FCC Test Report

Report No: FCS202011056W02

Issued for

Applicant:	Guangzhou Cal-Boz Electrical Science &Technology Co., Ltd
Address:	Building A-1, No.4 Weiwu Road, Zengjiang Street, Zengcheng District, Guangzhou City,Guangdong Province, China
Product Name:	Mini computer
Brand Name:	NA
Model Name:	Z83II
Series Model:	NA
FCC ID:	2AX54-Z83II

Issued By: Flux Compliance Service Laboratory
Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Tel: 769-27280901 Fax:769-27280901 http://www.FCS-lab.com

TEST RESULT CERTIFICATION

Applicant's Name .....:	Guangzhou Cal-Boz Electrical Science &Technology Co., Ltd
Address.....:	Building A-1, No.4 Weiwu Road, Zengjiang Street, Zengcheng District, Guangzhou City,Guangdong Province, China
Manufacture's Name .....:	Guangzhou Cal-Boz Electrical Science &Technology Co., Ltd
Address.....:	Building A-1, No.4 Weiwu Road, Zengjiang Street, Zengcheng District, Guangzhou City,Guangdong Province, China

Product Description

Product Name .....:	Mini computer
Model Name.....:	Z83II
Series Model .....:	N/A
Test Standards .....:	CFR 47 FCC Part15E section 15.407
Test Procedure.....:	ANSI C63.10-2013 KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

This device described above has been tested by Flux Compliance Service Laboratory, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
This report shall not be reproduced except in full, without the written approval of Flux Compliance Service Laboratory, this document may be altered or revised by Flux Compliance Service Laboratory, personal only, and shall be noted in the revision of the document..

Date of Test ..... :

Date (s) of performance of tests :	05 Nov, 2020 ~ 19 Nov, 2020
Date of Issue ..... :	20 Nov, 2020
Test Result ..... :	Pass

Tested by : Scott Shen

(Scott Shen)

Reviewed by : Duke Qian

(Duke Qian)

Approved by :

(Kait Chen)

Table of Contents **Page**

1. SUMMARY OF TEST RESULTS **6**

1.1 TEST FACTORY 7

1.2 MEASUREMENT UNCERTAINTY 7

2. GENERAL INFORMATION **8**

2.1 GENERAL DESCRIPTION OF THE EUT 8

2.2 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 11

2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS 11

2.4 EQUIPMENTS LIST 12

3. 26DB BANDWIDTH, 6DB BANDWIDTH AND 99% BANDWIDTH **13**

3.1 LIMIT 13

3.2 TEST PROCEDURE 13

3.3 TEST SETUP 13

3.4 TEST RESULTS 14

3.5 ORIGINAL TEST DATA 17

4. CONDUCTED OUTPUT POWER **29**

4.1 LIMIT 29

4.2 TEST PROCEDURE 29

4.3 TEST SETUP 29

4.4 TEST RESULTS 30

5. POWER SPECTRAL DENSITY **34**

5.1 LIMIT 34

5.2 TEST PROCEDURE 34

5.3 TEST SETUP 35

6. DUTY CYCLE **50**

6.1 TEST REQUIREMENT 50

6.2 TEST PROCEDURE 50

6.3 TEST SETUP 50

6.4 TEST RESULTS 51

7. RADIATED EMISSION MEASUREMENT **52**

7.1 RADIATED EMISSION LIMITS 52

Table of Contents **Page**

7.2 TEST PROCEDURE 53
7.3 TESTSETUP 54
7.4 RADIATED EMISSION TEST RESULTS 56
7.5 BANDEDGE TEST RESULT 66
8. CONDUCTED SPURIOUS EMISSIONS AND BANDEDGE 74
8.1 LIMIT 74
8.2 TEST PROCEDURE 74
8.3 TEST SETUP 75
8.4 TEST RESULTS 75
9. CONDUCTED EMISSION TEST 76
10. ANTENNA REQUIREMENT 80
10.1 STANDARD REQUIREMENT 80
10.2 RESULT 80

Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	20 Nov, 2020	FCS202011056W02	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
Test procedures according to the technical standards:
§ 15.407,KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

Standard Section	Test Item	Judgment	Remark
FCC 15.407 (a) FCC 15.407 (e)	6/26db Bandwidth and 99% Bandwidth	PASS	--
FCC 15.407 (a)	Maximum Conducted Output Power	PASS	--
FCC 15.407 (a)	Power Spectral Density	PASS	--
FCC 15.407 (g)	Frequency Stability Measurement	PASS	
FCC 15.407 (b) FCC 15.209 FCC 15.205	Emissions in restricted frequency bands	PASS	
FCC 15.407 (b) FCC 15.209 FCC 15.205	Band Edge Compliance	PASS	
FCC 15.207	Power Line Conducted Emission	PASS	
FCC 15.203	Antenna requirement	PASS	--

1.1 TEST FACTORY

Company Name:	Flux Compliance Service Laboratory
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Telephone:	+86-769-27280901
Fax:	+86-769-27280901
FCC Test Firm Registration Number: 514908 Designation number: CN0127 A2LA accreditation number：5545.01	

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ±**U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.71dB
2	Unwanted Emissions, conducted	±2.988 dB
3	Conducted Emission (9KHz-150KHz)	±4.13 dB
4	Conducted Emission (150KHz-30MHz)	±4.74 dB
5	All emissions,radiated(<1G) 30MHz-1000MHz	±5.2 dB
6	All emissions,radiated 1GHz -18GHz	±4.66 dB
7	All emissions,radiated 18GHz -40GHz	±4.31 dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Mini computer
Trade Name	NA
Model Name	Z83II
Series Model	NA
Model Difference	NA
Channel List	Please refer to the Note 2.2.
Operation Frequency:	IEEE 802.11a/ n(HT20)/ac(VHT20): 5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40): 5.190GHz-5.230GHz
	IEEE 802.11a/ n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.270GHz-5.310GHz
	IEEE 802.11a/ n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.510GHz-5.670GHz
	IEEE 802.11a/ n(HT20)/ac(VHT20): 5.745GHz-5.825GHz IEEE 802.11a/ n(HT40)/ac(VHT40): 5.755GHz-5.795GHz
Modulation Type:	802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM
Max.Output Power(Conducted):	11.339 dBm
Power supply	DC 5V by adapter
Hardware version number	V1.0
Software version number	V1.0
Sample type	Protable equipment
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.

Operation Frequency of channel			
5.180GHz-5.240GHz		5.500GHz-5.720GHz	
Channel	Frequency	Channel	Frequency
36	5180	100	5500
38	5190	102	5510
40	5200	104	5520
44	5220	108	5540
46	5230	110	5550
48	5240	112	5560
		116	5580
5.260GHz-5.320GHz		118	5590
Channel	Frequency	124	5620
52	5260	126	5630
54	5270	128	5640
56	5280	132	5660
60	5300	134	5670
62	5310	136	5680
64	5320	140	5700
5.745GHz-5.825GHz			
Channel	Frequency		
149	5745		
151	5755		
153	5765		
157	5785		
159	5795		
161	5805		
165	5825		

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:
Carrier Frequency Channel
5GHz:

For 802.11a/n(HT20)/ac(VHT20)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
36	5180	52	5260
40	5200	60	5300
48	5240	64	5320

For 802.11a/n(HT20)/ac(VHT20)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
100	5500	149	5745
116	5580	157	5785
140	5700	165	5825

For 802.11 n(HT40)/ac(VHT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
38	5190	54	5270
46	5230	62	5310

For 802.11 n(HT40)/ac(VHT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
102	5510	151	5755
110	5550	159	5795
134	5670		

Remark: The EUT not support TPC function.

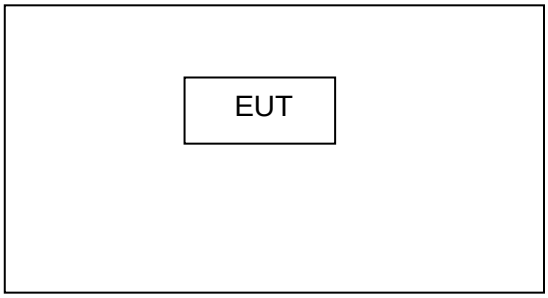
3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	Z83II	PIFA	N/A	1.44 dBi	Antenna

2.2 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & 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.

Block diagram of EUT configuration for test



Test software: the QA tool-D
The test softeware was used to control EUT work in continuous TX mode, and select test channel, Wireless mode as below table

2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
1	Adapter	n/a	n/a	NA	This adapter only test for this report.

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.4 EQUIPMENTS LIST

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2020.10.09	2021.10.08
Signal Analyzer	R&S	FSV40-N	FCS-E012	2020.10.09	2021.10.08
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2020.10.09	2021.10.08
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2020.10.26	2021.10.25
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2020.10.03	2021.10.02
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2020.10.09	2021.10.08
Pre-Amplifier(0.1M-3G Hz)	EMCI	EM330N	FCS-E004	2020.05.31	2021.05.30
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2020.10.03	2021.10.02
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2020.10.08	2021.10.07
Temperature & Humidity	HTC-1	victor	FCS-E005	2020.10.03	2021.10.02

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2020.10.03	2021.10.02
LISN	R&S	ENV216	FCS-E007	2020.10.03	2021.10.02
LISN	ETS	3810/2NM	FCS-E009	2020.10.15	2021.10.14
Temperature & Humidity	HTC-1	victor	FCS-E008	2020.10.03	2021.10.02

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
MXA SIGNAL Analyzer	Keysight	N9020A	FCS-E015	2020.10.02	2021.10.01
Spectrum Analyzer	Agilent	E4447A	MY50180039	2020.11.08	2021.11.07
Spectrum Analyzer	R&S	FSV-40	101499	2020.10.10	2021.10.09

3. 26dB Bandwidth, 6dB Bandwidth and 99% Bandwidth

3.1 LIMIT

FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Bandwidth	26 dB Bandwidth	5150-5250
	26 dB Bandwidth	5250-5350
	26 dB Bandwidth	For FCC:5470-5725 For IC:5470-5600 5650-5725
	Minimum 500kHz 6dB Bandwidth	5725-5850

3.2 TEST PROCEDURE

(1) Connect EUT’s antenna output to spectrum analyzer by RF cable.

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6dB Bandwidth: RBW=100kHz For 26dB Bandwidth: approximately 1% of the emission bandwidth.
VBW	For 6dB Bandwidth: VBW=300kHz For 26dB Bandwidth: >3RBW
Trace	Max hold
Sweep	Auto couple

(2) Allow the trace to stabilize, 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 26dB and 6dB relative to the maximum level measured in the fundamental emission.

3.3 TEST SETUP

3.4 TEST RESULTS

5150-5250MHz		
Frequency	26dB Bandwidth(MHz)	Result
802.11a		
5180	19.65	PASS
5200	19.60	PASS
5240	19.52	PASS
802.11n20		
5180	19.99	PASS
5200	20.03	PASS
5240	19.95	PASS
802.11n40		
5190	40.35	PASS
5230	40.27	PASS
802.11ac20		
5180	19.95	PASS
5200	20.04	PASS
5240	19.96	PASS
802.11ac40		
5190	40.03	PASS
5230	40.05	PASS

5250-5350MHz		
Frequency	26dB Bandwidth(MHz)	Result
802.11a		
5260	19.60	PASS
5300	19.52	PASS
5320	19.69	PASS
802.11n20		
5260	19.99	PASS
5300	19.97	PASS
5320	19.90	PASS
802.11n40		
5270	40.11	PASS
5310	40.29	PASS
802.11ac20		
5260	19.96	PASS
5300	19.91	PASS
5320	20.00	PASS
802.11ac40		

5270	40.08	PASS
5310	40.01	PASS

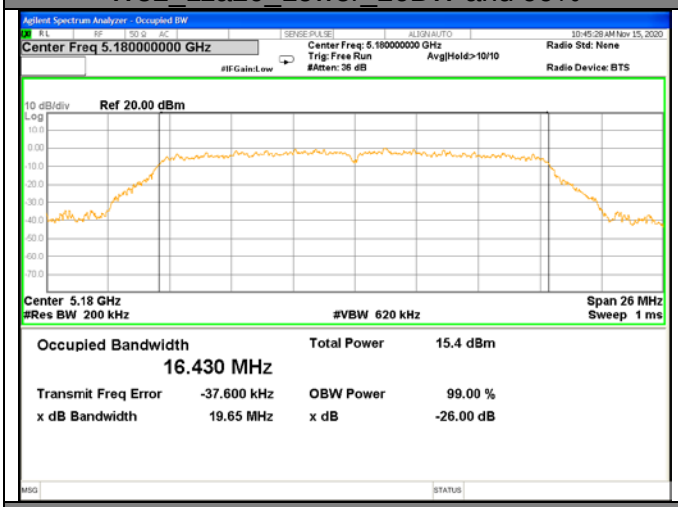
5470-5725MHz		
Frequency	26dB Bandwidth(MHz)	Result
802.11a		
5500	19.58	PASS
5580	19.56	PASS
5700	20.49	PASS
802.11n20		
5500	19.99	PASS
5580	19.93	PASS
5700	19.98	PASS
802.11n40		
5510	40.28	PASS
5550	40.30	PASS
5670	40.22	PASS
802.11ac20		
5500	19.97	PASS
5580	20.03	PASS
5700	19.98	PASS
802.11ac40		
5510	40.00	PASS
5550	40.04	PASS
5670	40.00	PASS

5725-5850MHz		
Frequency	6dB Bandwidth(MHz)	Result
802.11a		
5745	15.11	PASS
5785	15.13	PASS
5825	15.12	PASS
802.11n20		
5745	15.10	PASS
5785	15.12	PASS
5825	15.05	PASS
802.11n40		
5755	35.13	PASS
5795	35.42	PASS
802.11ac20		
5745	15.10	PASS
5785	15.12	PASS
5825	15.12	PASS
802.11ac40		
5755	35.10	PASS
5795	35.13	PASS

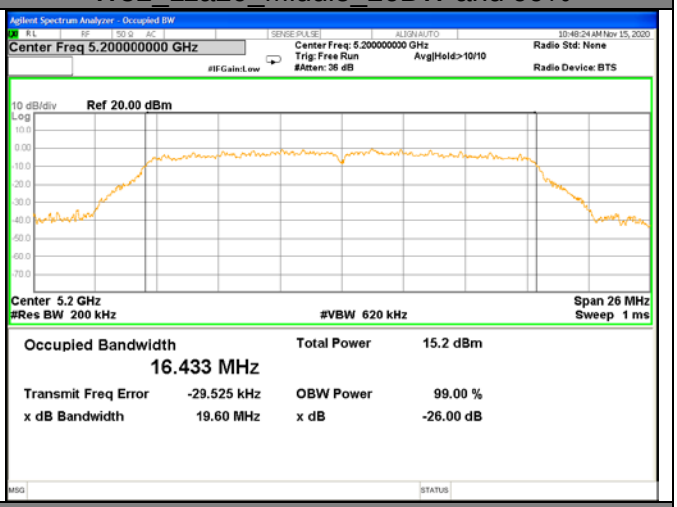
3.5 ORIGINAL TEST DATA
26BW AND 99%
WLAN_Band-1

WLAN_Band-1

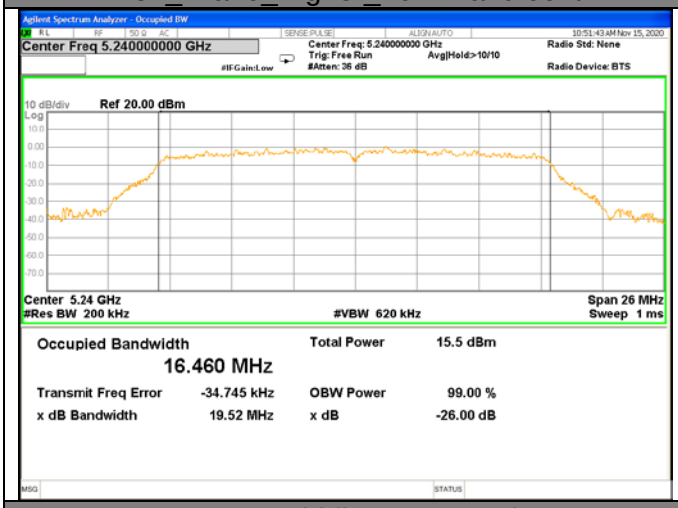
W52_11a20_Lower_26BW and 99%



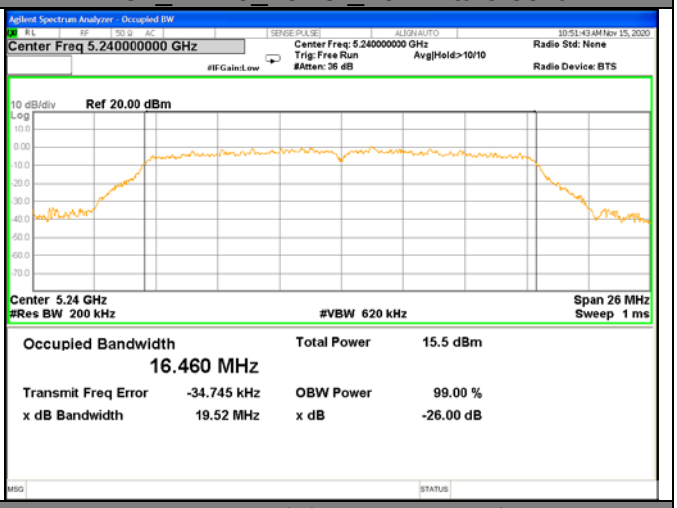
W52_11a20_Middle_26BW and 99%



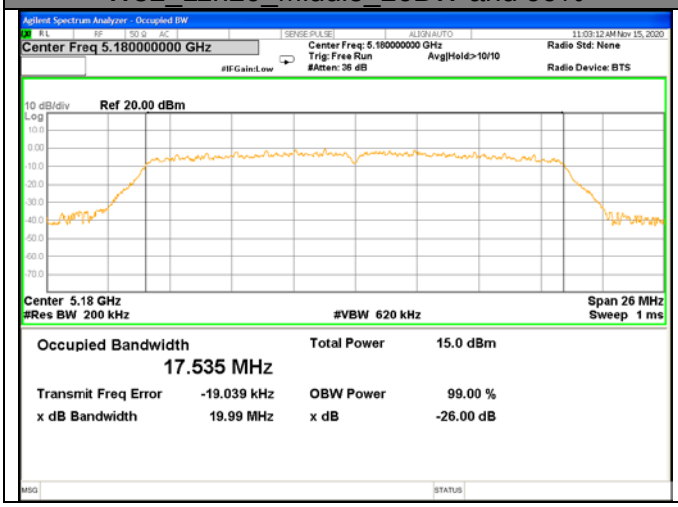
W52_11a20_Higher_26BW and 99%



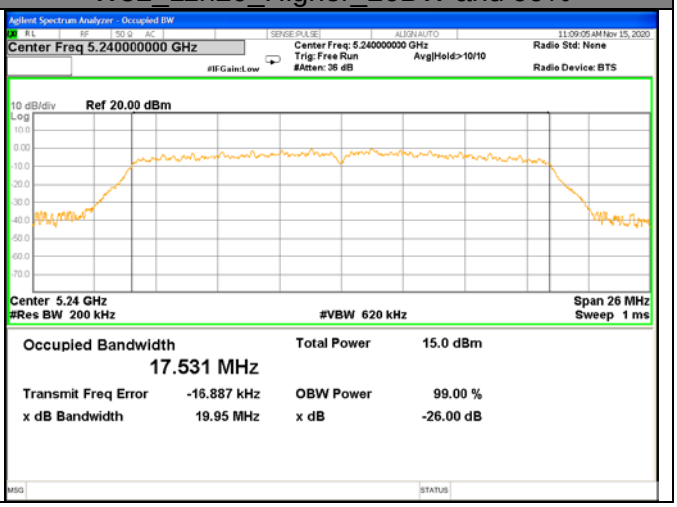
W52_11n20_Lower_26BW and 99%



W52_11n20_Middle_26BW and 99%



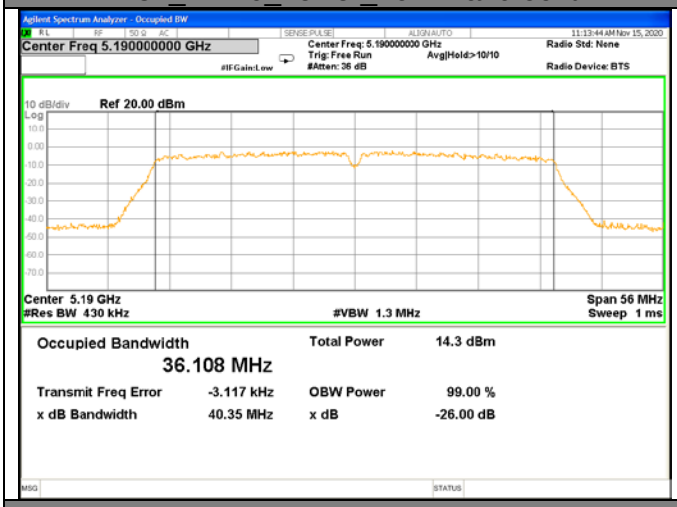
W52_11n20_Higher_26BW and 99%



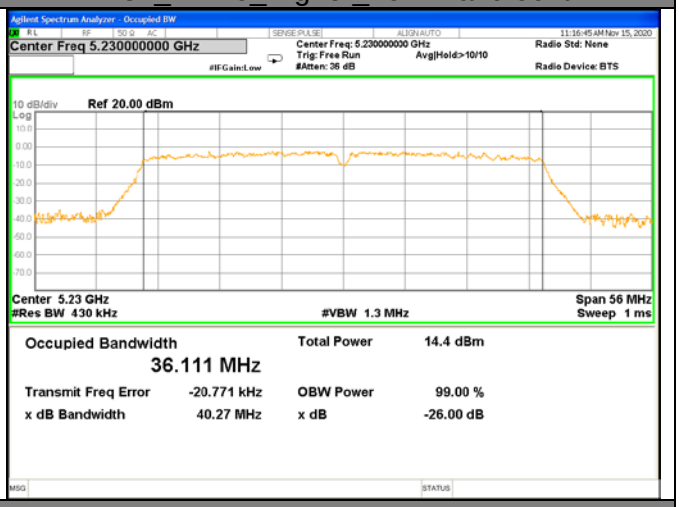
WLAN_Band-1

WLAN_Band-1

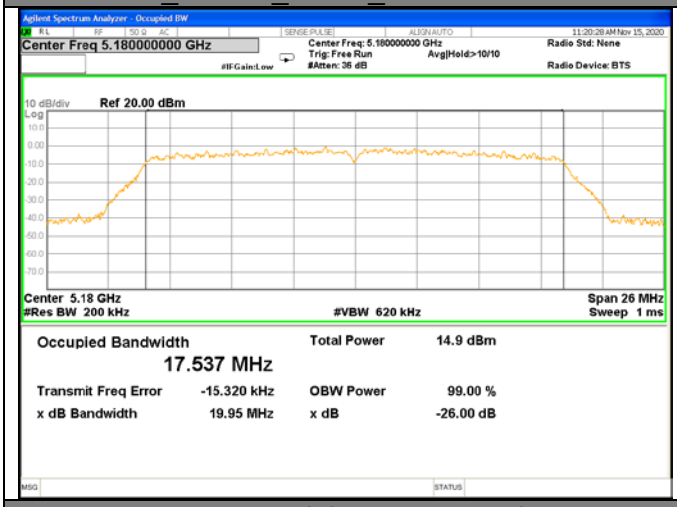
W52_11n40_Lower_26BW and 99%



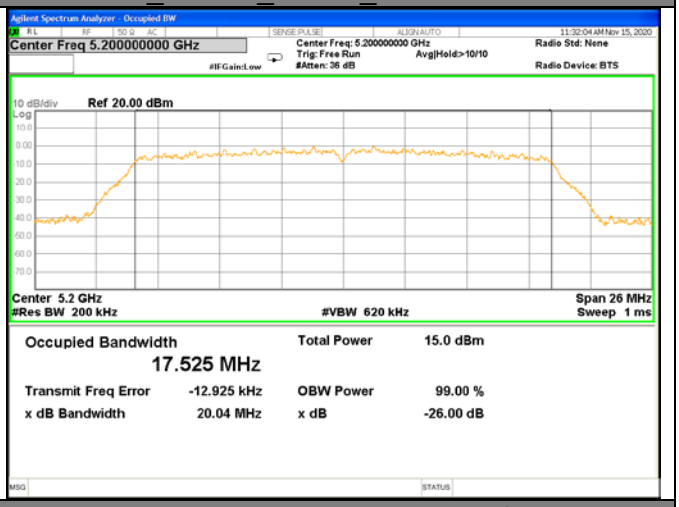
W52_11n40_Higher_26BW and 99%



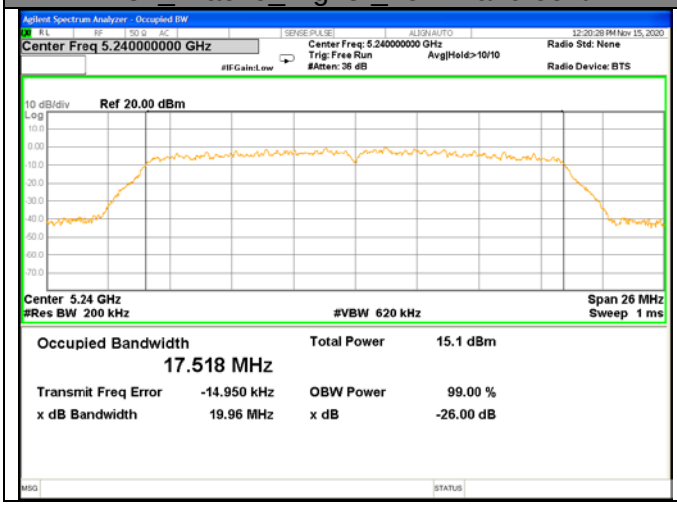
W52_11ac20_Lower_26BW and 99%



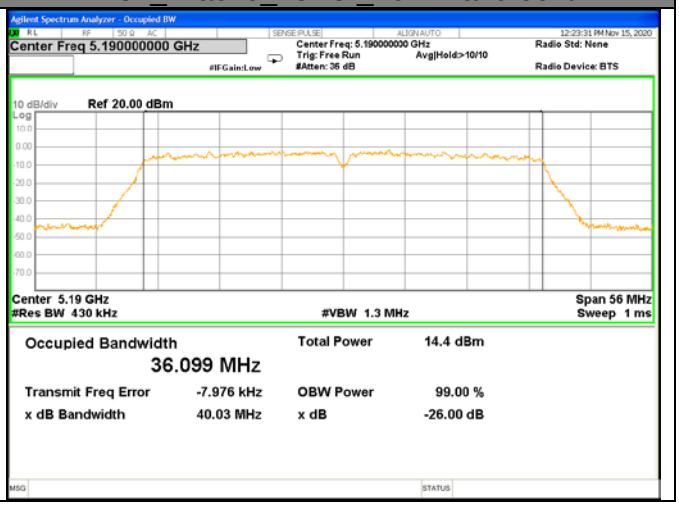
W52_11ac20_Middle_26BW and 99%



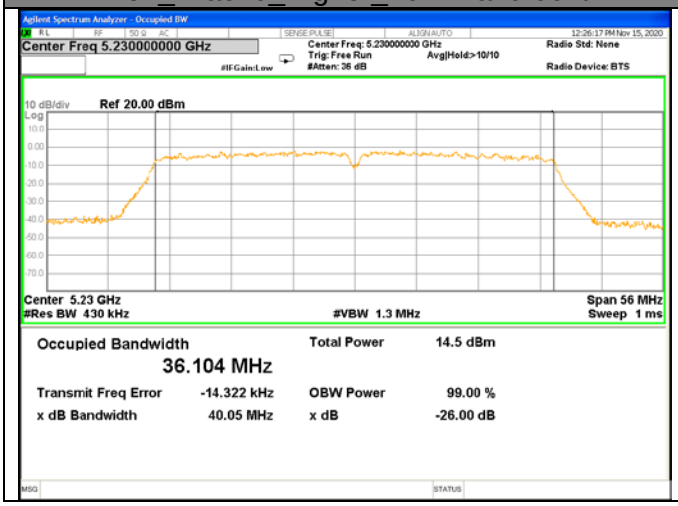
W52_11ac20_Higher_26BW and 99%



W52_11ac40_Lower_26BW and 99%



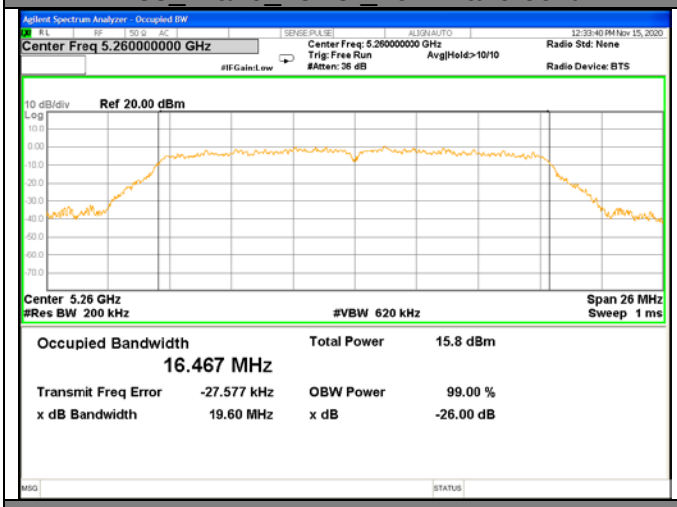
WLAN_Band-1

WLAN_Band-1	
W52_11ac40_Higher_26BW and 99%	
	

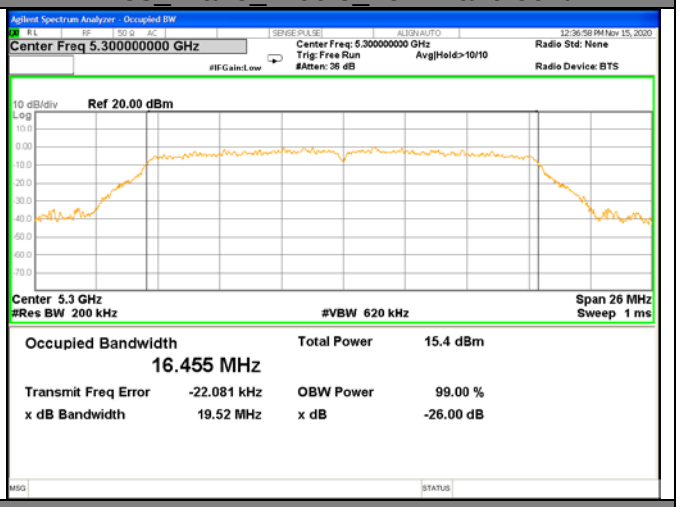
WLAN_Band-2

WLAN_Band-2

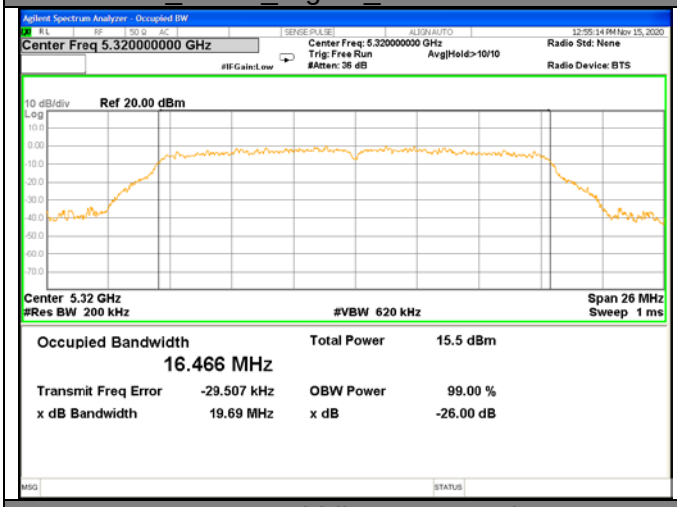
W53_11a20_Lower_26BW and 99%



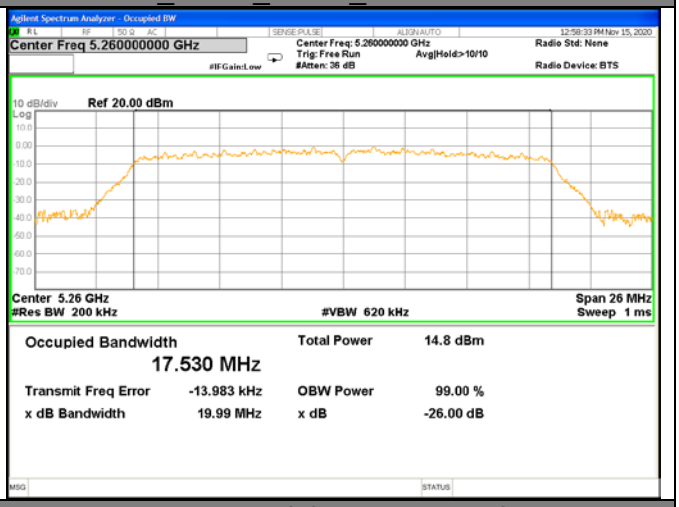
W53_11a20_Middle_26BW and 99%



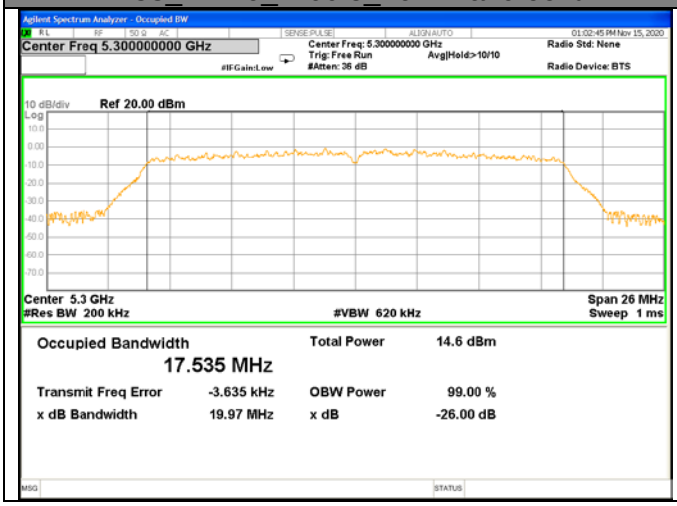
W53_11a20_Higher_26BW and 99%



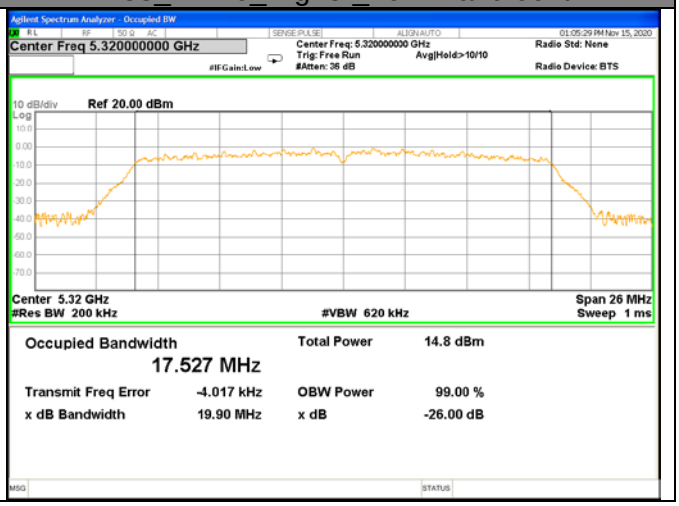
W53_11n20_Lower_26BW and 99%



W53_11n20_Middle_26BW and 99%



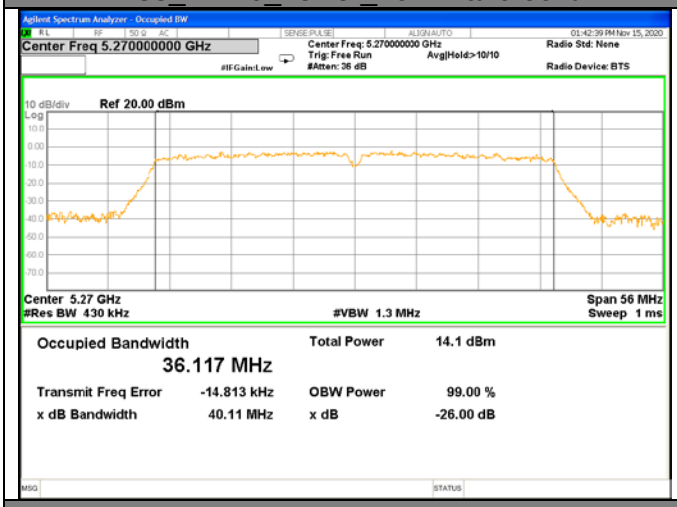
W53_11n20_Higher_26BW and 99%



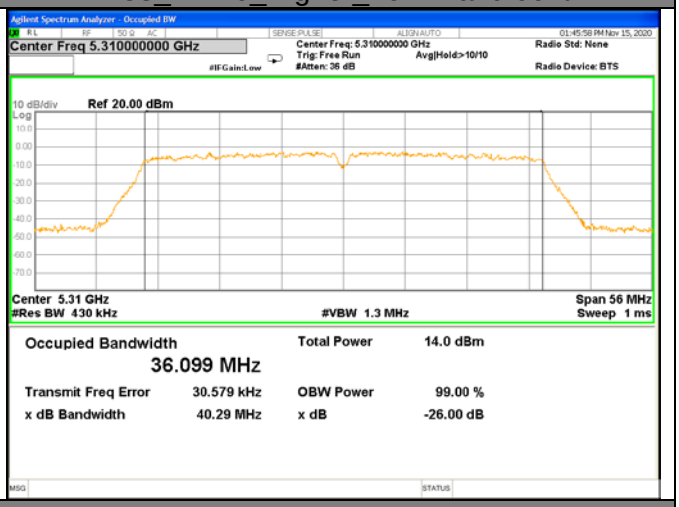
WLAN_Band-2

WLAN_Band-2

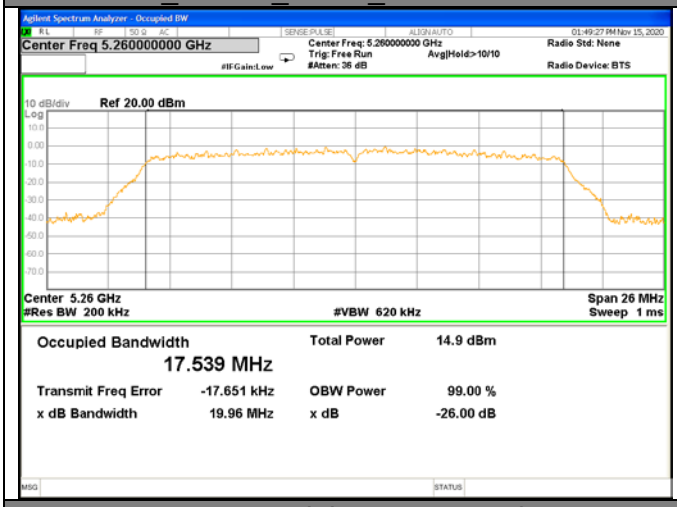
W53_11n40_Lower_26BW and 99%



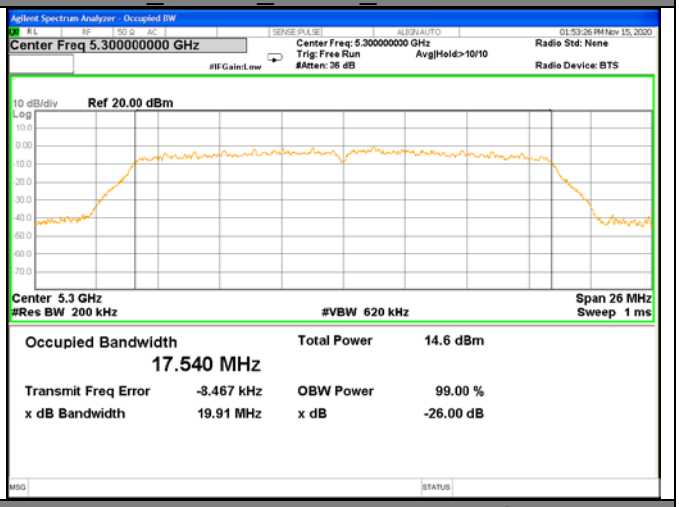
W53_11n40_Higher_26BW and 99%



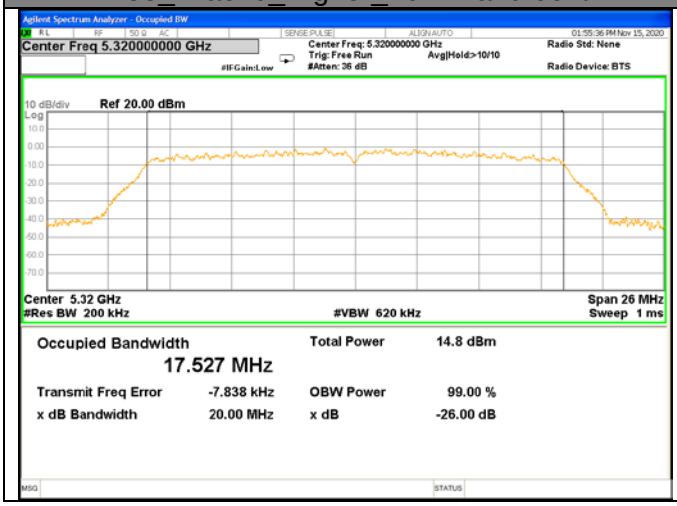
W53_11ac20_Lower_26BW and 99%



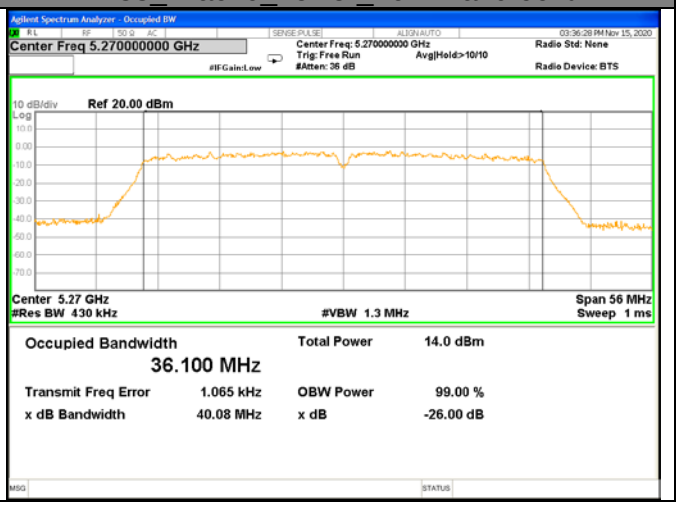
W53_11ac20_Middle_26BW and 99%



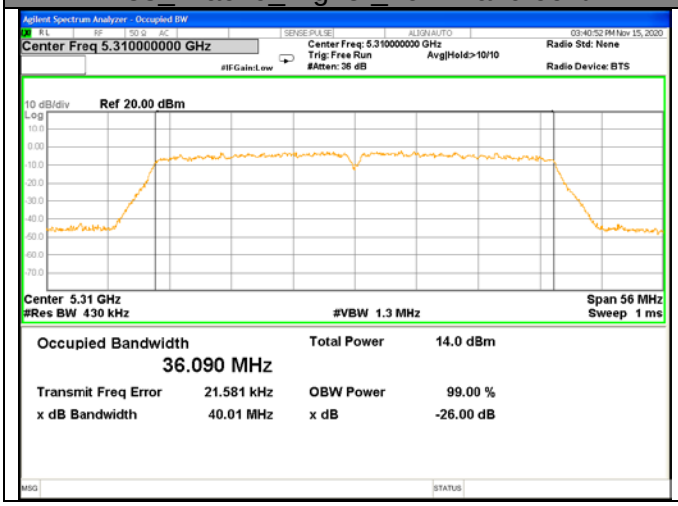
W53_11ac20_Higher_26BW and 99%



W53_11ac40_Lower_26BW and 99%



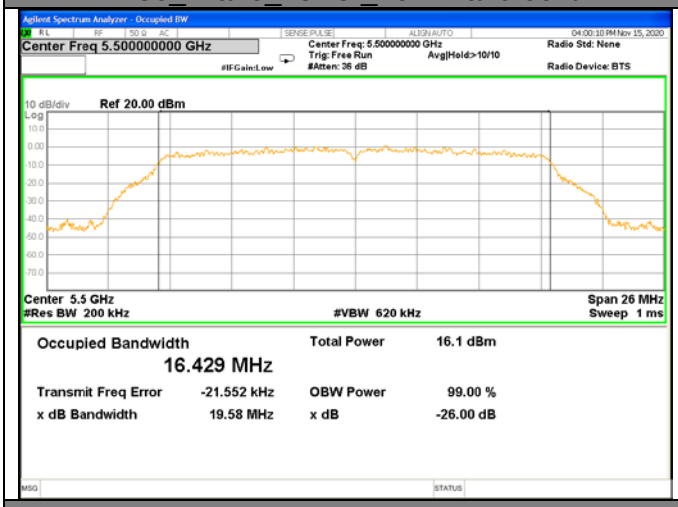
WLAN_Band-2

WLAN_Band-2	
W53_11ac40_Higher_26BW and 99%	
	

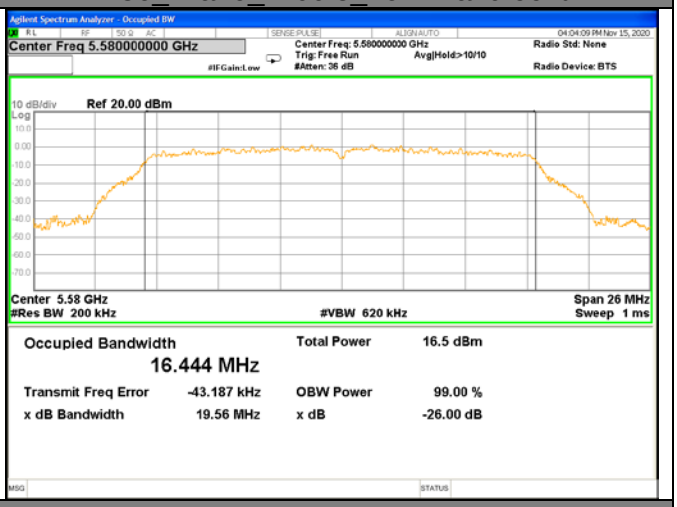
WLAN_Band-3

WLAN_Band-3

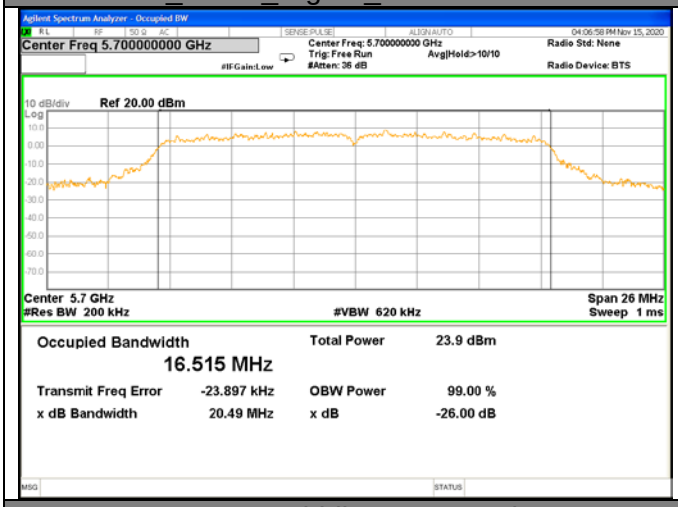
W56_11a20_Lower_26BW and 99%



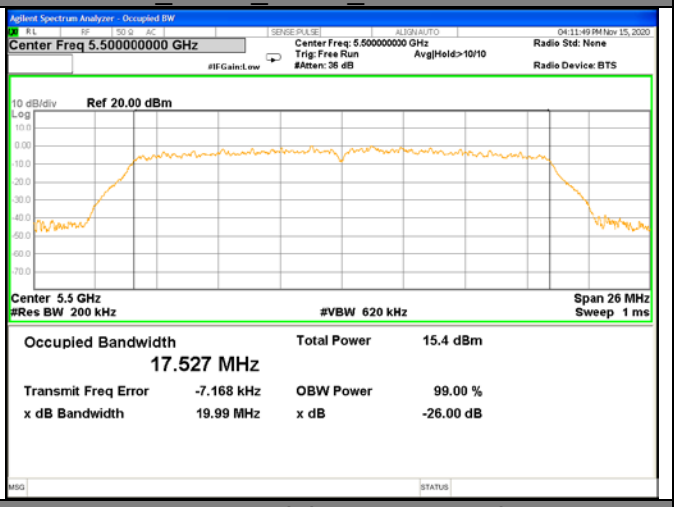
W56_11a20_Middle_26BW and 99%



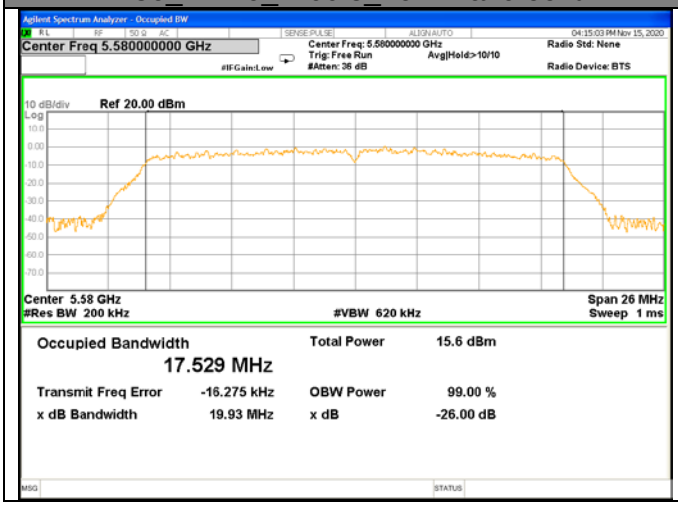
W56_11a20_Higher_26BW and 99%



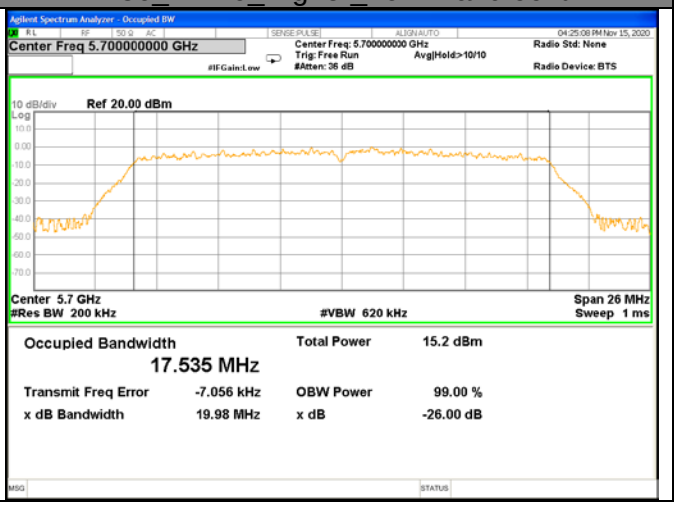
W56_11n20_Lower_26BW and 99%



W56_11n20_Middle_26BW and 99%



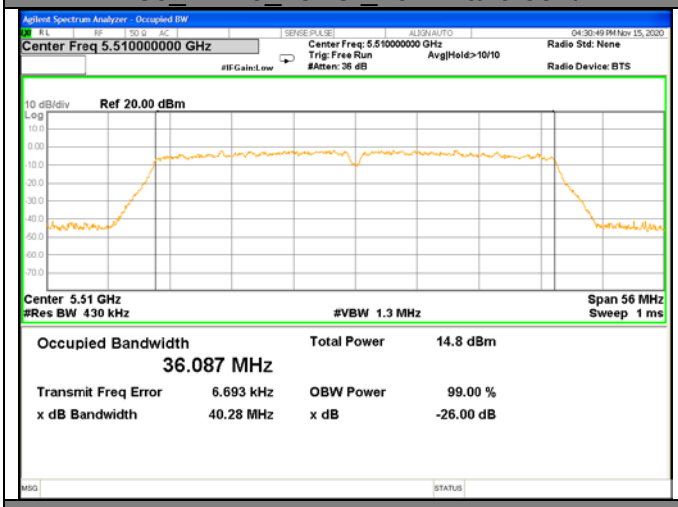
W56_11n20_Higher_26BW and 99%



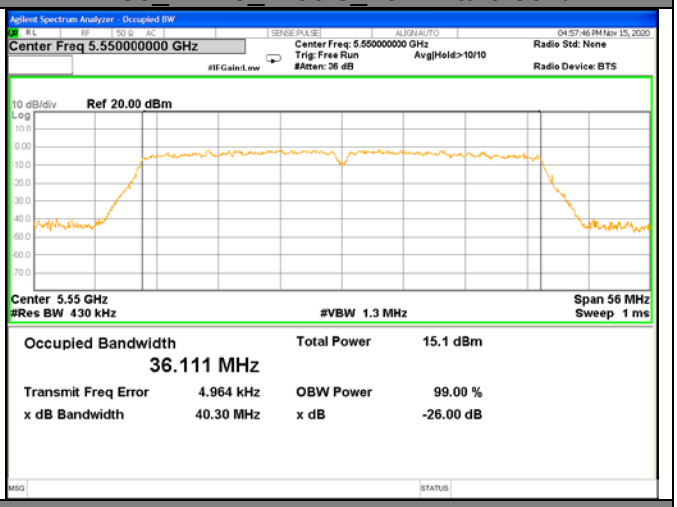
WLAN_Band-3

WLAN_Band-3

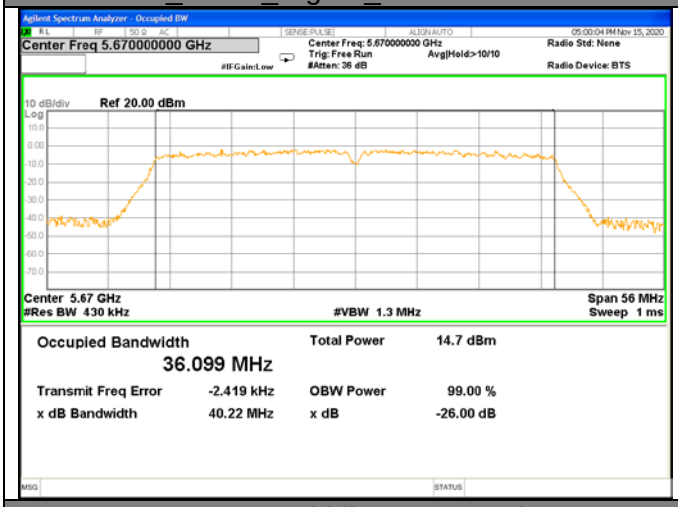
W56_11n40_Lower_26BW and 99%



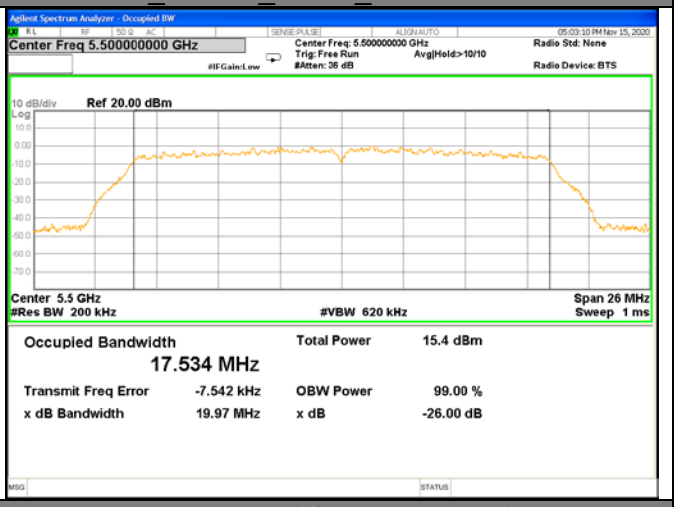
W56_11n40_Middle_26BW and 99%



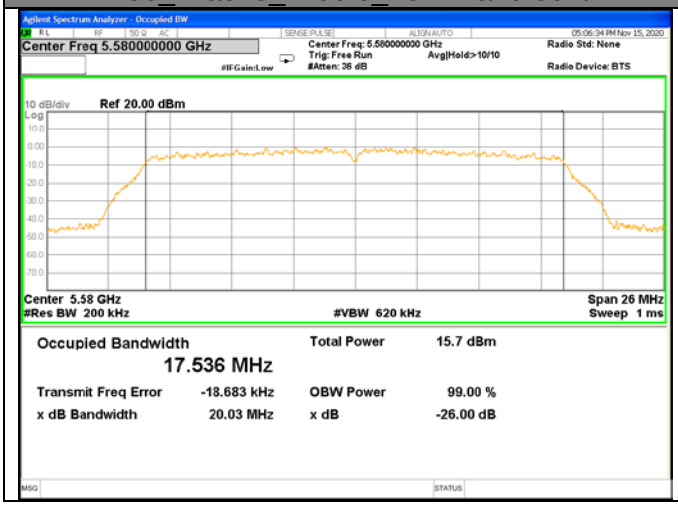
W56_11n40_Higher_26BW and 99%



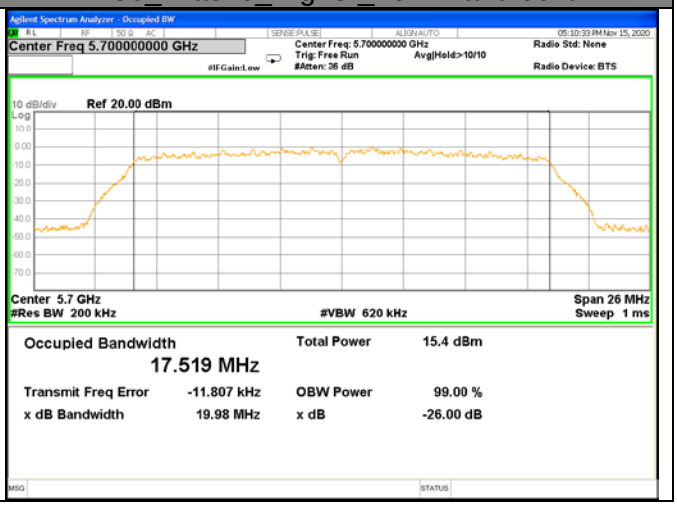
W56_11ac20_Lower_26BW and 99%



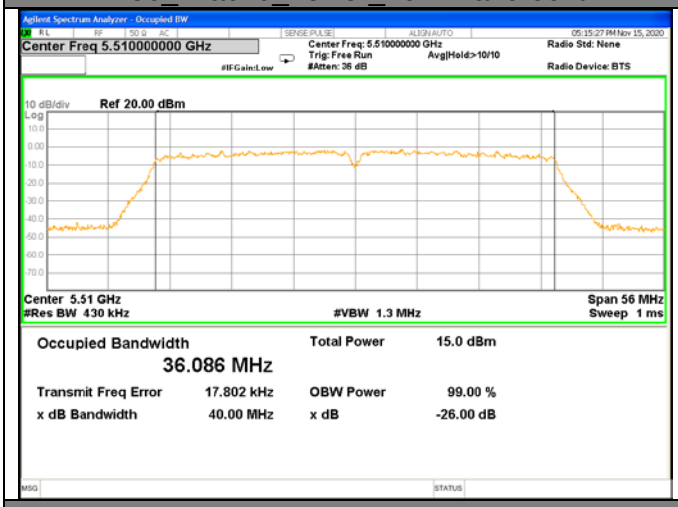
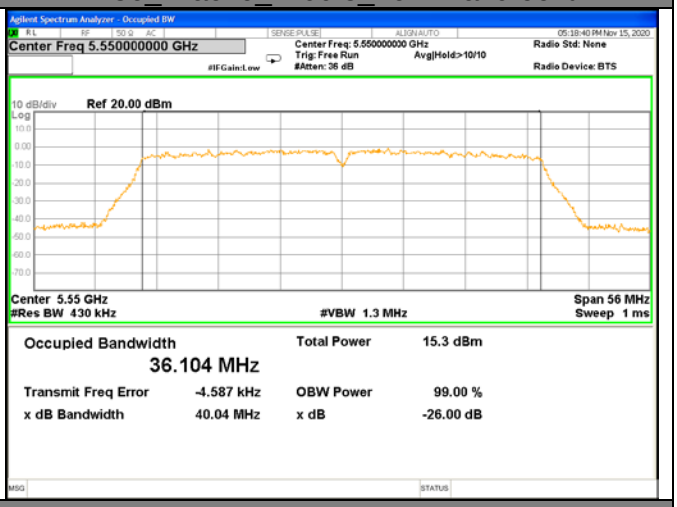
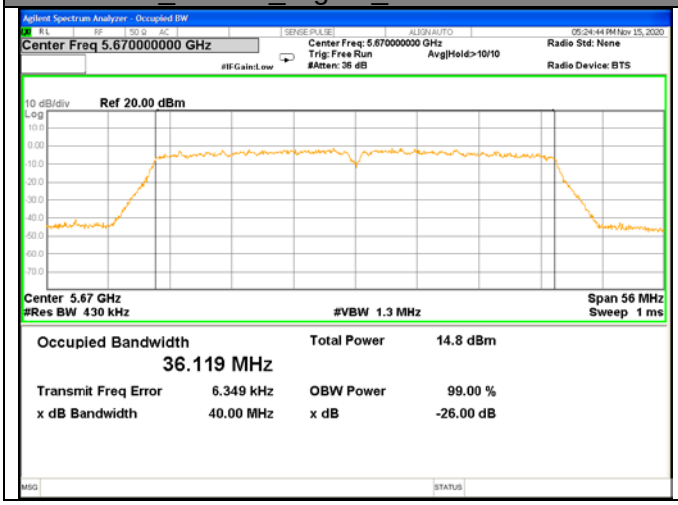
W56_11ac20_Middle_26BW and 99%



W56_11ac20_Higher_26BW and 99%



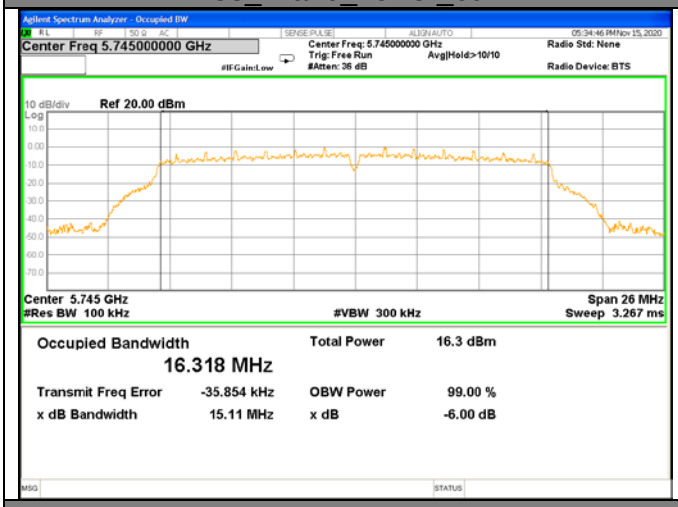
WLAN_Band-3

WLAN_Band-3	
W56_11ac40_Lower_26BW and 99%	W56_11ac40_Middle_26BW and 99%
	
W56_11ac40_Higher_26BW and 99%	
	

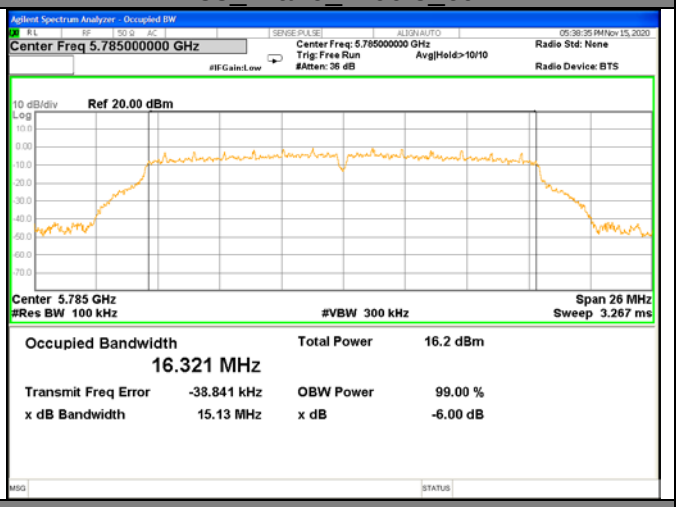
WLAN_Band-4

WLAN_Band-4

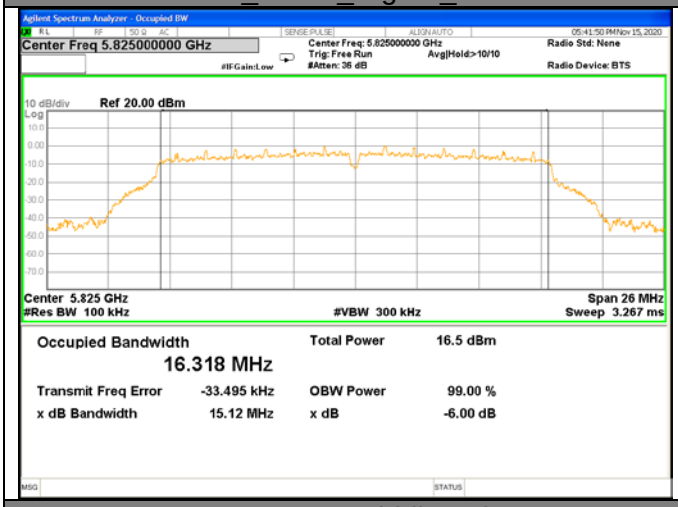
W58_11a20_Lower_6dB



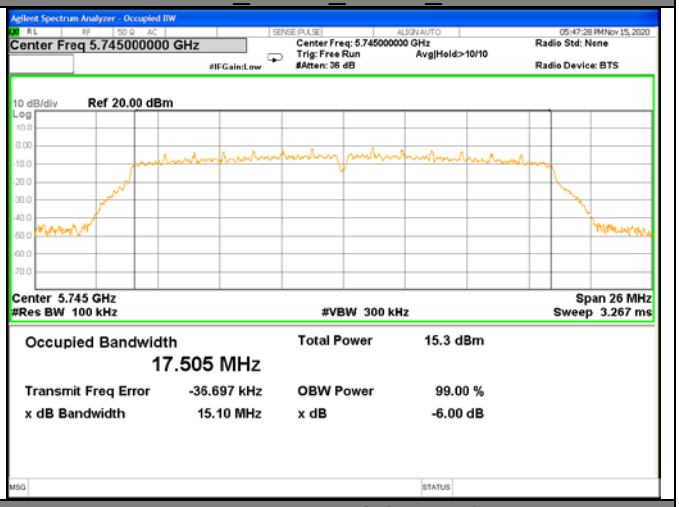
W58_11a20_Middle_6dB



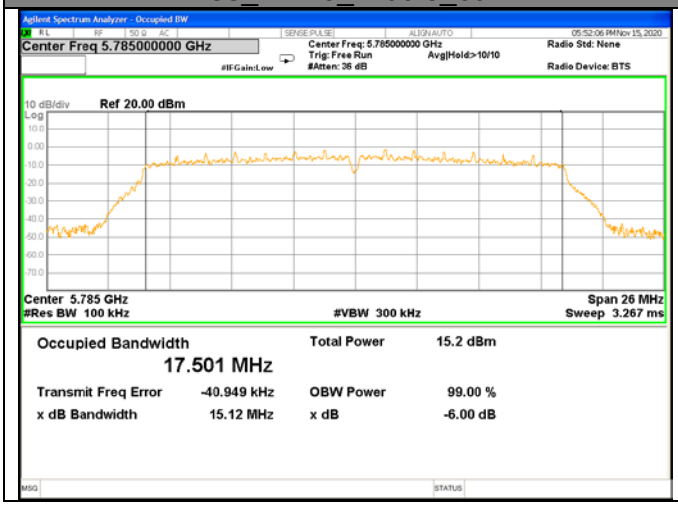
W58_11a20_Higher_6dB



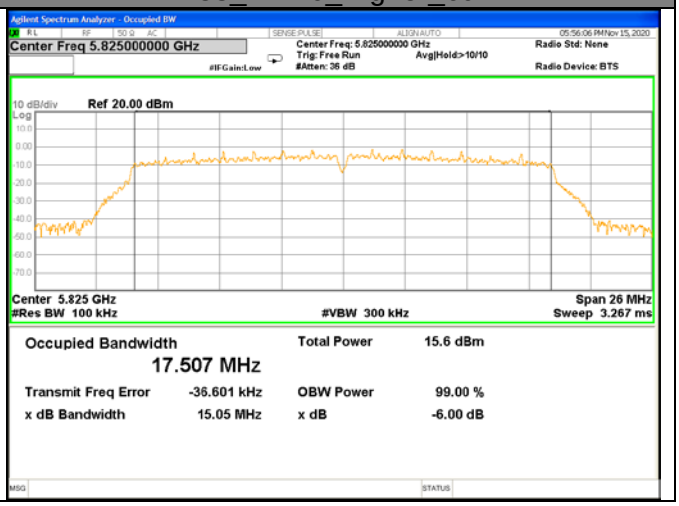
W58_11n20_Lower_6dB



W58_11n20_Middle_6dB



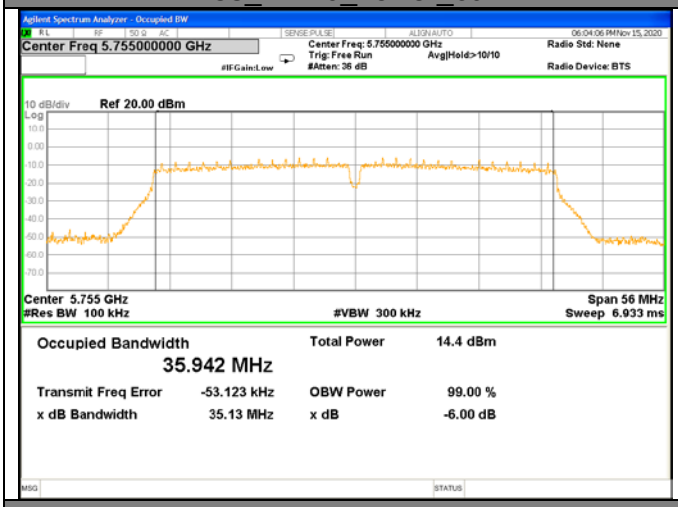
W58_11n20_Higher_6dB



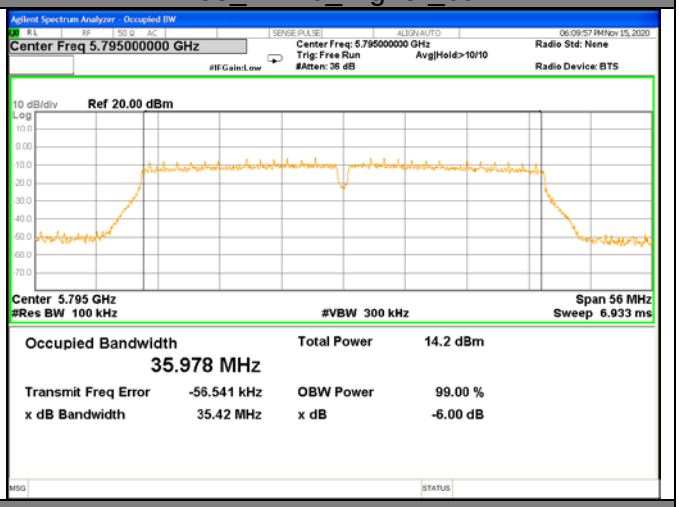
WLAN_Band-4

WLAN_Band-4

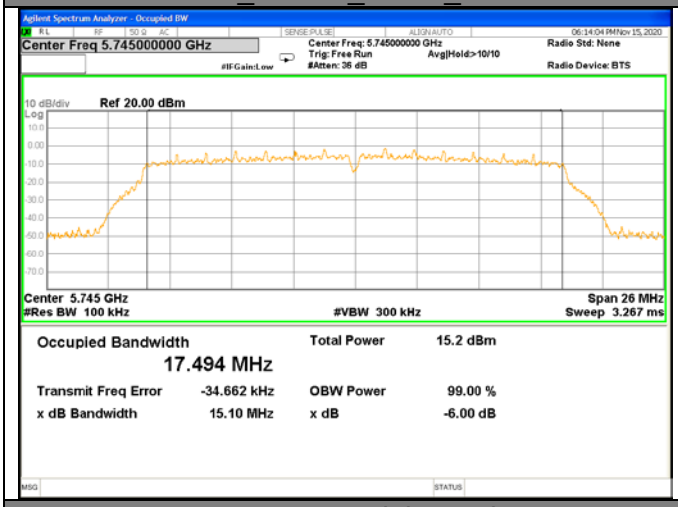
W58_11n40_Lower_6dB



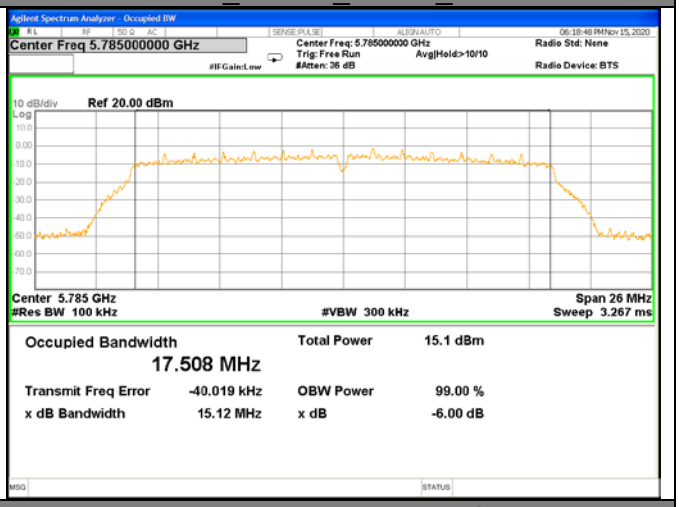
W58_11n40_Higher_6dB



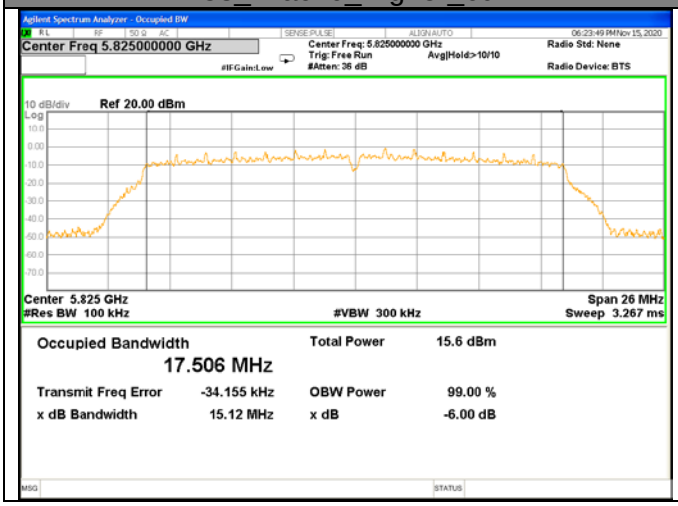
W58_11ac20_Lower_6dB



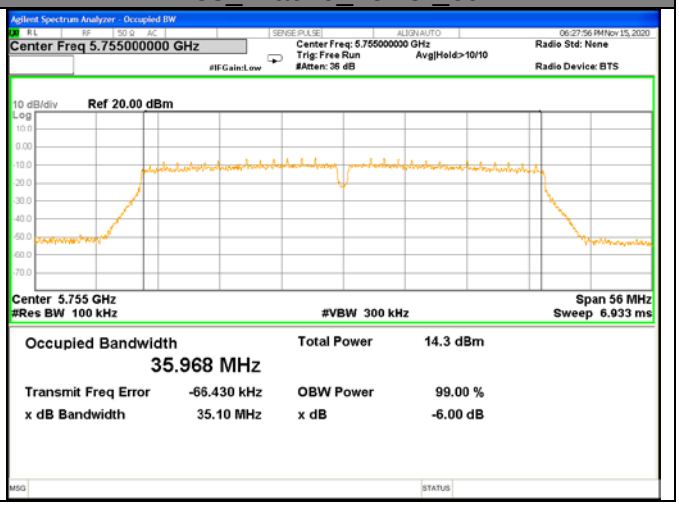
W58_11ac20_Middle_6dB



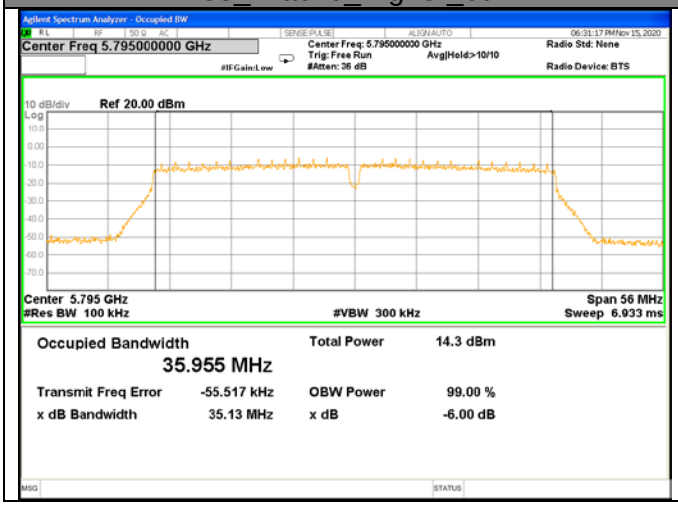
W58_11ac20_Higher_6dB



W58_11ac40_Lower_6dB



WLAN_Band-4

WLAN_Band-4	
W58_11ac40_Higher_6dB	
	

4. CONDUCTED OUTPUT POWER

4.1 limit

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	For FCC client devices: 250mW (24dBm)	5150-5250
	For RSS: e.i.r.p. power: not exceed 200 mW(23dBm) or 10 + 10 log10 B	
	250mW (24dBm) or 11 + 10 log10 B	5250-5350
	250mW (24dBm) or 11 + 10 log10 B	For FCC:5470-5725 For IC:5470-5600 5650-5725
	1 Watt (30dBm)	5725-5850
Note: For ISED: B=99% bandwidth.		

4.2 test procedure

a. Connect each EUT’s antenna output to power meter by RF cable and attenuator
b. Get each antenna port’s output power of EUT.

4.3 TEST SETUP

4.4 test results

Band I (5.15-5.25GHz)		
802.11a		
Test Channel	Frequency (MHz)	AV Power (dBm)
36	5180	9.77
40	5200	9.68
48	5240	9.37
802.11n(HT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
36	5180	8.71
40	5200	8.53
48	5240	8.46
802.11n(HT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
38	5190	8.06
46	5230	7.93
802.11ac(VHT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
36	5180	8.61
40	5200	8.66
48	5240	8.49
802.11ac(VHT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
38	5190	8.11
46	5230	7.88

Band II(5.25-5.35GHz)		
802.11a		
Test Channel	Frequency (MHz)	AV Power (dBm)
52	5260	9.24
60	5300	8.94
64	5320	8.86
802.11n(HT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
52	5260	8.26
60	5300	8.00
64	5320	7.88
802.11n(HT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
54	5270	7.61
62	5310	7.30
802.11ac(VHT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
52	5260	8.17
60	5300	7.89
64	5320	7.85
802.11ac(VHT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
54	5270	7.59
62	5310	7.24

Band III(5.47-5.725GHz)		
802.11a		
Test Channel	Frequency (MHz)	AV Power (dBm)
100	5500	8.56
116	5580	9.35
140	5700	8.92
802.11n(HT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
100	5500	7.60
116	5580	8.37
140	5700	7.94
802.11n(HT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
102	5510	7.02
110	5550	7.52
134	5670	7.77
802.11ac(VHT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
100	5500	7.58
116	5580	8.20
140	5700	7.88
802.11ac(VHT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
102	5510	7.13
110	5550	7.58
134	5670	7.94

Band IV (5.725-5.85GHz)		
802.11a		
Test Channel	Frequency (MHz)	AV Power (dBm)
149	5745	9.01
157	5785	9.15
165	5825	9.37
802.11n(HT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
149	5745	8.41
157	5785	8.09
165	5825	8.35
802.11n(HT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
151	5755	7.42
159	5795	7.47
802.11ac(VHT20)		
Test Channel	Frequency (MHz)	AV Power (dBm)
149	5745	8.01
157	5785	7.98
165	5825	8.36
802.11ac(VHT40)		
Test Channel	Frequency (MHz)	AV Power (dBm)
151	5755	7.56
159	5795	7.48

5. POWER SPECTRAL DENSITY

5.1 LIMIT

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	For FCC: Other than Mobile and portable:17dBm/MHz Mobile and portable:11dBm/MHz	5150-5250
	For RSS eirp:10dBm/MHz	
	11dBm/MHz	5250-5350
	11dBm/MHz	For FCC:5470-5725 For IC:5470-5600 5650-5725
	30dBm/500kHz	5725-5850

5.2 TEST PROCEDURE

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW.

Connect the UUT to the spectrum analyser and use the following settings:

5725MHz-5850MHz

Center Frequency	The centre frequency of the channel under test
Detector	RMS
RBW	500kHz
VBW	≥3 × RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

Note:

1. For UNII-3, according to KDB publication 789033 D02 General UNII Test Procedures New Rules v01, section II.F.5., it is acceptable to set RBW at 1MHz and VBW at 3MHz if the spectrum analyzer does not have 500kHz RBW.

2. The value measured with RBW=1MHz is to be added with 10log(500kHz/1MHz) which is - 3dB. For example, if the measured value is +10dBm using RBW=1MHz (that is +10dBm/MHz), then the converted value will be +7dBm/500kHz.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

5.3 TEST SETUP

5.4 TEST RESULT

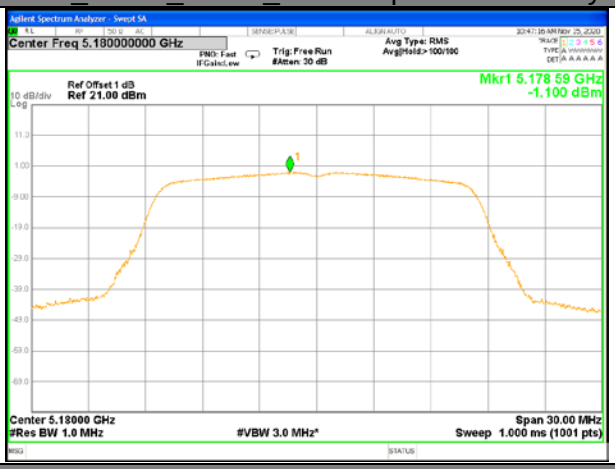
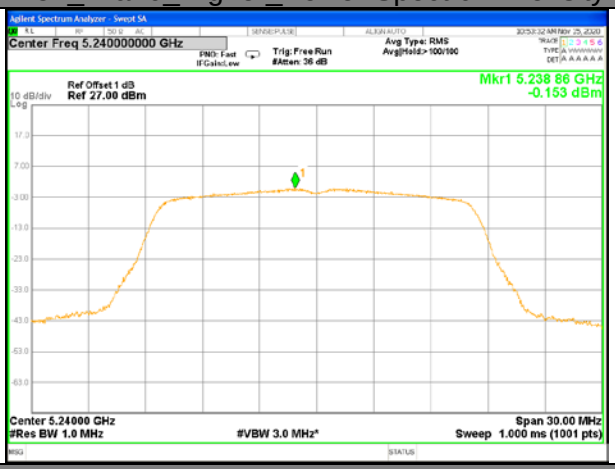
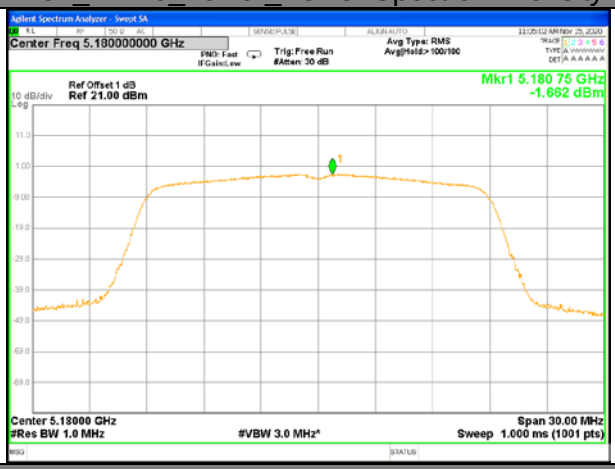
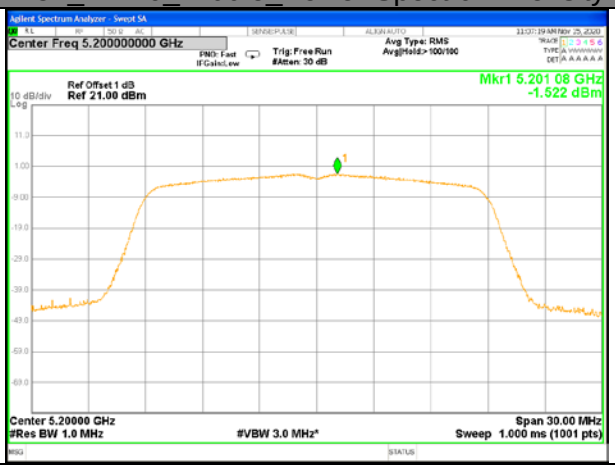
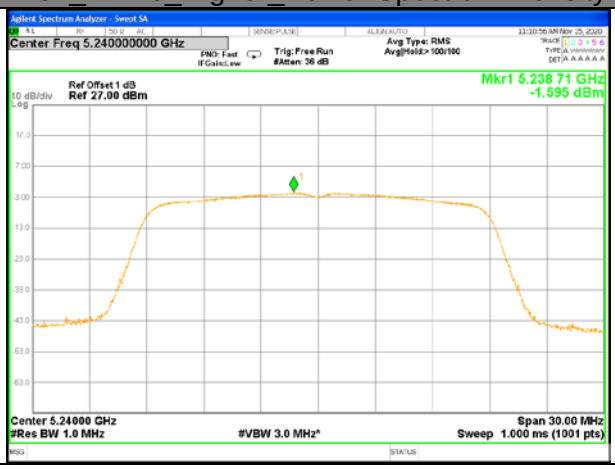
5150-5250MHz			
Frequency	Power Density (dBm)	Limit (dBm)	Result
802.11a			
5180	-1.100	11	PASS
5200	-1.119	11	PASS
5240	-0.153	11	PASS
802.11n20			
5180	-1.662	11	PASS
5200	-1.522	11	PASS
5240	-1.595	11	PASS
802.11n40			
5190	-5.511	11	PASS
5230	-5.489	11	PASS
802.11ac20			
5180	-1.805	11	PASS
5200	-1.914	11	PASS
5240	-1.293	11	PASS
802.11ac40			
5190	-5.284	11	PASS
5230	-5.339	11	PASS

5250-5350MHz			
Frequency	Power Density (dBm)	Limit (dBm)	Result
802.11a			
5260	-0.447	11	PASS
5300	-0.535	11	PASS
5320	-0.537	11	PASS
802.11n20			
5260	-1.799	11	PASS
5300	-2.035	11	PASS
5320	-1.971	11	PASS
802.11n40			
5270	-5.601	11	PASS
5310	-5.910	11	PASS
802.11ac20			
5260	-2.019	11	PASS
5300	-2.049	11	PASS
5320	-1.829	11	PASS
802.11ac40			
5270	-5.574	11	PASS
5310	-5.970	11	PASS

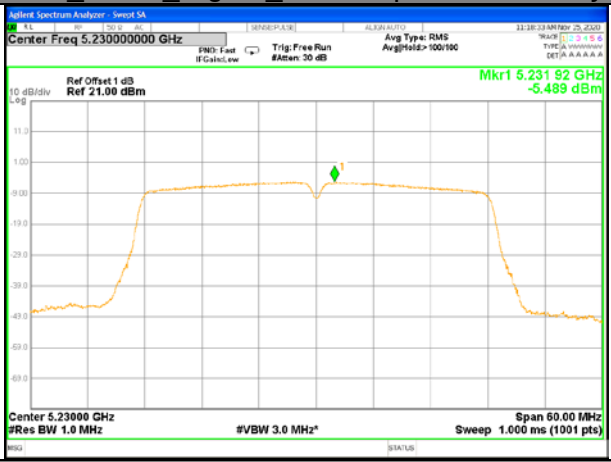
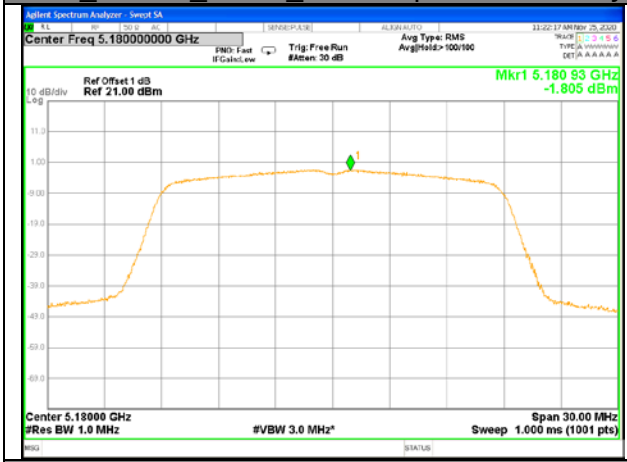
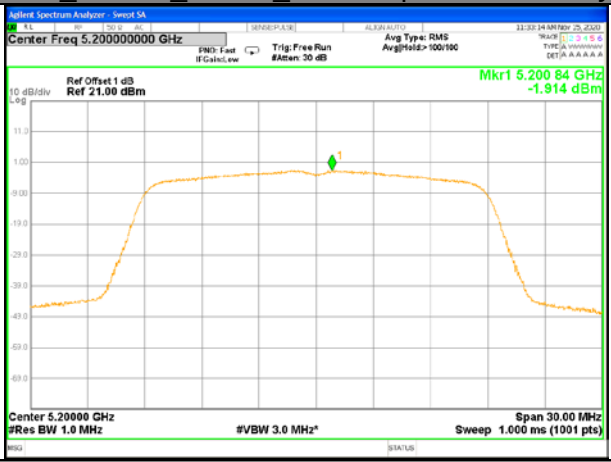
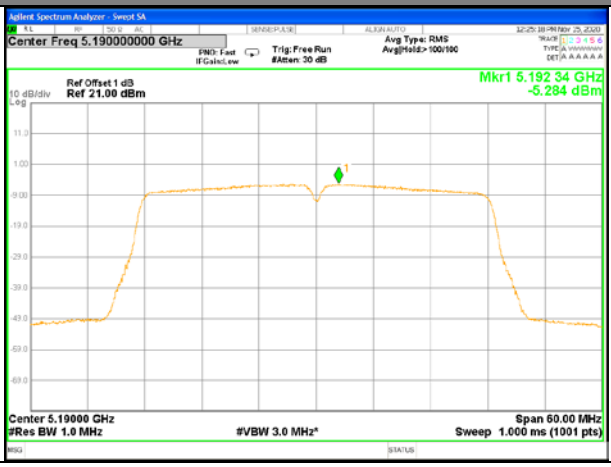
5470-5725MHz			
Frequency	Power Density (dBm)	Limit (dBm)	Result
802.11a			
5500	-0.082	11	PASS
5580	0.056	11	PASS
5700	-0.368	11	PASS
802.11n20			
5500	-1.206	11	PASS
5580	-1.172	11	PASS
5700	-1.506	11	PASS
802.11n40			
5510	-4.633	11	PASS
5550	-4.754	11	PASS
5670	-5.234	11	PASS
802.11ac20			
5500	-1.334	11	PASS
5580	-0.893	11	PASS
5700	-1.088	11	PASS
802.11ac40			
5510	-4.934	11	PASS
5550	-4.452	11	PASS
5670	-4.816	11	PASS

5725-5850MHz			
Frequency	Power Density (dBm)	Limit (dBm)	Result
802.11a			
5745	-2.416	30	PASS
5785	-3.059	30	PASS
5825	-2.088	30	PASS
802.11n20			
5745	-3.707	30	PASS
5785	-3.800	30	PASS
5825	-3.781	30	PASS
802.11n40			
5755	-7.584	30	PASS
5795	-8.157	30	PASS
802.11ac20			
5745	-3.853	30	PASS
5785	-3.679	30	PASS
5825	-3.726	30	PASS
802.11ac40			
5755	-7.918	30	PASS
5795	-7.807	30	PASS

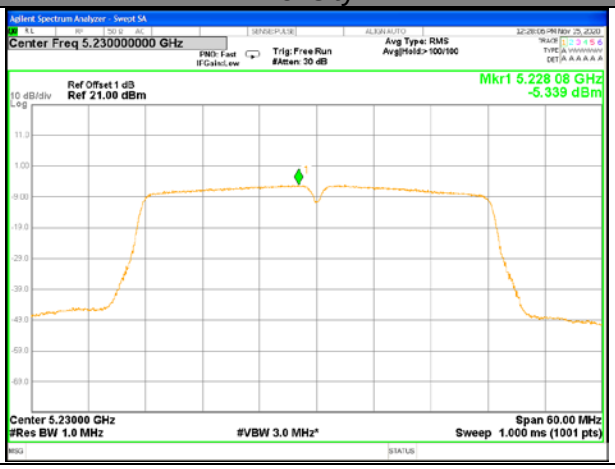
WLAN_Band-1

WLAN_Band-1	
W52_11a20_Lower_Power Spectrum Density	W52_11a20_Middle_Power Spectrum Density
	
W52_11a20_Higher_Power Spectrum Density	W52_11n20_Lower_Power Spectrum Density
	
W52_11n20_Middle_Power Spectrum Density	W52_11n20_Higher_Power Spectrum Density
	

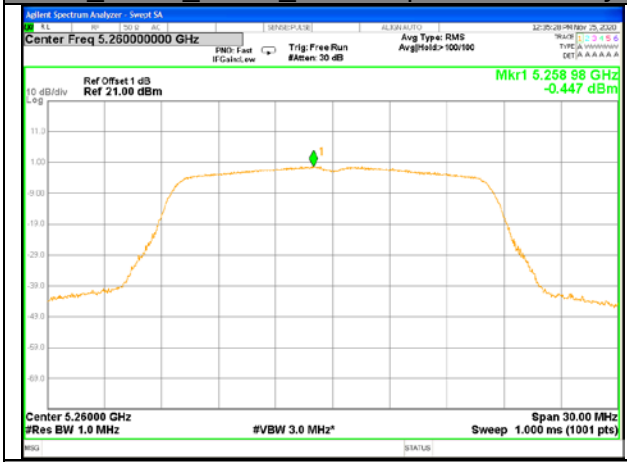
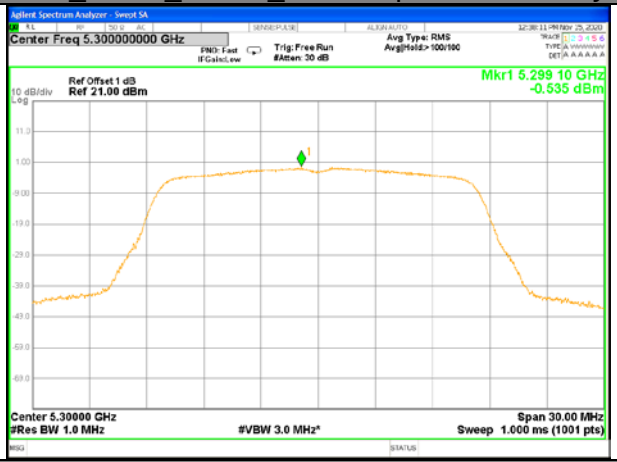
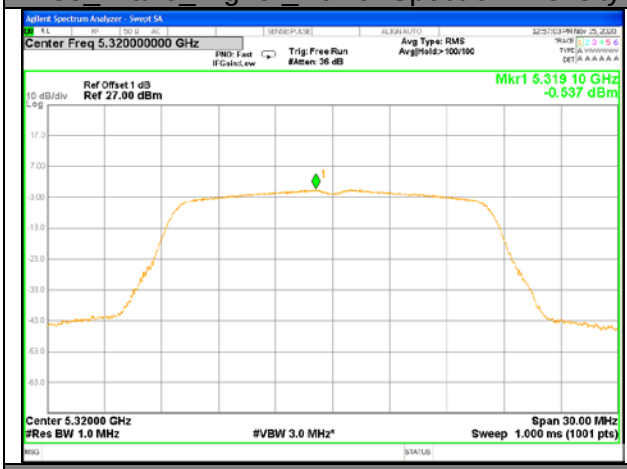
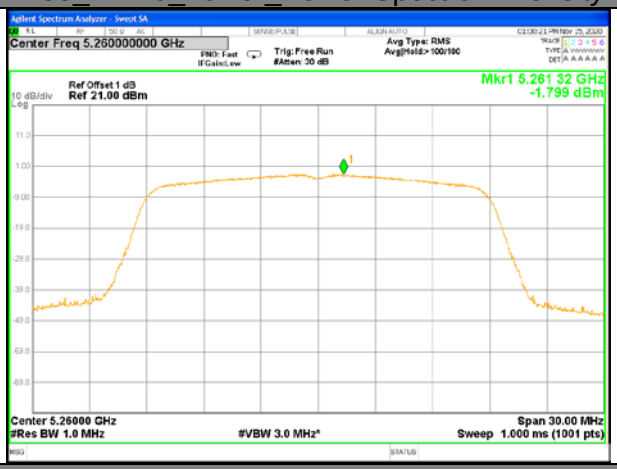
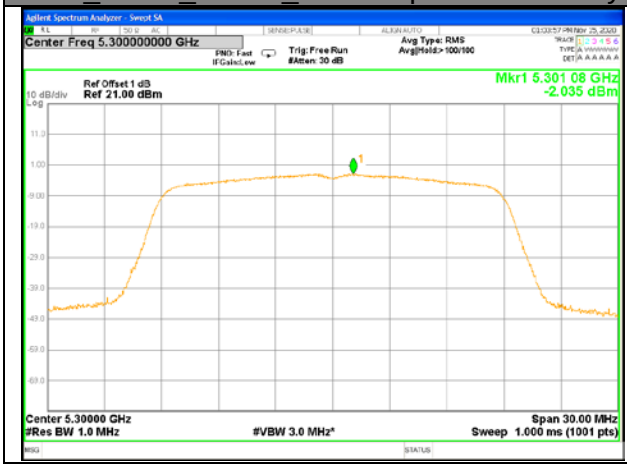
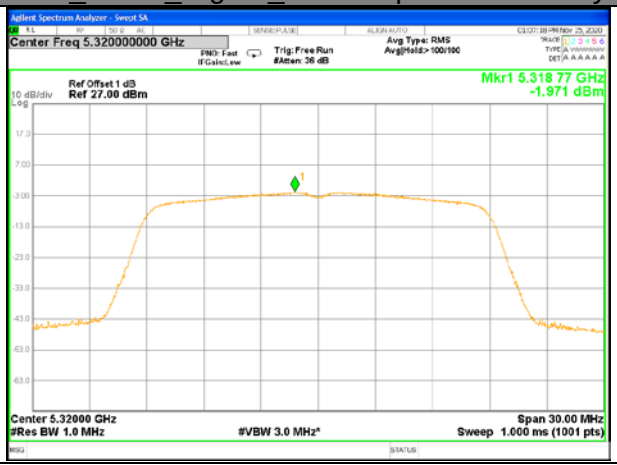
WLAN_Band-1

WLAN_Band-1	
W52_11n40_Lower_Power Spectrum Density	W52_11n40_Higher_Power Spectrum Density
	
W52_11ac20_Lower_Power Spectrum Density	W52_11ac20_Middle_Power Spectrum Density
	
W52_11ac20_Higher_Power Spectrum Density	W52_11ac40_Lower_Power Spectrum Density
	

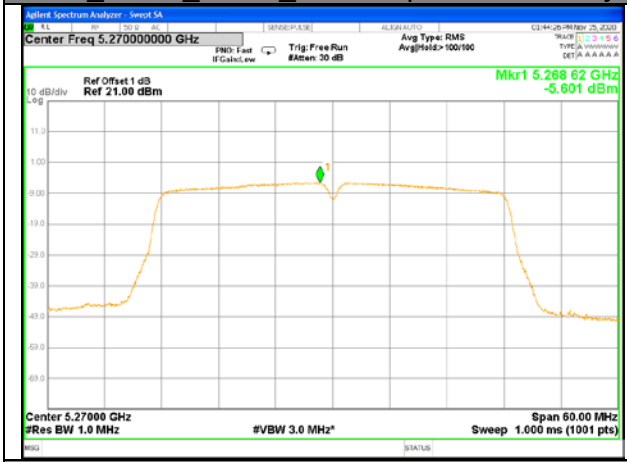
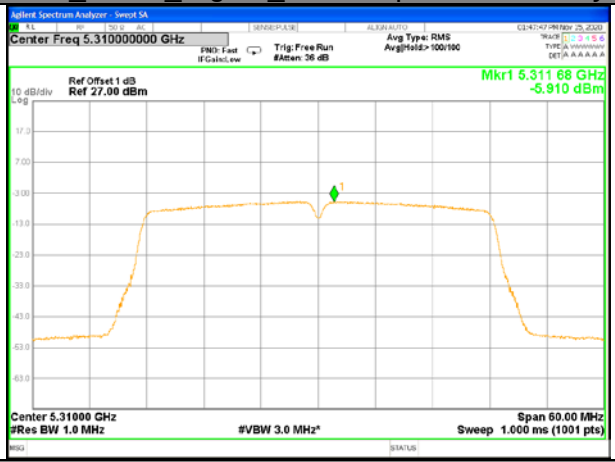
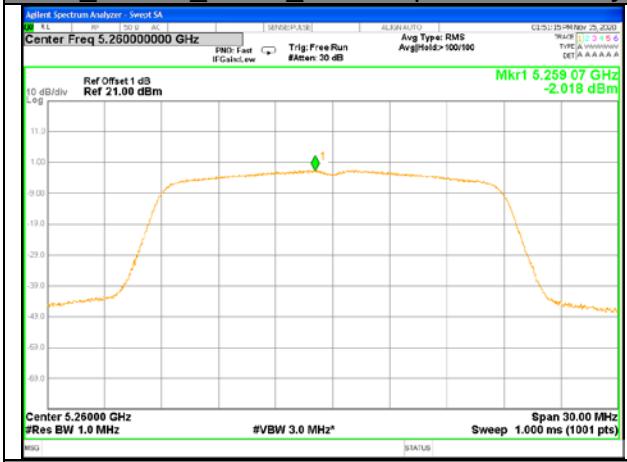
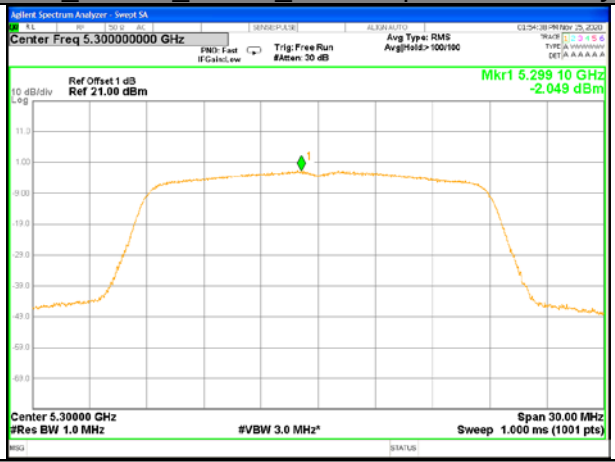
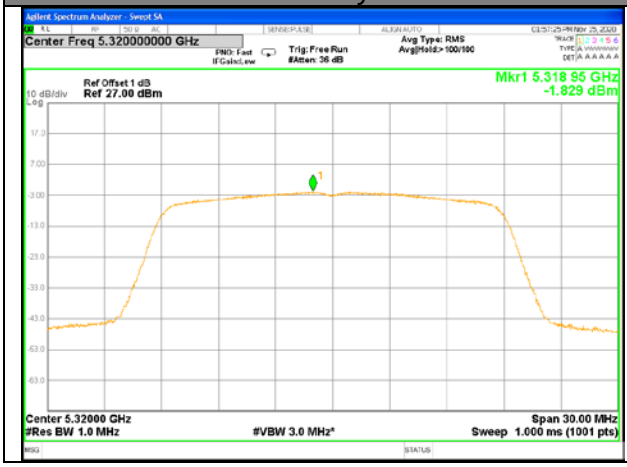
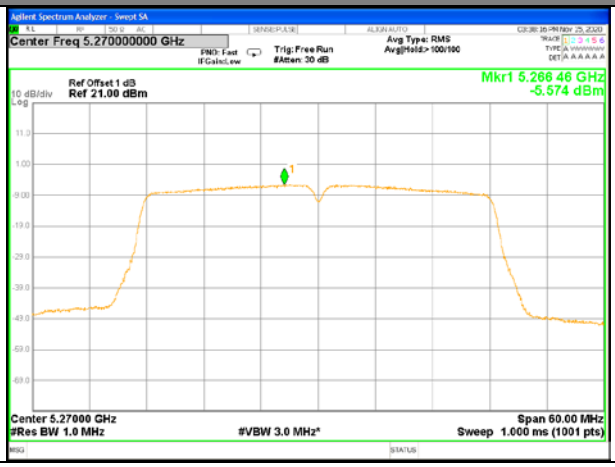
WLAN_Band-1

WLAN_Band-1	
W52_11ac40_Higher_Power Spectrum Density	
	

WLAN_Band-2

WLAN_Band-2	
W53_11a20_Lower_Power Spectrum Density	W53_11a20_Middle_Power Spectrum Density
	
W53_11a20_Higher_Power Spectrum Density	W53_11n20_Lower_Power Spectrum Density
	
W53_11n20_Middle_Power Spectrum Density	W53_11n20_Higher_Power Spectrum Density
	

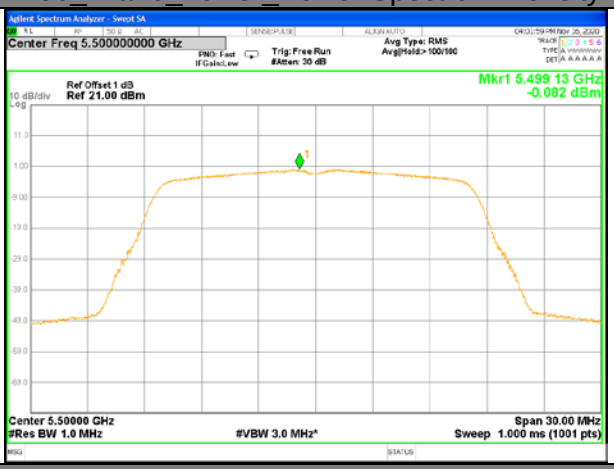
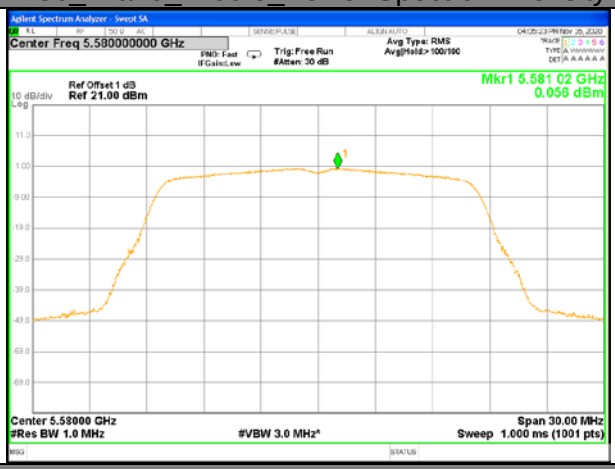
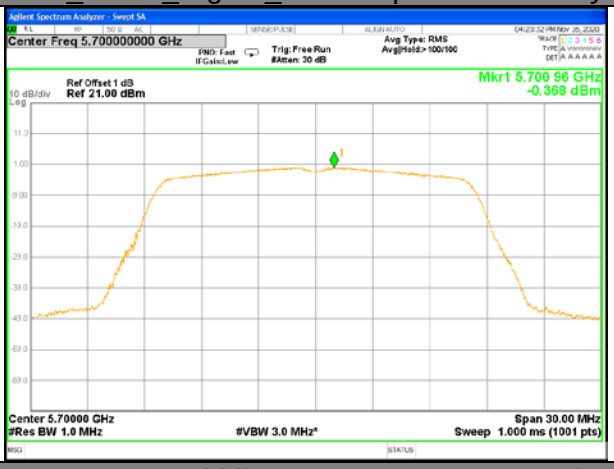
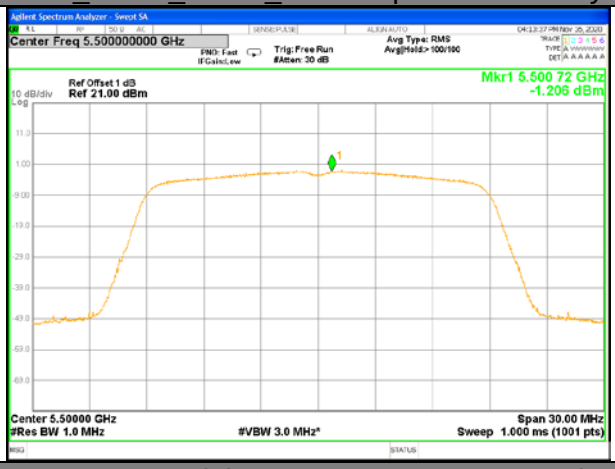
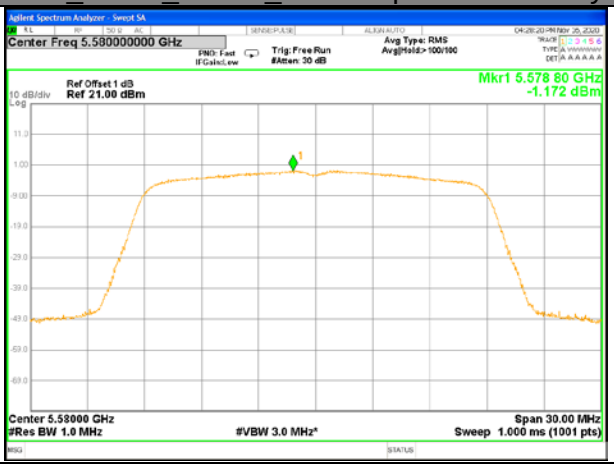
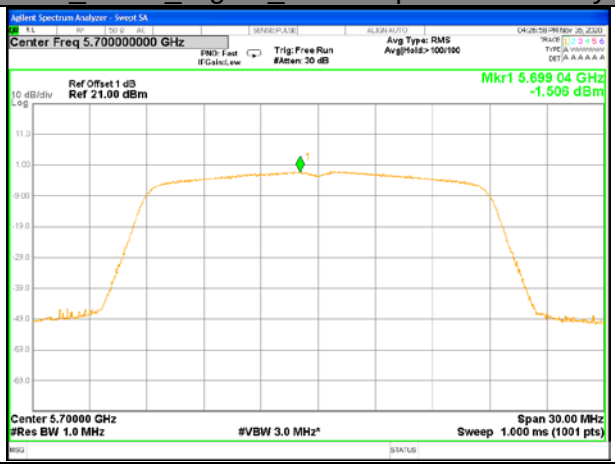
WLAN_Band-2

WLAN_Band-2	
W53_11n40_Lower_Power Spectrum Density	W53_11n40_Higher_Power Spectrum Density
	
W53_11ac20_Lower_Power Spectrum Density	W53_11ac20_Middle_Power Spectrum Density
	
W53_11ac20_Higher_Power Spectrum Density	W53_11ac40_Lower_Power Spectrum Density
	

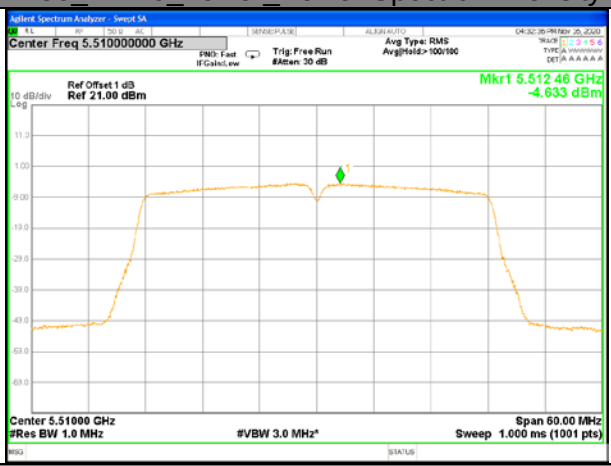
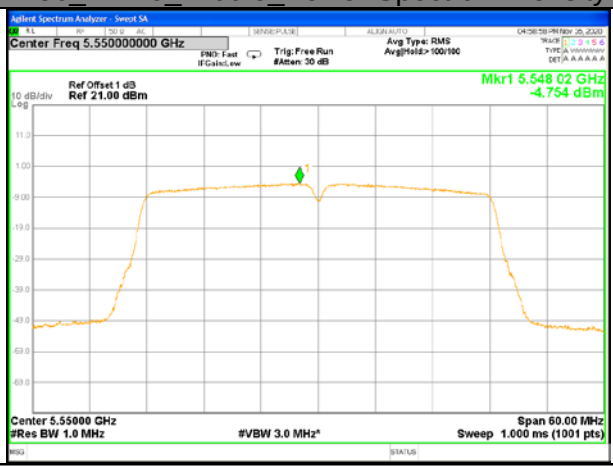
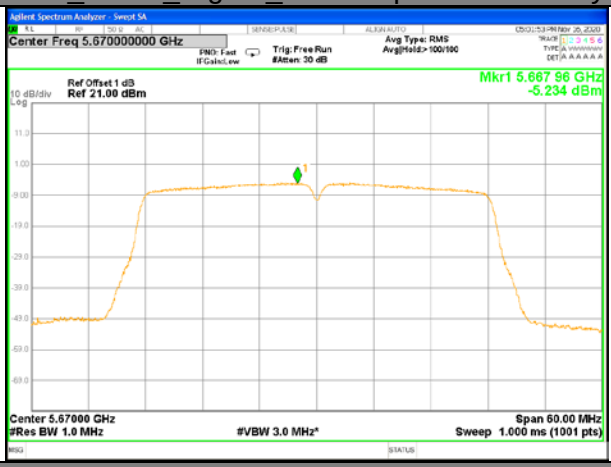
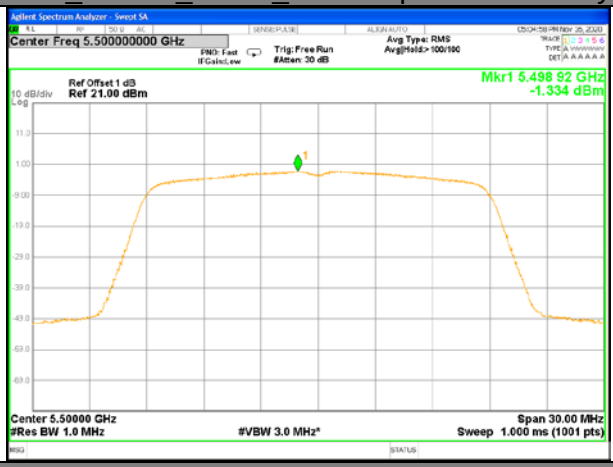
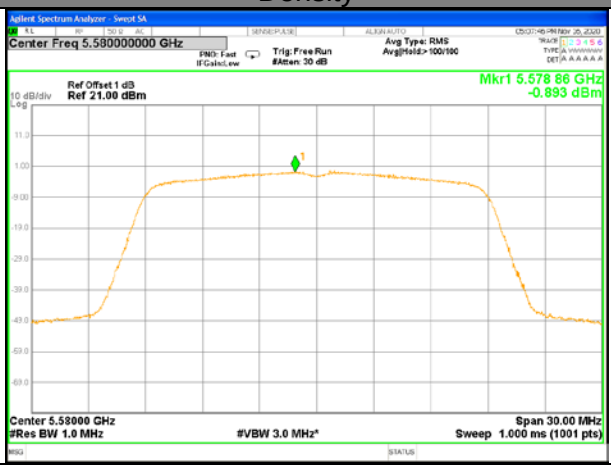
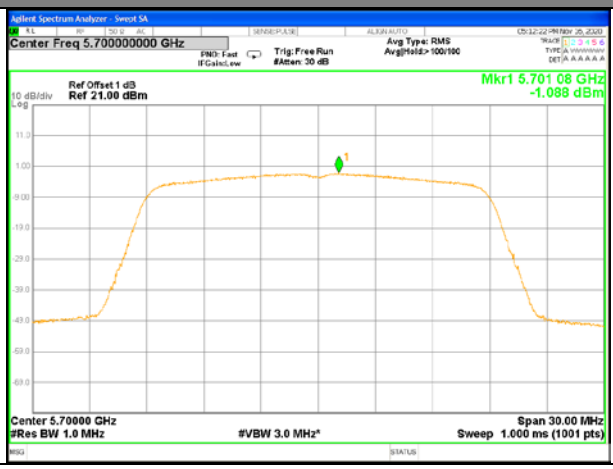
WLAN_Band-2

WLAN_Band-2	
W53_11ac40_Higher_Power Spectrum Density	

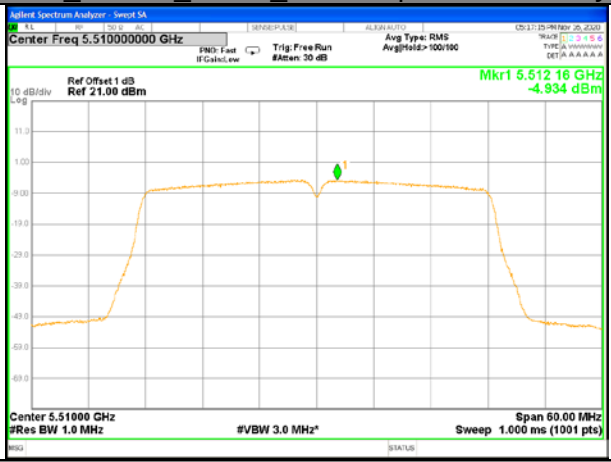
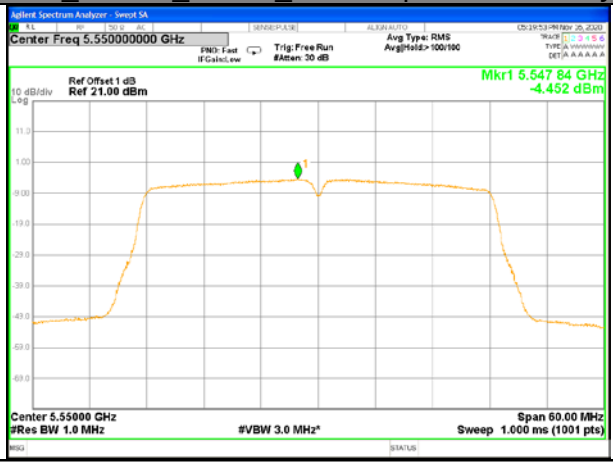
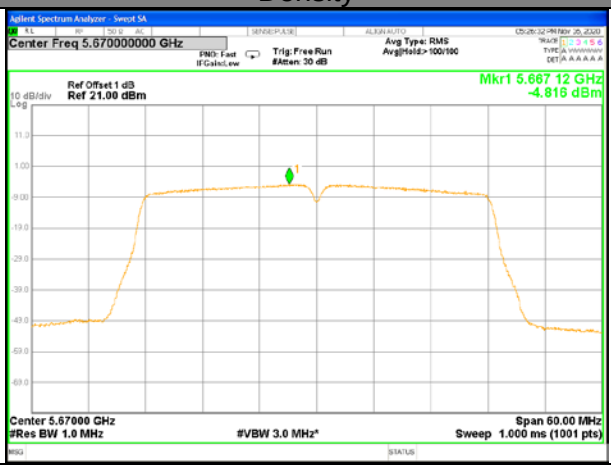
WLAN_Band-3

WLAN_Band-3	
W56_11a20_Lower_Power Spectrum Density	W56_11a20_Middle_Power Spectrum Density
	
W56_11a20_Higher_Power Spectrum Density	W56_11n20_Lower_Power Spectrum Density
	
W56_11n20_Middle_Power Spectrum Density	W56_11n20_Higher_Power Spectrum Density
	

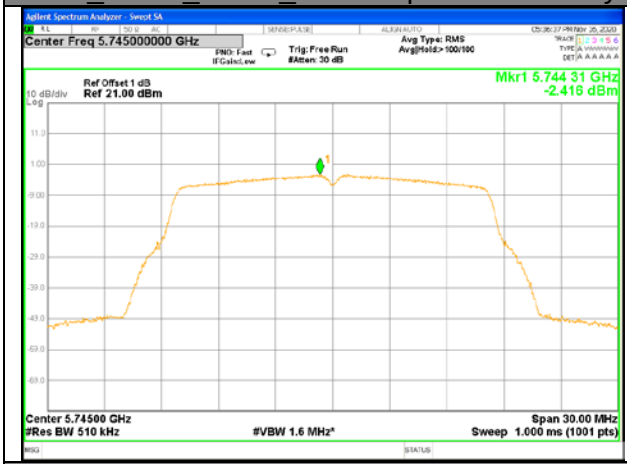
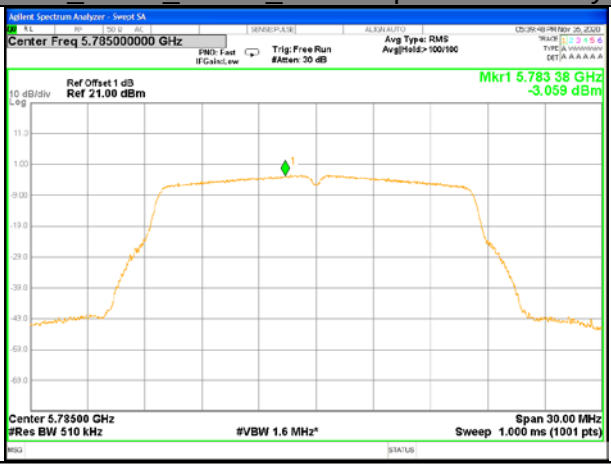
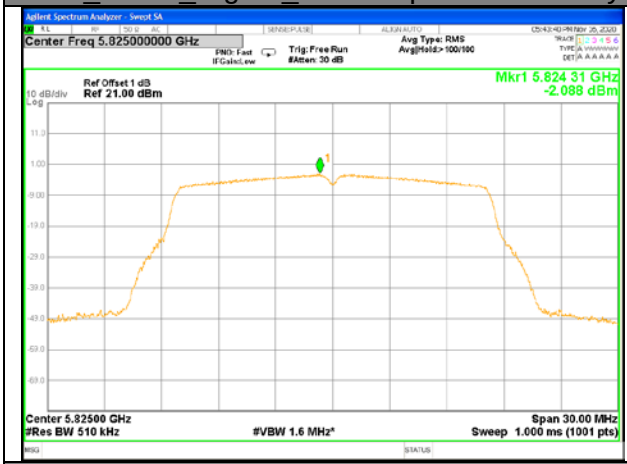
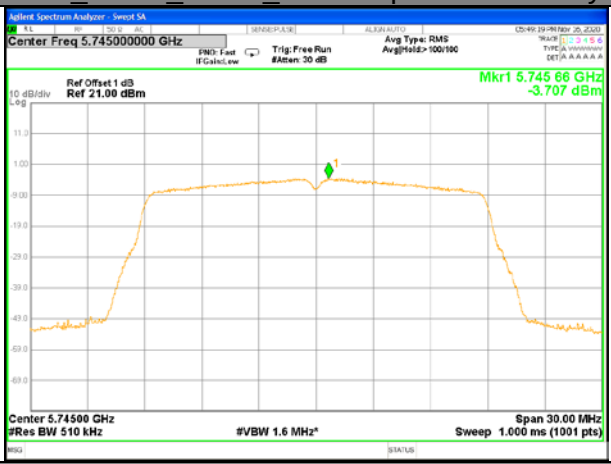
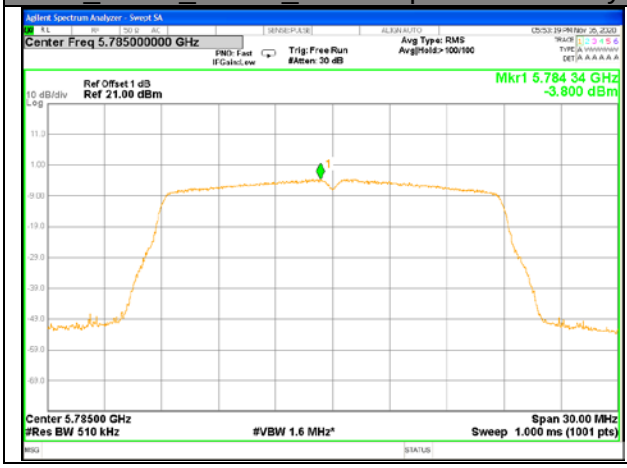
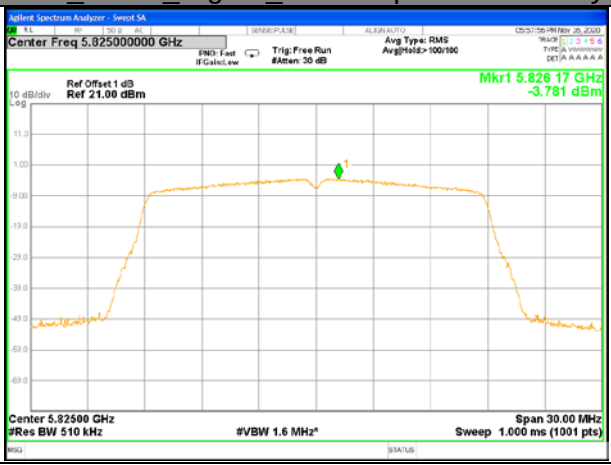
WLAN_Band-3

WLAN_Band-3	
W56_11n40_Lower_Power Spectrum Density	W56_11n40_Middle_Power Spectrum Density
	
W56_11n40_Higher_Power Spectrum Density	W56_11ac20_Lower_Power Spectrum Density
	
W56_11ac20_Middle_Power Spectrum Density	W56_11ac20_Higher_Power Spectrum Density
	

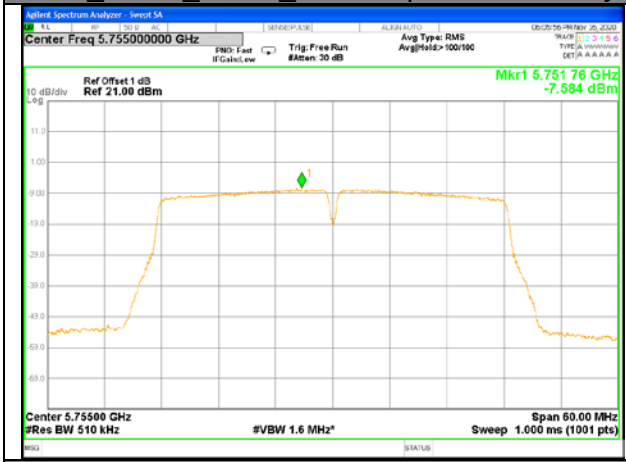
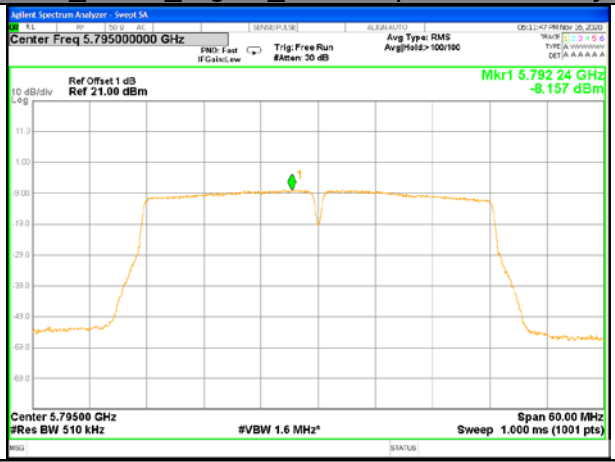
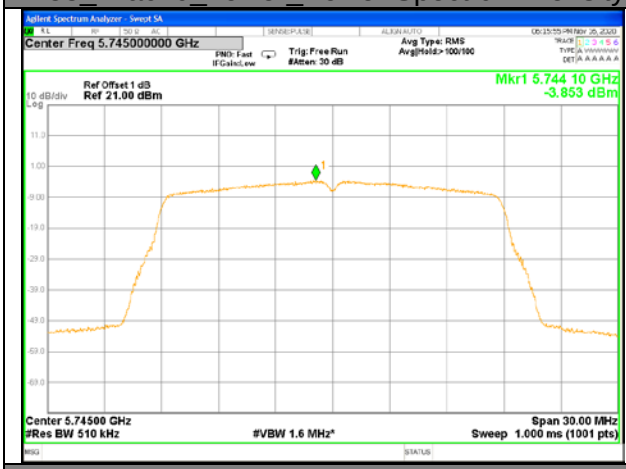
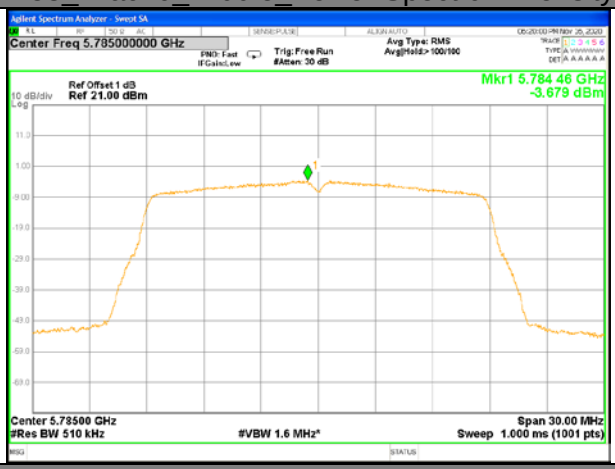
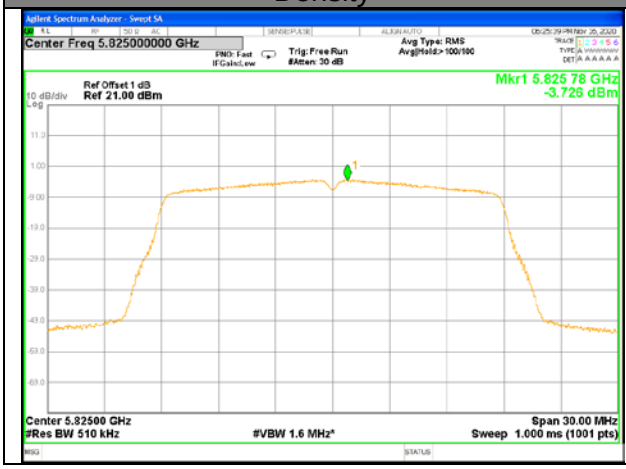
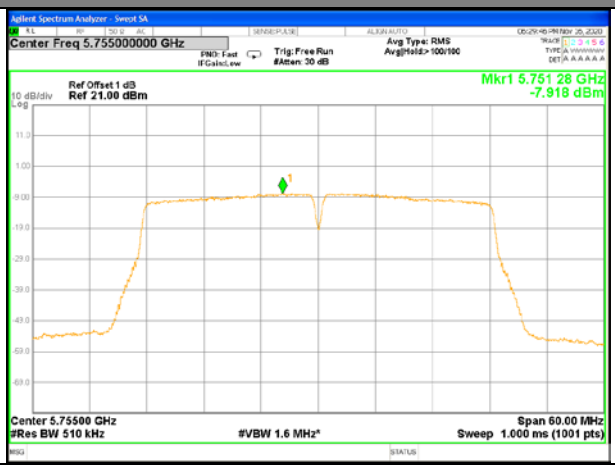
WLAN_Band-3

WLAN_Band-3	
W56_11ac40_Lower_Power Spectrum Density	W56_11ac40_Middle_Power Spectrum Density
	
W56_11ac40_Higher_Power Spectrum Density	
	

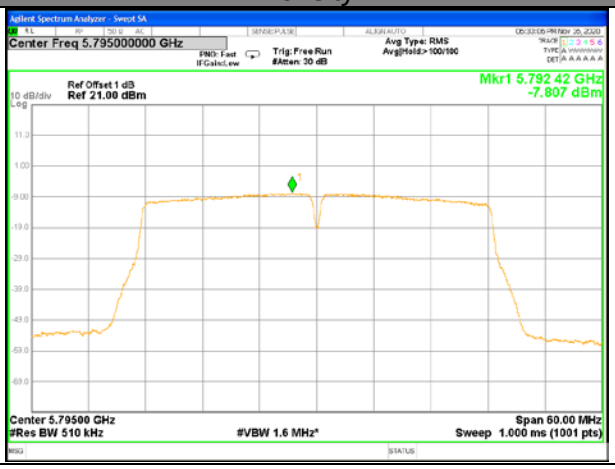
WLAN_Band-4

WLAN_Band-4	
W58_11a20_Lower_Power Spectrum Density	W58_11a20_Middle_Power Spectrum Density
	
W58_11a20_Higher_Power Spectrum Density	W58_11n20_Lower_Power Spectrum Density
	
W58_11n20_Middle_Power Spectrum Density	W58_11n20_Higher_Power Spectrum Density
	

WLAN_Band-4

WLAN_Band-4	
W58_11n40_Lower_Power Spectrum Density	W58_11n40_Higher_Power Spectrum Density
	
W58_11ac20_Lower_Power Spectrum Density	W58_11ac20_Middle_Power Spectrum Density
	
W58_11ac20_Higher_Power Spectrum Density	W58_11ac40_Lower_Power Spectrum Density
	

WLAN_Band-4

WLAN_Band-4	
W58_11ac40_Higher_Power Spectrum Density	
	

6. Duty Cycle

6.1 TEST REQUIREMENT

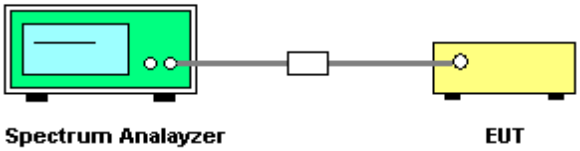
47 CFR Part 15C 15.407 and 789033 D02 General UNII Test Procedures New Rules v02r01(December 14, 2017), Section (B)

ANSI C63.10: 2013

6.2 TEST PROCEDURE

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

6.3 TEST SETUP



6.4 TEST RESULTS

Duty cycle

Band1	
Mode	Duty cycle(%)
a	100%
n20	100%
n40	100%
ac20	100%
ac40	100%
Band II	
Mode	Duty cycle(%)
a	100%
n20	100%
n40	100%
ac20	100%
ac40	100%
Band III	
Mode	Duty cycle(%)
a	100%
n20	100%
n40	100%
ac20	100%
ac40	100%
Band IV	
Mode	Duty cycle(%)
a	100%
n20	100%
n40	100%
ac20	100%
ac40	100%

7. RADIATED EMISSION MEASUREMENT

7.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
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

For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted band)	PK=1MHz / 1MHz, AV=1 MHz /10 Hz

7.2 TEST PROCEDURE

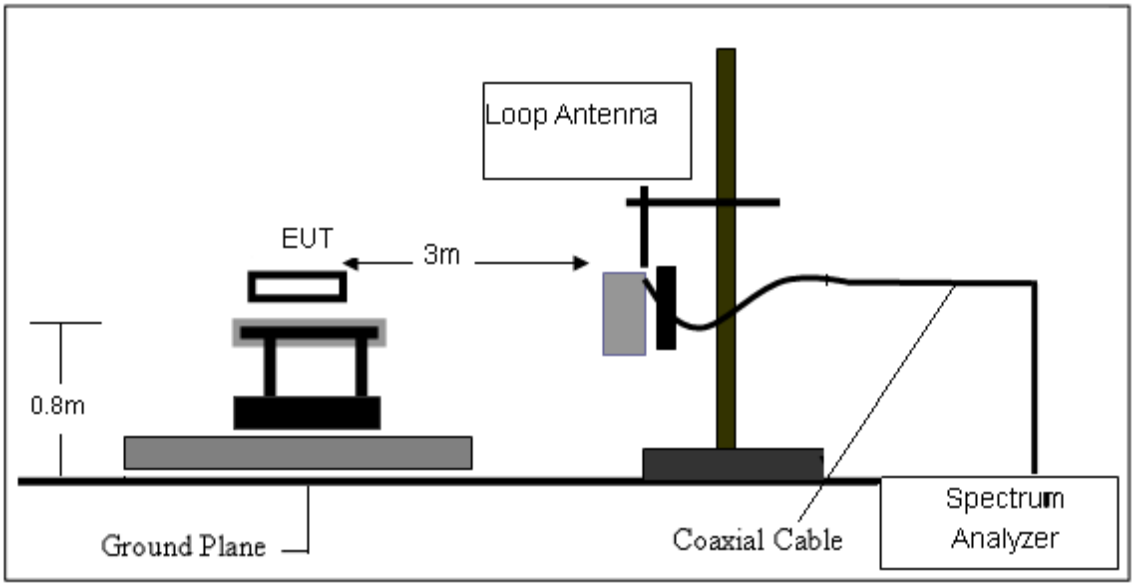
a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz,and above 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then QuasiPeak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

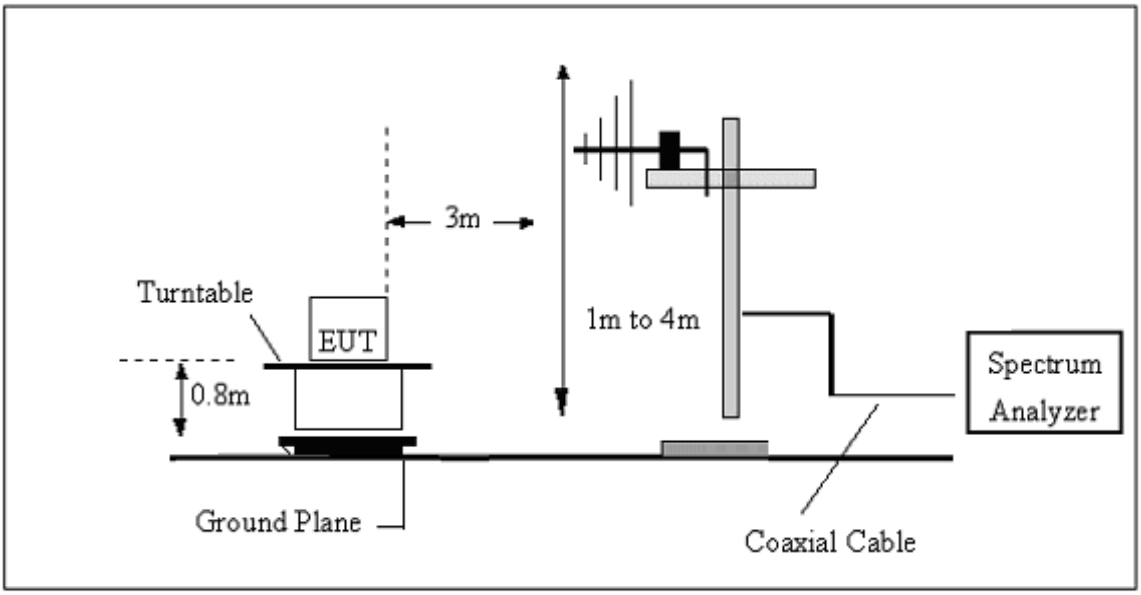
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

7.3 TESTSETUP

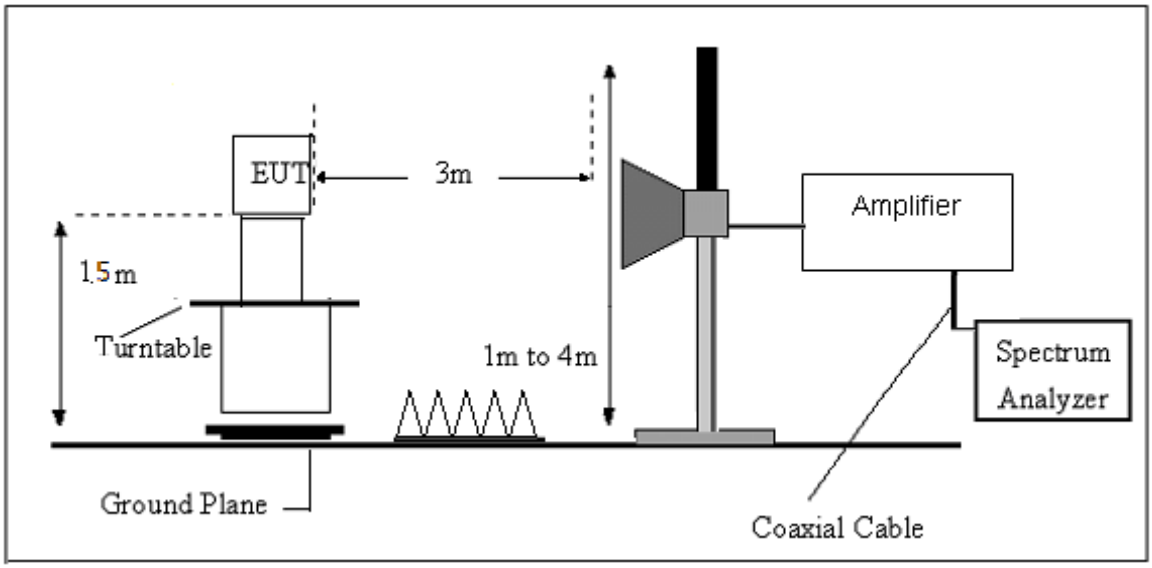
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



7.4 RADIATED EMISSION TEST RESULTS

(9KHz-30MHz)

Temperature:	23.5(C)	Relative Humidtity:	49%RH
Test Mode:	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

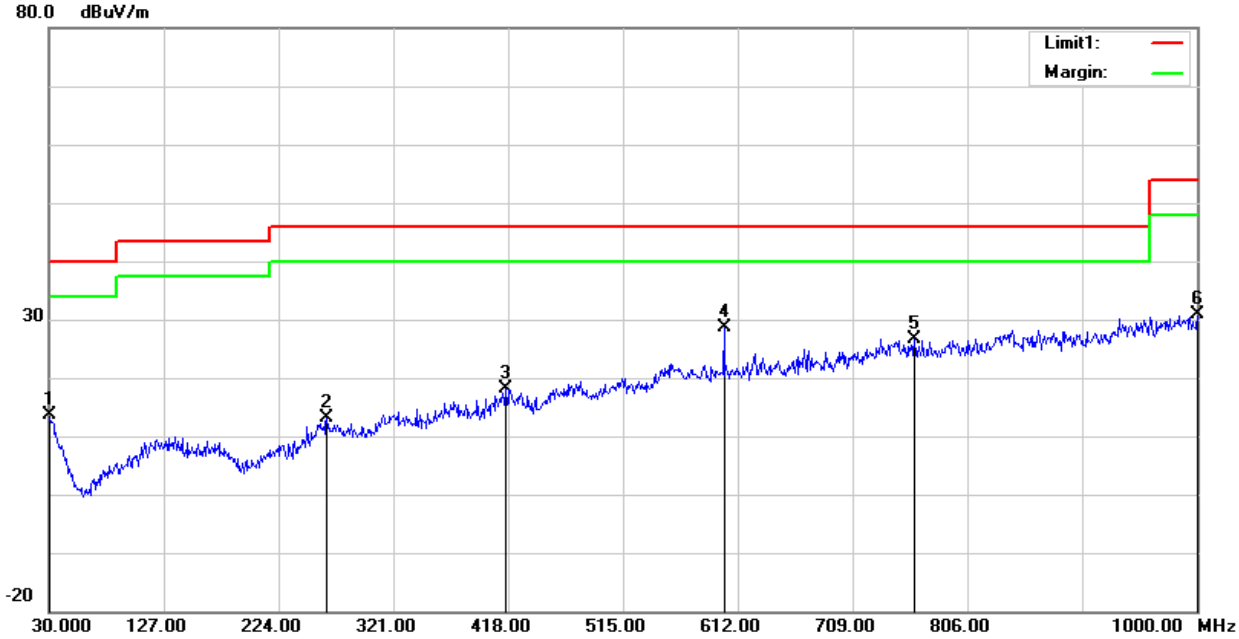
.

Between 30MHz – 1GHz

Temperature	23.5(C)	Relative Humidtity:	49%RH
Test Mode	TX IEEE 802.11a HT20 CH36	Polarization:	Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	26.41	-12.85	13.56	40.00	-26.44	QP
2	264.7400	27.80	-14.75	13.05	46.00	-32.95	QP
3	416.0600	28.46	-10.28	18.18	46.00	-27.82	QP
4	600.3600	34.42	-5.84	28.58	46.00	-17.42	QP
5	761.3800	28.90	-2.19	26.71	46.00	-19.29	QP
6	1000.0000	28.96	2.04	31.00	54.00	-23.00	QP

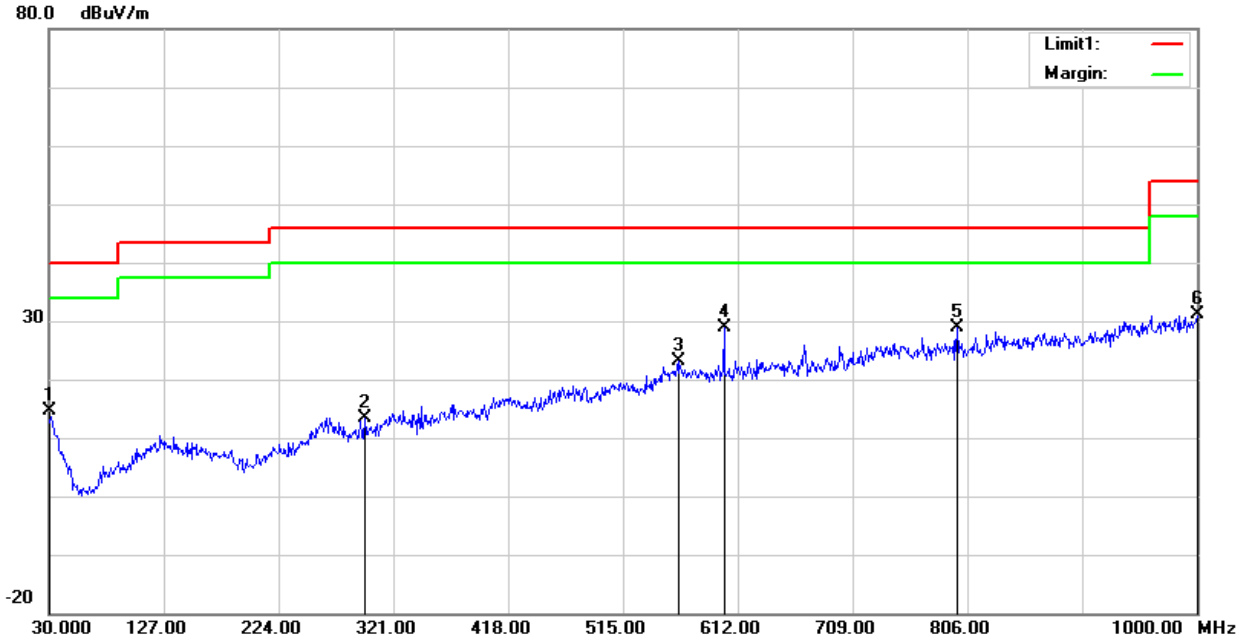
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Temperature	23.5(C)	Relative Humidtity:	49%RH
Test Voltage	Test Mode	Polarization:	Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	27.49	-12.85	14.64	40.00	-25.36	QP
2	296.7500	28.25	-14.92	13.33	46.00	-32.67	QP
3	561.5600	28.69	-5.51	23.18	46.00	-22.82	QP
4	600.3600	34.73	-5.84	28.89	46.00	-17.11	QP
5	797.2700	30.90	-2.03	28.87	46.00	-17.13	QP
6	1000.0000	29.01	2.04	31.05	54.00	-22.95	QP

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), the worst case is 802.11ac (VHT-20).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

(1GHz~40GHz) Restricted band and Spurious emission Requirements

Band I 5150-5250MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11 ac20/ 5180 MHz)										
3262.94	44.72	44.70	6.70	28.20	-9.80	34.92	68.20	-33.28	Pk	Vertical
3262.94	41.97	44.70	6.70	28.20	-9.80	32.17	54.00	-21.83	AV	Vertical
3257.96	44.54	44.70	6.70	28.20	-9.80	34.74	68.20	-33.46	Pk	Horizontal
3257.96	41.71	44.70	6.70	28.20	-9.80	31.91	54.00	-22.09	AV	Horizontal
3982.11	39.45	44.20	7.90	29.70	-6.60	32.85	68.20	-35.35	Pk	Vertical
3982.11	36.31	44.20	7.90	29.70	-6.60	29.71	54.00	-24.29	AV	Vertical
3982.92	39.42	44.20	7.90	29.70	-6.60	32.82	68.20	-35.38	Pk	Horizontal
3982.92	36.01	44.20	7.90	29.70	-6.60	29.41	54.00	-24.59	AV	Horizontal
7220.32	37.04	43.50	11.40	35.50	3.40	40.44	68.20	-27.76	Pk	Vertical
7220.32	34.65	43.50	11.40	35.50	3.40	38.05	54.00	-15.95	AV	Vertical
7223.33	37.87	43.50	11.40	35.50	3.40	41.27	68.20	-26.93	Pk	Horizontal
7223.33	34.86	43.50	11.40	35.50	3.40	38.26	54.00	-15.74	AV	Horizontal
10360.28	40.01	44.50	13.80	38.80	8.10	48.11	68.20	-20.09	Pk	Vertical
10360.28	36.43	44.50	13.80	38.80	8.10	44.53	54.00	-9.47	AV	Vertical
10360.24	39.88	44.50	13.80	38.80	8.10	47.98	68.20	-20.22	Pk	Horizontal
10360.24	36.48	44.50	13.80	38.80	8.10	44.58	54.00	-9.42	AV	Horizontal
11032.07	33.25	43.60	14.30	39.50	10.20	43.45	68.20	-24.75	Pk	Vertical
11032.07	30.35	43.60	14.30	39.50	10.20	40.55	54.00	-13.45	AV	Vertical
11025.24	33.95	43.60	14.30	39.50	10.20	44.15	68.20	-24.05	Pk	Horizontal
11025.24	30.67	43.60	14.30	39.50	10.20	40.87	54.00	-13.13	AV	Horizontal
13299.18	32.28	42.60	15.90	38.90	12.20	44.48	68.20	-23.72	Pk	Vertical
13299.18	29.70	42.60	15.90	38.90	12.20	41.90	54.00	-12.10	AV	Vertical
13282.26	32.08	42.60	15.90	38.90	12.20	44.28	68.20	-23.92	Pk	Horizontal
13282.26	29.02	42.60	15.90	38.90	12.20	41.22	54.00	-12.78	AV	Horizontal
Mid Channel (802.11 ac20/ 5200 MHz)										
3260.97	44.89	44.70	6.70	28.20	-9.80	35.09	68.20	-33.11	Pk	Vertical
3260.97	40.79	44.70	6.70	28.20	-9.80	30.99	54.00	-23.01	AV	Vertical
3263.21	45.02	44.70	6.70	28.20	-9.80	35.22	68.20	-32.98	Pk	Horizontal
3263.21	42.21	44.70	6.70	28.20	-9.80	32.41	54.00	-21.59	AV	Horizontal
3990.85	40.10	44.20	7.90	29.70	-6.60	33.50	68.20	-34.70	Pk	Vertical
3990.85	35.76	44.20	7.90	29.70	-6.60	29.16	54.00	-24.84	AV	Vertical
3997.36	39.30	44.20	7.90	29.70	-6.60	32.70	68.20	-35.50	Pk	Horizontal
3997.36	36.28	44.20	7.90	29.70	-6.60	29.68	54.00	-24.32	AV	Horizontal
7232.57	37.13	43.50	11.40	35.50	3.40	40.53	68.20	-27.67	Pk	Vertical
7232.57	33.52	43.50	11.40	35.50	3.40	36.92	54.00	-17.08	AV	Vertical
7229.44	36.57	43.50	11.40	35.50	3.40	39.97	68.20	-28.23	Pk	Horizontal
7229.44	34.44	43.50	11.40	35.50	3.40	37.84	54.00	-16.16	AV	Horizontal
10400.18	39.89	44.50	13.80	38.80	8.10	47.99	68.20	-20.21	Pk	Vertical
10400.18	36.11	44.50	13.80	38.80	8.10	44.21	54.00	-9.79	AV	Vertical
10399.97	38.73	44.50	13.80	38.80	8.10	46.83	68.20	-21.37	Pk	Horizontal
10399.97	36.71	44.50	13.80	38.80	8.10	44.81	54.00	-9.19	AV	Horizontal
11017.21	32.85	43.60	14.30	39.50	10.20	43.05	68.20	-25.15	Pk	Vertical
11017.21	31.07	43.60	14.30	39.50	10.20	41.27	54.00	-12.73	AV	Vertical
11030.14	33.11	43.60	14.30	39.50	10.20	43.31	68.20	-24.89	Pk	Horizontal
11030.14	29.71	43.60	14.30	39.50	10.20	39.91	54.00	-14.09	AV	Horizontal
13298.37	31.54	42.60	15.90	38.90	12.20	43.74	68.20	-24.46	Pk	Vertical
13298.37	28.61	42.60	15.90	38.90	12.20	40.81	54.00	-13.19	AV	Vertical
13288.28	31.86	42.60	15.90	38.90	12.20	44.06	68.20	-24.14	Pk	Horizontal
13288.28	29.94	42.60	15.90	38.90	12.20	42.14	54.00	-11.86	AV	Horizontal

High Channel (802.11 ac20/ 5240 MHz)										
3260.81	45.24	44.70	6.70	28.20	-9.80	35.44	68.20	-32.76	Pk	Vertical
3260.81	41.88	44.70	6.70	28.20	-9.80	32.08	54.00	-21.92	AV	Vertical
3256.78	45.16	44.70	6.70	28.20	-9.80	35.36	68.20	-32.84	Pk	Horizontal
3256.78	40.78	44.70	6.70	28.20	-9.80	30.98	54.00	-23.02	AV	Horizontal
3992.53	39.67	44.20	7.90	29.70	-6.60	33.07	68.20	-35.13	Pk	Vertical
3992.53	36.37	44.20	7.90	29.70	-6.60	29.77	54.00	-24.23	AV	Vertical
3996.65	39.86	44.20	7.90	29.70	-6.60	33.26	68.20	-34.94	Pk	Horizontal
3996.65	36.09	44.20	7.90	29.70	-6.60	29.49	54.00	-24.51	AV	Horizontal
7227.23	36.67	43.50	11.40	35.50	3.40	40.07	68.20	-28.13	Pk	Vertical
7227.23	33.71	43.50	11.40	35.50	3.40	37.11	54.00	-16.89	AV	Vertical
7226.89	37.76	43.50	11.40	35.50	3.40	41.16	68.20	-27.04	Pk	Horizontal
7226.89	34.24	43.50	11.40	35.50	3.40	37.64	54.00	-16.36	AV	Horizontal
10480.36	39.15	44.50	13.80	38.80	8.10	47.25	68.20	-20.95	Pk	Vertical
10480.36	37.01	44.50	13.80	38.80	8.10	45.11	54.00	-8.89	AV	Vertical
10480.25	39.71	44.50	13.80	38.80	8.10	47.81	68.20	-20.39	Pk	Horizontal
10480.25	36.05	44.50	13.80	38.80	8.10	44.15	54.00	-9.85	AV	Horizontal
11030.78	33.72	43.60	14.30	39.50	10.20	43.92	68.20	-24.28	Pk	Vertical
11030.78	30.69	43.60	14.30	39.50	10.20	40.89	54.00	-13.11	AV	Vertical
11027.81	32.70	43.60	14.30	39.50	10.20	42.90	68.20	-25.30	Pk	Horizontal
11027.81	31.14	43.60	14.30	39.50	10.20	41.34	54.00	-12.66	AV	Horizontal
13285.48	32.85	42.60	15.90	38.90	12.20	45.05	68.20	-23.15	Pk	Vertical
13285.48	29.49	42.60	15.90	38.90	12.20	41.69	54.00	-12.31	AV	Vertical
13280.83	32.57	42.60	15.90	38.90	12.20	44.77	68.20	-23.43	Pk	Horizontal
13280.83	29.21	42.60	15.90	38.90	12.20	41.41	54.00	-12.59	AV	Horizontal

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), the worst case is 802.11ac (VHT-20).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Band II 5250-5350MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11 n20/ 5260 MHz)										
3252.82	45.08	44.70	6.70	28.20	-9.80	35.28	68.20	-32.92	Pk	Vertical
3252.82	41.07	44.70	6.70	28.20	-9.80	31.27	54.00	-22.73	AV	Vertical
3254.19	44.84	44.70	6.70	28.20	-9.80	35.04	68.20	-33.16	Pk	Horizontal
3254.19	41.40	44.70	6.70	28.20	-9.80	31.60	54.00	-22.40	AV	Horizontal
3985.49	40.03	44.20	7.90	29.70	-6.60	33.43	68.20	-34.77	Pk	Vertical
3985.49	36.81	44.20	7.90	29.70	-6.60	30.21	54.00	-23.79	AV	Vertical
3991.97	39.17	44.20	7.90	29.70	-6.60	32.57	68.20	-35.63	Pk	Horizontal
3991.97	36.79	44.20	7.90	29.70	-6.60	30.19	54.00	-23.81	AV	Horizontal
7223.84	36.59	43.50	11.40	35.50	3.40	39.99	68.20	-28.21	Pk	Vertical
7223.84	33.62	43.50	11.40	35.50	3.40	37.02	54.00	-16.98	AV	Vertical
7218.20	37.42	43.50	11.40	35.50	3.40	40.82	68.20	-27.38	Pk	Horizontal
7218.20	34.86	43.50	11.40	35.50	3.40	38.26	54.00	-15.74	AV	Horizontal
10360.12	40.13	44.50	13.80	38.80	8.10	48.23	68.20	-19.97	Pk	Vertical
10360.12	36.88	44.50	13.80	38.80	8.10	44.98	54.00	-9.02	AV	Vertical
10359.96	39.69	44.50	13.80	38.80	8.10	47.79	68.20	-20.41	Pk	Horizontal
10359.96	36.93	44.50	13.80	38.80	8.10	45.03	54.00	-8.97	AV	Horizontal
11017.98	33.61	43.60	14.30	39.50	10.20	43.81	68.20	-24.39	Pk	Vertical
11017.98	30.32	43.60	14.30	39.50	10.20	40.52	54.00	-13.48	AV	Vertical
11020.12	33.90	43.60	14.30	39.50	10.20	44.10	68.20	-24.10	Pk	Horizontal
11020.12	30.33	43.60	14.30	39.50	10.20	40.53	54.00	-13.47	AV	Horizontal
13289.18	32.56	42.60	15.90	38.90	12.20	44.76	68.20	-23.44	Pk	Vertical
13289.18	28.92	42.60	15.90	38.90	12.20	41.12	54.00	-12.88	AV	Vertical
13289.32	31.64	42.60	15.90	38.90	12.20	43.84	68.20	-24.36	Pk	Horizontal
13289.32	29.32	42.60	15.90	38.90	12.20	41.52	54.00	-12.48	AV	Horizontal
Mid Channel (802.11 n20/ 5300 MHz)										
3259.71	44.29	44.70	6.70	28.20	-9.80	34.49	68.20	-33.71	Pk	Vertical
3259.71	41.61	44.70	6.70	28.20	-9.80	31.81	54.00	-22.19	AV	Vertical
3261.78	45.07	44.70	6.70	28.20	-9.80	35.27	68.20	-32.93	Pk	Horizontal
3261.78	41.67	44.70	6.70	28.20	-9.80	31.87	54.00	-22.13	AV	Horizontal
3995.10	38.97	44.20	7.90	29.70	-6.60	32.37	68.20	-35.83	Pk	Vertical
3995.10	35.82	44.20	7.90	29.70	-6.60	29.22	54.00	-24.78	AV	Vertical
3994.26	38.86	44.20	7.90	29.70	-6.60	32.26	68.20	-35.94	Pk	Horizontal
3994.26	37.04	44.20	7.90	29.70	-6.60	30.44	54.00	-23.56	AV	Horizontal
7227.37	36.51	43.50	11.40	35.50	3.40	39.91	68.20	-28.29	Pk	Vertical
7227.37	34.15	43.50	11.40	35.50	3.40	37.55	54.00	-16.45	AV	Vertical
7229.57	37.06	43.50	11.40	35.50	3.40	40.46	68.20	-27.74	Pk	Horizontal
7229.57	33.69	43.50	11.40	35.50	3.40	37.09	54.00	-16.91	AV	Horizontal
10400.43	39.58	44.50	13.80	38.80	8.10	47.68	68.20	-20.52	Pk	Vertical
10400.43	36.71	44.50	13.80	38.80	8.10	44.81	54.00	-9.19	AV	Vertical
10400.15	39.90	44.50	13.80	38.80	8.10	48.00	68.20	-20.20	Pk	Horizontal
10400.15	36.31	44.50	13.80	38.80	8.10	44.41	54.00	-9.59	AV	Horizontal
11023.94	33.93	43.60	14.30	39.50	10.20	44.13	68.20	-24.07	Pk	Vertical
11023.94	30.75	43.60	14.30	39.50	10.20	40.95	54.00	-13.05	AV	Vertical
11034.73	33.56	43.60	14.30	39.50	10.20	43.76	68.20	-24.44	Pk	Horizontal
11034.73	31.11	43.60	14.30	39.50	10.20	41.31	54.00	-12.69	AV	Horizontal
13297.91	32.14	42.60	15.90	38.90	12.20	44.34	68.20	-23.86	Pk	Vertical
13297.91	29.55	42.60	15.90	38.90	12.20	41.75	54.00	-12.25	AV	Vertical
13293.33	31.95	42.60	15.90	38.90	12.20	44.15	68.20	-24.05	Pk	Horizontal
13293.33	29.19	42.60	15.90	38.90	12.20	41.39	54.00	-12.61	AV	Horizontal

High Channel (802.11 n20/ 5320 MHz)										
3250.35	43.80	44.70	6.70	28.20	-9.80	34.00	68.20	-34.20	Pk	Vertical
3250.35	40.88	44.70	6.70	28.20	-9.80	31.08	54.00	-22.92	AV	Vertical
3250.77	45.02	44.70	6.70	28.20	-9.80	35.22	68.20	-32.98	Pk	Horizontal
3250.77	41.35	44.70	6.70	28.20	-9.80	31.55	54.00	-22.45	AV	Horizontal
3999.75	39.15	44.20	7.90	29.70	-6.60	32.55	68.20	-35.65	Pk	Vertical
3999.75	36.83	44.20	7.90	29.70	-6.60	30.23	54.00	-23.77	AV	Vertical
3984.00	39.89	44.20	7.90	29.70	-6.60	33.29	68.20	-34.91	Pk	Horizontal
3984.00	36.38	44.20	7.90	29.70	-6.60	29.78	54.00	-24.22	AV	Horizontal
7231.11	37.89	43.50	11.40	35.50	3.40	41.29	68.20	-26.91	Pk	Vertical
7231.11	34.71	43.50	11.40	35.50	3.40	38.11	54.00	-15.89	AV	Vertical
7221.68	37.81	43.50	11.40	35.50	3.40	41.21	68.20	-26.99	Pk	Horizontal
7221.68	33.88	43.50	11.40	35.50	3.40	37.28	54.00	-16.72	AV	Horizontal
10480.16	39.01	44.50	13.80	38.80	8.10	47.11	68.20	-21.09	Pk	Vertical
10480.16	36.82	44.50	13.80	38.80	8.10	44.92	54.00	-9.08	AV	Vertical
10480.08	40.07	44.50	13.80	38.80	8.10	48.17	68.20	-20.03	Pk	Horizontal
10480.08	36.30	44.50	13.80	38.80	8.10	44.40	54.00	-9.60	AV	Horizontal
11019.64	33.92	43.60	14.30	39.50	10.20	44.12	68.20	-24.08	Pk	Vertical
11019.64	30.18	43.60	14.30	39.50	10.20	40.38	54.00	-13.62	AV	Vertical
11028.19	34.14	43.60	14.30	39.50	10.20	44.34	68.20	-23.86	Pk	Horizontal
11028.19	31.12	43.60	14.30	39.50	10.20	41.32	54.00	-12.68	AV	Horizontal
13289.91	31.83	42.60	15.90	38.90	12.20	44.03	68.20	-24.17	Pk	Vertical
13289.91	29.97	42.60	15.90	38.90	12.20	42.17	54.00	-11.83	AV	Vertical
13282.45	31.81	42.60	15.90	38.90	12.20	44.01	68.20	-24.19	Pk	Horizontal
13282.45	29.51	42.60	15.90	38.90	12.20	41.71	54.00	-12.29	AV	Horizontal

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), the worst case is 802.11n (HT-20).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Band III 5470-5725MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11 n40/ 5510 MHz)										
3263.12	43.92	44.70	6.70	28.20	-9.80	34.12	68.20	-34.08	Pk	Vertical
3263.12	41.24	44.70	6.70	28.20	-9.80	31.44	54.00	-22.56	AV	Vertical
3271.66	44.72	44.70	6.70	28.20	-9.80	34.92	68.20	-33.28	Pk	Horizontal
3271.66	40.89	44.70	6.70	28.20	-9.80	31.09	54.00	-22.91	AV	Horizontal
4012.25	39.02	44.20	7.90	29.70	-6.60	32.42	68.20	-35.78	Pk	Vertical
4012.25	35.69	44.20	7.90	29.70	-6.60	29.09	54.00	-24.91	AV	Vertical
4021.40	38.89	44.20	7.90	29.70	-6.60	32.29	68.20	-35.91	Pk	Horizontal
4021.40	35.64	44.20	7.90	29.70	-6.60	29.04	54.00	-24.96	AV	Horizontal
7260.93	37.06	43.50	11.40	35.50	3.40	40.46	68.20	-27.74	Pk	Vertical
7260.93	34.01	43.50	11.40	35.50	3.40	37.41	54.00	-16.59	AV	Vertical
7272.26	37.61	43.50	11.40	35.50	3.40	41.01	68.20	-27.19	Pk	Horizontal
7272.26	33.93	43.50	11.40	35.50	3.40	37.33	54.00	-16.67	AV	Horizontal
10414.02	39.53	44.50	13.80	38.80	8.10	47.63	68.20	-20.57	Pk	Vertical
10414.02	36.37	44.50	13.80	38.80	8.10	44.47	54.00	-9.53	AV	Vertical
10402.83	39.08	44.50	13.80	38.80	8.10	47.18	68.20	-21.02	Pk	Horizontal
10402.83	35.75	44.50	13.80	38.80	8.10	43.85	54.00	-10.15	AV	Horizontal
11060.37	33.27	43.60	14.30	39.50	10.20	43.47	68.20	-24.73	Pk	Vertical
11060.37	30.14	43.60	14.30	39.50	10.20	40.34	54.00	-13.66	AV	Vertical
11060.35	33.03	43.60	14.30	39.50	10.20	43.23	68.20	-24.97	Pk	Horizontal
11060.35	30.47	43.60	14.30	39.50	10.20	40.67	54.00	-13.33	AV	Horizontal
13353.73	31.82	42.60	15.90	38.90	12.20	44.02	68.20	-24.18	Pk	Vertical
13353.73	29.07	42.60	15.90	38.90	12.20	41.27	54.00	-12.73	AV	Vertical
13357.00	33.03	42.60	15.90	38.90	12.20	45.23	68.20	-22.97	Pk	Horizontal
13357.00	29.69	42.60	15.90	38.90	12.20	41.89	54.00	-12.11	AV	Horizontal
High Channel (802.11 n40/ 5670 MHz)										
3270.41	44.72	44.70	6.70	28.20	-9.80	34.92	68.20	-33.28	Pk	Vertical
3270.41	40.80	44.70	6.70	28.20	-9.80	31.00	54.00	-23.00	AV	Vertical
3269.31	44.16	44.70	6.70	28.20	-9.80	34.36	68.20	-33.84	Pk	Horizontal
3269.31	41.66	44.70	6.70	28.20	-9.80	31.86	54.00	-22.14	AV	Horizontal
4015.18	39.03	44.20	7.90	29.70	-6.60	32.43	68.20	-35.77	Pk	Vertical
4015.18	36.35	44.20	7.90	29.70	-6.60	29.75	54.00	-24.25	AV	Vertical
4008.23	39.86	44.20	7.90	29.70	-6.60	33.26	68.20	-34.94	Pk	Horizontal
4008.23	35.79	44.20	7.90	29.70	-6.60	29.19	54.00	-24.81	AV	Horizontal
7270.22	37.05	43.50	11.40	35.50	3.40	40.45	68.20	-27.75	Pk	Vertical
7270.22	33.63	43.50	11.40	35.50	3.40	37.03	54.00	-16.97	AV	Vertical
7270.46	37.86	43.50	11.40	35.50	3.40	41.26	68.20	-26.94	Pk	Horizontal
7270.46	33.65	43.50	11.40	35.50	3.40	37.05	54.00	-16.95	AV	Horizontal
10536.35	39.47	44.50	13.80	38.80	8.10	47.57	68.20	-20.63	Pk	Vertical
10536.35	35.76	44.50	13.80	38.80	8.10	43.86	54.00	-10.14	AV	Vertical
10536.53	39.11	44.50	13.80	38.80	8.10	47.21	68.20	-20.99	Pk	Horizontal
10536.53	36.36	44.50	13.80	38.80	8.10	44.46	54.00	-9.54	AV	Horizontal
11079.14	33.15	43.60	14.30	39.50	10.20	43.35	68.20	-24.85	Pk	Vertical
11079.14	30.62	43.60	14.30	39.50	10.20	40.82	54.00	-13.18	AV	Vertical
11083.11	33.93	43.60	14.30	39.50	10.20	44.13	68.20	-24.07	Pk	Horizontal
11083.11	29.82	43.60	14.30	39.50	10.20	40.02	54.00	-13.98	AV	Horizontal
13367.97	31.78	42.60	15.90	38.90	12.20	43.98	68.20	-24.22	Pk	Vertical
13367.97	29.80	42.60	15.90	38.90	12.20	42.00	54.00	-12.00	AV	Vertical
13371.20	31.87	42.60	15.90	38.90	12.20	44.07	68.20	-24.13	Pk	Horizontal
13371.20	29.36	42.60	15.90	38.90	12.20	41.56	54.00	-12.44	AV	Horizontal

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20),802.11ac (VHT-40), the worst case is 802.11n (HT-20).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Band IV(5.725-5.850) GHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11 n20/ 5745 MHz)										
3261.78	44.60	44.70	6.70	28.20	-9.80	34.80	68.20	-33.40	Pk	Vertical
3261.78	41.95	44.70	6.70	28.20	-9.80	32.15	54.00	-21.85	AV	Vertical
3253.27	44.70	44.70	6.70	28.20	-9.80	34.90	68.20	-33.30	Pk	Horizontal
3253.27	41.72	44.70	6.70	28.20	-9.80	31.92	54.00	-22.08	AV	Horizontal
3997.39	39.61	44.20	7.90	29.70	-6.60	33.01	68.20	-35.19	Pk	Vertical
3997.39	36.48	44.20	7.90	29.70	-6.60	29.88	54.00	-24.12	AV	Vertical
3981.91	40.12	44.20	7.90	29.70	-6.60	33.52	68.20	-34.68	Pk	Horizontal
3981.91	36.53	44.20	7.90	29.70	-6.60	29.93	54.00	-24.07	AV	Horizontal
7233.95	37.82	43.50	11.40	35.50	3.40	41.22	68.20	-26.98	Pk	Vertical
7233.95	34.82	43.50	11.40	35.50	3.40	38.22	54.00	-15.78	AV	Vertical
7221.23	37.12	43.50	11.40	35.50	3.40	40.52	68.20	-27.68	Pk	Horizontal
7221.23	34.62	43.50	11.40	35.50	3.40	38.02	54.00	-15.98	AV	Horizontal
10360.41	39.17	44.50	13.80	38.80	8.10	47.27	68.20	-20.93	Pk	Vertical
10360.41	35.97	44.50	13.80	38.80	8.10	44.07	54.00	-9.93	AV	Vertical
10359.97	40.14	44.50	13.80	38.80	8.10	48.24	68.20	-19.96	Pk	Horizontal
10359.97	36.05	44.50	13.80	38.80	8.10	44.15	54.00	-9.85	AV	Horizontal
11019.50	33.49	43.60	14.30	39.50	10.20	43.69	68.20	-24.51	Pk	Vertical
11019.50	30.14	43.60	14.30	39.50	10.20	40.34	54.00	-13.66	AV	Vertical
11032.84	33.44	43.60	14.30	39.50	10.20	43.64	68.20	-24.56	Pk	Horizontal
11032.84	29.94	43.60	14.30	39.50	10.20	40.14	54.00	-13.86	AV	Horizontal
13291.95	32.68	42.60	15.90	38.90	12.20	44.88	68.20	-23.32	Pk	Vertical
13291.95	29.68	42.60	15.90	38.90	12.20	41.88	54.00	-12.12	AV	Vertical
13291.80	32.29	42.60	15.90	38.90	12.20	44.49	68.20	-23.71	Pk	Horizontal
13291.80	29.83	42.60	15.90	38.90	12.20	42.03	54.00	-11.97	AV	Horizontal
Mid Channel (802.11 n20/ 5785MHz)										
3254.76	44.25	44.70	6.70	28.20	-9.80	34.45	68.20	-33.75	Pk	Vertical
3254.76	40.75	44.70	6.70	28.20	-9.80	30.95	54.00	-23.05	AV	Vertical
3251.93	44.76	44.70	6.70	28.20	-9.80	34.96	68.20	-33.24	Pk	Horizontal
3251.93	40.82	44.70	6.70	28.20	-9.80	31.02	54.00	-22.98	AV	Horizontal
3991.43	39.84	44.20	7.90	29.70	-6.60	33.24	68.20	-34.96	Pk	Vertical
3991.43	36.36	44.20	7.90	29.70	-6.60	29.76	54.00	-24.24	AV	Vertical
3981.17	39.52	44.20	7.90	29.70	-6.60	32.92	68.20	-35.28	Pk	Horizontal
3981.17	36.81	44.20	7.90	29.70	-6.60	30.21	54.00	-23.79	AV	Horizontal
7232.91	36.92	43.50	11.40	35.50	3.40	40.32	68.20	-27.88	Pk	Vertical
7232.91	33.98	43.50	11.40	35.50	3.40	37.38	54.00	-16.62	AV	Vertical
7219.16	37.14	43.50	11.40	35.50	3.40	40.54	68.20	-27.66	Pk	Horizontal
7219.16	34.21	43.50	11.40	35.50	3.40	37.61	54.00	-16.39	AV	Horizontal
10400.22	39.25	44.50	13.80	38.80	8.10	47.35	68.20	-20.85	Pk	Vertical
10400.22	35.96	44.50	13.80	38.80	8.10	44.06	54.00	-9.94	AV	Vertical
10400.30	38.94	44.50	13.80	38.80	8.10	47.04	68.20	-21.16	Pk	Horizontal
10400.30	36.21	44.50	13.80	38.80	8.10	44.31	54.00	-9.69	AV	Horizontal
11019.71	34.16	43.60	14.30	39.50	10.20	44.36	68.20	-23.84	Pk	Vertical
11019.71	30.06	43.60	14.30	39.50	10.20	40.26	54.00	-13.74	AV	Vertical
11020.37	33.37	43.60	14.30	39.50	10.20	43.57	68.20	-24.63	Pk	Horizontal
11020.37	31.02	43.60	14.30	39.50	10.20	41.22	54.00	-12.78	AV	Horizontal
13290.44	31.66	42.60	15.90	38.90	12.20	43.86	68.20	-24.34	Pk	Vertical
13290.44	29.03	42.60	15.90	38.90	12.20	41.23	54.00	-12.77	AV	Vertical
13286.56	32.87	42.60	15.90	38.90	12.20	45.07	68.20	-23.13	Pk	Horizontal
13286.56	29.24	42.60	15.90	38.90	12.20	41.44	54.00	-12.56	AV	Horizontal

High Channel (802.11 n20/ 5825 MHz)										
3263.05	44.31	44.70	6.70	28.20	-9.80	34.51	68.20	-33.69	Pk	Vertical
3263.05	41.17	44.70	6.70	28.20	-9.80	31.37	54.00	-22.63	AV	Vertical
3256.79	43.83	44.70	6.70	28.20	-9.80	34.03	68.20	-34.17	Pk	Horizontal
3256.79	41.34	44.70	6.70	28.20	-9.80	31.54	54.00	-22.46	AV	Horizontal
3992.29	40.07	44.20	7.90	29.70	-6.60	33.47	68.20	-34.73	Pk	Vertical
3992.29	36.35	44.20	7.90	29.70	-6.60	29.75	54.00	-24.25	AV	Vertical
3990.60	39.58	44.20	7.90	29.70	-6.60	32.98	68.20	-35.22	Pk	Horizontal
3990.60	36.97	44.20	7.90	29.70	-6.60	30.37	54.00	-23.63	AV	Horizontal
7232.49	37.34	43.50	11.40	35.50	3.40	40.74	68.20	-27.46	Pk	Vertical
7232.49	34.90	43.50	11.40	35.50	3.40	38.30	54.00	-15.70	AV	Vertical
7218.14	37.46	43.50	11.40	35.50	3.40	40.86	68.20	-27.34	Pk	Horizontal
7218.14	34.27	43.50	11.40	35.50	3.40	37.67	54.00	-16.33	AV	Horizontal
10480.28	39.92	44.50	13.80	38.80	8.10	48.02	68.20	-20.18	Pk	Vertical
10480.28	36.97	44.50	13.80	38.80	8.10	45.07	54.00	-8.93	AV	Vertical
10480.29	39.13	44.50	13.80	38.80	8.10	47.23	68.20	-20.97	Pk	Horizontal
10480.29	37.04	44.50	13.80	38.80	8.10	45.14	54.00	-8.86	AV	Horizontal
11031.18	34.18	43.60	14.30	39.50	10.20	44.38	68.20	-23.82	Pk	Vertical
11031.18	31.03	43.60	14.30	39.50	10.20	41.23	54.00	-12.77	AV	Vertical
11034.99	33.62	43.60	14.30	39.50	10.20	43.82	68.20	-24.38	Pk	Horizontal
11034.99	30.10	43.60	14.30	39.50	10.20	40.30	54.00	-13.70	AV	Horizontal
13295.37	32.06	42.60	15.90	38.90	12.20	44.26	68.20	-23.94	Pk	Vertical
13295.37	29.53	42.60	15.90	38.90	12.20	41.73	54.00	-12.27	AV	Vertical
13296.32	32.25	42.60	15.90	38.90	12.20	44.45	68.20	-23.75	Pk	Horizontal
13296.32	29.63	42.60	15.90	38.90	12.20	41.83	54.00	-12.17	AV	Horizontal

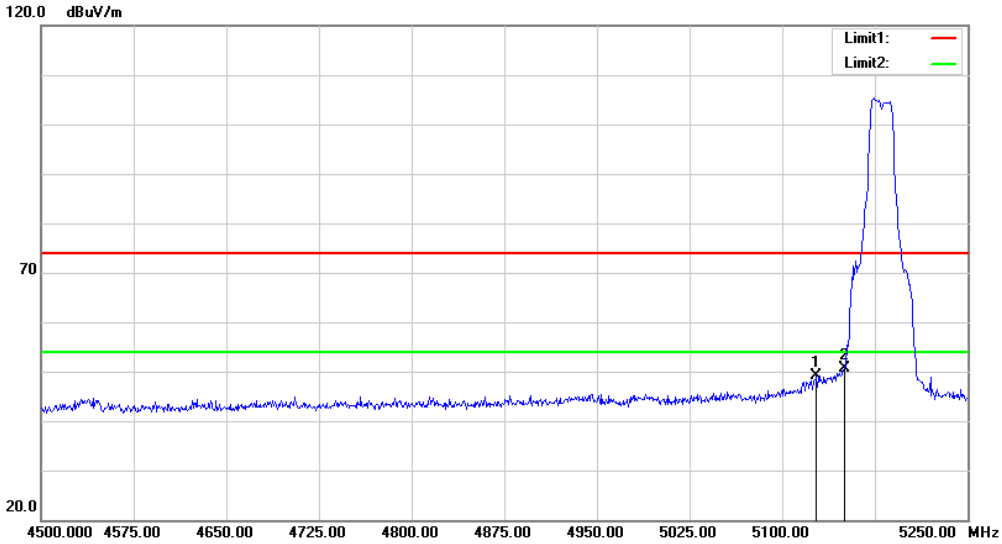
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), the worst case is 802.11n (HT-20).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

7.5 BANDEDGE TEST RESULT

Band I 5150-5250MHz

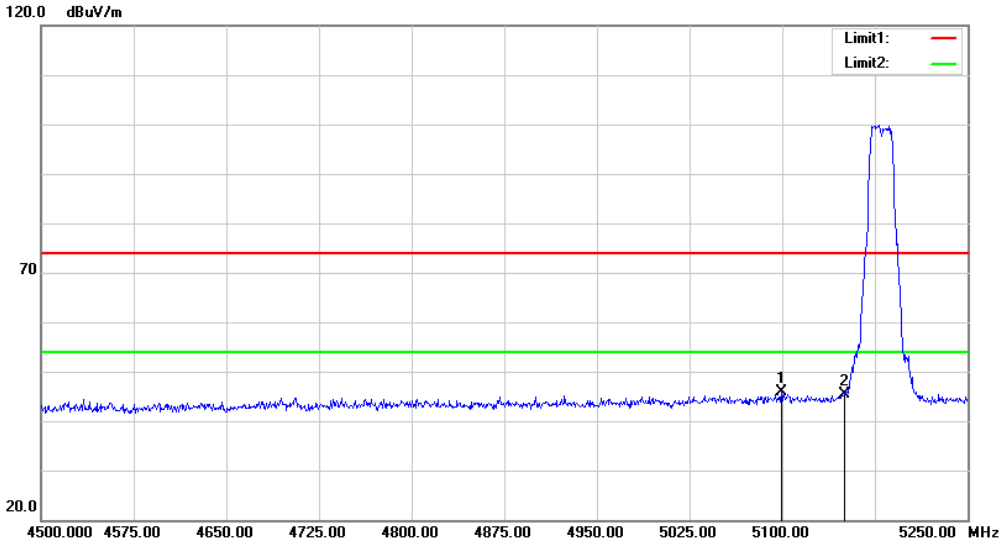
802.11ac (VHT20) Low

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5127.750	54.80	-5.74	49.06	74.00	-24.94	peak
2	5150.000	56.30	-5.73	50.57	74.00	-23.43	peak

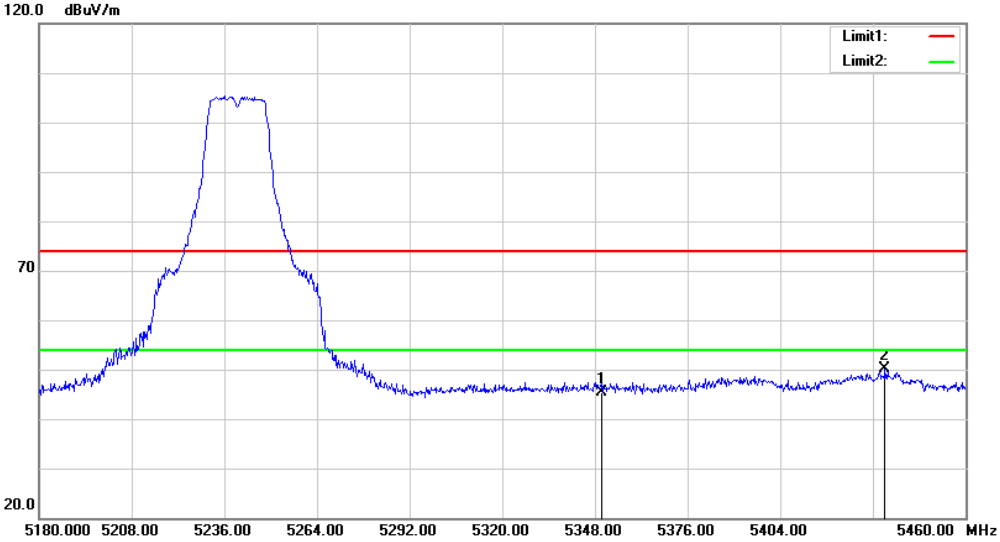
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5099.250	51.74	-5.74	46.00	74.00	-28.00	peak
2	5150.000	51.10	-5.73	45.37	74.00	-28.63	peak

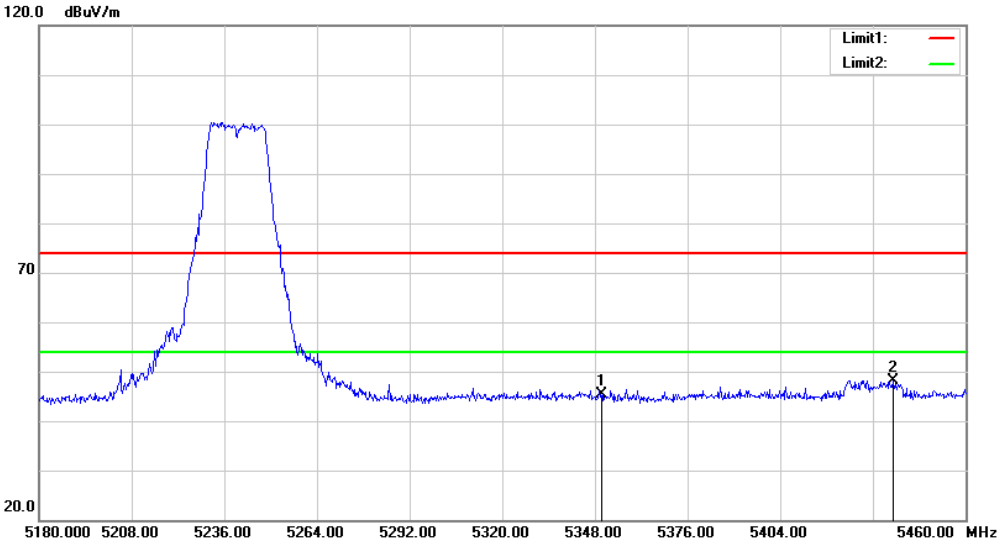
802.11ac (VHT20) High

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	50.72	-5.23	45.49	74.00	-28.51	peak
2	5435.640	55.21	-5.17	50.04	74.00	-23.96	peak

Vertical



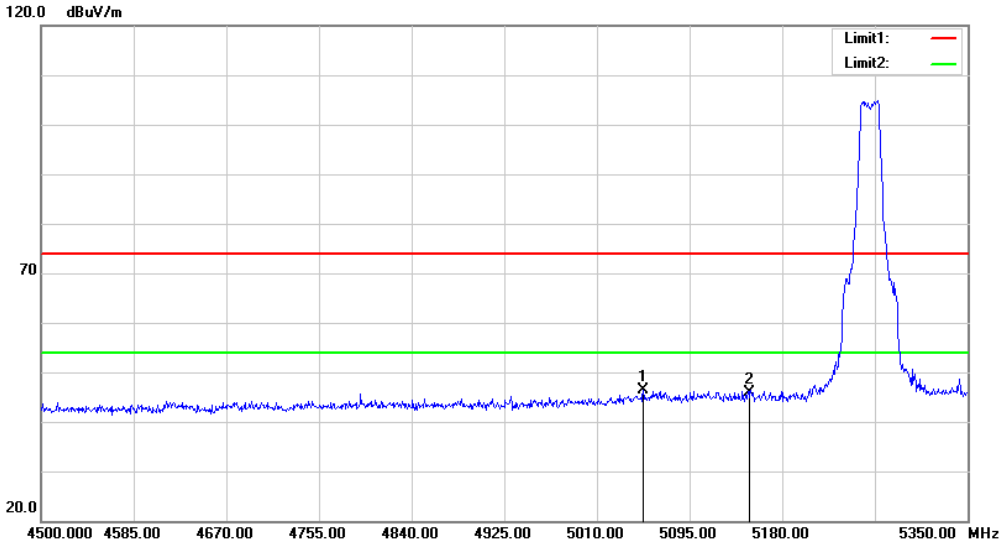
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	50.56	-5.23	45.33	74.00	-28.67	peak
2	5438.160	53.35	-5.16	48.19	74.00	-25.81	peak

Note: 1. 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40) all has been tested, the worst case is 802.11ac (VHT20), only shown the worst case.

Band II 5250-5350MHz

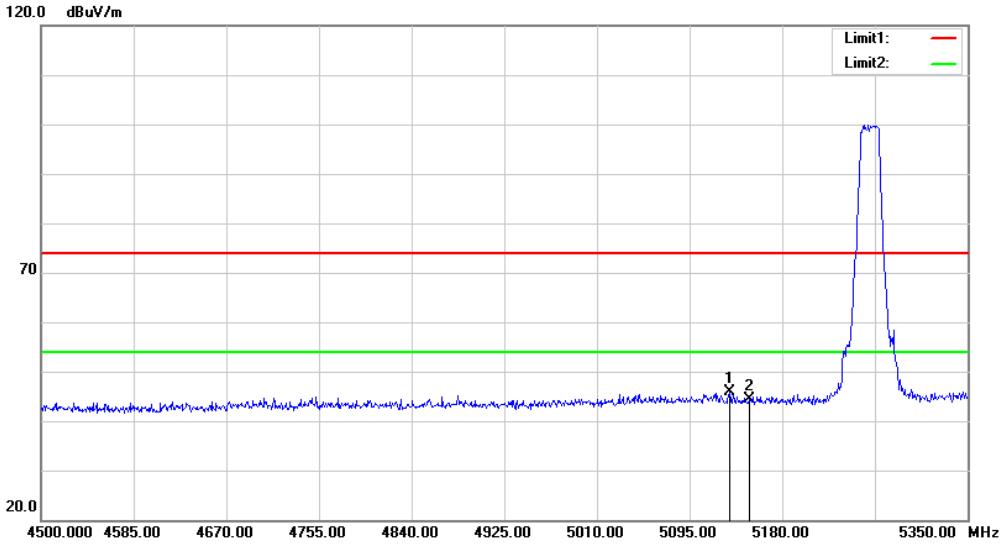
802.11n(HT20) Low

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5052.500	52.32	-5.96	46.36	74.00	-27.64	peak
2	5150.000	51.57	-5.73	45.84	74.00	-28.16	peak

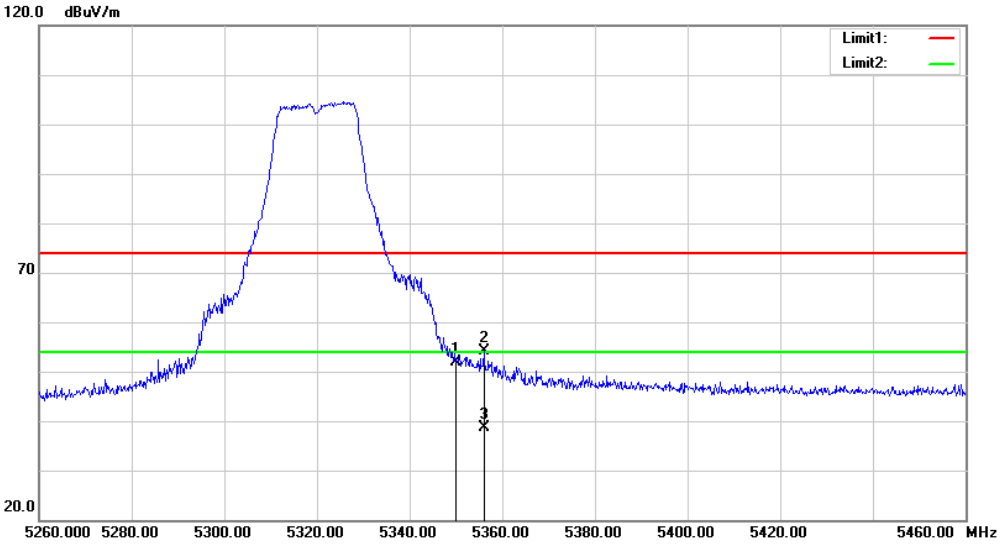
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5131.550	51.51	-5.73	45.78	74.00	-28.22	peak
2	5150.000	50.20	-5.73	44.47	74.00	-29.53	peak

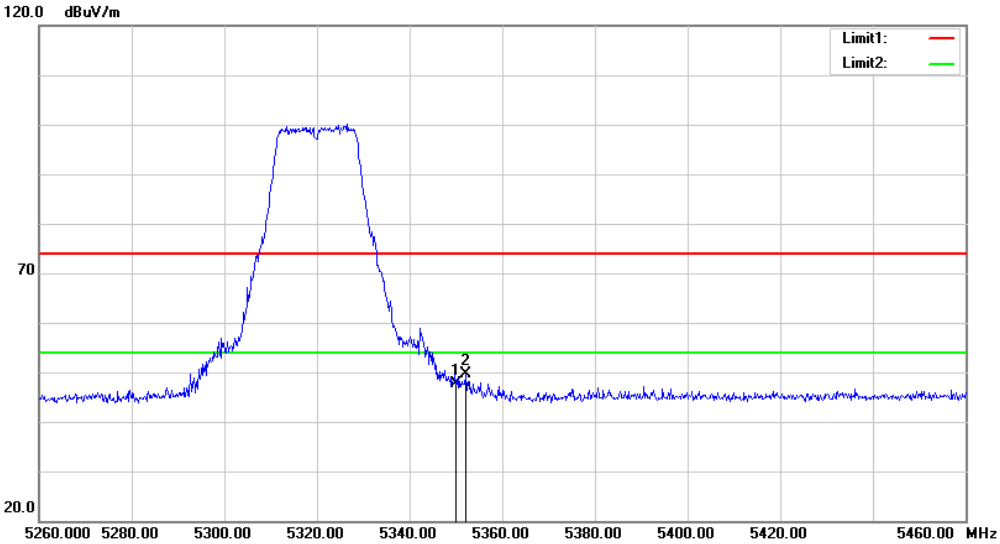
802.11n(HT20) High

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	57.13	-5.23	51.90	74.00	-22.10	peak
2	5356.000	59.33	-5.24	54.09	74.00	-19.91	peak
3	5356.000	43.88	-5.24	38.64	54.00	-15.36	AVG

Vertical



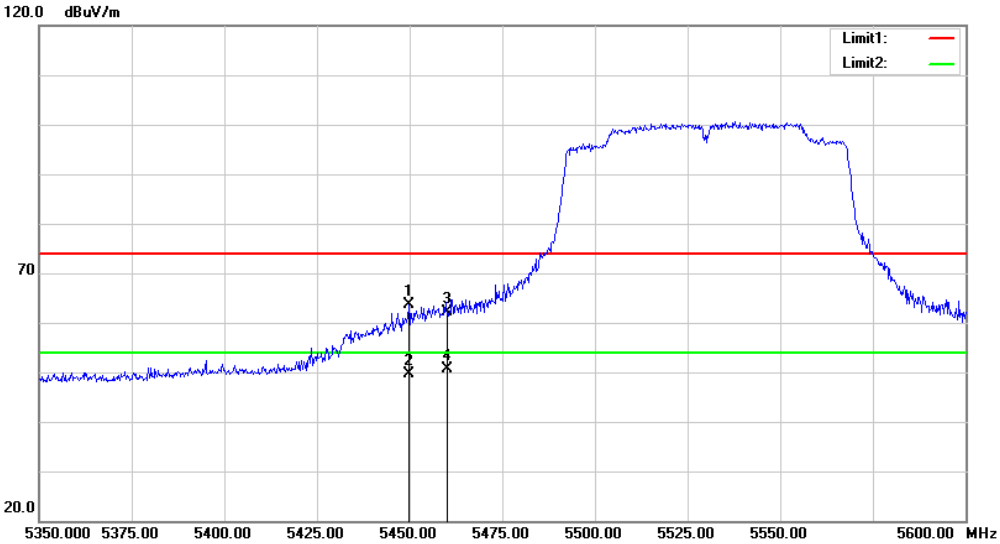
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	52.87	-5.23	47.64	74.00	-26.36	peak
2	5352.200	54.86	-5.23	49.63	74.00	-24.37	peak

Note: 1. 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), all has been tested, the worst case is 802.11n(HT20),only shown the worst case.

Band III 5470-5725MHz

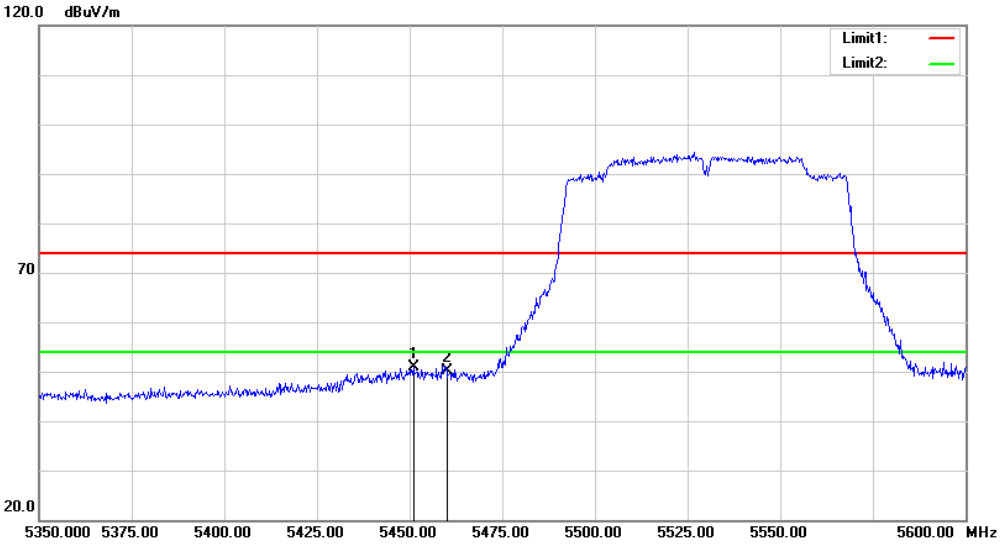
802.11a Low

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5449.750	68.88	-5.14	63.74	74.00	-10.26	peak
2	5449.750	54.78	-5.14	49.64	54.00	-4.36	AVG
3	5460.000	67.20	-5.11	62.09	74.00	-11.91	peak
4	5460.000	55.72	-5.11	50.61	54.00	-3.39	AVG

Vertical

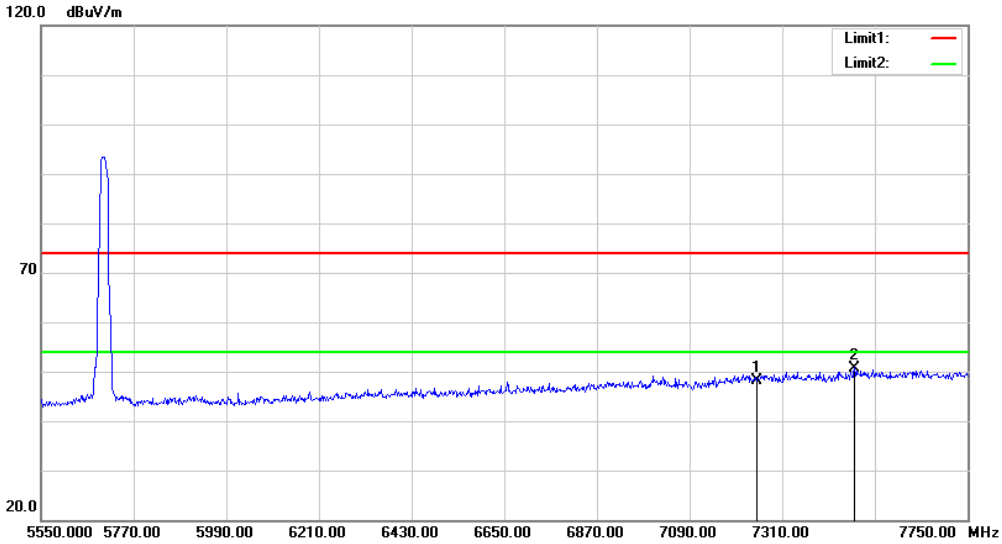


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5451.000	55.97	-5.13	50.84	74.00	-23.16	peak
2	5460.000	55.22	-5.11	50.11	74.00	-23.89	peak

Note: 1. 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40) all has been tested, the worst case is 802.11a, only shown the worst case.

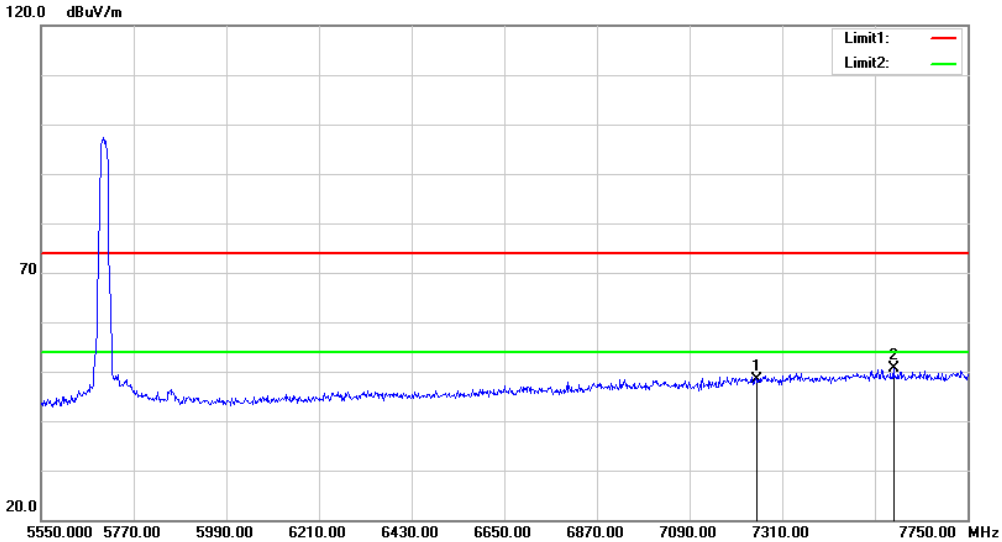
802.11a Low

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7250.000	47.36	0.72	48.08	74.00	-25.92	peak
2	7481.600	49.19	1.56	50.75	74.00	-23.25	peak

Vertical

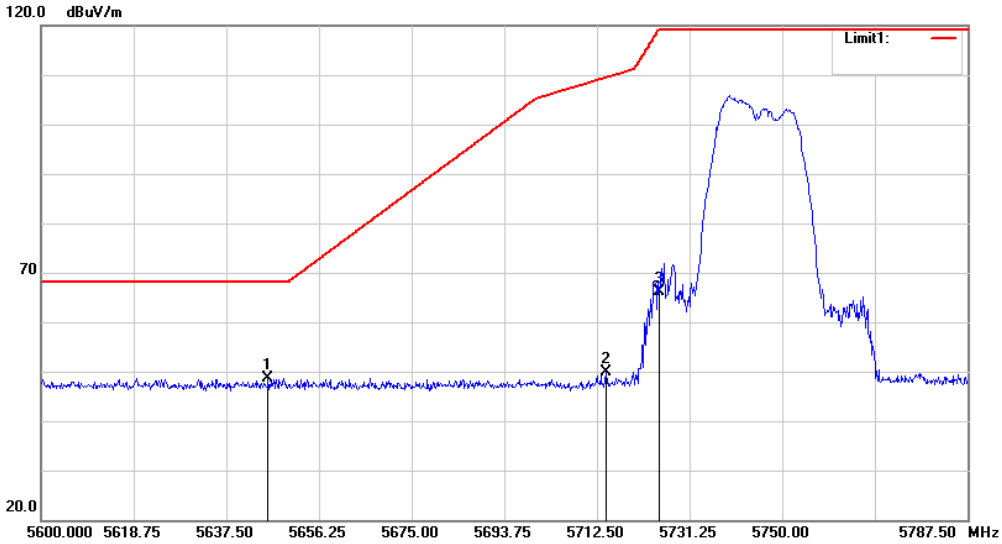


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7250.000	47.58	0.72	48.30	74.00	-25.70	peak
2	7574.000	48.82	1.71	50.53	74.00	-23.47	peak

Note: 1. 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40) all has been tested, the worst case is 802.11a, only shown the worst case.

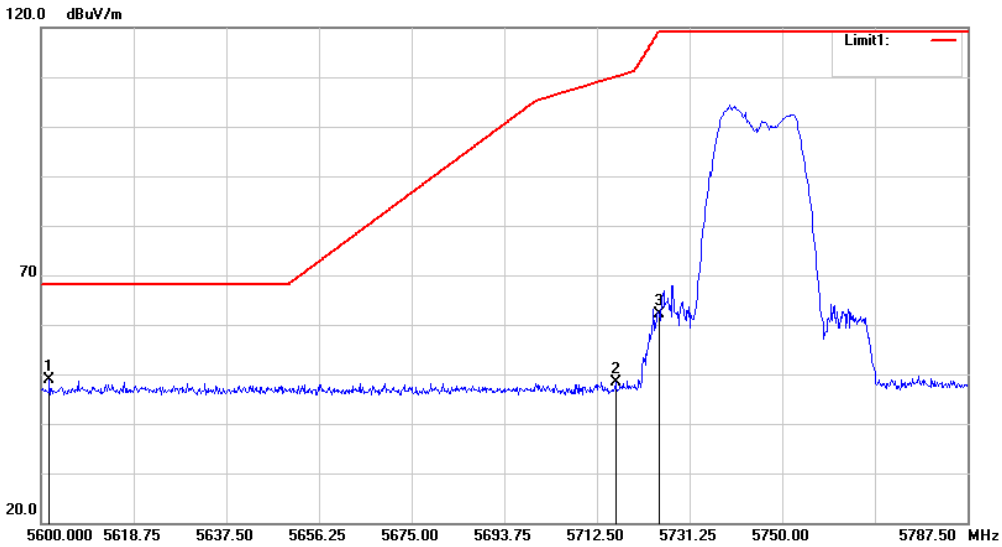
Band IV(5.725-5.85 GHz)

802.11ac20-H



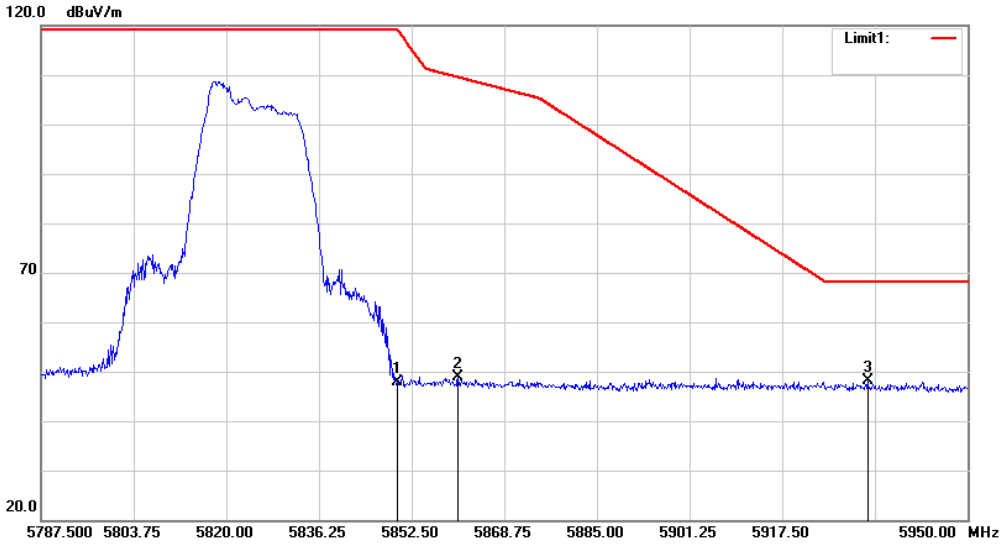
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5645.938	53.35	-4.69	48.66	68.20	-19.54	peak
2	5714.375	54.53	-4.61	49.92	109.51	-59.59	peak
3	5725.000	70.80	-4.57	66.23	119.20	-52.97	peak

802.11ac20-V



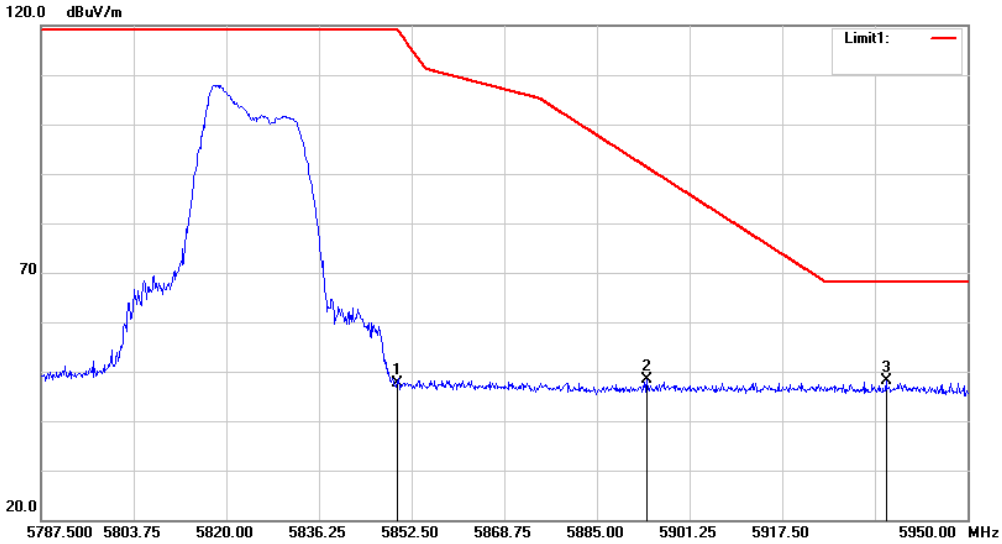
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5601.688	53.55	-4.70	48.85	68.20	-19.35	peak
2	5716.250	53.06	-4.60	48.46	110.08	-61.62	peak
3	5725.000	66.58	-4.57	62.01	119.20	-57.19	peak

802.11ac20-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	52.03	-4.10	47.93	119.20	-71.27	peak
2	5860.625	52.99	-4.05	48.94	109.51	-60.57	peak
3	5932.450	52.10	-3.94	48.16	68.20	-20.04	peak

802.11ac20-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	51.78	-4.10	47.68	119.20	-71.52	peak
2	5893.775	52.19	-3.91	48.28	91.31	-43.03	peak
3	5935.700	52.13	-3.94	48.19	68.20	-20.01	peak

8. CONDUCTED SPURIOUS EMISSIONS AND BANDEDGE

8.1 LIMIT

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) 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.

8.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	1000 KHz/3000 KHz
Trace-Mode:	Max hold

.

For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 5140 to 5775 MHz Upper Band Edge: 5230 to 5950 MHz (The specific test chart shall prevail)
RB / VB (emission in restricted band)	1000 KHz/3000 KHz
Trace-Mode:	Max hold

8.3 TEST SETUP

The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.
Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1000 kHz. In order to make an accurate measurement, set the span greater than RBW.

8.4 TEST RESULTS

See Attach A

9. CONDUCTED EMISSION TEST

9.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 207(a) limit in the table below has to be followed.

FREQUENCY (MHz)	Conducted Emissionlimit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

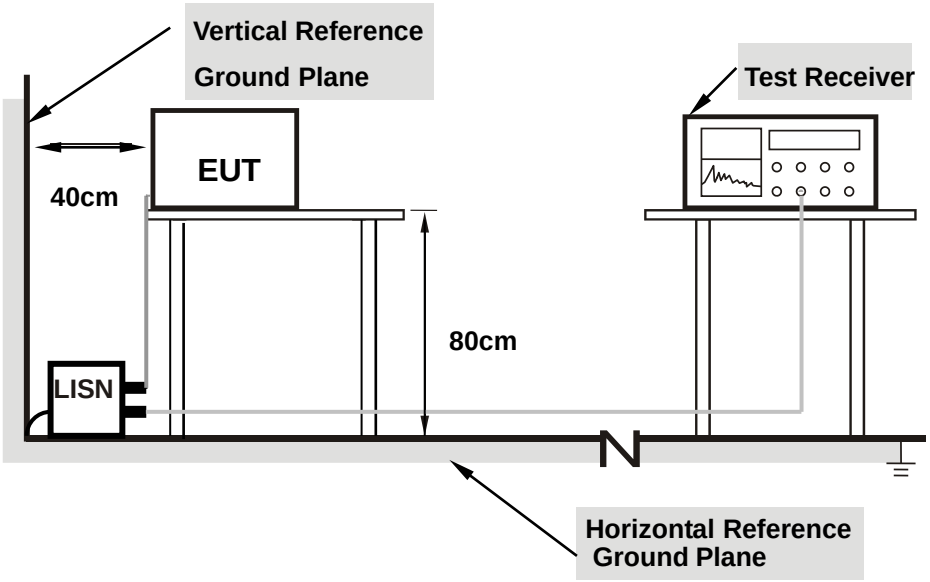
The following table is the setting of the receiver

Receiver Parameters	**Setting**
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

9.2 TEST PROCEDURE

a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

9.3 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

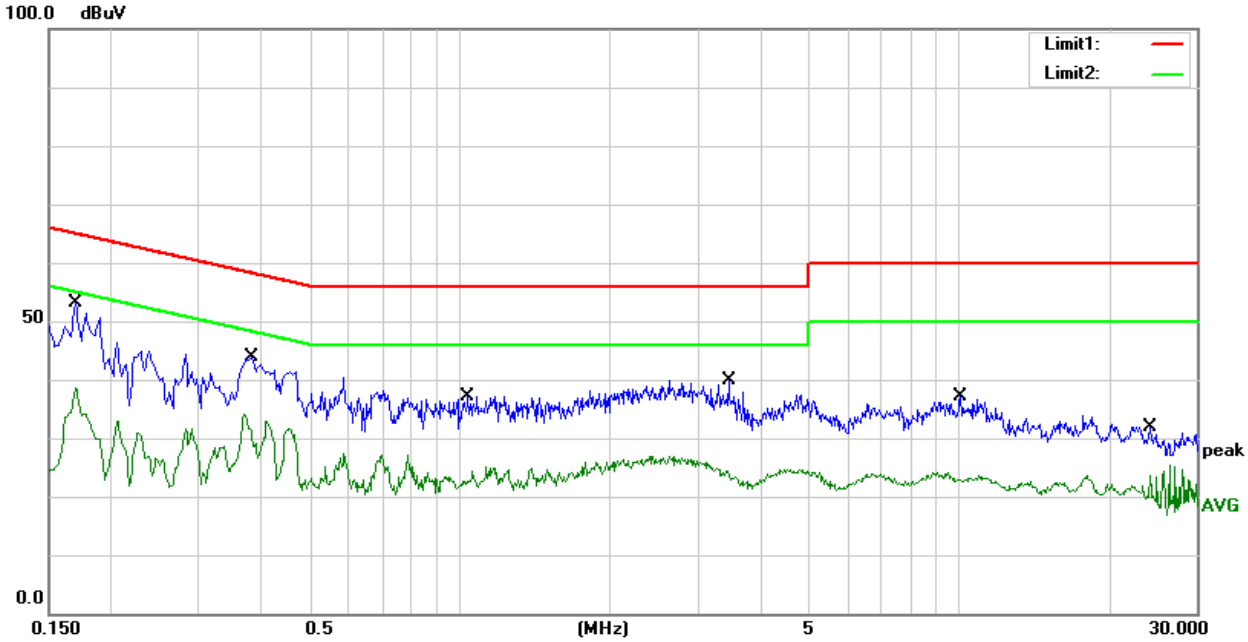
9.4 TEST RESULT

Temperature:	22.1 ℃	Relative Humidity:	56%
Test Voltage:	120V/60HZ	Phase:	L/N
Test Mode:	ON		

L-line

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1700	32.84	20.23	53.07	64.96	-11.89	QP
2	0.1700	18.49	20.23	38.72	54.96	-16.24	AVG
3	0.3820	23.35	20.54	43.89	58.24	-14.35	QP
4	0.3820	9.95	20.54	30.49	48.24	-17.75	AVG
5	1.0380	16.89	20.16	37.05	56.00	-18.95	QP
6	1.0380	1.87	20.16	22.03	46.00	-23.97	AVG
7	3.4580	19.98	19.97	39.95	56.00	-16.05	QP
8	3.4580	3.15	19.97	23.12	46.00	-22.88	AVG
9	10.1100	17.02	20.13	37.15	60.00	-22.85	QP
10	10.1100	2.58	20.13	22.71	50.00	-27.29	AVG
11	24.1940	11.39	20.58	31.97	60.00	-28.03	QP
12	24.1940	-0.48	20.58	20.10	50.00	-29.90	AVG

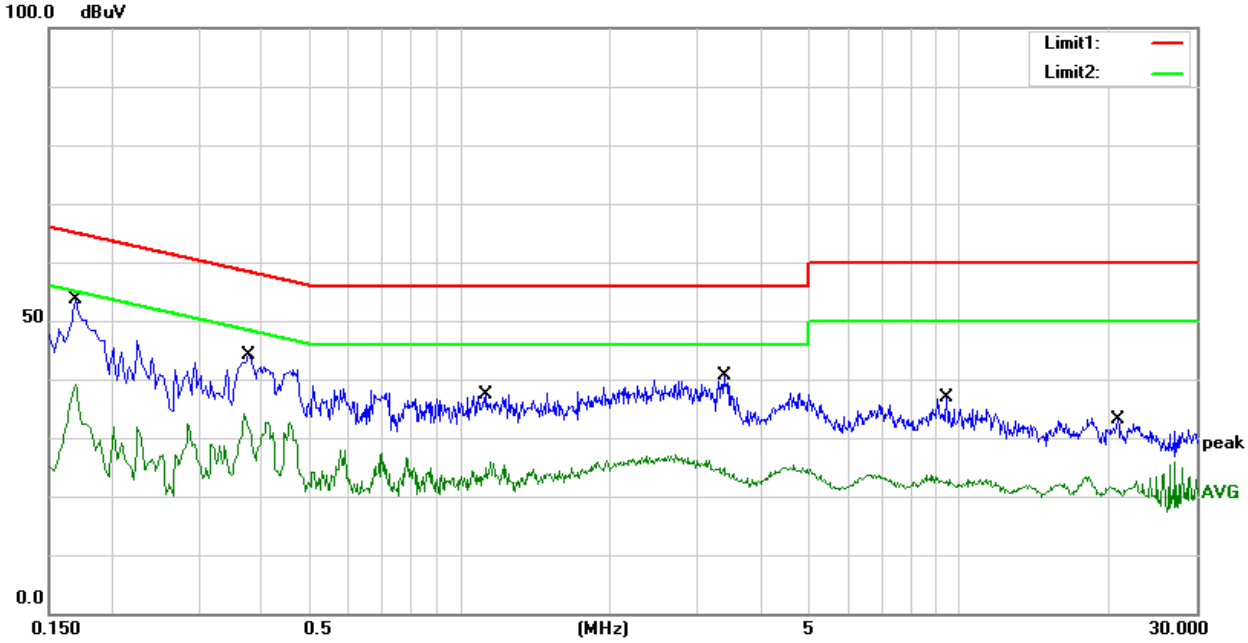
Remark:
1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)



N-line

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1700	33.28	20.24	53.52	64.96	-11.44	QP
2	0.1700	18.96	20.24	39.20	54.96	-15.76	AVG
3	0.3780	23.55	20.58	44.13	58.32	-14.19	QP
4	0.3780	10.83	20.58	31.41	48.32	-16.91	AVG
5	1.1340	17.22	20.16	37.38	56.00	-18.62	QP
6	1.1340	4.71	20.16	24.87	46.00	-21.13	AVG
7	3.3940	20.52	20.07	40.59	56.00	-15.41	QP
8	3.3940	3.70	20.07	23.77	46.00	-22.23	AVG
9	9.4980	17.00	19.86	36.86	60.00	-23.14	QP
10	9.4980	2.75	19.86	22.61	50.00	-27.39	AVG
11	20.8900	12.41	20.65	33.06	60.00	-26.94	QP
12	20.8900	0.47	20.65	21.12	50.00	-28.88	AVG

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)



10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2 RESULT

The antennas used for this product are PIFA antenna and other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 1.44 dBi.

※※※※※END OF THE REPORT※※※※※