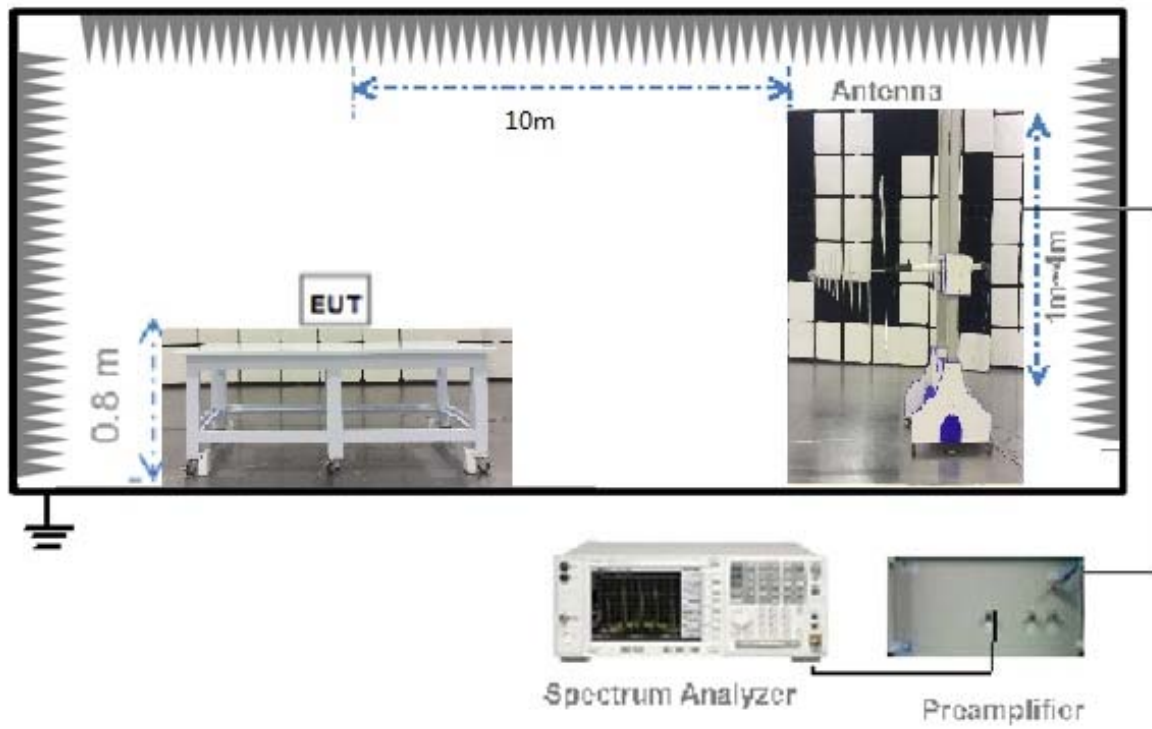
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



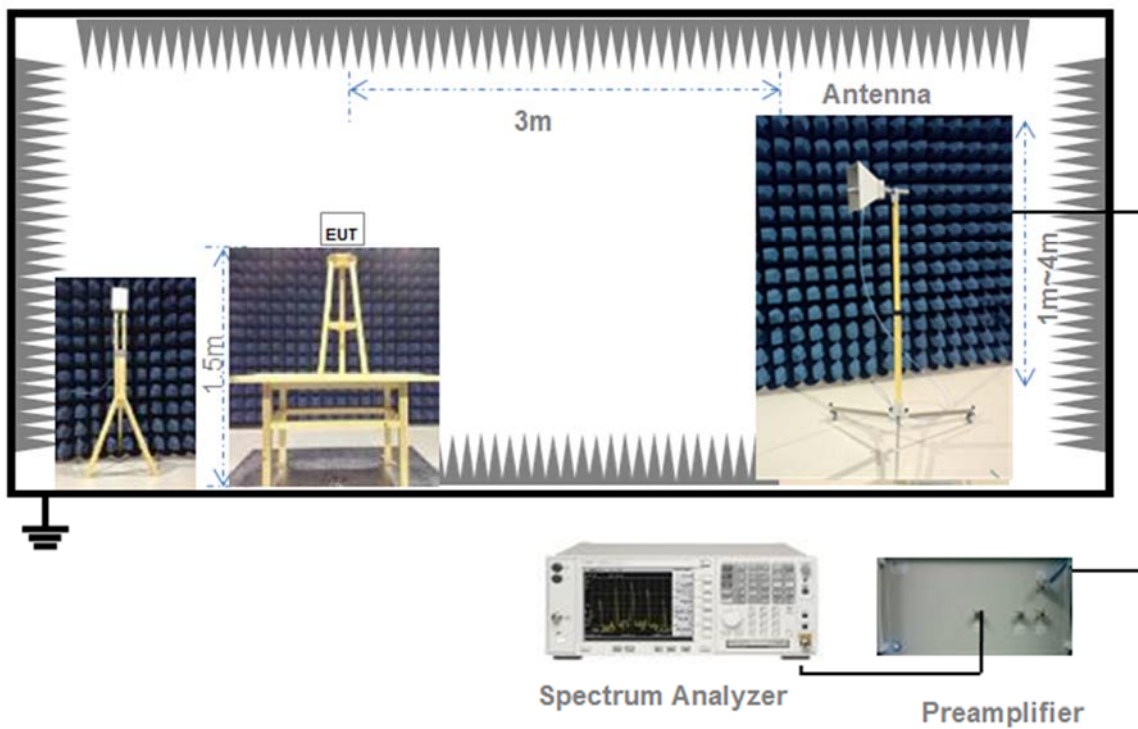
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



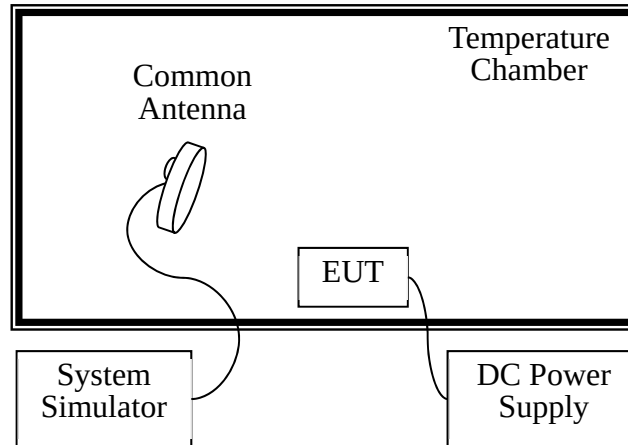
(Diagram 4)

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	1 W
5725-5850	1 W
Note 1 : For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W	
Note 2 : For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W	

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	17 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.

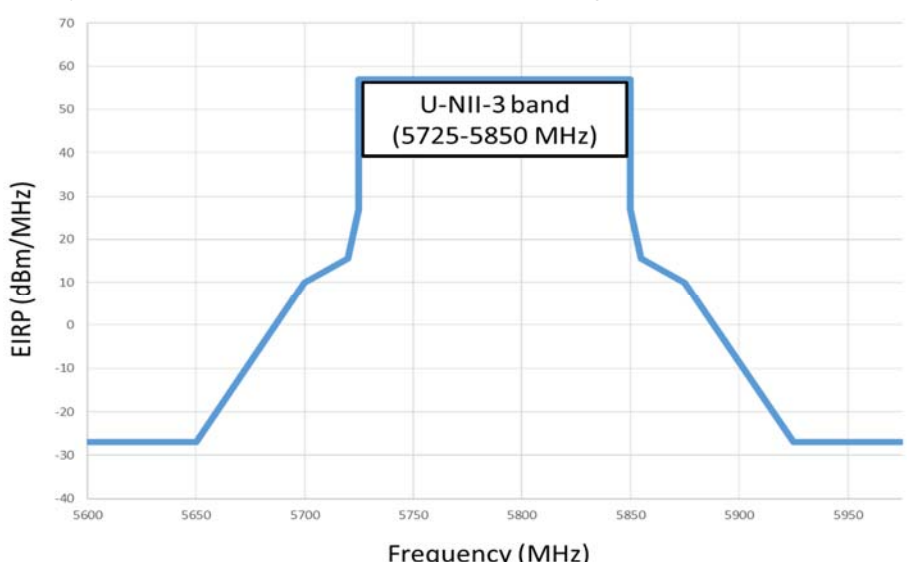
5.4.4 Test Result

Please refer to ANNEX A.5.

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

5.5.1 Limit

FCC §15.407(b)

Unwanted Emissions that fall Outside of the Restricted Bands	
Frequency Band (MHz)	Limit
5150 - 5250	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm/MHz
5250 - 5350	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm/MHz
5470 - 5725	Outside of the 5.47-5.725 GHz band: e.i.r.p. -27 dBm/MHz
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. 

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

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

Duty Cycle

Test Mode	Duty Cycle	T (ms)	1/T(kHz)
802.11a	100%	-	-
11ac (HT20)	100%	-	-
11ac (HT40)	100%	-	-
11ac (HT80)	100%	-	-

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)	FCC Limit (mW)	Verdict
11a	CH36	5180	19.19	82.99	1000	Pass
11a	CH44	5220	21.91	155.24	1000	Pass
11a	CH48	5240	22.06	160.69	1000	Pass
11ac (HT20)	CH36	5180	19.87	97.05	1000	Pass
11ac (HT20)	CH44	5220	21.97	157.40	1000	Pass
11ac (HT20)	CH48	5240	22.03	159.59	1000	Pass
11ac (HT40)	CH38	5190	16.04	40.18	1000	Pass
11ac (HT40)	CH46	5230	21.12	129.42	1000	Pass
11ac (HT80)	CH42	5210	13.76	23.77	1000	Pass

Band IV (5725 - 5850 MHz)						
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (mW)	FCC Limit (mW)	Verdict
11a	CH149	5745	20.99	125.60	1000	Pass
11a	CH157	5785	21.02	126.47	1000	Pass
11a	CH165	5825	21.14	130.02	1000	Pass
11ac (HT20)	CH149	5745	20.87	122.18	1000	Pass
11ac (HT20)	CH157	5785	20.96	124.74	1000	Pass
11ac (HT20)	CH165	5825	21.07	127.94	1000	Pass
11ac (HT40)	CH151	5755	21.11	129.12	1000	Pass
11ac (HT40)	CH159	5795	21.03	126.77	1000	Pass
11ac (HT80)	CH155	5775	18.81	76.03	1000	Pass

A.2 Emission Bandwidth & 99% Bandwidth

Note: Test plots please refer to the document “Annex No.: BL-SZ1760138-603 Data Part 1.pdf”.

Test Data

Band I (5150 - 5250 MHz)			
Mode	Channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	17.13
11a	CH44	5220	17.08
11a	CH48	5240	17.25
11ac (HT20)	CH36	5180	17.95
11ac (HT20)	CH44	5220	18.18
11ac (HT20)	CH48	5240	18.00
11ac (HT40)	CH38	5190	36.30
11ac (HT40)	CH46	5230	36.90
11ac (HT80)	CH42	5210	75.80

Band IV (5725 - 5850 MHz)			
Mode	Channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	24.66
11a	CH157	5785	25.12
11a	CH165	5825	25.01
11ac (HT20)	CH149	5745	24.66
11ac (HT20)	CH157	5785	25.76
11ac (HT20)	CH165	5825	25.93
11ac (HT40)	CH151	5755	43.20
11ac (HT40)	CH159	5795	44.00
11ac (HT80)	CH155	5775	77.40

A.3 6 dB Bandwidth

Note: Test plots please refer to the document “Annex No.: BL-SZ1760138-603 Data Part 2.pdf”.

Test Data

Band IV (5725 - 5850 MHz)					
Mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)	Verdict
11a	CH149	5745	16.52	500	Pass
11a	CH157	5785	16.52	500	Pass
11a	CH165	5825	16.52	500	Pass
11ac (HT20)	CH149	5745	17.72	500	Pass
11ac (HT20)	CH157	5785	17.72	500	Pass
11ac (HT20)	CH165	5825	17.67	500	Pass
11ac (HT40)	CH151	5755	36.52	500	Pass
11ac (HT40)	CH159	5795	36.47	500	Pass
11ac (HT80)	CH155	5775	76.47	500	Pass

A.4 Power Spectral Density

Note: Test plots please refer to the document “Annex No.: BL-SZ1760138-603 Data Part 3.pdf”.

Test Data

Note¹: The RBW used in Band IV is 1 MHz, and the PSD factor is: $10 \cdot \log(500 \text{ kHz/RBW}) = -3 \text{ dBm}$.

Band I (5150 - 5250 MHz)					
Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit(dBm/MHz)	Verdict
11a	CH36	5180	6.00	17	Pass
11a	CH44	5220	8.40	17	Pass
11a	CH48	5240	8.93	17	Pass
11ac (HT20)	CH36	5180	5.71	17	Pass
11ac (HT20)	CH44	5220	8.42	17	Pass
11ac (HT20)	CH48	5240	8.68	17	Pass
11ac (HT40)	CH38	5190	-1.00	17	Pass
11ac (HT40)	CH46	5230	4.52	17	Pass
11ac (HT80)	CH42	5210	-5.98	17	Pass

Band IV (5725 - 5850 MHz)					
Mode	Channel	Frequency (MHz)	PSD(dBm/MHz)	Limit(dBm/500 kHz)	Verdict
11a	CH149	5745	6.46	30	Pass
11a	CH157	5785	6.14	30	Pass
11a	CH165	5825	5.21	30	Pass
11ac (HT20)	CH149	5745	5.81	30	Pass
11ac (HT20)	CH157	5785	5.23	30	Pass
11ac (HT20)	CH165	5825	4.79	30	Pass
11ac (HT40)	CH151	5755	2.88	30	Pass
11ac (HT40)	CH159	5795	2.89	30	Pass
11ac (HT80)	CH155	5775	-2.09	30	Pass

A.5 Conducted Emissions

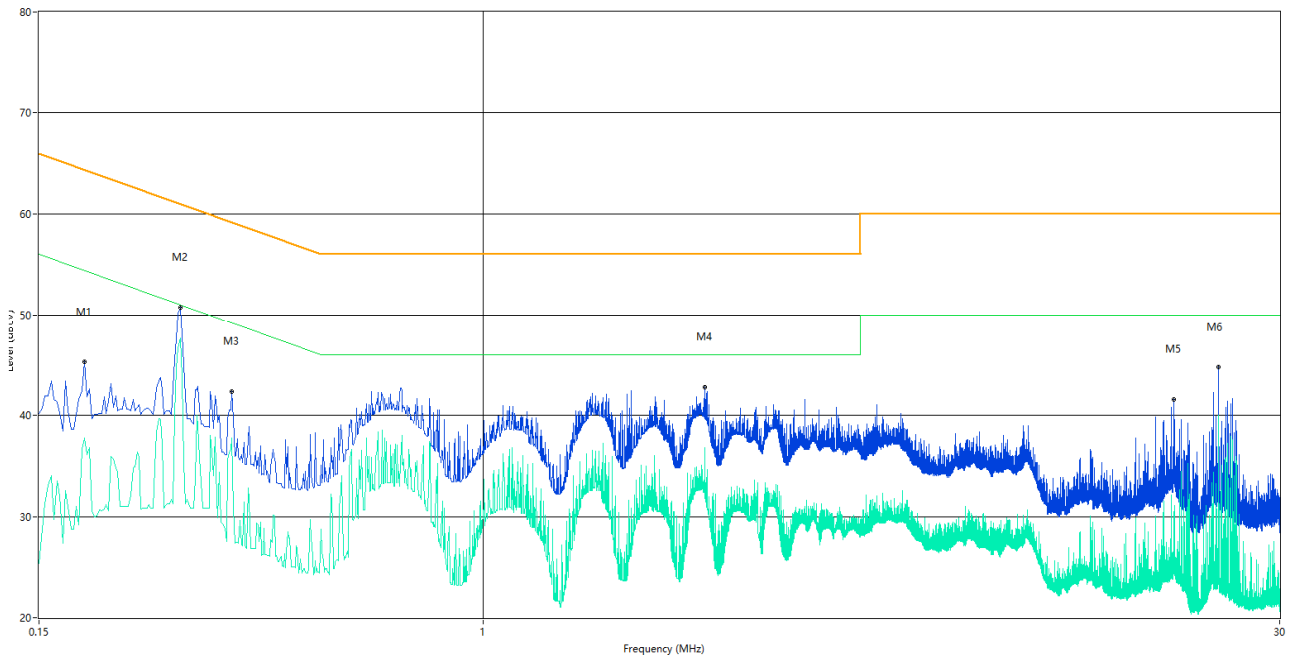
Note ¹: The EUT is working in the Normal link mode.

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

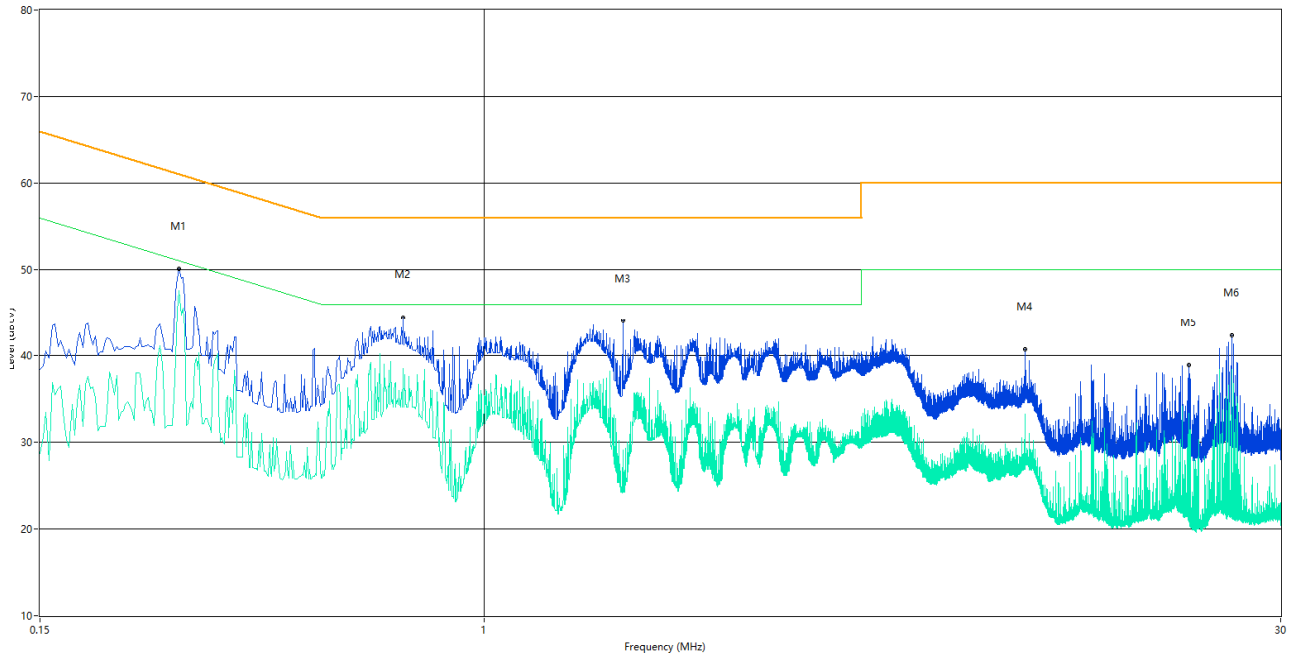
CE Test case_CE_EN 55032_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.182	45.3	10.46	64.4	19.10	Peak	L Line	Pass
1**	0.182	37.8	10.46	54.4	16.60	AV	L Line	Pass
2	0.274	50.7	10.62	61.0	10.30	Peak	L Line	Pass
2**	0.274	47.6	10.62	51.0	3.40	AV	L Line	Pass
3	0.342	42.3	9.50	59.2	16.90	Peak	L Line	Pass
3**	0.342	37.8	9.50	49.2	11.40	AV	L Line	Pass
4	2.578	42.8	10.51	56.0	13.20	Peak	L Line	Pass
4**	2.578	36.8	10.51	46.0	9.20	AV	L Line	Pass
5	19.100	41.6	10.94	60.0	18.40	Peak	L Line	Pass
5**	19.100	28.9	10.94	50.0	21.10	AV	L Line	Pass
6	23.126	44.8	11.34	60.0	15.20	Peak	L Line	Pass
6**	23.126	40.0	11.34	50.0	10.00	AV	L Line	Pass

PHASE N

CE Test case_CE_CE_EN 55032_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.272	50.1	10.57	61.1	11.00	Peak	N Line	Pass
1**	0.272	47.5	10.57	51.1	3.60	AV	N Line	Pass
2	0.706	44.5	10.69	56.0	11.50	Peak	N Line	Pass
2**	0.706	38.2	10.69	46.0	7.80	AV	N Line	Pass
3	1.808	44.0	10.45	56.0	12.00	Peak	N Line	Pass
3**	1.808	29.1	10.45	46.0	16.90	AV	N Line	Pass
4	10.058	40.7	10.30	60.0	19.30	Peak	N Line	Pass
4**	10.058	33.3	10.30	50.0	16.70	AV	N Line	Pass
5	20.258	38.9	10.84	60.0	21.10	Peak	N Line	Pass
5**	20.258	33.3	10.84	50.0	16.70	AV	N Line	Pass
6	24.346	42.3	11.60	60.0	17.70	Peak	N Line	Pass
6**	24.346	38.4	11.60	50.0	11.60	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-SZ1760138-603 Data Part 4.pdf”.

Test Band	Mode	Channel	Verdict
Band I	802.11a	Low	Pass
		Middle	Pass
		High	Pass
	802.11ac(HT20)	Low	Pass
		Middle	Pass
		High	Pass
	802.11ac(HT40)	Low	Pass
		High	Pass
	802.11ac(HT80)	---	Pass
Band IV	802.11a	Low	Pass
		Middle	Pass
		High	Pass
	802.11ac(HT20)	Low	Pass
		Middle	Pass
		High	Pass
	802.11ac(HT40)	Low	Pass
		High	Pass
	802.11ac(HT80)	---	Pass

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

Test Data

Radiated spurious emission test

Note¹: The symbol of “--” in the table which means not application.

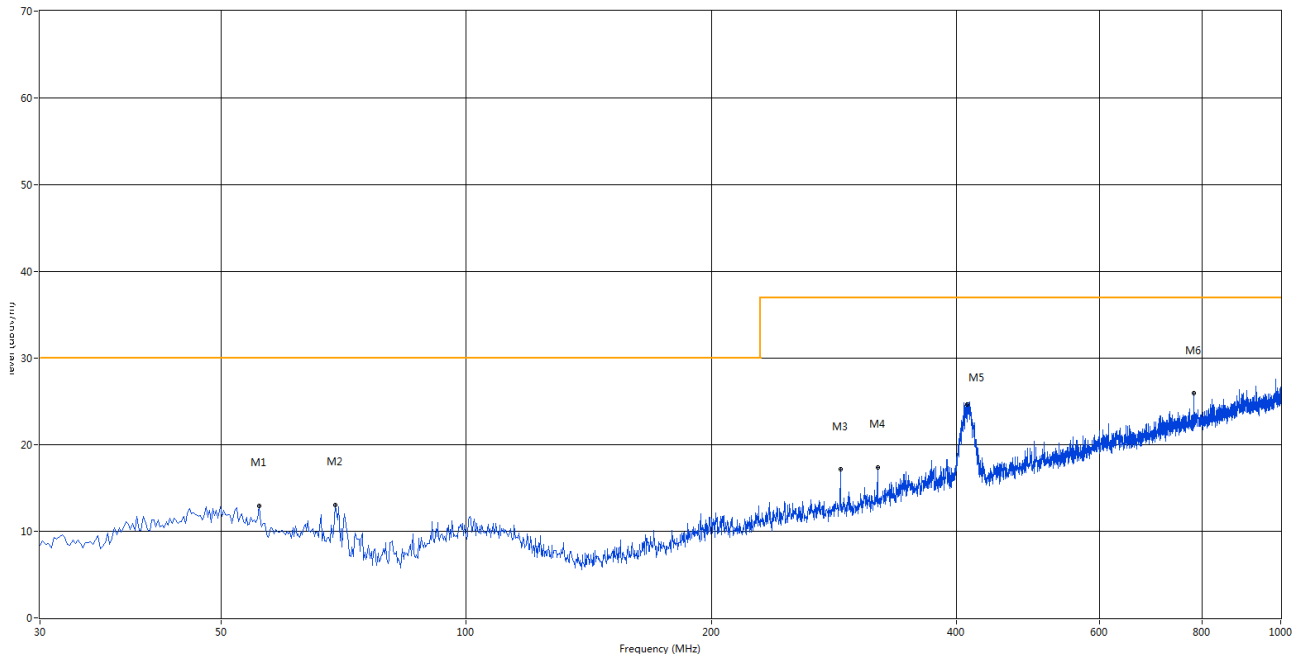
Note²: For the test data above 1 GHz, According the ANSI C63.4, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note³: 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.

Note⁴: The EUT is working in the Normal link mode below 1 GHz.

30 MHz to 1 GHz, ANT H

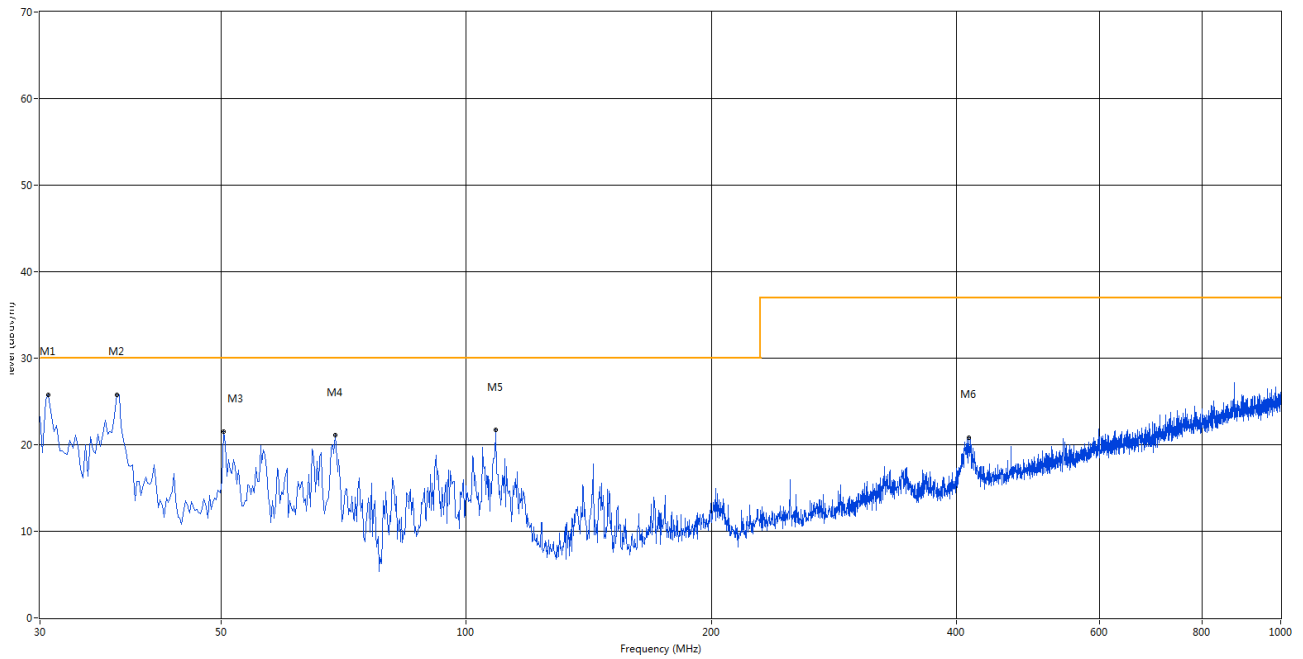
RE Test Case_CE Certification_EN 55032 Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	55.705	12.88	-13.95	30.0	17.12	Peak	31.00	100	Horizontal	Pass
2	69.043	13.02	-17.16	30.0	16.98	Peak	17.00	100	Horizontal	Pass
3	288.020	17.10	-12.52	37.0	19.90	Peak	229.00	100	Horizontal	Pass
4	320.030	17.38	-11.80	37.0	19.62	Peak	13.00	100	Horizontal	Pass
5	412.422	24.58	-9.30	37.0	12.42	Peak	184.00	100	Horizontal	Pass
6	781.993	25.90	-2.48	37.0	11.10	Peak	96.00	100	Horizontal	Pass

30 MHz to 1 GHz, ANT V

RE Test Case_CE Certification_EN 55032 Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.727	25.77	-16.69	30.0	4.23	Peak	148.00	100	Vertical	Pass
2	37.275	25.76	-15.12	30.0	4.24	Peak	11.00	100	Vertical	Pass
3	50.370	21.53	-13.33	30.0	8.47	Peak	155.00	100	Vertical	Pass
4	69.043	21.05	-17.16	30.0	8.95	Peak	87.00	100	Vertical	Pass
5	108.812	21.66	-15.19	30.0	8.34	Peak	155.00	100	Vertical	Pass
6	414.605	20.77	-9.25	37.0	16.23	Peak	93.00	100	Vertical	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.

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	2387.23	53.13	1.68	68.2	15.07	Peak	199.2	150	Vertical	PASS
2	3887.23	52.08	6.46	68.2	16.12	Peak	211.4	150	Vertical	PASS
3	5180.38	106.81	10.83	68.2	-38.61	Peak	199.8	150	Vertical	N/A
4	7054.18	44.45	13.19	68.2	23.75	Peak	200.8	150	Vertical	PASS
5	12038.00	51.18	17.31	68.2	17.02	Peak	262.5	150	Vertical	PASS
6	15313.25	51.22	22.93	68.2	16.98	Peak	213.1	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	2380.83	53.09	1.63	68.2	15.11	Peak	116.1	150	Horizontal	PASS
2	3887.44	51.63	6.54	68.2	16.57	Peak	76.9	150	Horizontal	PASS
3	5180.30	107.31	10.86	68.2	-39.11	Peak	222.7	150	Horizontal	N/A
4	7051.42	44.52	13.01	68.2	23.68	Peak	270.4	150	Horizontal	PASS
5	12150.75	46.34	20.04	68.2	21.86	Peak	220.2	150	Horizontal	PASS
6	15786.25	57.12	25.99	68.2	11.08	Peak	272.7	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	2381.87	51.91	1.60	68.2	16.29	Peak	53.1	150	Vertical	PASS
2	3885.95	52.10	6.46	68.2	16.10	Peak	9.8	150	Vertical	PASS
3	5220.07	108.93	10.84	68.2	-40.73	Peak	128.6	150	Vertical	N/A
4	7050.25	45.45	13.19	68.2	22.75	Peak	78.5	150	Vertical	PASS
5	13360.75	51.66	18.20	68.2	16.54	Peak	121.4	150	Vertical	PASS
6	16405.00	52.26	21.04	68.2	15.94	Peak	321.6	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	2379.17	53.76	1.63	68.2	14.44	Peak	353.9	150	Horizontal	PASS
2	3886.23	52.68	6.49	68.2	15.52	Peak	116.8	150	Horizontal	PASS
3	5220.19	108.19	10.86	68.2	-39.99	Peak	61.1	150	Horizontal	N/A
4	7043.01	44.60	12.90	68.2	23.60	Peak	338.3	150	Horizontal	PASS
5	9037.75	48.36	14.59	68.2	19.84	Peak	164.2	150	Horizontal	PASS
6	11884.00	49.07	16.15	68.2	19.13	Peak	203.1	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	2379.06	52.12	1.65	68.2	16.08	Peak	357.5	150	Vertical	PASS
2	3888.83	52.66	6.54	68.2	15.54	Peak	107.9	150	Vertical	PASS
3	5240.04	108.67	10.83	68.2	-40.47	Peak	358.1	150	Vertical	N/A
4	7061.53	44.72	13.19	68.2	23.48	Peak	58.6	150	Vertical	PASS
5	11556.75	49.27	22.16	68.2	18.93	Peak	228.6	150	Vertical	PASS
6	17045.75	51.80	25.83	68.2	16.40	Peak	112.5	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	2380.67	52.62	1.68	68.2	15.58	Peak	155.1	150	Horizontal	PASS
2	3884.99	51.83	6.55	68.2	16.37	Peak	11.9	150	Horizontal	PASS
3	5240.24	109.64	10.83	68.2	-41.44	Peak	108.1	150	Horizontal	N/A
4	7046.35	45.35	13.08	68.2	22.85	Peak	348.3	150	Horizontal	PASS
5	9675.75	46.03	15.02	68.2	22.17	Peak	187.7	150	Horizontal	PASS
6	10902.25	46.46	17.77	68.2	21.74	Peak	201	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band I 802.11ac20 Low Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2377.15	52.81	1.63	68.2	15.39	Peak	313	150	Vertical	PASS
2	3885.56	52.48	6.54	68.2	15.72	Peak	221.8	150	Vertical	PASS
3	5180.31	107.29	10.85	68.2	-39.09	Peak	303.5	150	Vertical	N/A
4	7064.44	44.41	13.26	68.2	23.79	Peak	155.1	150	Vertical	PASS
5	11446.75	47.40	19.80	68.2	20.80	Peak	26	150	Vertical	PASS
6	15745.00	54.56	24.70	68.2	13.64	Peak	141.9	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band I 802.11ac20 Low Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2381.17	52.27	1.67	68.2	15.93	Peak	230.3	150	Horizontal	PASS
2	3885.10	51.96	6.52	68.2	16.24	Peak	296.5	150	Horizontal	PASS
3	5180.98	107.02	10.86	68.2	-38.82	Peak	139.5	150	Horizontal	N/A
4	7049.25	44.30	13.13	68.2	23.90	Peak	316.8	150	Horizontal	PASS
5	14521.25	50.54	18.14	68.2	17.66	Peak	249.7	150	Horizontal	PASS
6	16432.50	53.59	20.57	68.2	14.61	Peak	101.8	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band I 802.11ac20 Middle Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2377.54	51.61	1.60	68.2	16.59	Peak	66.1	150	Vertical	PASS
2	3885.79	51.82	6.55	68.2	16.38	Peak	322.4	150	Vertical	PASS
3	5220.86	109.88	10.83	68.2	-41.68	Peak	119.7	150	Vertical	N/A
4	7065.01	43.70	13.20	68.2	24.50	Peak	165.6	150	Vertical	PASS
5	11257.00	47.31	17.68	68.2	20.89	Peak	180.8	150	Vertical	PASS
6	17029.25	57.44	23.67	68.2	10.76	Peak	165.7	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band I 802.11ac20 Middle Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2379.69	52.86	1.60	68.2	15.34	Peak	250.3	150	Horizontal	PASS
2	3882.35	53.10	6.49	68.2	15.10	Peak	341.9	150	Horizontal	PASS
3	5220.61	109.99	10.85	68.2	-41.79	Peak	276.2	150	Horizontal	N/A
4	7054.66	45.21	13.01	68.2	22.99	Peak	227.6	150	Horizontal	PASS
5	9191.75	47.06	16.05	68.2	21.14	Peak	196.2	150	Horizontal	PASS
6	10649.25	45.38	17.55	68.2	22.82	Peak	25.6	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band I 802.11ac20 High Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2379.32	53.27	1.65	68.2	14.93	Peak	110.9	150	Vertical	PASS
2	3885.01	51.97	6.49	68.2	16.23	Peak	188.4	150	Vertical	PASS
3	5240.99	109.83	10.83	68.2	-41.63	Peak	32.5	150	Vertical	N/A
4	7061.42	44.64	13.31	68.2	23.56	Peak	85.3	150	Vertical	PASS
5	12310.25	48.09	20.64	68.2	20.11	Peak	101.9	150	Vertical	PASS
6	17967.00	55.05	21.85	68.2	13.15	Peak	233.5	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band I 802.11ac20 High Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2380.13	53.50	1.63	68.2	14.70	Peak	125.4	150	Horizontal	PASS
2	3887.33	53.14	6.49	68.2	15.06	Peak	196.3	150	Horizontal	PASS
3	5240.80	111.17	10.85	68.2	-42.97	Peak	64.3	150	Horizontal	N/A
4	7041.91	44.04	13.08	68.2	24.16	Peak	228.4	150	Horizontal	PASS
5	9238.50	45.32	14.85	68.2	22.88	Peak	80.6	150	Horizontal	PASS
6	10580.50	48.55	17.68	68.2	19.65	Peak	12.8	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band I 802.11ac40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2377.99	53.13	1.65	68.2	15.07	Peak	248.3	150	Vertical	PASS
2	3988.45	51.28	6.46	68.2	16.92	Peak	11.8	150	Vertical	PASS
3	5190.42	102.84	10.83	68.2	-34.64	Peak	39.8	150	Vertical	N/A
4	7064.29	44.54	13.20	68.2	23.66	Peak	353.2	150	Vertical	PASS
5	9642.75	41.98	15.33	68.2	26.22	Peak	329.8	150	Vertical	PASS
6	10371.50	47.58	17.05	68.2	20.62	Peak	345.4	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band I 802.11ac40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2278.75	52.16	1.57	68.2	16.04	Peak	132.2	150	Horizontal	PASS
2	3986.56	52.42	6.55	68.2	15.78	Peak	187.3	150	Horizontal	PASS
3	5210.52	102.44	10.86	68.2	-34.24	Peak	274.8	150	Horizontal	N/A
4	7046.29	44.27	13.08	68.2	23.93	Peak	274.9	150	Horizontal	PASS
5	9378.75	46.08	17.04	68.2	22.12	Peak	294.2	150	Horizontal	PASS
6	11576.00	45.63	16.62	68.2	22.57	Peak	206.4	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band I 802.11ac40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2281.09	51.63	1.63	68.2	16.57	Peak	93.6	150	Vertical	PASS
2	4284.32	51.81	6.52	68.2	16.39	Peak	68	150	Vertical	PASS
3	5230.97	106.07	10.84	68.2	-37.87	Peak	156.2	150	Vertical	N/A
4	7056.05	44.83	13.19	68.2	23.37	Peak	263.6	150	Vertical	PASS
5	8751.75	46.56	15.26	68.2	21.64	Peak	267.5	150	Vertical	PASS
6	10555.75	47.50	17.46	68.2	20.70	Peak	4.4	150	Vertical	PASS

1 GHz to 18 GHz, ANT V Band I 802.11ac40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2378.54	52.83	1.63	68.2	15.37	Peak	157.8	150	Horizontal	PASS
2	4187.74	53.00	6.49	68.2	15.20	Peak	172.4	150	Horizontal	PASS
3	5230.58	106.11	10.86	68.2	-37.91	Peak	19	150	Horizontal	N/A
4	7044.57	44.73	13.01	68.2	23.47	Peak	92.8	150	Horizontal	PASS
5	9480.50	43.44	15.20	68.2	24.76	Peak	72.3	150	Horizontal	PASS
6	10305.50	45.65	17.76	68.2	22.55	Peak	62.7	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band I 802.11ac80

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2281.19	51.89	1.68	68.2	16.31	Peak	45.1	150	Vertical	PASS
2	3988.95	52.31	6.52	68.2	15.89	Peak	178.5	150	Vertical	PASS
3	5210.66	101.47	10.83	68.2	-33.27	Peak	24.5	150	Vertical	N/A
4	7063.28	44.46	13.27	68.2	23.74	Peak	138.5	150	Vertical	PASS
5	9329.25	44.47	15.27	68.2	23.73	Peak	267.4	150	Vertical	PASS
6	11752.00	44.02	17.55	68.2	24.18	Peak	182.1	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band I 802.11ac80

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1980.04	53.47	1.57	68.2	14.73	Peak	54.5	150	Horizontal	PASS
2	4285.84	51.69	6.54	68.2	16.51	Peak	292	150	Horizontal	PASS
3	5210.55	101.62	10.86	68.2	-33.42	Peak	127.4	150	Horizontal	N/A
4	7046.99	44.96	12.90	68.2	23.24	Peak	239.6	150	Horizontal	PASS
5	8988.25	43.62	15.27	68.2	24.58	Peak	224.1	150	Horizontal	PASS
6	11545.75	46.89	16.66	68.2	21.31	Peak	254.8	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	2389.94	49.53	1.48	68.2	18.67	Peak	335.4	150	Vertical	PASS
2	2915.70	50.97	5.54	68.2	17.23	Peak	122.3	150	Vertical	PASS
3	5745.62	111.79	11.46	68.2	-43.59	Peak	245.5	150	Vertical	N/A
4	7012.23	44.84	12.47	68.2	23.36	Peak	270	150	Vertical	PASS
5	11494.00	57.92	18.47	68.2	10.28	Peak	289.7	150	Vertical	PASS
6	15967.75	52.86	23.25	68.2	15.34	Peak	160.6	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	2271.56	50.15	1.76	68.2	18.05	Peak	211.4	150	Horizontal	PASS
2	2879.92	52.55	6.12	68.2	15.65	Peak	171.5	150	Horizontal	PASS
3	5745.87	109.44	11.49	68.2	-41.24	Peak	216.6	150	Horizontal	N/A
4	7050.08	44.97	13.19	68.2	23.23	Peak	64.3	150	Horizontal	PASS
5	11497.75	59.50	21.72	68.2	8.70	Peak	55.3	150	Horizontal	PASS
6	17562.75	54.13	23.48	68.2	14.07	Peak	261.4	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	2390.32	49.67	1.47	68.2	18.53	Peak	26	150	Vertical	PASS
2	2915.48	52.74	5.54	68.2	15.46	Peak	189.5	150	Vertical	PASS
3	5785.27	111.42	11.51	68.2	-43.22	Peak	272.5	150	Vertical	N/A
4	7015.79	44.16	12.49	68.2	24.04	Peak	223.9	150	Vertical	PASS
5	11573.50	58.14	18.51	68.2	10.06	Peak	126.8	150	Vertical	PASS
6	15673.50	58.49	24.81	68.2	9.71	Peak	68.9	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	2273.98	49.91	1.76	68.2	18.29	Peak	112.9	150	Horizontal	PASS
2	2881.46	52.29	6.31	68.2	15.91	Peak	129.2	150	Horizontal	PASS
3	5785.04	109.84	11.58	68.2	-41.64	Peak	167.3	150	Horizontal	N/A
4	7053.28	45.65	13.31	68.2	22.55	Peak	108.9	150	Horizontal	PASS
5	9593.25	45.73	15.20	68.2	22.47	Peak	44.1	150	Horizontal	PASS
6	11577.75	58.90	18.07	68.2	9.30	Peak	318.7	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	2388.20	49.14	1.47	68.2	19.06	Peak	58.9	150	Vertical	PASS
2	2915.42	51.64	5.54	68.2	16.56	Peak	129.7	150	Vertical	PASS
3	5825.92	111.37	11.48	68.2	-43.17	Peak	317.9	150	Vertical	N/A
4	7011.41	43.62	12.49	68.2	24.58	Peak	93.1	150	Vertical	PASS
5	11652.75	58.62	20.68	68.2	9.58	Peak	20	150	Vertical	PASS
6	16218.00	55.48	23.15	68.2	12.72	Peak	78.9	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	2272.00	48.47	1.88	68.2	19.73	Peak	108	150	Horizontal	PASS
2	2881.20	52.24	6.06	68.2	15.96	Peak	178.4	150	Horizontal	PASS
3	5825.68	109.65	11.53	68.2	-41.45	Peak	241.9	150	Horizontal	N/A
4	7056.81	45.66	13.20	68.2	22.54	Peak	178.4	150	Horizontal	PASS
5	8647.25	43.37	14.66	68.2	24.83	Peak	263.1	150	Horizontal	PASS
6	11650.25	57.61	17.52	68.2	10.59	Peak	113.8	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band IV 802.11ac20 Low Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2389.25	49.52	1.49	68.2	18.68	Peak	344.1	150	Vertical	PASS
2	2913.01	52.20	5.54	68.2	16.00	Peak	91.2	150	Vertical	PASS
3	5745.14	112.33	11.55	68.2	-44.13	Peak	51.4	150	Vertical	N/A
4	7005.04	45.07	12.49	68.2	23.13	Peak	67.2	150	Vertical	PASS
5	11492.25	57.72	18.04	68.2	10.48	Peak	154.6	150	Vertical	PASS
6	16677.25	51.39	25.43	68.2	16.81	Peak	334.7	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band IV 802.11ac20 Low Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2270.64	49.20	1.88	68.2	19.00	Peak	280.8	150	Horizontal	PASS
2	2879.21	52.07	6.06	68.2	16.13	Peak	7.5	150	Horizontal	PASS
3	5745.53	109.23	11.53	68.2	-41.03	Peak	260.8	150	Horizontal	N/A
4	7057.70	44.53	13.26	68.2	23.67	Peak	305.5	150	Horizontal	PASS
5	11496.00	56.80	18.60	68.2	11.40	Peak	247.8	150	Horizontal	PASS
6	17180.50	55.91	21.77	68.2	12.29	Peak	301.8	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band IV 802.11ac20 Middle Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2386.36	49.63	1.45	68.2	18.57	Peak	243.9	150	Vertical	PASS
2	2913.25	50.85	5.54	68.2	17.35	Peak	170.1	150	Vertical	PASS
3	5785.32	111.03	11.49	68.2	-42.83	Peak	225.2	150	Vertical	N/A
4	7009.17	43.75	12.52	68.2	24.45	Peak	249.2	150	Vertical	PASS
5	11572.75	57.45	17.46	68.2	10.75	Peak	265.1	150	Vertical	PASS
6	15580.00	56.69	20.87	68.2	11.51	Peak	159	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band IV 802.11ac20 Middle Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2273.12	49.18	1.69	68.2	19.02	Peak	137.8	150	Horizontal	PASS
2	2879.47	52.73	6.31	68.2	15.47	Peak	199.2	150	Horizontal	PASS
3	5785.81	108.38	11.55	68.2	-40.18	Peak	56.3	150	Horizontal	N/A
4	7050.72	44.02	13.13	68.2	24.18	Peak	141.1	150	Horizontal	PASS
5	9455.75	44.08	15.03	68.2	24.12	Peak	99	150	Horizontal	PASS
6	11578.00	57.50	18.46	68.2	10.70	Peak	296.1	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band IV 802.11ac20 High Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2388.17	49.67	1.47	68.2	18.53	Peak	37.8	150	Vertical	PASS
2	2915.41	52.53	5.54	68.2	15.67	Peak	358.8	150	Vertical	PASS
3	5825.42	110.50	11.48	68.2	-42.30	Peak	331	150	Vertical	N/A
4	7005.60	45.41	12.47	68.2	22.79	Peak	32.3	150	Vertical	PASS
5	11653.00	57.30	18.30	68.2	10.90	Peak	113.2	150	Vertical	PASS
6	16240.00	52.58	26.02	68.2	15.62	Peak	190.9	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band IV 802.11ac20 High Channel

No	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2271.14	48.97	1.76	68.2	19.23	Peak	242.6	150	Horizontal	PASS
2	2879.07	52.05	6.36	68.2	16.15	Peak	356.7	150	Horizontal	PASS
3	5825.27	108.73	11.53	68.2	-40.53	Peak	132.2	150	Horizontal	N/A
4	7060.18	44.57	13.26	68.2	23.63	Peak	62.3	150	Horizontal	PASS
5	9002.00	43.71	15.33	68.2	24.49	Peak	188	150	Horizontal	PASS
6	11657.00	58.07	17.50	68.2	10.13	Peak	149.9	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band IV 802.11ac40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2390.03	50.39	1.43	68.2	17.81	Peak	173.4	150	Vertical	PASS
2	2723.65	51.55	4.56	68.2	16.65	Peak	303.8	150	Vertical	PASS
3	5755.40	110.31	11.75	68.2	-42.11	Peak	336.6	150	Vertical	N/A
4	7016.09	44.51	12.62	68.2	23.69	Peak	39.1	150	Vertical	PASS
5	9422.75	45.11	16.29	68.2	23.09	Peak	332.3	150	Vertical	PASS
6	11514.75	56.66	17.52	68.2	11.54	Peak	143.8	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band IV 802.11ac40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2389.02	51.64	1.43	68.2	16.56	Peak	296	150	Horizontal	PASS
2	2725.21	51.47	4.57	68.2	16.73	Peak	205.6	150	Horizontal	PASS
3	5775.15	110.53	11.73	68.2	-42.33	Peak	320.9	150	Horizontal	N/A
4	7026.34	44.86	12.67	68.2	23.34	Peak	29.2	150	Horizontal	PASS
5	9266.00	45.56	16.49	68.2	22.64	Peak	249.1	150	Horizontal	PASS
6	11515.25	56.90	18.30	68.2	11.30	Peak	291.6	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band IV 802.11ac40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2391.61	51.16	1.39	68.2	17.04	Peak	267.5	150	Vertical	PASS
2	2724.45	52.60	4.58	68.2	15.60	Peak	68.9	150	Vertical	PASS
3	5795.77	109.25	11.75	68.2	-41.05	Peak	13.3	150	Vertical	N/A
4	7022.20	44.49	12.56	68.2	23.71	Peak	307.3	150	Vertical	PASS
5	8710.50	44.91	15.24	68.2	23.30	Peak	256.5	150	Vertical	PASS
6	11596.75	56.40	17.23	68.2	11.80	Peak	25.6	150	Vertical	PASS

1 GHz to 18 GHz, ANT V Band IV 802.11ac40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2391.08	50.68	1.39	68.2	17.52	Peak	353.4	150	Horizontal	PASS
2	2725.34	51.14	4.58	68.2	17.06	Peak	5.5	150	Horizontal	PASS
3	5795.29	109.20	11.75	68.2	-41.00	Peak	207.1	150	Horizontal	N/A
4	7028.45	44.49	12.52	68.2	23.71	Peak	345.7	150	Horizontal	PASS
5	8518.00	44.74	16.35	68.2	23.46	Peak	169.4	150	Horizontal	PASS
6	11596.25	55.75	17.58	68.2	12.45	Peak	45	150	Horizontal	PASS

1 GHz to 18 GHz, ANT V Band IV 802.11ac80

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2395.22	49.38	1.30	68.2	18.82	Peak	222	150	Vertical	PASS
2	2884.62	51.29	6.53	68.2	16.91	Peak	266.2	150	Vertical	PASS
3	5775.77	105.67	11.74	68.2	-37.47	Peak	123.9	150	Vertical	N/A
4	7042.83	45.26	12.78	68.2	22.94	Peak	337.4	150	Vertical	PASS
5	9541.00	44.52	15.13	68.2	23.68	Peak	95.4	150	Vertical	PASS
6	11553.50	54.44	17.52	68.2	13.76	Peak	204.4	150	Vertical	PASS

1 GHz to 18 GHz, ANT H Band IV 802.11ac80

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2395.71	49.49	1.33	68.2	18.71	Peak	192.5	150	Horizontal	PASS
2	2880.33	53.01	6.55	68.2	15.19	Peak	357.4	150	Horizontal	PASS
3	5775.74	103.82	11.76	68.2	-35.62	Peak	109.6	150	Horizontal	N/A
4	7042.12	44.58	12.81	68.2	23.62	Peak	104.6	150	Horizontal	PASS
5	8892.00	45.39	15.84	68.2	22.81	Peak	336.8	150	Horizontal	PASS
6	11553.50	55.33	17.40	68.2	12.87	Peak	30.4	150	Horizontal	PASS

Test Frequency: 18 GHz ~ 40 GHz

Note: Only noise floor was seen above 18 GHz and not reported.

A.7.2 Band Edge (Restricted-band)

Note: Test plots please refer to the document “Annex No.: BL-SZ1680175-604 Data Part 5.pdf”.

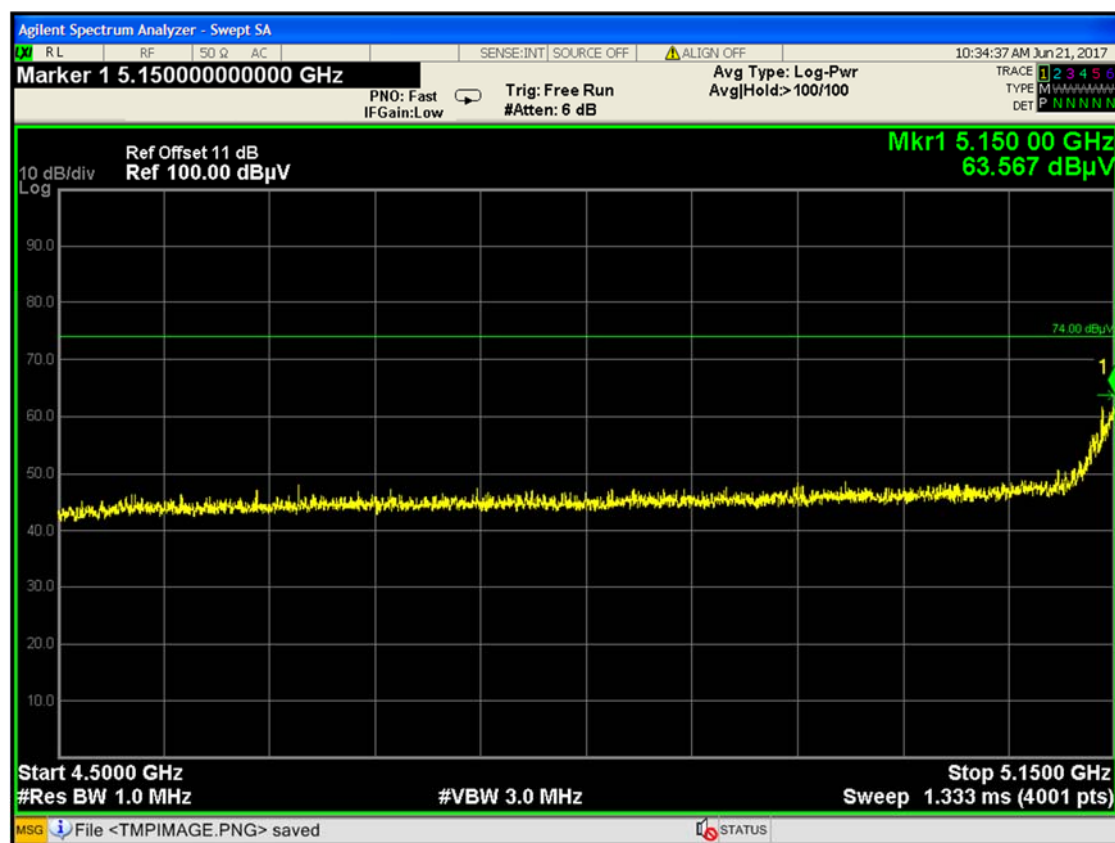
Test Band	Mode	Channel	Verdict
Band I	802.11a	Low	Pass
		High	Pass
	802.11ac(HT20)	Low	Pass
		High	Pass
	802.11ac(HT40)	Low	Pass
		High	Pass
	802.11ac(HT80)	---	Pass
Band IV	802.11a	Low	Pass
		High	Pass
	802.11ac(HT20)	Low	Pass
		High	Pass
	802.11ac(HT40)	Low	Pass
		High	Pass
	802.11ac(HT80)	---	Pass

Test Plots

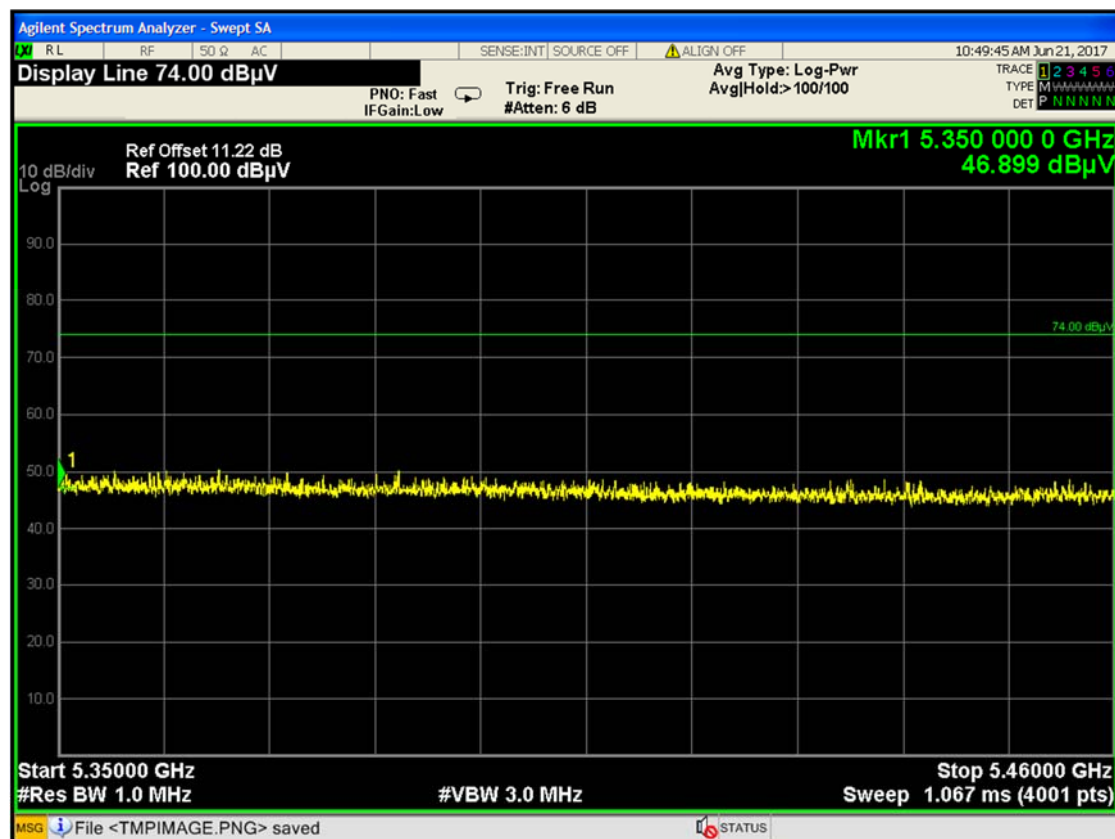
Band I 11a CH36, AV



Band I 11a CH36, Peak



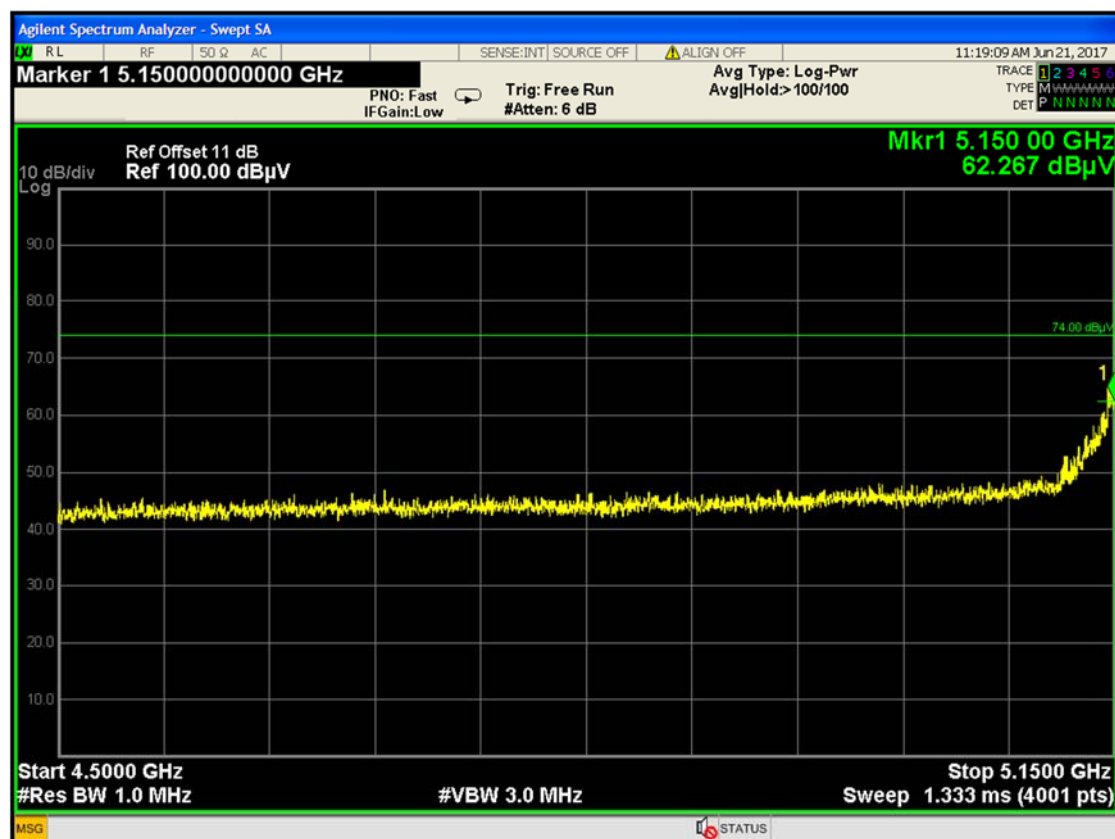
Band I 11a CH48



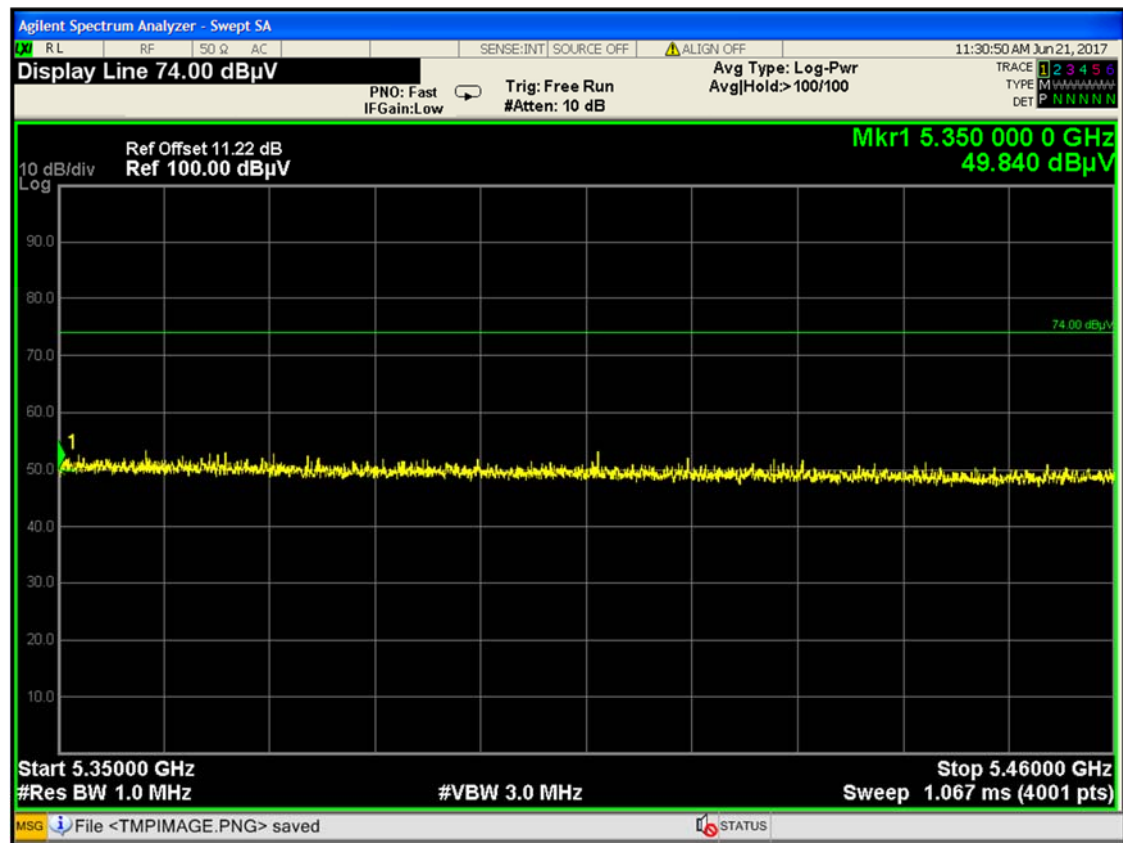
Band I 11ac(HT20) CH36 AV



Band I 11ac(HT20) CH36 Peak

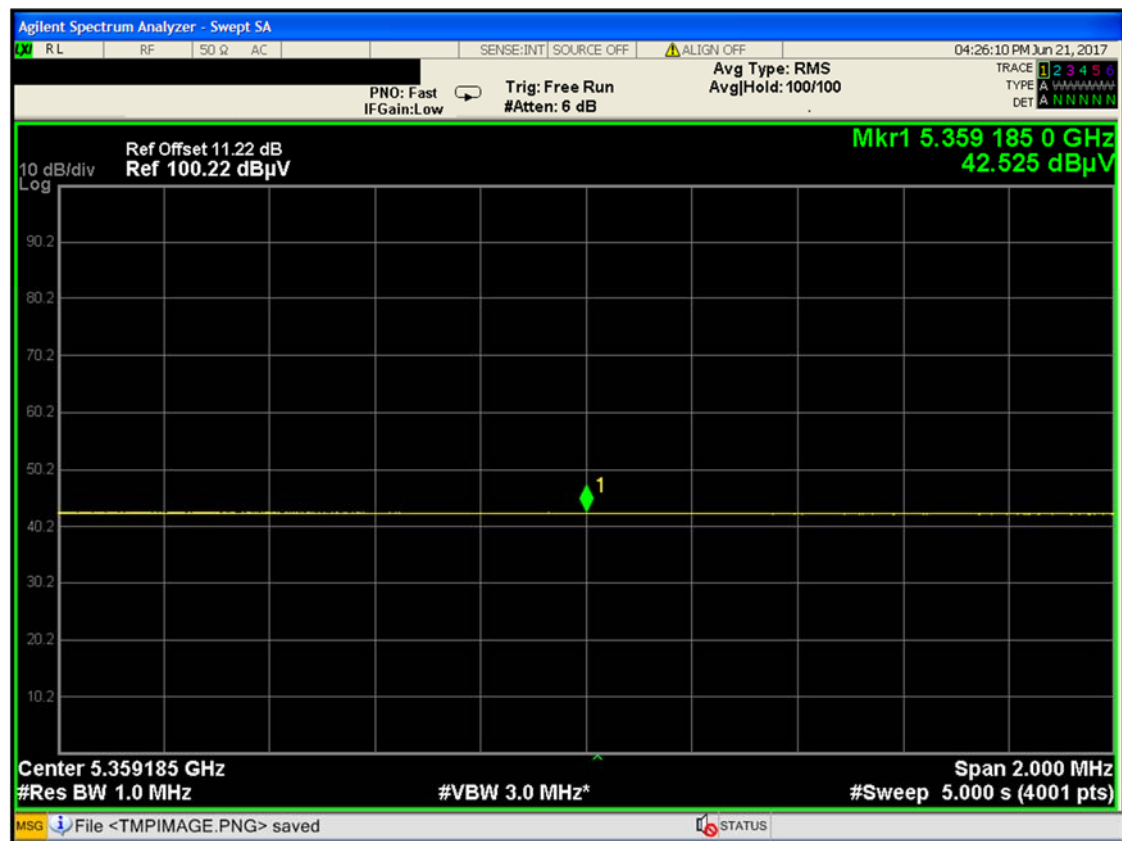
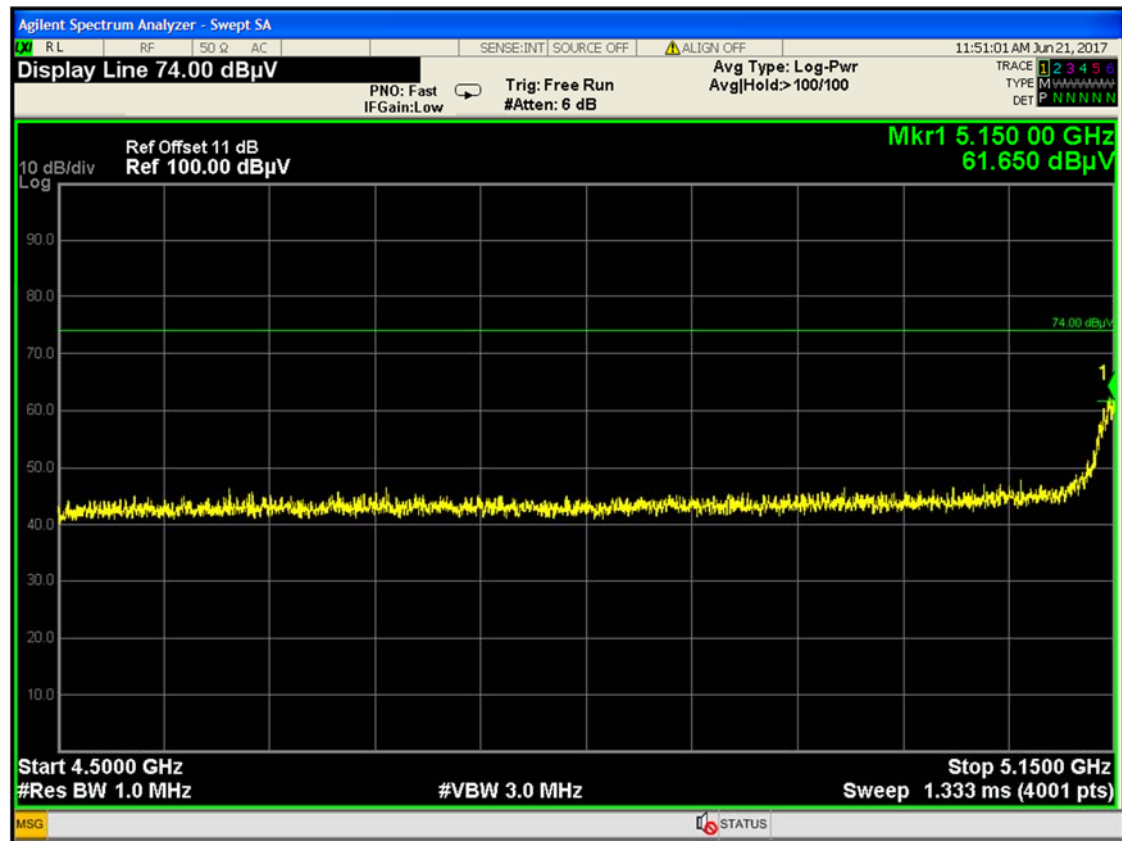


Band I 11ac(HT20) CH48

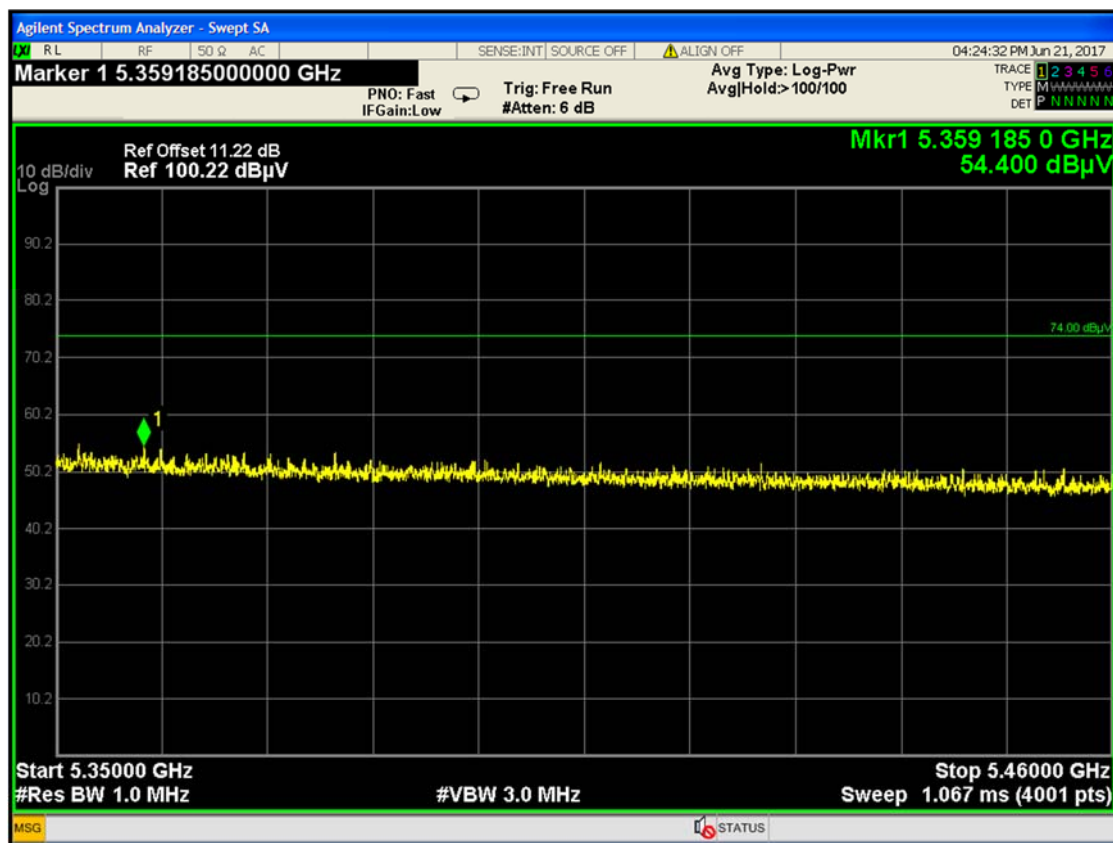


Band I 11ac(HT40) CH38 AV





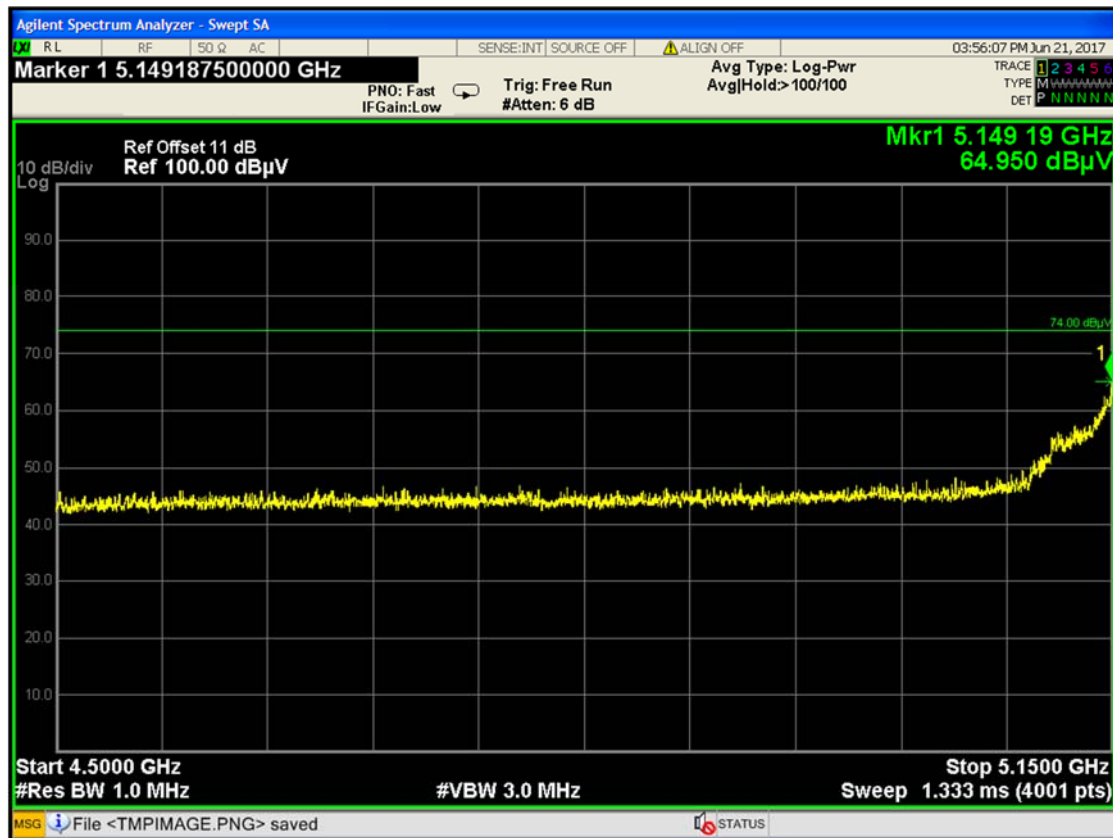
Band I 11ac(HT40) CH46 Peak



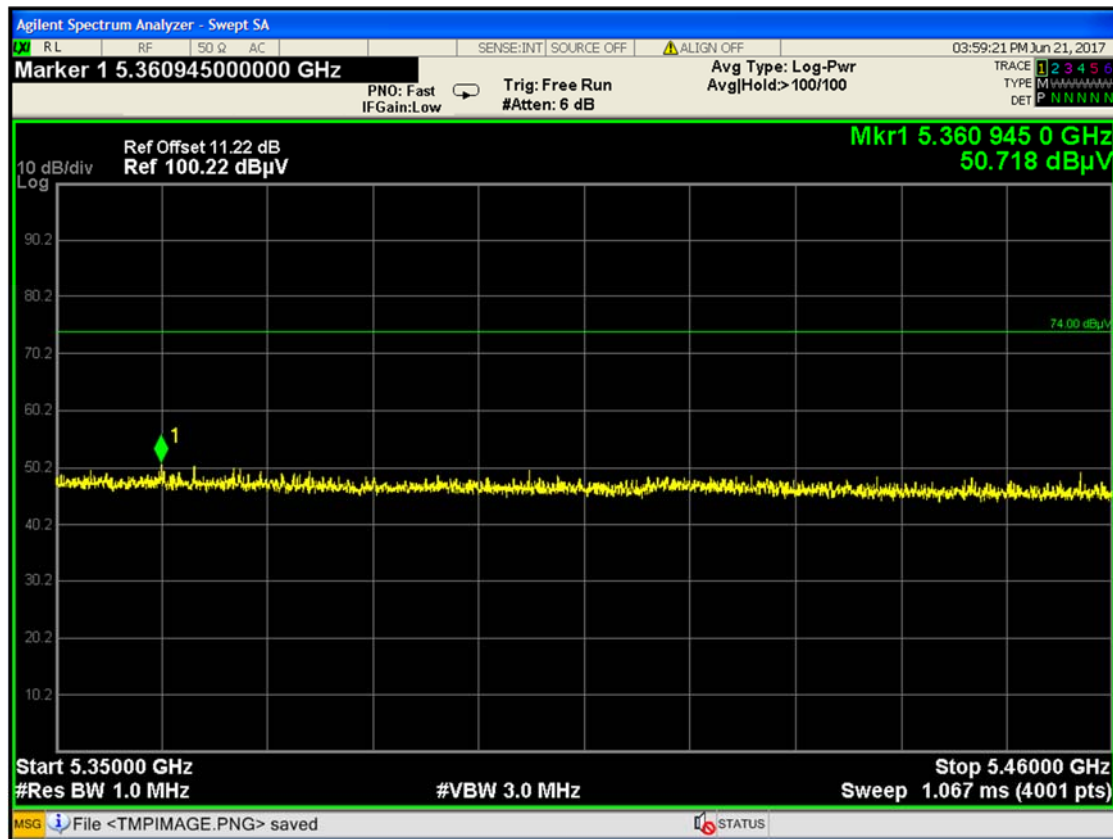
Left Band I 11ac(HT80) CH42 AV



Left Band I 11ac(HT80) CH42 Peak



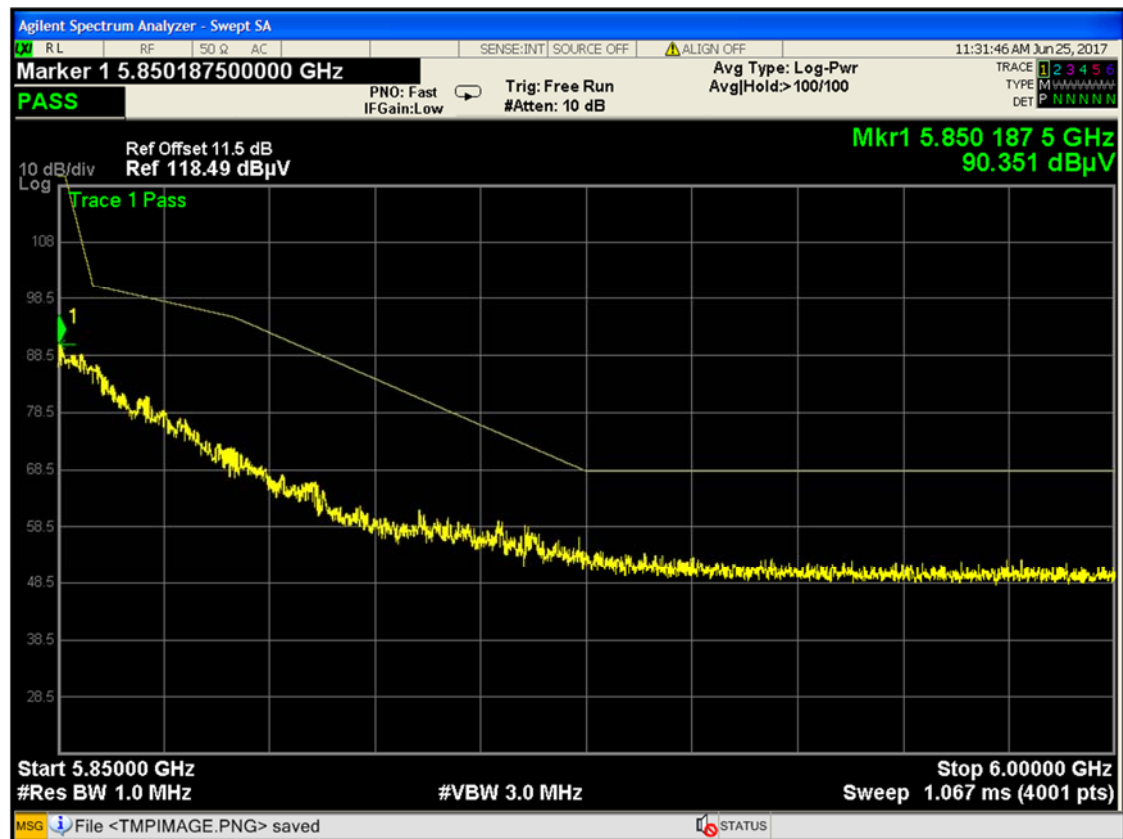
Right Band I 11ac(HT80) CH42 Peak



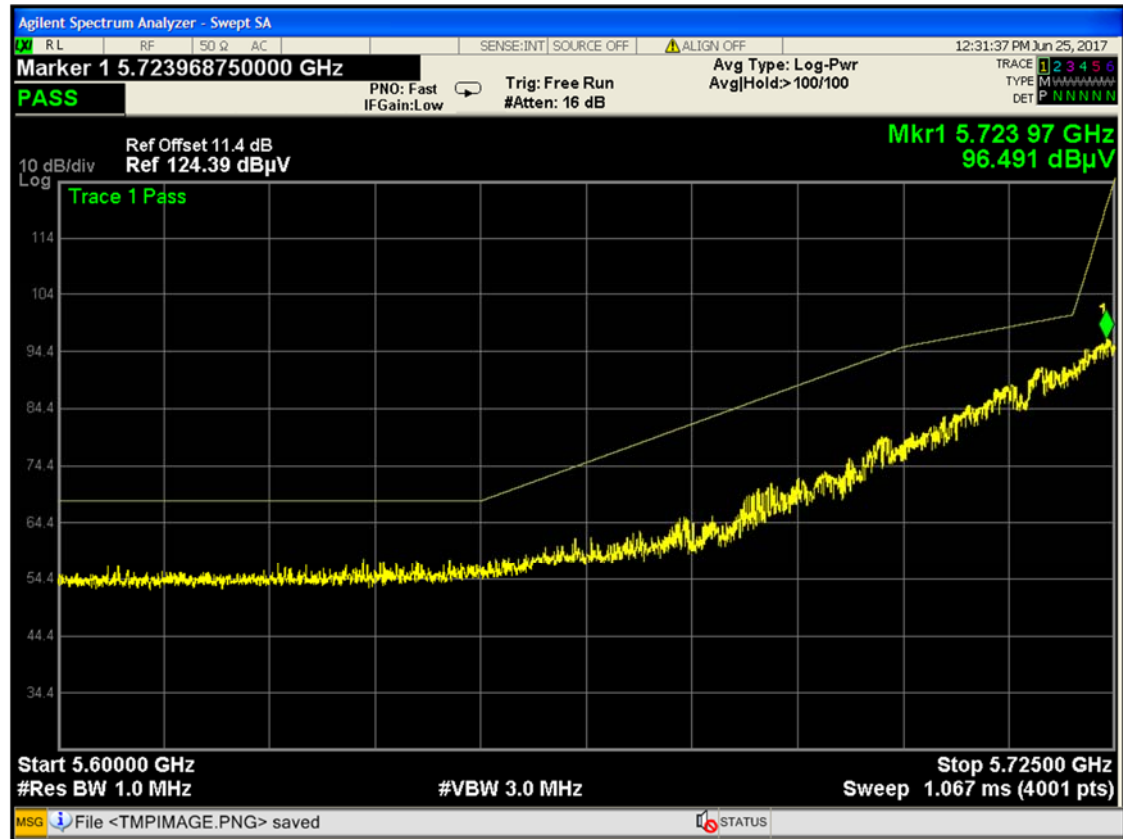
Band IV 11a CH149



Band IV 11a CH165



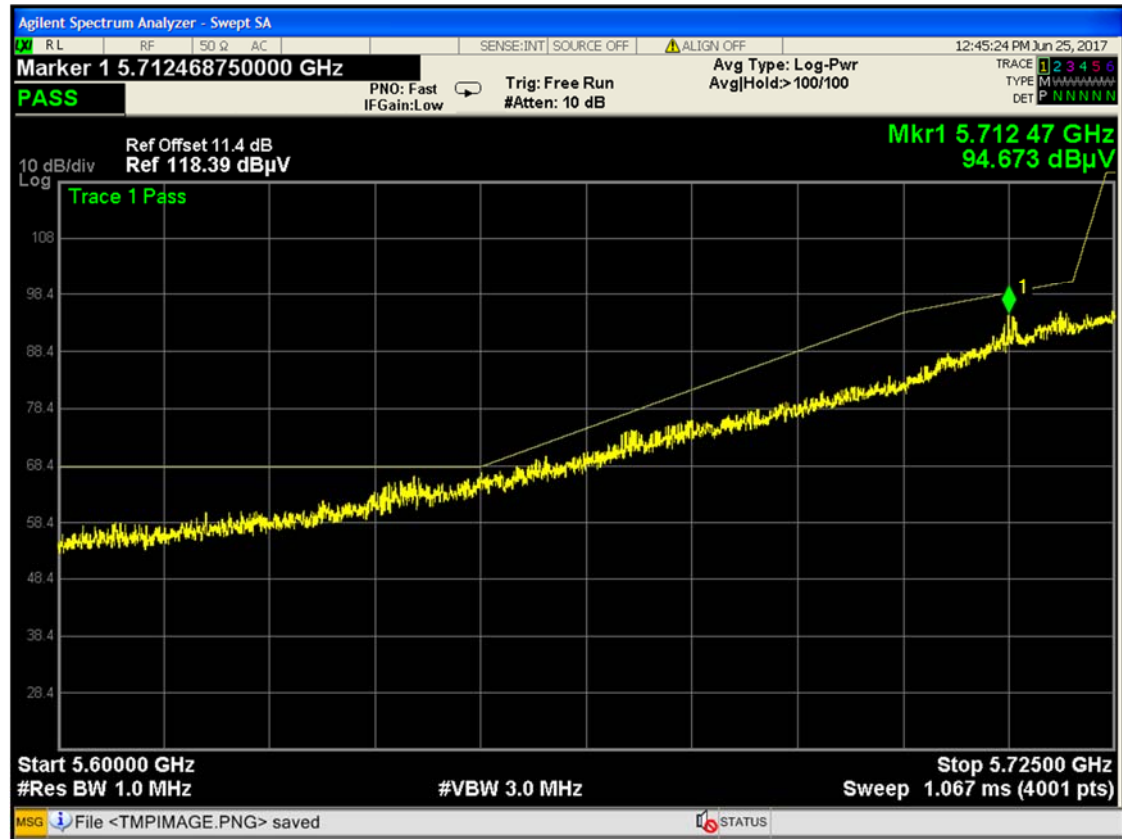
Band IV 11ac(HT20) CH149



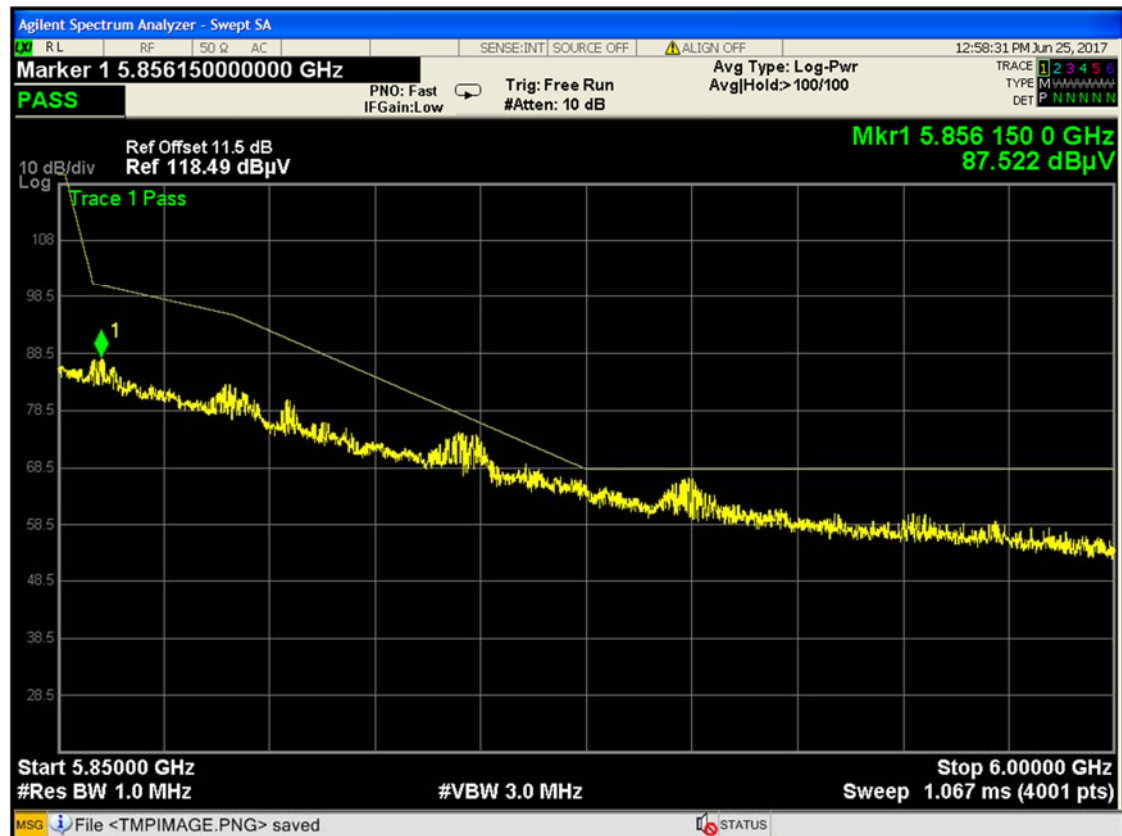
Band IV 11ac(HT20) CH165



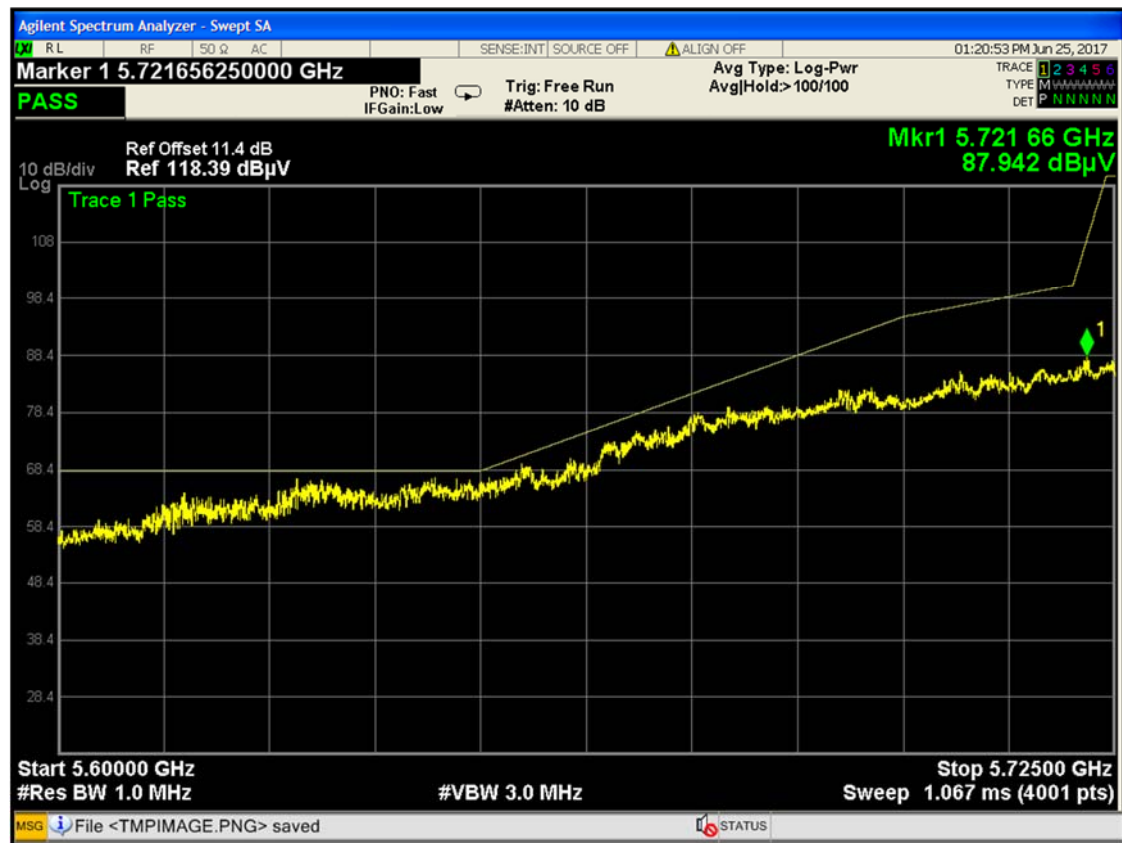
Band IV 11ac(HT40) CH151



Band IV 11ac(HT40) CH159



Left Band IV 11ac(HT80) CH155



Right Band IV 11ac(HT80) CH155



est Data and Plot

A.8 Frequency Stability

Measurement Data (the worst channel)

Voltage vs. Frequency Stability (5180 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
TEMP. (°C)	Voltage (Vac)		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	100	5180	5180.044653	8.62	5179.965762	-6.61	5179.98599	-2.70	5179.973835	-5.05
	110	5180	5180.047045	9.08	5180.002506	0.48	5179.979654	-3.93	5179.965258	-6.71
	120	5180	5179.980286	-3.81	5180.03623	6.99	5179.97036	-5.72	5179.973075	-5.20

Temperature vs. Frequency Stability (5180 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
Voltage (Vac)	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)
110	-10	5180	5180.046488	8.97	5180.046514	8.98	5180.055937	10.80	5179.968753	-6.03
	-5	5180	5180.036143	6.98	5179.975243	-4.78	5180.033672	6.50	5180.024679	4.76
	0	5180	5180.053621	10.35	5180.050254	9.70	5179.967341	-6.30	5180.034353	6.63
	5	5180	5179.970884	-5.62	5180.003484	0.67	5179.983634	-3.16	5180.052816	10.20
	10	5180	5180.01848	3.57	5179.992547	-1.44	5179.965539	-6.65	5180.031848	6.15
	15	5180	5180.041387	7.99	5180.053118	10.25	5180.009677	1.87	5180.059507	11.49
	20	5180	5180.014325	2.77	5180.052513	10.14	5180.028407	5.48	5180.03285	6.34
	30	5180	5179.977349	-4.37	5180.052982	10.23	5180.053403	10.31	5180.059082	11.41
	40	5180	5180.029352	5.67	5179.976121	-4.61	5179.998302	-0.33	5180.035825	6.92

Voltage vs. Frequency Stability (5745 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
TEMP. (°C)	Voltage (Vac)		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	100	5745	5745.012234	2.13	5745.05845	10.17	5744.995185	-0.84	5745.034674	6.04
	110	5745	5745.02847	4.96	5745.026825	4.67	5745.009087	1.58	5744.960031	-6.96
	120	5745	5745.012241	2.13	5744.973873	-4.55	5744.998677	-0.23	5744.995293	-0.82

Temperature vs. Frequency Stability (5745 MHz)

Test Conditions		Test Frequency (MHz)	0 Minute		2 Minute		5 Minute		10Minute	
Voltage (Vac)	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)
110	-10	5745	5745.033725	5.87	5744.986799	-2.30	5745.040188	7.00	5744.963525	-6.35
	-5	5745	5744.991211	-1.53	5745.039342	6.85	5745.010941	1.90	5745.012414	2.16
	0	5745	5744.98793	-2.10	5745.036835	6.41	5745.029123	5.07	5744.986666	-2.32
	5	5745	5745.001575	0.27	5745.023017	4.01	5745.023173	4.03	5745.038316	6.67
	10	5745	5745.056528	9.84	5745.028375	4.94	5744.99115	-1.54	5745.052808	9.19
	15	5745	5744.983195	-2.93	5745.014556	2.53	5745.038776	6.75	5744.981036	-3.30
	20	5745	5745.037859	6.59	5744.991238	-1.53	5744.972361	-4.81	5744.976112	-4.16
	30	5745	5745.008611	1.50	5745.04109	7.15	5744.995037	-0.86	5744.984001	-2.78
	40	5745	5744.973166	-4.67	5744.971909	-4.89	5744.962769	-6.48	5744.963388	-6.37

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1760138-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL- SZ1760138-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL- SZ1760138-AI.PDF”.

--END OF REPORT--