FCC RADIO TEST REPORT

For

FCC ID: 2ABPZ-YS13KA-JP

Report Reference No..... :	19EFAS09065 2461
Date of issue..... :	2019-9-18
Testing Laboratory..... :	DongGuan ShuoXin Electronic Technology Co., Ltd.
Address..... :	Zone A, 1F, No. 6, XinGang Road YuanGang Street, XinAn District, ChangAn Town, DongGuan City, GuangDong, China
Applicant's name ..... :	Emdoor Digital Technology Co., Ltd.
Address..... :	6 th Floor, Jin Fu Lai Mansion, No.49-1 Dabaolu Rd Baoan28 District, Shenzhen, China
Manufacturer..... :	Emdoor Digital Technology Co., Ltd.
Test specification:	
Test item description..... :	YOGA NOTEBOOK
Trade Mark ..... :	N/A
Model/Type reference ..... :	YS13KA_JP
Ratings..... :	Adapter1:CHA-120250MNX01 INPUT: 100-240V~ 50/60Hz 0.6A, Output: DC12V 2.5A Adapter2:SOY-1200250-298 INPUT: 100-240V~ 50/60Hz 1.2A, Output: DC12V 2.5ADC 7.6V 5950mAh Li-poly Battery

Responsible Engineer : Smile Wang

Smile Wang

Authorized Signatory: King Wang

King Wang

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TEST REPORT DECLARE

Applicant	:	Emdoor Digital Technology Co., Ltd.
Address	:	6 th Floor, Jin Fu Lai Mansion, No.49-1 Dabaolu Rd Baoan28 District, Shenzhen, China
Equipment under Test	:	YOGA NOTEBOOK
Model No	:	YS13KA_JP
Trade Mark	:	N/A
Manufacturer	:	Emdoor Digital Technology Co., Ltd.
Address	:	6 th Floor, Jin Fu Lai Mansion, No.49-1 Dabaolu Rd Baoan28 District, Shenzhen, China

Test Standard Used: FCC Part 15E 15.407

Test procedure used: ANSI C63.10-2013 and KDB 789033 D02 General UNII Test Procedures New Rules v02r01 .

We Declare:

The equipment described above is tested by DongGuan ShuoXin Electronic Technology Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and DongGuan ShuoXin Electronic Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	19EFAS09065 2461		
Date of Test:	2019-6-28	**Date of Report**:	2019-09-18

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of DongGuan ShuoXin Electronic Technology Co., Ltd.

1. SUMMARY OF TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below.		
FCC Part15 (15.407) , Subpart E		
Description of Test Item	**Standard**	**Results**
AC Power Line Conducted Emissions	FCC §15.207/ RSS-Gen	PASS
Spurious Radiated Emissions	FCC §15.209(a), 15.407(b)	PASS
26 dB and 99% Emission Bandwidth	FCC §15.407(a)	PASS
Maximum Conducted Output Power	FCC §407(a)(1)	PASS
Band Edges	FCC §2.1051, §15.407(b)	PASS
Power Spectral Density	FCC §15.407(a)(1)	PASS
Spurious Emissions at Antenna Terminals	FCC §2.1051, §15.407(b)	PASS
Frequency Stability	FCC §15.407(a)(6)	PASS
Antenna Requirement	FCC §15.203	PASS

2. GENERAL TEST INFORMATION

2.1. DESCRIPTION OF EUT

EUT* Name	:	YOGA NOTEBOOK
Model Number	:	YS13KA_JP
EUT function description	:	YOGA NOTEBOOK with WiFi & BT function.
Power supply	:	Adapter1:CHA-120250MNX01 INPUT: 100-240V~ 50/60Hz 0.6A, Output: DC12V 2.5A Adapter2:SOY-1200250-298 INPUT: 100-240V~ 50/60Hz 1.2A, Output: DC12V 2.5A
Adaptor		Adapter1:CHA-120250MNX01 Adapter2:SOY-1200250-298
Operation frequency	:	WiFi: 802.11a/802.11n(HT20) /ac(VHT20): 5180MHz ~ 5240MHz; 5745MHz ~ 5825MHz 802.11n(HT40)/ac(VHT40): 5190MHz ~ 5230MHz, 5755MHz ~ 5795MHz 802.11ac(VHT80): 5210MHz, 5775MHz,
Modulation	:	OFDM with OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM for 802.11a/n/ac;
Data Rate	:	802.11 a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20):MCS0-MCS7; 802.11n(HT40): MCS0-MCS7; 802.11ac(HT20/HT40/HT80):Up to 433Mbps
Antenna Type	:	FPCB Antenna, Antenna A only WIFI, Antenna B WIFI&BT maximum PK gain: Antenna A :1 .85dBi(Main) Antenna B : 1.9dBi(Aux)
Battery	:	N/A
Date of Receipt	:	2019/06/28
Sample Type	:	N/A

UNII-1		UNII-1		UNII-1	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

UNII-4		UNII-4		UNII-4	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

2.2. ACCESSORIES OF EUT

Description of Accessories	Shielded Type	Ferrite Core	Length
Adapter	SICHUAN CHANGHONG ELECTRONIC COMPONENT CO., LTD	CHA-120250MNX01	/
Adapter	ShenZhen SOY Techonlogy Co., Ltd	SOY-1200250-298	/

2.3. ASSISTANT EQUIPMENT USED FOR TEST

Description of Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	SN
/	/	/	/	/

2.4. BLOCK DIAGRAM OF EUT CONFIGURATION FOR TEST

2.5. TEST ENVIRONMENT CONDITIONS

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Link Mode
Mode 2	802.11a / n 20/ac20 CH36/ CH40/ CH48 802.11a / n 20/ac20 CH149/ CH157/ CH165
Mode 3	802.11n40/ac40 CH38/ CH 46 802.11 n40/ac40 CH151/ CH159

For Radiated Emission	
Final Test Mode	Description
Mode 1	Link Mode
Mode 2	802.11a / n 20 CH36/ CH40/ CH48 802.11a / n 20 CH149/ CH157/ CH165
Mode 3	802.11n40 CH38/ CH 46 802.11 n40 CH151/ CH159

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

(3) The EUT was used fully-charged battery and programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

(4) The EUT does not support MIMO mode.

2.6. TEST ENVIRONMENT CONDITIONS

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

Temperature range:	21-25℃
Humidity range:	40-75%
Pressure range:	86-106kPa

2.7. MEASUREMENT UNCERTAINTY

Test Item	Uncertainty
Uncertainty for Conduction emission test (9kHz-150kHz)	3.7 dB
Uncertainty for Conduction emission test (150kHz-30MHz)	3.3 dB
Uncertainty for Radiation Emission test (30MHz-200MHz)	4.6 dB (Polarize: V)
	4.6 dB (Polarize: H)
Uncertainty for Radiation Emission test (200MHz-1GHz)	6.0 dB (Polarize: V)
	5.0 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz-6GHz)	5.1 dB (Polarize: V)
	5.1 dB (Polarize: H)
Uncertainty for Radiation Emission test (6GHz-18GHz)	5.4 dB (Polarize: V)
	5.4 dB (Polarize: H)
Uncertainty for Radiation Emission test (18GHz-40GHz)	5.06 dB (Polarize: V)
	5.06 dB (Polarize: H)
Uncertainty for radio frequency	±0.048kHz
Uncertainty for conducted RF Power	±0.32dB

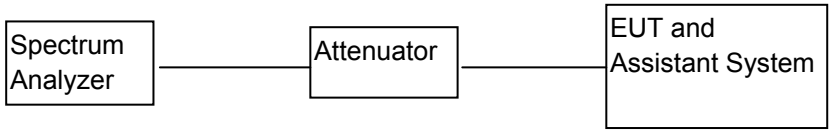
Note：This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. POWER SPECTRAL DENSITY TEST

3.1. TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Due.	Cal. Interval
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2020/05/25	1 Year
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/12/17	1 Year
3	RF Cable	Micable	C10-01-01-1	100309	2019/12/17	1 Year
4	Spectrum analyzer	R&S	FSV40	101470	2020/06/28	1 Year

3.2. BLOCK DIAGRAM OF TEST SETUP



3.3. APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)(3)

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 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 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 power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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 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.

For the band 5.725-5.85 GHz

For the band 5.725-5.85 GHz, 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..

3.4. TEST PROCEDURE

（For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

3.5. TEST RESULT

CH. No.	Frequency	Power Density ANT A (dBm/MHz)	Power Density ANT B (dBm/MHz)	total power density (dBm/MHz)	Limit (dBm/MHz)	Result
TX 802.11a Mode						
CH36	5180	-2.59	-2.62	--	11	Pass
CH40	5200	-2.31	-2.35	--	11	Pass
CH48	5240	-2.48	-2.51	--	11	Pass
CH 149	5745	-3.98	-3.99	--	30	Pass
CH 157	5785	-4.14	-4.26	--	30	Pass
CH 165	5825	-4.62	-4.71	--	30	Pass
TX 802.11n20 Mode						
CH36	5180	-2.96	-3.02	--	11	Pass
CH40	5200	-2.76	-2.83	--	11	Pass
CH48	5240	-2.97	-2.98	--	11	Pass
CH 149	5745	-4.00	-4.12	--	30	Pass
CH 157	5785	-4.28	-4.36	--	30	Pass
CH 165	5825	-5.43	-5.55	--	30	Pass
TX 802.11n40 Mode						
CH38	5190	-7.35	-7.42	--	11	Pass
CH46	5230	-7.20	-7.31	--	11	Pass
CH151	5755	-7.29	-7.35	--	30	Pass
CH159	5795	-8.93	-8.96	--	30	Pass

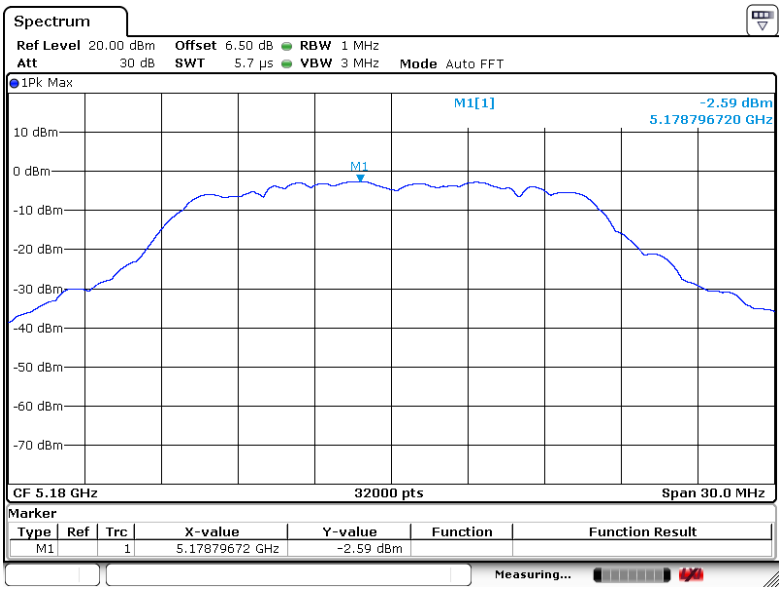
CH. No.	Frequency	Power Density ANT A (dBm/MHz)	Power Density ANT B (dBm/MHz)	total power density (dBm/MHz)	Limit (dBm/MHz)	Result
TX 802.11 ac(VHT20) Mode						
CH36	5180	-3.44	-3.50	--	11	Pass
CH40	5200	-2.59	-2.62	--	11	Pass
CH48	5240	-2.89	-2.97	--	11	Pass
CH 149	5745	-3.48	-3.53	--	30	Pass
CH 157	5785	-4.00	-4.16	--	30	Pass
CH 165	5825	-5.14	-5.24	--	30	Pass
TX 802.11 ac(VHT40) Mode						
CH38	5190	-7.23	-7.29	--	11	Pass
CH46	5230	-7.99	-8.06	--	11	Pass
CH 151	5755	-8.66	-8.74	--	30	Pass
CH 159	5795	-7.27	-7.32	--	30	Pass
TX 802.11 ac(VHT80) Mode						
CH42	5210	-10.77	-10.82	--	11	Pass
CH155	5775	-11.81	-11.90	--	30	Pass

Note: The worst data is Antenna A, only shown Antenna A Plot.

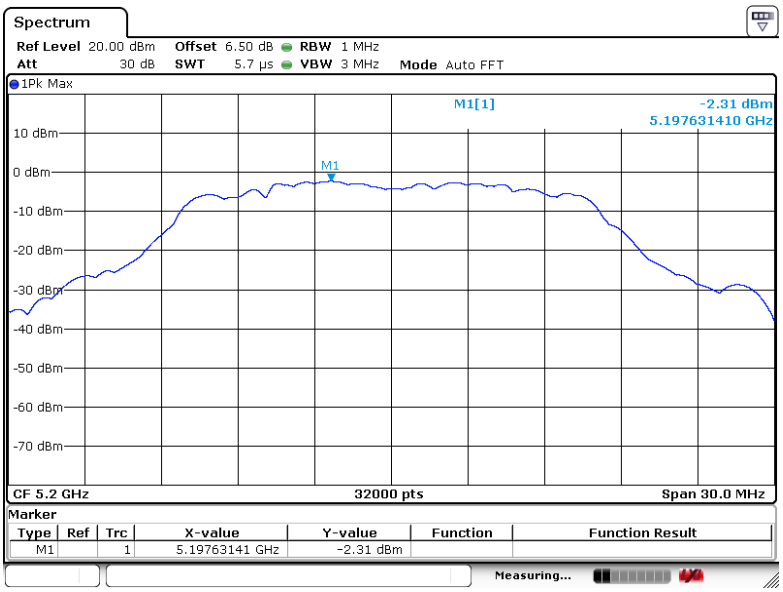
Test plots as followed: Antenna A

802.11a

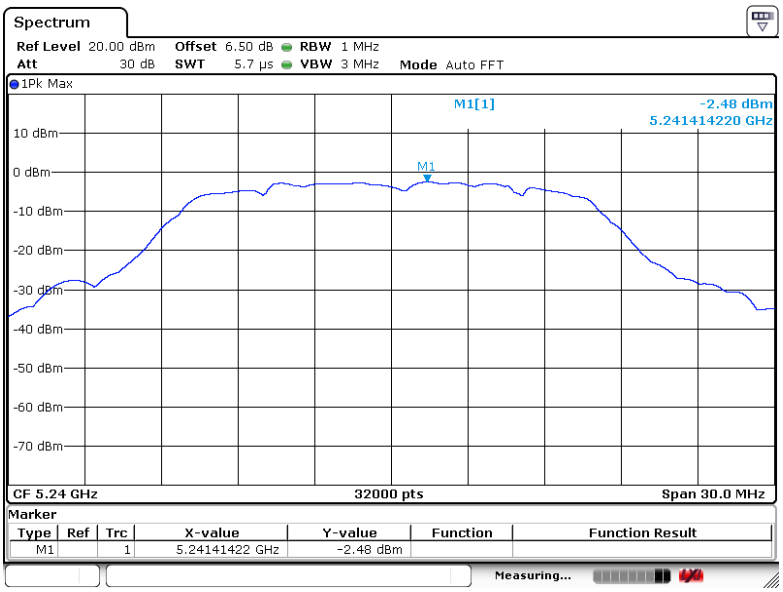
Channel: 36



Channel: 40

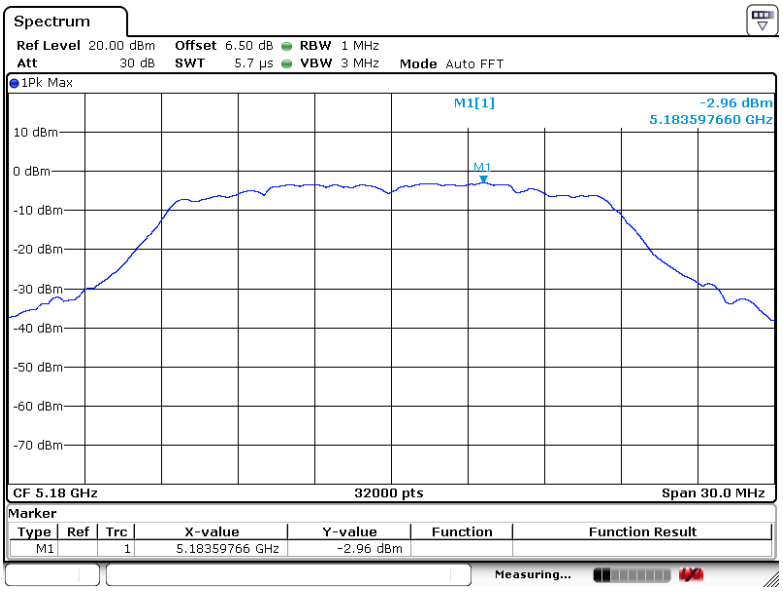


Channel: 48


Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -2.48 dBm
5.241414220 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.24 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.24141422 GHz -2.48 dBm
Measuring...

802.11n20

Channel: 36



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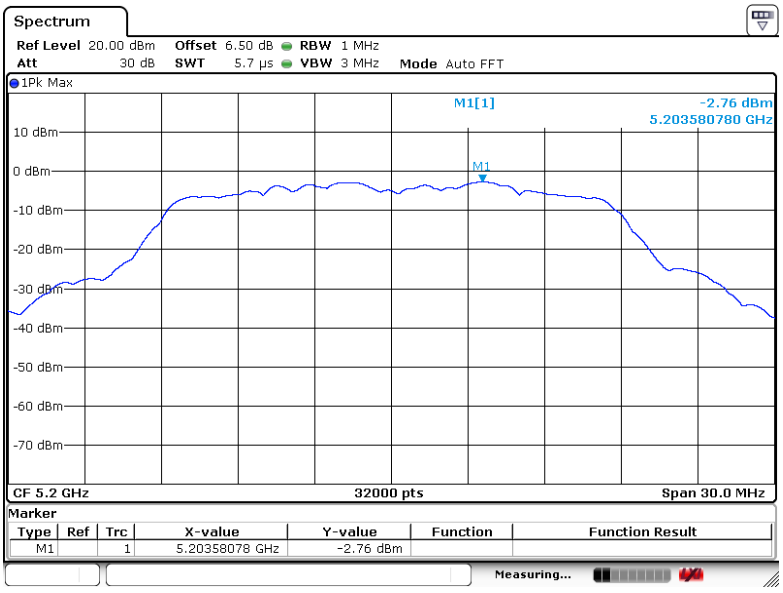
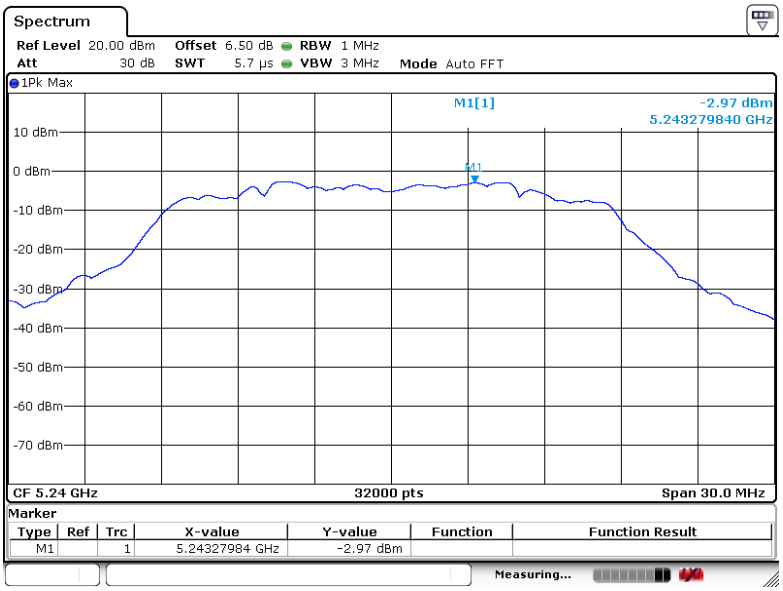
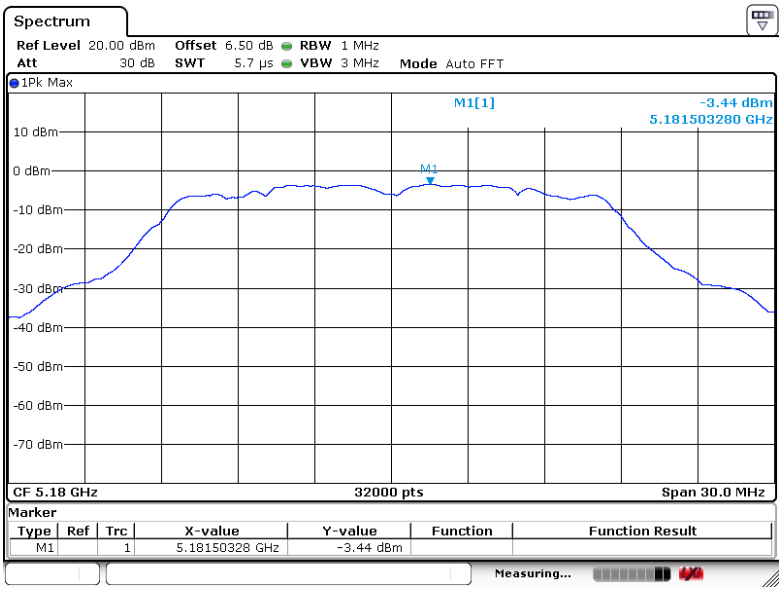


Channel: 48


Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -2.97 dBm
5.243279840 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.24327984 GHz -2.97 dBm
Measuring...

802.11ac20

Channel: 36



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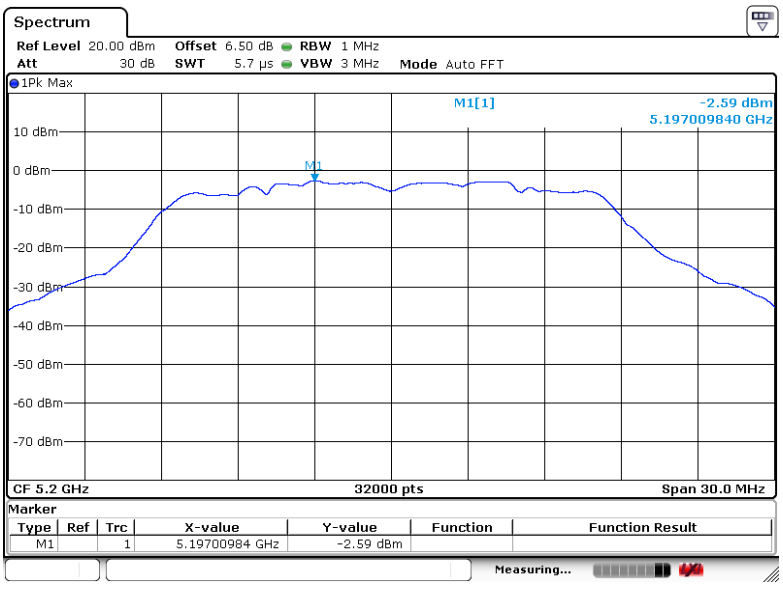

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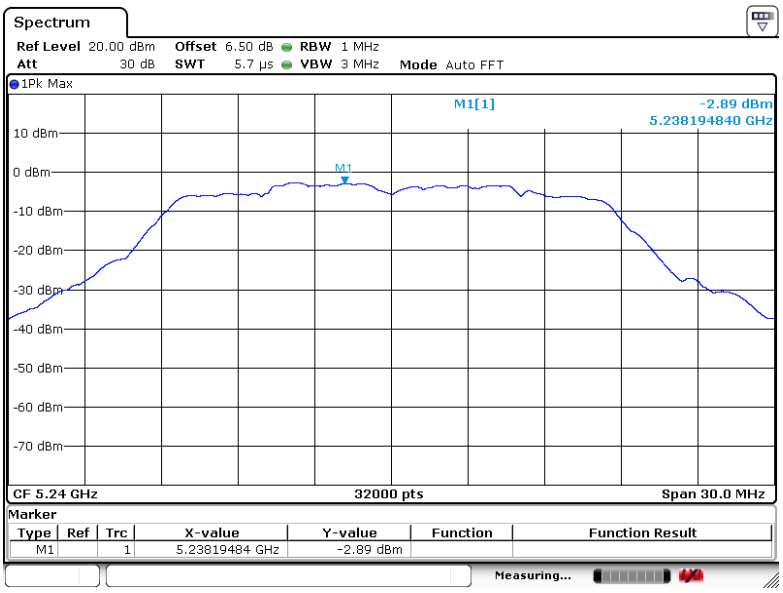
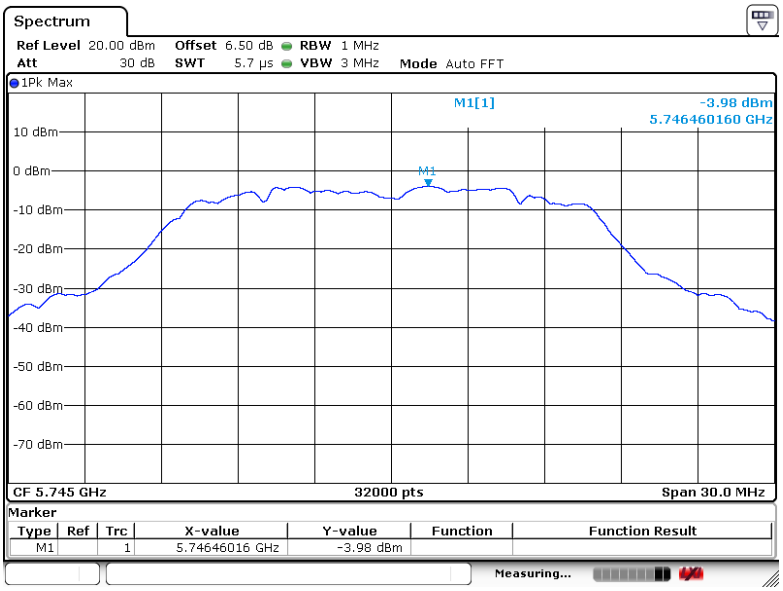
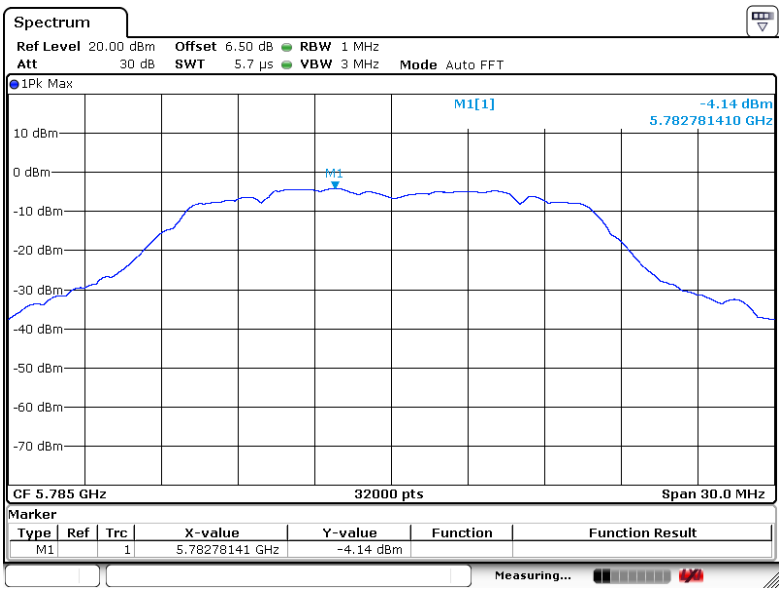

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -2.89 dBm
5.238194840 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.24 GHz 32000 pts Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.23819484 GHz -2.89 dBm
Measuring...

802.11a

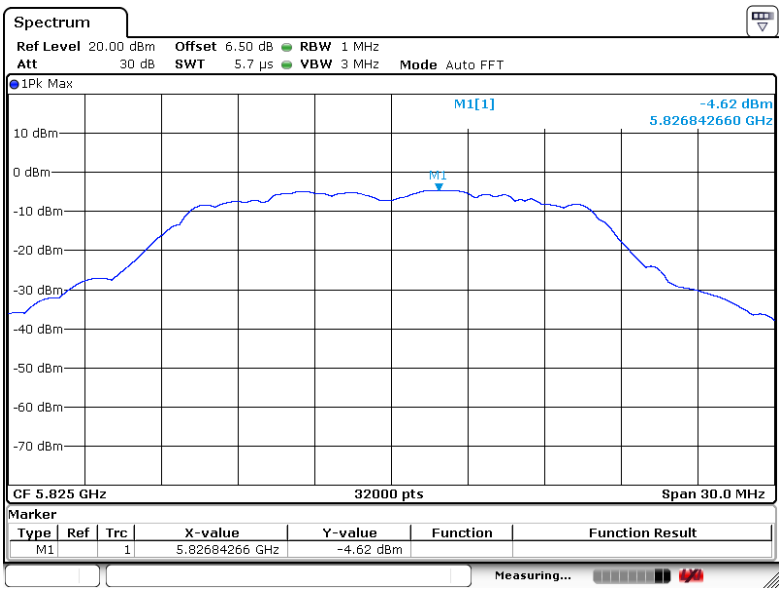
Channel: 149



Channel: 157

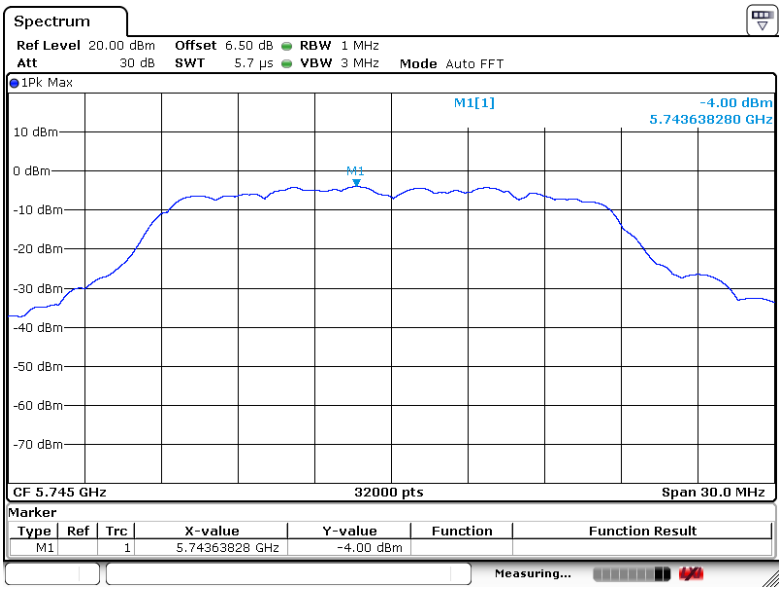


Channel: 165


Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -4.62 dBm
5.826842660 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz 32000 pts Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.82684266 GHz -4.62 dBm
Measuring...

802.11n20

Channel: 149



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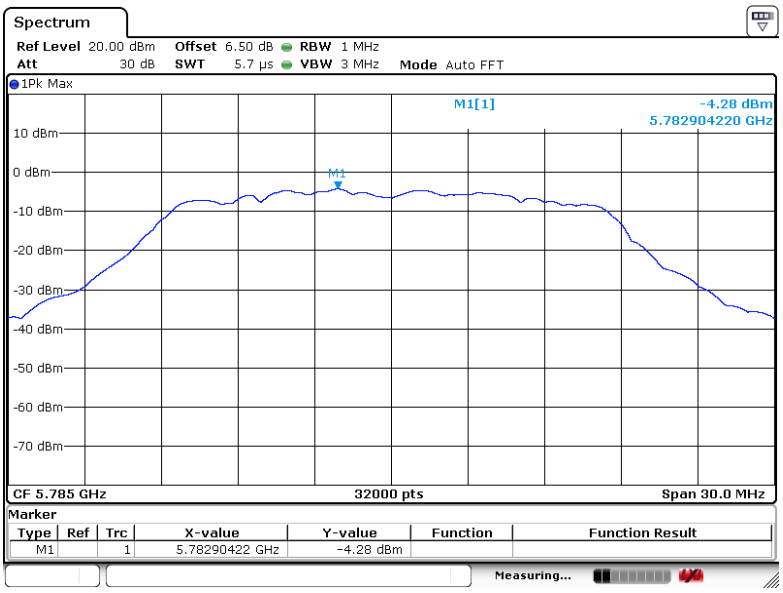
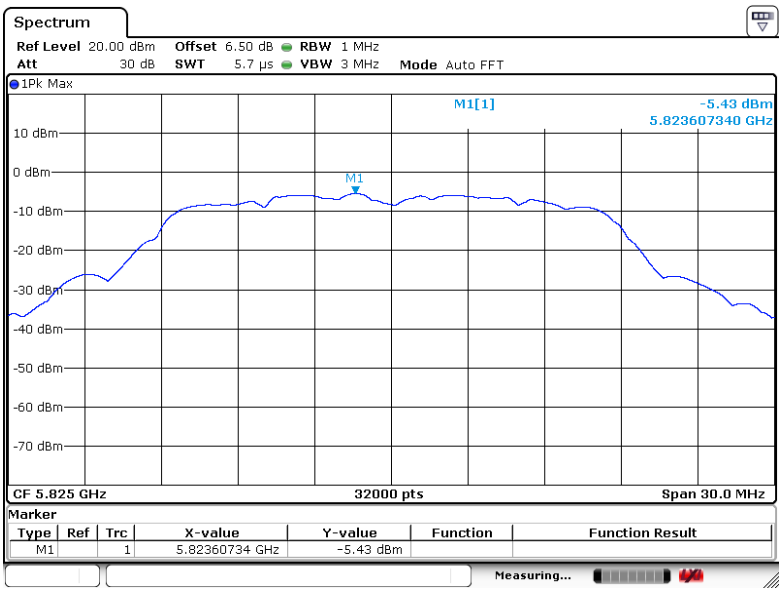
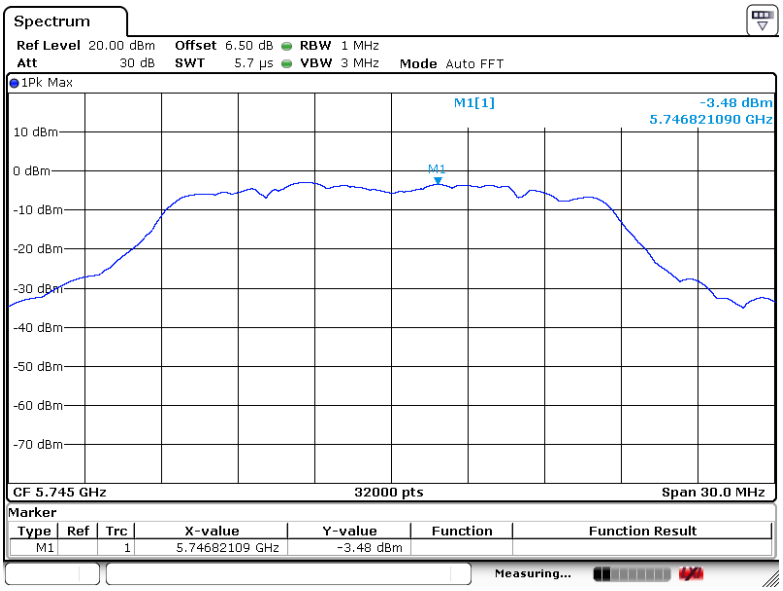


Channel: 165

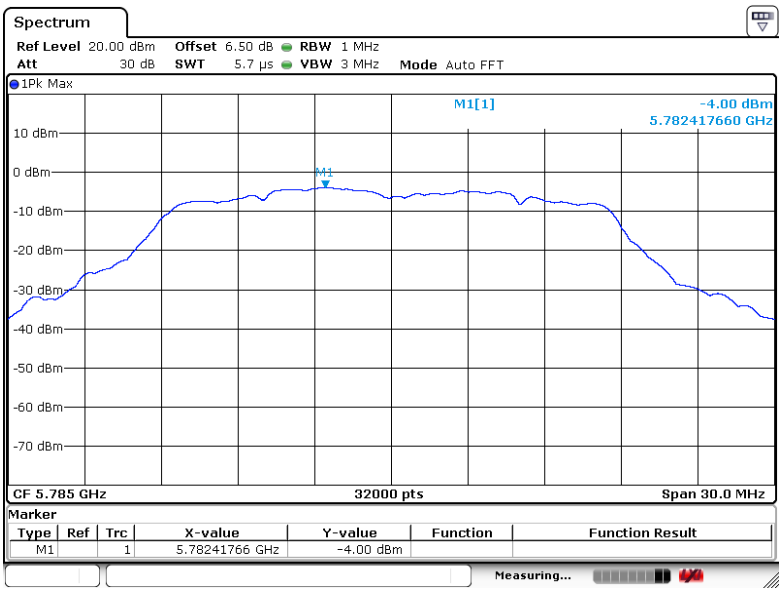

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -5.43 dBm
5.823607340 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz 32000 pts Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.82360734 GHz -5.43 dBm
Measuring...

802.11ac20

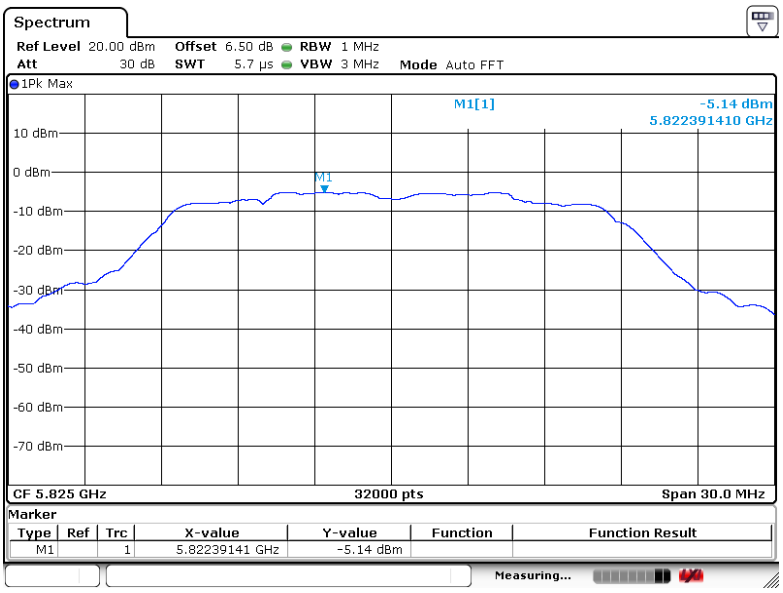
Channel: 149



Channel: 157

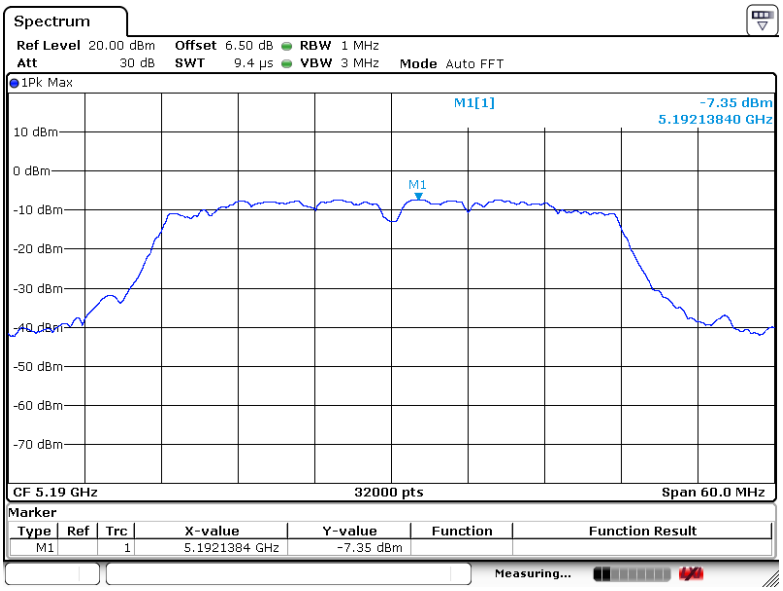


Channel: 165

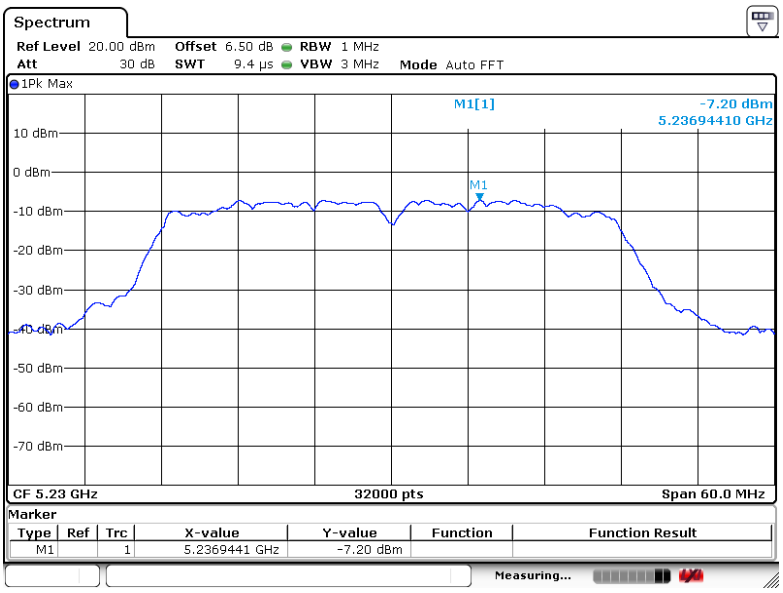

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -5.14 dBm
5.822391410 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz 32000 pts Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.82239141 GHz -5.14 dBm
Measuring...

802.11n40

Channel: 38

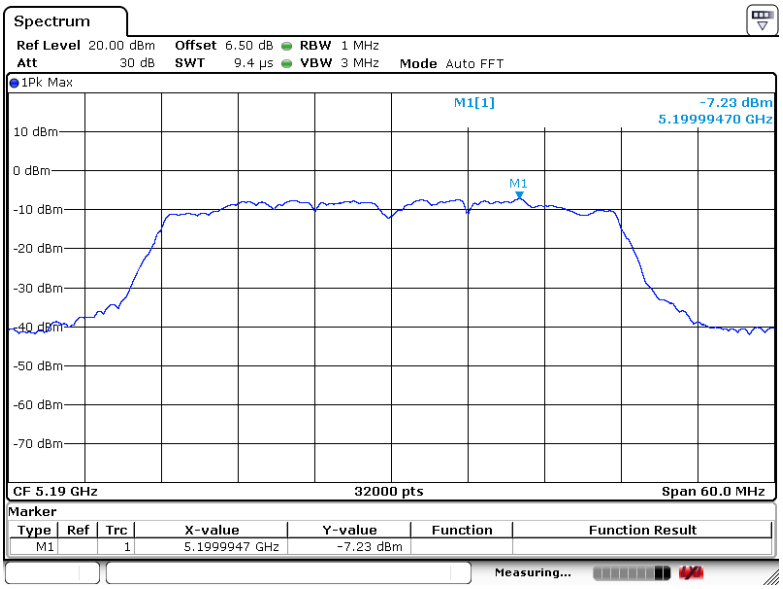


Channel: 46

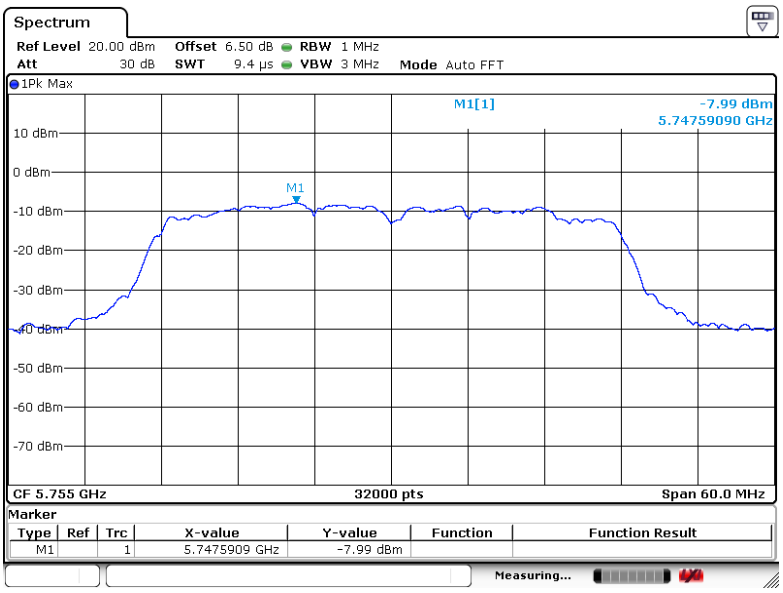


802.11ac40

Channel: 38

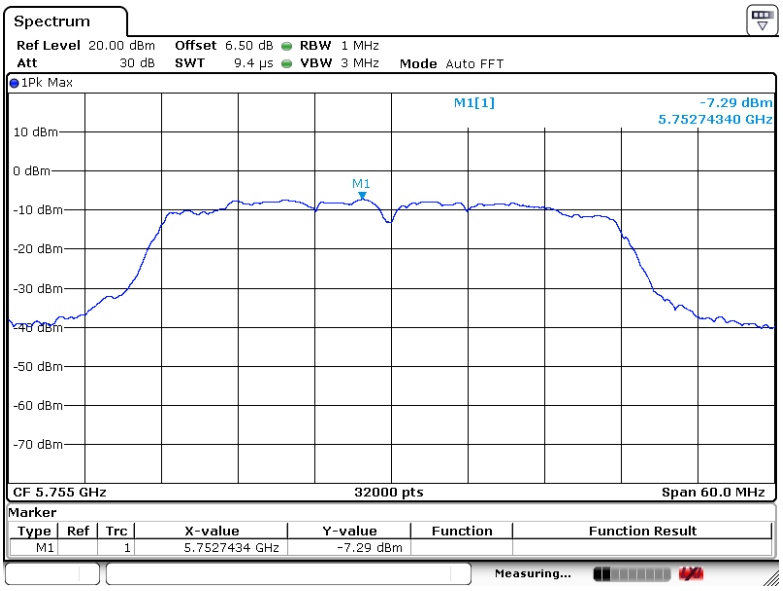


Channel: 46

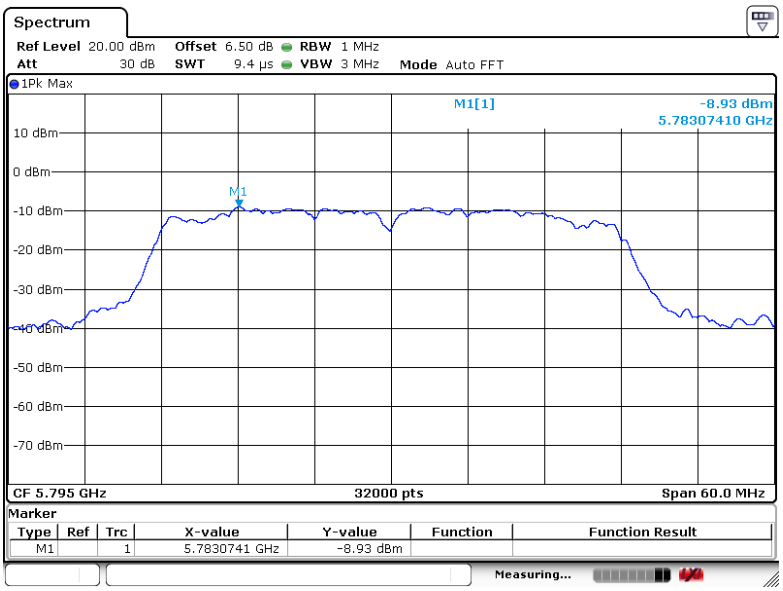


802.11n40

Channel: 151

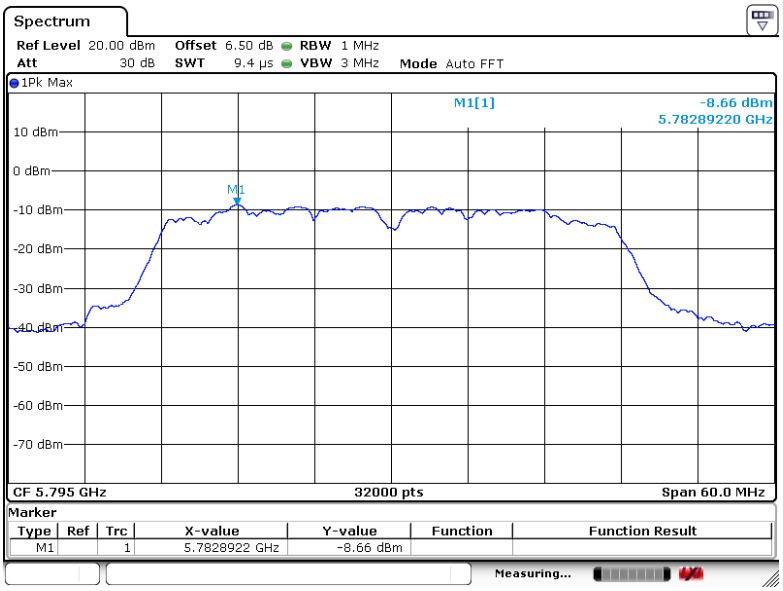


Channel: 159

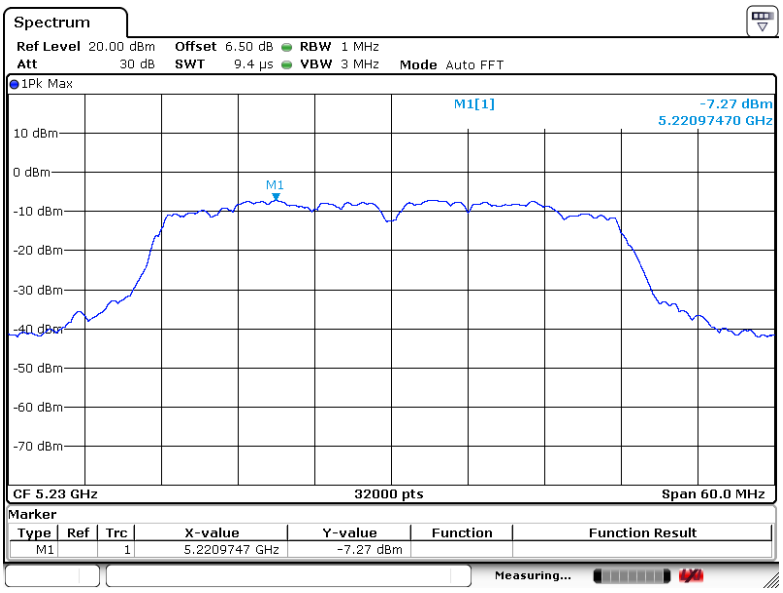


802.11ac40

Channel: 151

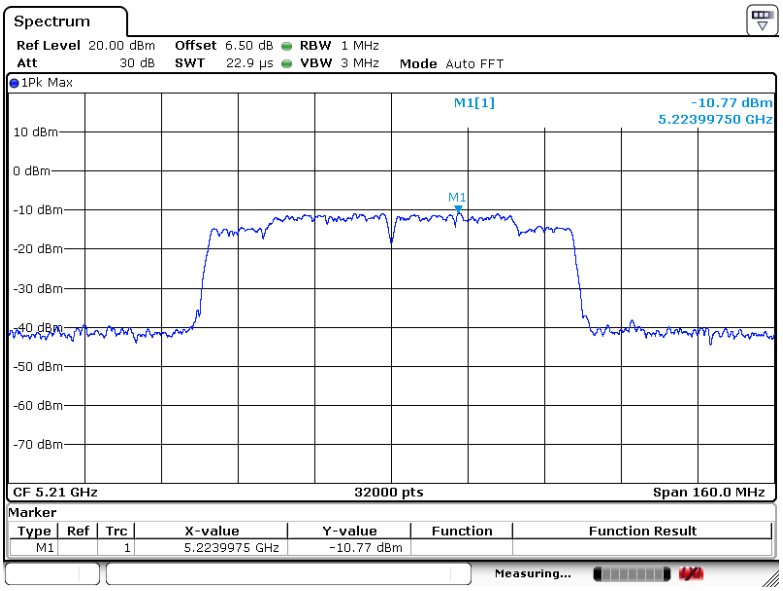


Channel: 159

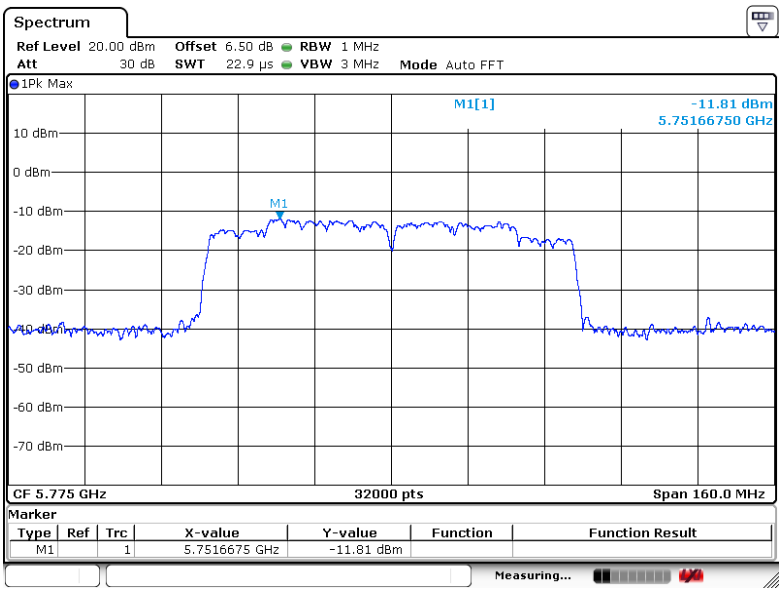


802.11ac80

Channel:42



Channel: 155

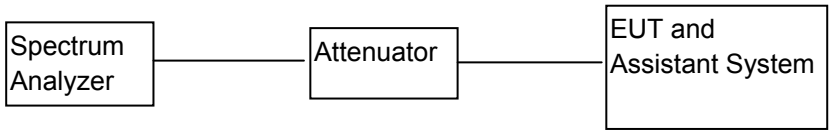


4. 26 dB & 99% Emission Bandwidth

4.1. TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Due.	Cal. Interval
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2020/05/25	1 Year
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/12/17	1 Year
3	RF Cable	Micable	C10-01-01-1	100309	2019/12/17	1 Year
4	Spectrum analyzer	R&S	FSV40	101470	2020/06/28	1 Year

4.2. BLOCK DIAGRAM OF TEST SETUP



4.3. APPLIED PROCEDURES / LIMIT

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power
is integrated over the full reference bandwidth.

4.4. TEST PROCEDURE

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

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes)

shall be used.

6. Use the 99 % power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as

the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

4.5. TEST RESULT

CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)		
		802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11a	802.11n (HT20)	802.11ac (VHT20)
36	5180.00	23.37	23.98	24.49	16.51	17.61	17.64
40	5200.00	22.81	24.65	24.64	16.47	17.65	17.69
48	5240.00	23.19	24.32	24.73	16.47	17.65	17.65
CH. No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)		
		802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11a	802.11n (HT20)	802.11ac (VHT20)
149	5745.00	15.33	15.70	15.11	16.40	17.58	17.59
157	5785.00	15.33	15.33	15.12	16.40	17.59	17.60
165	5825.00	15.64	15.31	15.12	16.44	17.59	17.61

CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		802.11n(HT40)	802.11ac(VHT40)	802.11n(HT40)	802.11ac(VHT40)
38	5190.00	43.12	43.46	36.23	36.06
46	5230.00	43.13	43.21	36.19	36.14
CH. No.	Frequency (MHz)	6B Occupied Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		802.11n(HT40)	802.11ac(VHT40)	802.11n(HT40)	802.11ac(VHT40)
151	5755.00	35.10	35.10	35.95	35.93
159	5795.00	35.09	35.10	35.98	35.99

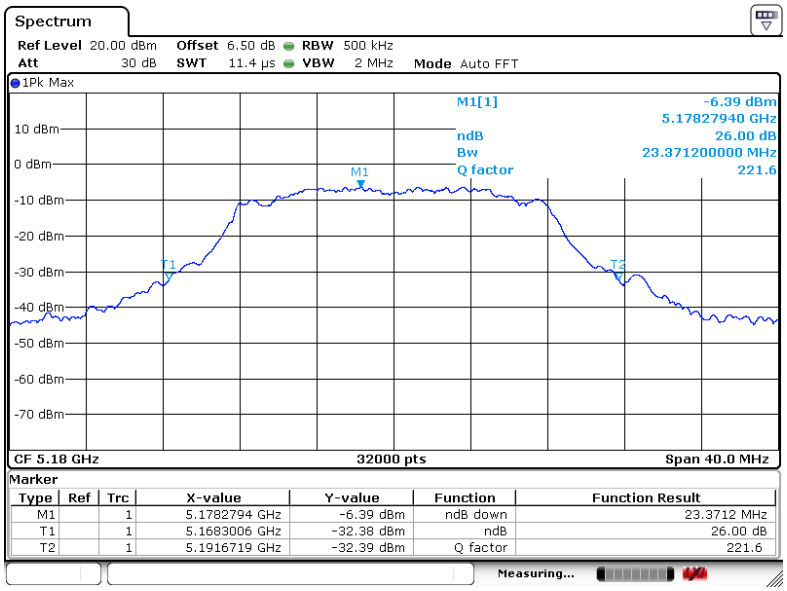
CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
		802.11ac(VHT80)	802.11ac(VHT80)
42	5210	82.99	75.30
CH. No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz) 802.11ac(VHT80)	99% Occupied Bandwidth (MHz) 802.11ac(VHT80)
155	5775	75.10	75.49

Note: The worst data is Antenna A, only shown Antenna A Plot.

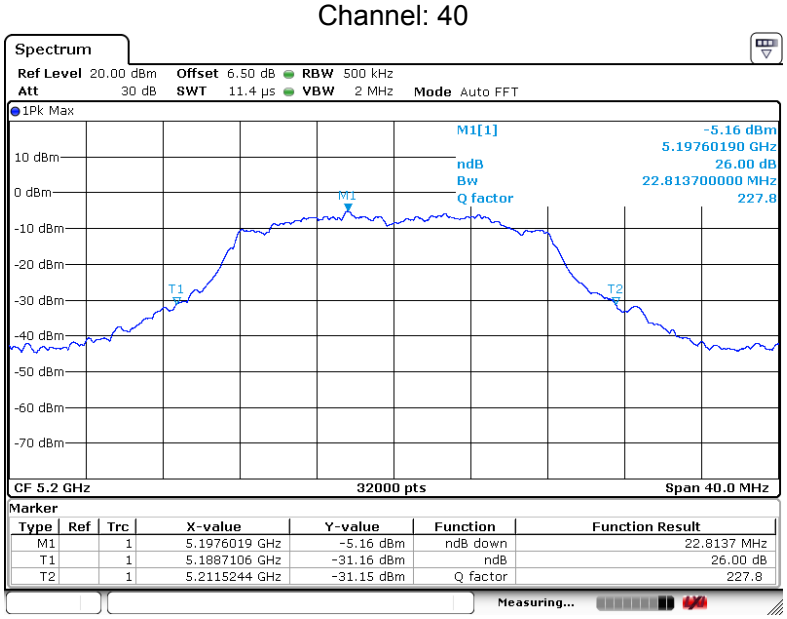
Test plots as followed: Antenna A

26dB BW 802.11a

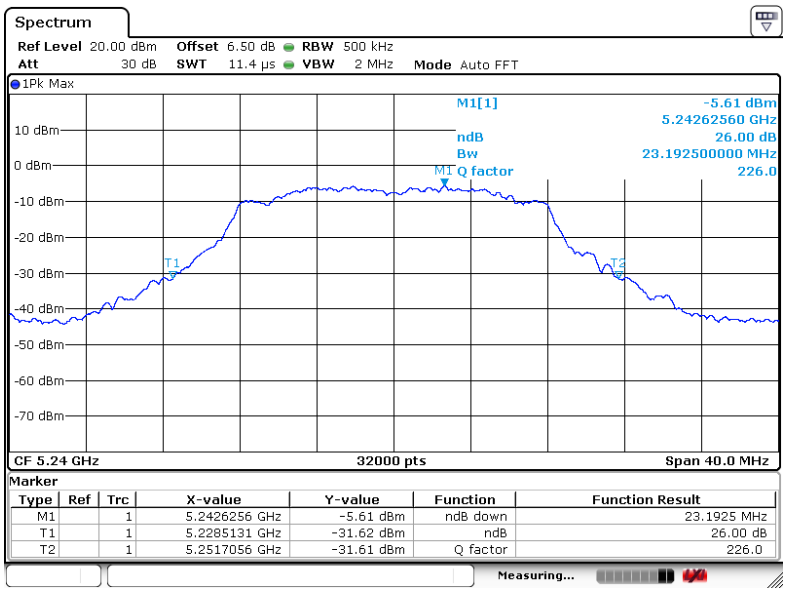
Channel: 36



Channel: 40

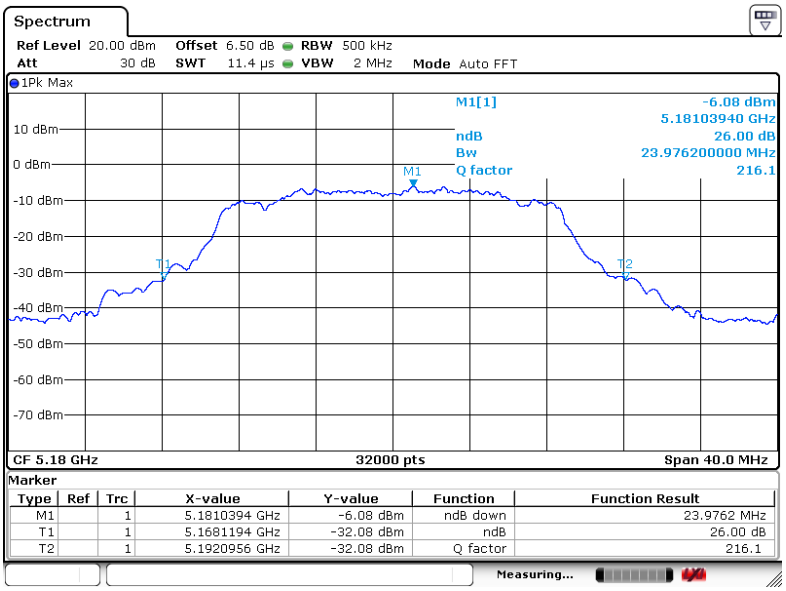


Channel: 48

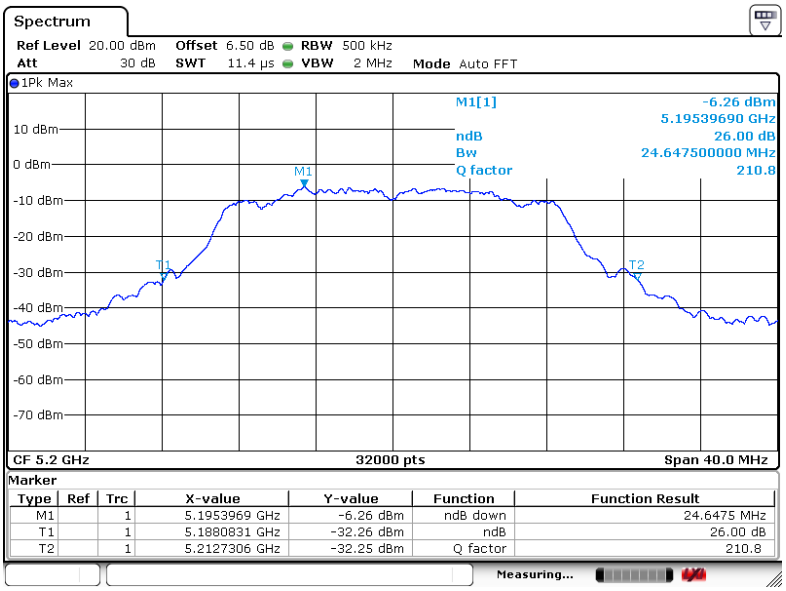

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 500 kHz
Att 30 dB SWT 11.4 µs VBW 2 MHz Mode Auto FFT
1Pk Max
M1[1] -5.61 dBm
5.24262560 GHz
ndB 26.00 dB
Bw 23.192500000 MHz
Q factor 226.0
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2426256 GHz -5.61 dBm ndB down 23.1925 MHz
T1 1 5.2285131 GHz -31.62 dBm ndB 26.00 dB
T2 1 5.2517056 GHz -31.61 dBm Q factor 226.0
Measuring...

26dB BW 802.11n20

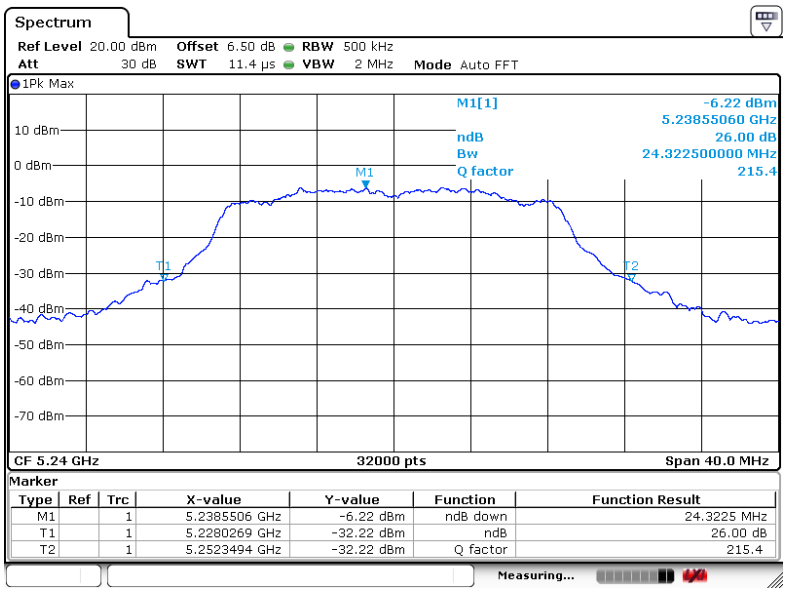
Channel: 36



Channel: 40

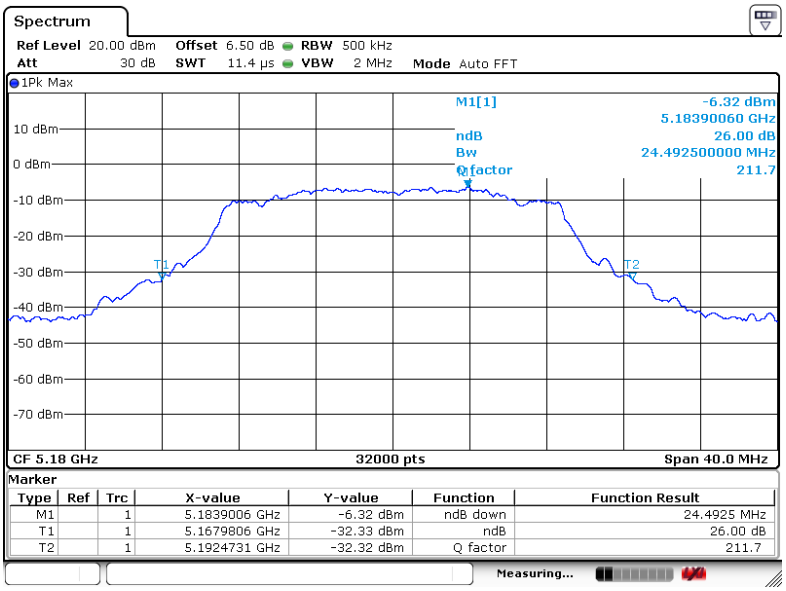


Channel: 48

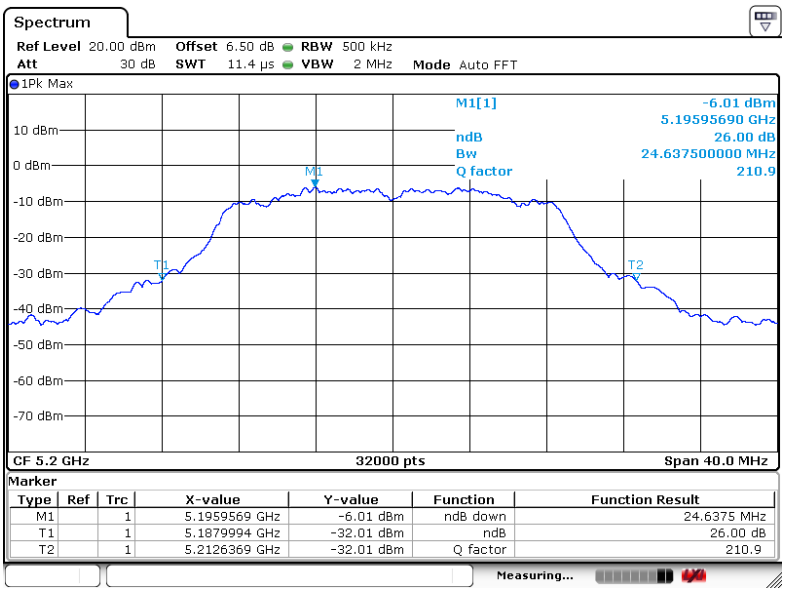

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 500 kHz
Att 30 dB SWT 11.4 µs VBW 2 MHz Mode Auto FFT
1Pk Max
M1[1] -6.22 dBm
5.23855060 GHz
ndB 26.00 dB
Bw 24.322500000 MHz
Q factor 215.4
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2385506 GHz -6.22 dBm ndB down 24.3225 MHz
T1 1 5.2280269 GHz -32.22 dBm ndB 26.00 dB
T2 1 5.2523494 GHz -32.22 dBm Q factor 215.4
Measuring...

802.11ac20

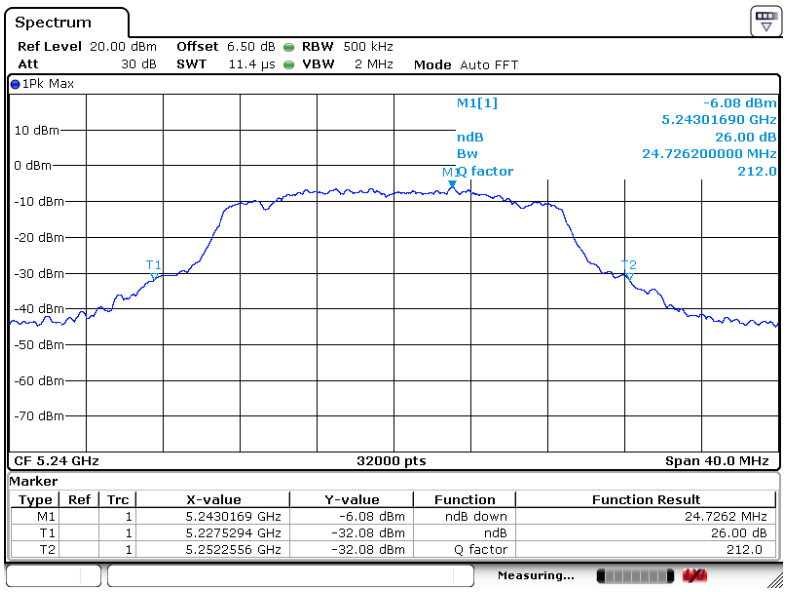
Channel: 36



Channel: 40

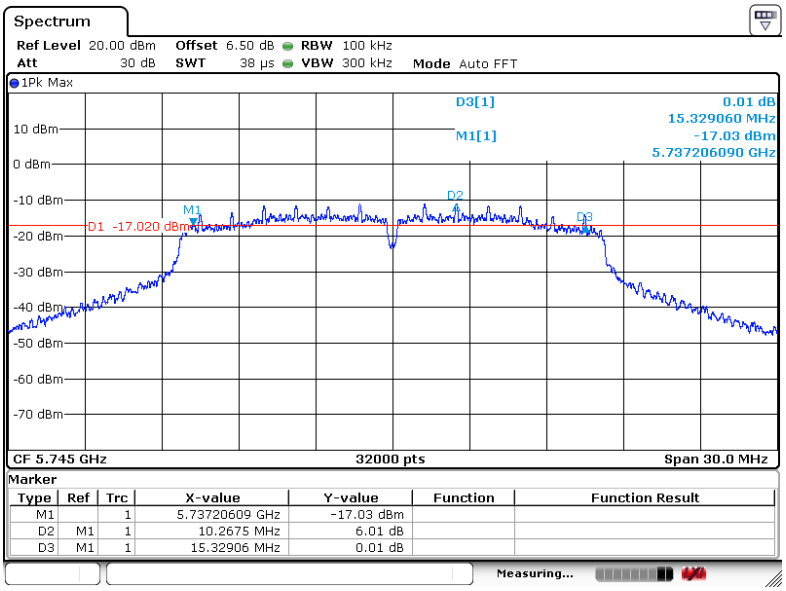


Channel: 48

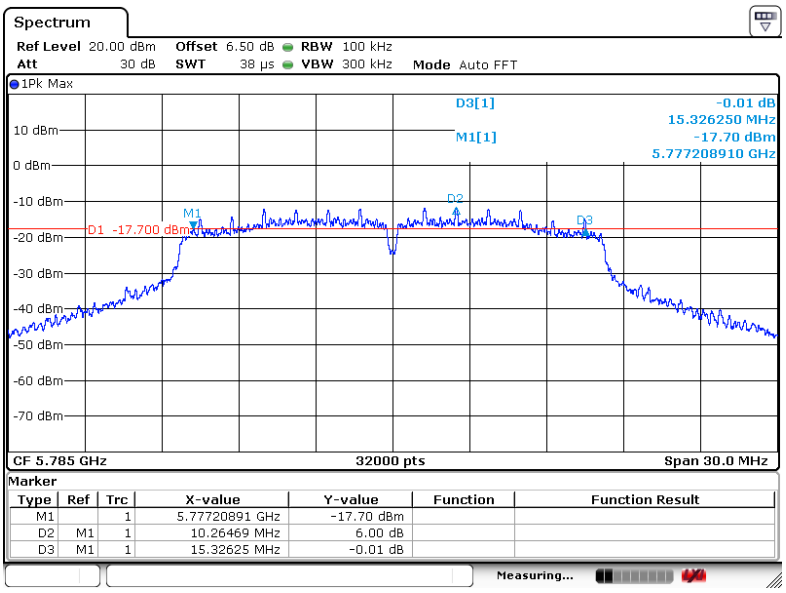

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 500 kHz
Att 30 dB SWT 11.4 µs VBW 2 MHz Mode Auto FFT
1Pk Max
M1[1] -6.08 dBm
5.24301690 GHz
ndB 26.00 dB
Bw 24.726200000 MHz
Q factor 212.0
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2430169 GHz -6.08 dBm ndB down 24.7262 MHz
T1 1 5.2275294 GHz -32.08 dBm ndB 26.00 dB
T2 1 5.2522556 GHz -32.08 dBm Q factor 212.0
Measuring...

6dB BW 802.11a

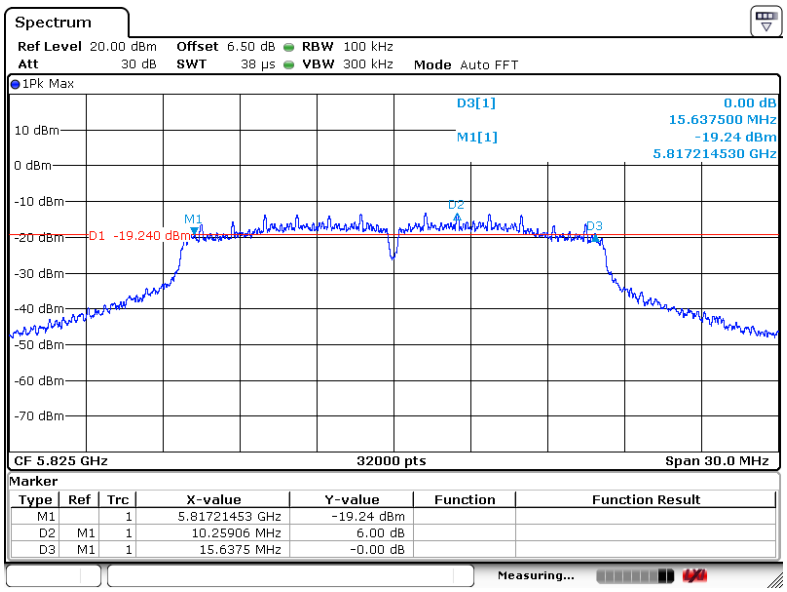
Channel: 149



Channel: 157

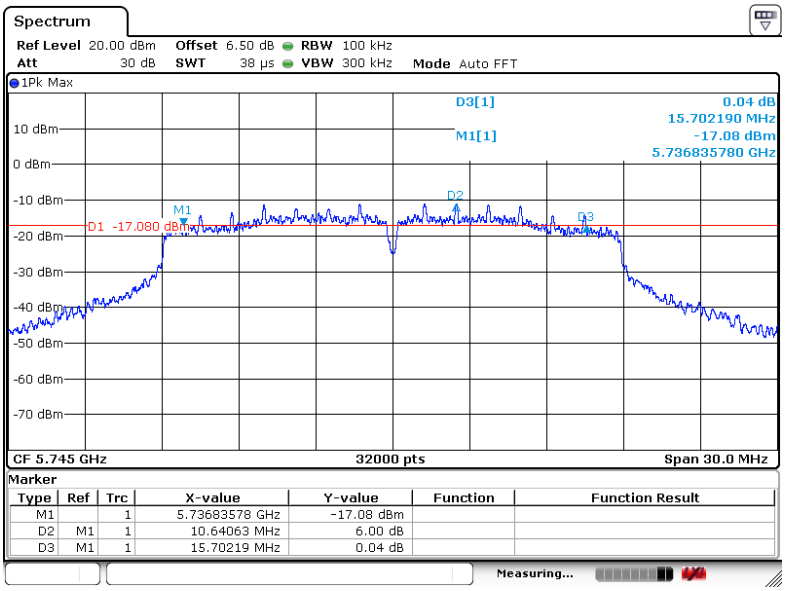


Channel: 165

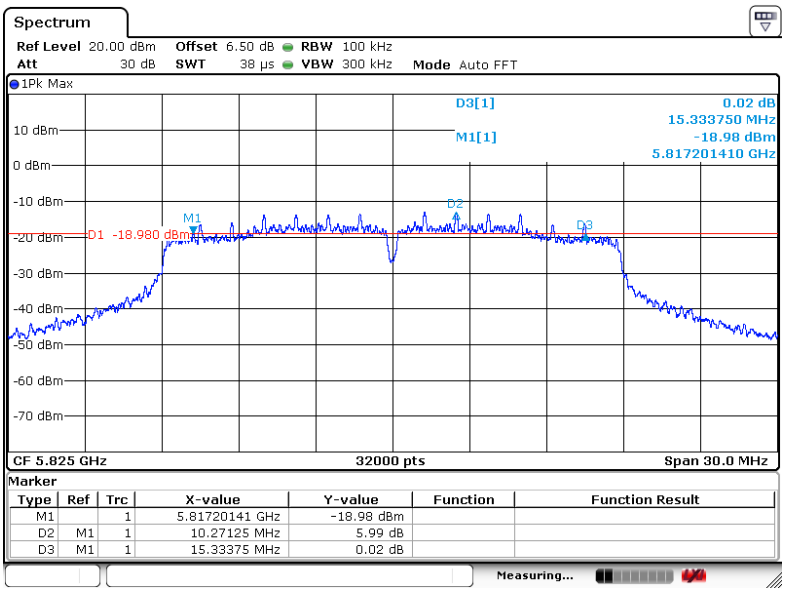

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.00 dB
15.637500 MHz
M1[1] -19.24 dBm
5.817214530 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D2
D3
D1 -19.240 dBm
CF 5.825 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.81721453 GHz -19.24 dBm
D2 M1 1 10.25906 MHz 6.00 dB
D3 M1 1 15.6375 MHz -0.00 dB
Measuring...

6dB BW 802.11n20

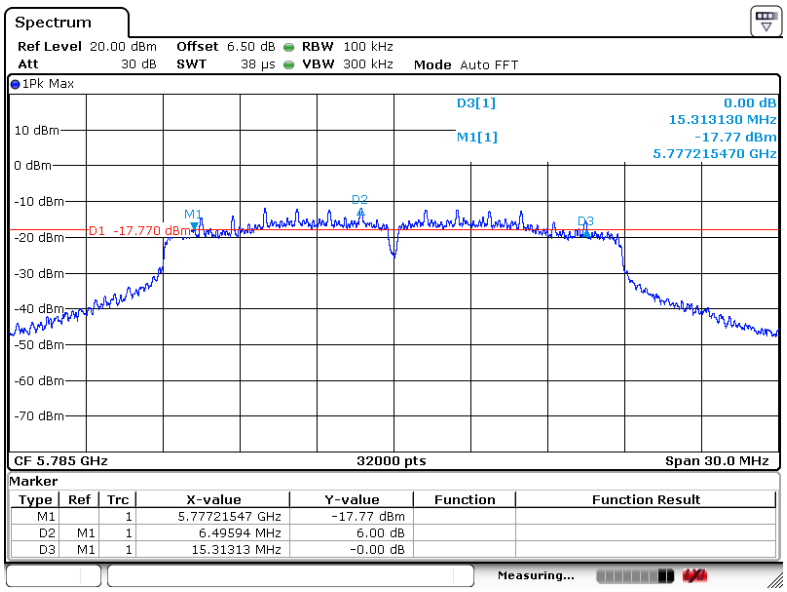
Channel: 149



Channel: 157

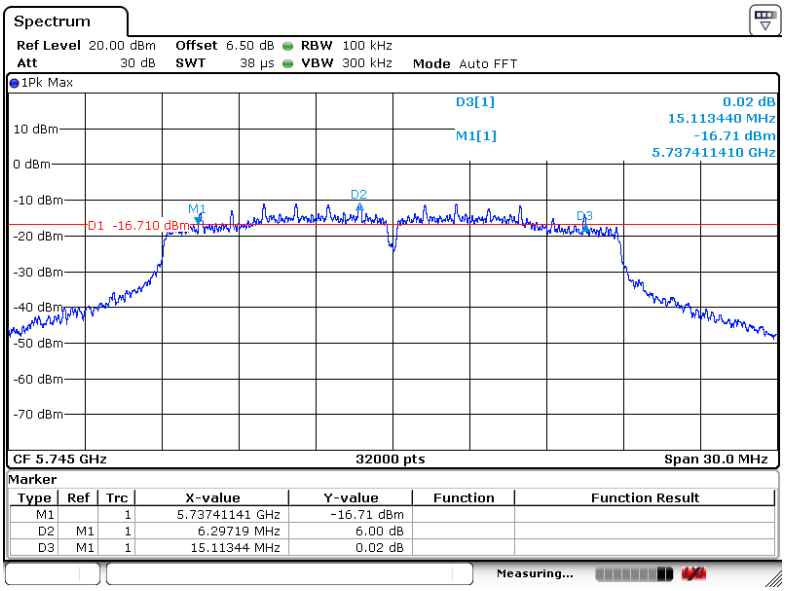


Channel: 165

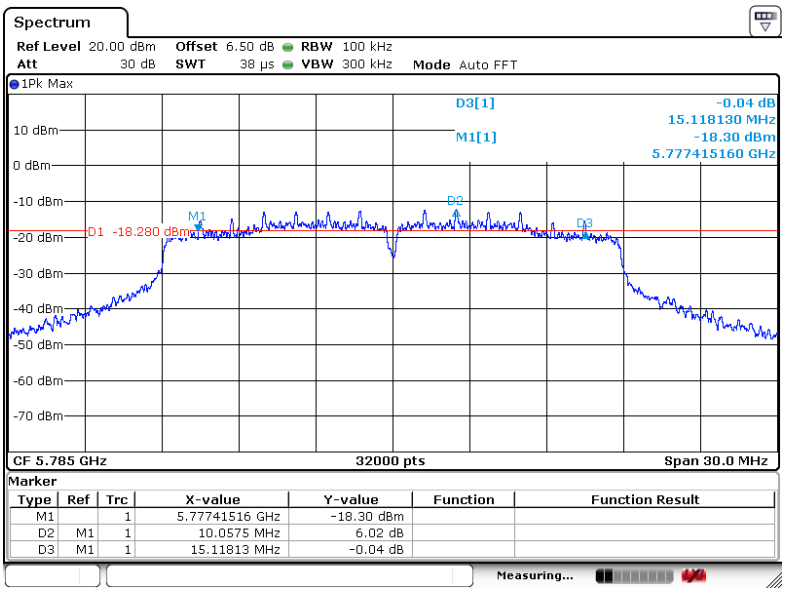

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.00 dB
15.313130 MHz
M1[1] -17.77 dBm
5.777215470 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -17.770 dBm
M1
D2
D3
CF 5.785 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.77721547 GHz -17.77 dBm
D2 M1 1 6.49594 MHz 6.00 dB
D3 M1 1 15.31313 MHz -0.00 dB
Measuring...

6dB BW 802.11ac20

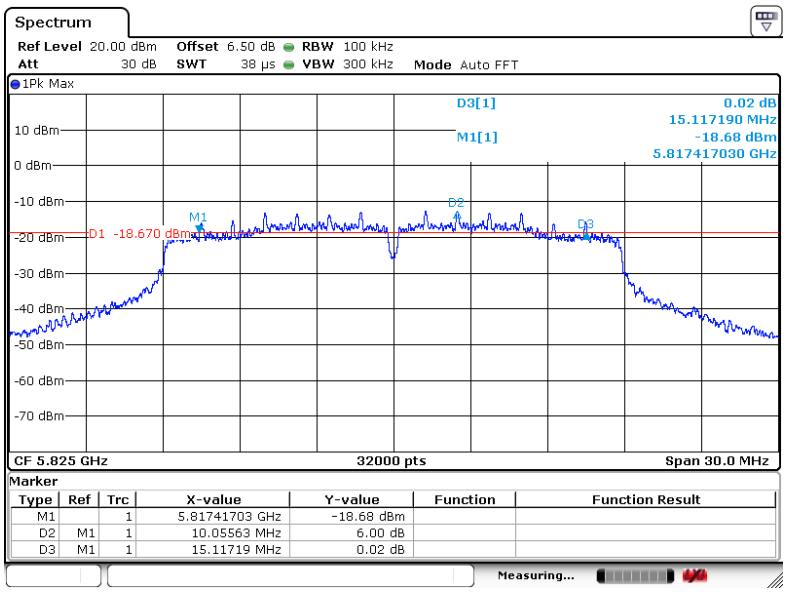
Channel: 149



Channel: 157

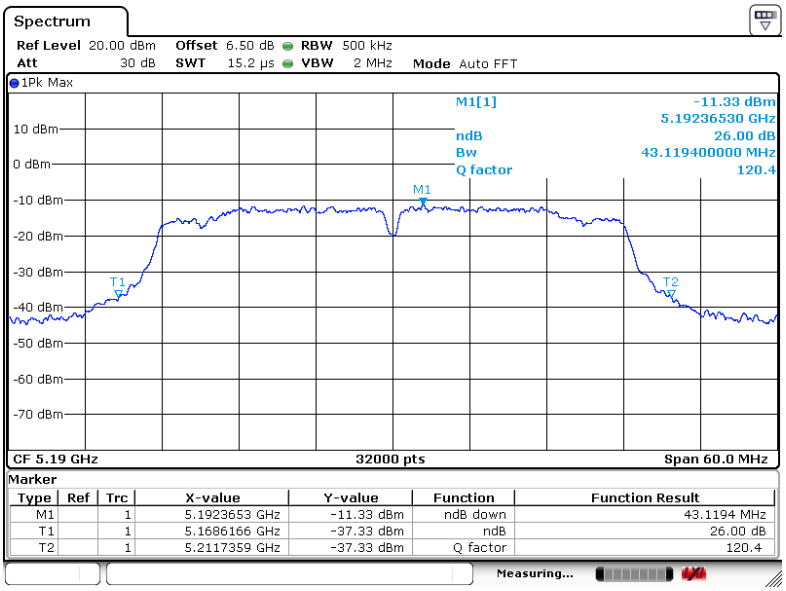


Channel: 165

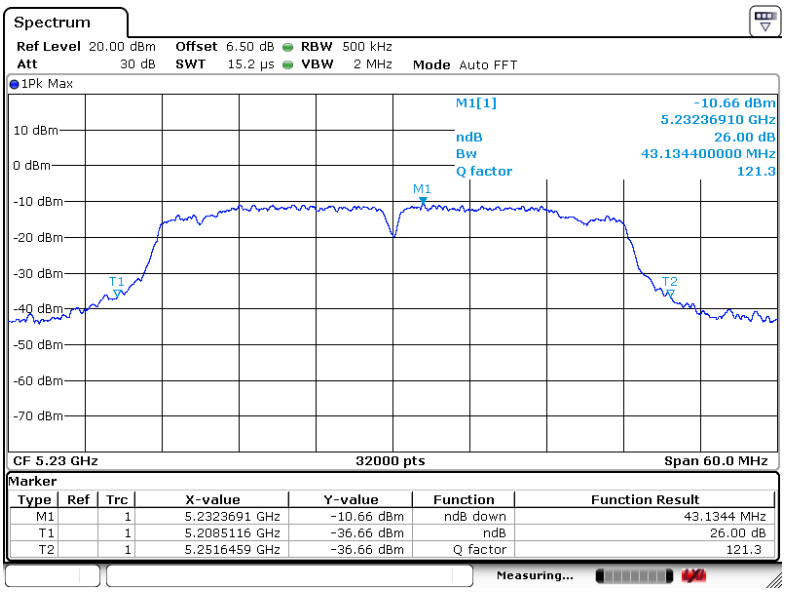

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.02 dB
15.117190 MHz
M1[1] -18.68 dBm
5.817417030 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -18.670 dBm
M1
D2
D3
CF 5.825 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.81741703 GHz -18.68 dBm
D2 M1 1 10.05563 MHz 6.00 dB
D3 M1 1 15.11719 MHz 0.02 dB
Measuring...

26dB BW 802.11n40

Channel: 38

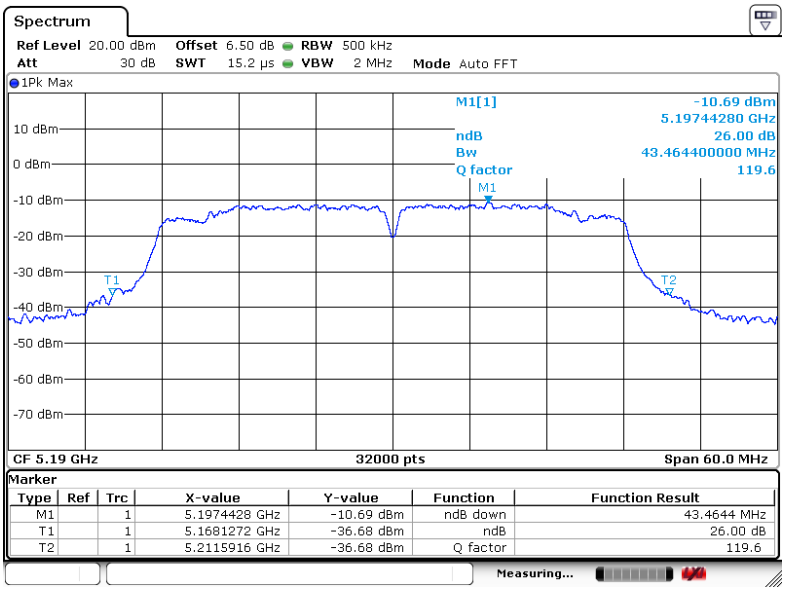


Channel: 46

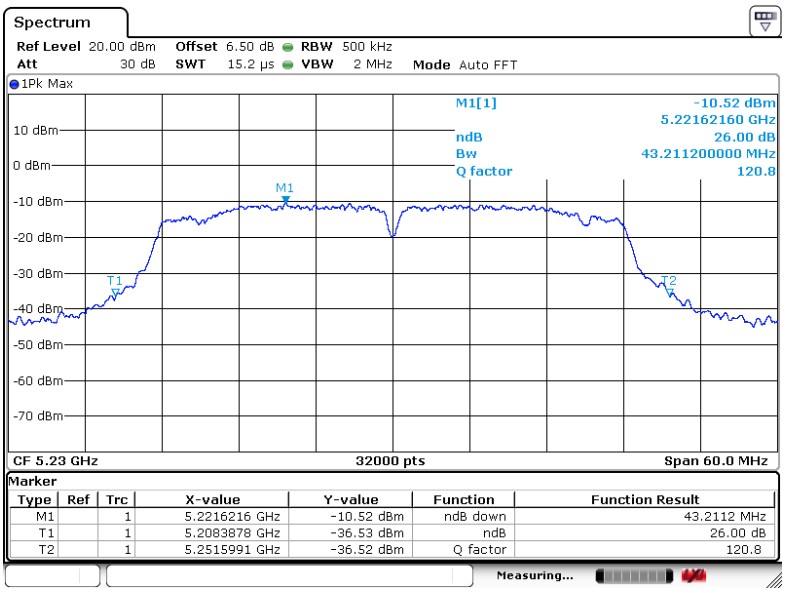


26dB BW 802.11ac40

Channel: 38

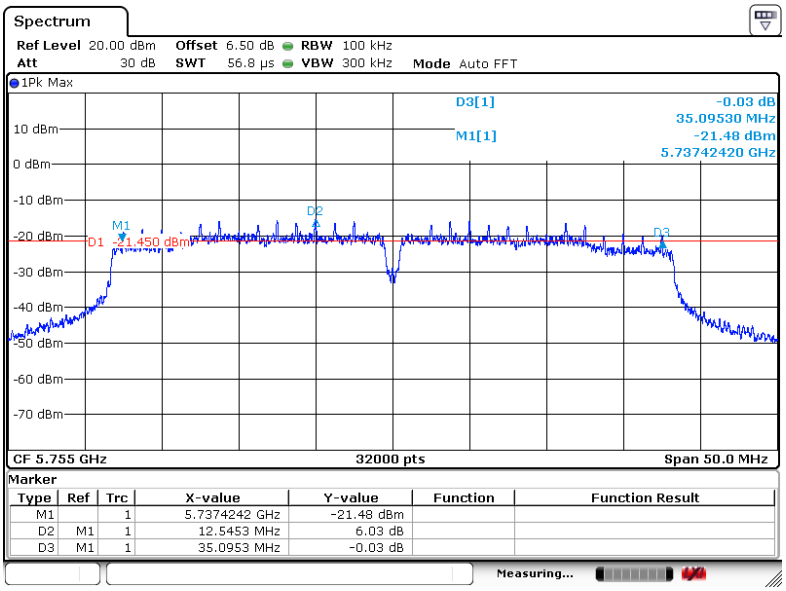


Channel: 46

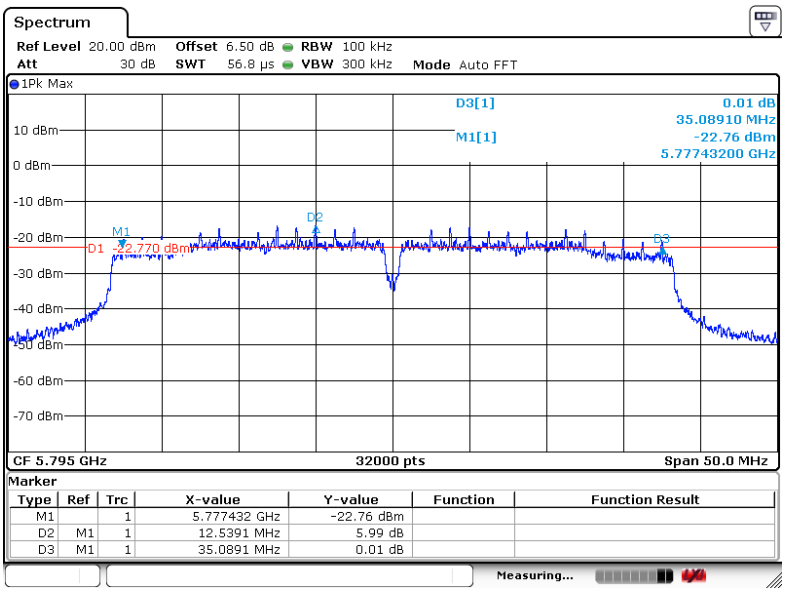


6dB BW 802.11n40

Channel: 151

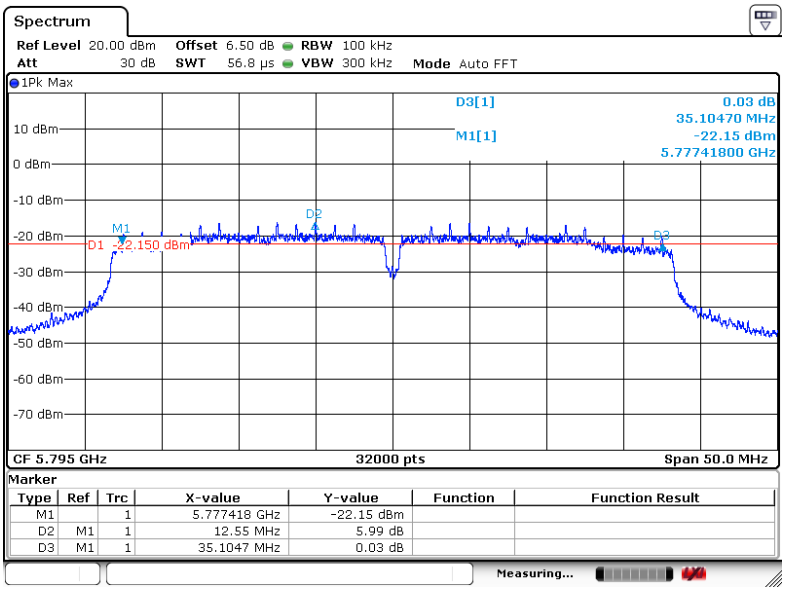


Channel: 159

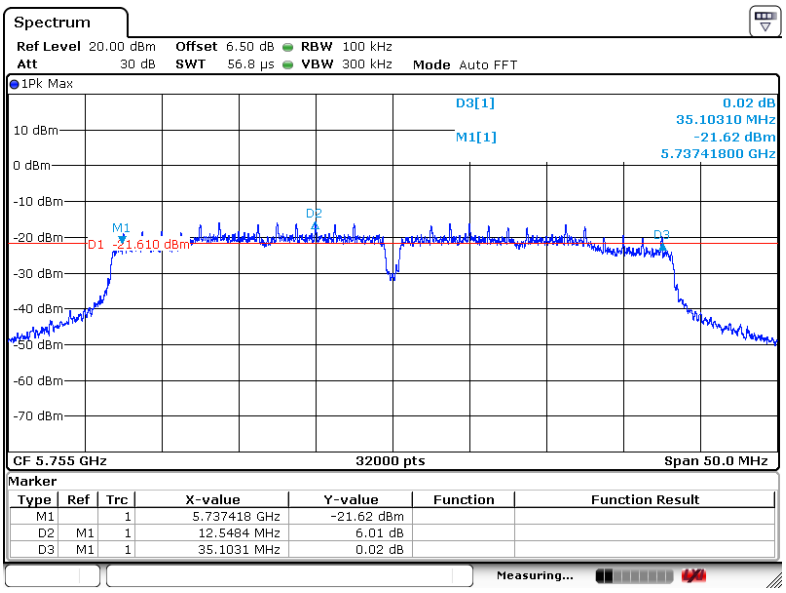


6dB BW 802.11ac40

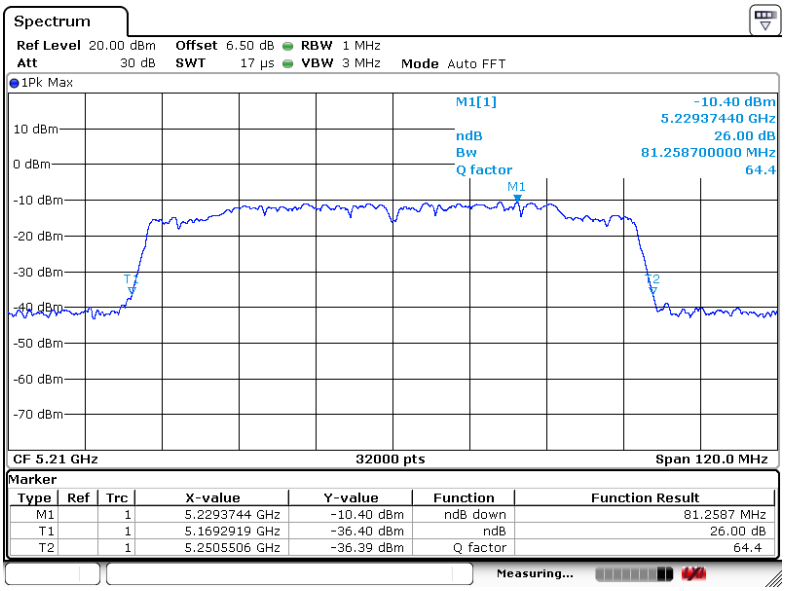
Channel: 151



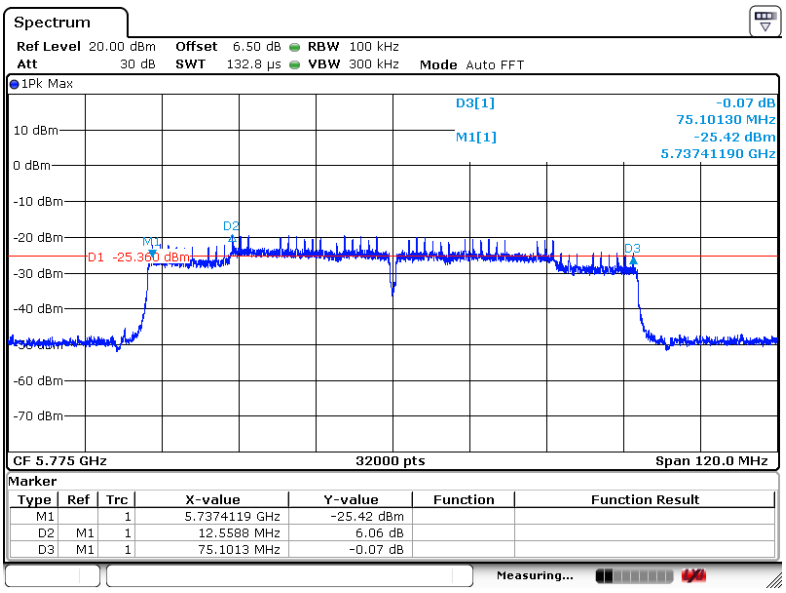
Channel: 159



26dB BW 802.11ac80
Channel:42

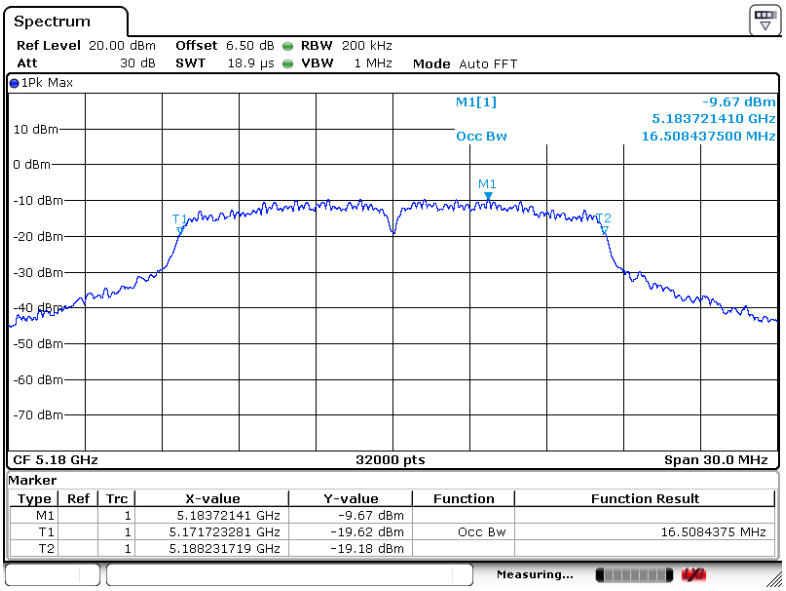


6dB BW 802.11ac80
Channel: 155

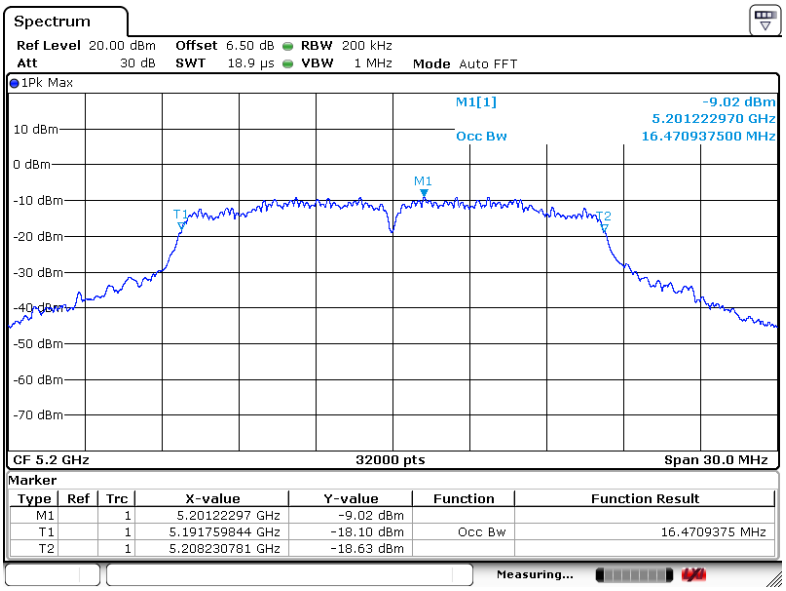


99% OBW 802.11a

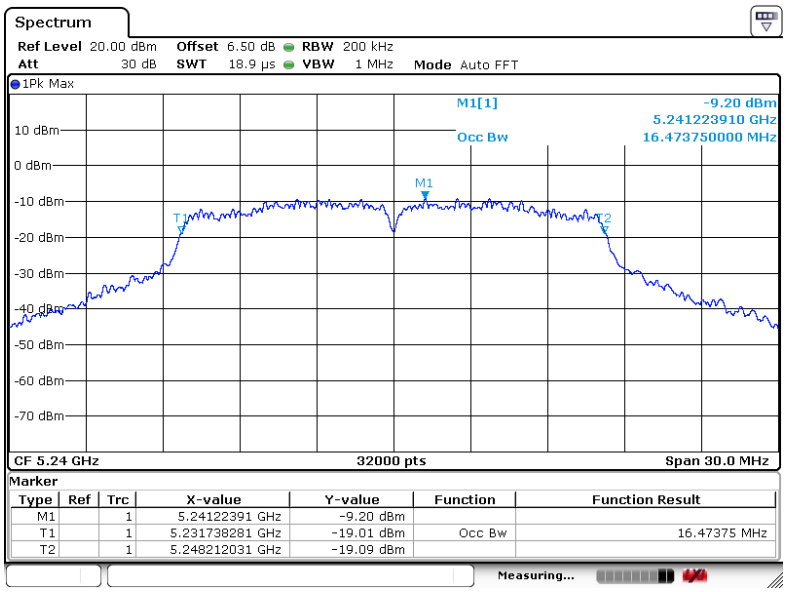
Channel: 36



Channel: 40

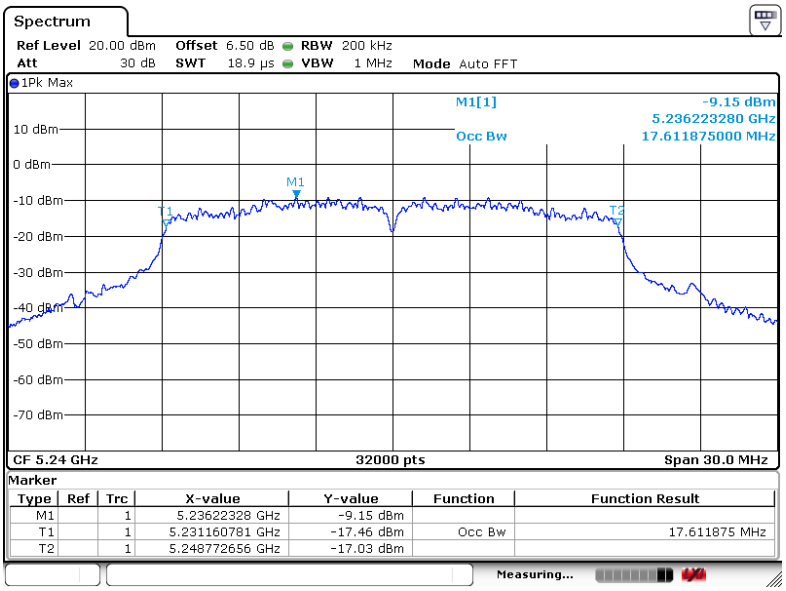


Channel: 48

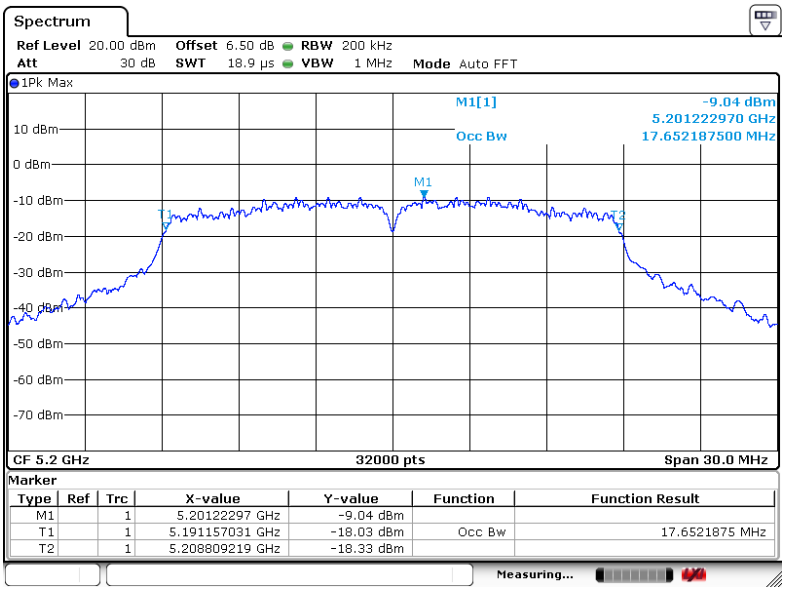

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 200 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -9.20 dBm
5.241223910 GHz
Occ Bw 16.473750000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.24 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.24122391 GHz -9.20 dBm
T1 1 5.231738281 GHz -19.01 dBm Occ Bw 16.47375 MHz
T2 1 5.248212031 GHz -19.09 dBm
Measuring...

99% OBW 802.11n20

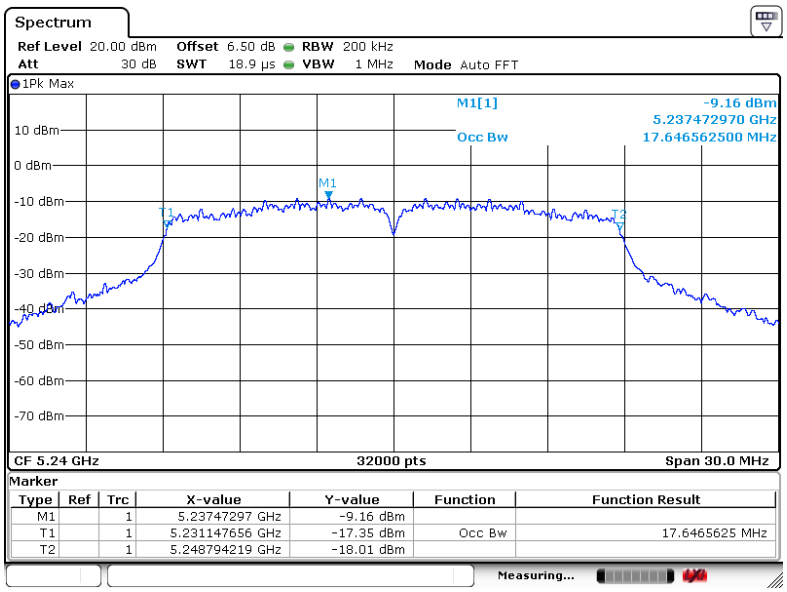
Channel: 36



Channel: 40

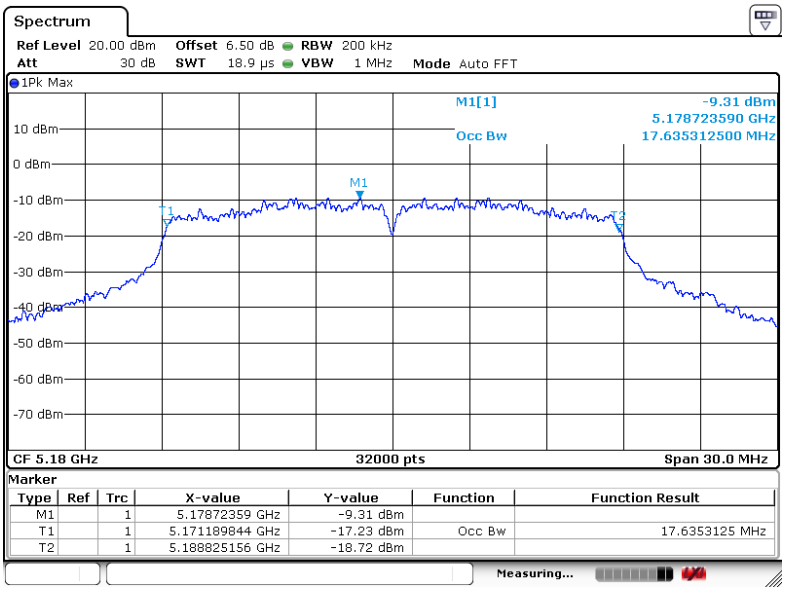


Channel: 48

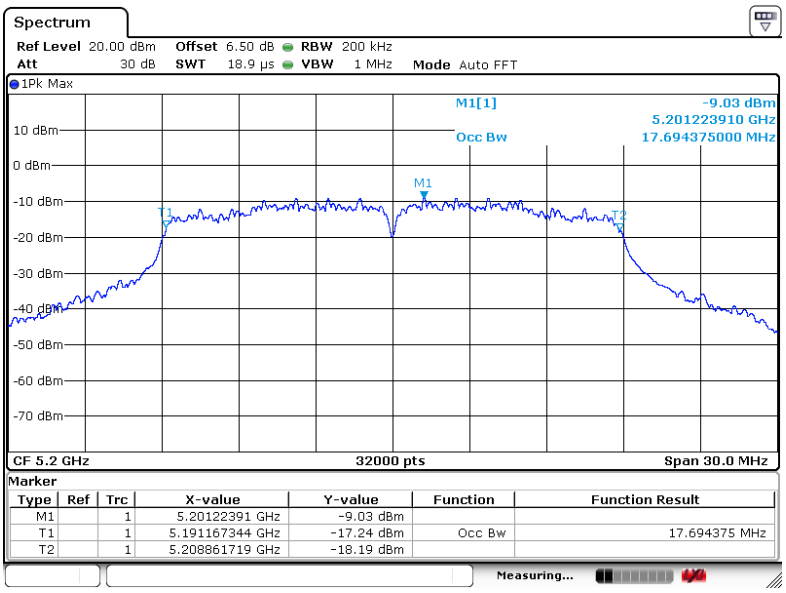

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 200 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -9.16 dBm
5.237472970 GHz
Occ Bw 17.646562500 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.24 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.23747297 GHz -9.16 dBm
T1 1 5.231147656 GHz -17.35 dBm Occ Bw 17.6465625 MHz
T2 1 5.248794219 GHz -18.01 dBm
Measuring...

99% OBW 802.11ac20

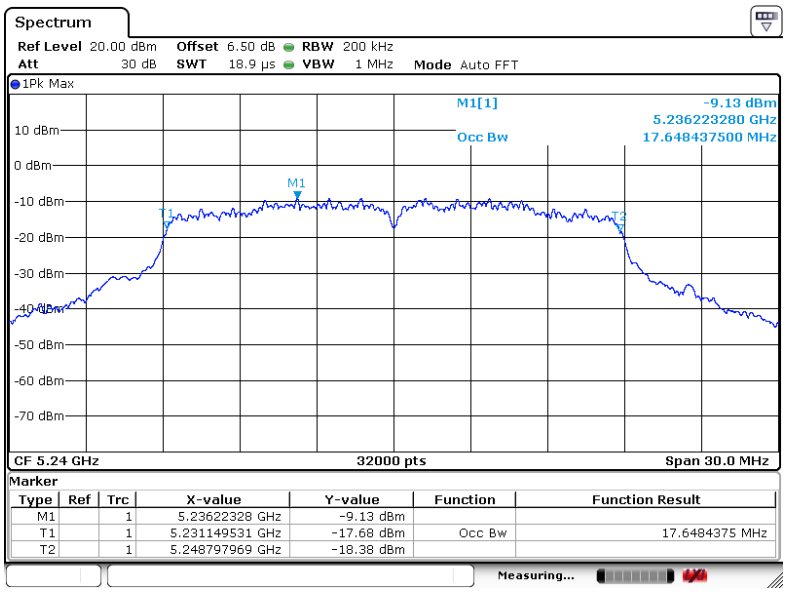
Channel: 36



Channel: 40

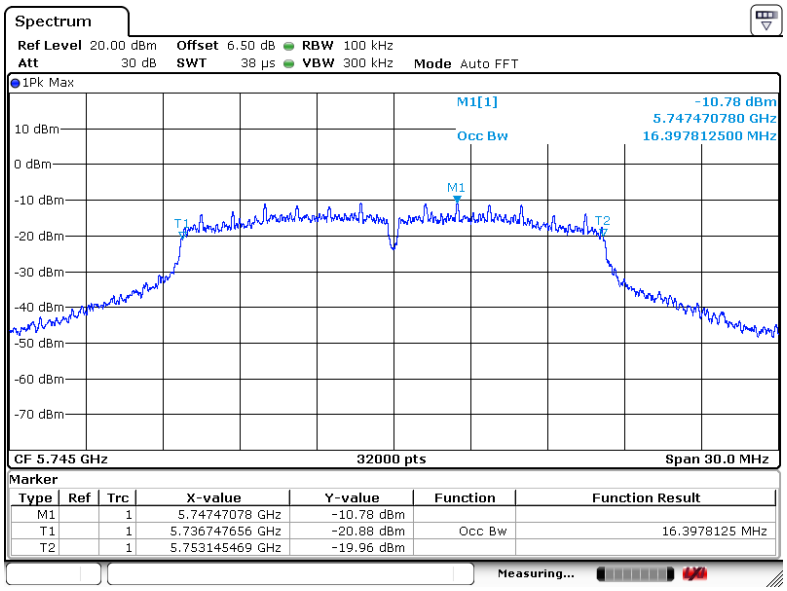


Channel: 48

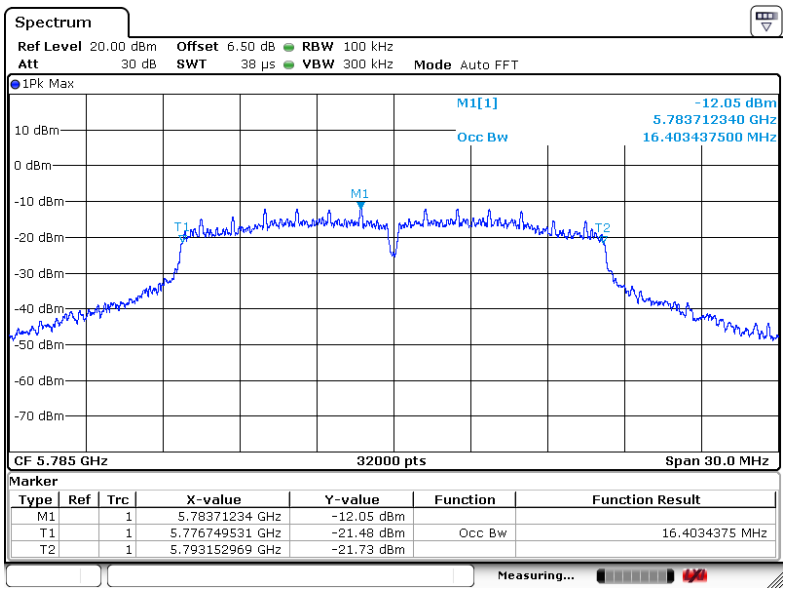

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 200 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -9.13 dBm
5.236223280 GHz
Occ Bw 17.648437500 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.24 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.23622328 GHz -9.13 dBm
T1 1 5.231149531 GHz -17.68 dBm Occ Bw 17.6484375 MHz
T2 1 5.248797969 GHz -18.38 dBm
Measuring...

99% OBW 802.11a

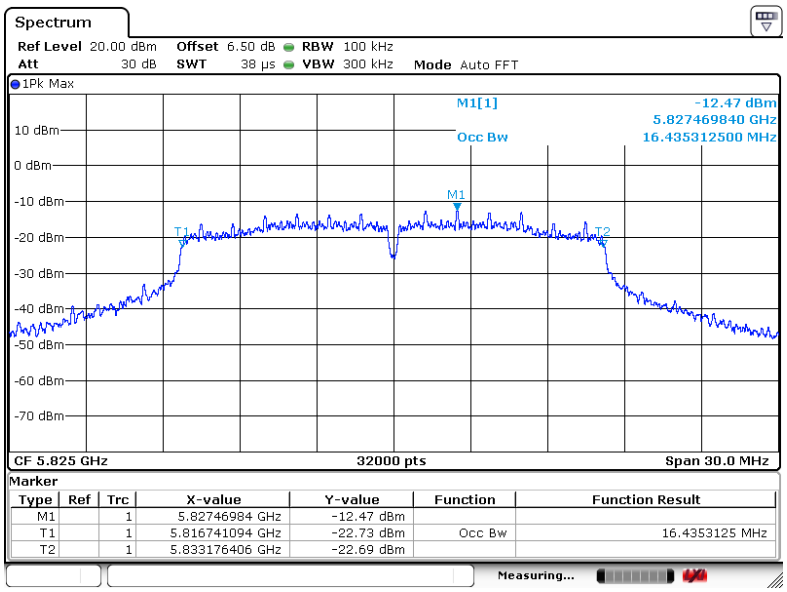
Channel: 149



Channel: 157

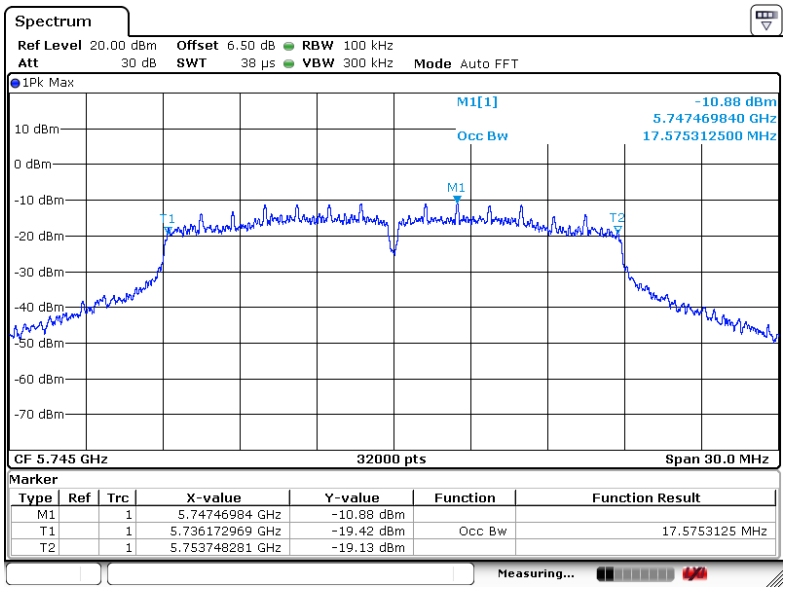


Channel: 165

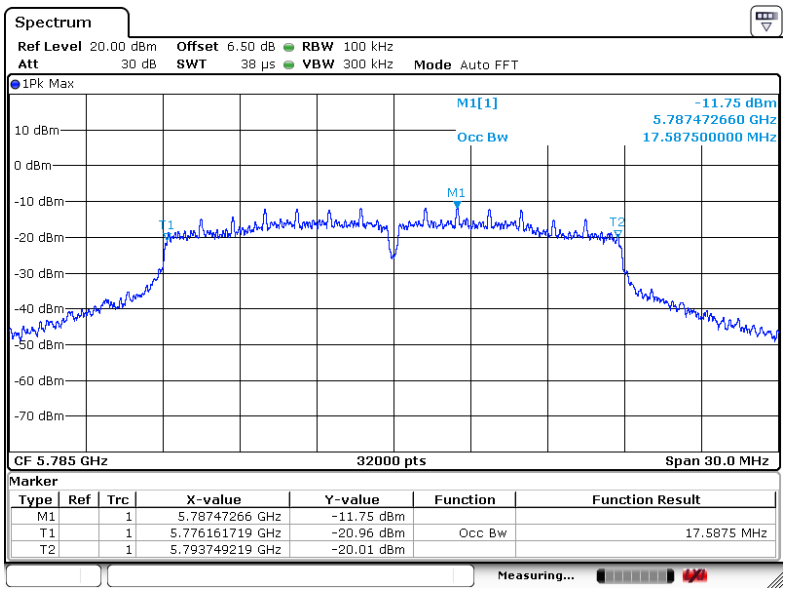

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -12.47 dBm
5.827469840 GHz
Occ Bw 16.435312500 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.82746984 GHz -12.47 dBm
T1 1 5.816741094 GHz -22.73 dBm Occ Bw 16.4353125 MHz
T2 1 5.833176406 GHz -22.69 dBm
Measuring...

99% OBW 802.11n20

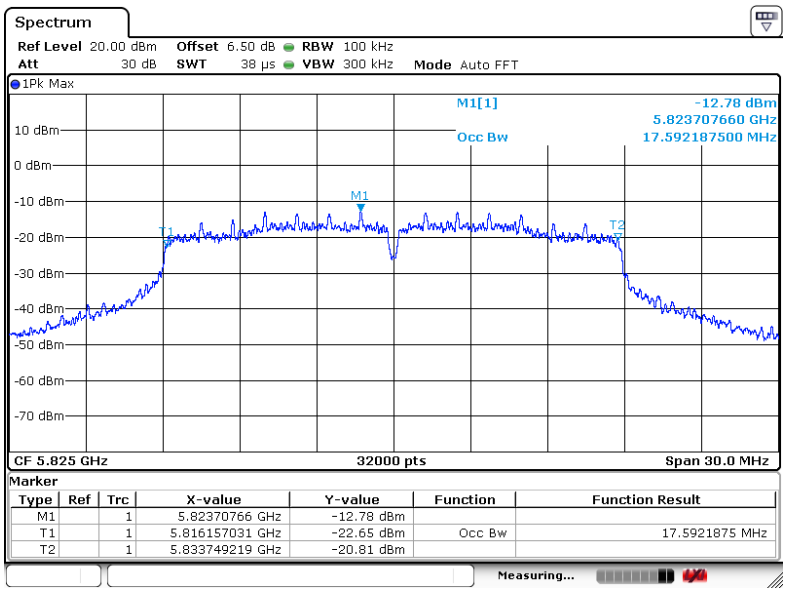
Channel: 149



Channel: 157

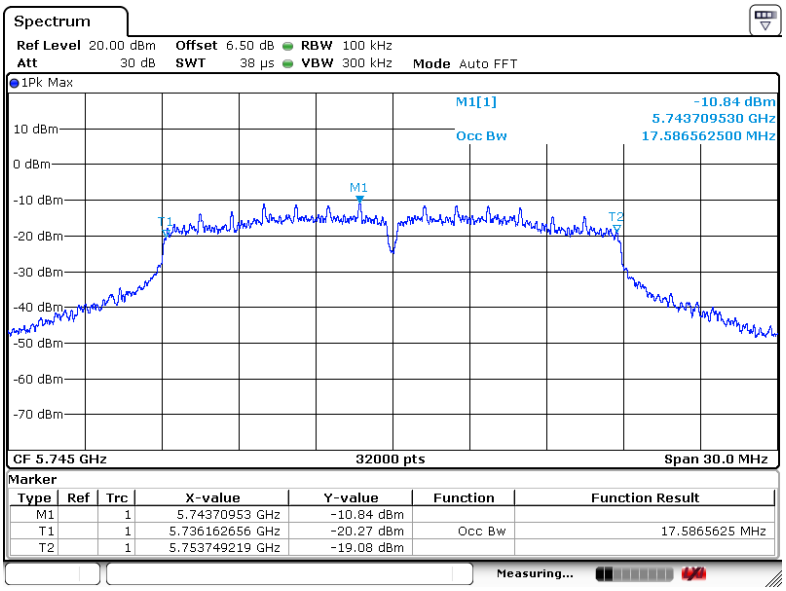


Channel: 165

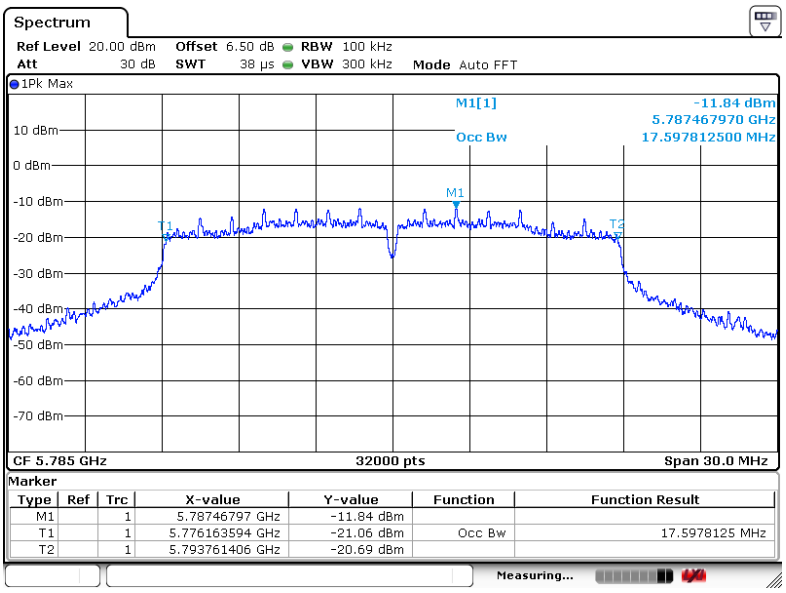

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -12.78 dBm
5.823707660 GHz
Occ Bw 17.592187500 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.82370766 GHz -12.78 dBm
T1 1 5.816157031 GHz -22.65 dBm Occ Bw 17.5921875 MHz
T2 1 5.833749219 GHz -20.81 dBm
Measuring...

99% OBW 802.11ac20

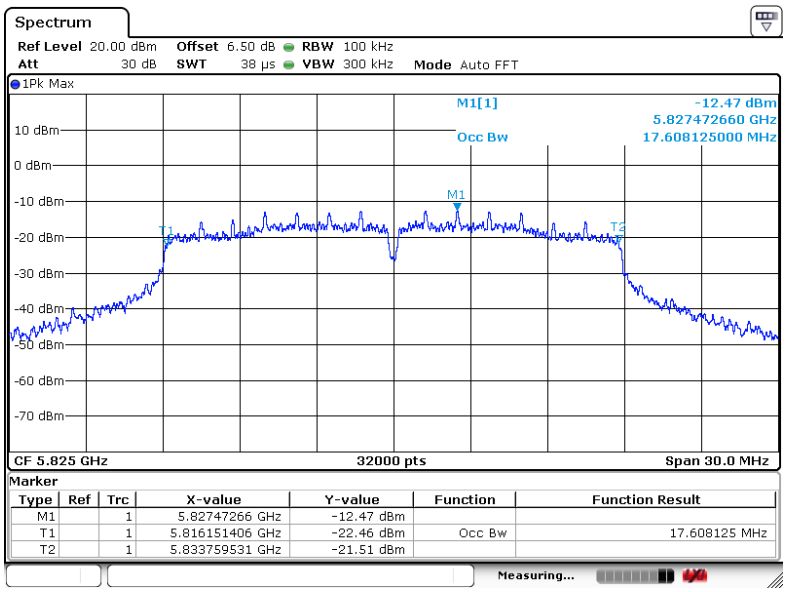
Channel: 149



Channel: 157

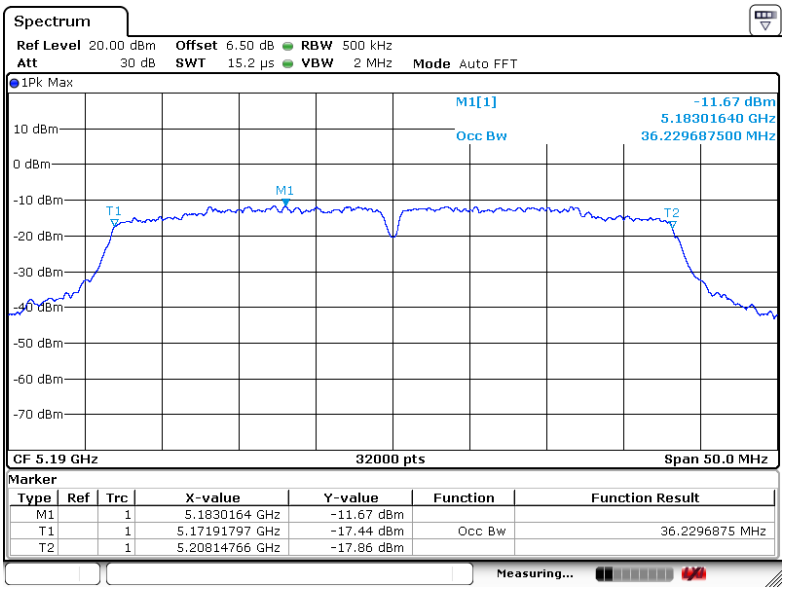


Channel: 165

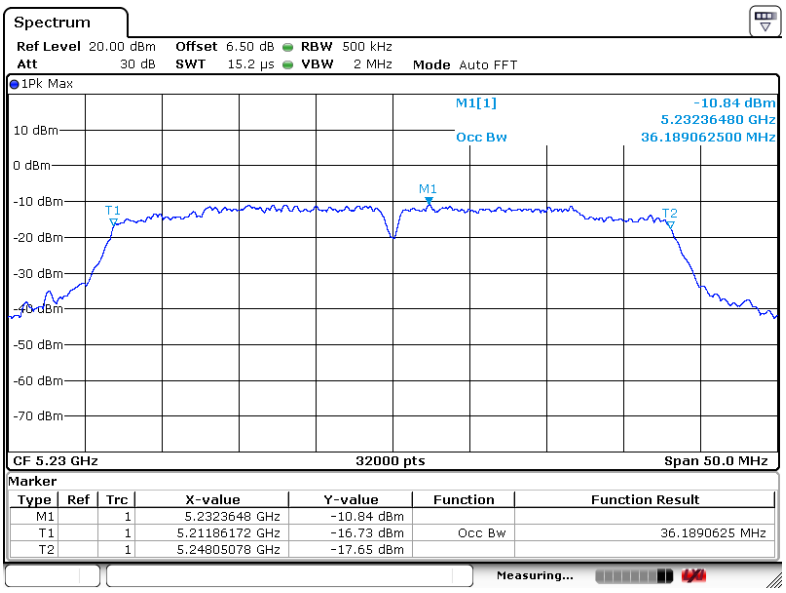

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -12.47 dBm
5.827472660 GHz
Occ Bw 17.608125000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.82747266 GHz -12.47 dBm
T1 1 5.816151406 GHz -22.46 dBm Occ Bw 17.608125 MHz
T2 1 5.833759531 GHz -21.51 dBm
Measuring...

99% OBW 802.11n40

Channel: 38

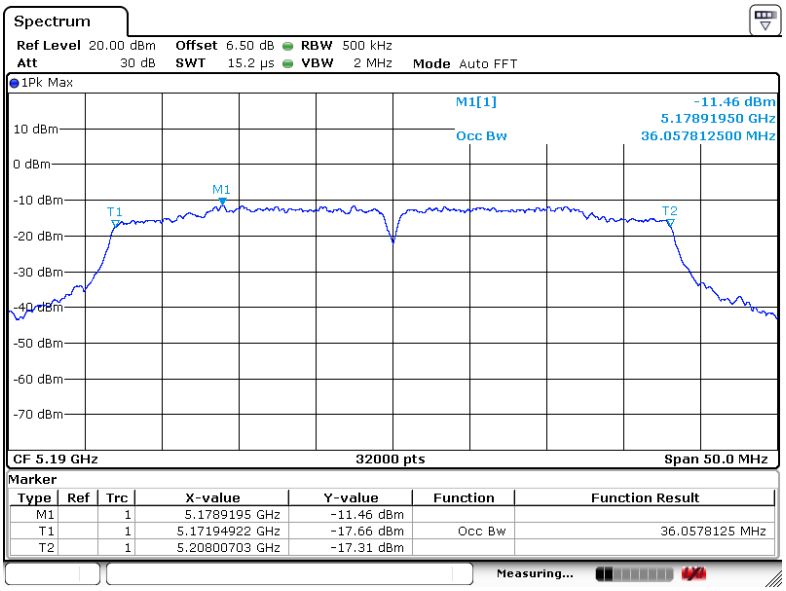


Channel: 46

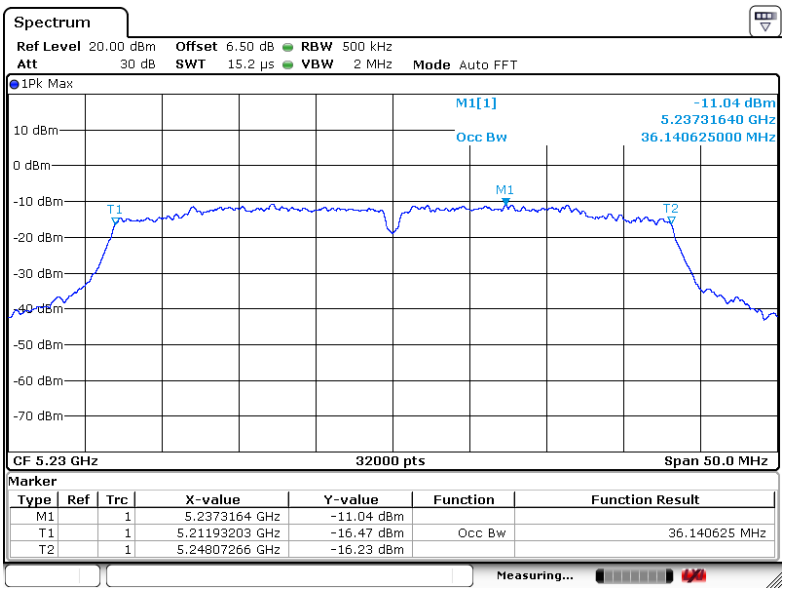


99% OBW 802.11ac40

Channel: 38

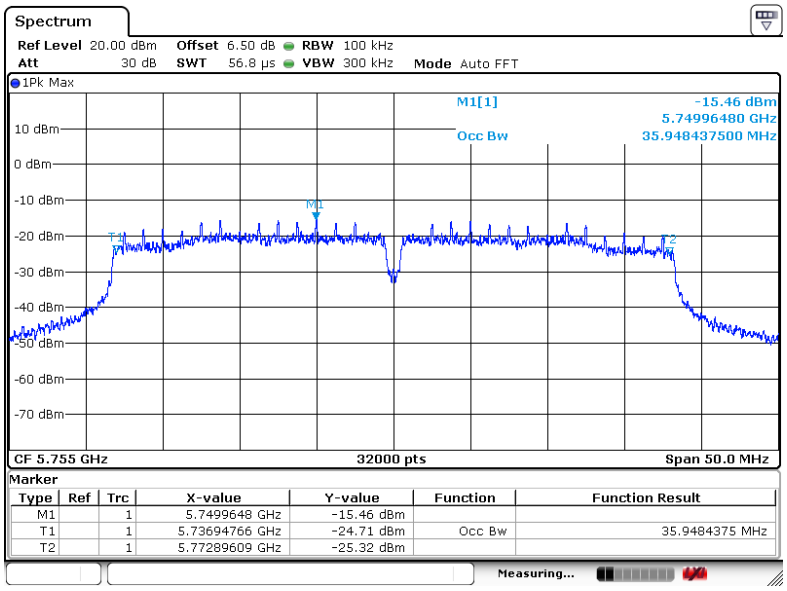


Channel: 46

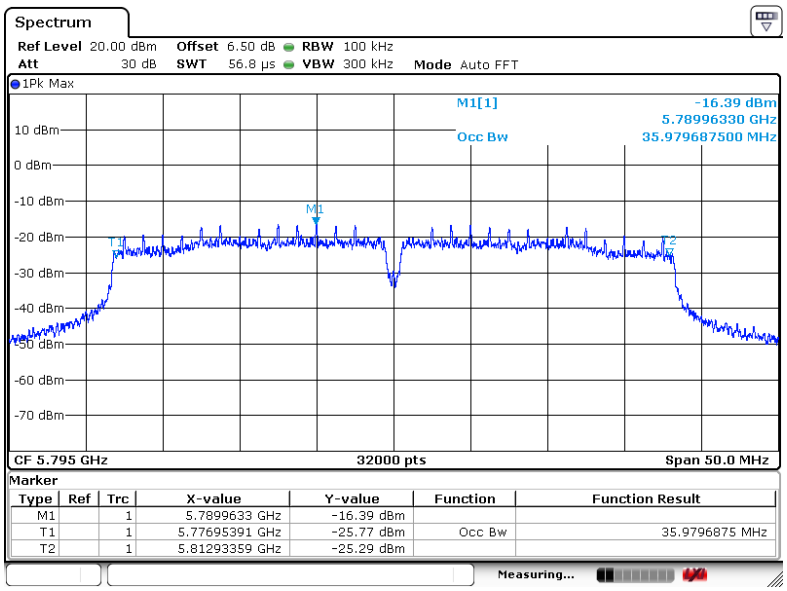


99% OBW 802.11n40

Channel: 151

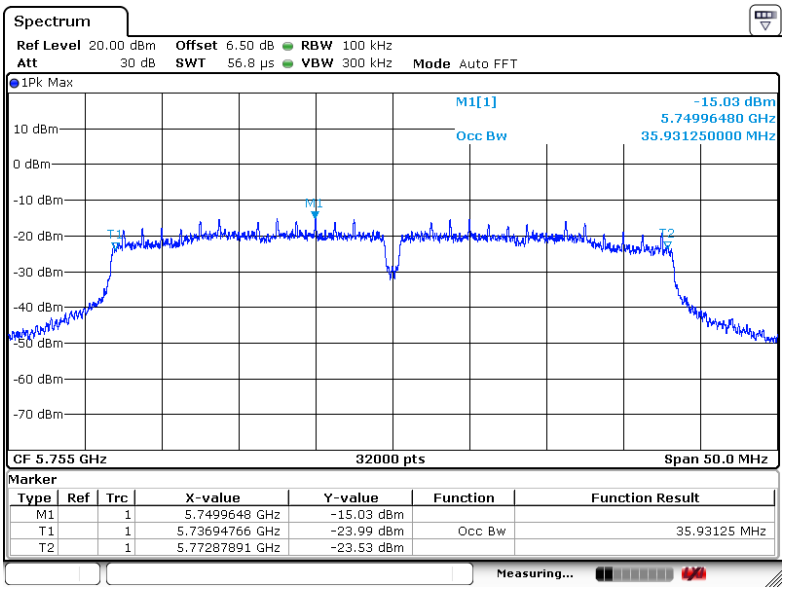


Channel: 159

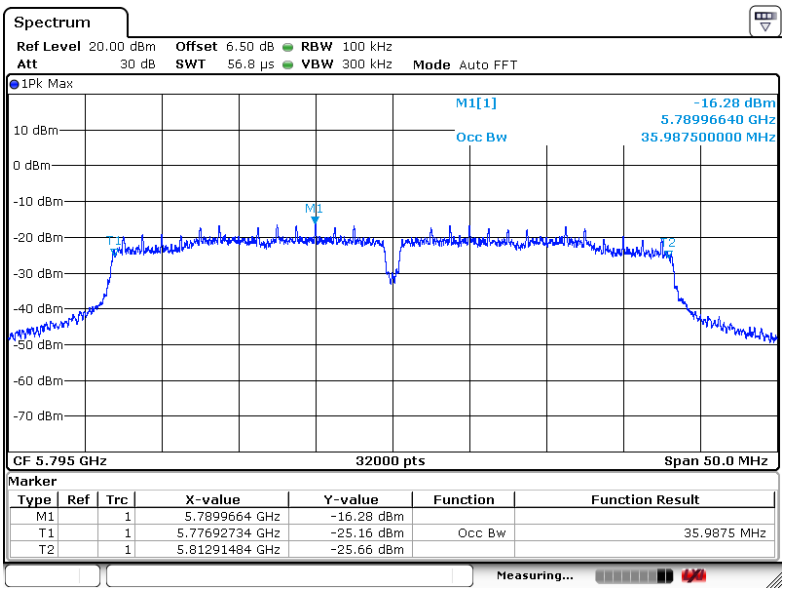


99% OBW 802.11ac40

Channel: 151

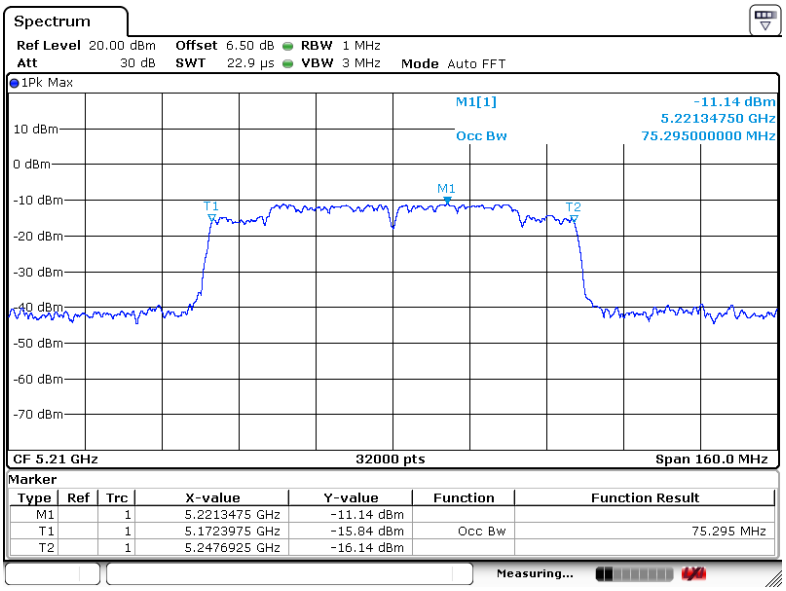


Channel: 159

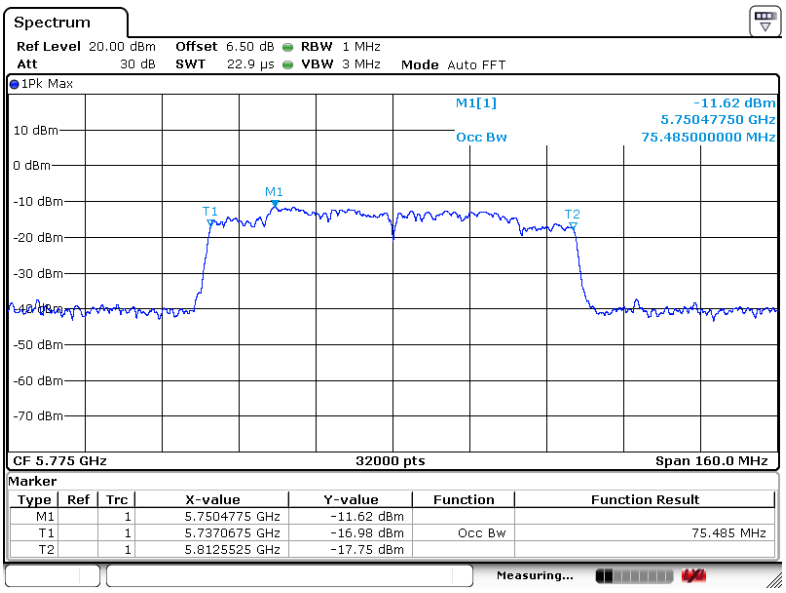


99% OBW 802.11ac80

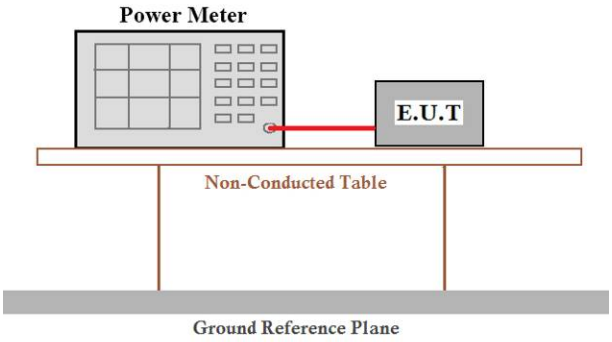
Channel:42



Channel: 155



5. MAXIMUM CONDUCTED OUTPUT POWER

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 250mW. For the band 5.745-5.850 GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 30dBm
Test setup:	
Test procedure:	**Measurement using an RF average power meter** (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle. b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level. c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five. (ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B). (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter. (iv) Adjust the measurement in dBm by adding 10 log(1/x) where x is the duty cycle (e.g., 10log(1/0.25) if the duty cycle is 25 percent).
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details

5.1. TEST RESULT

Antenna A:

CH. No.	Frequency (MHz)	Output Power (dBm)			Limit(dBm)	Result
		802.11a	802.11n (HT20)	802.11ac (VHT20)		
36	5180.00	6.68	6.18	6.16	24	Pass
40	5200.00	7.07	6.87	6.81	24	Pass
48	5240.00	7.10	6.93	6.89	24	Pass
149	5745.00	7.04	7.04	7.01	30	Pass
157	5785.00	5.62	5.73	5.56	30	Pass
165	5825.00	5.57	5.61	5.49	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)		Limit(dBm)	Result
		802.11n(HT40)	802.11ac(VHT40)		
38	5190.00	6.12	6.08	24	Pass
46	5230.00	6.65	6.57	24	Pass
151	5755.00	5.90	5.83	30	Pass
159	5795.00	5.16	5.07	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)	Limit(dBm)	Result
		802.11ac(VHT80)		
42	5210	6.43	24	Pass
155	5775	6.14	30	Pass

Antenna B:

CH. No.	Frequency (MHz)	Output Power (dBm)			Limit(dBm)	Result
		802.11a	802.11n (HT20)	802.11ac (VHT20)		
36	5180.00	6.56	6.10	6.06	24	Pass
40	5200.00	7.00	6.75	6.64	24	Pass
48	5240.00	7.01	6.81	6.65	24	Pass
149	5745.00	6.98	8.88	6.77	30	Pass
157	5785.00	5.49	5.53	5.36	30	Pass
165	5825.00	5.36	5.42	5.24	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)		Limit(dBm)	Result
		802.11n(HT40)	802.11ac(VHT40)		
38	5190.00	6.02	6.00	24	Pass
46	5230.00	6.49	6.35	24	Pass
151	5755.00	5.76	5.48	30	Pass
159	5795.00	5.07	5.00	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)	Limit(dBm)	Result
		802.11ac(VHT80)		
42	5210	6.29	24	Pass
155	5775	6.04	30	Pass

6. Band Edges Measurement

Test Requirement:	FCC Part15 E Section 15.407 and 5.205
Test Method:	ANSI C63.10:2013
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	AV	1MHz	3MHz	Average Value

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Undesirable emission limits:

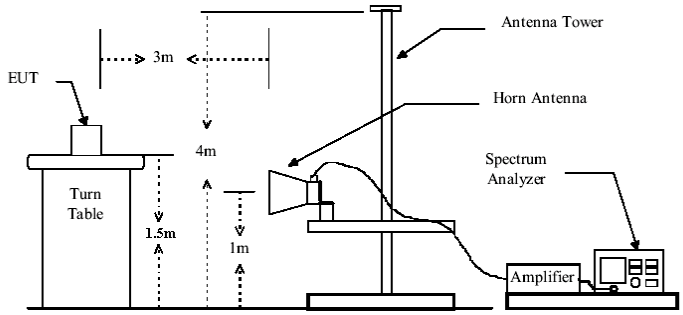
(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(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 EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

(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 EIRP of −27 dBm/MHz.

Test Procedure:

a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a

	data sheet.
Test setup:	Above 1GHz 
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Remark:

According to KDB 789033 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:

E[dBuV/m] = EIRP[dBm] + 95.2;

For example, if EIRP = -27dBm

E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

6.1. TEST RESULT

Peak value:

Test mode:		802.11a		Test channel:		Lowest	
Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector	Antenna Pol.
5150	44.35	7.18	51.53	68.2	-16.67	PK	H
5150	43.24	7.18	50.42	68.2	-17.78	PK	V
Test mode:		802.11a		Test channel:		Highest	
Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector	Antenna Pol.
5350	43.41	7.2	50.61	68.2	-17.59	PK	H
5350	49.23	7.2	56.43	68.2	-11.77	PK	V

Peak value:

Test mode:		802.11n(HT20)		Test channel:		Lowest	
Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector	Antenna Pol.
5150	47.51	7.18	54.69	68.2	-13.51	PK	H
5150	54.16	7.18	61.34	68.2	-6.86	PK	V
Test mode:		802.11n(HT20)		Test channel:		Highest	
Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector	Antenna Pol.
5350	43.22	7.2	50.42	68.2	-17.78	PK	H
5350	50.11	7.2	57.31	68.2	-10.89	PK	V

Peak value:

Test mode:		802.11n(HT40)		Test channel:		Lowest	
Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Pol.
5150	42.81	7.18	49.99	68.2	-18.21	PK	H
5150	43.16	7.18	50.34	68.2	-17.86	PK	V
Test mode:		802.11n(HT40)		Test channel:		Highest	
Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Pol.
5350	43.88	7.2	51.08	68.2	-17.12	PK	H
5350	47.14	7.2	54.34	68.2	-13.86	PK	V

Peak value:

Test mode:		802.11ac(VHT80)		Test channel:		Lowest	
Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Pol.
5150	45.23	7.18	52.41	68.2	-15.79	PK	H
5150	48.42	7.18	55.6	68.2	-12.6	PK	V
Test mode:		802.11ac(VHT80)		Test channel:		Highest	
Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Pol.
5350	46.06	7.2	53.26	68.2	-14.94	PK	H
5350	48.29	7.2	55.49	68.2	-12.71	PK	V

Test mode:	802.11a	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725	40.16	8.79	48.95	74	-25.05	Horizontal
5741.35	82.32	8.57	90.89	N/A	N/A	Horizontal
5725	40.94	8.79	49.73	74	-24.27	Vertical
5741.35	84.46	8.57	93.03	N/A	N/A	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725	30.09	8.79	38.88	54	-15.12	Horizontal
5741.35	72.22	8.57	80.79	N/A	N/A	Horizontal
5725	30.41	8.79	39.2	54	-14.8	Vertical
5741.35	75.03	8.57	83.6	N/A	N/A	Vertical

Test mode:	802.11a	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	78.36	8.79	87.15	N/A	N/A	Horizontal
5850	38.11	8.82	46.93	74	-27.07	Horizontal
5826.2	85.19	8.79	93.98	N/A	N/A	Vertical
5850	39.89	8.82	48.71	74	-25.29	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	69.94	8.79	78.73	N/A	N/A	Horizontal
5850	28.23	8.82	37.05	54	-16.95	Horizontal
5826.2	76.06	8.79	84.85	N/A	N/A	Vertical
5850	28.41	8.82	37.23	54	-16.77	Vertical

Test mode: 802.11n(HT20) Test channel: Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725	37.52	8.79	46.31	74	-27.69	Horizontal
5742.19	77.16	8.57	85.73	N/A	N/A	Horizontal
5725	39.81	8.79	48.6	74	-25.4	Vertical
5742.19	84.06	8.57	92.63	N/A	N/A	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725	28.22	8.79	37.01	54	-16.99	Horizontal
5742.19	68.36	8.57	76.93	N/A	N/A	Horizontal
5725	29.24	8.79	38.03	54	-15.97	Vertical
5742.19	75.46	8.57	84.03	N/A	N/A	Vertical

Test mode: 802.11n(HT20) Test channel: Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	77.23	8.79	86.02	N/A	N/A	Horizontal
5850	38.16	8.82	46.98	74	-27.02	Horizontal
5826.2	35.45	8.79	44.24	N/A	N/A	Vertical
5850	40.27	8.82	49.09	74	-24.91	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	68.19	8.79	76.98	N/A	N/A	Horizontal
5850	28.32	8.82	37.14	54	-16.86	Horizontal
5826.2	74.22	8.79	83.01	N/A	N/A	Vertical
5850	28.99	8.82	37.81	54	-16.19	Vertical

Test mode: 802.11n(HT40) Test channel: Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725	38.24	8.52	46.76	74	-27.24	Horizontal
5745	74.96	8.57	83.53	N/A	N/A	Horizontal
5725	37.81	8.52	46.33	74	-27.67	Vertical
5745	84.33	8.57	92.9	N/A	N/A	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725	30.19	8.52	38.71	54	-15.29	Horizontal
5745	68.64	8.57	77.21	N/A	N/A	Horizontal
5725	28.21	8.52	36.73	54	-17.27	Vertical
5745	75.11	8.57	83.68	N/A	N/A	Vertical

Test mode: 802.11n(HT40) Test channel: Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5784.88	78.46	8.68	87.14	N/A	N/A	Horizontal
5850	38.51	8.82	47.33	74	-26.67	Horizontal
5784.88	84.36	8.68	93.04	N/A	N/A	Vertical
5850	42.45	8.82	51.27	74	-22.73	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5784.88	71.24	8.68	79.92	N/A	N/A	Horizontal
5850	28.13	8.82	36.95	54	-17.05	Horizontal
5784.88	74.27	8.68	82.95	N/A	N/A	Vertical
5850	27.3	8.82	36.12	54	-17.88	Vertical

Test mode: 802.11ac(VHT80) Test channel: Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.000	37.52	8.52	46.04	74	-27.96	Horizontal
5778.180	78.31	8.68	86.99	N/A	N/A	Horizontal
5850.000	36.25	8.82	45.07	74	-28.93	Horizontal
5725.000	37.46	8.52	45.98	74	-28.02	Vertical
5778.180	82.11	8.68	90.79	N/A	N/A	Vertical
5850.000	40.23	8.82	49.05	74	-24.95	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.000	29.54	8.52	38.06	54	-15.94	Horizontal
5778.180	69.78	8.68	78.46	N/A	N/A	Horizontal
5850.000	28.21	8.82	37.03	54	-16.97	Horizontal
5725.000	28.55	8.52	37.07	54	-16.93	Vertical
5778.180	71.09	8.68	79.77	N/A	N/A	Vertical
5850.000	29.32	8.82	38.14	54	-15.86	Vertical

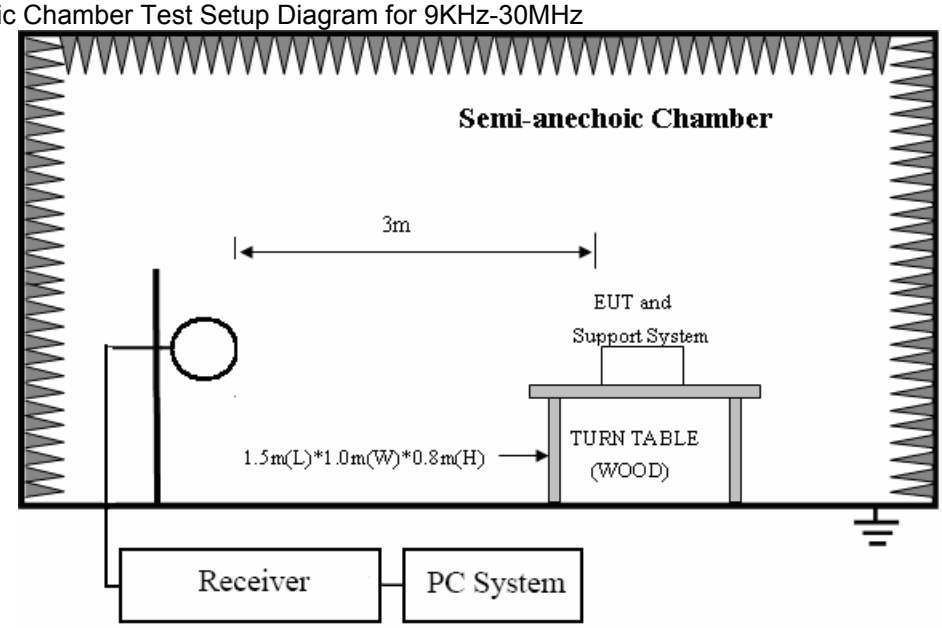
7. RADIATED EMISSION MEASUREMENT

7.1. Test equipment

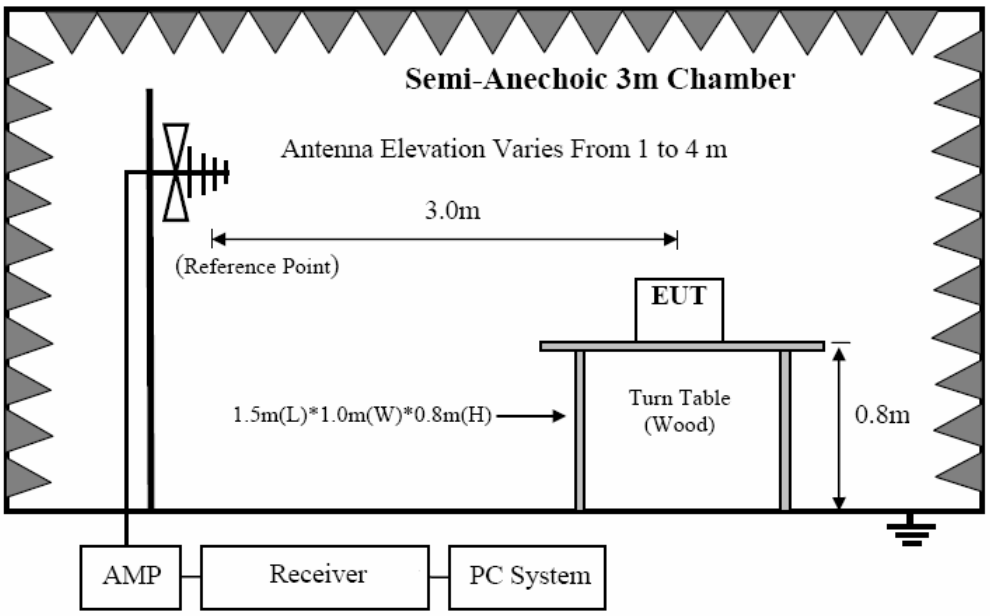
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	Calibrated Date
1	EMI Test Receiver	R&S	ESCI	101307	12/17/2019	12/18/2018
2	Spectrum analyzer	Agilent	E4407B	US40240708	07/04/2020	07/05/2019
3	Trilog Broadband Antenna	Schwarzbeck	VULB9168	VULB9168 -192	03/04/2020	03/05/2019
4	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D1065	100276	12/17/2019	12/18/2018
5	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D1065	100546	12/17/2019	12/18/2018
6	Dipole antenna	Schwarzbeck	UHAP	1101	12/17/2019	12/18/2018
7	Dipole antenna	Schwarzbeck	VHAP	1118	12/17/2019	12/18/2018
8	Pre-Amplifier	CY	EMC011830	980136	12/17/2019	12/18/2018
9	Pre-amplifier	HP	8447F	3113A05680	12/17/2019	12/18/2018
10	RF Cable	R&S	R01	10403	12/17/2019	12/18/2018
11	RF Cable	R&S	R02	10512	12/17/2019	12/18/2018
12	RF Cable	R&S	R01	10454	12/17/2019	12/18/2018
13	RF Cable	R&S	R02	10343	12/17/2019	12/18/2018
14	Spectrum analyze	R&S	FSV40	101470	06/28/2020	06/29/2019
15	MeasurementSoftware	Farad	EZ-EMC (Ver.ATT-03A)	N/A	N/A	N/A
16	Loop antenna	TESEQ	HLA6120	20129	12/17/2019	12/18/2018

7.2. Block diagram of test setup

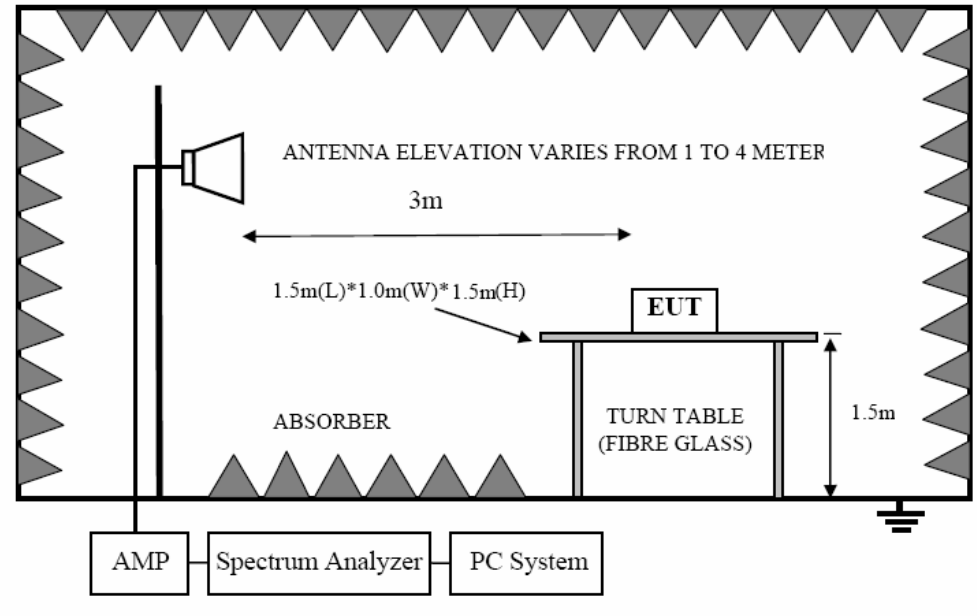
In 3m Anechoic Chamber Test Setup Diagram for 9KHz-30MHz



In 3m Anechoic Chamber Test Setup Diagram for 30MHz-1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

7.3. Limit

9.3.1 FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

9.3.2. FCC 15.209 Limit.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(KHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(KHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer then that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$Limit_{3m}(dBuV/m) = Limit_{30m}(dBuV/m) + 40Log(30m/3m)$

9.3.3. Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 30dB below the fundamental emissions, or comply with 15.209 limits.

7.4. Test Procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.

(2) Setup EUT and assistant system according clause 2.4 and 7.2

(3) Test antenna was located 3m(except 18GHz-40GHz was 1m) from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used
9KHz-30MHz	Active Loop antenna
30MHz-1GHz	Trilog Broadband Antenna
1GHz-18GHz	Double Ridged Horn Antenna(1GHz-18GHz)
18GHz-40GHz	Horn Antenna(18GHz-40GHz)

According ANSI C63.10:2013 clause 6.4.4.2 and 6,5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30MHz, the Trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(4) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9KHz to 25GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1m to 4m(Except loop antenna, it's fixed 1m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) new battery is used during testing

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18GHz to 25GHz, so below final test was performed with frequency range from 9KHz to 18GHz.

(5) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2013 on Radiated Emission test.

(6) The emissions from 9KHz to 1GHz were measured based on CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz, for emissions from 9KHz-90KHz,110KHz-490KHz and above 1GHz were measured based on average detector, for emissions above 1GHz, peak emissions also be measured and need comply with Peak limit.

(7) The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9KHz-150KHz	200Hz
150KHz-30MHz	9KHz
30MHz-1GHz	120KHz

（8）For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure(according ANSI C63.10:2013 clause 4.2.3.2.3 procedure for average measure). Peak detector is used for Peak and AV measurement both.

7.5. Test result(Below 30MHz)

EUT:	YOGA NOTEBOOK	Model No.:	YS13KA_JP
Temperature:	24℃	Relative Humidity:	55%
Distance:	3m	Test Power:	120V 60Hz
Polarization:	--	Test Result:	Pass
Test Mode:	Keeping TX mode	Test By:	Smile

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

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

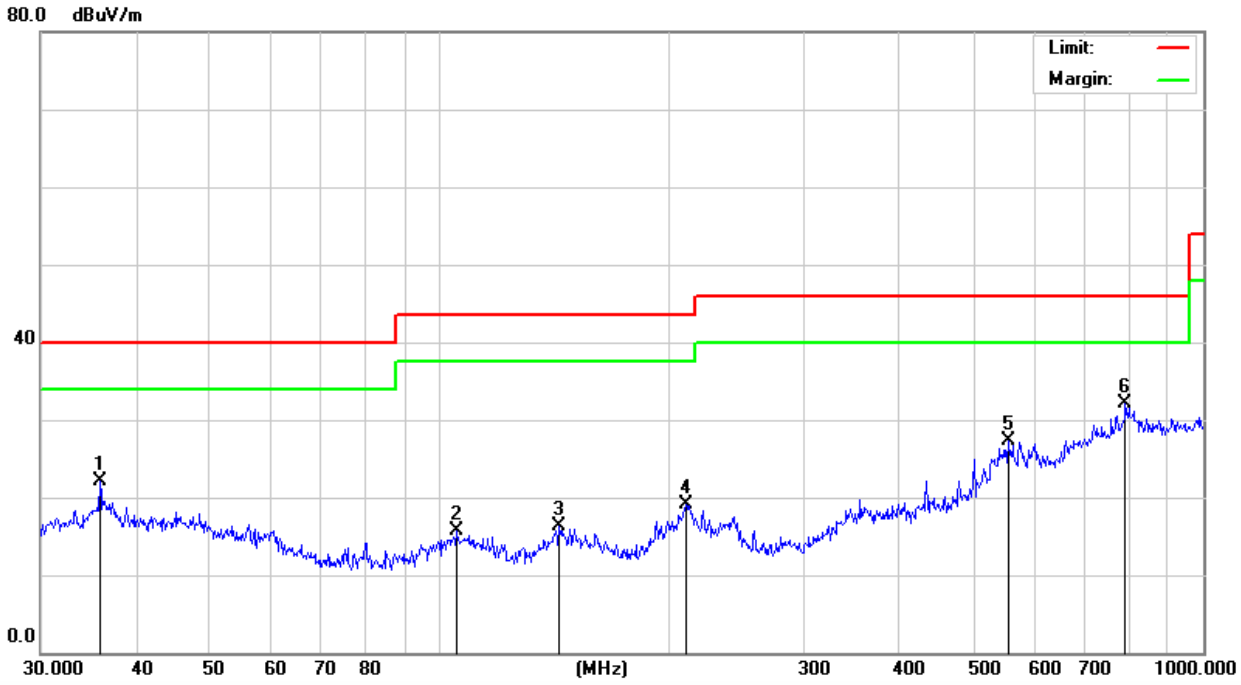
Distance extrapolation factor =20 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

Note: The worst data is Antenna A, only shown Antenna A Plot.

TEST RESULTS (Between 30M – 1000 MHz)

EUT:	YOGA NOTEBOOK	Model No.:	YS13KA_JP
Temperature:	24	Relative Humidity:	55%
Distance:	3m	Test Power:	AC120V/60Hz
Polarization:	Vertical	Test Result:	Pass
Standard:	(RE)FCC PART 15	Test By:	Smile
Test Mode:	Keeping TX mode		

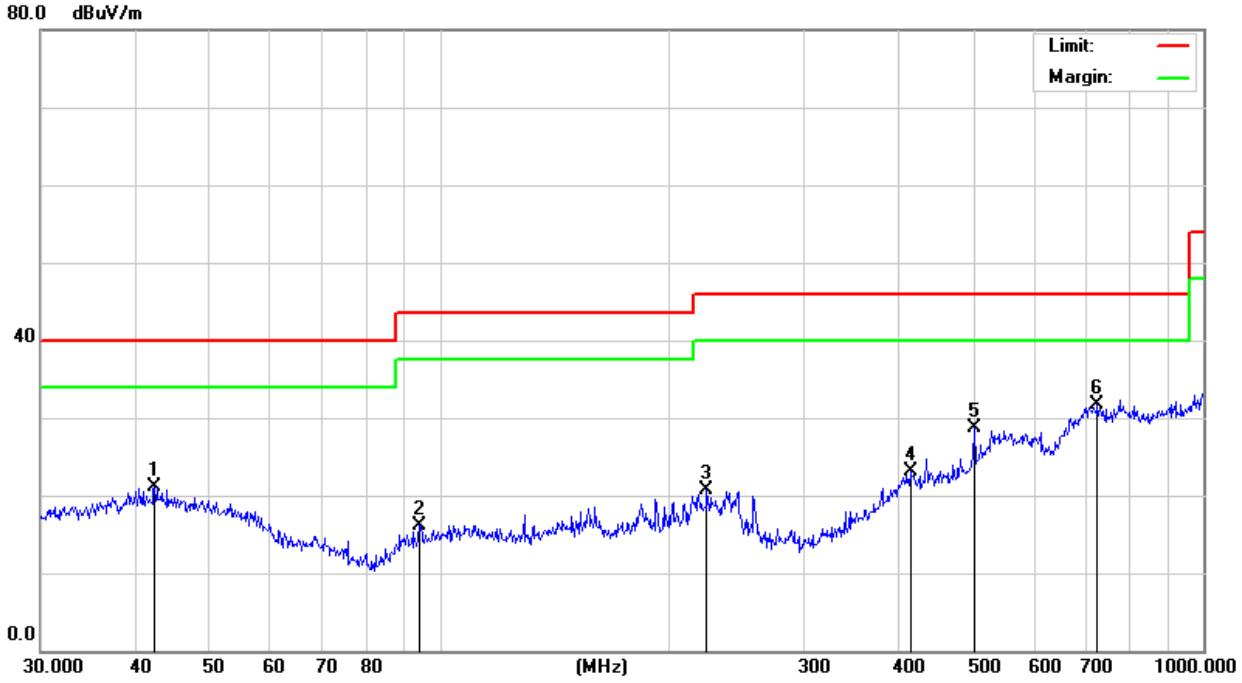


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		35.8746	26.75	-4.69	22.06	40.00	-17.94	peak
2		105.2718	23.47	-7.82	15.65	43.50	-27.85	peak
3		143.3261	23.57	-7.31	16.26	43.50	-27.24	peak
4		210.0482	22.77	-3.75	19.02	43.50	-24.48	peak
5		554.8254	25.59	1.75	27.34	46.00	-18.66	peak
6	*	790.6188	24.43	7.69	32.12	46.00	-13.88	peak

The test result is calculated as the following:

(1) Result = Reading + Correct Factor
(2) Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain + Attenuator
(3) Margin = Result - Limit

EUT:	YOGA NOTEBOOK	Model No.:	YS13KA_JP
Temperature:	24	Relative Humidity:	55%
Distance:	3m	Test Power:	AC120V/60Hz
Polarization:	**Horizontal**	Test Result:	Pass
Standard:	(RE)FCC PART 15	Test By:	Smile
Test Mode:	Keeping TX mode		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		42.3021	22.96	-1.92	21.04	40.00	-18.96	peak
2		94.0978	24.64	-8.46	16.18	43.50	-27.32	peak
3		223.7333	27.28	-6.52	20.76	46.00	-25.24	peak
4		413.2706	24.93	-1.89	23.04	46.00	-22.96	peak
5		501.1789	27.31	1.43	28.74	46.00	-17.26	peak
6	*	726.8052	24.42	7.22	31.64	46.00	-14.36	peak

The test result is calculated as the following:

(4) Result = Reading + Correct Factor
(5) Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain + Attenuator
(6) Margin = Result - Limit

TEST RESULTS (Above 1000 MHz)

EUT:	YOGA NOTEBOOK	Model No.:	YS13KA_JP
Temperature:	24℃	Relative Humidity:	55%
Distance:	3m	Test Power:	120V 60Hz
Polarization:		Test Result:	Pass
Test Mode:	TX-802.11a/n20/n40/ac20/ac40/ac/80	Test By:	Smile

Above 1GHz:

Mode	Polar (H/V)	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
802.11a-5180MHz	H	10360	34.86	12.56	47.42	74.00	-26.58	PEAK
	H	15540	35.69	16.45	52.14	74.00	-21.86	PEAK
	V	10360	35.79	12.56	48.35	74.00	-25.65	PEAK
	V	15540	36.72	16.45	53.17	74.00	-20.83	PEAK
802.11a-5200 MHz	H	10400	35.76	12.64	48.40	74.00	-25.60	PEAK
	H	15600	35.83	16.53	52.36	74.00	-21.64	PEAK
	V	10400	36.74	12.64	49.38	74.00	-24.62	PEAK
	V	15600	35.01	16.53	51.54	74.00	-22.46	PEAK
802.11a-5240 MHz	H	10480	33.45	12.68	46.13	74.00	-27.87	PEAK
	H	15720	35.18	16.54	51.72	74.00	-22.28	PEAK
	V	10480	35.72	12.68	48.40	74.00	-25.60	PEAK
	V	15720	34.24	16.54	50.78	74.00	-23.22	PEAK
802.11a-5745 MHz	H	11490	32.32	16.82	49.14	74.00	-24.86	PEAK
	H	17235	29.33	22.93	52.26	74.00	-21.74	PEAK
	V	11490	30.75	16.82	47.57	74.00	-26.43	PEAK
	V	17235	29.41	22.93	52.34	74.00	-21.66	PEAK
802.11a-5785 MHz	H	11570	32.45	16.71	49.16	74.00	-24.84	PEAK
	H	17355	27.44	24.37	51.81	74.00	-22.19	PEAK
	V	11570	30.26	16.71	46.97	74.00	-27.03	PEAK
	V	17355	28.42	24.37	52.79	74.00	-21.21	PEAK
802.11a-5825 MHz	H	11650	34.13	16.61	50.74	74.00	-23.26	PEAK
	H	17475	27.30	25.01	52.31	74.00	-21.69	PEAK
	V	11650	32.12	16.61	48.73	74.00	-25.27	PEAK
	V	17475	28.75	25.01	53.76	74.00	-20.24	PEAK

Mode	Polar (H/V)	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
802.11n HT20-5180MHz	H	10360	32.61	12.56	45.17	74.00	-28.83	PEAK
	H	15540	35.22	16.45	51.67	74.00	-22.33	PEAK
	V	10360	35.19	12.56	47.75	74.00	-26.25	PEAK
	V	15540	35.64	16.45	52.09	74.00	-21.91	PEAK
802.11n HT20-5200MHz	H	10400	35.20	12.64	47.84	74.00	-26.16	PEAK
	H	15600	33.28	16.53	49.81	74.00	-24.19	PEAK
	V	10400	36.36	12.64	49.00	74.00	-25.00	PEAK
	V	15600	35.76	16.53	52.29	74.00	-21.71	PEAK
802.11n HT20-5240MHz	H	10480	34.75	12.68	47.43	74.00	-26.57	PEAK
	H	15720	32.41	16.54	48.95	74.00	-25.05	PEAK
	V	10480	34.43	12.68	47.11	74.00	-26.89	PEAK
	V	15720	33.75	16.54	50.29	74.00	-23.71	PEAK
802.11n HT20-5745MHz	H	11490	31.03	16.82	47.85	74.00	-26.15	PEAK
	H	17235	29.91	22.93	52.84	74.00	-21.16	PEAK
	V	11570	32.22	16.71	48.93	74.00	-25.07	PEAK
	V	17235	28.52	22.93	51.45	74.00	-22.55	PEAK
802.11n HT20-5785MHz	H	11570	30.20	16.71	46.91	74.00	-27.09	PEAK
	H	17355	27.99	24.37	52.36	74.00	-21.64	PEAK
	V	11570	32.80	16.71	49.51	74.00	-24.49	PEAK
	V	17355	29.11	24.37	53.48	74.00	-20.52	PEAK
802.11n HT20-5825MHz	H	11650	31.73	16.61	48.34	74.00	-25.66	PEAK
	H	17475	27.29	25.01	52.30	74.00	-21.70	PEAK
	V	11650	33.97	16.61	50.58	74.00	-23.42	PEAK
	V	17475	28.19	25.01	53.20	74.00	-20.80	PEAK
802.11n HT40-5190MHz	H	10380	35.91	12.58	48.49	74.00	-25.51	PEAK
	H	15570	34.48	16.48	50.96	74.00	-23.04	PEAK
	V	10380	36.62	12.58	49.20	74.00	-24.80	PEAK
	V	15570	33.48	16.48	49.96	74.00	-24.04	PEAK

Mode	Polar (H/V)	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV/m)	Margin (dB)	Detector (PK/AV)
802.11n HT40-5230MHz	H	10460	37.36	12.66	50.02	74.00	-23.98	PEAK
	H	15690	34.96	16.53	51.49	74.00	-22.51	PEAK
	V	10460	35.43	12.66	48.09	74.00	-25.91	PEAK
	V	15690	34.34	16.53	50.87	74.00	-23.13	PEAK
802.11n HT40-5755MHz	H	11510	31.71	16.78	48.49	74.00	-25.51	PEAK
	H	17265	27.64	23.29	50.93	74.00	-23.07	PEAK
	V	11510	33.18	16.78	49.96	74.00	-24.04	PEAK
	V	17265	28.90	23.29	52.19	74.00	-21.81	PEAK
802.11n HT40-5795MHz	H	11590	30.31	16.69	47.00	74.00	-27.00	PEAK
	H	17385	26.57	24.73	51.30	74.00	-22.70	PEAK
	V	11590	32.69	16.69	49.38	74.00	-24.62	PEAK
	V	17385	27.34	24.73	52.07	74.00	-21.93	PEAK
802.11ac HT20-5180MHz	H	10360	33.72	12.56	46.28	74.00	-27.72	PEAK
	H	15540	33.58	16.45	50.03	74.00	-23.97	PEAK
	V	10360	33.15	12.56	45.71	74.00	-28.29	PEAK
	V	15540	34.65	16.45	51.10	74.00	-22.90	PEAK
802.11ac HT20-5200MHz	H	10400	33.79	12.64	46.43	74.00	-27.57	PEAK
	H	15600	31.54	16.53	48.07	74.00	-25.93	PEAK
	V	10400	32.64	12.64	45.28	74.00	-28.72	PEAK
	V	15600	31.31	16.53	47.84	74.00	-26.16	PEAK
802.11ac HT20-5240MHz	H	10480	33.92	12.68	46.60	74.00	-27.40	PEAK
	H	15720	31.97	16.54	48.51	74.00	-25.49	PEAK
	V	10480	32.69	12.68	45.37	74.00	-28.63	PEAK
	V	15720	33.60	16.54	50.14	74.00	-23.86	PEAK
802.11ac HT20-5745MHz	H	11490	31.73	16.82	48.55	74.00	-25.45	PEAK
	H	17235	30.03	22.93	52.96	74.00	-21.04	PEAK
	V	11490	31.84	16.82	48.66	74.00	-25.34	PEAK
	V	17235	28.49	22.93	51.42	74.00	-22.58	PEAK

Mode	Polar (H/V)	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
802.11ac HT20-5785MHz	H	11570	32.90	16.71	49.61	74.00	-24.39	PEAK
	H	17355	27.83	24.37	52.20	74.00	-21.80	PEAK
	V	11570	31.24	16.71	47.95	74.00	-26.05	PEAK
	V	17355	28.26	24.37	52.63	74.00	-21.37	PEAK
802.11ac HT20-5825MHz	H	11650	31.44	16.61	48.05	74.00	-25.95	PEAK
	H	17475	26.05	25.01	51.06	74.00	-22.94	PEAK
	V	11650	32.10	16.61	48.71	74.00	-25.29	PEAK
	V	17475	27.60	25.01	52.61	74.00	-21.39	PEAK
802.11ac HT40-5190MHz	H	10380	32.89	12.58	45.47	74.00	-28.53	PEAK
	H	15570	34.92	16.48	51.40	74.00	-22.60	PEAK
	V	10380	34.58	12.58	47.16	74.00	-26.84	PEAK
	V	15570	32.73	16.48	49.21	74.00	-24.79	PEAK
802.11ac HT40-5230MHz	H	10460	34.46	12.66	47.12	74.00	-26.88	PEAK
	H	15690	31.63	16.53	48.16	74.00	-25.84	PEAK
	V	10460	33.82	12.66	46.48	74.00	-27.52	PEAK
	V	15690	32.37	16.53	48.90	74.00	-25.10	PEAK
802.11ac HT40-5755MHz	H	11510	31.79	16.78	48.57	74.00	-25.43	PEAK
	H	17265	27.10	23.29	50.39	74.00	-23.61	PEAK
	V	11510	31.40	16.78	48.18	74.00	-25.82	PEAK
	V	17265	27.50	23.29	50.79	74.00	-23.21	PEAK
802.11ac HT40-5795MHz	H	11590	32.00	16.69	48.69	74.00	-25.31	PEAK
	H	17385	26.44	24.73	51.17	74.00	-22.83	PEAK
	V	11590	31.07	16.69	47.76	74.00	-26.24	PEAK
	V	17385	27.11	24.73	51.84	74.00	-22.16	PEAK
802.11ac HT80-5210MHz	H	10420	32.91	12.62	45.53	74.00	-28.47	PEAK
	H	15630	32.76	16.52	49.28	74.00	-24.72	PEAK
	V	10420	33.04	12.62	45.66	74.00	-28.34	PEAK
	V	15630	31.40	16.52	47.92	74.00	-26.08	PEAK

Mode	Polar (H/V)	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV/m)	Margin (dB)	Detector (PK/AV)
802.11ac HT80-5775MHz	H	11550	31.59	16.73	48.32	74.00	-25.68	PEAK
	H	17325	26.24	24.01	50.25	74.00	-23.75	PEAK
	V	11550	29.25	16.73	45.98	74.00	-28.02	PEAK
	V	17325	25.49	24.01	49.50	74.00	-24.50	PEAK

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

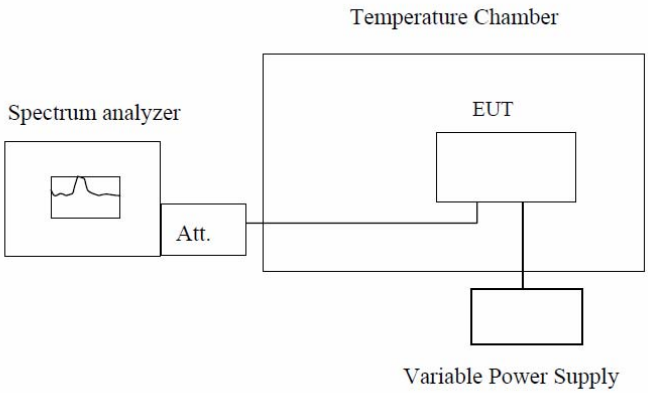
Average measurement was not performed if peak level lower than average limit.

No any other emissions level very low which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

8. FREQUENCY STABILITY

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.4, 2014; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Frequency stability versus Temp.					
Power Supply: DC 7.6V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5180.0277	5180.0868	5180.3821	5179.9272
	5200	5199.9963	5200.8422	5199.9505	5199.3159
	5220	5219.8063	5220.3181	5220.4859	5220.0618
	5240	5239.9478	5240.6941	5240.2101	5239.6616
	5745	5745.0042	5745.0753	5745.0896	5745.1580
	5785	5784.9512	5785.0571	5785.0649	5785.0647
	5825	5825.0134	5825.0640	5825.1324	5824.9185
-20	5180	5179.8107	5180.3083	5180.5447	5179.9329
	5200	5199.4925	5200.5183	5200.2066	5199.7750
	5220	5219.4807	5220.4902	5220.1852	5219.6651
	5240	5239.2352	5240.2261	5240.4605	5239.0199
	5745	5744.9561	5744.8729	5745.0397	5745.0382
	5785	5784.8803	5785.0630	5785.0416	5784.8525
	5825	5824.8946	5825.0386	5824.9463	5824.9506
-10	5180	5179.0571	5180.3766	5180.1767	5178.9596
	5200	5199.9289	5200.7507	5200.8966	5199.0634
	5220	5219.6564	5220.6702	5220.1536	5219.5465
	5240	5239.4799	5240.6293	5240.8690	5239.2351
	5745	5744.8798	5745.0731	5745.0007	5745.0231
	5785	5785.0640	5784.8509	5785.1275	5784.9117
	5825	5824.9422	5824.9879	5825.0053	5825.0313
0	5180	5180.0490	5180.6005	5180.3467	5179.3446
	5200	5199.4503	5200.6680	5200.7492	5199.8630
	5220	5219.1149	5219.9097	5219.9868	5219.9018
	5240	5239.4125	5240.7923	5240.2024	5239.4531
	5745	5744.9066	5745.0235	5744.9358	5745.0889
	5785	5785.0324	5785.0054	5784.9673	5784.8381
	5825	5825.1169	5824.8916	5825.0385	5824.9837

10	5180	5179.8436	5180.0661	5180.1752	5179.8430
	5200	5199.9026	5200.1270	5200.6027	5199.7190
	5220	5219.0841	5220.2818	5220.0601	5220.0017
	5240	5239.8056	5240.4354	5240.6364	5239.6698
	5745	5744.8979	5744.9767	5745.1872	5745.1250
	5785	5785.0119	5785.0046	5785.0006	5785.0347
	5825	5825.0049	5825.0175	5824.9160	5825.0265
20	5180	5179.8968	5180.0435	5180.3442	5179.3197
	5200	5199.5505	5200.2741	5200.7853	5199.4282
	5220	5219.4505	5220.8103	5220.3957	5219.5161
	5240	5239.1767	5240.9325	5240.3036	5239.3475
	5745	5745.0782	5744.9704	5745.1251	5744.8111
	5785	5784.8895	5784.8751	5784.9440	5785.0899
	5825	5824.8765	5824.9357	5825.0983	5824.9854
30	5180	5179.8272	5180.0749	5180.2773	5179.8130
	5200	5199.2887	5200.1858	5200.3973	5199.6039
	5220	5219.2839	5220.4641	5220.8846	5219.4948
	5240	5239.5995	5240.2536	5240.7082	5239.9878
	5745	5744.9390	5744.9203	5744.9784	5745.1017
	5785	5785.0306	5784.8355	5784.7839	5784.7760
	5825	5824.9628	5825.0624	5824.8212	5824.7950
40	5180	5179.7777	5180.5906	5180.1990	5180.0189
	5200	5199.3176	5200.6572	5200.9044	5199.7816
	5220	5219.4788	5220.6848	5220.6310	5219.7759
	5240	5239.2129	5240.8234	5240.8016	5240.0228
	5745	5744.9419	5745.0190	5745.1410	5745.1177
	5785	5785.0248	5785.1318	5784.9372	5785.1186
	5825	5825.0375	5825.1471	5824.9446	5824.8779
50	5180	5179.4134	5180.5832	5180.3777	5179.1745
	5200	5199.3490	5200.8674	5200.2790	5199.2496
	5220	5219.7035	5220.7766	5220.5040	5219.4211
	5240	5239.5462	5240.2674	5239.9857	5239.3446
	5745	5745.0497	5744.9527	5745.0178	5744.9264
	5785	5784.9748	5784.9486	5785.0387	5785.0123
	5825	5824.9864	5824.9157	5825.1436	5825.0805

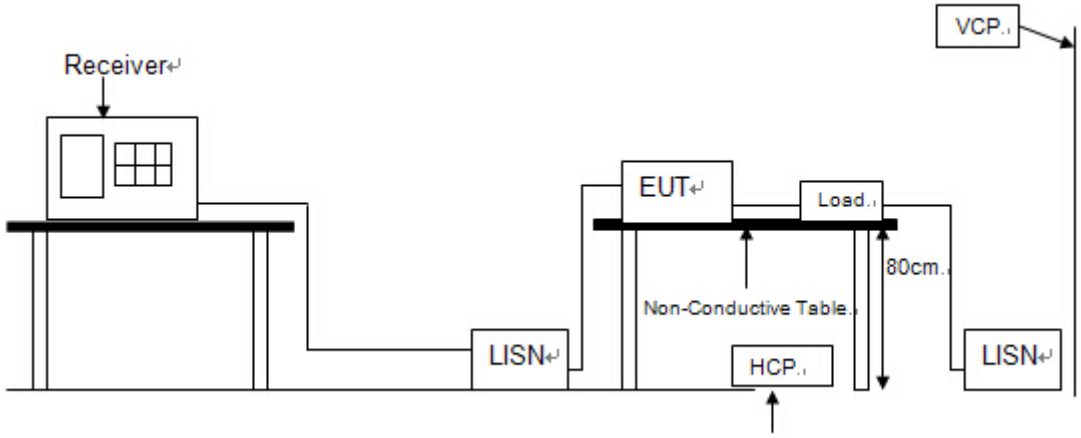
Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
6.9	5180	5180.0307	5179.9976	5179.9821	5180.0629
	5200	5199.9664	5200.1429	5199.7644	5200.0289
	5220	5220.0208	5220.3151	5219.9200	5219.8401
	5240	5240.8361	5240.6709	5239.8912	5239.4962
	5745	5745.0007	5744.8499	5744.8966	5745.0880
	5785	5784.8106	5785.0776	5784.8497	5785.0848
	5825	5824.9984	5824.8418	5825.0111	5824.9828
7.6	5180	5181.0745	5180.2221	5179.2738	5179.2492
	5200	5200.1640	5200.5092	5199.8811	5199.1999
	5220	5220.0970	5220.1827	5219.8447	5219.6235
	5240	5240.0493	5240.8873	5239.2812	5239.7471
	5745	5744.9503	5744.8903	5745.1004	5745.0375
	5785	5784.8728	5785.1265	5785.0992	5785.0385
	5825	5824.9524	5824.9752	5824.9221	5824.9011
8.4	5180	5180.0796	5180.6286	5179.1720	5179.1962
	5200	5200.3700	5200.4116	5199.2115	5199.2478
	5220	5219.8450	5220.6826	5219.0497	5219.3094
	5240	5240.7180	5240.3970	5239.5422	5239.0429
	5745	5744.8755	5744.9984	5745.0308	5744.9859
	5785	5784.7975	5784.8083	5784.9587	5784.8571
	5825	5824.8248	5824.8750	5824.8094	5824.9731

9. POWER LINE CONDUCTED EMISSION

9.1 Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pulse Limiter	MTS-systemtechnik	MTS-IMP-136	261115-010-0024	12/17/2019
2	EMI Test Receiver	R&S	ESCI	101308	12/17/2019
3	LISN	AFJ	LS16	16011103219	12/17/2019
4	LISN	Schwarzbeck	NSLK 8127	8127-432	12/17/2019
5	Measurement Software	Farad	EZ-EMC (Ver.ATT-03A)	N/A	N/A
6	MeasurementSoftware	Farad	EZ-EMC (Ver.ATT-03A)	N/A	N/A

9.2 Block diagram of test setup



9.3 Power Line Conducted Emission Limits(Class B)

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

9.4 TEST PROCEDURE

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

9.5 Test Result

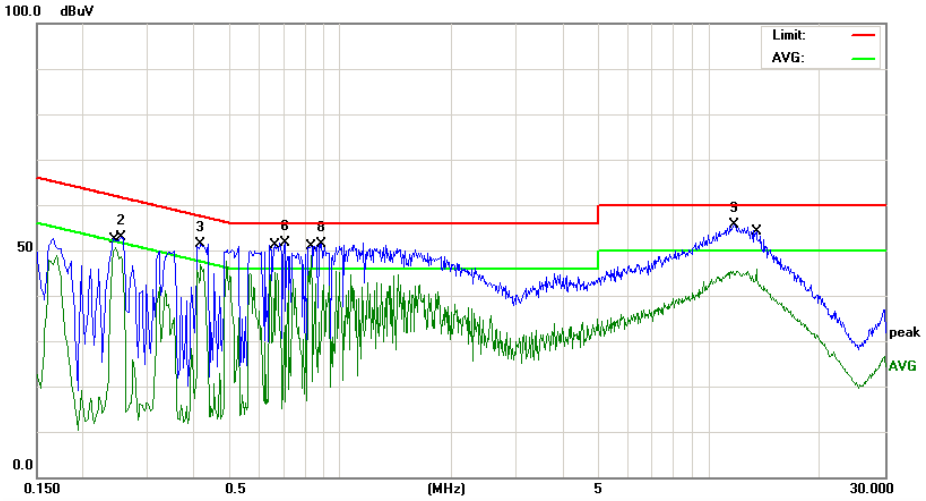
PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “-----” means peak detection; “-----” mans average detection

ADAPTER1：

EUT:	Table PC	Model No.:	YS13KA_JP
Temperature:	23℃	Relative Humidity:	52%
Probe:	N	Test Power:	AC 120V/60Hz
Test Time:	2019-9-12	Test Result:	Pass
Standard:	(CE)FCC PART 15 class B_QP		
Test Mode:	TX		
Note:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.2460	37.30	10.90	48.20	51.89	-3.69	AVG
2		0.2540	41.92	10.88	52.80	61.62	-8.82	peak
3		0.4180	41.28	10.10	51.38	57.49	-6.11	peak
4		0.4180	31.20	10.10	41.30	47.49	-6.19	AVG
5		0.6620	30.22	9.98	40.20	46.00	-5.80	AVG
6		0.7060	41.74	9.98	51.72	56.00	-4.28	peak
7		0.8340	26.94	9.96	36.90	46.00	-9.10	AVG
8		0.8860	41.45	9.95	51.40	56.00	-4.60	peak
9		11.6980	45.35	10.34	55.69	60.00	-4.31	peak
10		13.4140	35.55	10.37	45.92	50.00	-4.08	AVG

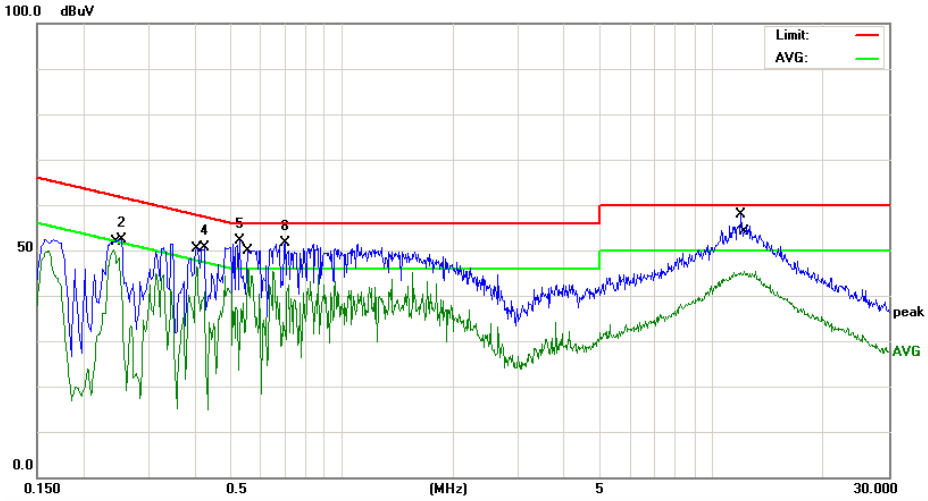
The test result is calculated as the following:

(1) Result = Reading + Correct Factor

(2) Correct Factor = (LISN, ISN, PLC or Current Probe) Factor + Cable Loss +Attenuator

(3) Margin = Result - Limit

EUT:	Table PC	Model No.:	YS13KA_JP
Temperature:	23℃	Relative Humidity:	52%
Probe:	L1	Test Power:	AC 120V/60Hz
Test Time:	2019-9-12	Test Result:	Pass
Standard:	(CE)FCC PART 15 class B_QP		
Test Mode:	TX		
Note:			



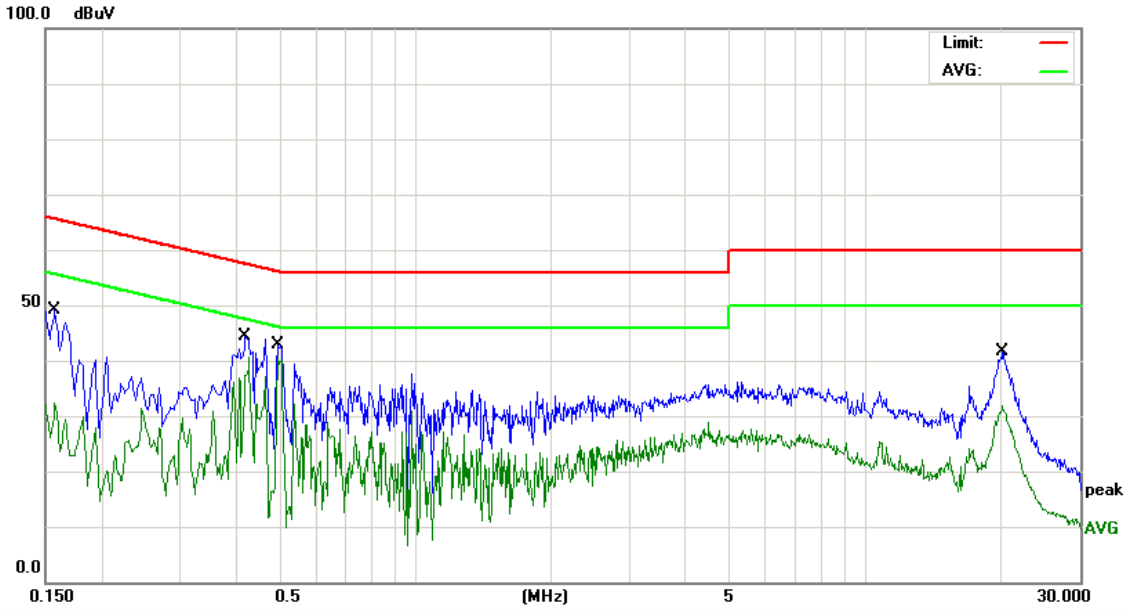
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2420	34.69	10.91	45.60	52.02	-6.42	AVG
2		0.2540	41.51	10.88	52.39	61.62	-9.23	peak
3		0.4060	30.08	10.12	40.20	47.73	-7.53	AVG
4		0.4260	40.41	10.10	50.51	57.33	-6.82	peak
5	*	0.5299	42.04	10.01	52.05	56.00	-3.95	peak
6		0.5580	27.50	10.00	37.50	46.00	-8.50	AVG
7		0.5580	28.40	10.00	38.40	46.00	-7.60	AVG
8		0.7019	41.70	9.98	51.68	56.00	-4.32	peak
9		11.9660	37.76	10.34	48.10	60.00	-11.90	QP
10		12.2100	35.12	10.34	45.46	50.00	-4.54	AVG

The test result is calculated as the following:

(1) Result = Reading + Correct Factor
(2) Correct Factor = (LISN, ISN, PLC or Current Probe) Factor + Cable Loss +Attenuator
(3) Margin = Result - Limit

ADAPTER2：

EUT:	**Table PC**	**Model No.:**	**YS13KA_JP**
Temperature:	**23℃**	**Relative Humidity:**	**52%**
Probe:	**N**	**Test Power:**	**AC 120V/60Hz**
Test Time:	**2019-9-12**	**Test Result:**	**Pass**
Standard:	**(CE)FCC PART 15 class B_QP**		
Test Mode:	**TX**		
Note:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1700	44.21	11.55	55.76	64.96	-9.20	peak
2	*	0.1700	35.41	11.55	46.96	54.96	-8.00	AVG
3		0.3020	35.57	10.21	45.78	60.19	-14.41	peak
4		0.3140	27.36	10.20	37.56	49.86	-12.30	AVG
5		0.4580	24.84	10.06	34.90	46.73	-11.83	AVG
6		0.4820	30.85	10.03	40.88	56.30	-15.42	peak

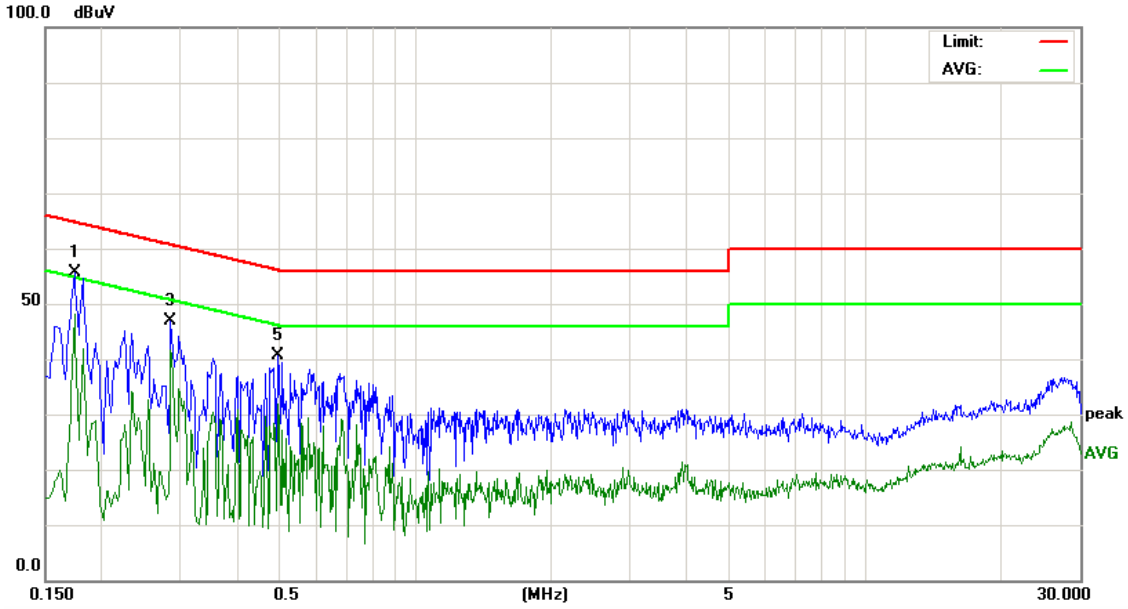
The test result is calculated as the following:

(4) Result = Reading + Correct Factor

(5) Correct Factor = (LISN, ISN, PLC or Current Probe) Factor + Cable Loss +Attenuator

(6) Margin = Result - Limit

EUT:	Table PC	Model No.:	YS13KA_JP
Temperature:	23℃	Relative Humidity:	52%
Probe:	L1	Test Power:	AC 120V/60Hz
Test Time:	2019-9-12	Test Result:	Pass
Standard:	(CE)FCC PART 15 class B_QP		
Test Mode:	TX		
Note:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1740	44.05	11.48	55.53	64.76	-9.23	peak
2	*	0.1740	36.59	11.48	48.07	54.76	-6.69	AVG
3		0.2860	36.35	10.61	46.96	60.64	-13.68	peak
4		0.2860	31.14	10.61	41.75	50.64	-8.89	AVG
5		0.4940	30.69	10.02	40.71	56.10	-15.39	peak
6		0.4940	21.93	10.02	31.95	46.10	-14.15	AVG

The test result is calculated as the following:

(4) Result = Reading + Correct Factor

(5) Correct Factor = (LISN, ISN, PLC or Current Probe) Factor + Cable Loss +Attenuator

(6) Margin = Result - Limit

10. ANTENNA REQUIREMENTS

10.1. Limit

15.203 requirement: For intentional device, according to 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.

10.2. EUT ANTENNA

The EUT antenna is permanent attached antenna. It comply with the standard requirement.