FCC TEST REPORT

FCC ID: 2AR6UR2

Product	:	Wireless Router
Model Name	:	Netduma R2
Brand	:	Netduma
Report No.	:	PTC18112601001E-FC02

Prepared for

Netduma Limited

20-22 Wenlock Road, London, N1 7GU, United Kingdom

Prepared by

Dongguan Precise Testing & Certification Corp., Ltd.

Building D, Baoding Technology Park, Guangming Road 2, Guangming Community, Dongcheng District, Dongguan, Guangdong, China

1 TEST RESULT CERTIFICATION

Applicant's name	:	Netduma Limited
Address	:	20-22 Wenlock Road, London, N1 7GU, United Kingdom
Manufacture's name	:	Visonicom Technology Corporation Limited
Address	:	Block B2, No. 14 Jian'an Road, Shajing Subdistrict, Baoan District, Shenzhen, 518104 China
Product name	:	Wireless Router
Model name	:	Netduma R2
Standards	:	FCC CFR47 Part 15 Section 15.407
Test procedure	:	ANSI C63.10:2013
Test Date	:	January 10, 2019 to February 28, 2019
Date of Issue	:	February 28, 2019
Test Result	:	Pass

This device described above has been tested by PTC, and 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.

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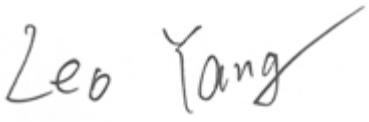
Test Engineer:



Leo Yang / Engineer

Technical Manager:

Chris Du / Manager

Contents

2 Test Summary

Test Items	Test Requirement	Result
AC Power Line Conduct Emission	15.207(a),15.407(b)(6)	PASS
Maximum Conducted Output Power	15.407(a)	PASS
6dB Emission Bandwidth	15.407 (e)	PASS
26dB Emission Bandwidth 99% Occupied Bandwidth	15.407 (a)	PASS
Power Spectral Density	15.407(a)	PASS
Band edge	15.407(b)	PASS
Radiated Emissions	15.205, 15.209, 15.407(b)	PASS
Antenna Requirement	15.203	PASS
Remark: N/A: Not Applicable		

3 General Information

3.1 General Description of E.U.T.

Product Name	:	Wireless Router
Model Name	:	Netduma R2
Modulation Technology	:	IEEE 802.11a/ n/ac
Operation Frequency	:	IEEE 802.11a/ n/ac(HT20) 5.180GHz-5.240GHz IEEE 802.11n/ac(HT40) 5.190GHz-5.310GHz IEEE 802.11ac(HT80) 5.210GHz
	:	IEEE 802.11a/ n/ac(HT20)5.745GHz-5.825GHz IEEE 802.11a/ n/ac(HT40)5.755GHz-5.795GHz IEEE 802.11ac(HT80) 5.775GHz
Type of Modulation	:	CCK/OFDM
Antenna installation	:	External Antenna
Antenna Type		2TX2RX
Antenna Port	:	☐Ant1; ☐Ant2; ☒Ant3; ☒Ant4
Smart system		☒SISO for 802.11b/g ☒MIMO for 802.11n
Smart system	:	5.0dBi (for per antenna port Max) 8.01dBi for MIMO(Ant3+Ant4 Directional Gain)
Power supply	:	For Adapter: Model: JZB-1201000E Input: AC 100-240V, 50/60Hz, 0.35A Max Output: DC 12V, 1000mA
Hardware Version	:	V1.2
Software Version	:	N/A

3.2 Channel List

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list :

For 5150-5250 MHz Band, 7 channels are provided to testing;

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210	/	/

802.11a, 802.11n (ht20) were tested with Channel 36, 40 and 48
802.11n ht40 were tested with Channel 38 and 46
802.11ac80 mode was tested with channel 42.

For 5725-5850MHz band, 8 Channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785
151	5755	159	5795
153	5765	161	5805
155	5775	165	5825

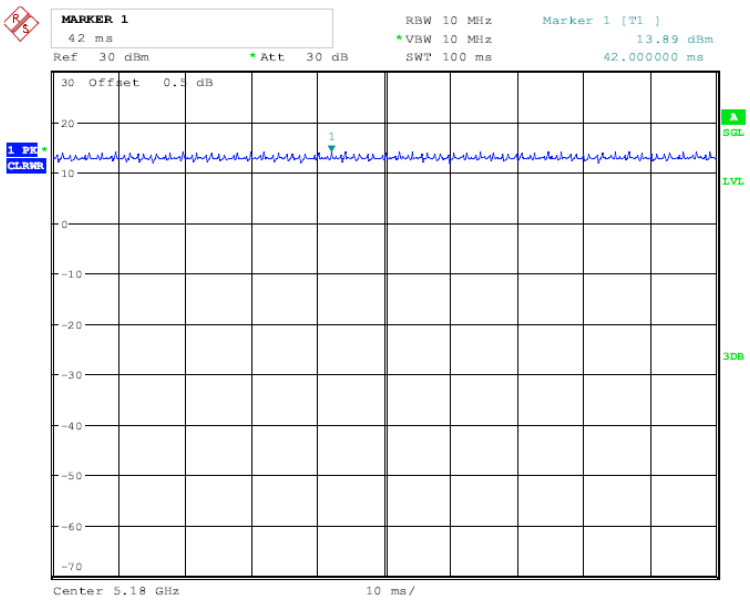
802.11a, 802.11n (ht20) were tested with Channel 149, 157and 165
802.11n ht40 were tested with Channel 151 and 159
802.11ac80 mode was tested with channel 155.

The maximum duty cycle as following table:

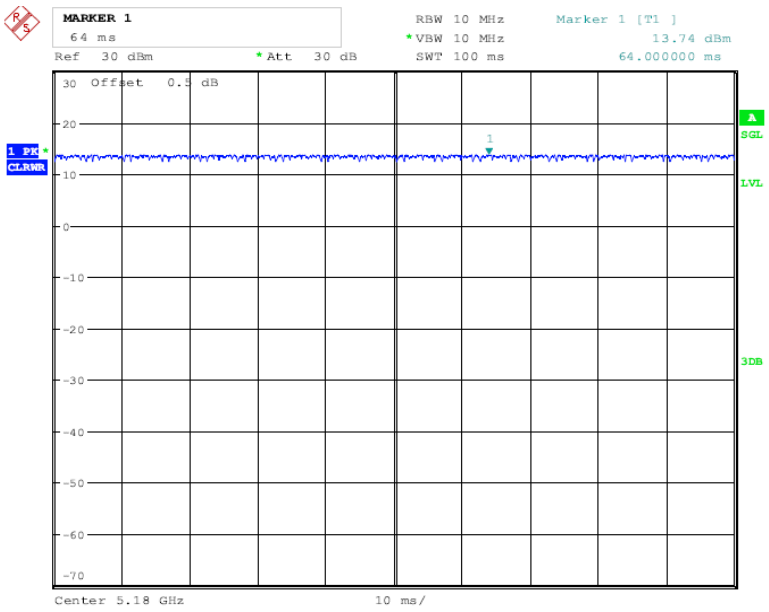
Test Mode	T_{on}(ms)	T_{on+off}(ms)	Duty Cycle(%)
802.11a	100	100	100%
802.11n (HT20)	100	100	100%
802.11n(HT40)	100	100	100%
802.11ac 80	100	100	100%

Test Plots:

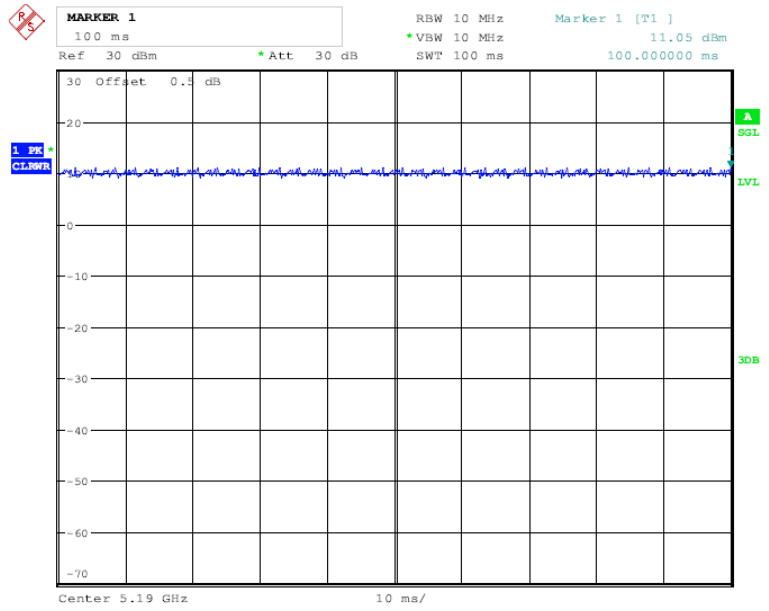
802.11a mode



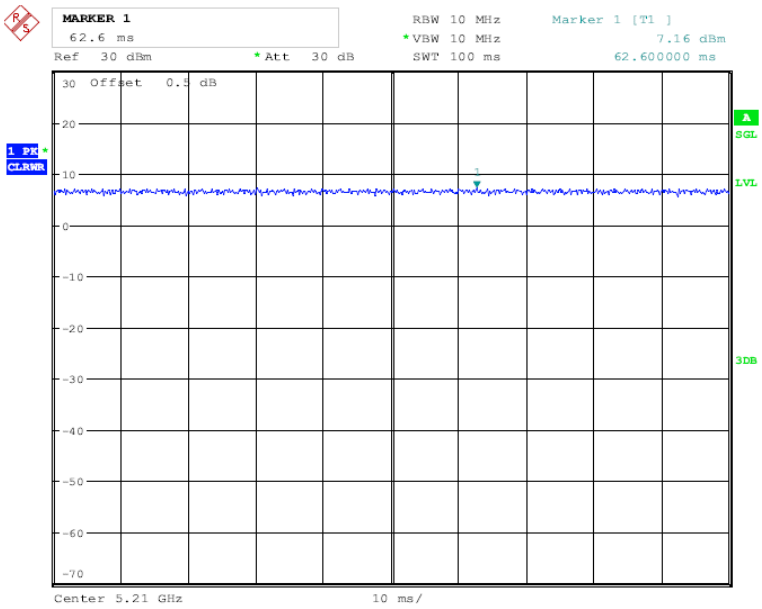
802.11n(HT20)



802.11n(HT40)



802.11n(HT40)


MARKER 1
62.6 ms
RBW 10 MHz
*VBW 10 MHz
SWT 100 ms
Marker 1 [T1]
7.16 dBm
62.600000 ms
Ref 30 dBm
* Att 30 dB
30 Offset 0.5 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
1 PK
CLRWR
A
SGL
LVL
3DB
Center 5.21 GHz
10 ms/

3.3 Test Site

Dongguan Precise Testing & Certification Corp., Ltd.

Building D, Baoding Technology Park, Guangming Road2, Dongcheng District, Dongguan, Guangdong, China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A-1

Test Lab: Shenzhen BCTC Testing Co., Ltd.

Address: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

FCC Registered No.: 712850

Test items: Radiated Spurious Emission(18GHz to 25GHz)

4 Equipment During Test

4.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Sep.19, 2019
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Sep.19, 2019
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Sep.19, 2019
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Sep.19, 2019

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions(Test Frequency from 9KHz-18GHz)

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Sep.19, 2019
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Sep.19, 2019
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Sep.19, 2019
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Sep.19, 2019
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Sep.19, 2019
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Sep.19, 2019
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Sep.19, 2019
Power Amplifier	LUNAR EM	LNA1G18-40	J10100000081	1GHz-26.5GHz	Sep.19, 2019
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Sep.19, 2019

Radiated Emission (Test Frequency from 18GHz-25GHz)

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-26.5GHz	Sep.19, 2019
Test Receiver	R&S	ESPI	101396	9KHz-7GHz	Sep.19, 2019
Horn Antenna	SCHWARZBECK	BBHA 9170	9170-181	14GHz-40GHz	Sep.19, 2019
Amplifier	SCHWARZBECK	BBV 9721	9721-205	18GHz-40GHz	Sep.19, 2019
RF Cable	R&S	R204	R21X	1GHz-40GHz	Sep.19, 2019
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Sep.19, 2019

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Sep.19, 2019
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	9KHz-300MHz	Sep.19, 2019
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	9KHz-300MHz	Sep.19, 2019

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB

4.3 Description of Support Units

Equipment	Model No.	Series No.
N/A	N/A	N/A

5 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method	:	ANSI C63.10: 2013
Test Result	:	PASS
Frequency Range	:	150kHz to 30MHz
Class/Severity	:	Class B

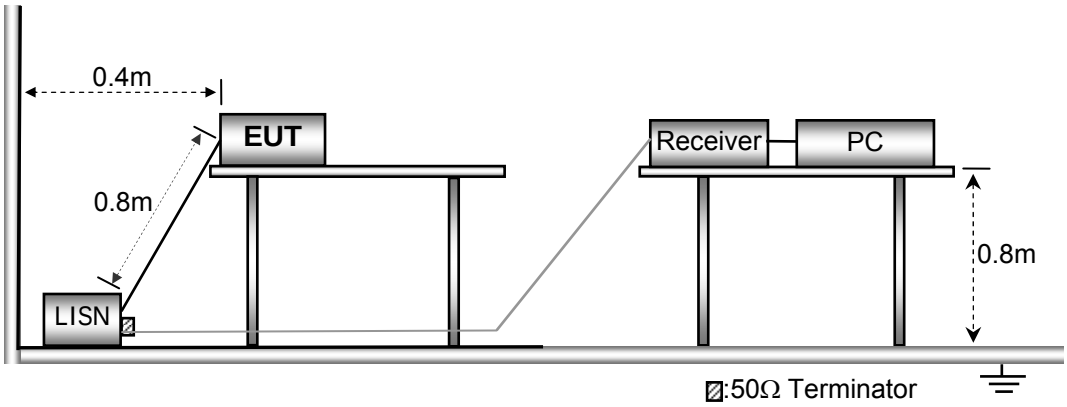
5.1 E.U.T. Operation

Operating Environment **:**

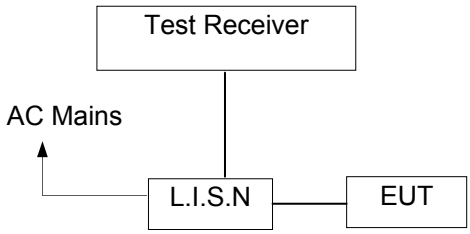
Temperature	:	25.5 °C
Humidity	:	51 % RH
Atmospheric Pressure	:	101.2kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:
1. The lower limit shall apply at the transition frequencies
2.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

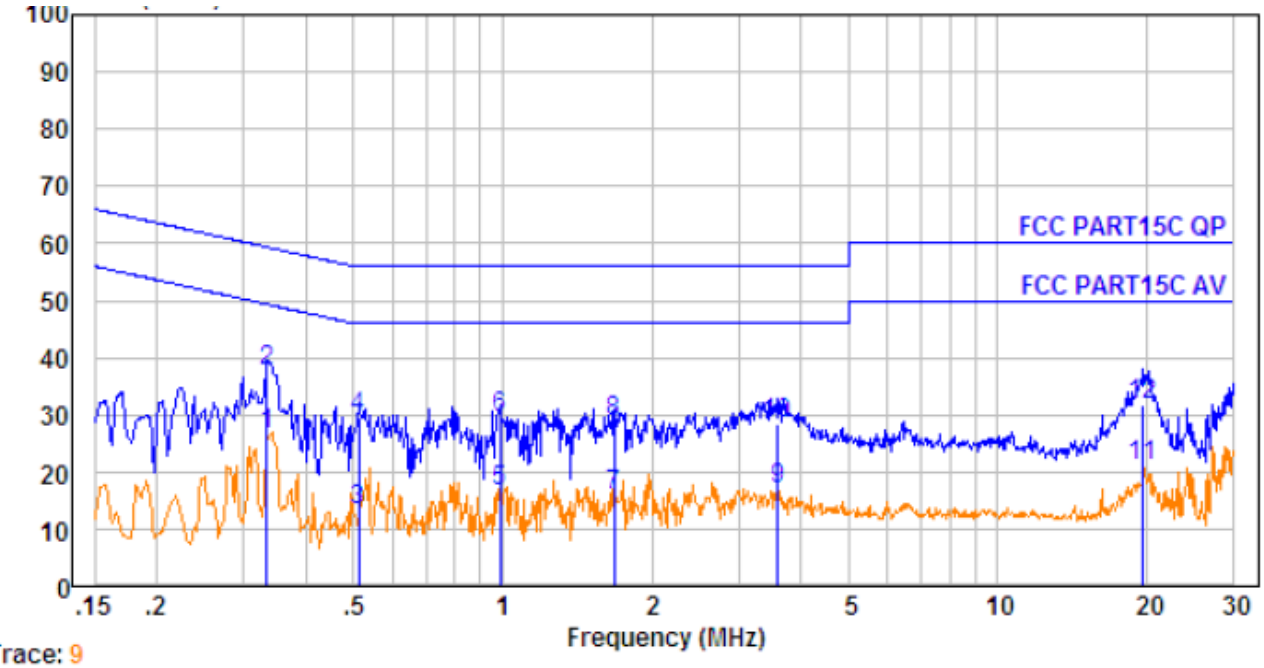
5.7 Conducted Emission Test Result

Pass.

All the modulation modes were tested the data of the worst mode (TX 802.11a Low Channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following test plots:

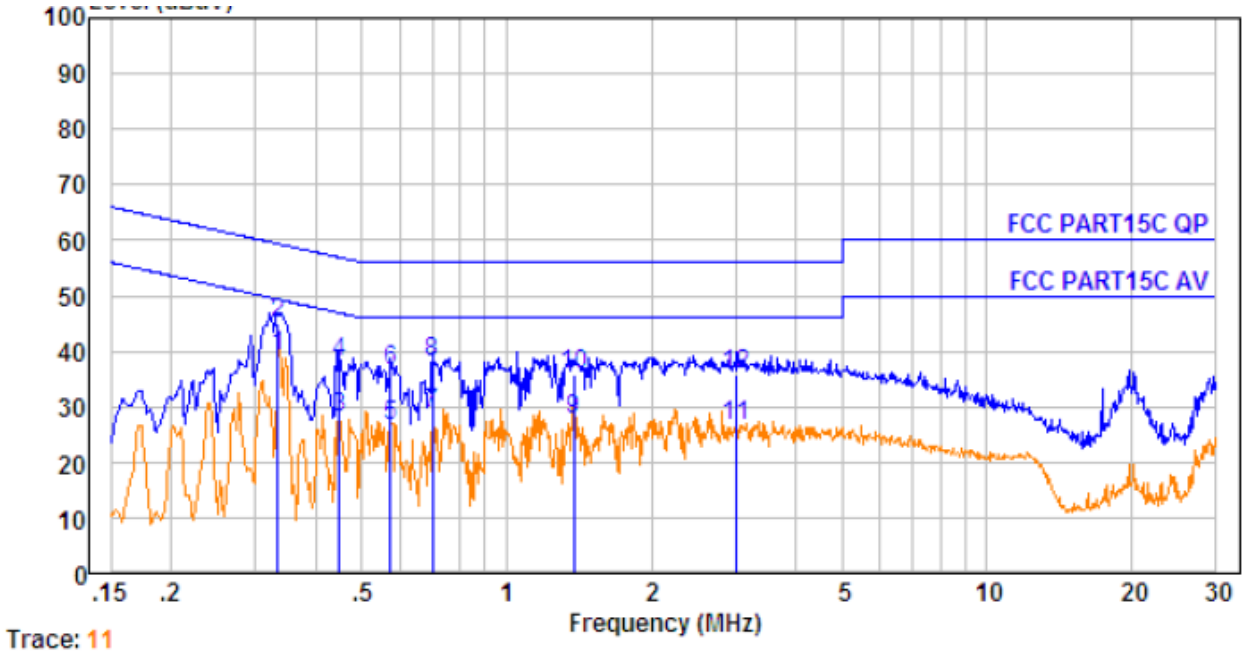
Line-AC 120V/60Hz



Trace: 9

No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.334	0.38	9.70	16.49	26.57	49.35	-22.78	Average
2.	0.334	0.38	9.70	27.40	37.48	59.35	-21.87	QP
3.	0.513	0.43	9.78	2.91	13.12	46.00	-32.88	Average
4.	0.513	0.43	9.78	19.25	29.46	56.00	-26.54	QP
5.	0.989	0.46	9.82	6.37	16.65	46.00	-29.35	Average
6.	0.989	0.46	9.82	19.32	29.60	56.00	-26.40	QP
7.	1.680	0.47	9.84	5.67	15.98	46.00	-30.02	Average
8.	1.680	0.47	9.84	18.52	28.83	56.00	-27.17	QP
9.	3.603	0.47	9.89	6.45	16.81	46.00	-29.19	Average
10.	3.603	0.47	9.89	18.20	28.56	56.00	-27.44	QP
11.	19.635	0.40	9.85	10.77	21.02	50.00	-28.98	Average
12.	19.635	0.40	9.85	21.30	31.55	60.00	-28.45	QP

Neutral-AC 120V/60Hz



Trace: 11

No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.334	0.38	9.73	28.92	39.03	49.35	-10.32	Average
2.	0.334	0.38	9.73	34.90	45.01	59.35	-14.34	QP
3.	0.449	0.42	9.79	17.77	27.98	46.89	-18.91	Average
4.	0.449	0.42	9.79	27.78	37.99	56.89	-18.90	QP
5.	0.573	0.43	9.82	16.37	26.62	46.00	-19.38	Average
6.	0.573	0.43	9.82	26.31	36.56	56.00	-19.44	QP
7.	0.701	0.44	9.83	18.52	28.79	46.00	-17.21	Average
8.	0.701	0.44	9.83	27.58	37.85	56.00	-18.15	QP
9.	1.381	0.46	9.86	17.47	27.79	46.00	-18.21	Average
10.	1.381	0.46	9.86	25.42	35.74	56.00	-20.26	QP
11.	3.009	0.47	9.92	16.31	26.70	46.00	-19.30	Average
12.	3.009	0.47	9.92	25.36	35.75	56.00	-20.25	QP

6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method : ANSI C63.10:2013

Test Result : PASS

Measurement Distance : 3m

Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

Operating Environment :

Temperature: : 23.5 °C

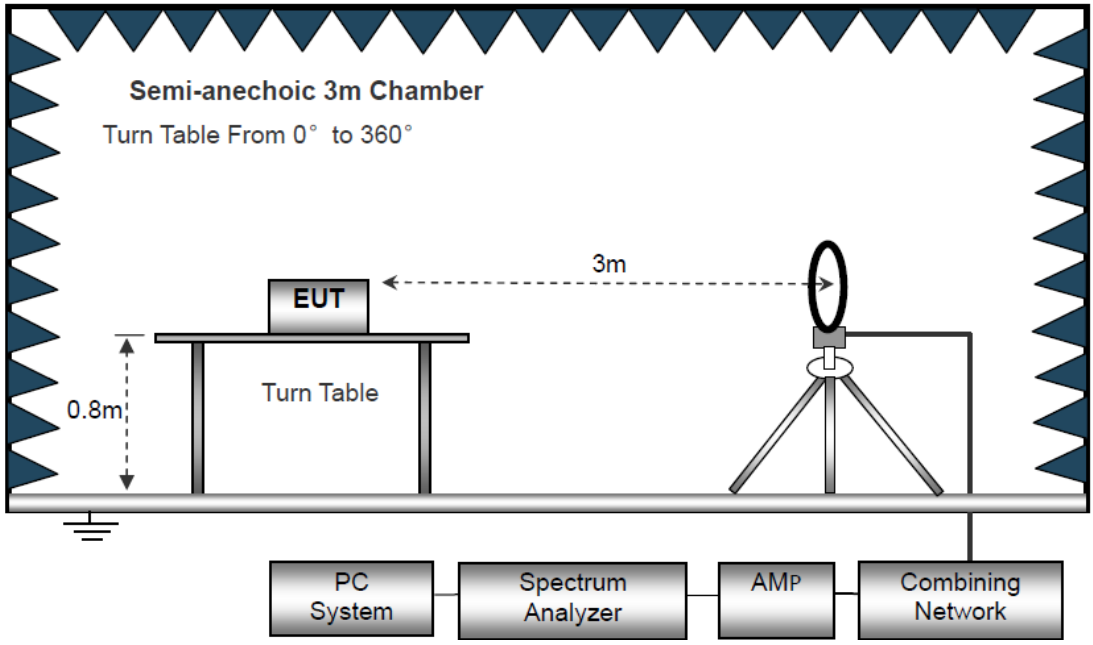
Humidity: : 51.1 % RH

Atmospheric Pressure: : 101.2kPa

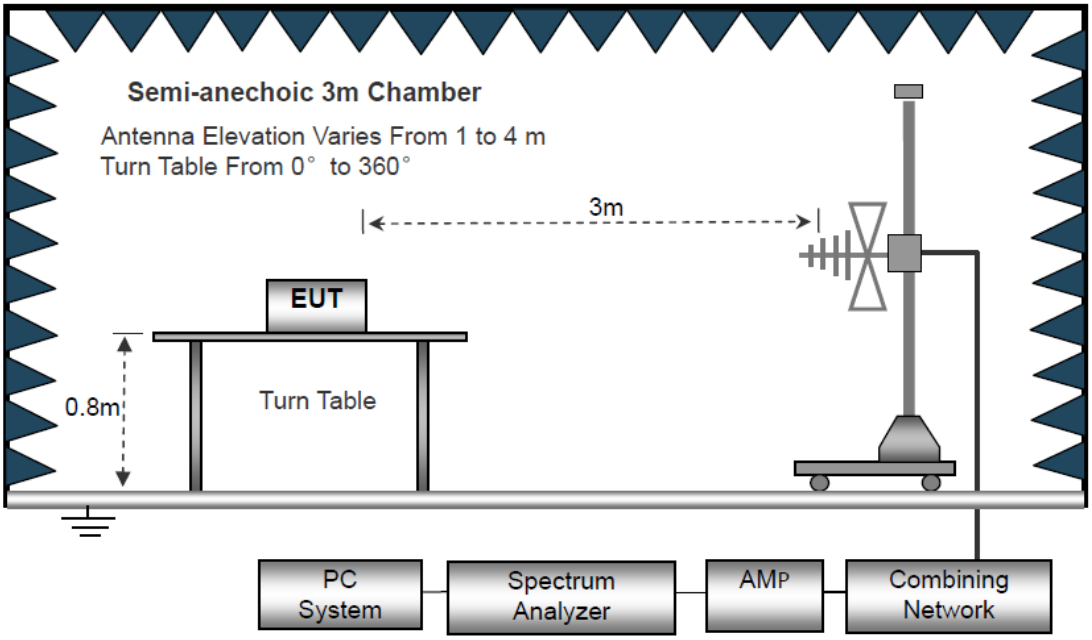
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

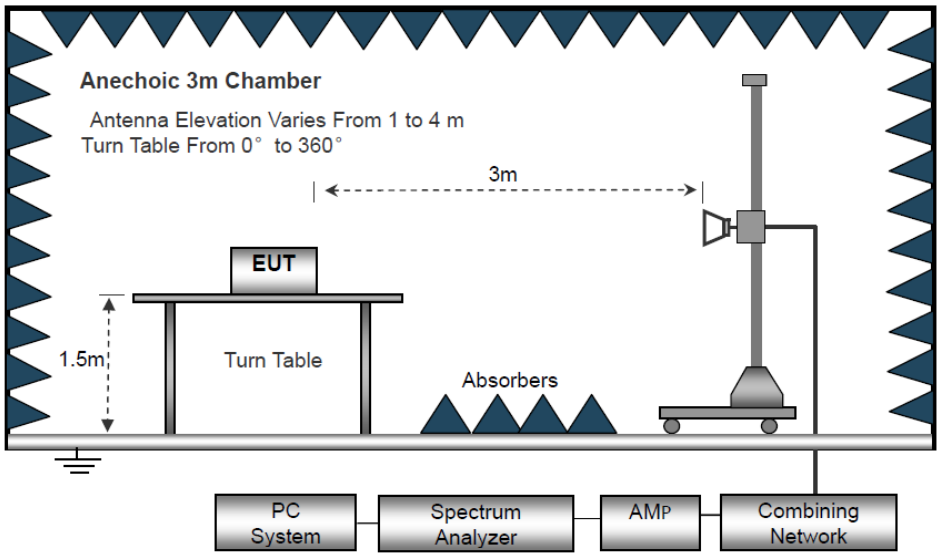
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

6.4 Test Procedure

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane, And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

6. Repeat above procedures until the measurements for all frequencies are complete.

7. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

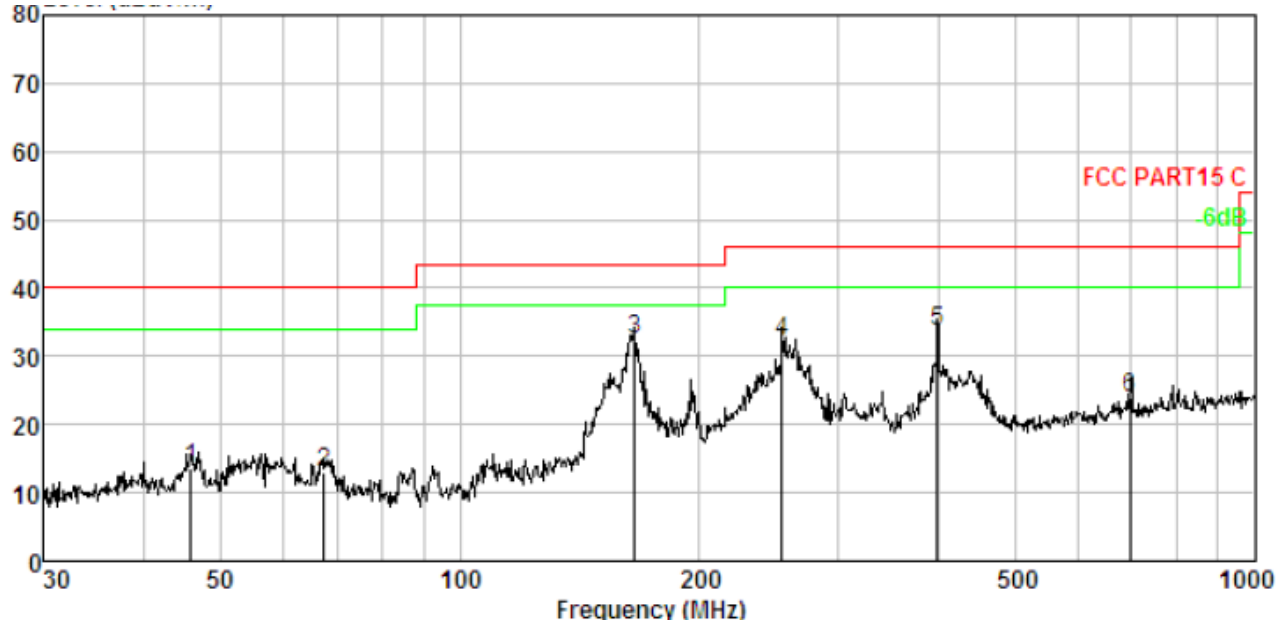
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

All the modulation modes were tested the data of the worst mode (TX 802.11a Low Channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following test plots:

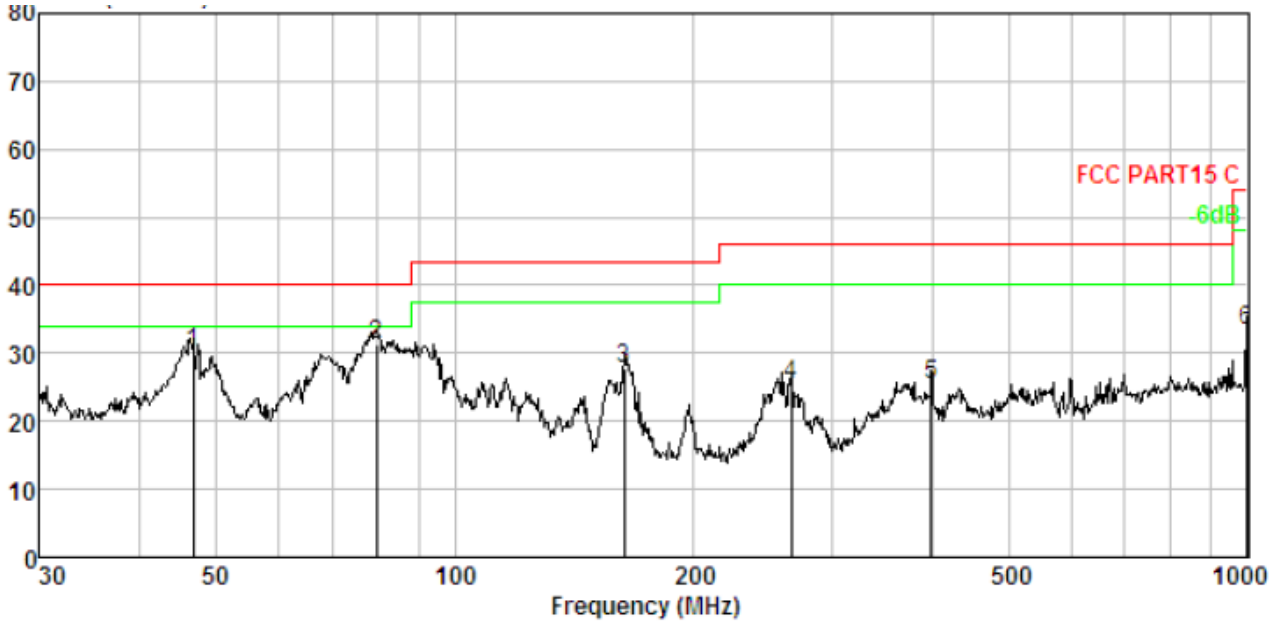
Antenna Polarization: Horizontal



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	45.855	1.44	13.07	29.15	30.12	13.54	40.00	-26.46	QP
2.	67.438	1.79	10.92	30.58	30.25	13.04	40.00	-26.96	QP
3.	166.068	2.60	13.54	46.78	30.57	32.35	43.50	-11.15	QP
4.	254.728	2.99	12.02	47.99	30.71	32.29	46.00	-13.71	QP
5.	399.030	3.40	15.30	45.70	30.87	33.53	46.00	-12.47	QP
6.	696.857	3.90	20.10	31.02	31.06	23.96	46.00	-22.04	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Antenna Polarization: Vertical



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	46.830	1.46	12.88	45.93	30.12	30.15	40.00	-9.85	QP
2.	79.800	1.94	8.81	50.87	30.31	31.31	40.00	-8.69	QP
3.	163.755	2.59	13.67	42.10	30.56	27.80	43.50	-15.70	QP
4.	265.676	3.03	12.33	40.62	30.73	25.25	46.00	-20.75	QP
5.	399.030	3.40	15.30	37.60	30.87	25.43	46.00	-20.57	QP
6.	996.500	4.23	23.44	37.02	31.19	33.50	54.00	-20.50	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Test Frequency: From 1GHz to 40GHz

All the modulation modes were tested the data of the worst mode (TX 802.11a Ant 3) are recorded in the following pages and the others modulation methods do not exceed the limits.

5180-5240MHz

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5180 MHz										
5180.00	64.29	PK	H	33.59	3.58	0.00	101.46	95.44	N/A	N/A
5180.00	54.57	AV	H	33.59	3.58	0.00	91.74	85.72	N/A	N/A
5180.00	74.28	PK	V	33.59	3.58	0.00	111.45	105.43	N/A	N/A
5180.00	64.95	AV	V	33.59	3.58	0.00	102.12	96.1	N/A	N/A
5150.00	27.89	PK	V	33.54	3.56	0.00	64.99	58.97	74.00	15.03
5150.00	14.79	AV	V	33.54	3.56	0.00	51.89	45.87	54.00	8.13
10360.00	49.26	PK	V	38.17	6.29	36.85	56.87	50.85	74.00	23.15
10360.00	37.58	AV	V	38.17	6.29	36.85	45.19	39.17	54.00	14.83
15540.00	45.48	PK	V	38.06	8.85	39.04	53.35	47.33	74.00	26.67
15540.00	33.26	AV	V	38.06	8.85	39.04	41.13	35.11	54.00	18.89
9829.00	57.36	PK	V	38.03	5.96	36.72	64.63	58.61	74.00	15.39
9829.00	45.29	AV	V	38.03	5.96	36.72	52.56	46.54	54.00	7.46
Middle Channel: 5200 MHz										
5200.00	64.75	PK	H	33.62	3.60	0.00	101.97	95.95	N/A	N/A
5200.00	54.66	AV	H	33.62	3.60	0.00	91.88	85.86	N/A	N/A
5200.00	74.58	PK	V	33.62	3.60	0.00	111.80	105.78	N/A	N/A
5200.00	64.73	AV	V	33.62	3.60	0.00	101.95	95.93	N/A	N/A
10400.00	48.46	PK	V	38.18	6.32	36.86	56.10	50.08	74.00	23.92
10400.00	35.94	AV	V	38.18	6.32	36.86	43.58	37.56	54.00	16.44
15600.00	45.65	PK	V	38.00	8.83	39.09	53.39	47.37	74.00	26.63
15600.00	33.38	AV	V	38.00	8.83	39.09	41.12	35.1	54.00	18.90
High Channel: 5240 MHz										
5240.00	64.62	PK	H	33.68	3.52	0.00	101.82	95.8	N/A	N/A
5240.00	54.78	AV	H	33.68	3.52	0.00	91.98	85.96	N/A	N/A
5240.00	74.34	PK	V	33.68	3.52	0.00	111.54	105.52	N/A	N/A
5240.00	64.57	AV	V	33.68	3.52	0.00	101.77	95.75	N/A	N/A
5350.00	25.45	PK	V	33.86	3.52	0.00	62.83	56.81	74.00	17.19
5350.00	13.48	AV	V	33.86	3.52	0.00	50.86	44.84	54.00	9.16
10480.00	47.95	PK	V	38.20	6.37	36.88	55.64	49.62	74.00	24.38
10480.00	36.03	AV	V	38.20	6.37	36.88	43.72	37.7	54.00	16.30
15720.00	45.79	PK	V	37.88	8.79	39.18	53.28	47.26	74.00	26.74
15720.00	33.54	AV	V	37.88	8.79	39.18	41.03	35.01	54.00	18.99

5725-5850MHz

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5745 MHz										
5745.00	65.37	PK	H	34.20	3.69	0.00	103.26	97.24	N/A	N/A
5745.00	55.49	AV	H	34.20	3.69	0.00	93.38	87.36	N/A	N/A
5745.00	78.16	PK	V	34.20	3.69	0.00	116.05	110.03	N/A	N/A
5745.00	68.52	AV	V	34.20	3.69	0.00	106.41	100.39	N/A	N/A
5725.00	39.84	PK	V	34.19	3.69	0.00	77.72	71.7	122.20	50.50
5720.00	32.56	PK	V	34.19	3.69	0.00	70.44	64.42	110.80	46.38
5700.00	27.48	PK	V	34.18	3.68	0.00	65.34	59.32	105.20	45.88
5650.00	26.15	PK	V	34.16	3.63	0.00	63.94	57.92	68.20	10.28
11490.00	48.63	PK	V	38.99	6.59	37.35	56.86	50.84	74.00	23.16
11490.00	36.55	AV	V	38.99	6.59	37.35	44.78	38.76	54.00	15.24
17235.00	46.38	PK	V	41.56	8.78	38.61	58.11	52.09	74.00	21.91
17235.00	34.54	AV	V	41.56	8.78	38.61	46.27	40.25	54.00	13.75
9840.00	57.49	PK	V	38.04	5.96	36.72	64.77	58.75	74.00	15.25
9840.00	44.27	AV	V	38.04	5.96	36.72	51.55	45.53	54.00	8.47
Middle Channel: 5785 MHz										
5785.00	63.48	PK	H	34.21	3.71	0.00	101.40	95.38	N/A	N/A
5785.00	53.52	AV	H	34.21	3.71	0.00	91.44	85.42	N/A	N/A
5785.00	76.68	PK	V	34.21	3.71	0.00	114.60	108.58	N/A	N/A
5785.00	66.43	AV	V	34.21	3.71	0.00	104.35	98.33	N/A	N/A
11570.00	47.86	PK	V	39.00	6.61	37.44	56.03	50.01	74.00	23.99
11570.00	34.92	AV	V	39.00	6.61	37.44	43.09	37.07	54.00	16.93
17355.00	46.44	PK	V	42.26	8.81	38.52	58.99	52.97	74.00	21.03
17355.00	34.58	AV	V	42.26	8.81	38.52	47.13	41.11	54.00	12.89
High Channel: 5825 MHz										
5825.00	62.36	PK	H	34.23	3.73	0.00	100.32	94.3	N/A	N/A
5825.00	52.49	AV	H	34.23	3.73	0.00	90.45	84.43	N/A	N/A
5825.00	75.18	PK	V	34.23	3.73	0.00	113.14	107.12	N/A	N/A
5825.00	65.23	AV	V	34.23	3.73	0.00	103.19	97.17	N/A	N/A
5850.00	28.67	PK	V	34.24	3.75	0.00	66.66	60.64	122.20	61.56
5855.00	28.12	PK	V	34.24	3.75	0.00	66.11	60.09	110.80	50.71
5875.00	27.56	PK	V	34.25	3.77	0.00	65.58	59.56	105.20	45.64
5925.00	25.84	PK	V	34.27	3.80	0.00	63.91	57.89	68.20	10.31
11650.00	47.56	PK	V	39.00	6.64	37.53	55.67	49.65	74.00	24.35
11650.00	35.48	AV	V	39.00	6.64	37.53	43.59	37.57	54.00	16.43
17475.00	46.23	PK	V	42.96	8.84	38.44	59.59	53.57	74.00	20.43
17475.00	34.76	AV	V	42.96	8.84	38.44	48.12	42.1	54.00	11.90

7 Band Edge Measurement

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.

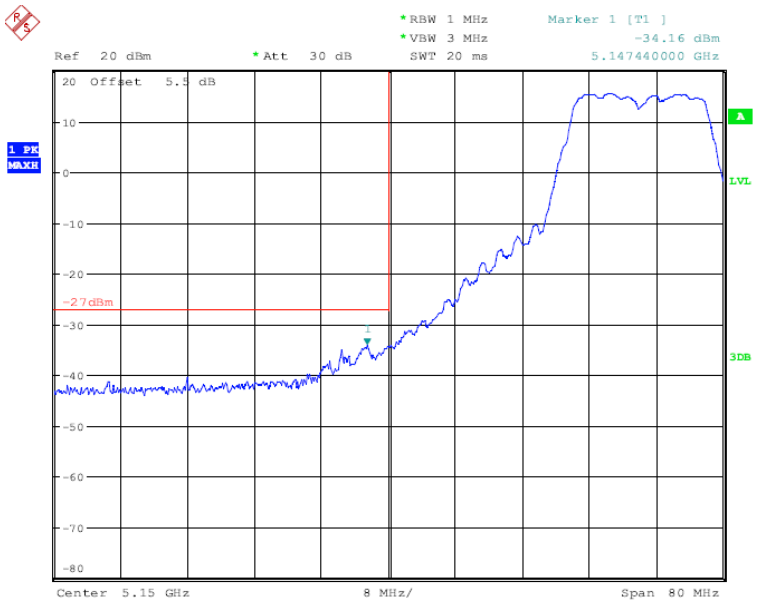
7.1 Test Procedure

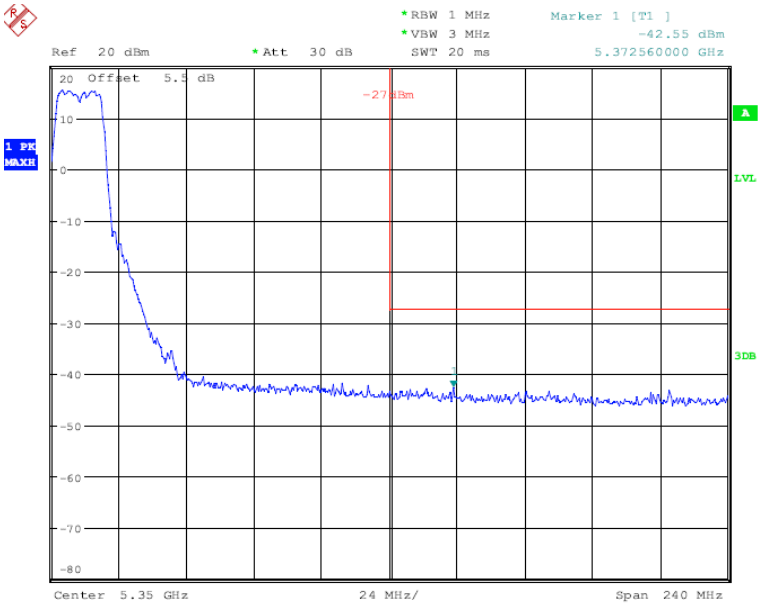
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1MHz, VBW = 3MHz, Sweep = auto
Detector function = peak, Trace = max hold

7.2 Test Result

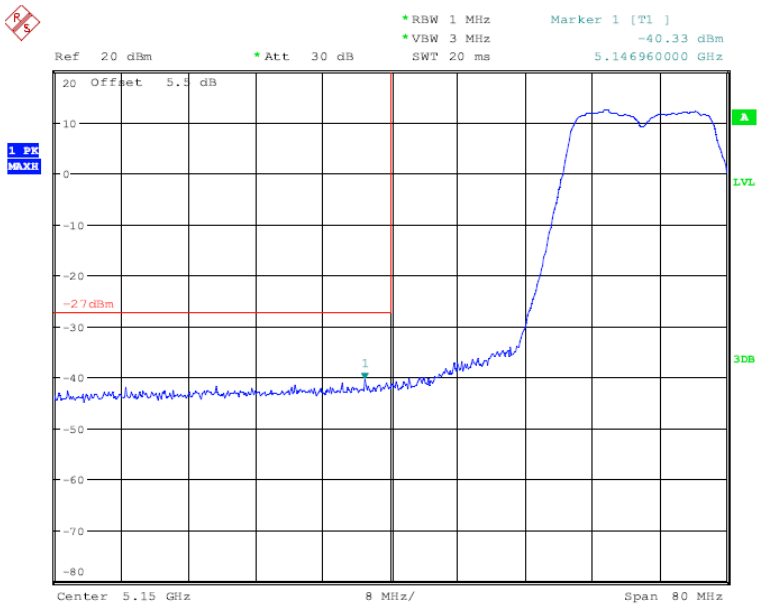
5150-5250MHz :

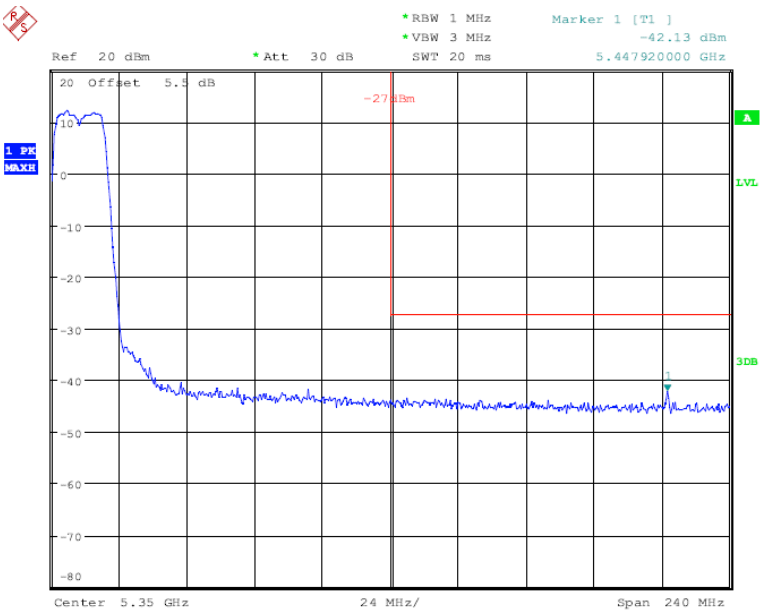
ANT 3 802.11a



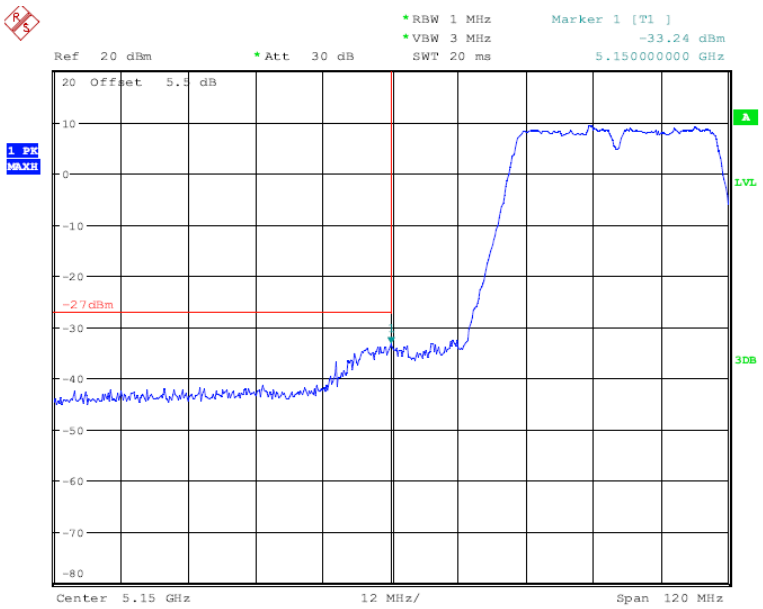


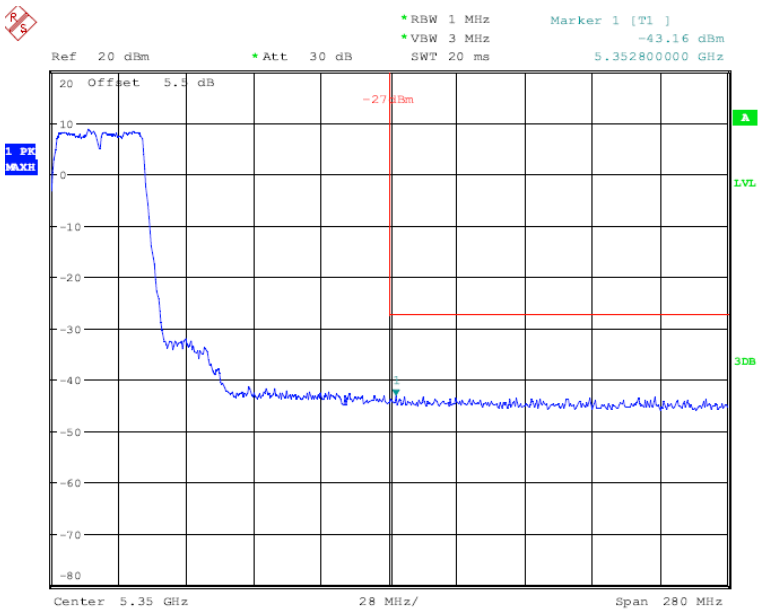
ANT 3 802.11 n(HT20)



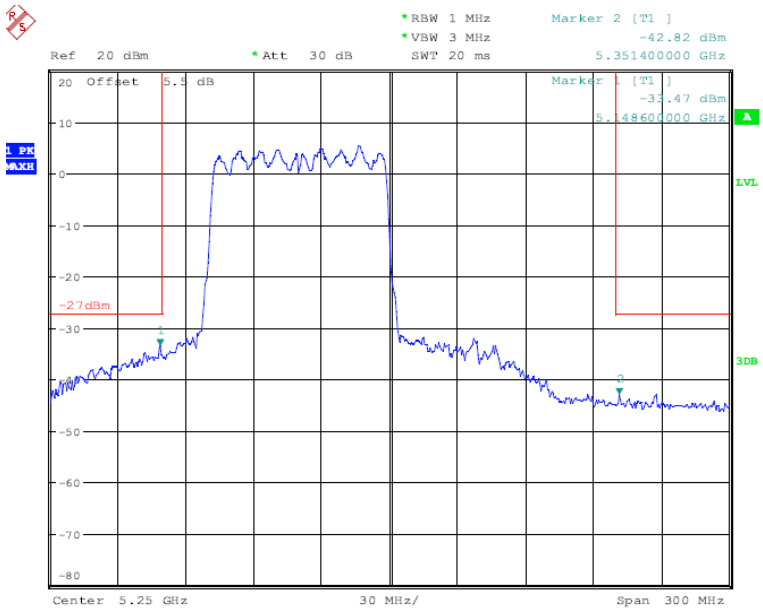


ANT 3 802.11n-HT40

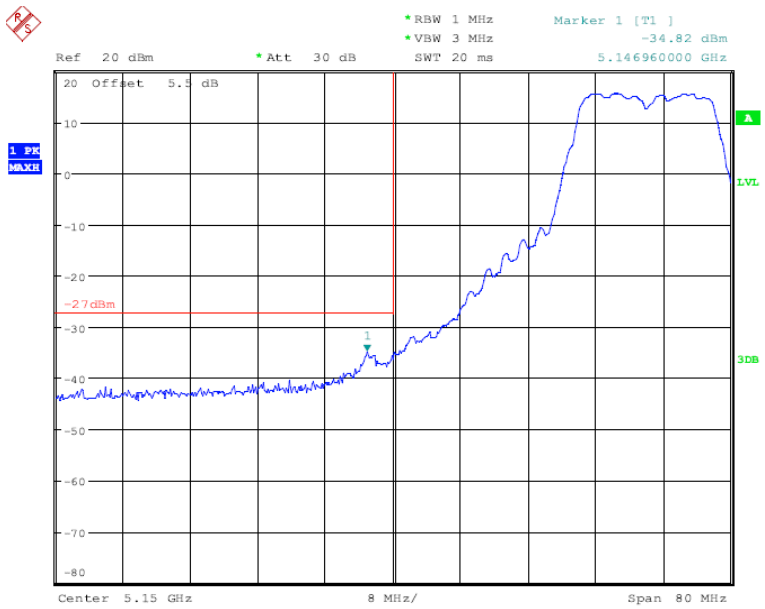


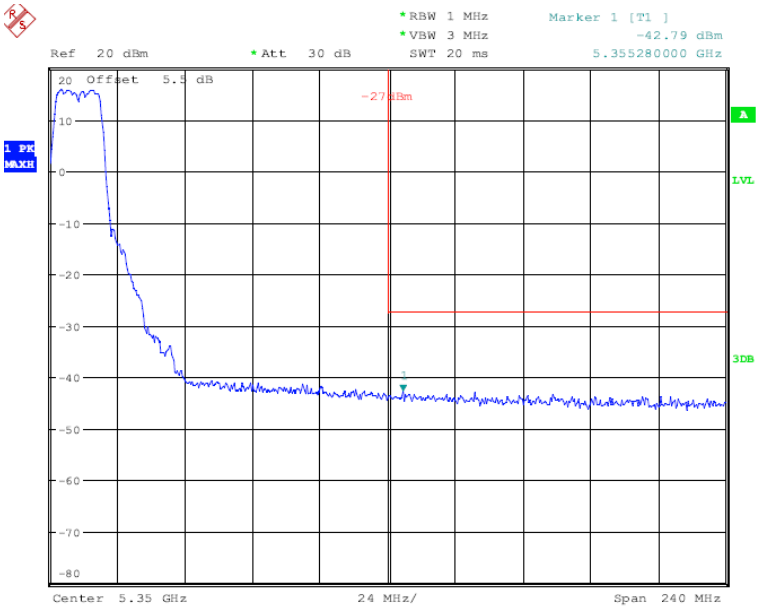


ANT 3 802.11ac 80

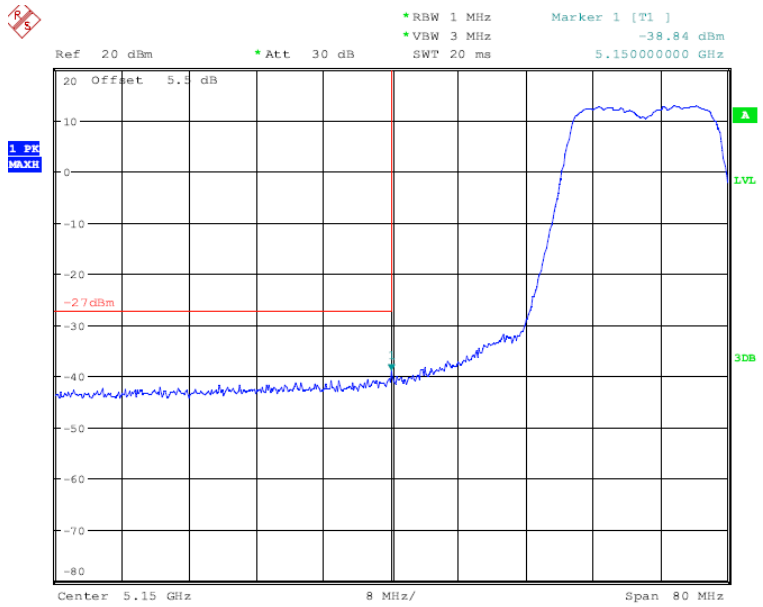


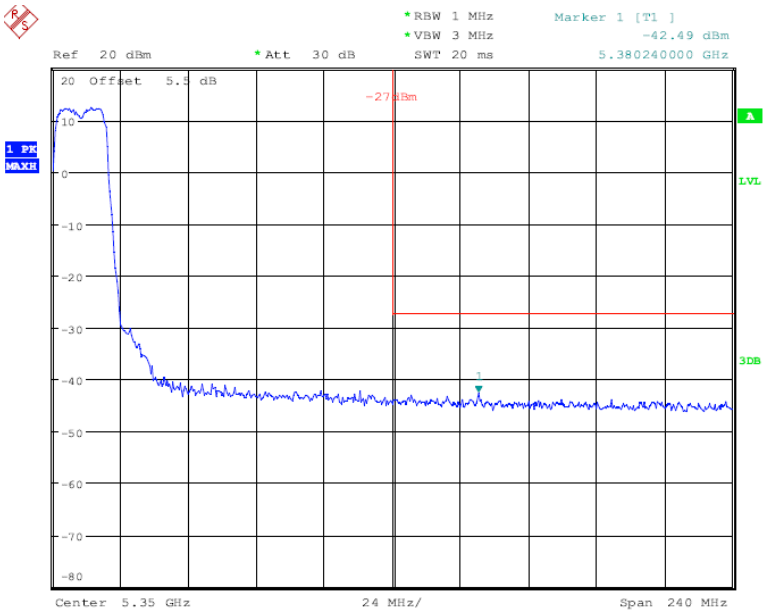
ANT 4 802.11a


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-34.82 dBm
5.146960000 GHz
Ref 20 dBm
Att 30 dB
Offset 5.5 dB
1 PK MAXH
-27dBm
A
LVL
3DB
Center 5.15 GHz
8 MHz/
Span 80 MHz

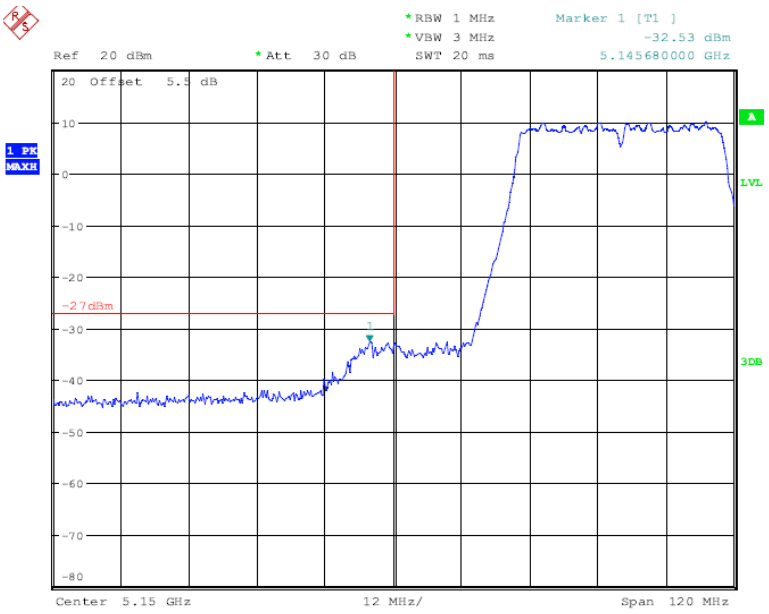

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-42.79 dBm
5.355280000 GHz
Ref 20 dBm
Att 30 dB
Offset 5.5 dB
1 PK MAXH
A
LVL
3DB
Center 5.35 GHz
24 MHz/
Span 240 MHz

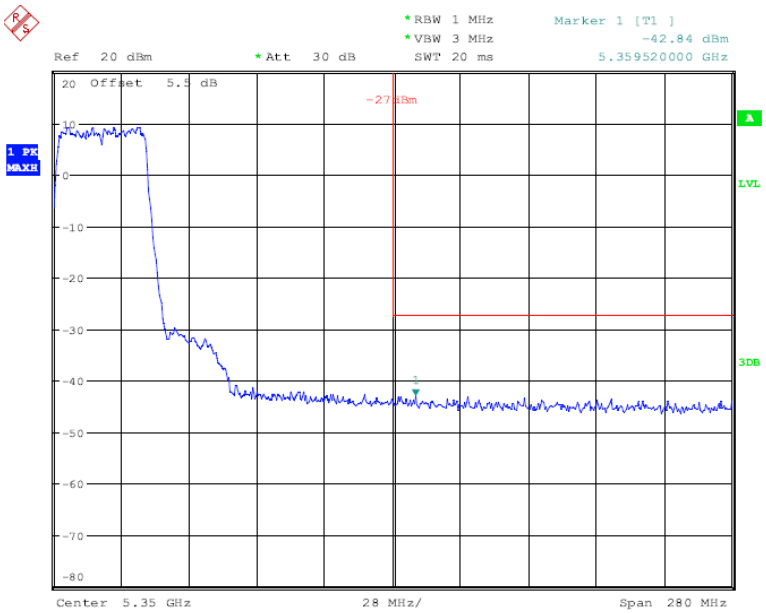
ANT 4 802.11n HT20



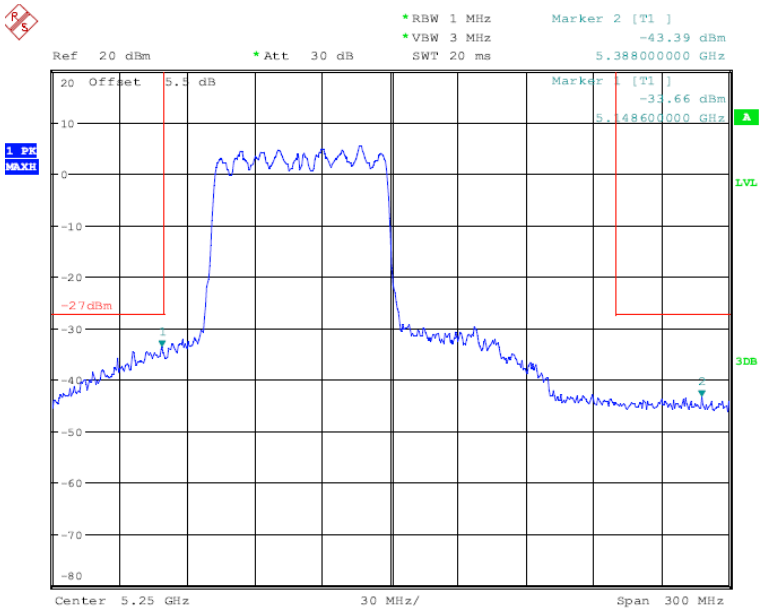


ANT 4 802.11n-HT40



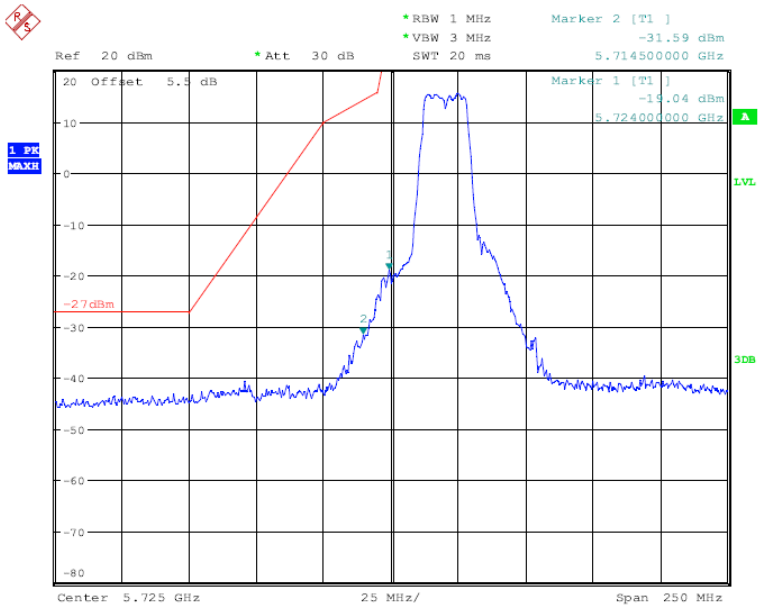


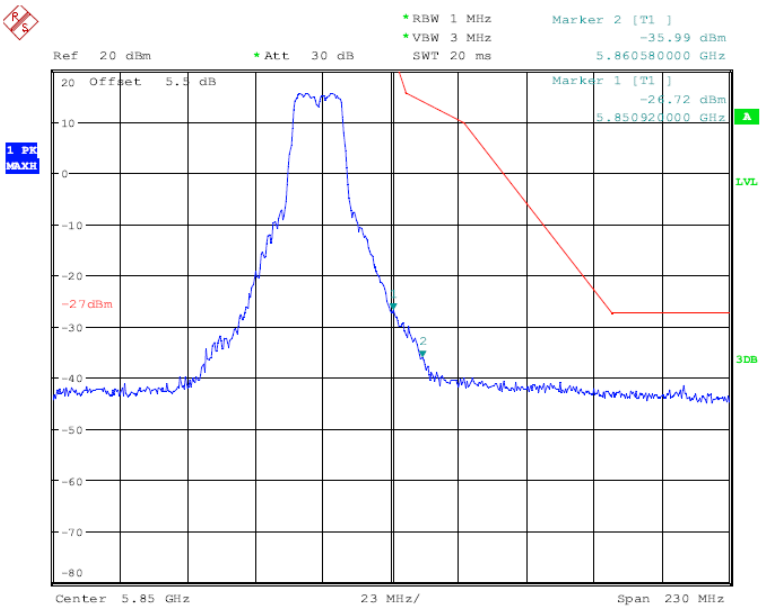
ANT 4 802.11 ac80



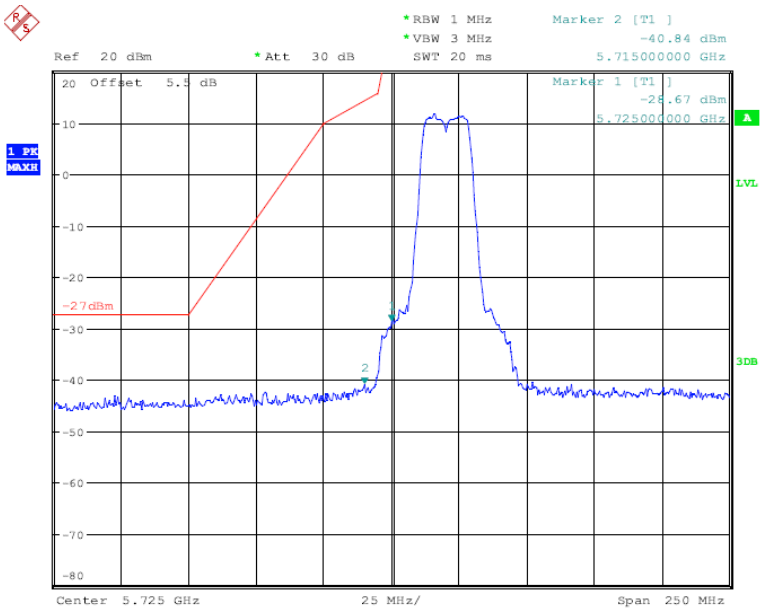
5725-5850MHz :

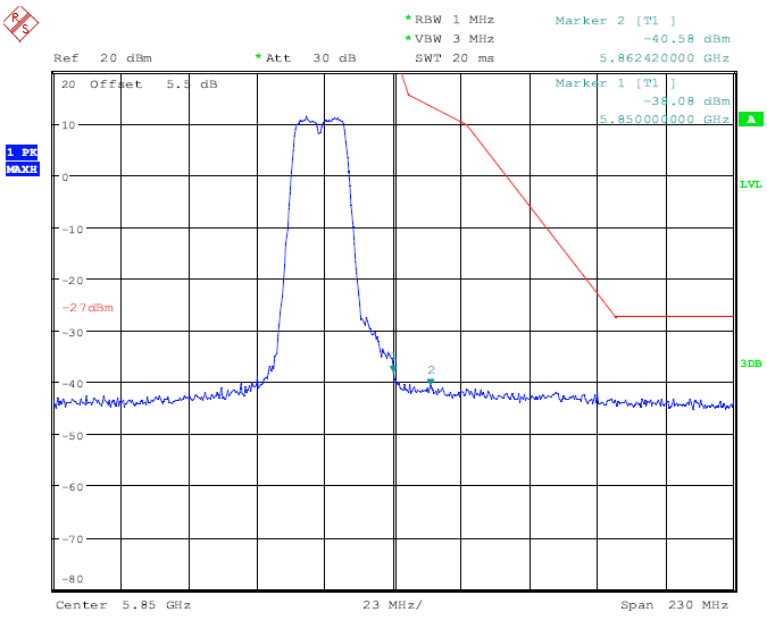
ANT 3 802.11a



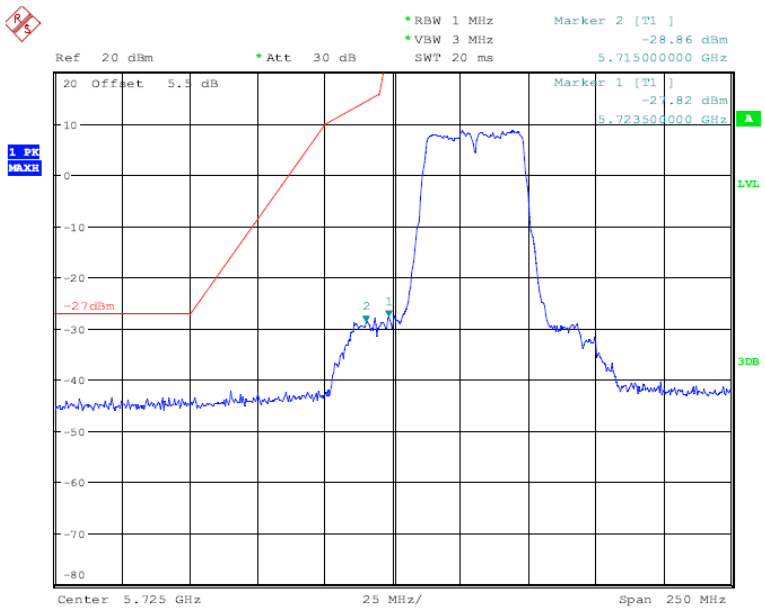


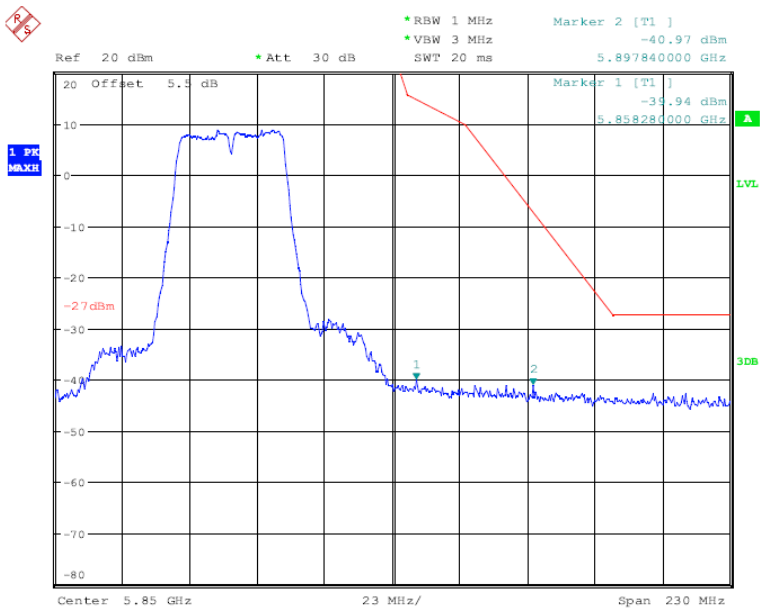
ANT 3 802.11 n(HT20)



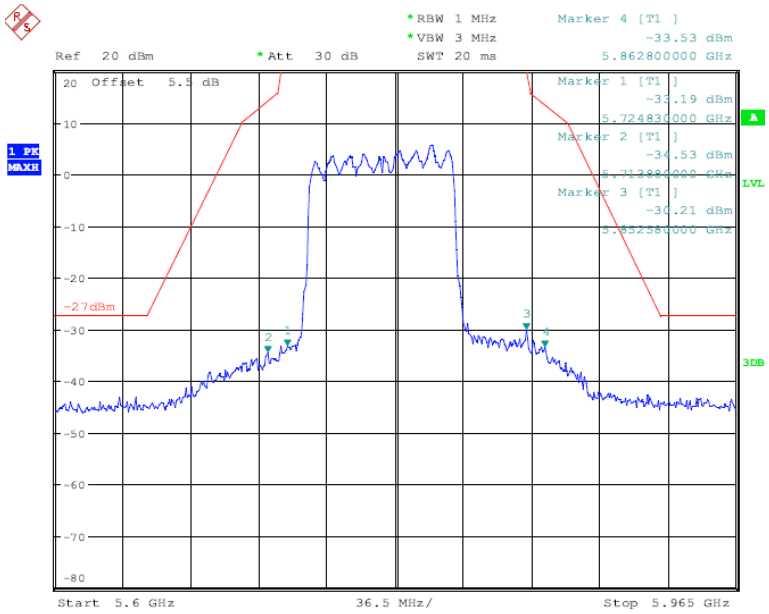


ANT 3 802.11n-HT40

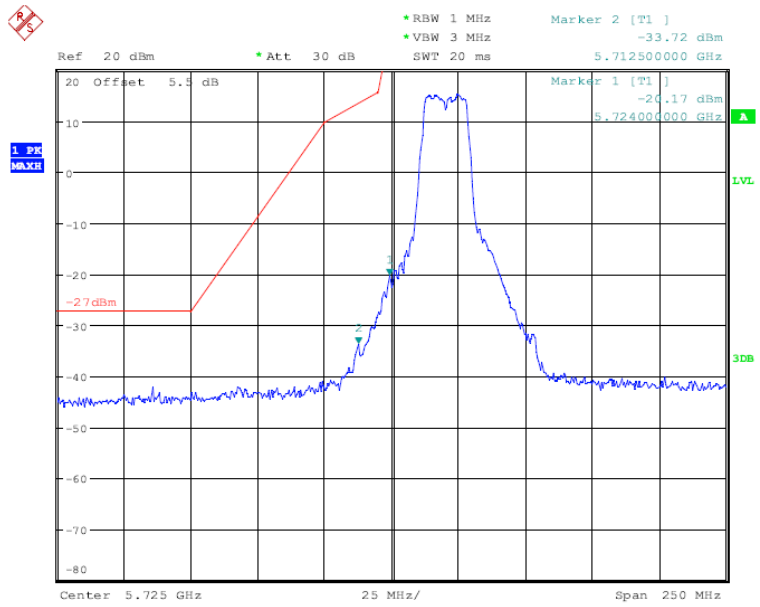


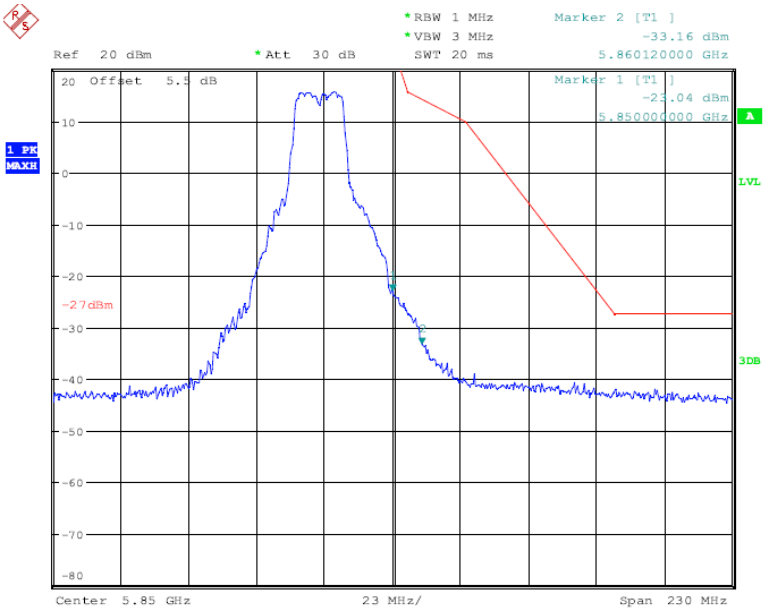


ANT 3 802.11ac 80

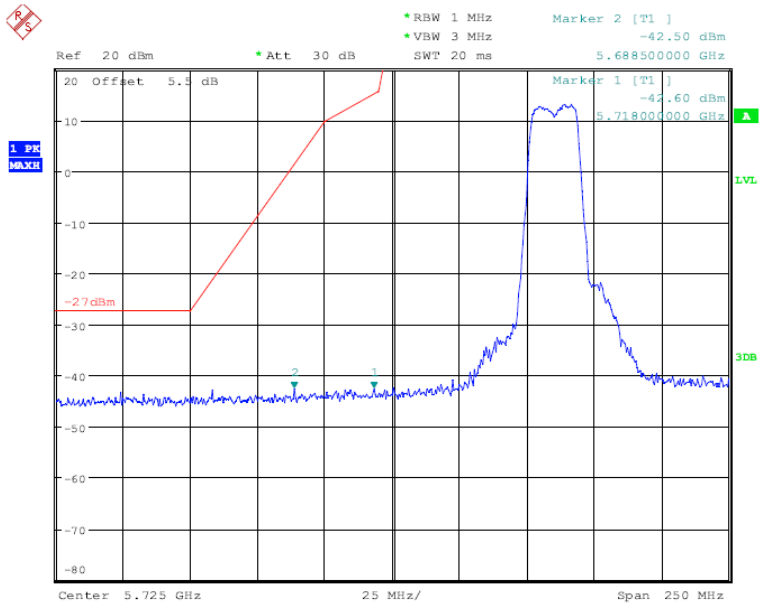


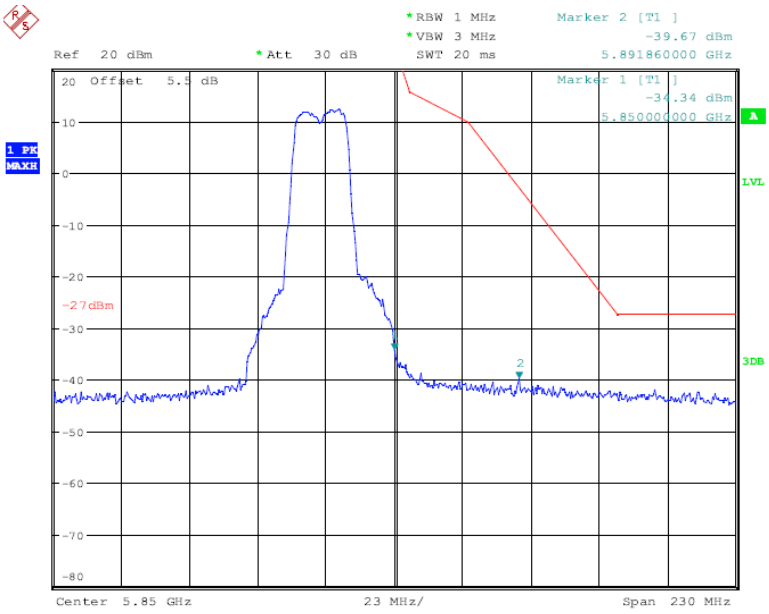
ANT 4 802.11a


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
Marker 2 [T1]
-33.72 dBm
5.712500000 GHz
Ref 20 dBm
Att 30 dB
Offset 5.5 dB
Marker 1 [T1]
-20.17 dBm
5.724000000 GHz
1 PK MAXH
A
LVL
3DB
-27dBm
Center 5.725 GHz
25 MHz/
Span 250 MHz

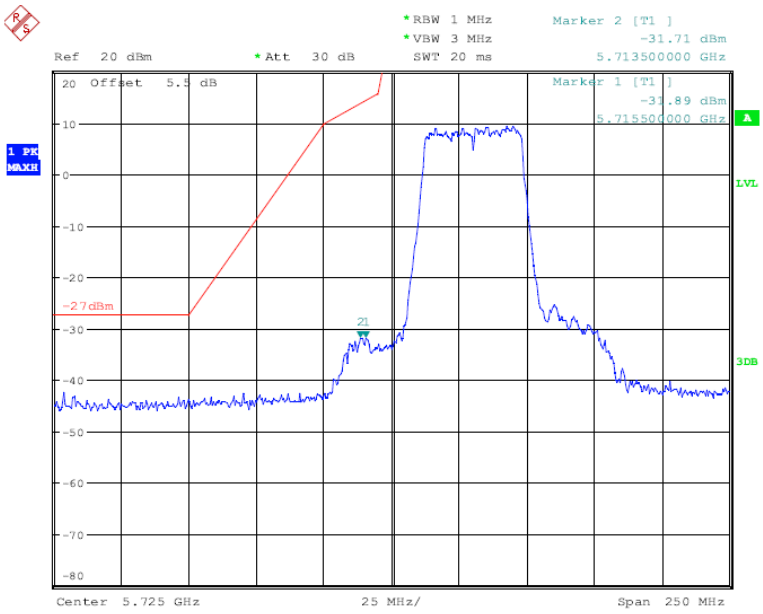

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
Marker 2 [T1]
-33.16 dBm
5.860120000 GHz
Ref 20 dBm
Att 30 dB
Offset 5.5 dB
Marker 1 [T1]
-23.04 dBm
5.850000000 GHz
1 PK MAXH
A
LVL
3DB
-27dBm
Center 5.85 GHz
23 MHz/
Span 230 MHz

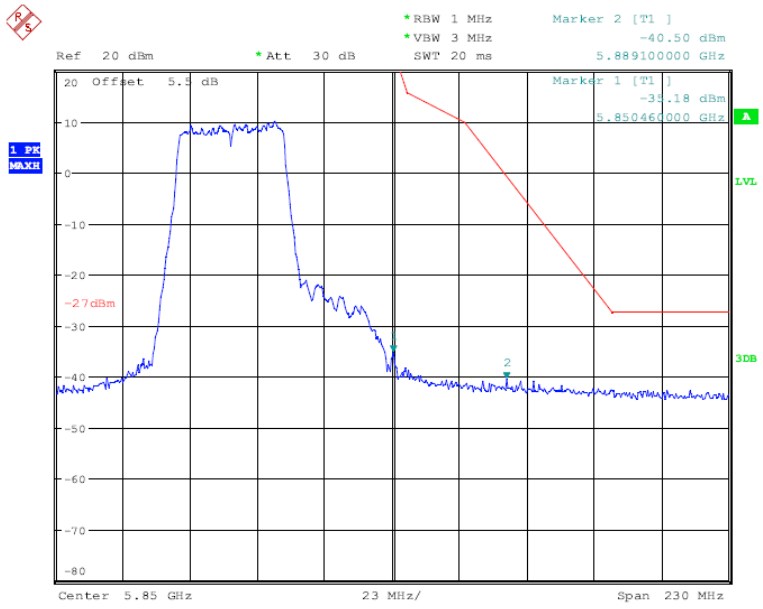
ANT 4 802.11n HT20



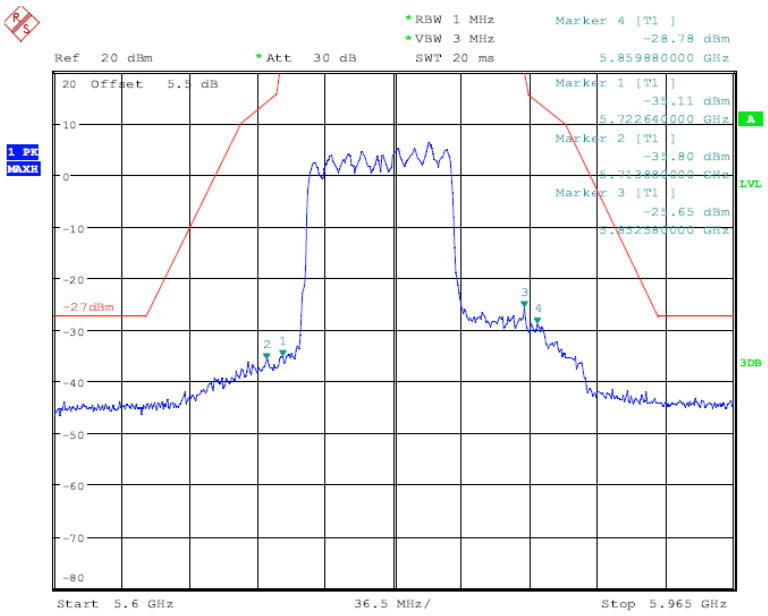


ANT 4 802.11n-HT40





ANT 4 802.11 ac80



8 6dB Bandwidth Measurement

Test Requirement	:	FCC CFR47 Part 15 Section 15.407
Test Method	:	ANSI C63.10:2013
Test Limit		Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

8.1 Test Procedure

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section C.

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

3. Set the VBW > =RBW.

4. Detector = Peak.

5. Trace mode = max hold.

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

Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement

as needed until the RBW/EBW ratio is approximately 1%.

8.2 Test Result

Test performed at ANT 3, Please refer to the following table and plots.

5150-5250MHz

Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	Low	5180	20.52	17.20
	Middle	5200	20.60	17.20
	High	5240	20.60	17.20
802.11n HT20	Low	5180	21.24	18.16
	Middle	5200	21.32	18.16
	High	5240	21.24	18.16
802.11n HT40	Low	5190	42.48	37.60
	High	5230	42.65	37.60
802.11ac 80	Middle	5210	81.12	76.48

Note: The 99% Occupied Bandwidth have not fall into the band 5250-5350MHz, please refer to the test plots of 99% Occupied Bandwidth.

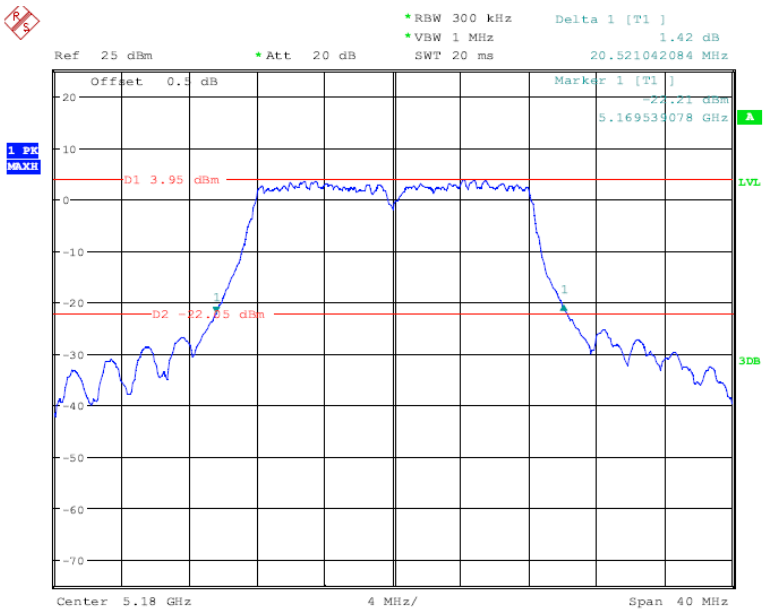
5725-5850MHz

Mode	Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	Low	5745	16.35	17.28
	Middle	5785	16.35	17.36
	High	5825	16.35	17.36
802.11n HT20	Low	5745	17.64	18.08
	Middle	5785	17.64	18.08
	High	5825	17.47	18.08
802.11n HT40	Low	5755	36.39	37.60
	High	5795	36.39	37.60
802.11ac 80	Middle	5775	75.03	76.80

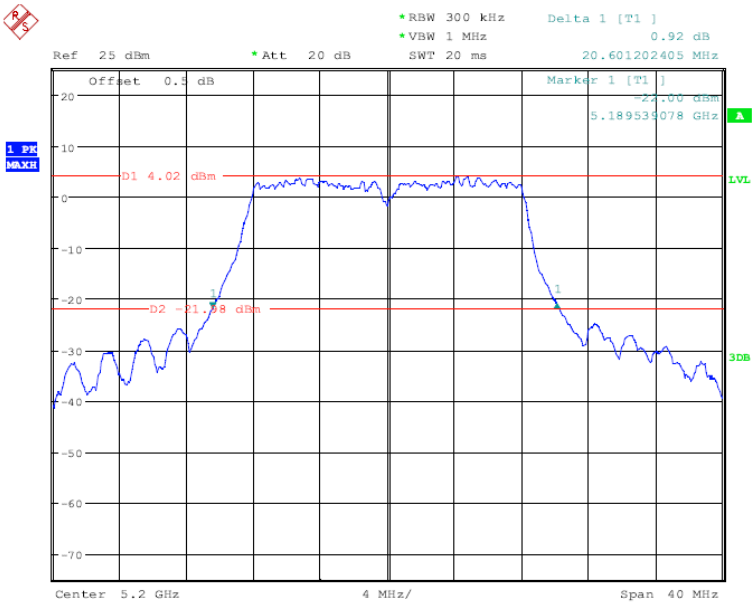
Note:

For 5725-5850MHz band, The 99% Occupied Bandwidth have not fall into the band 5470-5725MHz.

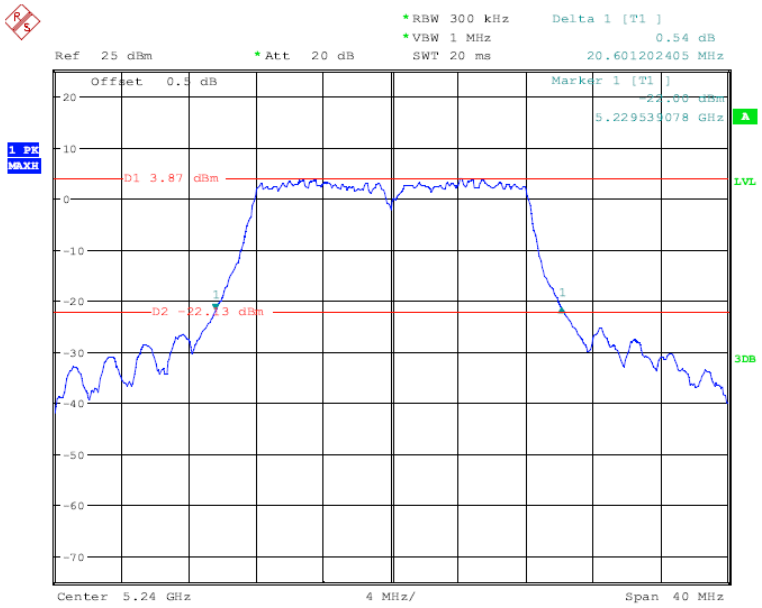
802.11a Low Channel



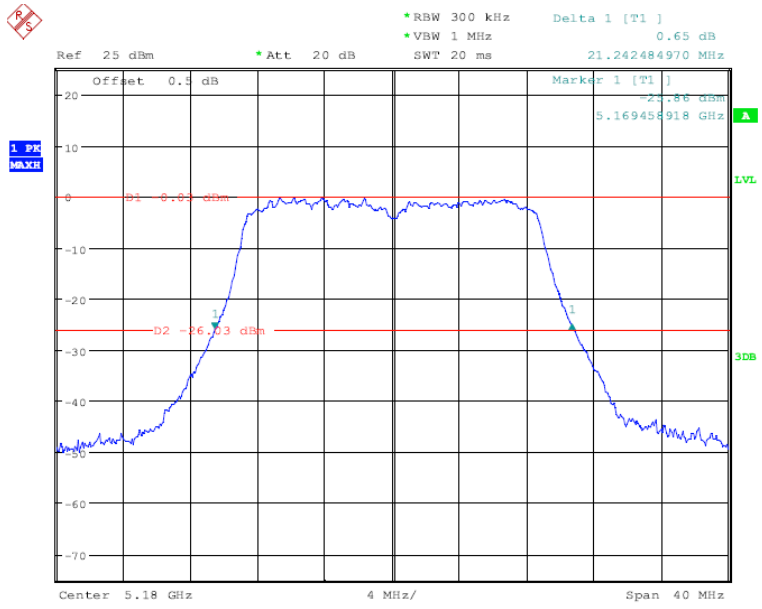
802.11a Middle Channel



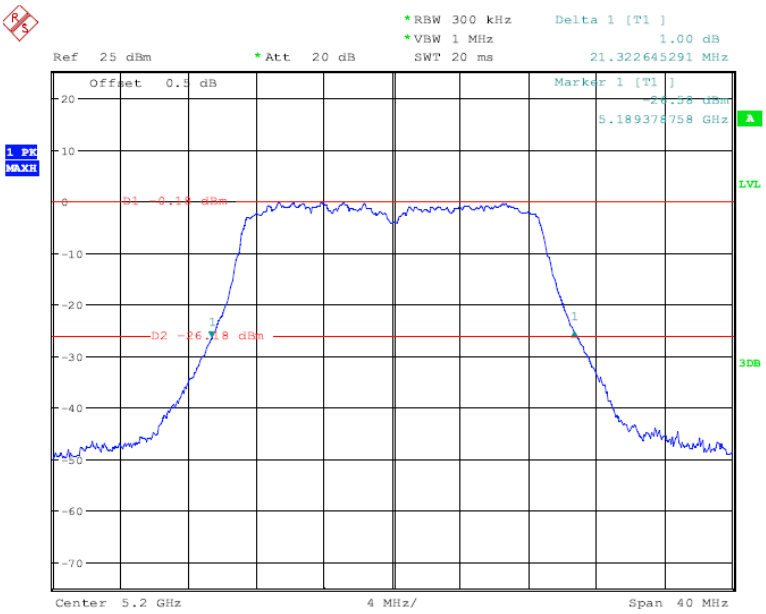
802.11a High Channel



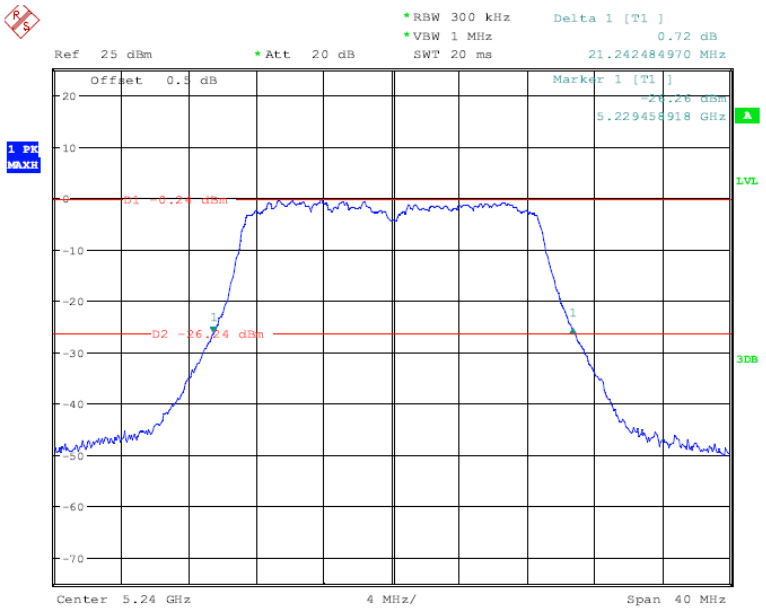
802.11n HT20 Low Channel



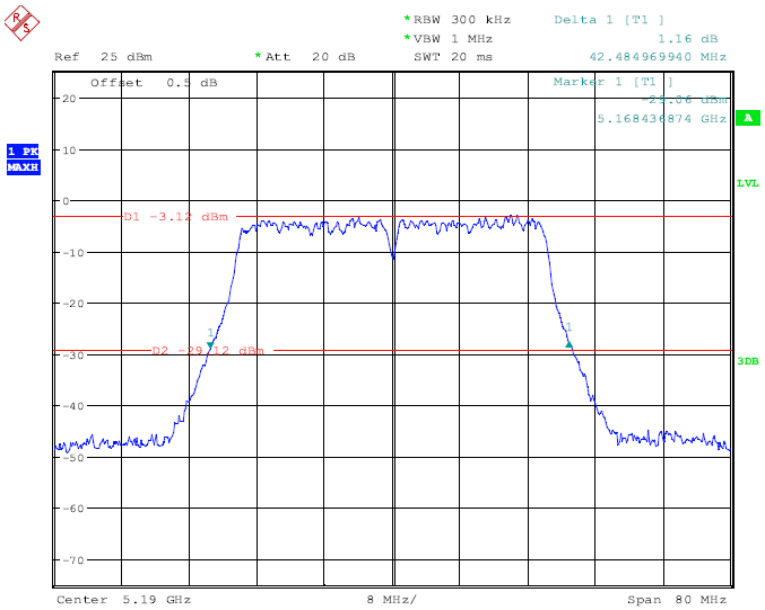
802.11n HT20 Middle Channel



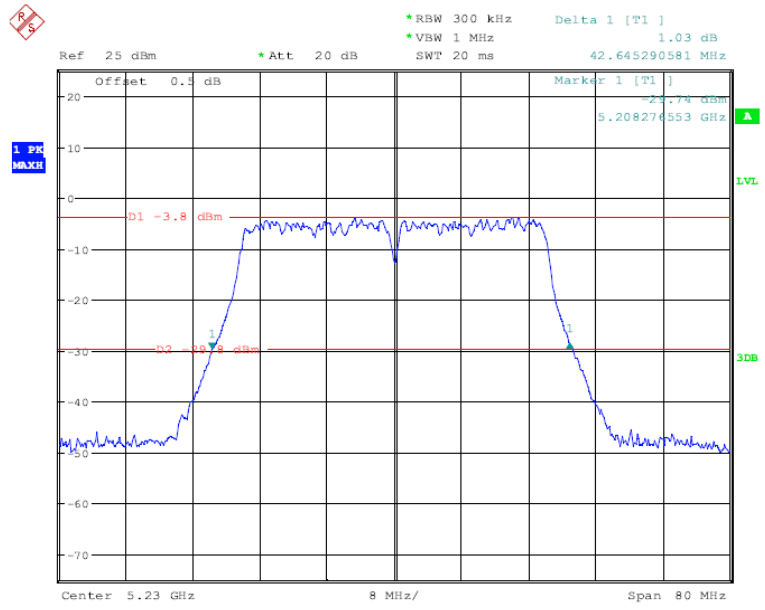
802.11n HT20 High Channel



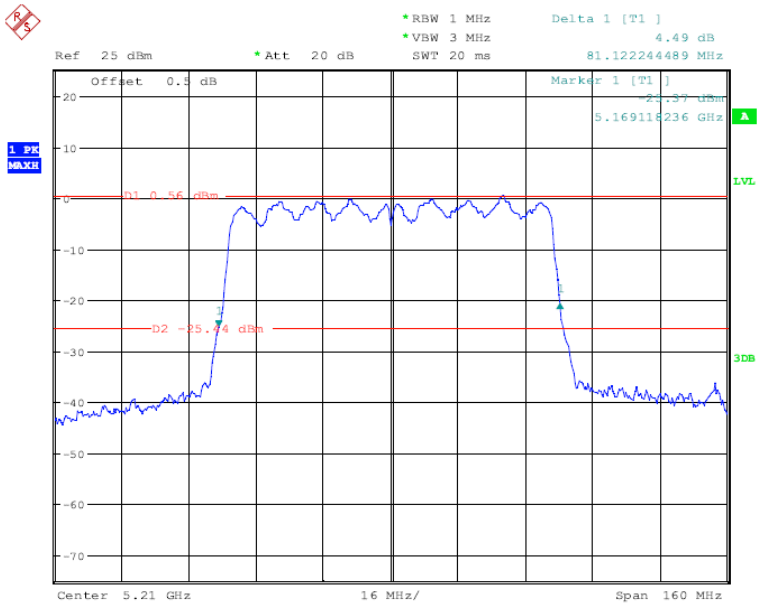
802.11n-HT40 Low Channel



802.11n-HT40 High Channel

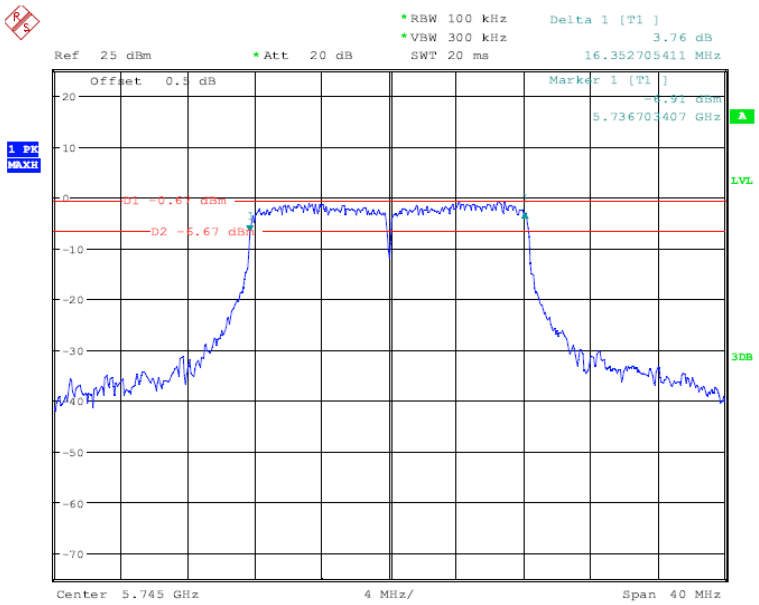


802.11ac 80 Middle Channel

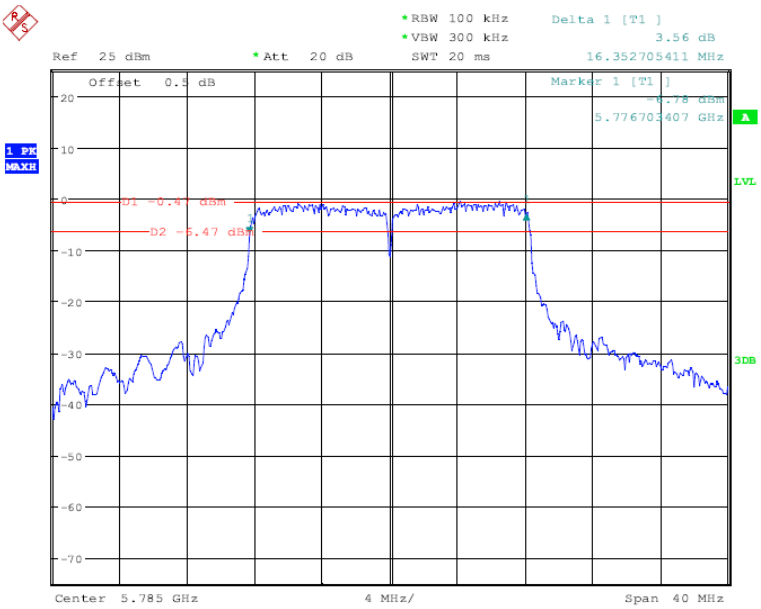


5725-5850MHz
6dB Bandwidth:

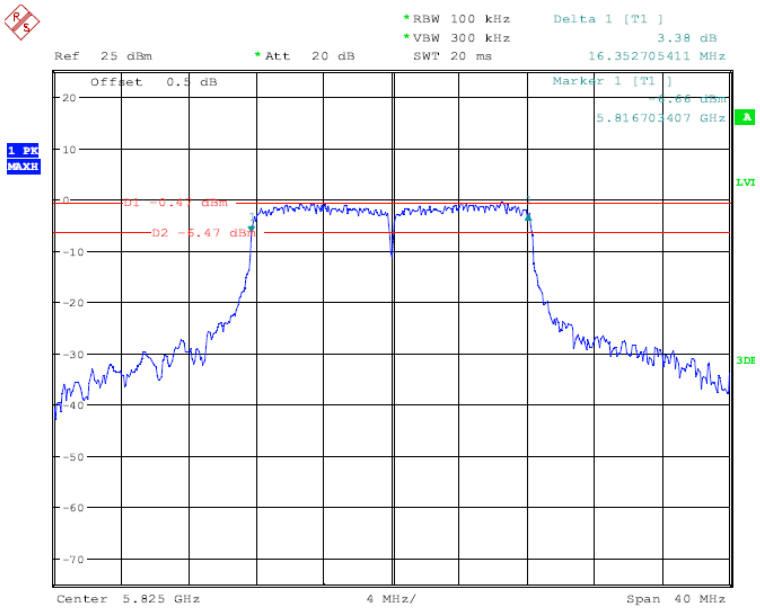
802.11a Low Channel



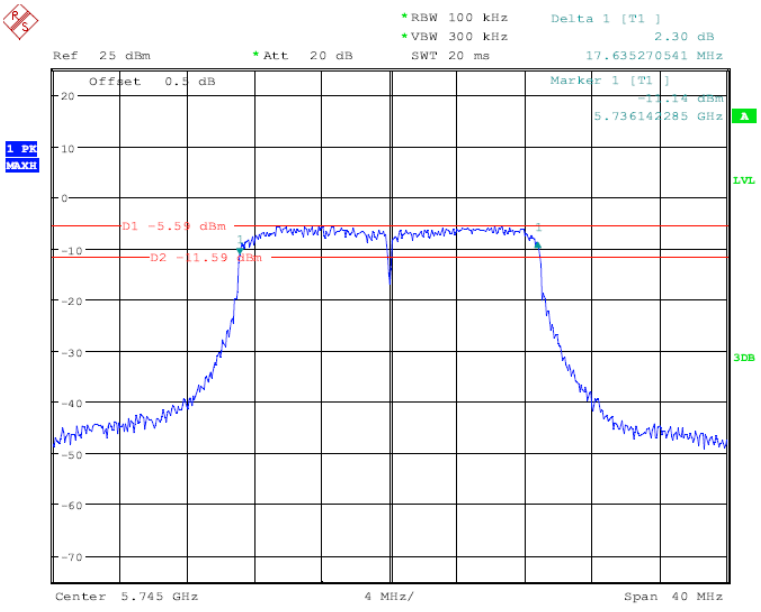
802.11a Middle Channel



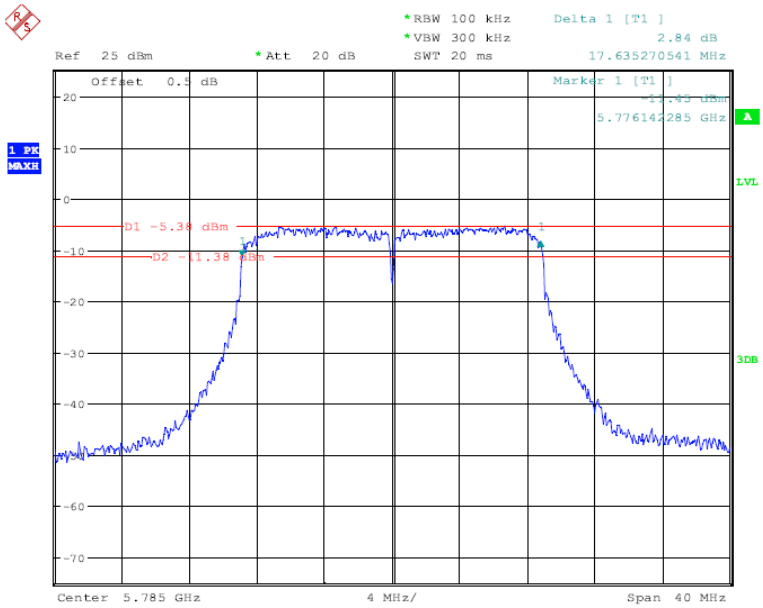
802.11a High Channel



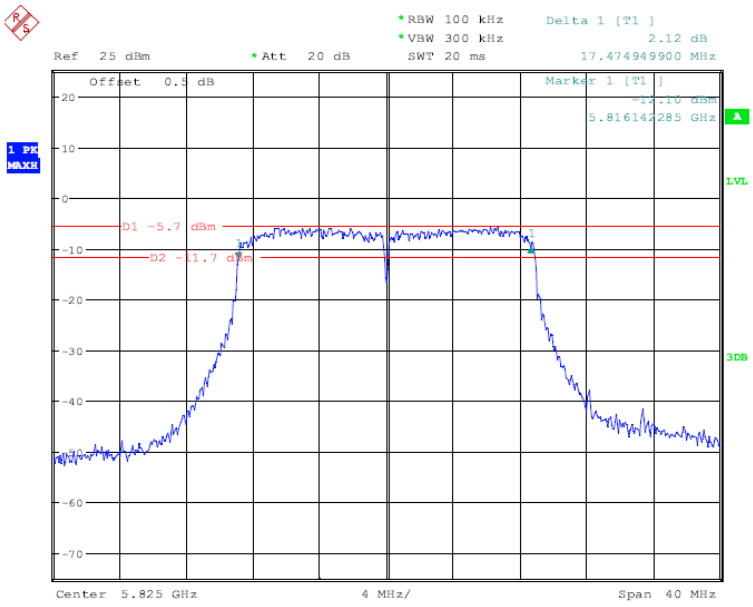
802.11n HT20 Low Channel



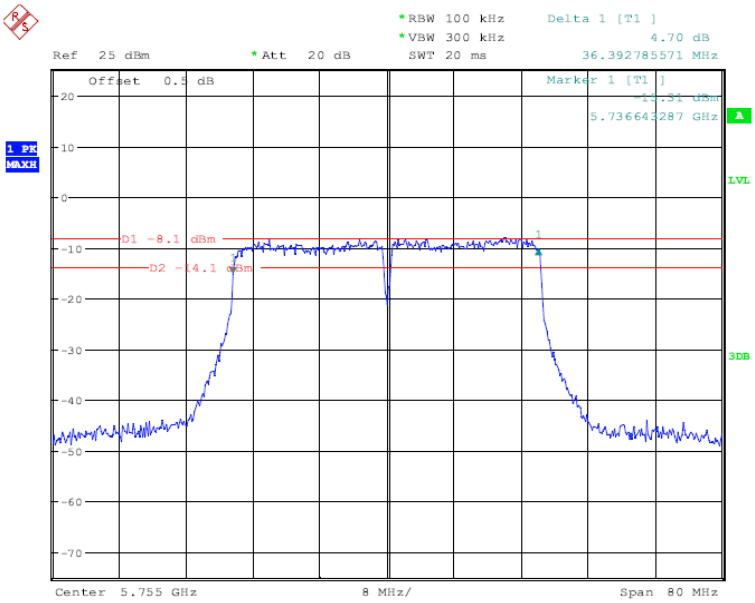
802.11n HT20 Middle Channel



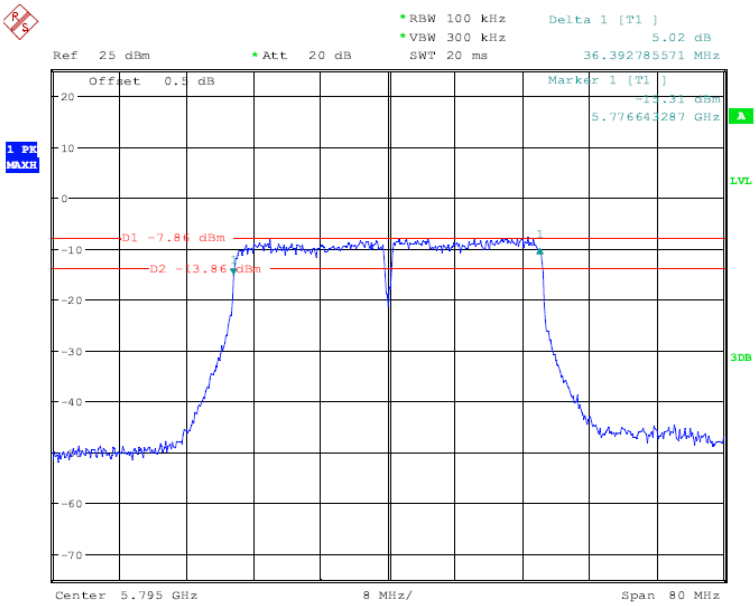
802.11n HT20 High Channel



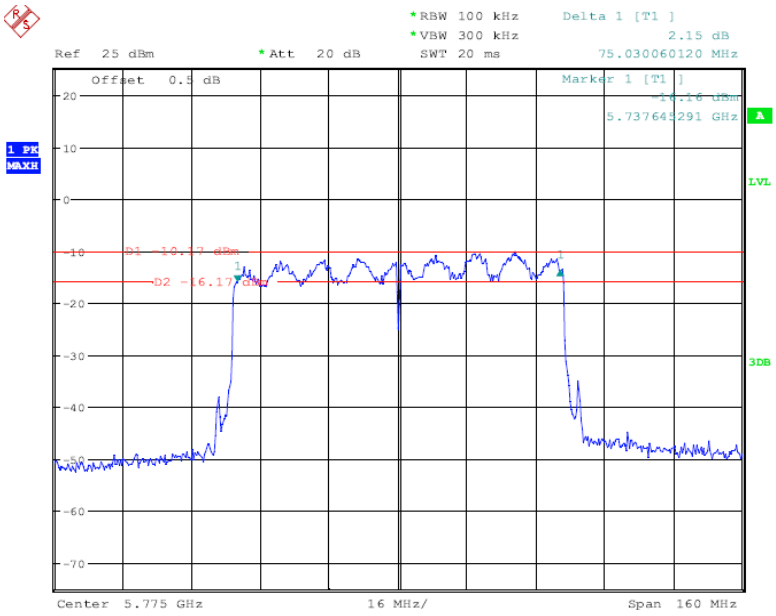
802.11n-HT40 Low Channel



802.11n-HT40 High Channel



802.11ac 80 Middle Channel



9 Maximum Peak Output Power

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

9.1 Test Procedure

According to 789033 D02 General UNII Test Procedures New Rules v02r01

9.2 Test Result

UNII Band	Mode	Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
			Ant 3	Ant 4	Total		
5150-5250MHz	802.11 a	5180	12.97	12.96	/	27.99	PASS
		5200	13.18	13.24	/	27.99	PASS
		5240	13.28	13.27	/	27.99	PASS
	802.11 HT20	5180	9.42	9.14	12.26	27.99	PASS
		5200	9.59	9.15	12.39	27.99	PASS
		5240	9.11	9.48	12.31	27.99	PASS
	802.11 HT40	5190	9.27	9.09	12.19	27.99	PASS
		5230	8.83	8.95	11.9	27.99	PASS
	802.11 AC 80	5210	7.31	7.18	10.26	27.99	PASS
5725-5850MHz	802.11 a	5745	12.97	13.11	/	27.99	PASS
		5785	12.65	12.69	/	27.99	PASS
		5825	12.65	12.71	/	27.99	PASS
	802.11 HT20	5745	8.52	9.00	11.78	27.99	PASS
		5785	8.70	9.33	12.04	27.99	PASS
		5825	8.26	9.14	11.73	27.99	PASS
	802.11 HT40	5755	8.64	9.04	11.85	27.99	PASS
		5795	8.67	8.90	11.80	27.99	PASS
	802.11 AC 80	5775	7.17	7.38	10.29	27.99	PASS

Note:

1. For MIMO System of 802.11n(HT20) and 802.11n(HT40), total power is calculated by combining the output power of each antenna according to KDB662911.
2. Antenna 3 Gain: 5dBi, Antenna 4 Gain: 5dBi. For antennas with gains of 6dBi or less, maximum allowed Transmitter output watt(+30dBm)
3. In MIMO, Ant 3+Ant 4 Directional Gain=GANT+10Log(N)dBi=5+10log(2)=8.01dBi. Therefore antenna Gain exceeds 6 dBi, then Output power Limit=30-(Gain - 6)=30-(8.01-6)=27.99dBm

10 Power Spectral density

1. For mobile and portable client devices in the 5.15-5.25 GHz band, , the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 1MHz. VBW = 3MHz, Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

10.2 Test Result

UNII Band	Mode	Frequency (MHz)	Power Spectral Density (dBm/MHz)			Limit (dBm)	Result
			Ant 3	Ant 4	Total		
5150-5250MHz	802.11 a	5180	2.27	3.12	/	17.0	PASS
		5200	3.05	3.47	/	17.0	PASS
		5240	2.78	3.31	/	17.0	PASS
	802.11 HT20	5180	-0.29	-0.24	2.75	14.99	PASS
		5200	-0.38	-0.24	2.70	14.99	PASS
		5240	-0.57	-0.33	2.56	14.99	PASS
	802.11 HT40	5190	-3.91	-3.40	-0.64	14.99	PASS
		5230	-4.45	-3.82	-1.11	14.99	PASS
	802.11 AC 80	5210	-7.51	-7.28	-4.38	14.99	PASS

UNII Band	Mode	Frequency(MHz)	Reading (dBm/300KHz)		Power Spectral Density (dBm/500KHz)			Limit (dBm)	Result
			Ant 3	Ant 4	Ant 3	Ant 4	Total		
5725-5850MHz	802.11 a	5745	-0.93	-1.12	1.29	1.10	/	17.0	PASS
		5785	-0.81	-1.07	1.41	1.15	/	17.0	PASS
		5825	-1.27	-1.50	0.95	0.72	/	17.0	PASS
	802.11 HT20	5745	-4.75	-5.03	-2.53	-2.81	0.34	14.99	PASS
		5785	-5.14	-4.65	-2.92	-2.43	0.34	14.99	PASS
		5825	-5.56	-4.89	-3.34	-2.67	0.02	14.99	PASS
	802.11 HT40	5755	-7.80	-6.99	-5.58	-4.77	-2.15	14.99	PASS
		5795	-7.72	-6.51	-5.50	-4.29	-1.84	14.99	PASS
	802.11 AC 80	5775	-10.87	-9.53	-8.65	-7.31	-4.92	14.99	PASS

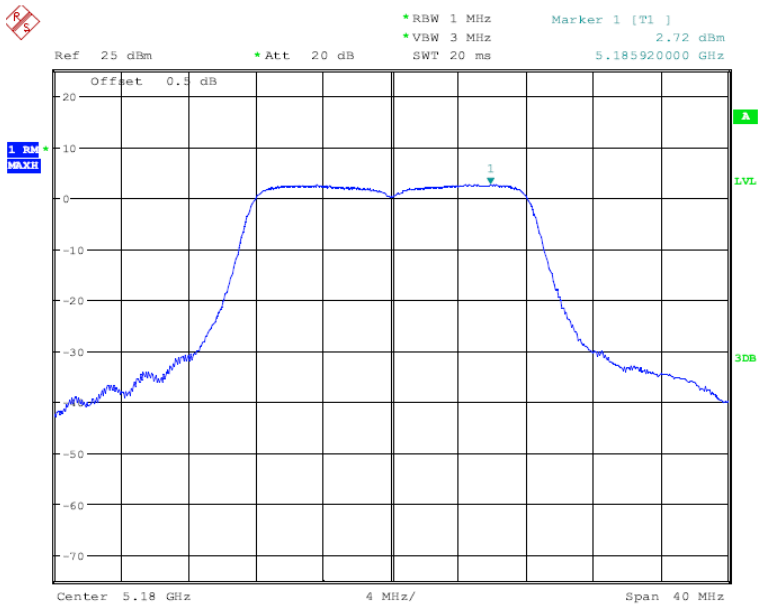
Note:

1. For MIMO System of 802.11n(HT20) and 802.11n(HT40), total power is calculated by combining the output power of each antenna according to KDB662911.

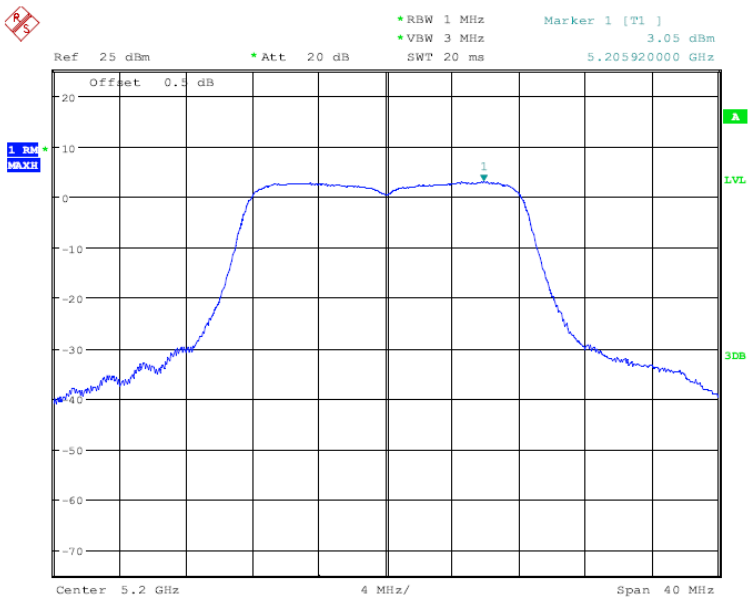
2. Antenna 3 Gain: 5dBi, Antenna 4 Gain: 5dBi. For antennas with gains of 6dBi or less, maximum allowed Transmitter output watt(+30dBm)

In MIMO, Ant 3+Ant 4 Directional Gain=G_{ANT}+10Log(N)dBi=5+10log(2)=8.01dBi. Therefore antenna Gain exceeds 6 dBi, then Limit=11-(Gain - 6)=17-(8.01-6)=8.9dBm

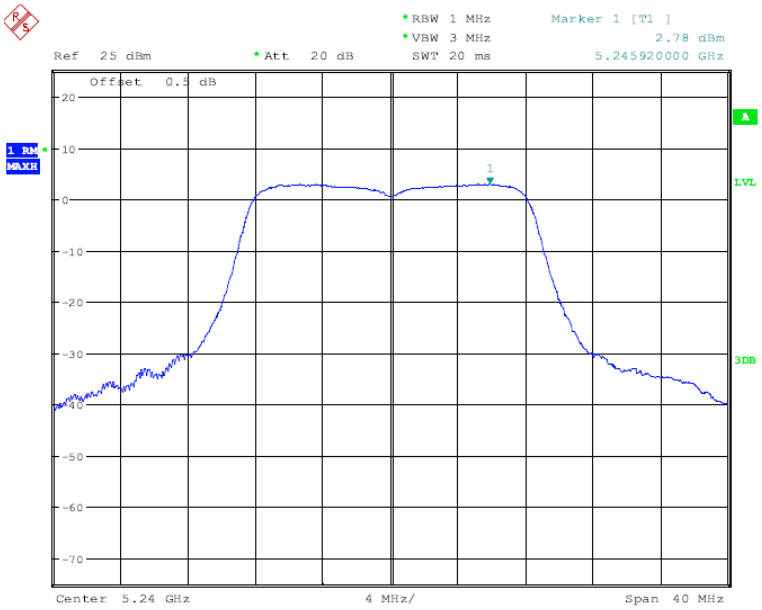
ANT 3 802.11a Low Channel



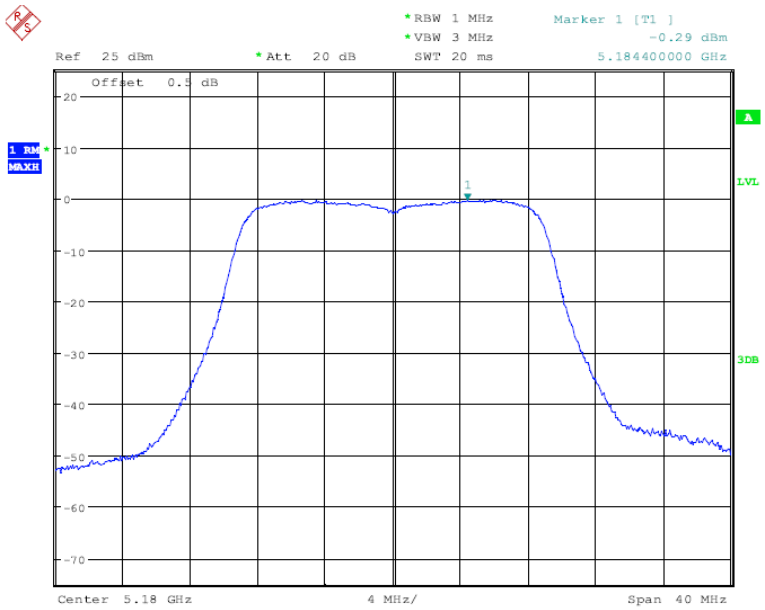
ANT 3 802.11a Middle Channel



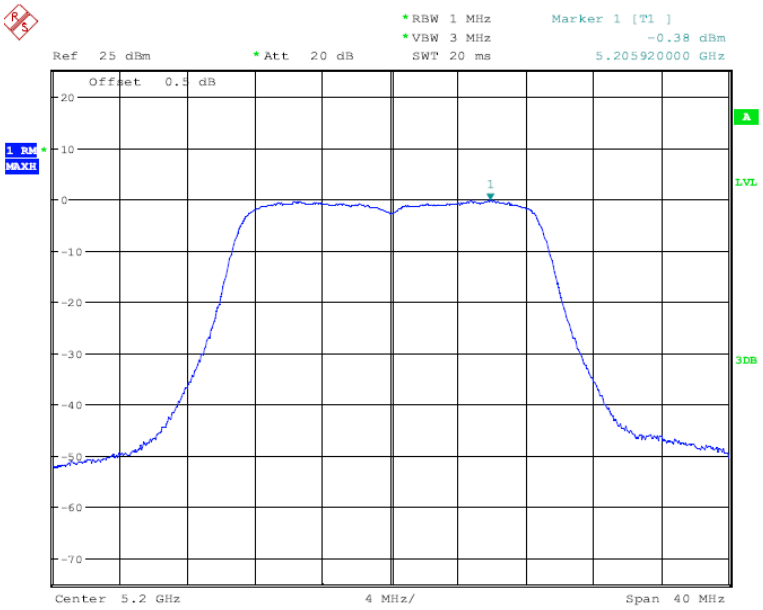
ANT 3 802.11a High Channel



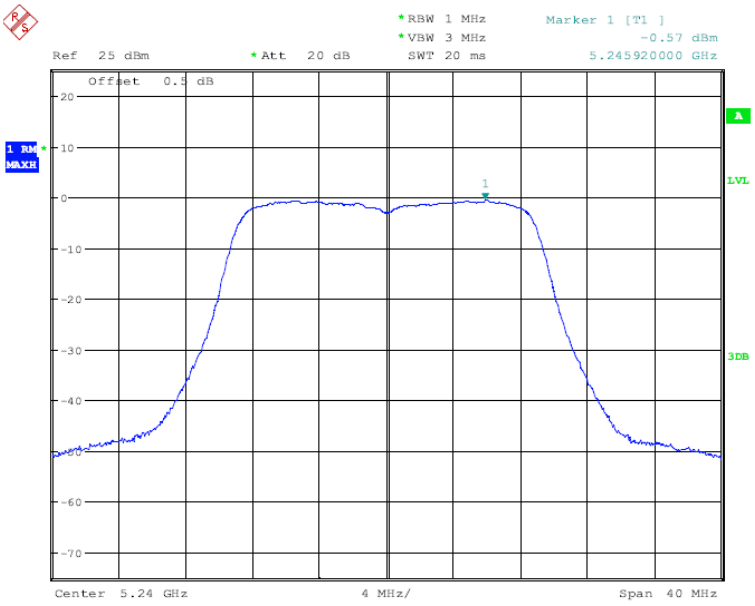
ANT 3 802.11n HT20 Low Channel



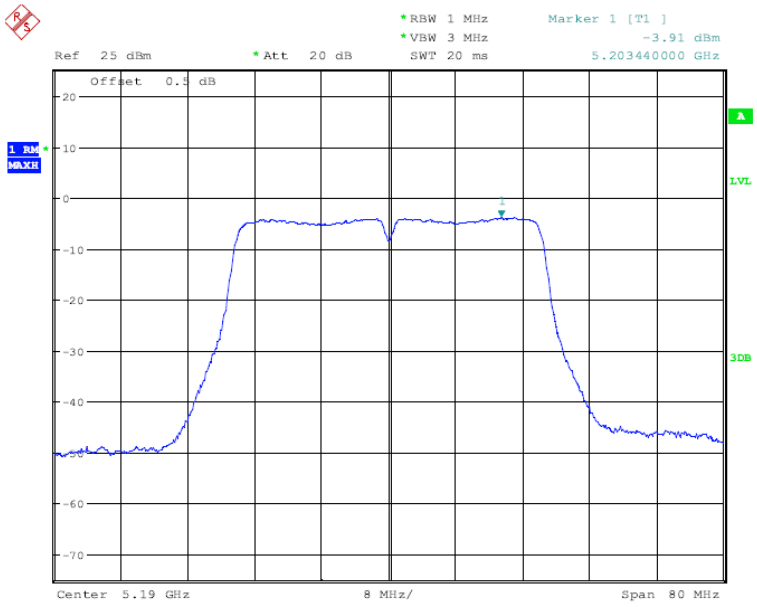
ANT 3 802.11n HT20Middle Channel



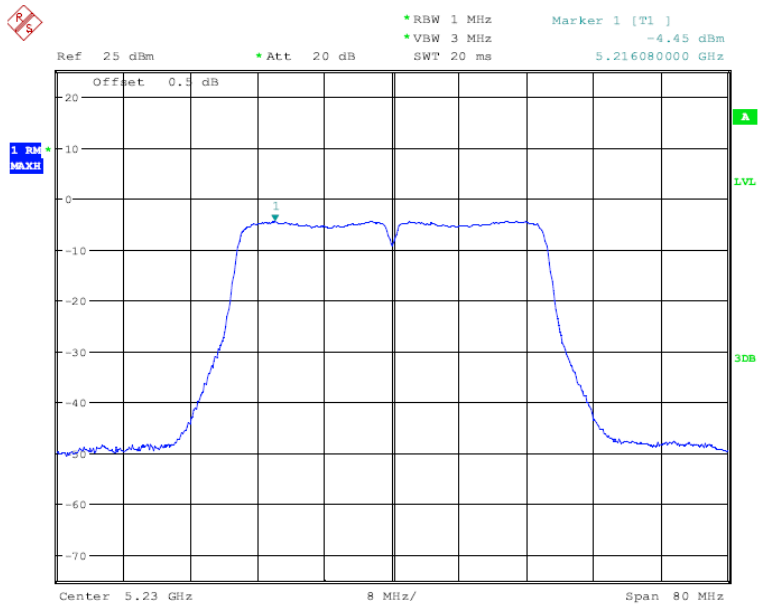
ANT 3 802.11n HT20 High Channel



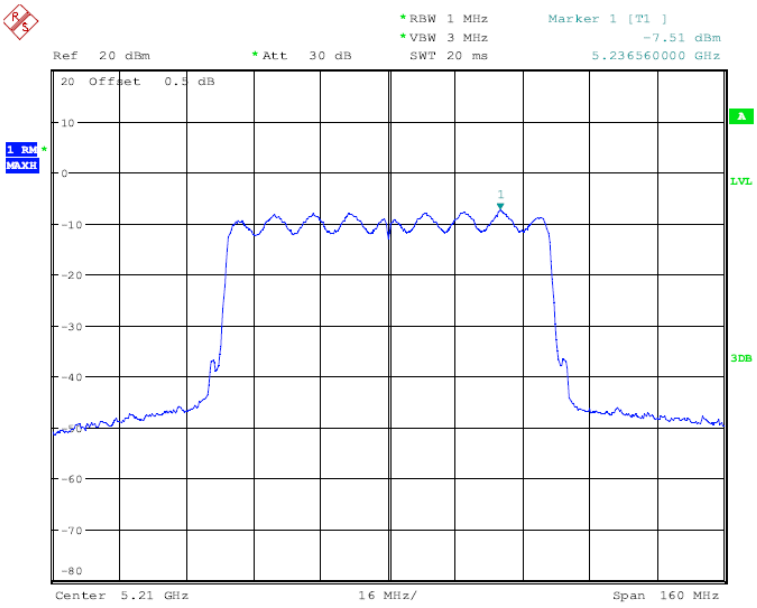
ANT 3 802.11n-HT40 Low Channel



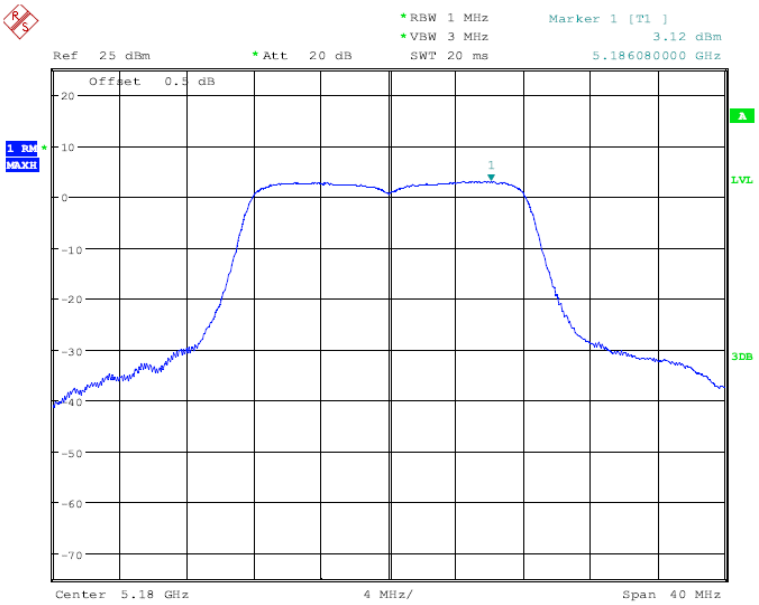
ANT 3 802.11n-HT40 High Channel



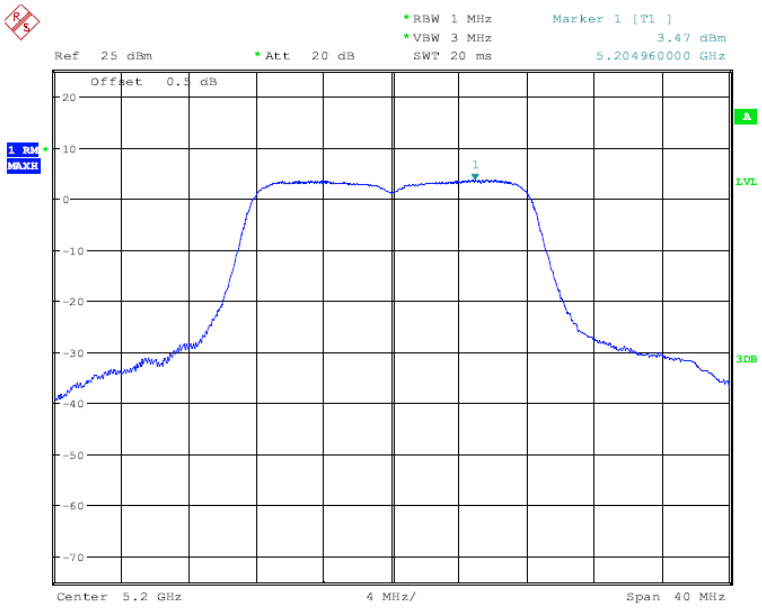
ANT 3 802.11ac 80 Middle Channel



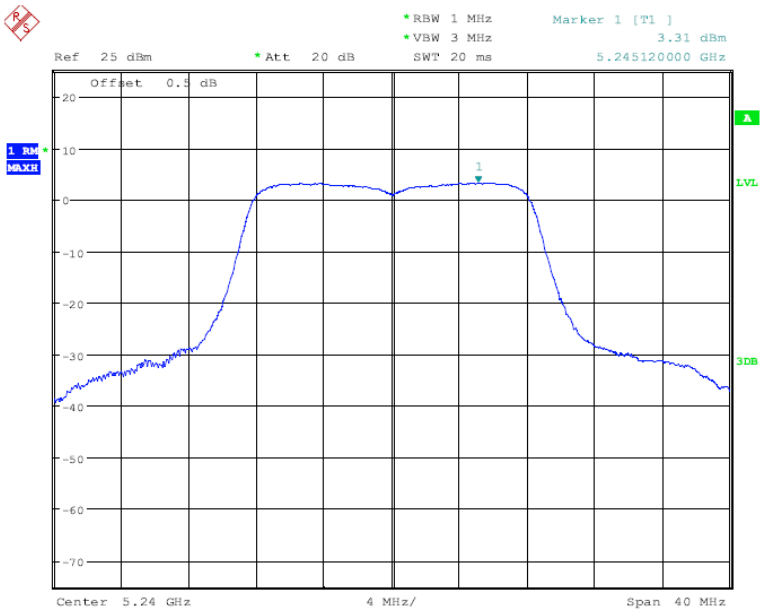
ANT 4 802.11a Low Channel



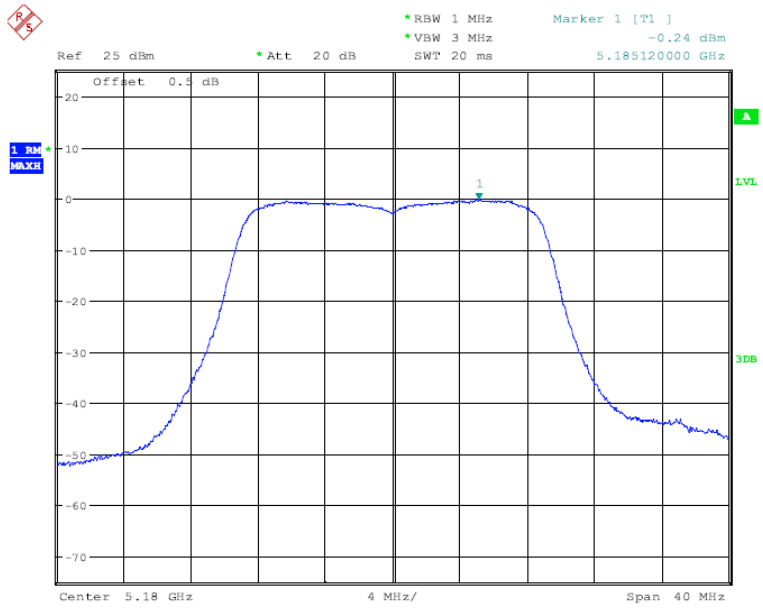
ANT 4 802.11a Middle Channel



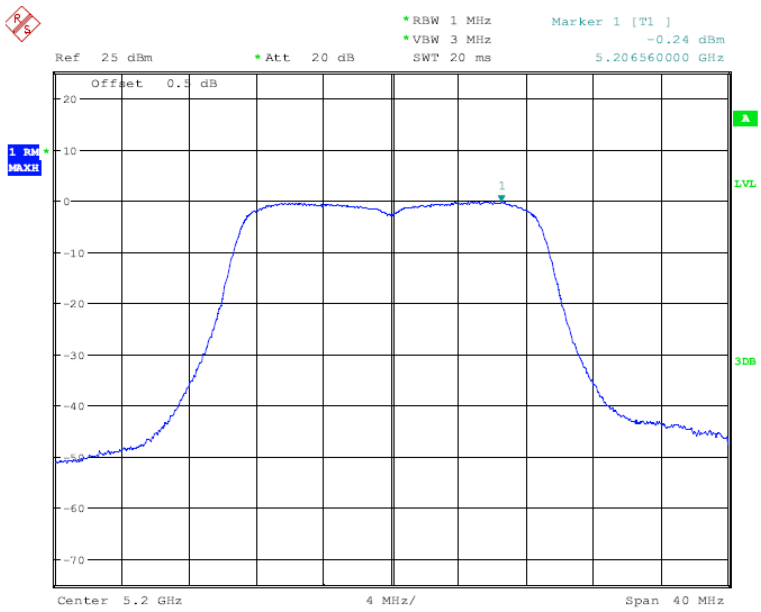
ANT 4 802.11a High Channel



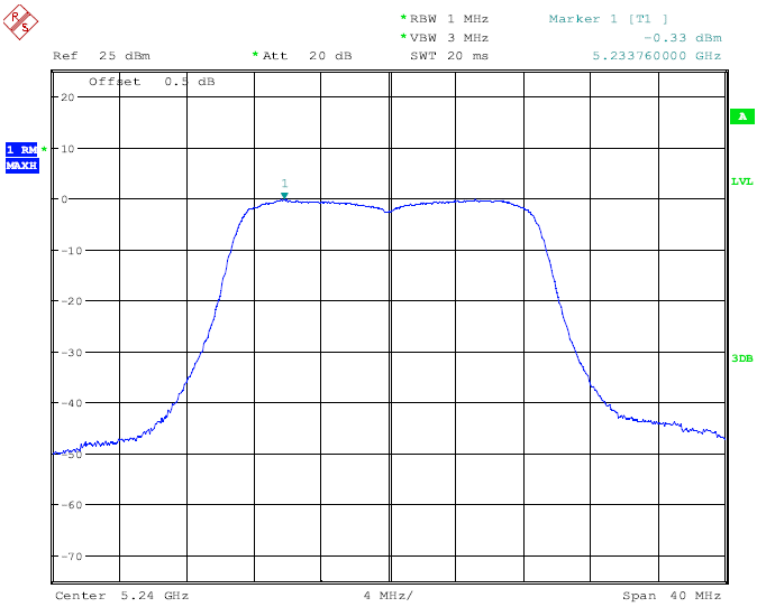
ANT 4 802.11n HT20 Low Channel



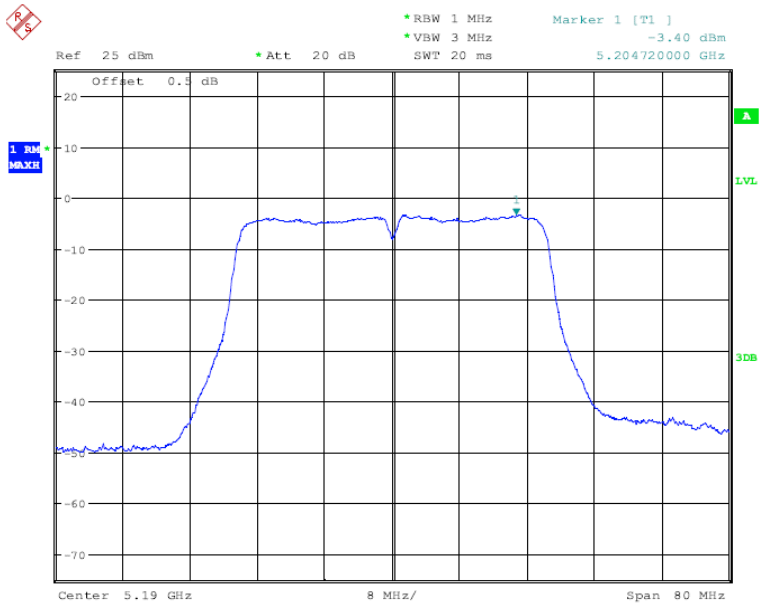
ANT 4 802.11n HT20 Middle Channel



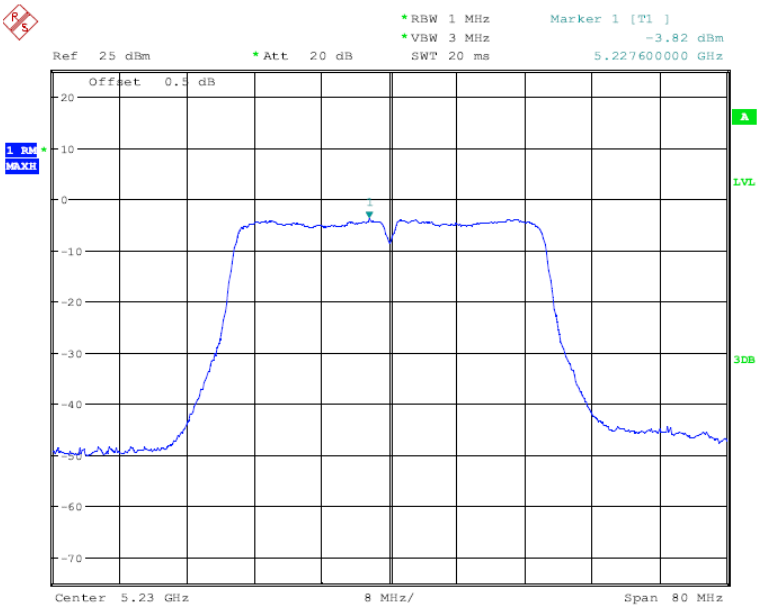
ANT 4 802.11n HT20 High Channel



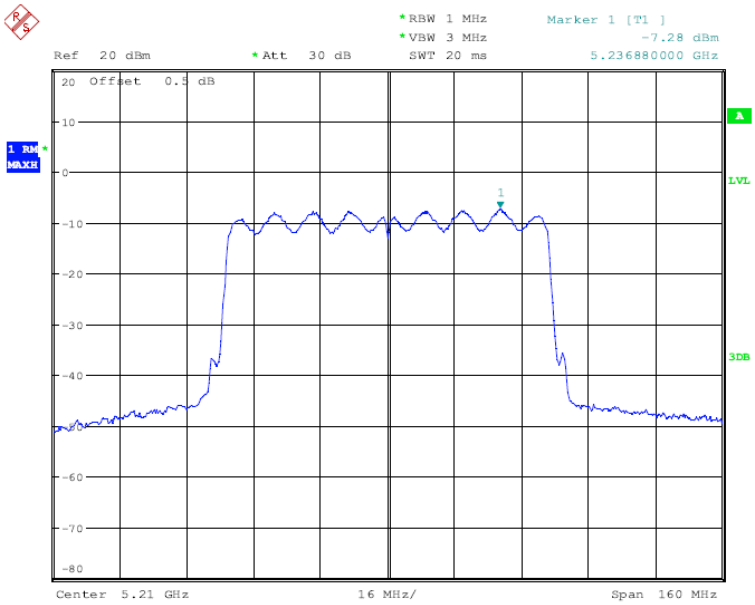
ANT 4 802.11n-HT40 Low Channel



ANT 4 802.11n-HT40 High Channel

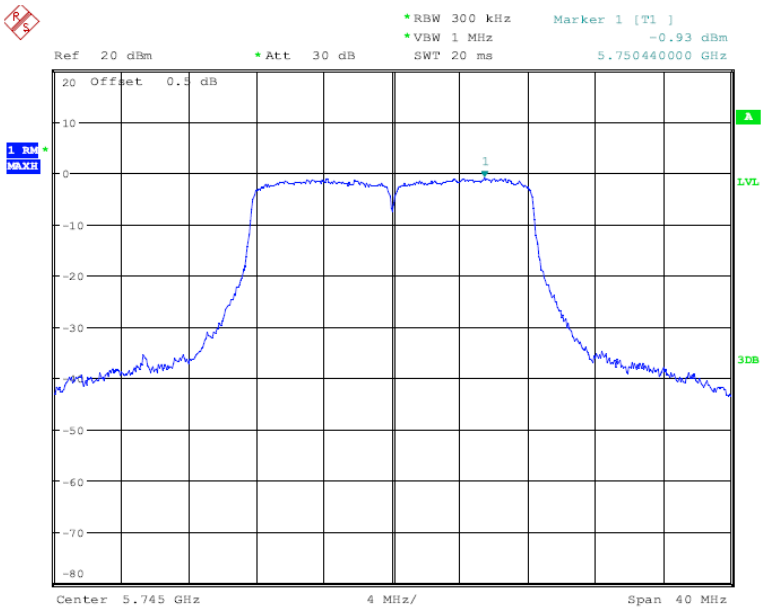


ANT 4 802.11ac80 middle Channel

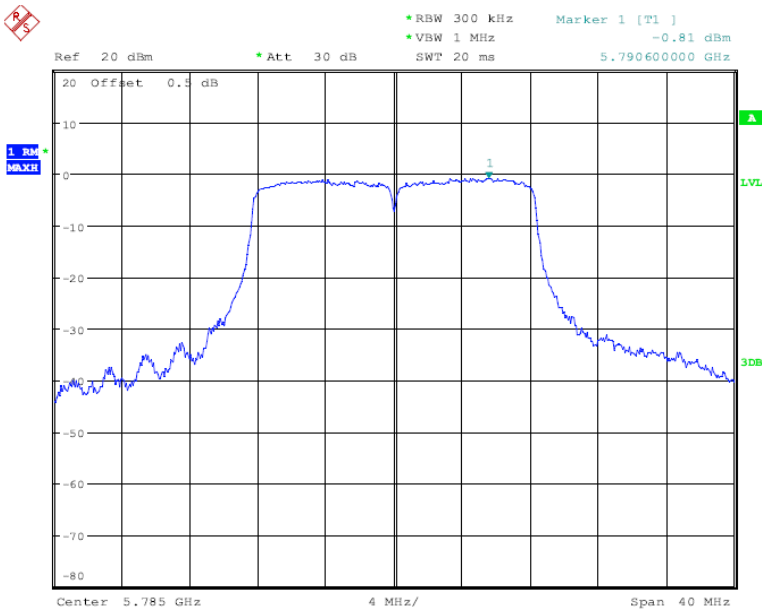


5725-5850MHz

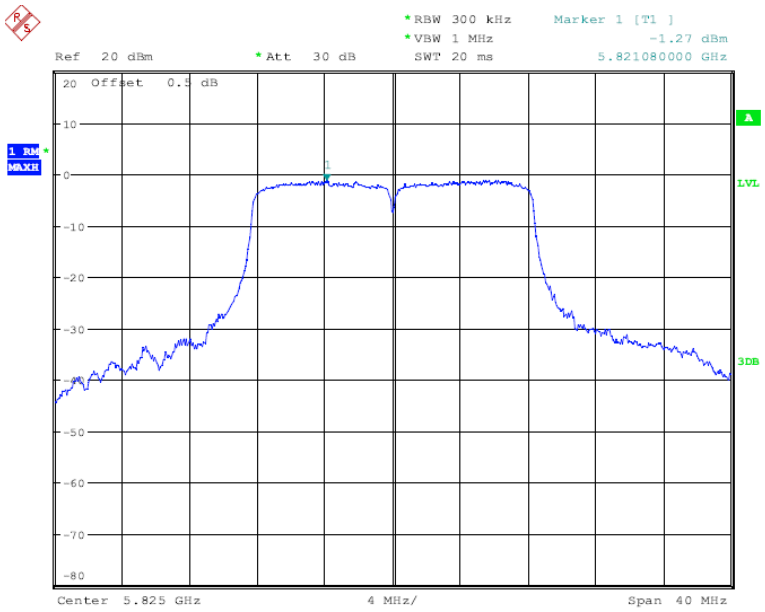
ANT 3 802.11a Low Channel



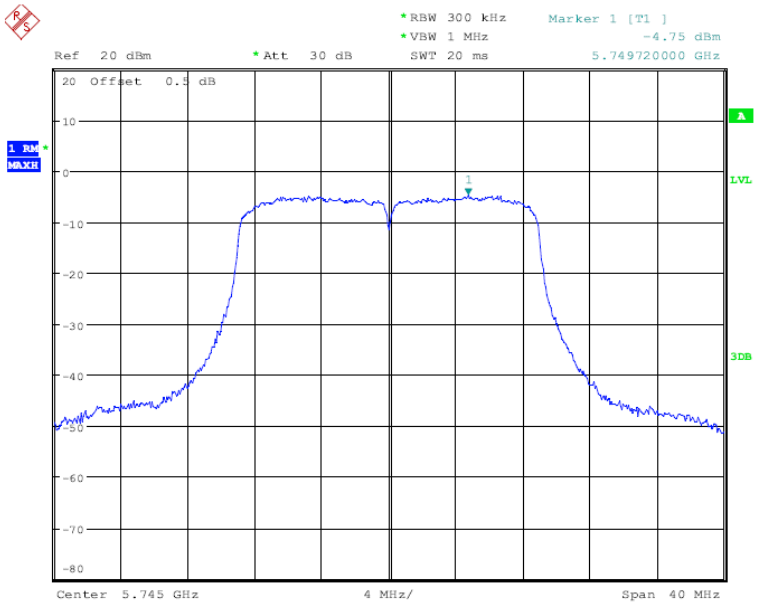
ANT 3 802.11a Middle Channel



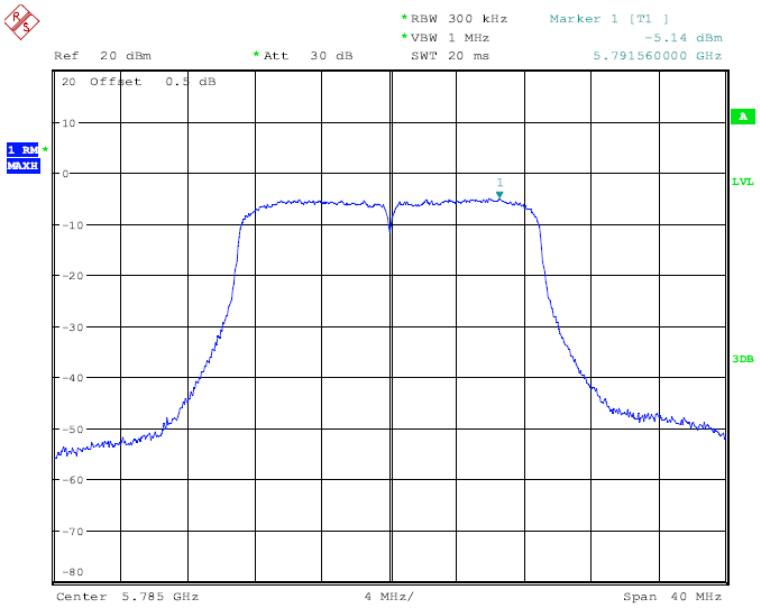
ANT 3 802.11a High Channel



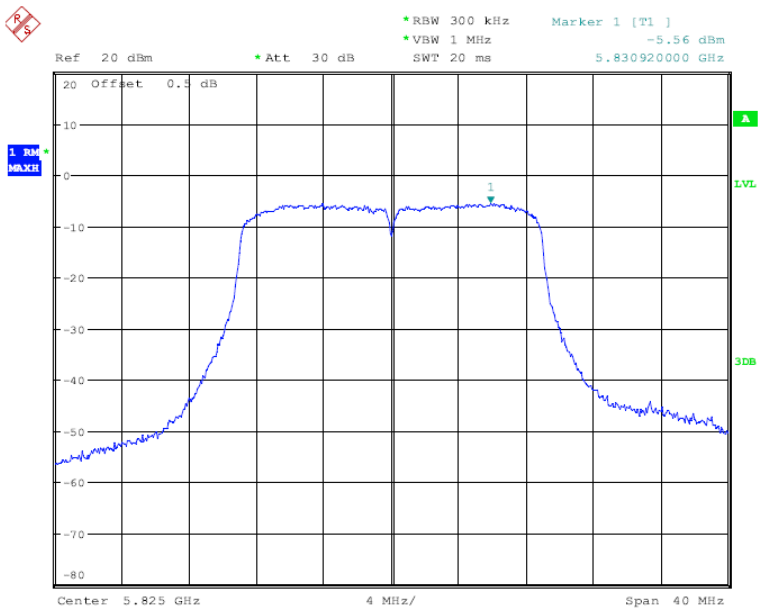
ANT 3 802.11n HT20 Low Channel



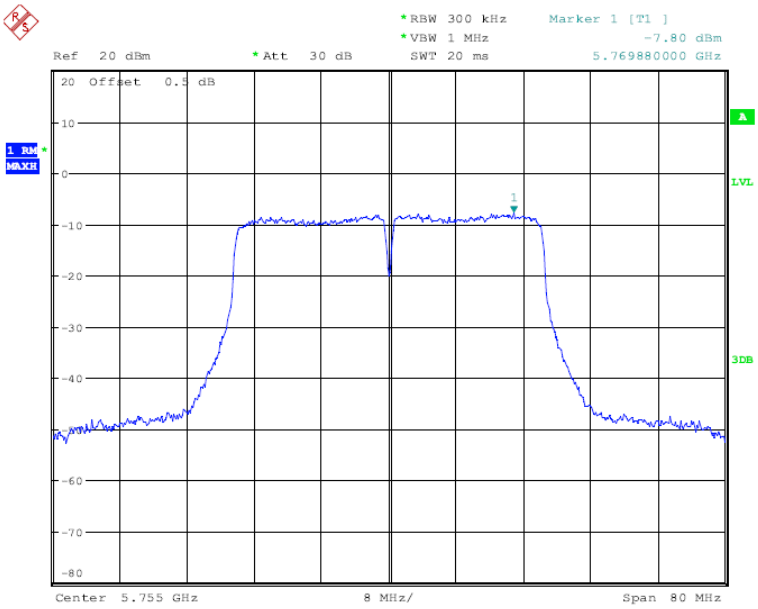
ANT 3 802.11n HT20Middle Channel



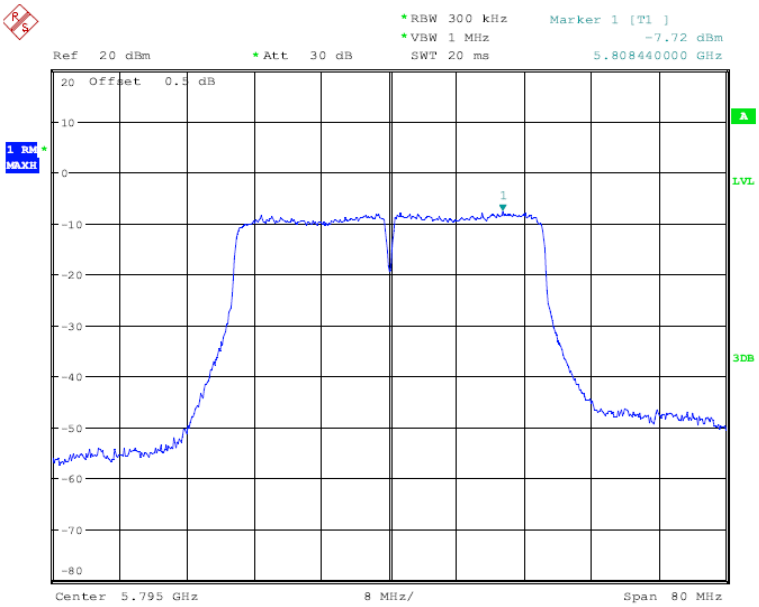
ANT 3 802.11n HT20 High Channel



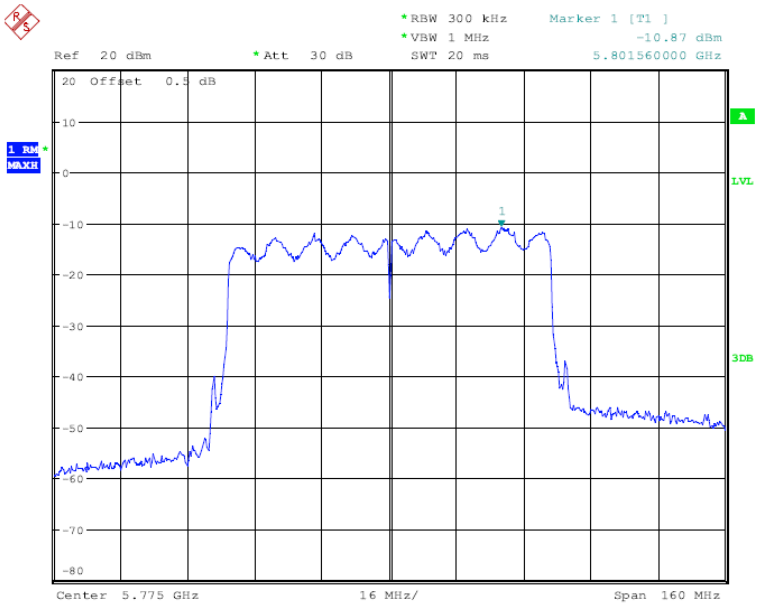
ANT 3 802.11n-HT40 Low Channel



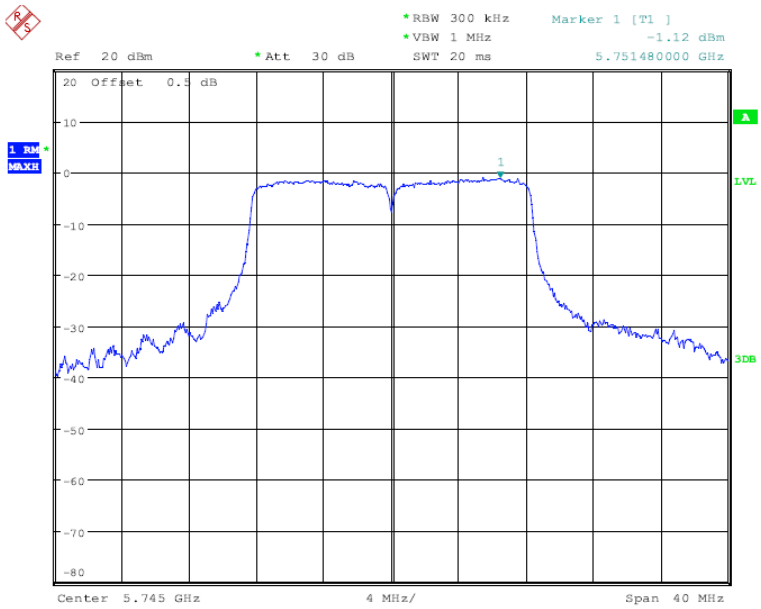
ANT 3 802.11n-HT40 High Channel



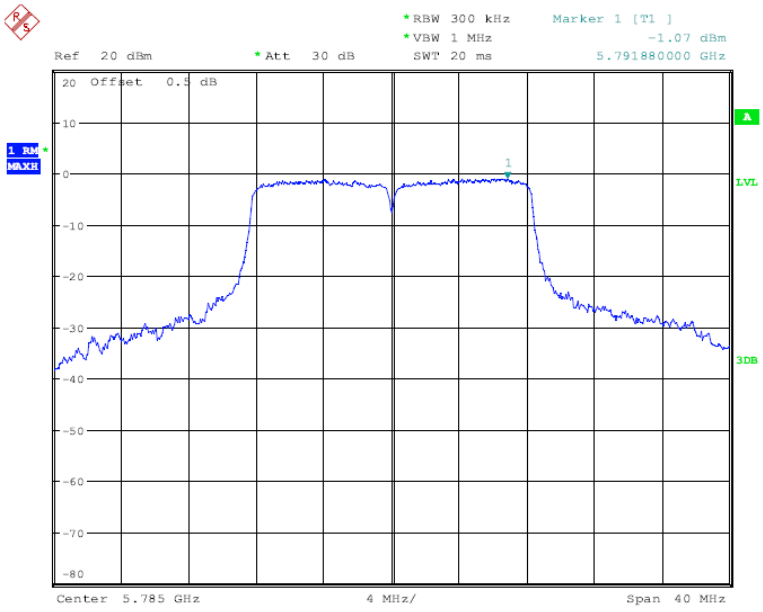
ANT 3 802.11ac 80 Middle Channel



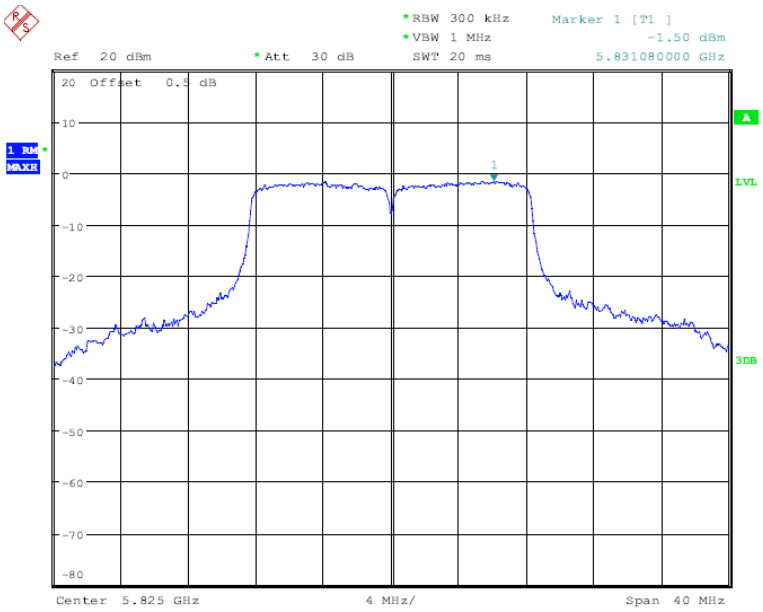
ANT 4 802.11a Low Channel



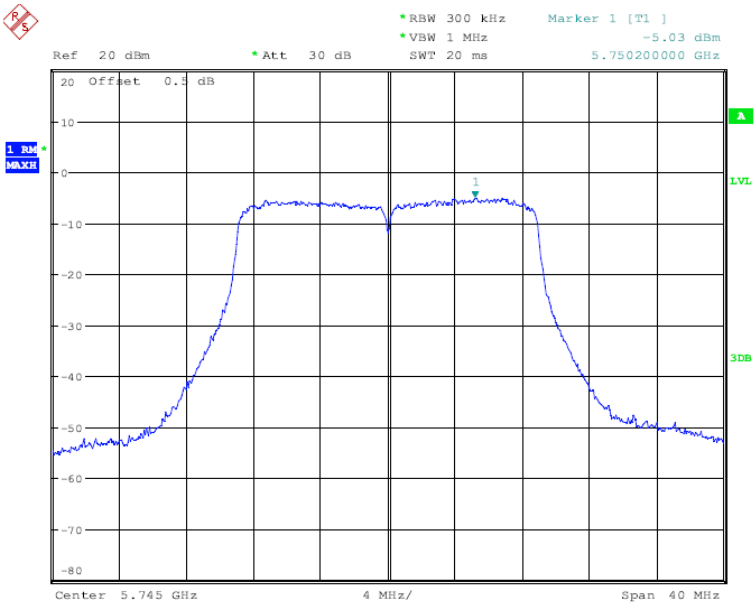
ANT 4 802.11a Middle Channel



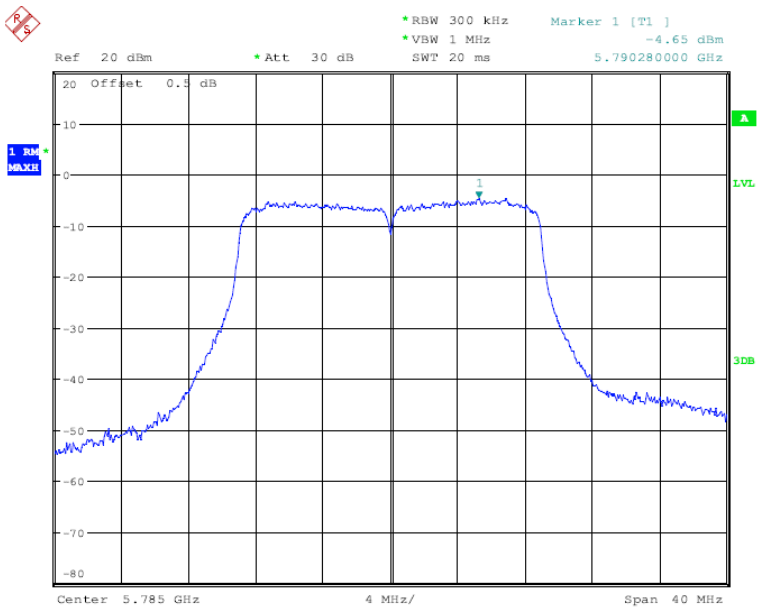
ANT 4 802.11a High Channel



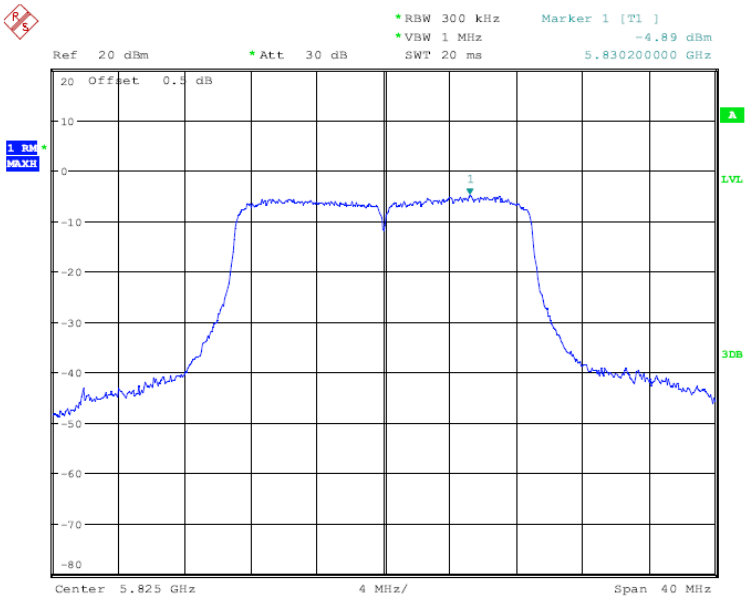
ANT 4 802.11n HT20 Low Channel



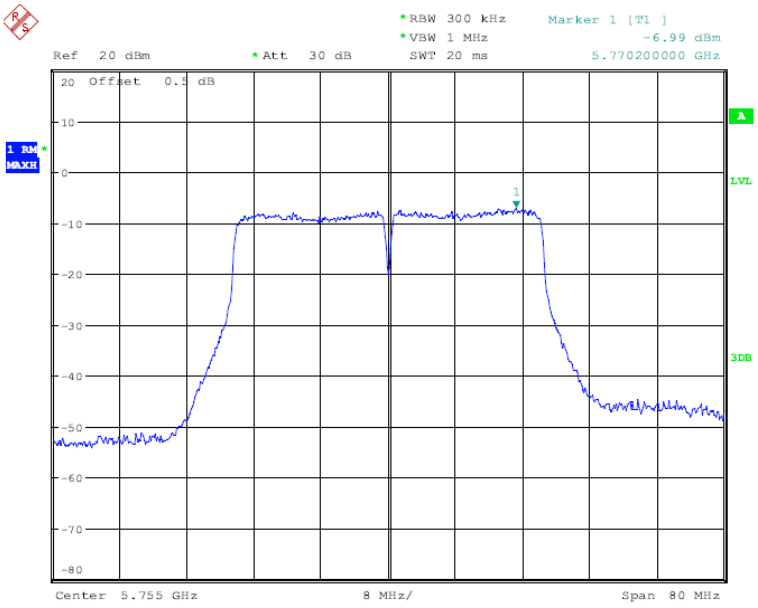
ANT 4 802.11n HT20 Middle Channel



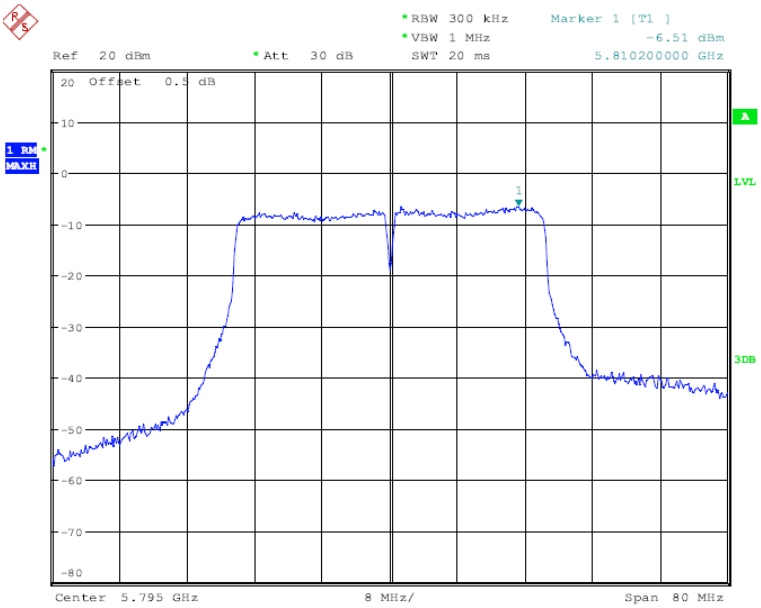
ANT 4 802.11n HT20 High Channel



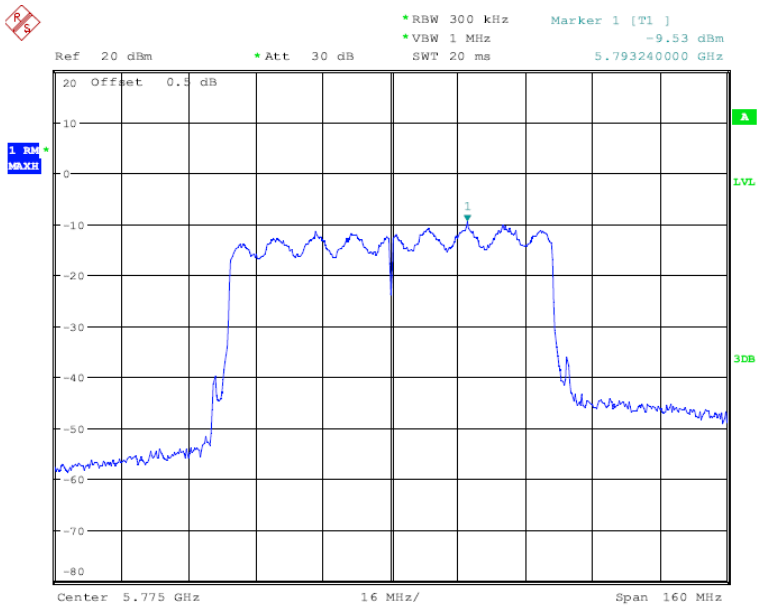
ANT 4 802.11n-HT40 Low Channel



ANT 4 802.11n-HT40 High Channel



ANT 4 802.11ac80 middle Channel



11 Antenna Application

11.1 Antenna Requirement

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. The use of a permanently attached antenna or of an antenna that uses an unique coupling to the intentional radiator shall be considered aufficient to comply with the provisions of this section. The manufacturer may design the units so that a broken antenna can be replaced by the user, but the use of standard antenna jack or electrical connector is prohibited.

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, Both the maximum conducted output power and the peak spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2 Result

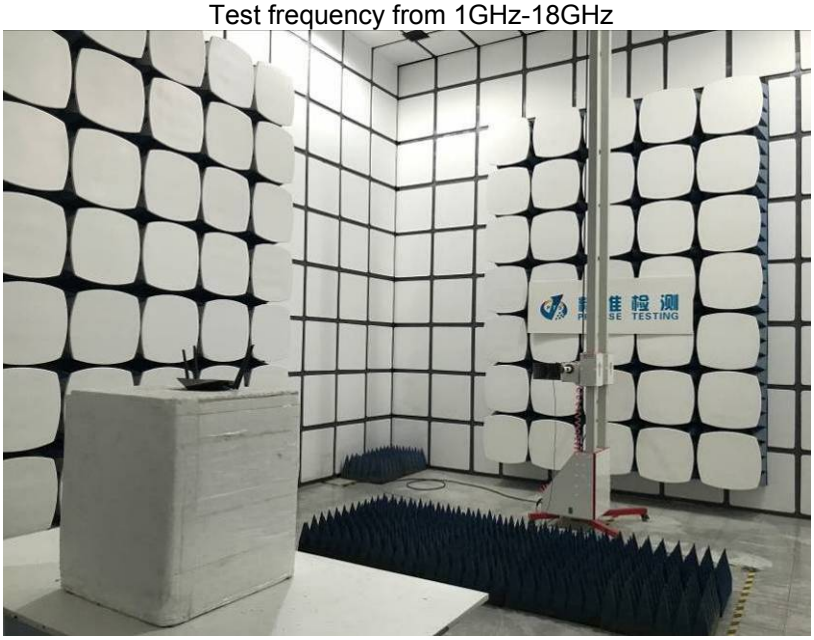
The EUT has 2 external antennas for 5G band, which permanent attached to the unit. Ant 3 and Ant 4 for TX and RX, The antenna's gain is 5dBi and meets the requirement. Please refer to the EUT photo.

12 Test Setup

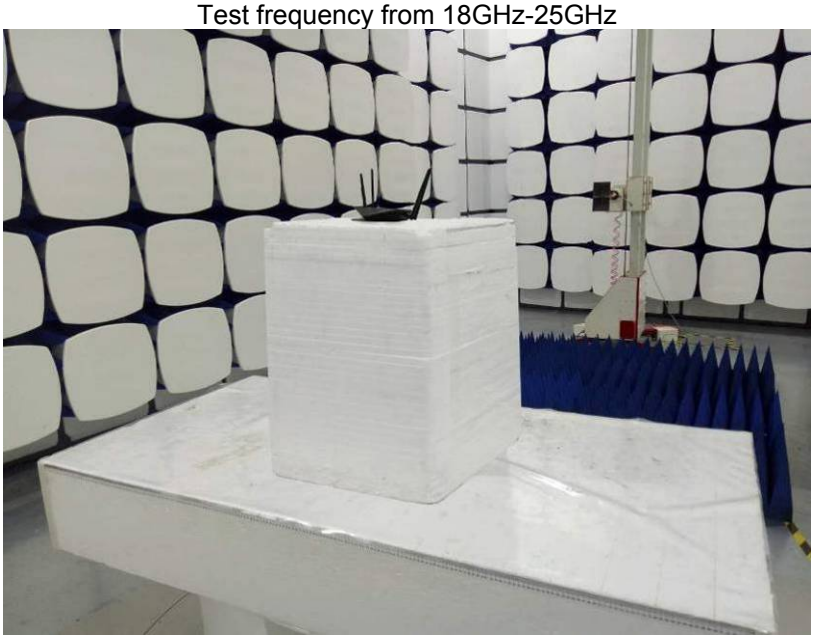
Conducted Emissions

Radiated Spurious Emissions
From 30MHz-1000MHz

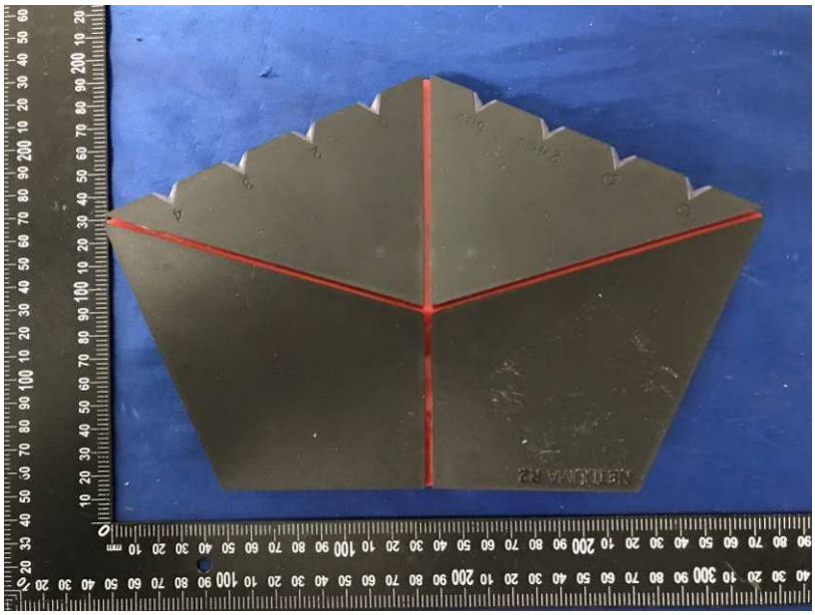
Test frequency from 1GHz-18GHz

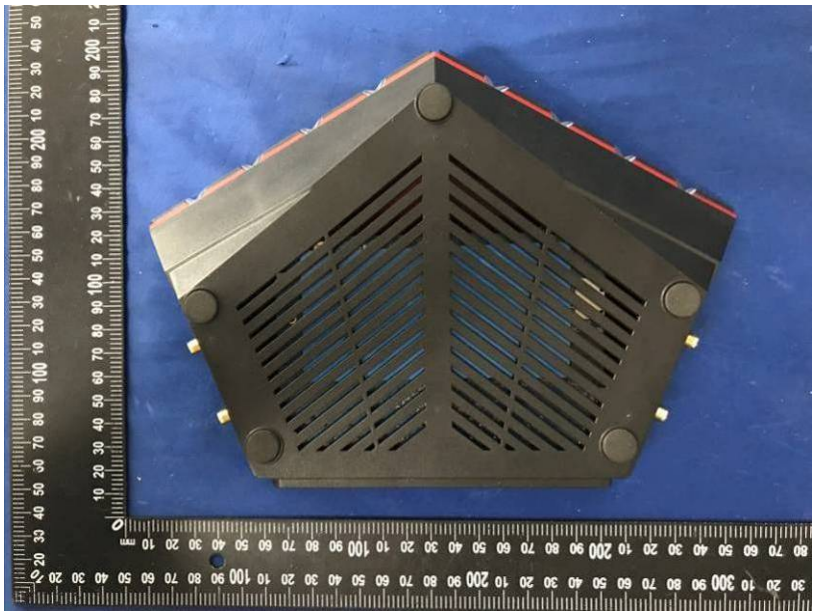


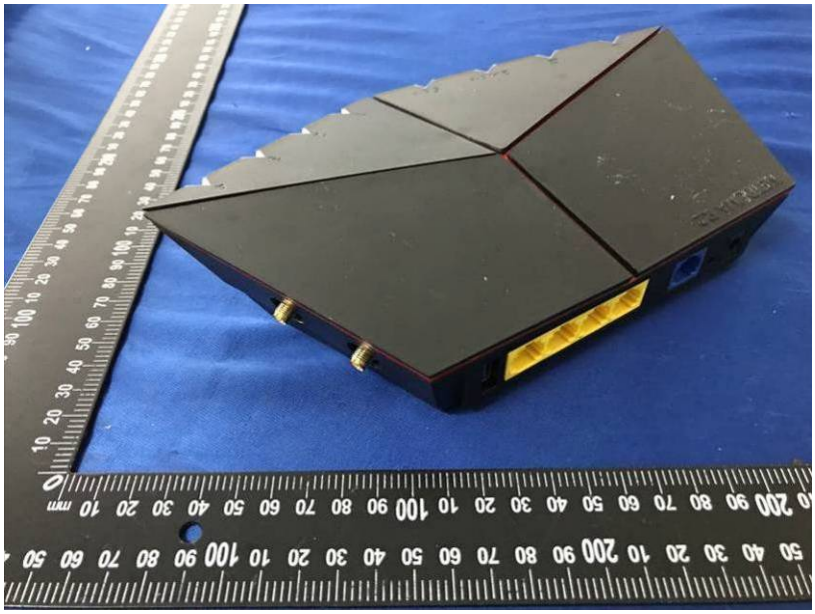
Test frequency from 18GHz-25GHz

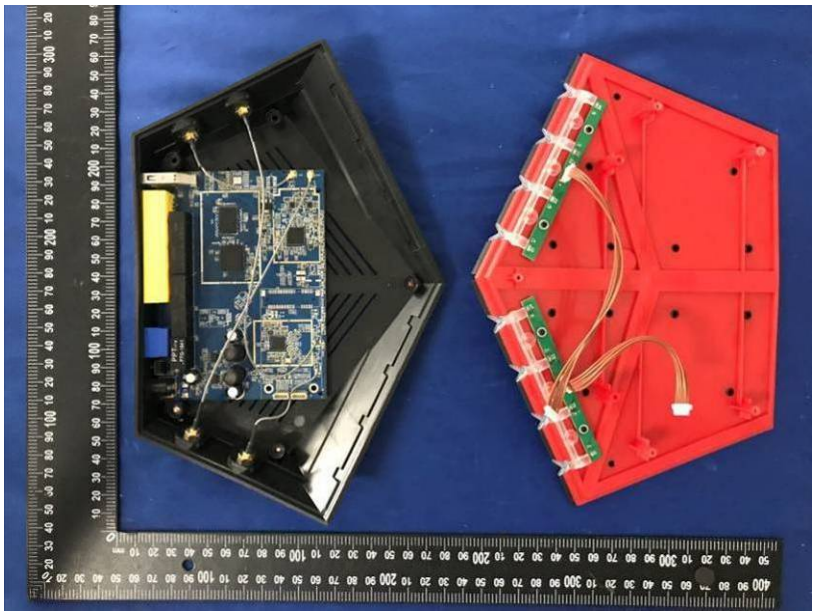


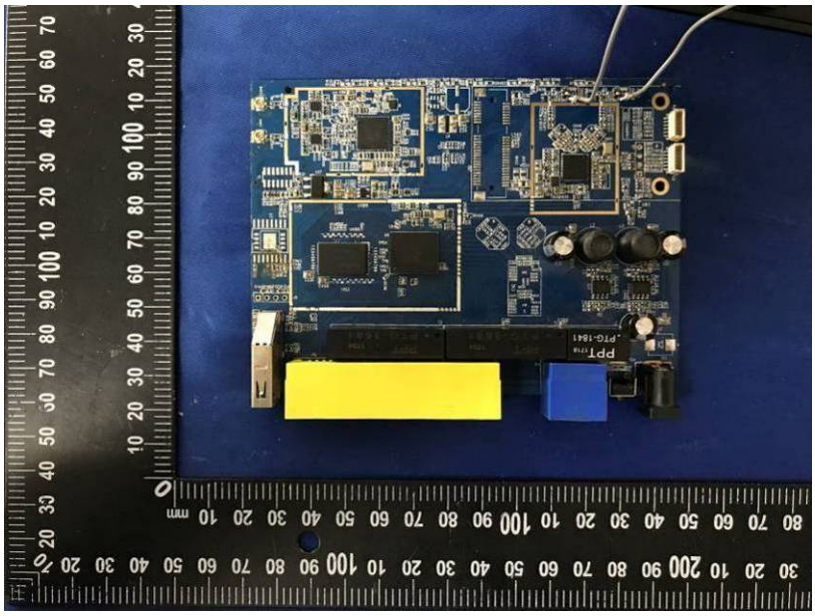
13 EUT Photos

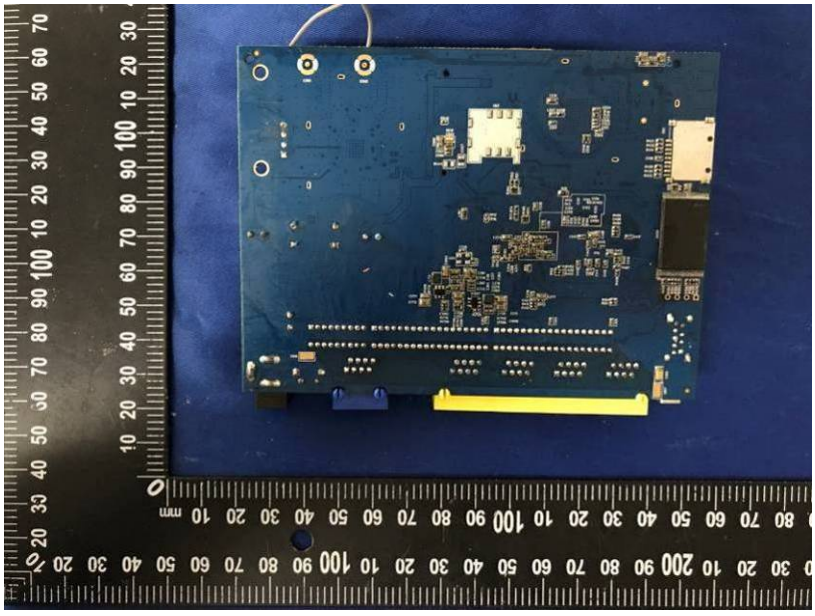


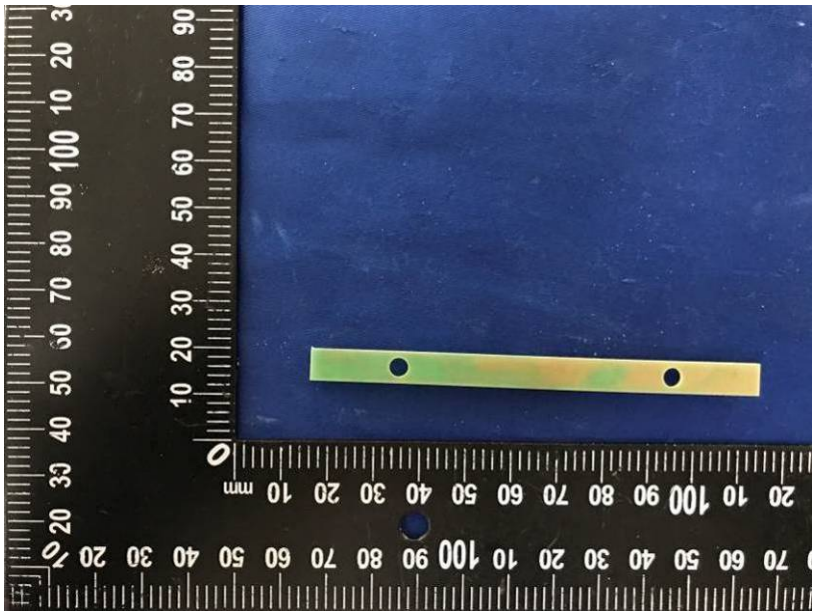


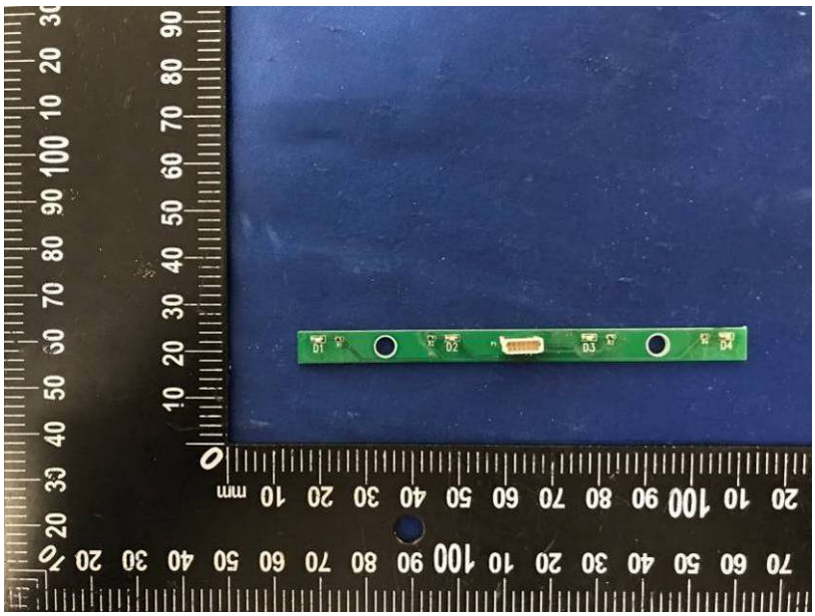


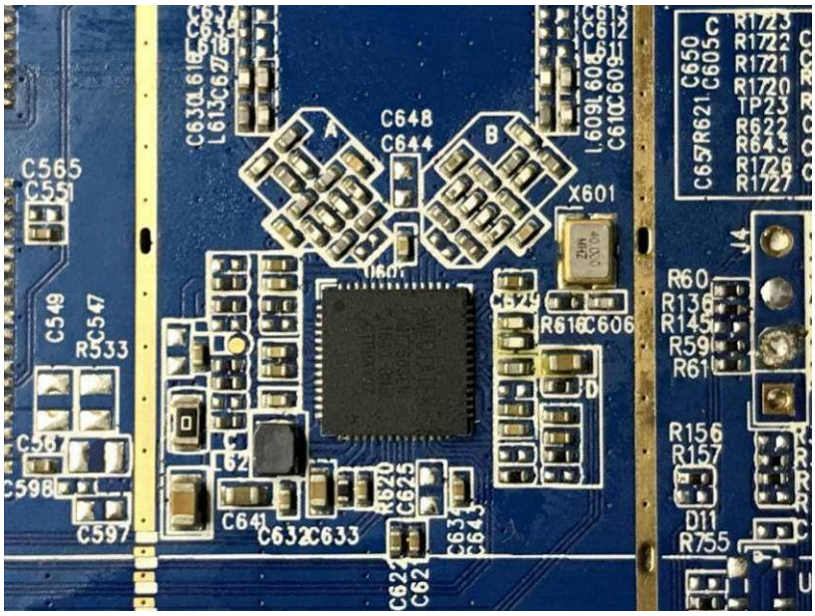












******THE END REPORT******