FCC RADIO TEST REPORT

For

FCC ID：2ATYD-1101

Report Reference No..... :	19EFAS12030 81
Date of issue..... :	2019-12-31
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 ..... :	Kano Computing Limited
Address..... :	3 Finsbury Ave London EC2M 2PA,London, United Kingdom
Manufacturer..... :	Kano Computing Limited
Test specification:	
Test item description..... :	Kano PC
Trade Mark ..... :	Kano
Model/Type reference ..... :	1101, 1101-01, 1101-02, 1101B-02, 1101-03, 1101-04, 1110-01, 1110-02, 1110B-02, 1110-03, 1110-04, 1110
Ratings..... :	Adapter:ES086A-U120300XYZ INPUT: 100-240V~ 50/60Hz 0.8A OUTPUT: DC 12V 3.0A

Responsible Engineer : Smile Wang

Smile Wang

Authorized Signatory: King Wang

King Wang

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TEST REPORT DECLARE

Applicant	:	Kano Computing Limited
Address	:	3 Finsbury Ave London EC2M 2PA,London, United Kingdom
Equipment under Test	:	Kano PC
Model No	:	1101, 1101-01, 1101-02, 1101B-02, 1101-03, 1101-04, 1110-01, 1110-02, 1110B-02, 1110-03, 1110-04, 1110
Trade Mark	:	Kano
Manufacturer	:	Kano Computing Limited
Address	:	3 Finsbury Ave London EC2M 2PA,London, United Kingdom

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:			
Date of Test:	2019-12-18	**Date of Report**:	2019-12-31

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	:	Kano PC
Model Number	:	1101
EUT function description	:	Kano PC with WiFi & BT function.
Power supply	:	Adapter:ES086A-U120300XYZ INPUT: 100-240V~ 50/60Hz 0.8A OUTPUT: DC 12V 3.0A
Adaptor		ES086A-U120300XYZ
Operation frequency	:	WiFi: 802.11a/802.11n(HT20) /ac(VHT20): 5180MHz~5240MHz;5260MHz~5320MHz; 5500MHz~5700MHz;5745MHz~5825MHz 802.11n(HT40)/ac(VHT40): 5190MHz~5230MHz;5270MHz~5310MHz 5510MHz~5670MHz;5755MHz~5795MHz 802.11ac(VHT80): 5210MHz,5290MHz,5530MHz~5610MHz,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 :1.60dBi(Main) Antenna B : 1.60dBi(Aux)
Battery	:	N/A
Date of Receipt	:	2019/12/18
Sample Type	:	N/A

Channel List							
802.11a/n/ac(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	44	5220	48	5240
52	5260	56	5280	60	5300	64	5320
100	5500	104	5520	108	5540	112	5560
116	5580	120	5600	124	5620	128	5640
132	5660	136	5680	140	5700	--	--
802.11n/ac(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230	54	5270	62	5310
102	5510	110	5550	118	5590	126	5630
134	5670	--	--	--	--	--	--
802.11 ac(80MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	58	5290	106	5530	122	5610

2.2. ACCESSORIES OF EUT

Description of Accessories	Shielded Type	Ferrite Core	Length
Adapter	SHENZHEN EAST SUN ELECTRONIC CO.,LTD.	ES086A-U120300XYZ	/

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/ CH44/ CH48 802.11a / n 20/ac20 CH52/ CH56/ CH64 802.11a / n 20/ac20 CH100/ CH120/ CH140 802.11a / n 20/ac20 CH149/ CH157/ CH165
Mode 3	802.11n40/ac40 CH38/ CH46 802.11n40/ac40 CH54/ CH62 802.11n40/ac40 CH102/ CH118/ CH134 802.11 n40/ac40 CH151/ CH159

For Radiated Emission	
Final Test Mode	Description
Mode 1	Link Mode
Mode 2	802.11a / n 20/ac20 CH36/ CH44/ CH48 802.11a / n 20/ac20 CH52/ CH56/ CH64 802.11a / n 20/ac20 CH100/ CH120/ CH140 802.11a / n 20/ac20 CH149/ CH157/ CH165
Mode 3	802.11n40/ac40 CH38/ CH46 802.11n40/ac40 CH54/ CH62 802.11n40/ac40 CH102/ CH118/ CH134 802.11 n40/ac40 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

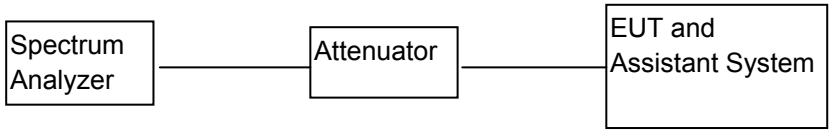
Note：This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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	2020/12/17	1 Year
3	RF Cable	Micable	C10-01-01-1	100309	2020/12/17	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	5.30	5.24	--	11	Pass
CH44	5220	4.79	4.73	--	11	Pass
CH48	5240	4.63	4.58	--	11	Pass
CH52	5260	4.66	4.59	--	11	Pass
CH56	5280	4.81	4.76	--	11	Pass
CH64	5230	4.99	4.91	--	11	Pass
CH100	5500	4.59	4.48	--	11	Pass
CH120	5600	4.92	4.83	--	11	Pass
CH140	5700	4.73	4.67	--	11	Pass
CH 149	5745	0.66	0.58	--	30	Pass
CH 157	5785	0.57	0.53	--	30	Pass
CH 165	5825	0.10	0.08	--	30	Pass
TX 802.11n20 Mode						
CH36	5180	4.83	4.79	--	11	Pass
CH44	5220	4.14	4.11	--	11	Pass
CH48	5240	3.68	3.56	--	11	Pass
CH52	5260	4.43	4.38	--	11	Pass
CH56	5280	4.01	4.00	--	11	Pass
CH64	5230	4.58	4.45	--	11	Pass
CH100	5500	3.88	3.78	--	11	Pass
CH120	5600	3.79	3.59	--	11	Pass
CH140	5700	3.94	3.87	--	11	Pass
CH 149	5745	-0.24	-0.36	--	30	Pass
CH 157	5785	-0.32	-0.41	--	30	Pass
CH 165	5825	-0.63	-0.75	--	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 802.11n40 Mode						
CH38	5190	-0.93	-0.99	--	11	Pass
CH46	5230	-0.61	-0.75	--	11	Pass
CH54	5270	-0.20	-0.36	--	11	Pass
CH62	5310	-0.56	-0.45	--	11	Pass
CH102	5510	-0.77	-0.94	--	11	Pass
CH118	5590	-1.17	-1.25	--	11	Pass
CH134	5670	-0.82	-0.97	--	11	Pass
CH151	5755	-4.67	-4.81	--	30	Pass
CH159	5795	-4.70	-4.73	--	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	4.35	4.29	--	11	Pass
CH44	5220	3.68	3.58	--	11	Pass
CH48	5240	4.10	4.06	--	11	Pass
CH52	5260	3.74	3.64	--	11	Pass
CH56	5280	3.75	3.68	--	11	Pass
CH64	5230	4.12	4.08	--	11	Pass
CH100	5500	3.49	3.42	--	11	Pass
CH120	5600	4.17	4.11	--	11	Pass
CH140	5700	3.50	3.49	--	11	Pass
CH 149	5745	-0.19	-0.32	--	30	Pass
CH 157	5785	-0.95	-1.02	--	30	Pass
CH 165	5825	-0.57	-0.63	--	30	Pass

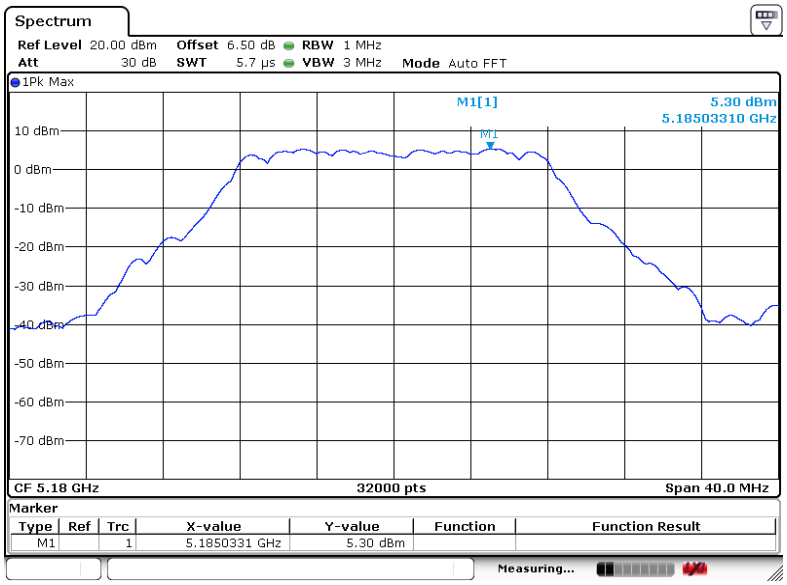
CH. No.	Frequency	Power Density ANT A (dBm/MHz)	Power Density ANT B (dBm/MHz)	total power density (dBm/MHz)	Limit (dBm/MHz)	Result
TX 802.11 ac(VHT40) Mode						
CH38	5190	-0.04	-0.11	--	11	Pass
CH46	5230	-0.78	-0.87	--	11	Pass
CH54	5270	-0.87	-0.93	--	11	Pass
CH62	5310	-0.94	-1.03	--	11	Pass
CH102	5510	-1.07	-1.12	--	11	Pass
CH118	5590	-0.99	-1.16	--	11	Pass
CH134	5670	-0.35	-0.43	--	11	Pass
CH151	5755	-4.77	-4.85	--	30	Pass
CH159	5795	-4.30	-4.46	--	30	Pass
TX 802.11 ac(VHT80) Mode						
CH42	5210	-4.46	-4.54	--	11	Pass
CH58	5290	-4.70	-4.81	--	11	Pass
CH106	5530	-4.40	-4.45	--	11	Pass
CH122	5610	-4.54	-4.54	--	11	Pass
CH155	5775	-4.08	-4.13	--	30	Pass

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

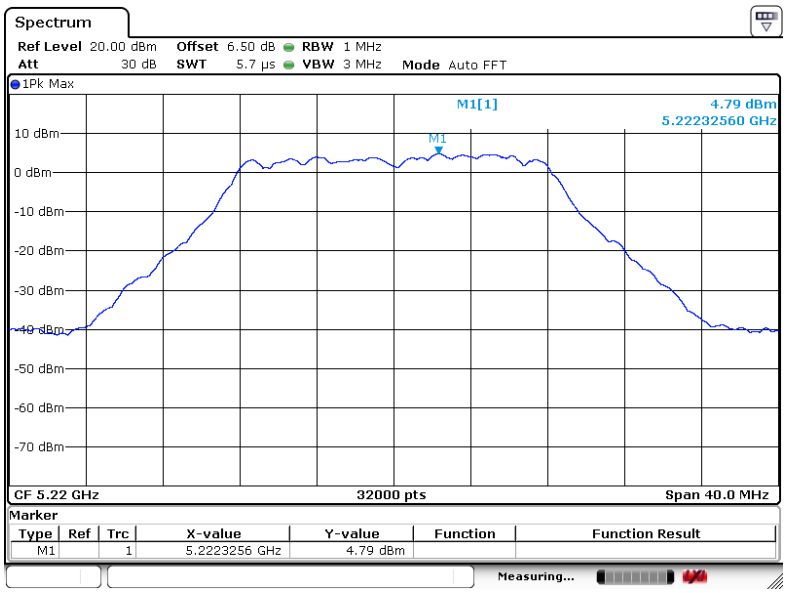
Test plots as followed: Antenna A

802.11a

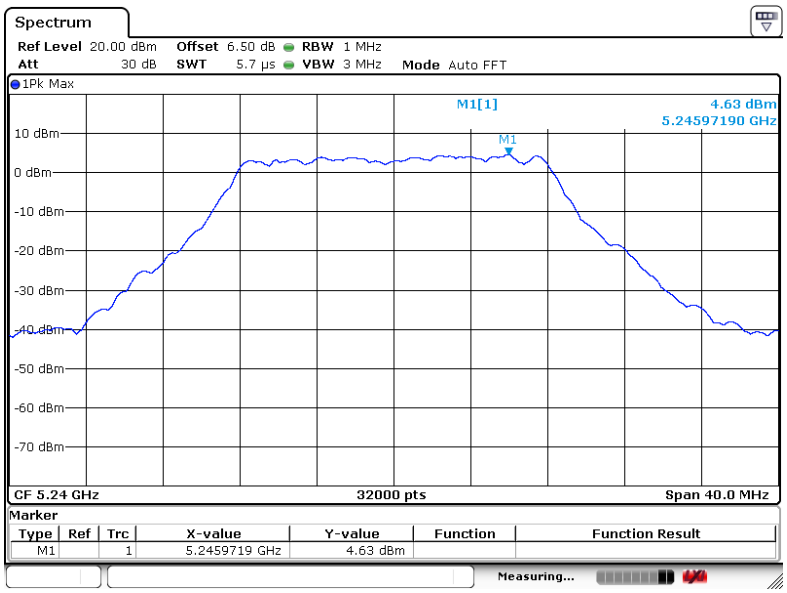
Channel: 36



Channel: 44

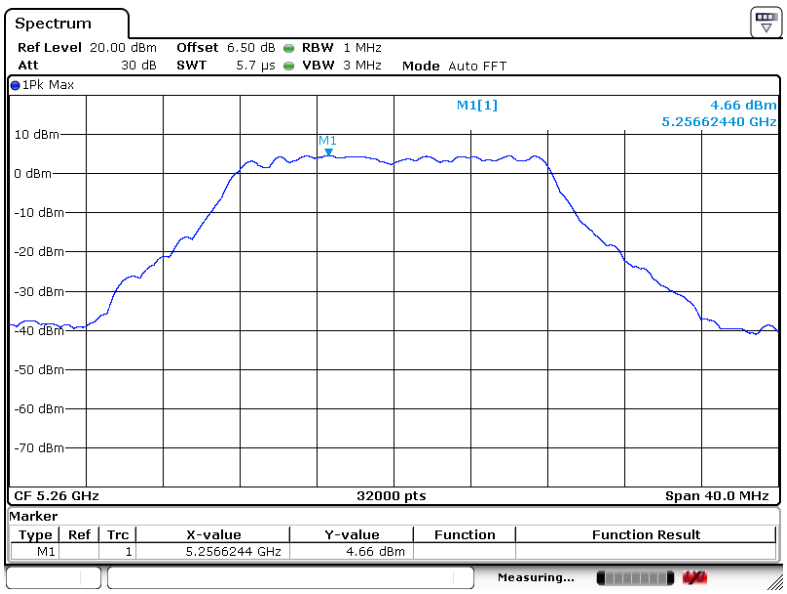


Channel: 48

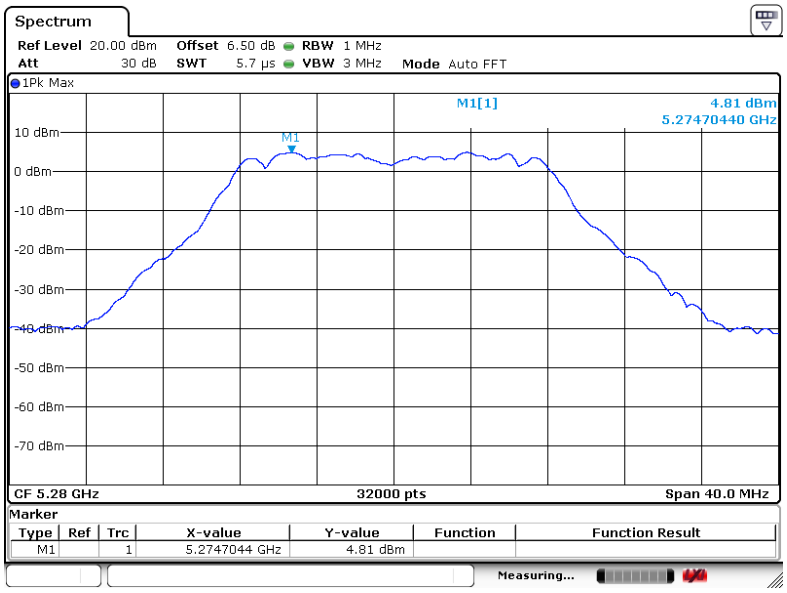

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1]
4.63 dBm
5.24597190 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2459719 GHz 4.63 dBm
Measuring...

802.11a

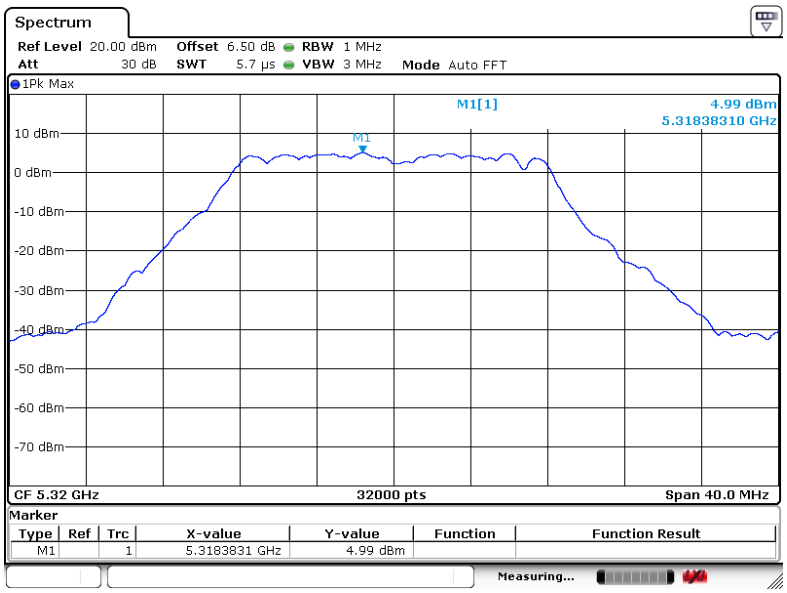
Channel: 52



Channel: 56

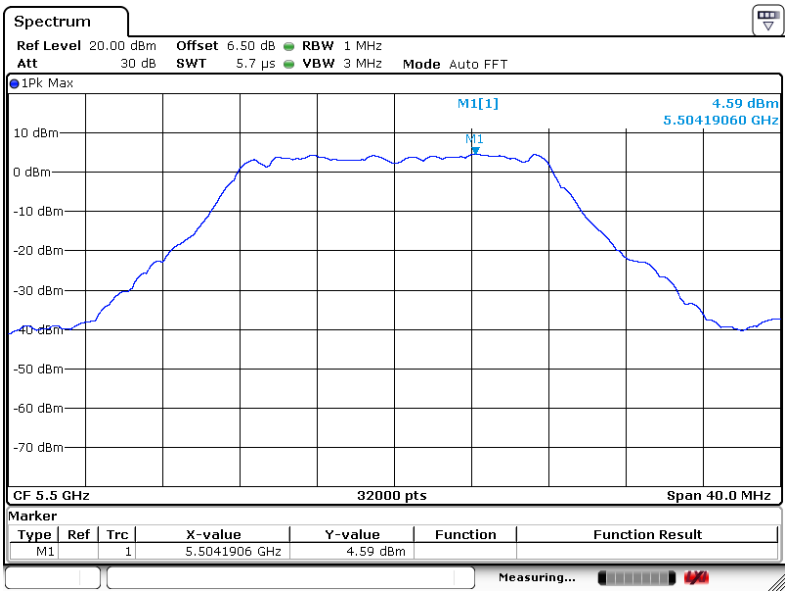


Channel: 64

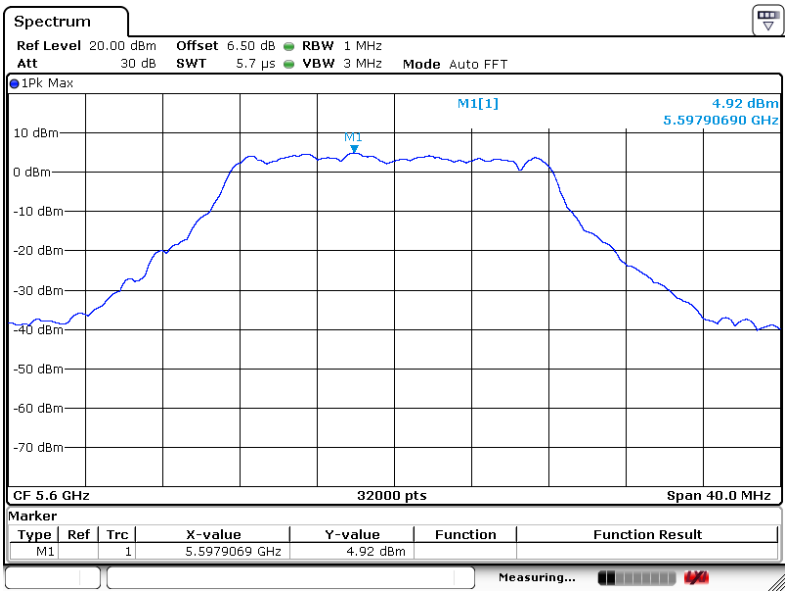

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 4.99 dBm
5.31838310 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3183831 GHz 4.99 dBm
Measuring...

802.11a

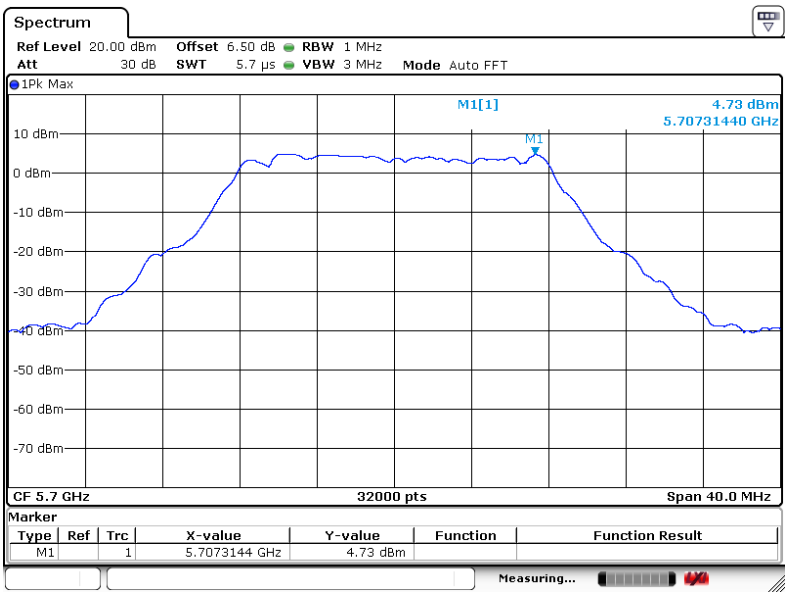
Channel: 100



Channel: 120

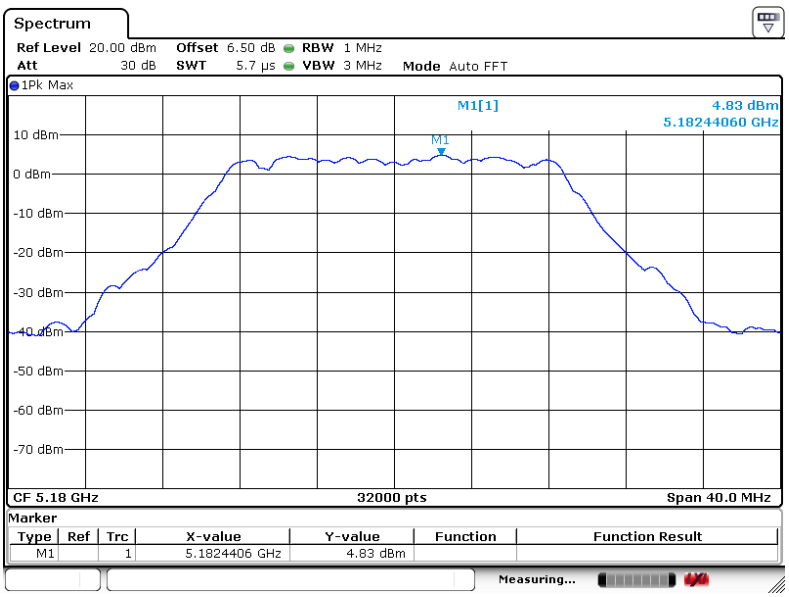


Channel: 140

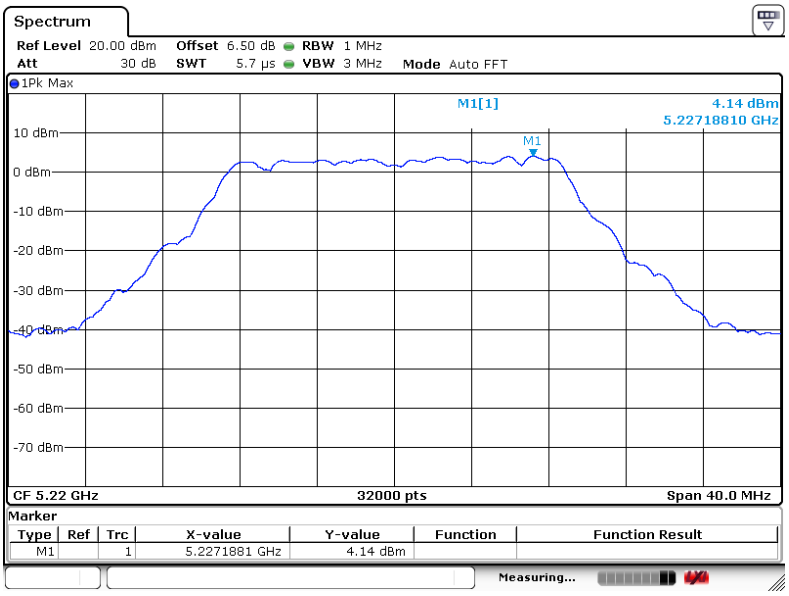

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 4.73 dBm
5.70731440 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7073144 GHz 4.73 dBm
Measuring...

802.11n20

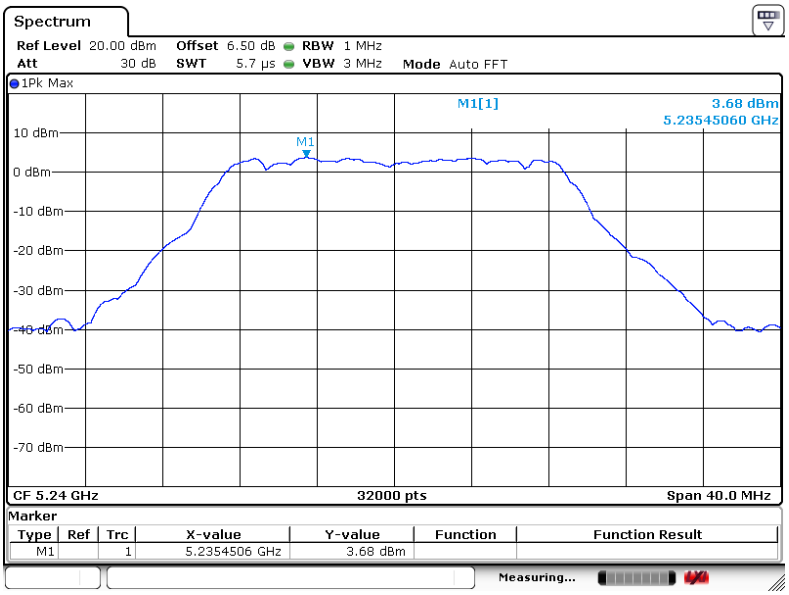
Channel: 36



Channel: 44

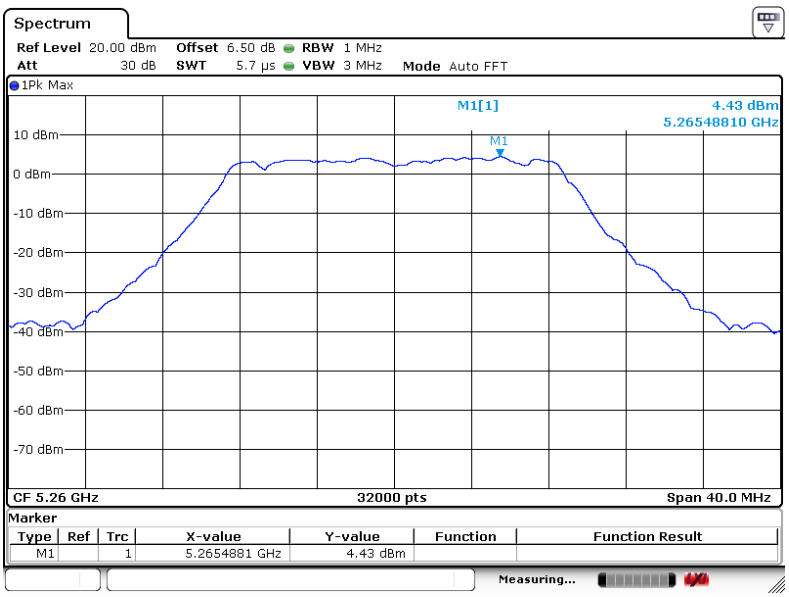


Channel: 48

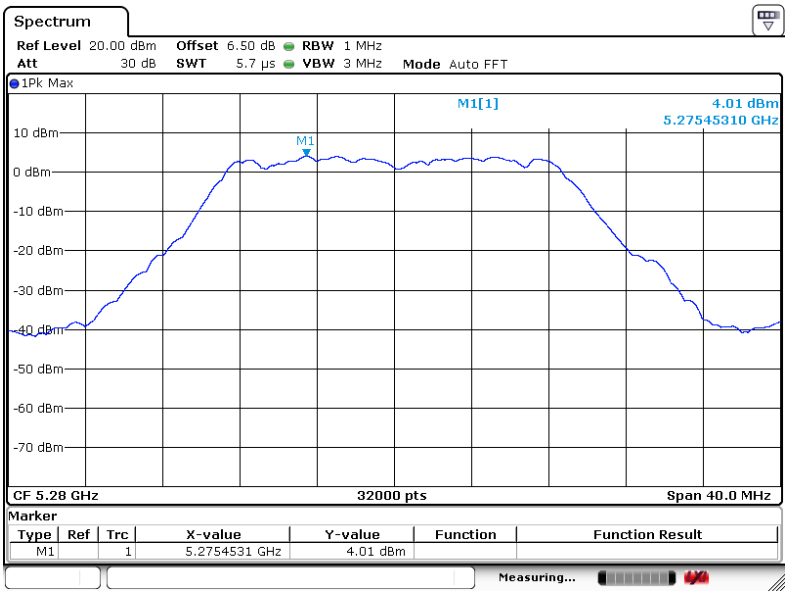

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.68 dBm
5.23545060 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2354506 GHz 3.68 dBm
Measuring...

802.11n20

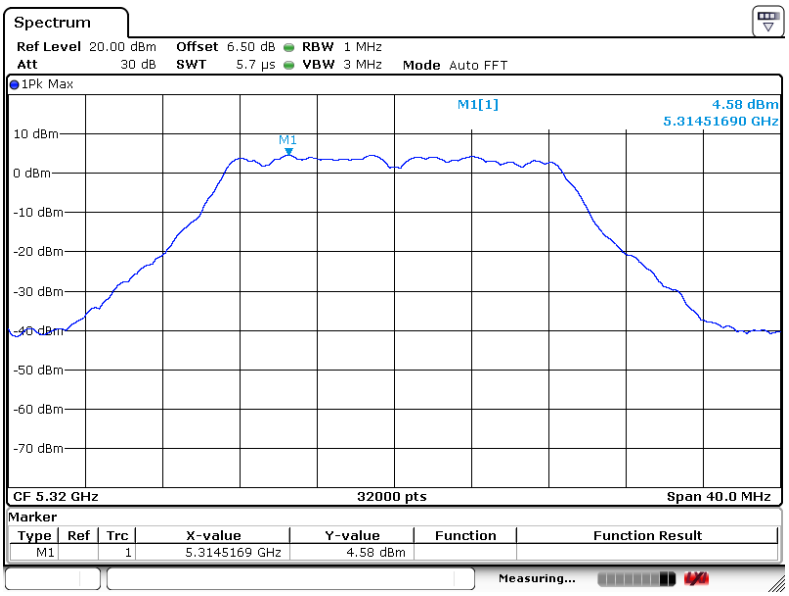
Channel: 52



Channel: 56

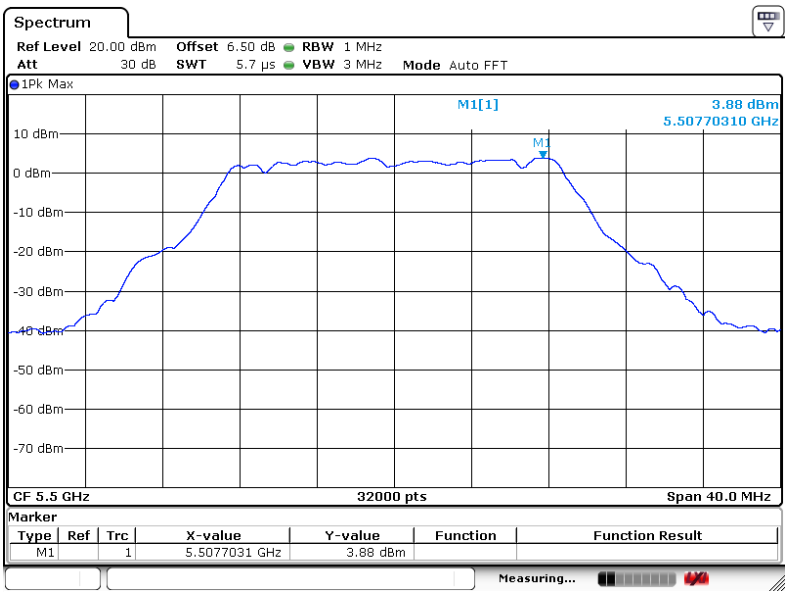


Channel: 64

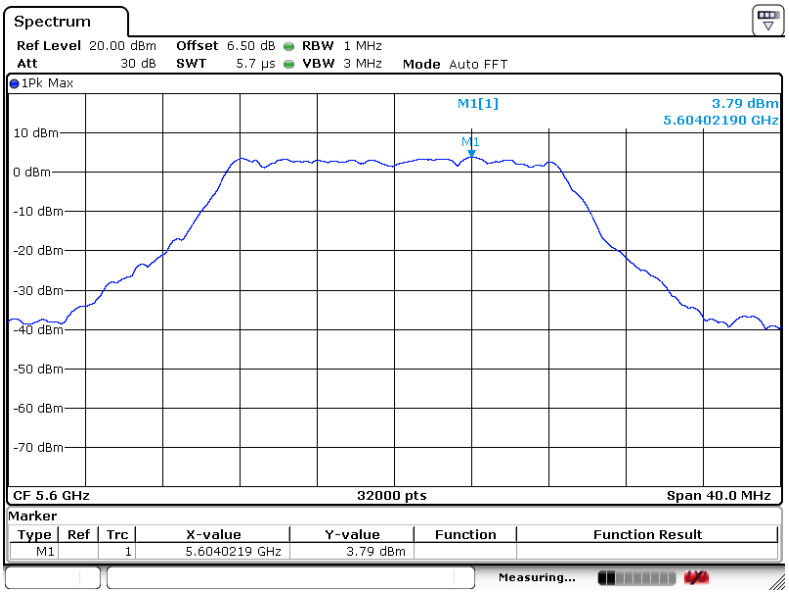

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 4.58 dBm
5.31451690 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3145169 GHz 4.58 dBm
Measuring...

802.11n20

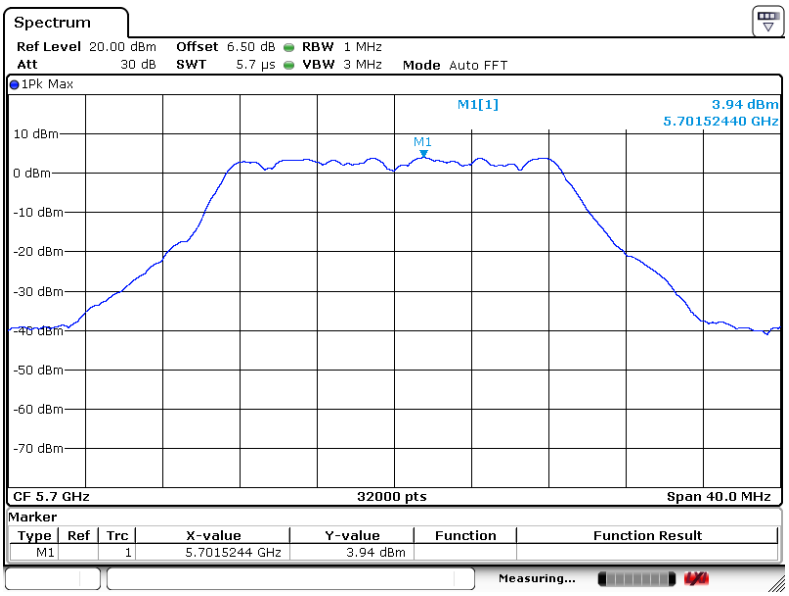
Channel: 100



Channel: 120

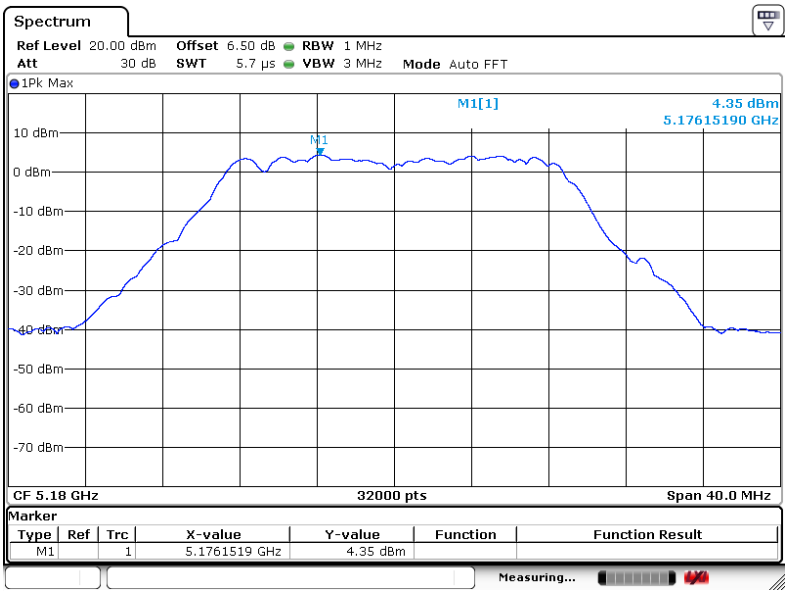


Channel: 140

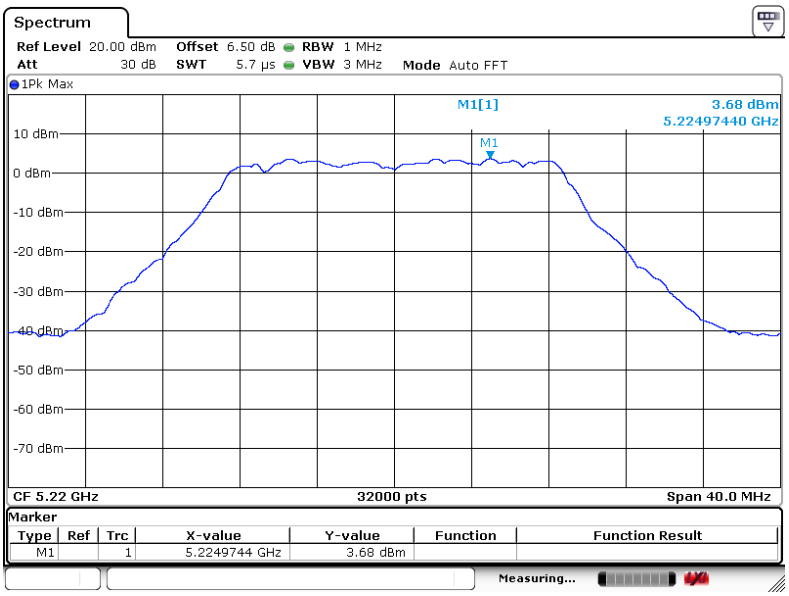

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1]
3.94 dBm
5.70152440 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7015244 GHz 3.94 dBm
Measuring...

802.11ac20

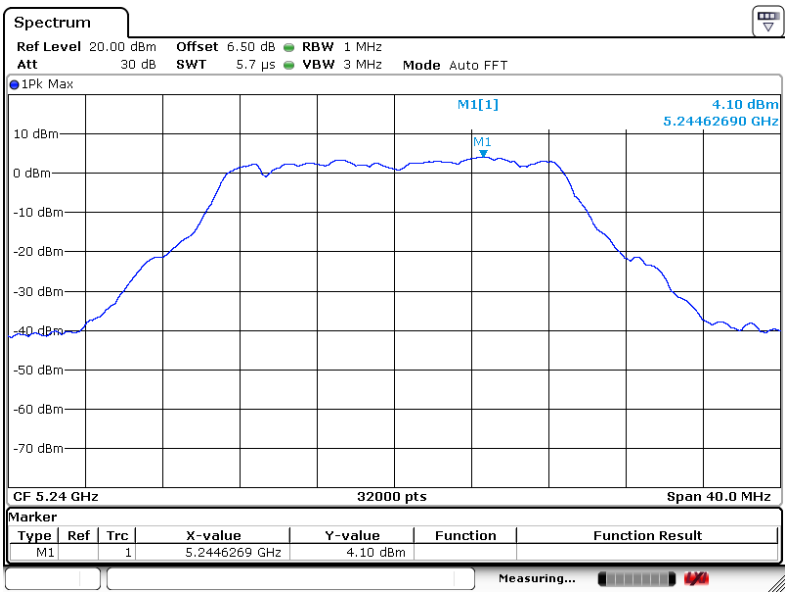
Channel: 36



Channel: 44

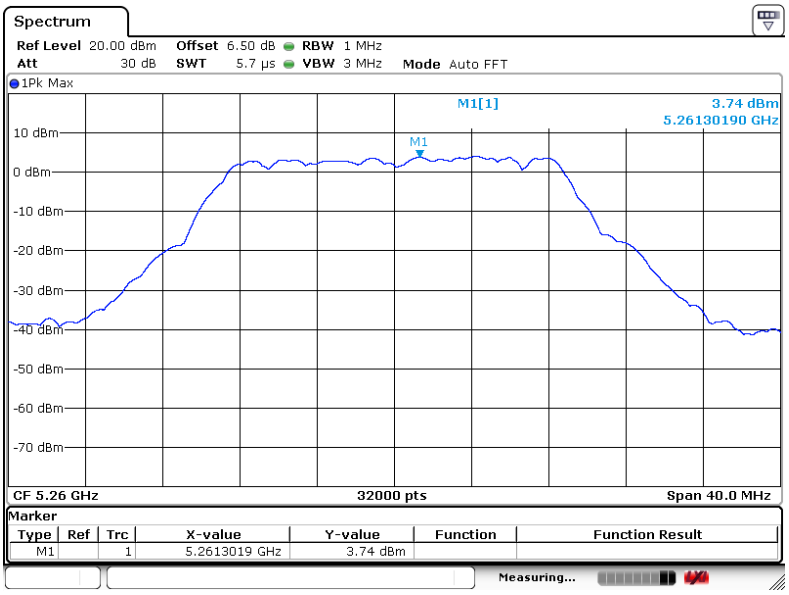


Channel: 48

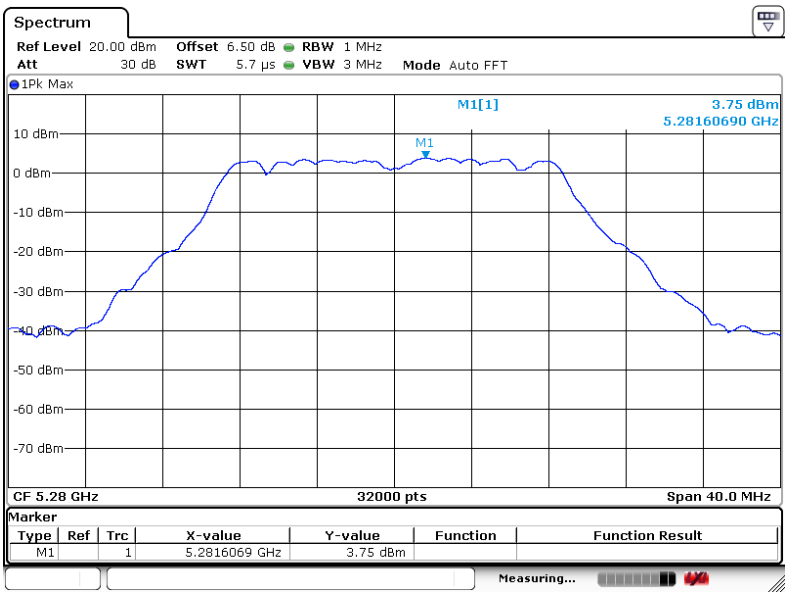

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 4.10 dBm
5.24462690 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2446269 GHz 4.10 dBm
Measuring...

802.11ac20

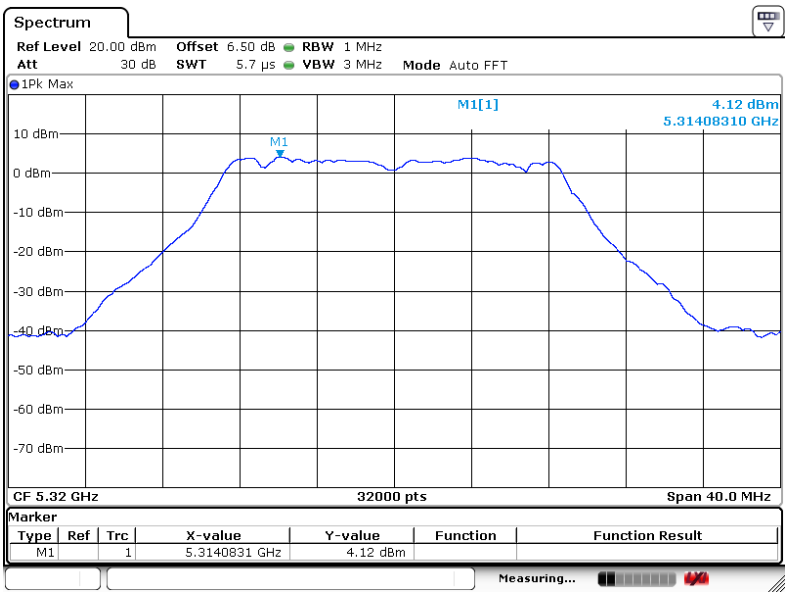
Channel: 52



Channel: 56

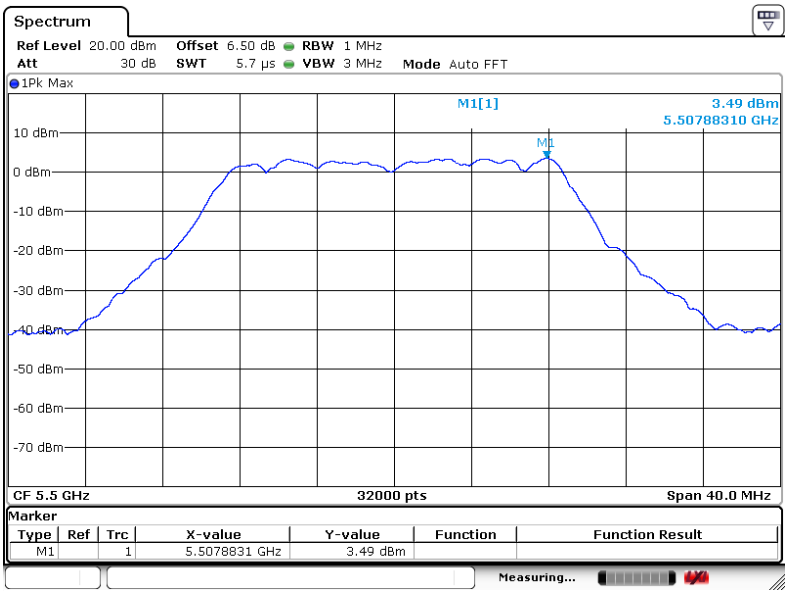


Channel: 64

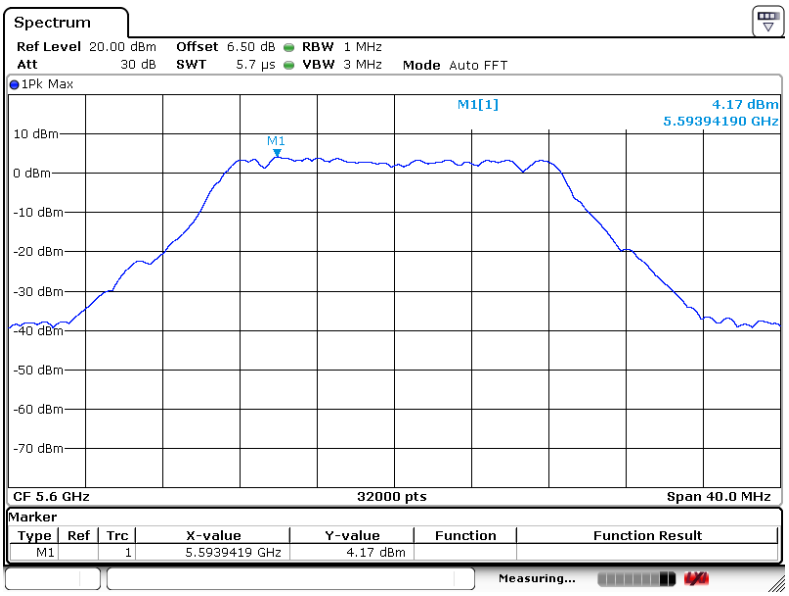

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 4.12 dBm
5.31408310 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3140831 GHz 4.12 dBm
Measuring...

802.11ac20

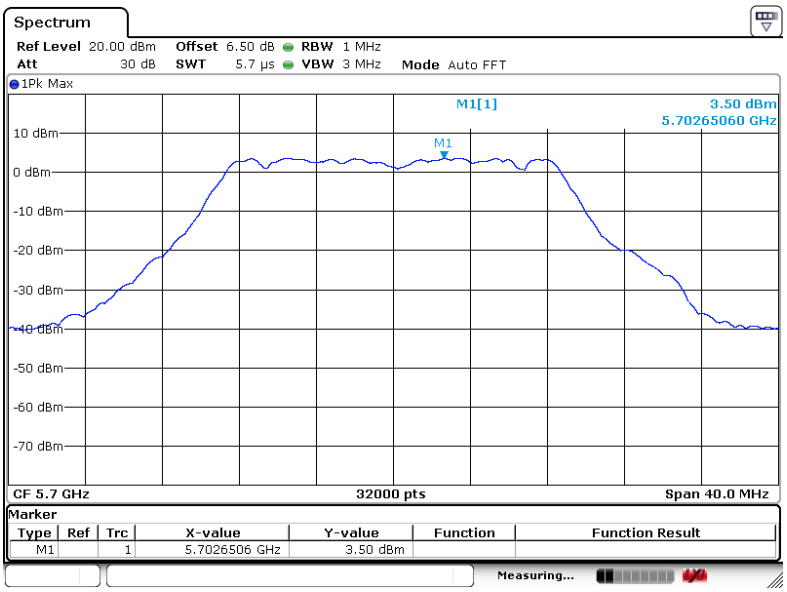
Channel: 100



Channel: 120

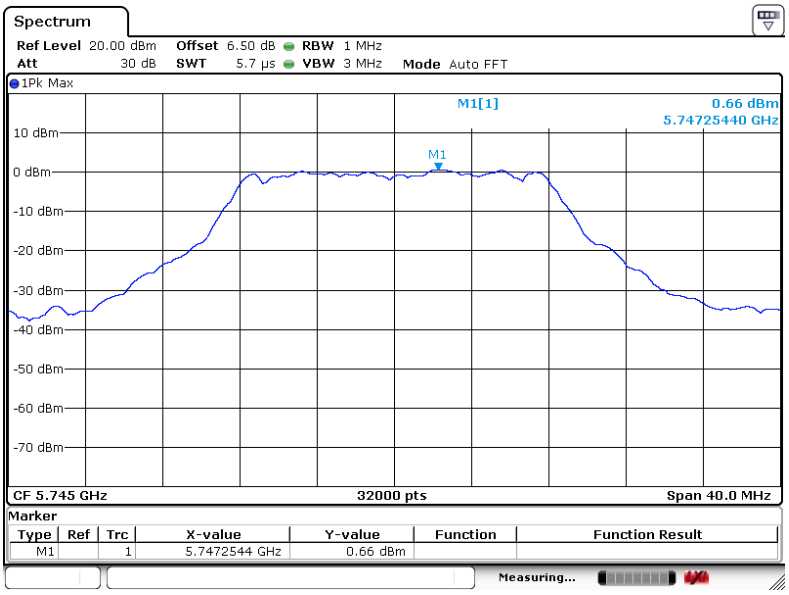


Channel: 140

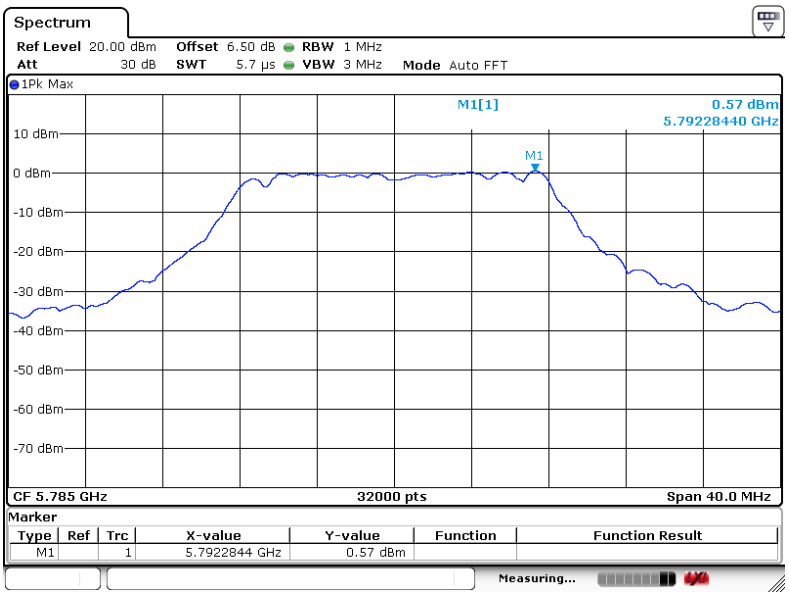

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.50 dBm
5.70265060 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7026506 GHz 3.50 dBm
Measuring...

802.11a

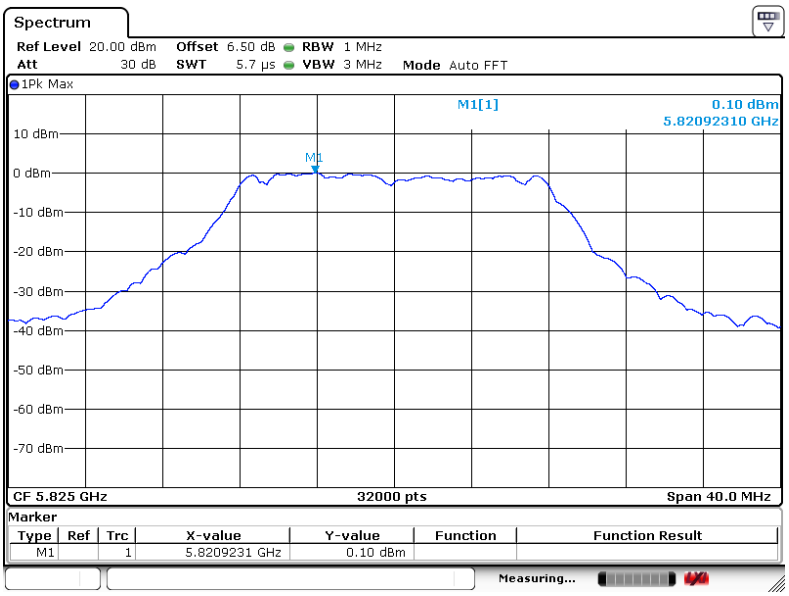
Channel: 149



Channel: 157

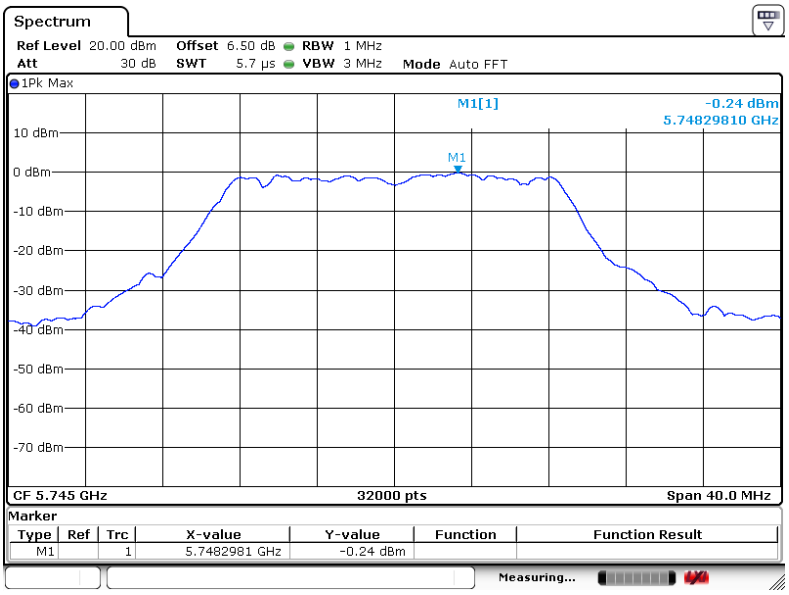


Channel: 165

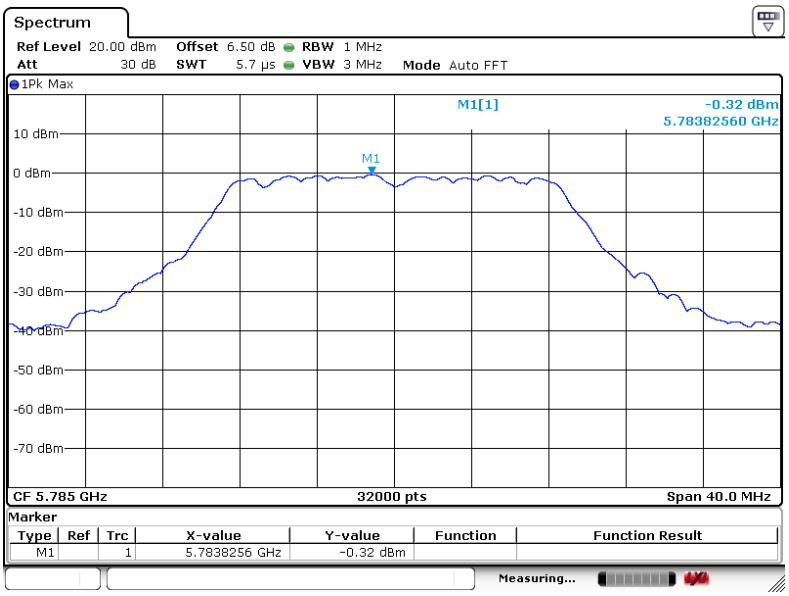

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1]
0.10 dBm
5.82092310 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8209231 GHz 0.10 dBm
Measuring...

802.11n20

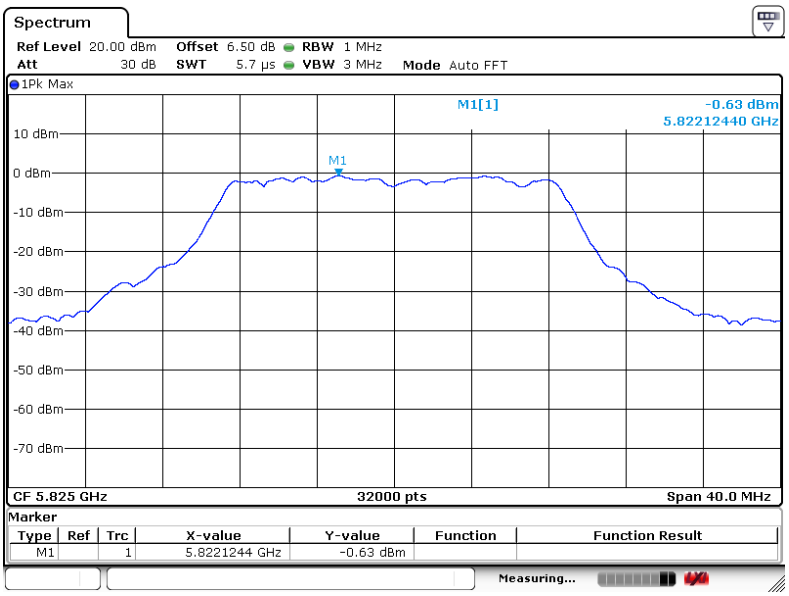
Channel: 149



Channel: 157

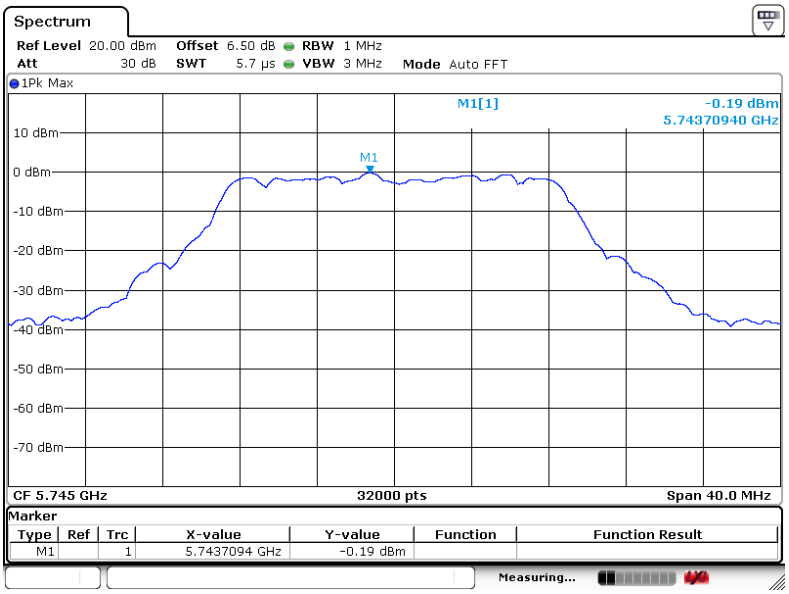


Channel: 165

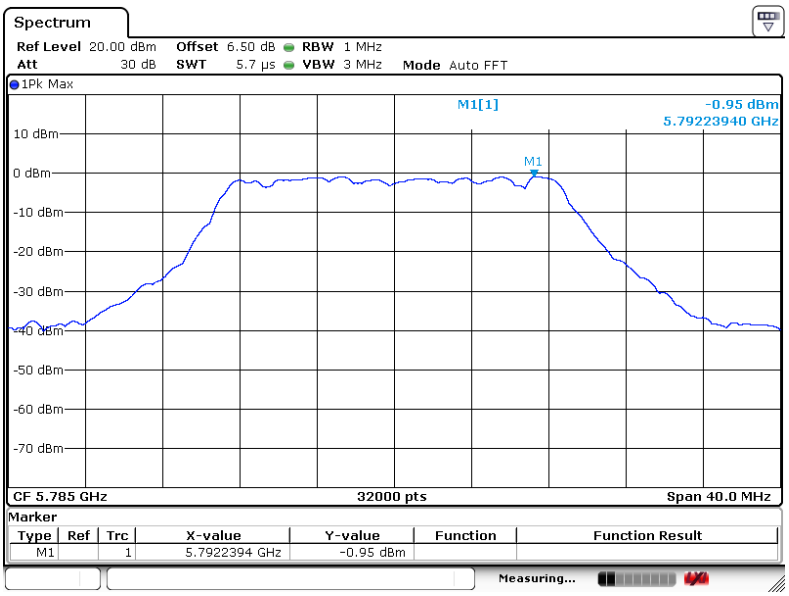

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -0.63 dBm
5.82212440 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8221244 GHz -0.63 dBm
Measuring...

802.11ac20

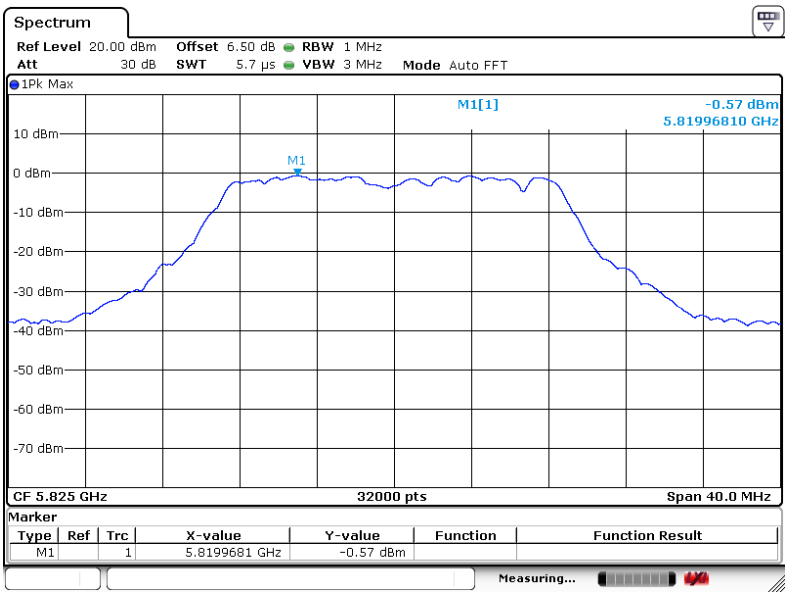
Channel: 149



Channel: 157

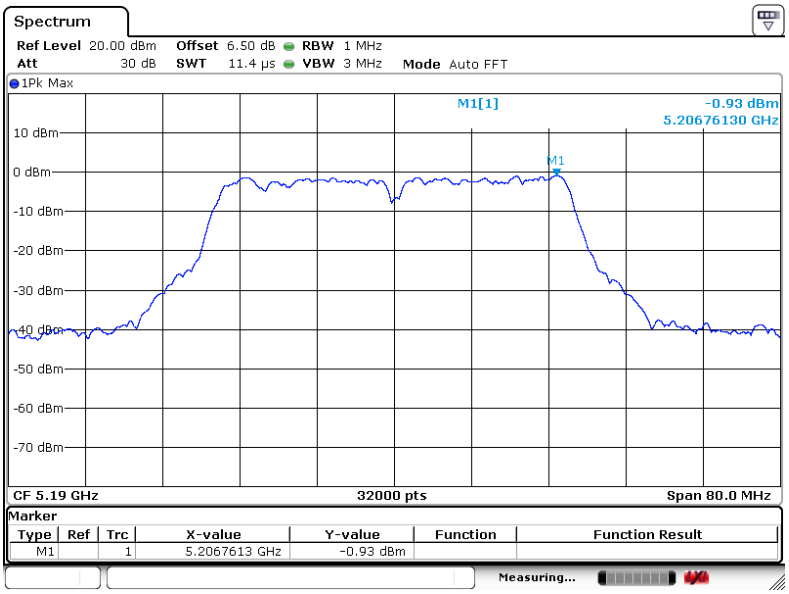


Channel: 165

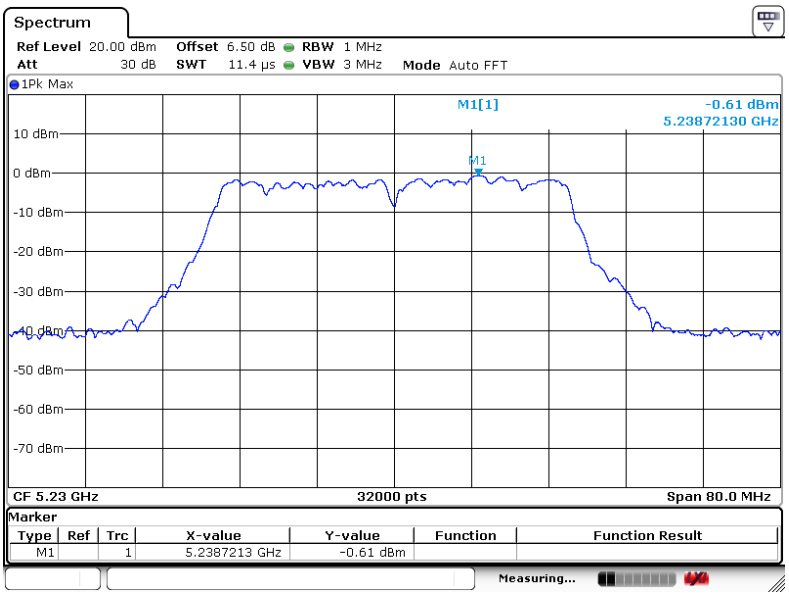

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1]
-0.57 dBm
5.81996810 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199681 GHz -0.57 dBm
Measuring...

802.11n40

Channel: 38

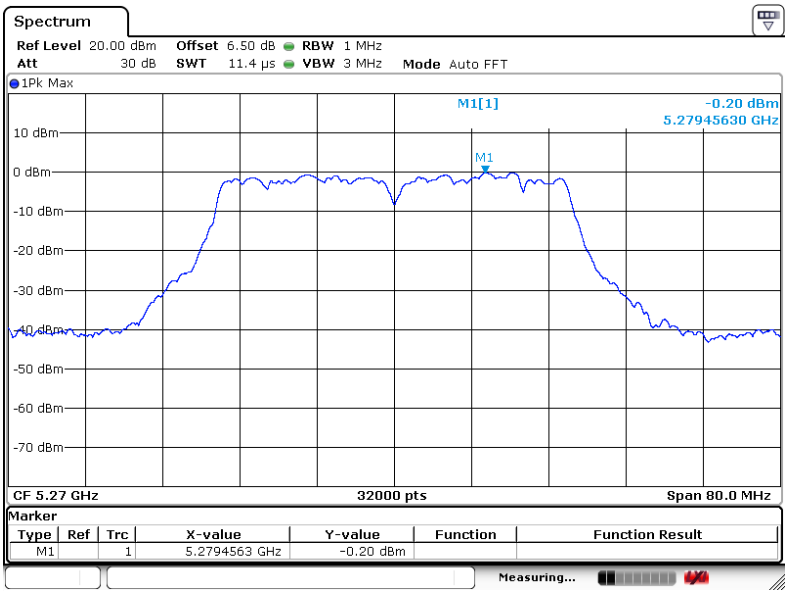


Channel: 46

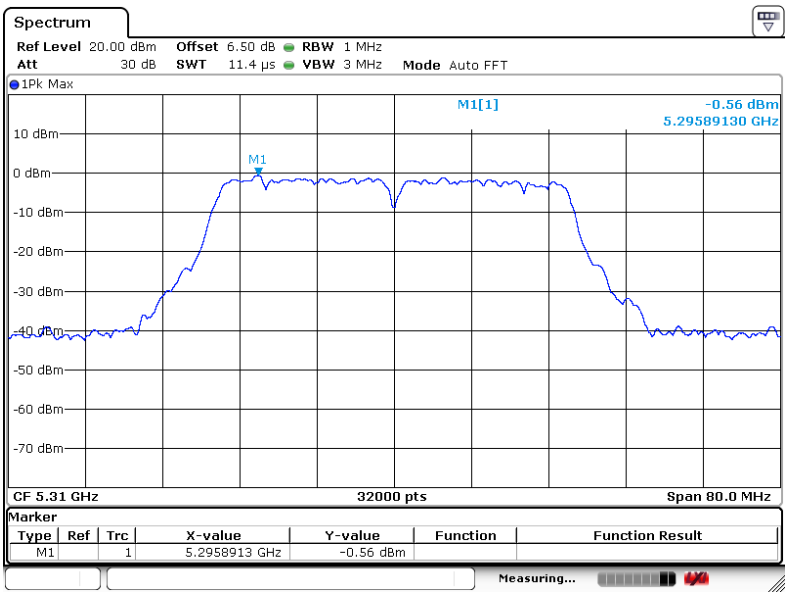


802.11n40

Channel: 54

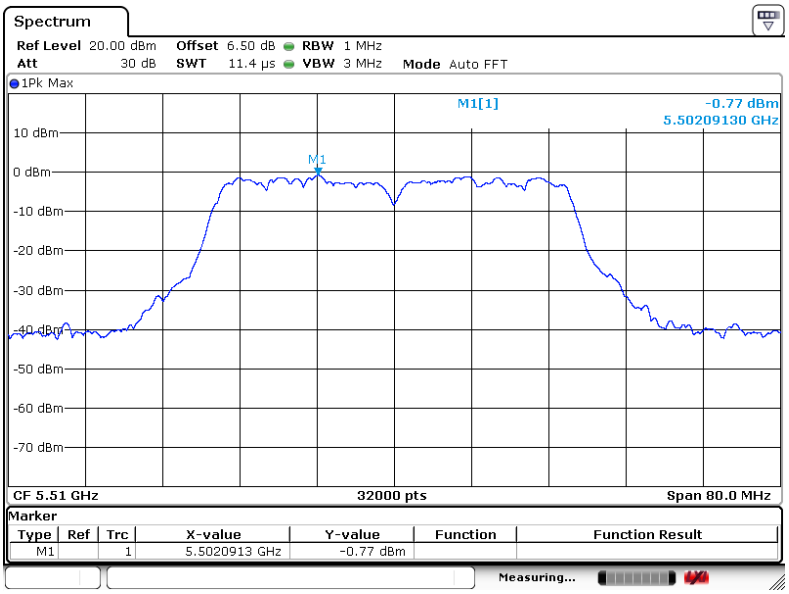


Channel: 62

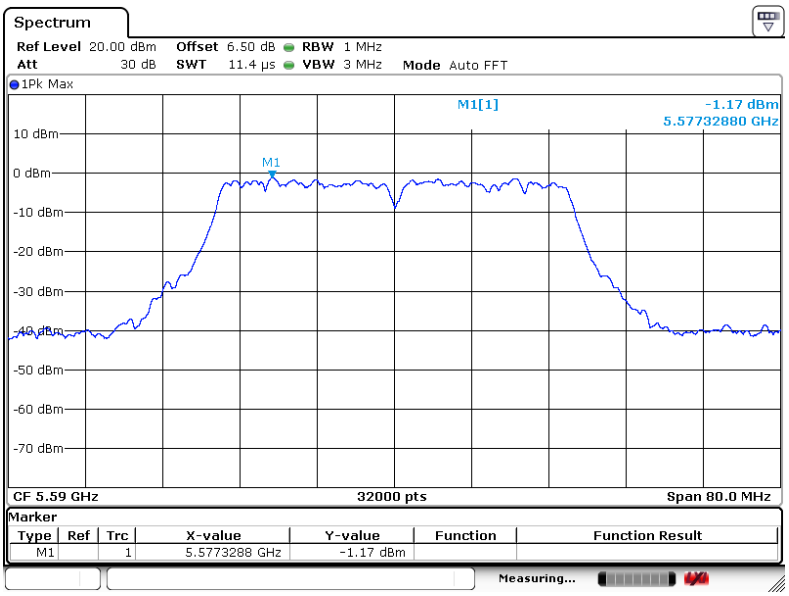


802.11n40

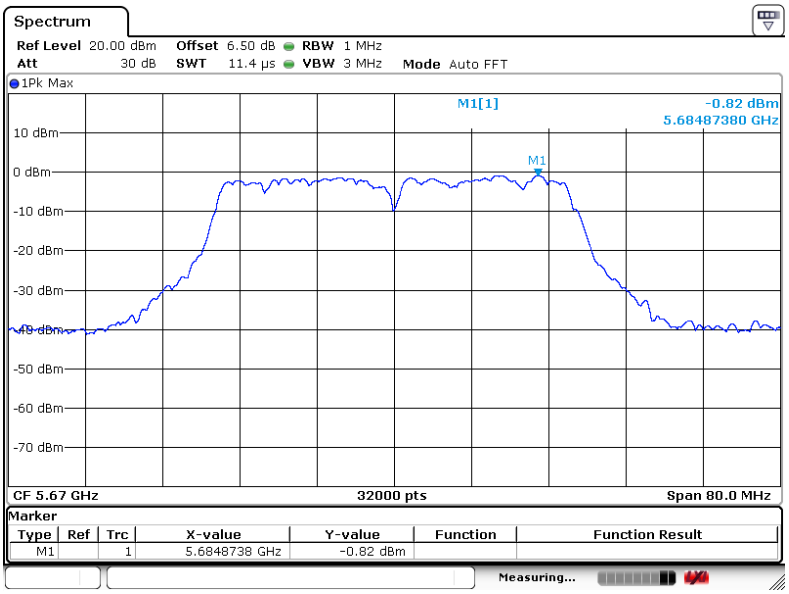
Channel: 102



Channel: 118

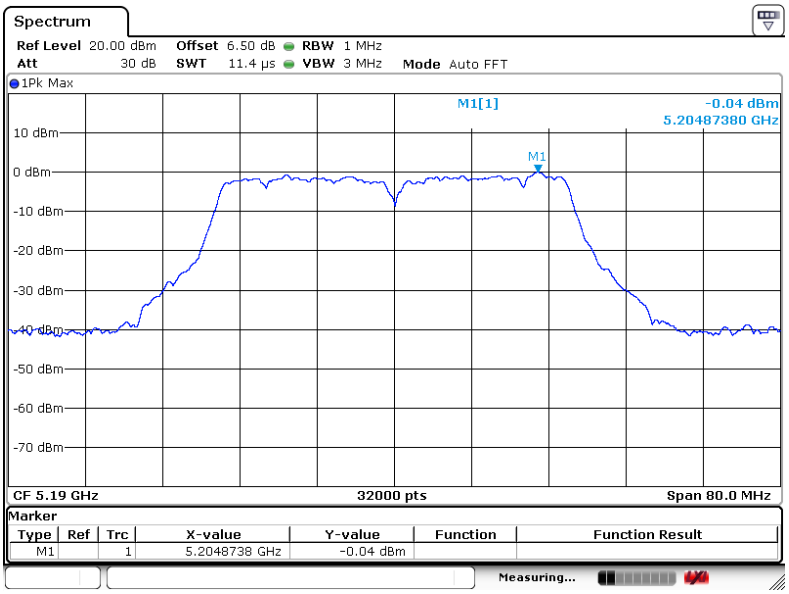


Channel: 134

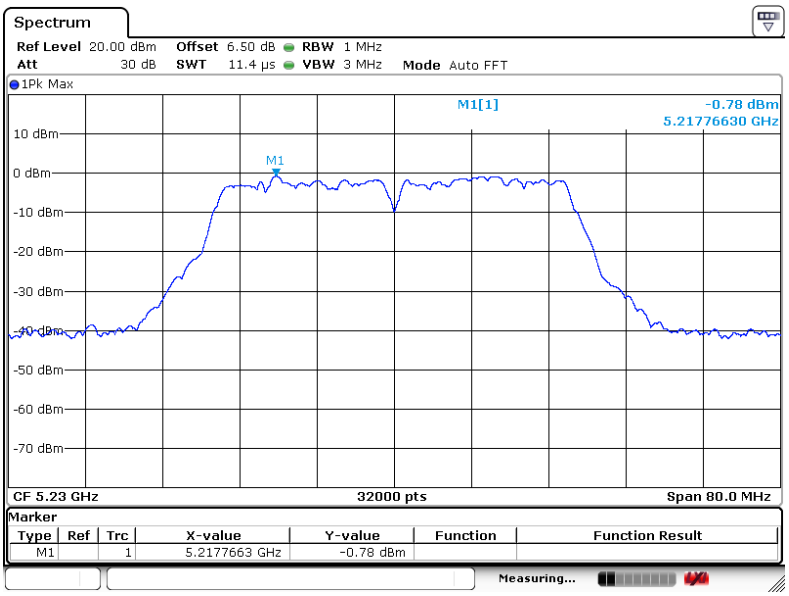

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 11.4 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -0.82 dBm
5.68487380 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.67 GHz 32000 pts Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6848738 GHz -0.82 dBm
Measuring...

802.11ac40

Channel: 38

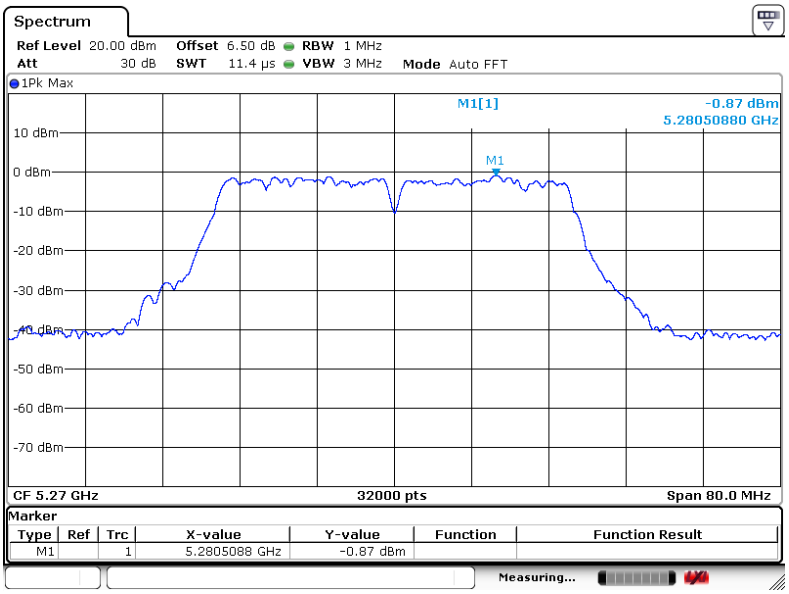


Channel: 46

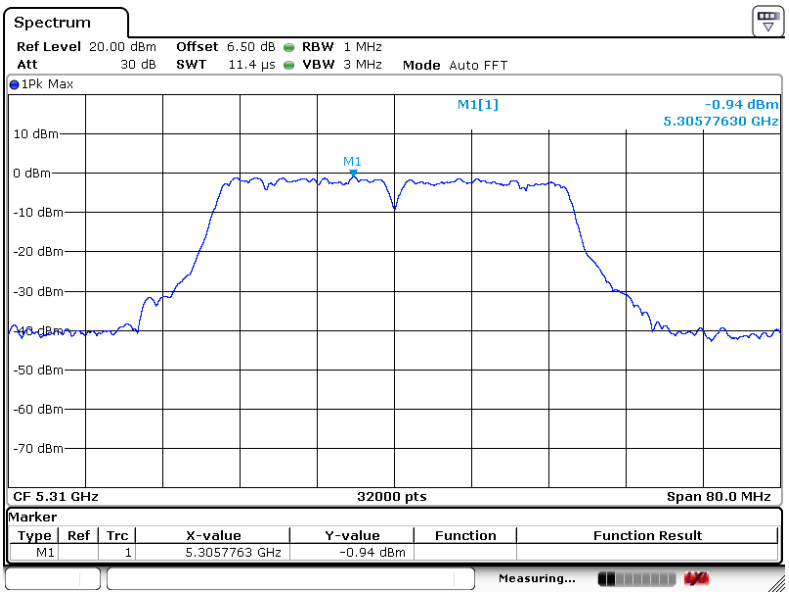


802.11ac40

Channel: 54

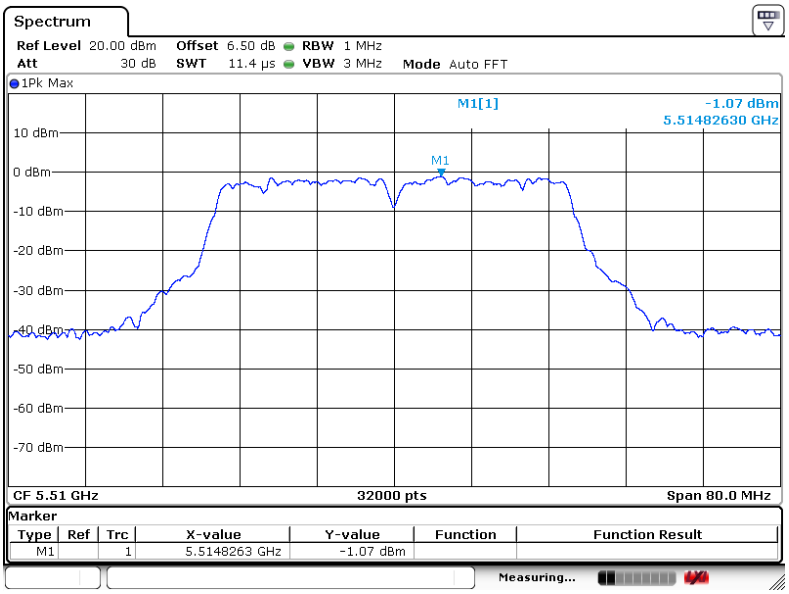


Channel: 62

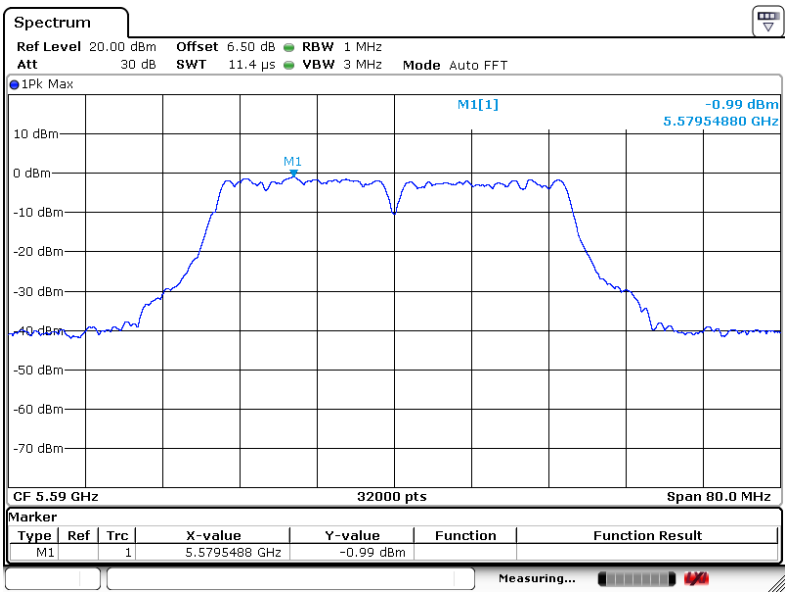


802.11ac40

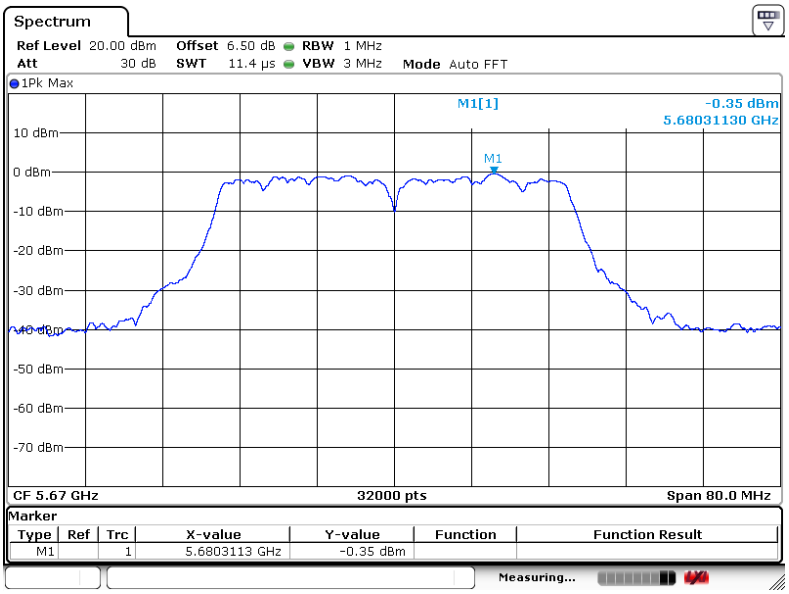
Channel: 102



Channel: 118

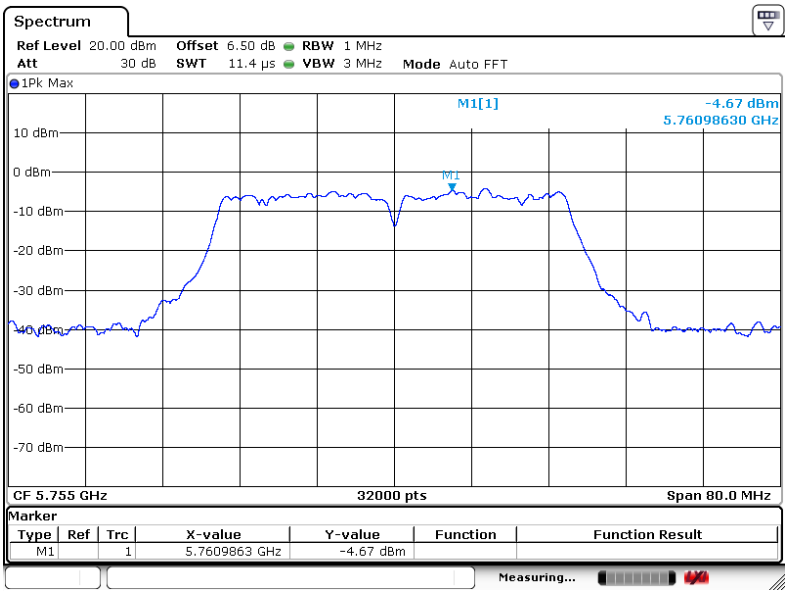


Channel: 134

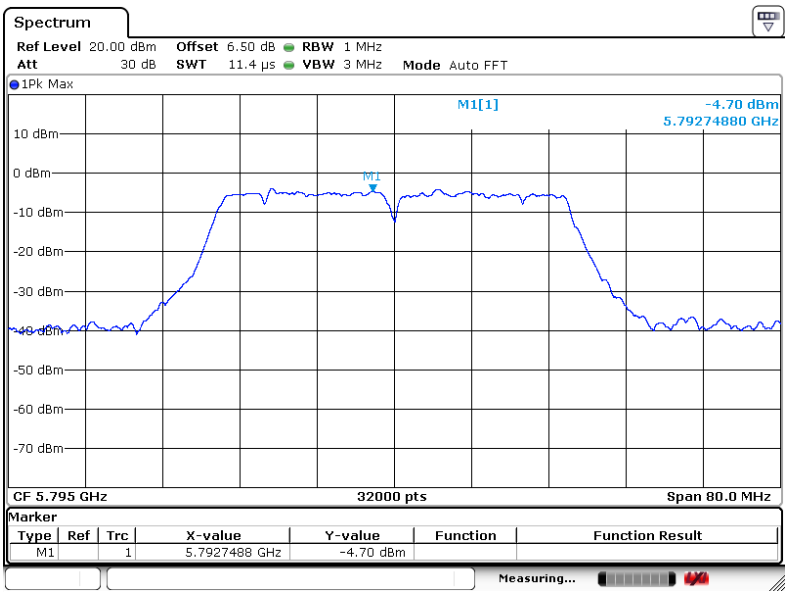

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 11.4 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -0.35 dBm
5.68031130 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.67 GHz 32000 pts Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6803113 GHz -0.35 dBm
Measuring...

802.11n40

Channel: 151

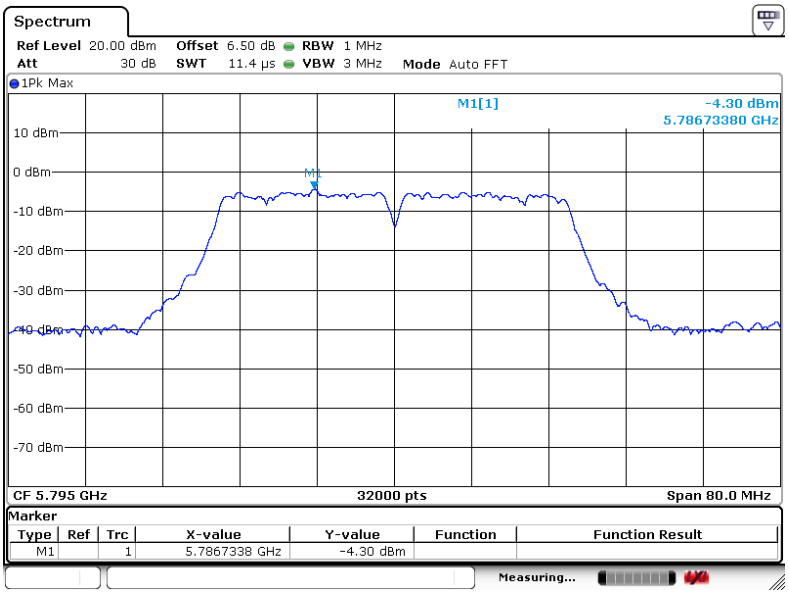


Channel: 159

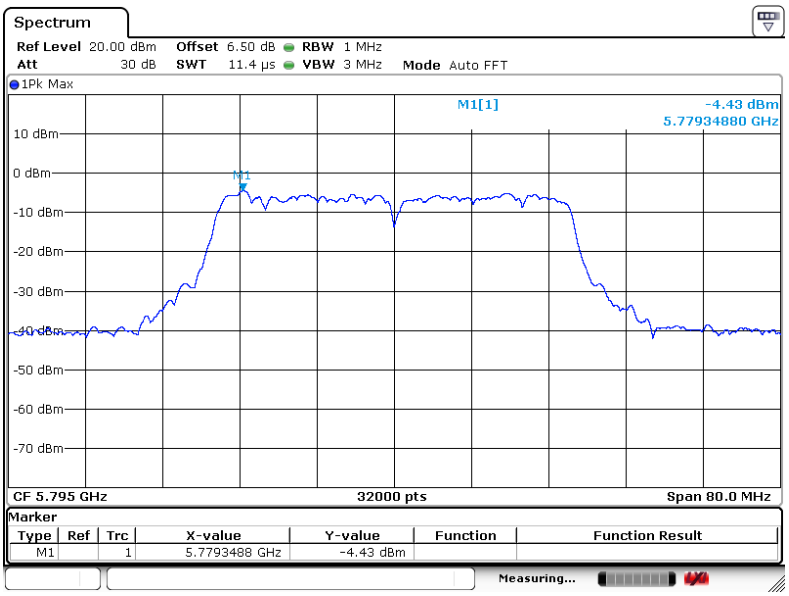


802.11ac40

Channel: 151

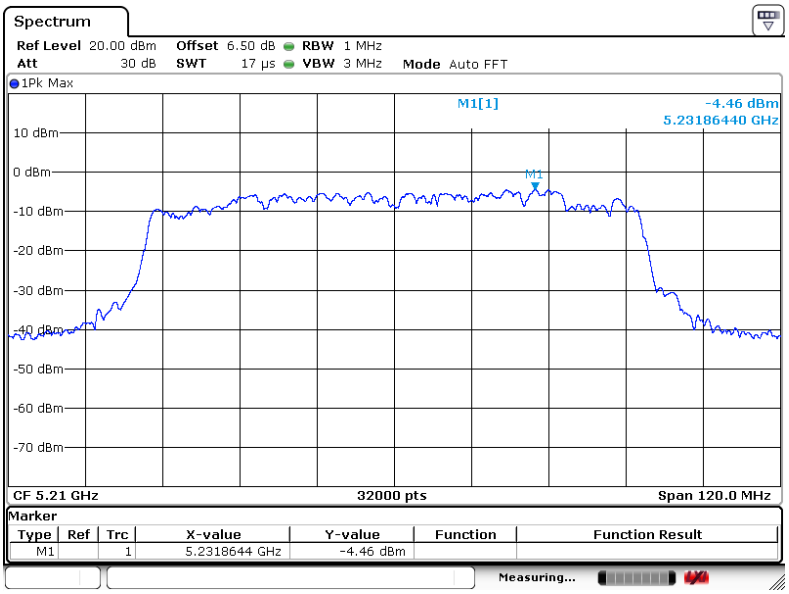


Channel: 159

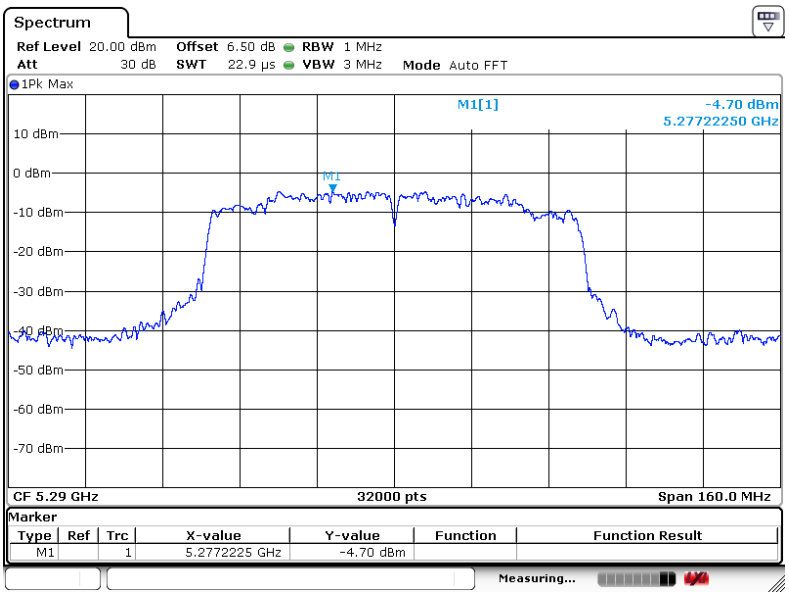


802.11ac80

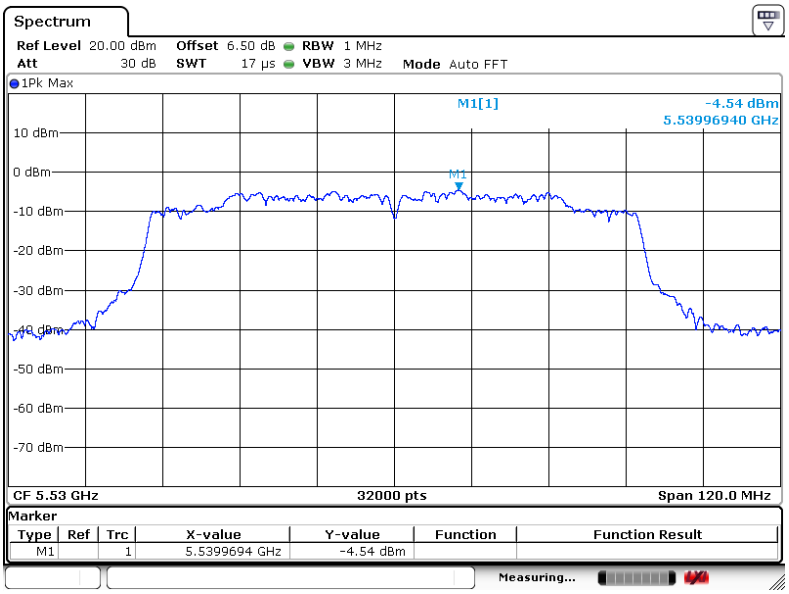
Channel:42



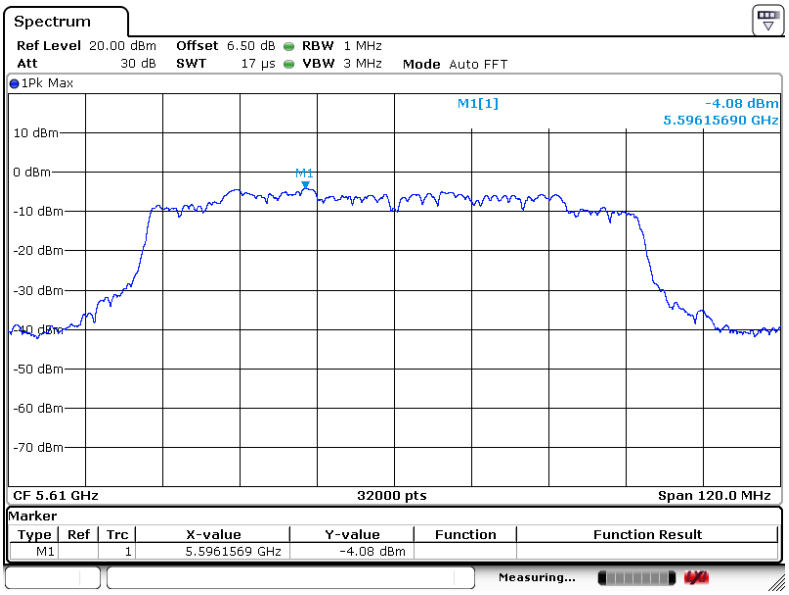
Channel: 58



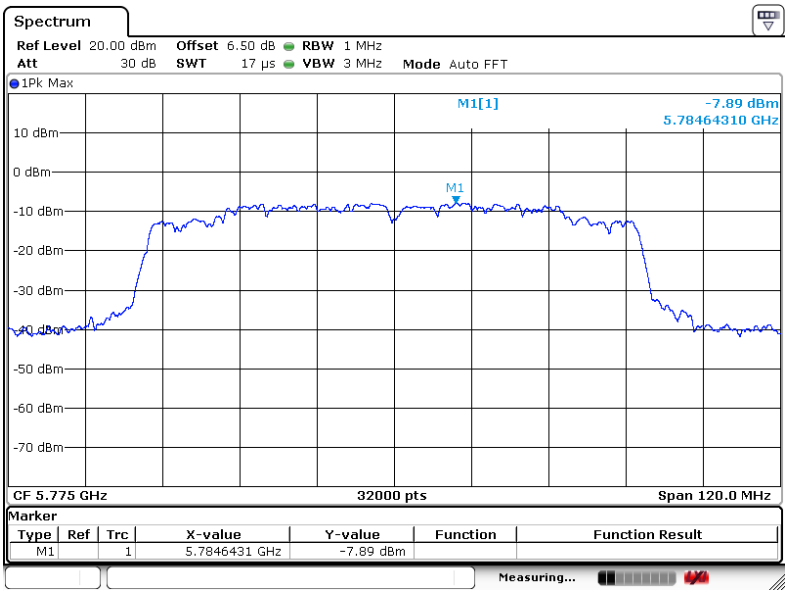
Channel:106



Channel: 122



Channel: 155

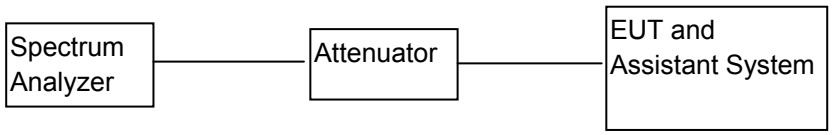

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 17 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -7.89 dBm
5.78464310 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.775 GHz
32000 pts
Span 120.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7846431 GHz -7.89 dBm
Measuring...

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	2020/12/17	1 Year
3	RF Cable	Micable	C10-01-01-1	100309	2020/12/17	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	23.50	24.79	24.18	16.56	17.77	17.77
44	5220.00	23.93	24.34	24.22	16.68	17.75	17.73
48	5240.00	23.40	24.11	23.96	16.64	17.76	17.72
52	5260.00	23.34	24.51	24.14	16.59	17.77	17.75
56	5280.00	23.34	23.74	24.01	16.56	17.72	17.76
64	5320.00	23.82	24.38	23.90	16.64	17.76	17.75
100	5500.00	23.74	23.91	24.08	16.62	17.75	17.72
120	5600.00	23.99	24.04	24.63	16.63	17.75	17.75
140	5700.00	24.03	24.47	24.82	16.63	17.77	17.74
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	16.33	17.57	17.58	16.67	17.79	17.76
157	5785.00	16.33	17.57	17.58	16.64	17.75	17.77
165	5825.00	16.33	17.57	17.56	16.67	17.79	17.77

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	44.23	45.25	36.24	36.24
46	5230.00	45.19	44.51	36.26	36.25
54	5270.00	44.85	43.97	36.24	36.23
62	5310.00	43.72	43.08	36.18	36.19
102	5510.00	44.33	44.44	36.25	36.23
118	5590.00	44.40	44.71	36.26	36.23
134	5670.00	44.64	45.29	36.26	36.26
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	36.31	36.32	36.26	36.27
159	5795.00	36.32	36.29	36.24	36.24

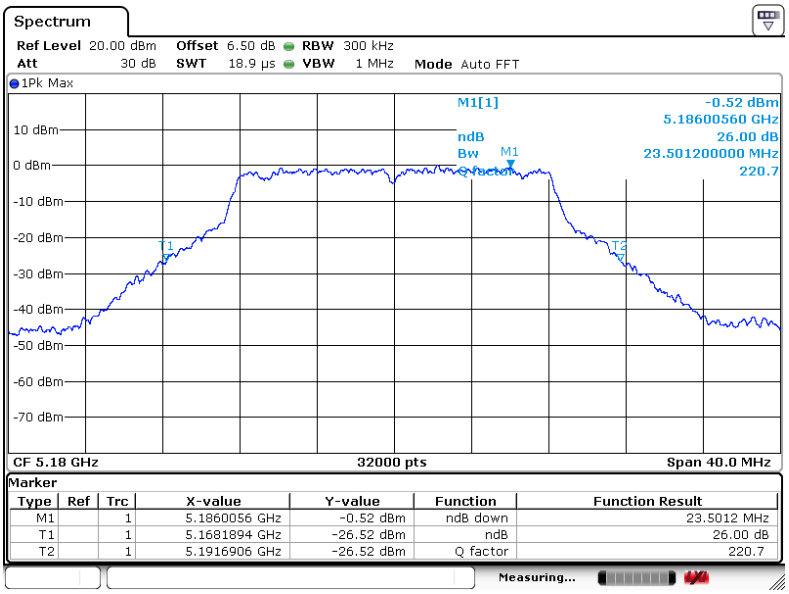
CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
		802.11ac(VHT80)	802.11ac(VHT80)
42	5210	83.85	75.15
58	5290	84.08	74.95
106	5530	83.83	74.98
122	5610	84.86	75.10
CH. No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz) 802.11ac(VHT80)	99% Occupied Bandwidth (MHz) 802.11ac(VHT80)
155	5775	75.07	75.00

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

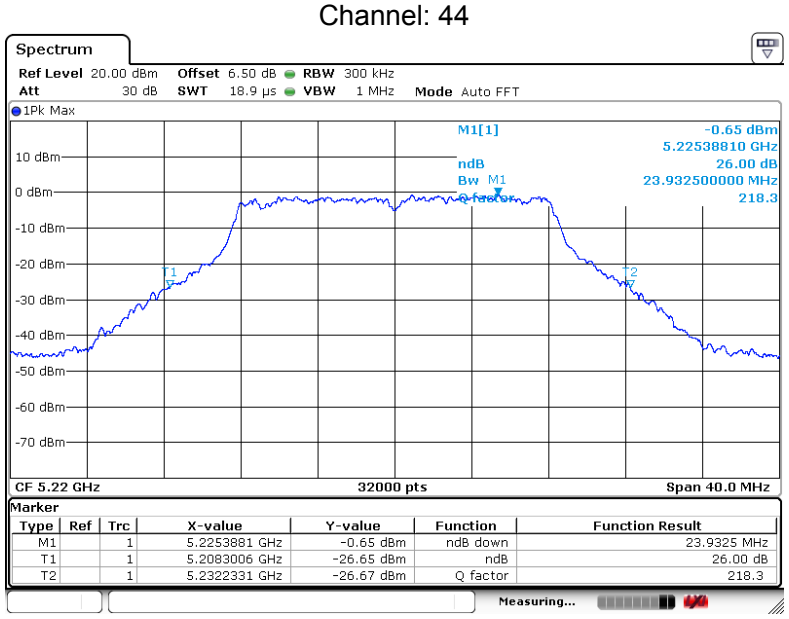
Test plots as followed: Antenna A

26dB BW 802.11a

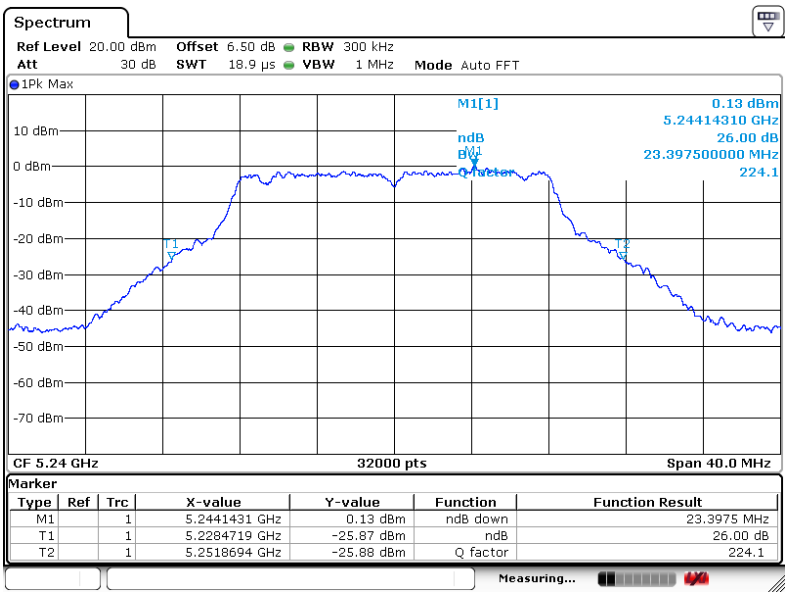
Channel: 36



Channel: 44

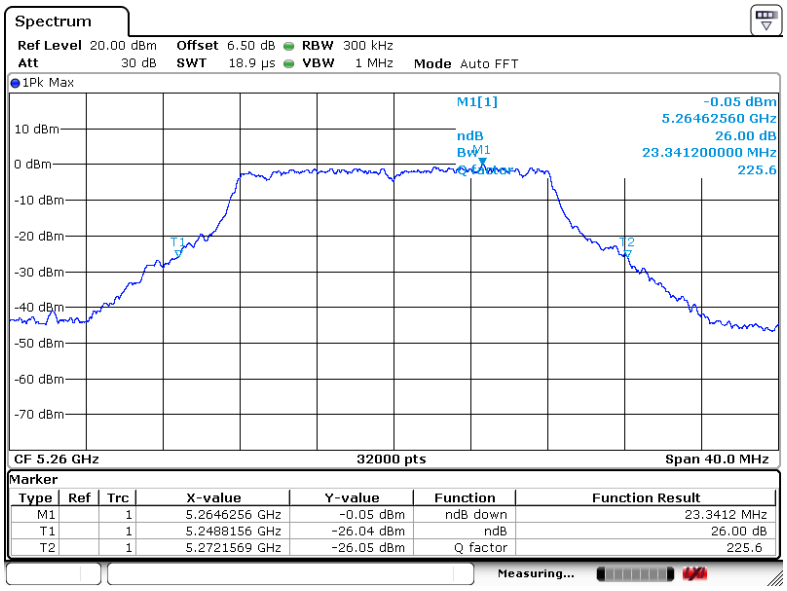


Channel: 48

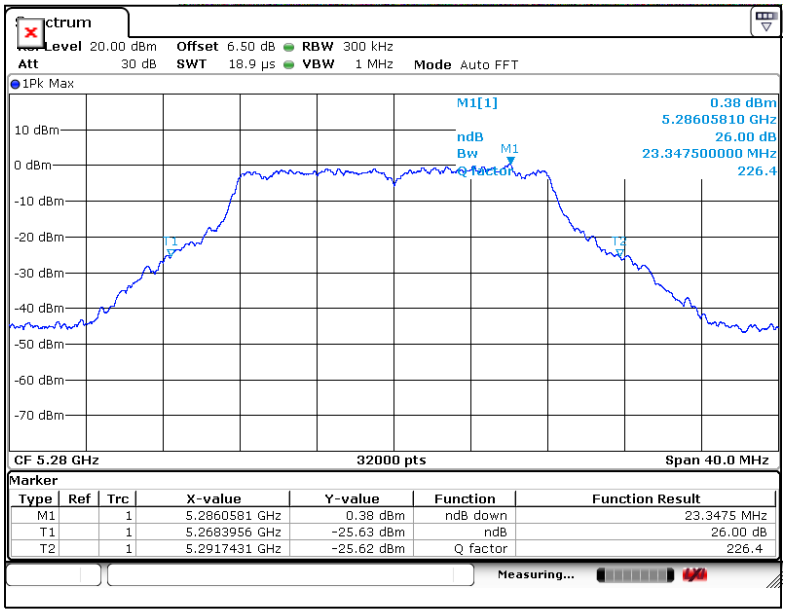

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1]
0.13 dBm
5.24414310 GHz
ndB 26.00 dB
BW1 23.397500000 MHz
Q-Factor 224.1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2441431 GHz 0.13 dBm ndB down 23.3975 MHz
T1 1 5.2284719 GHz -25.87 dBm ndB 26.00 dB
T2 1 5.2518694 GHz -25.88 dBm Q factor 224.1
Measuring...

26dB BW 802.11a

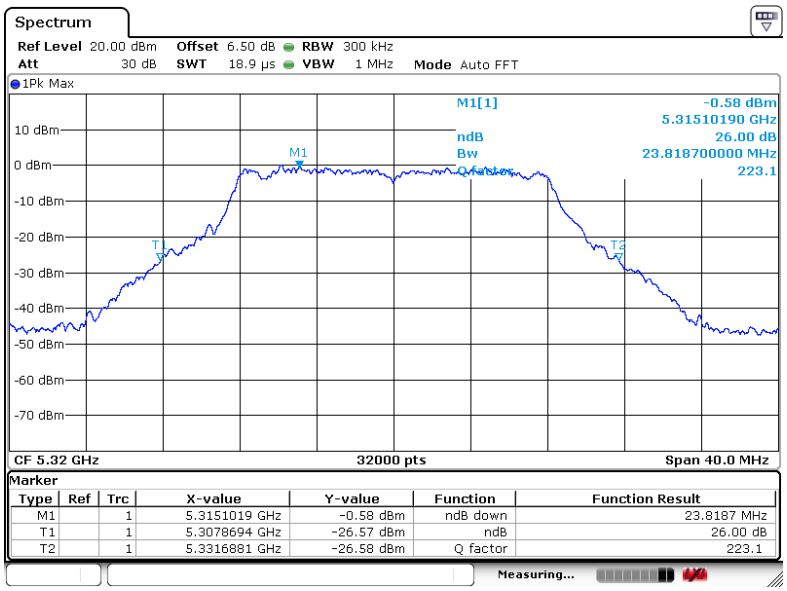
Channel: 52



Channel: 56

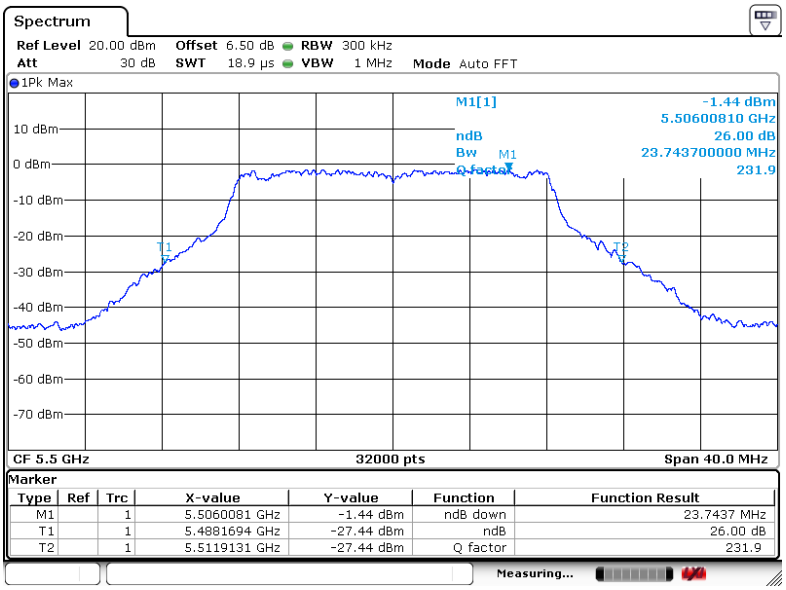


Channel: 64

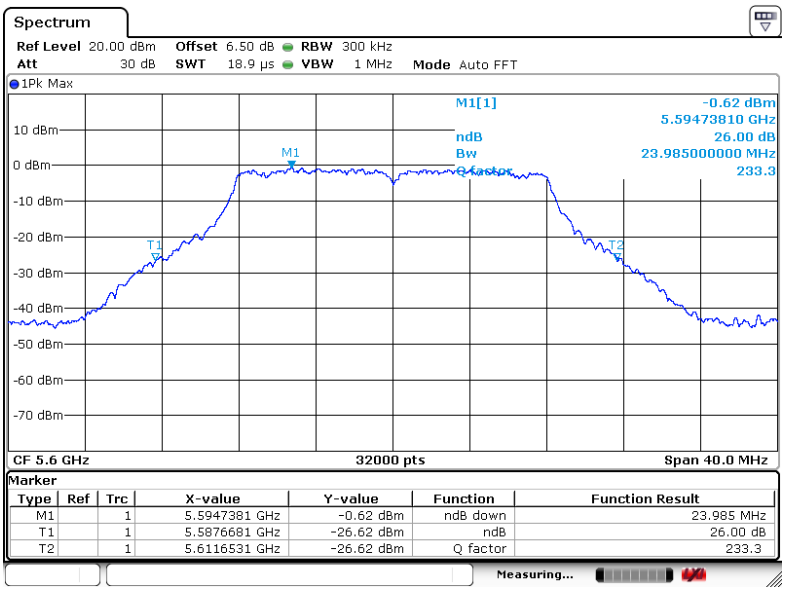

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -0.58 dBm
5.31510190 GHz
ndB 26.00 dB
Bw 23.818700000 MHz
Q factor 223.1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3151019 GHz -0.58 dBm ndB down 23.8187 MHz
T1 1 5.3078694 GHz -26.57 dBm ndB 26.00 dB
T2 1 5.3316881 GHz -26.58 dBm Q factor 223.1
Measuring...

26dB BW 802.11a

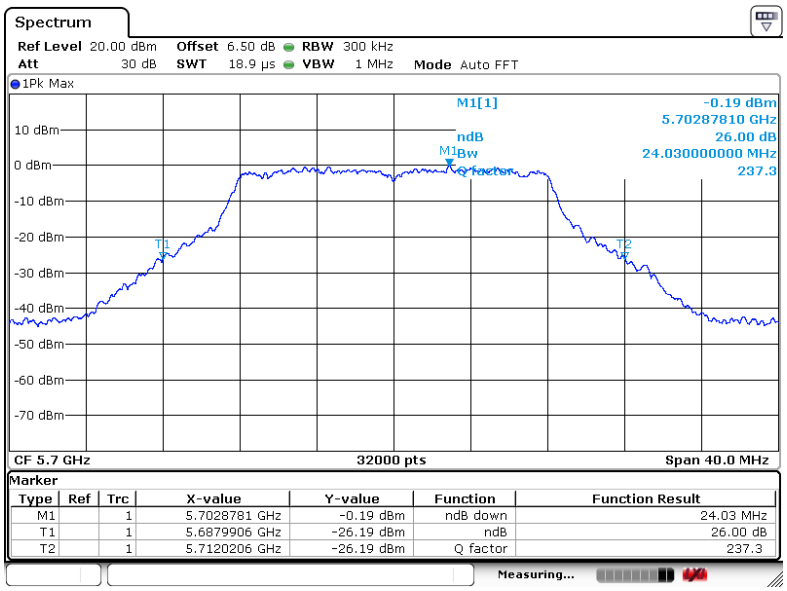
Channel: 100



Channel: 120

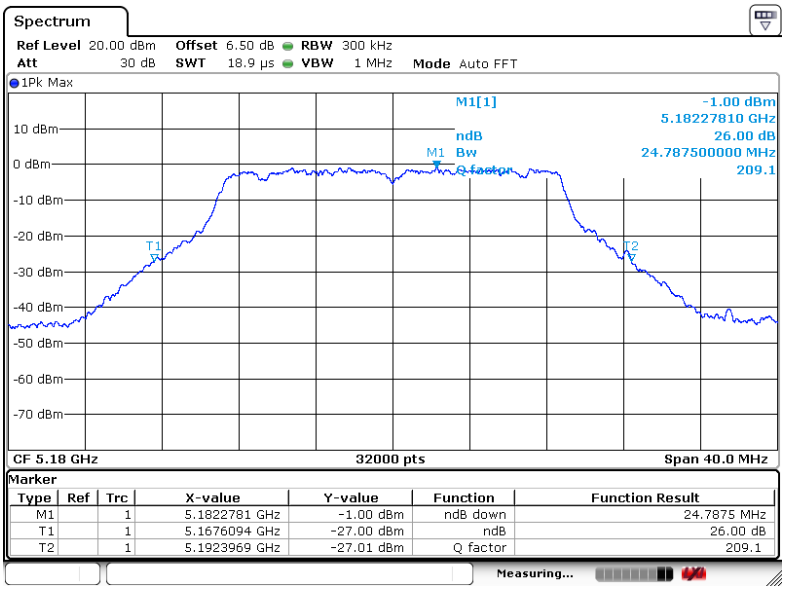


Channel: 140

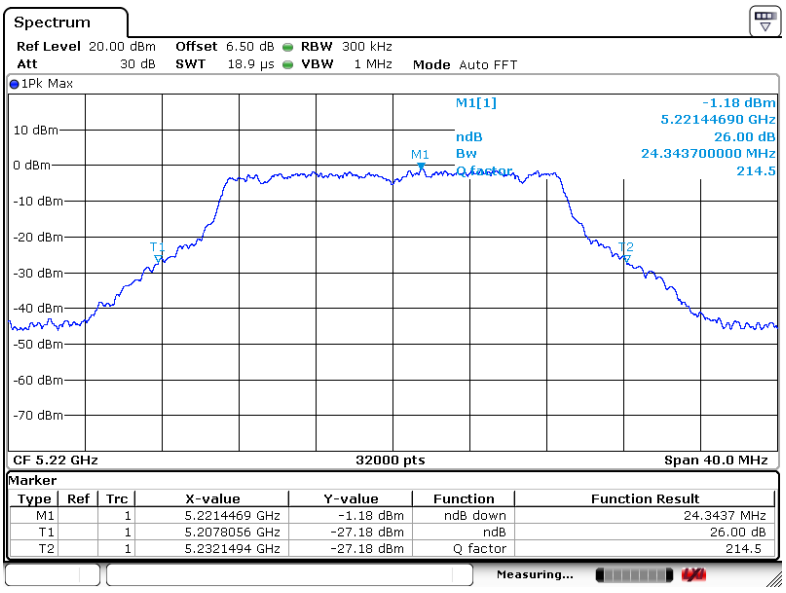

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1]
-0.19 dBm
5.70287810 GHz
ndB 26.00 dB
Bw 24.030000000 MHz
Q factor 237.3
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7028781 GHz -0.19 dBm ndB down 24.03 MHz
T1 1 5.6879906 GHz -26.19 dBm ndB 26.00 dB
T2 1 5.7120206 GHz -26.19 dBm Q factor 237.3
Measuring...

26dB BW 802.11n20

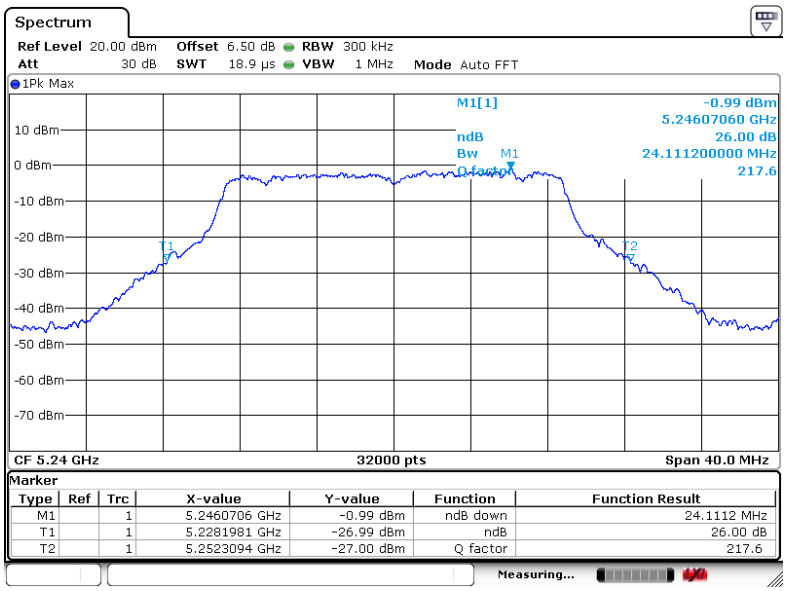
Channel: 36



Channel: 44

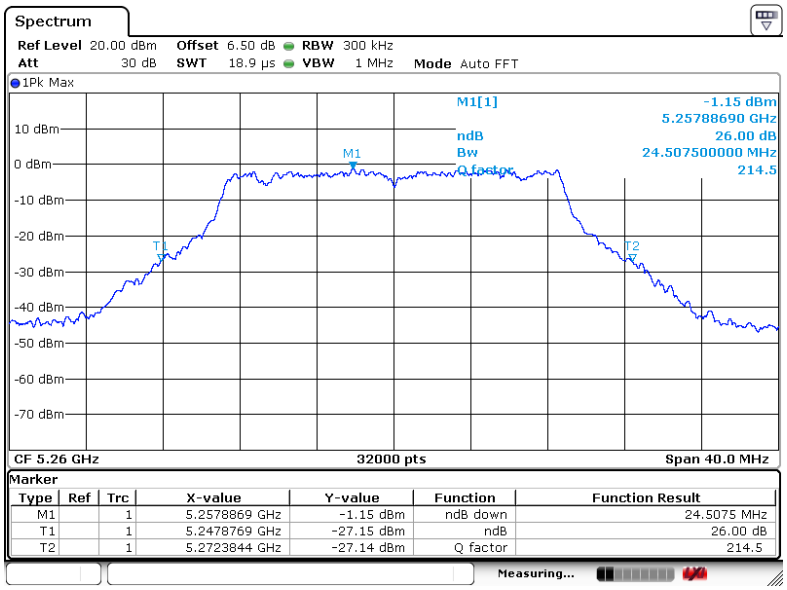


Channel: 48

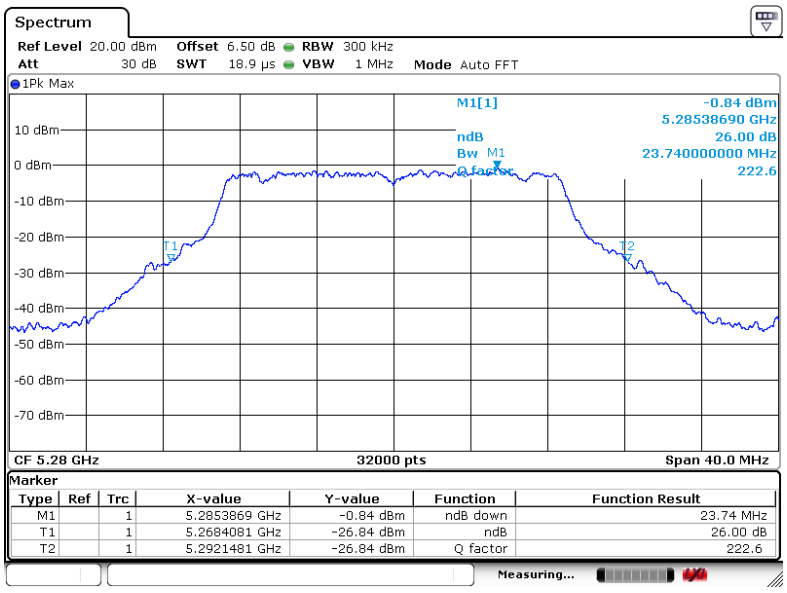

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -0.99 dBm
5.24607060 GHz
ndB 26.00 dB
Bw M1 24.111200000 MHz
Q factor 217.6
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2460706 GHz -0.99 dBm ndB down 24.1112 MHz
T1 1 5.2281981 GHz -26.99 dBm ndB 26.00 dB
T2 1 5.2523094 GHz -27.00 dBm Q factor 217.6
Measuring...

26dB BW 802.11n20

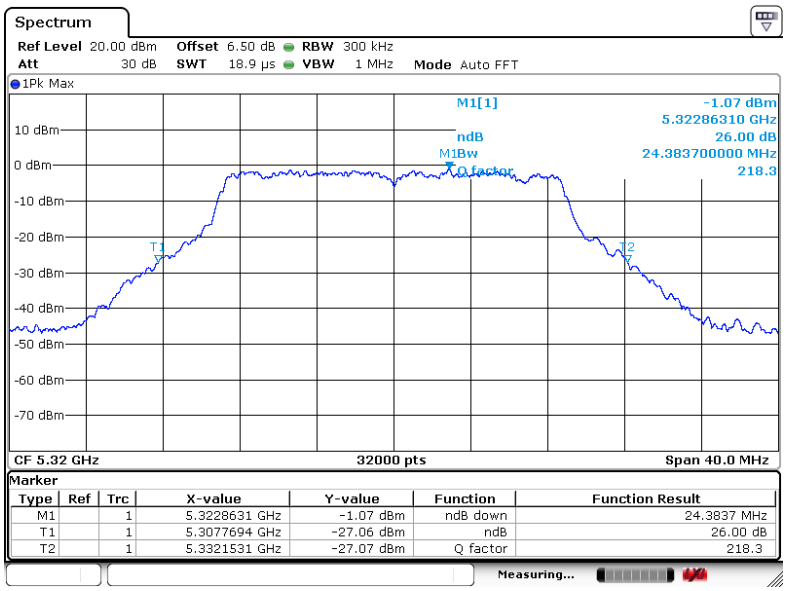
Channel: 52



Channel: 56

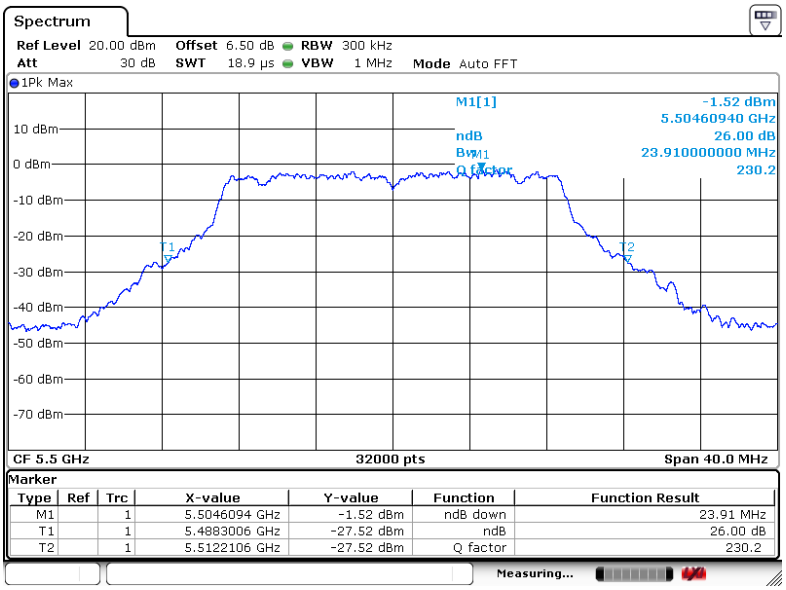


Channel: 64

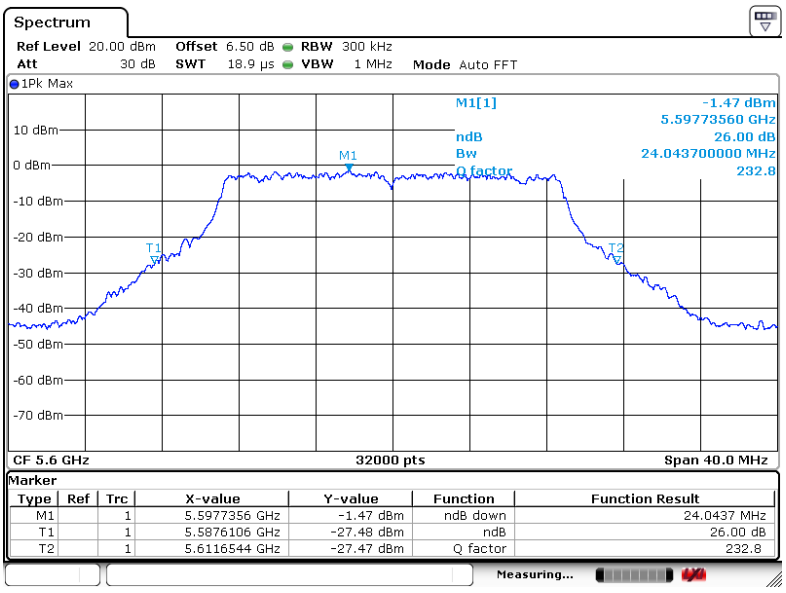

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1]
-1.07 dBm
5.32286310 GHz
ndB
26.00 dB
M1Bw
24.383700000 MHz
Q factor
218.3
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3228631 GHz -1.07 dBm ndB down 24.3837 MHz
T1 1 5.3077694 GHz -27.06 dBm ndB 26.00 dB
T2 1 5.3321531 GHz -27.07 dBm Q factor 218.3
Measuring...

26dB BW 802.11n20

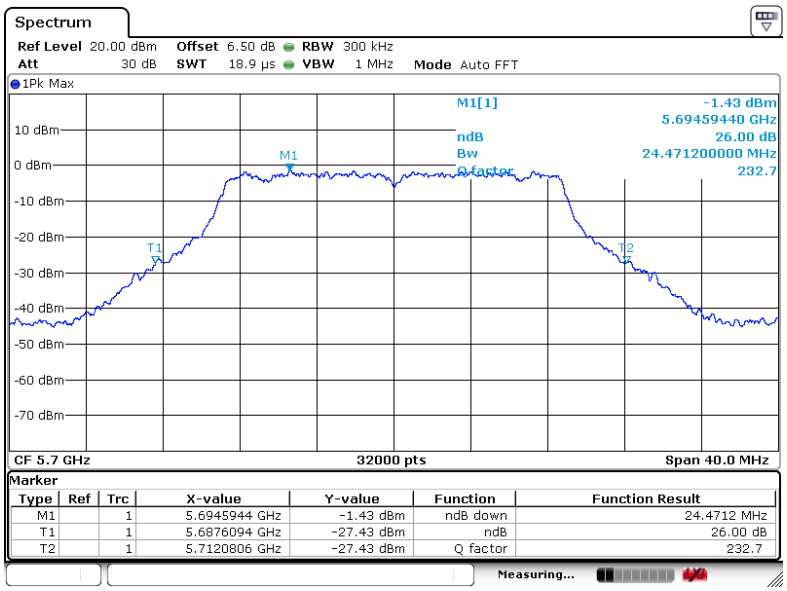
Channel: 100



Channel: 120

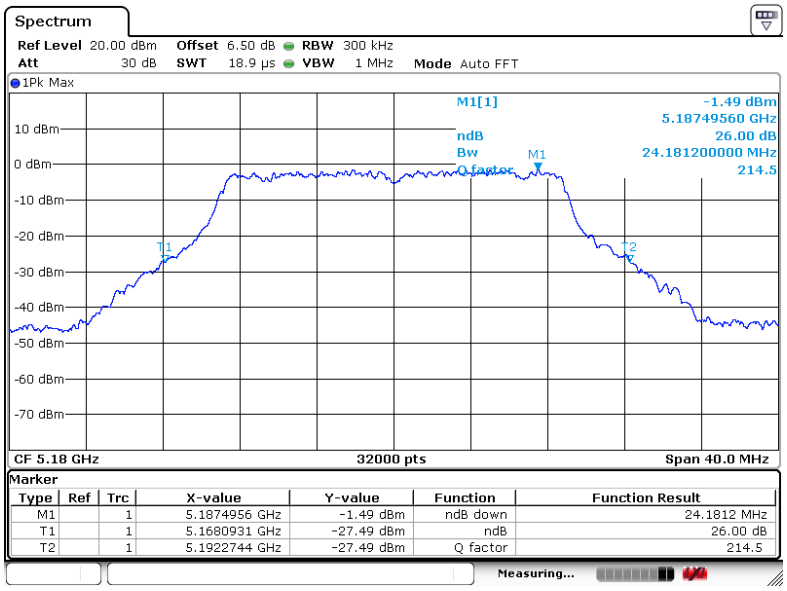


Channel: 140

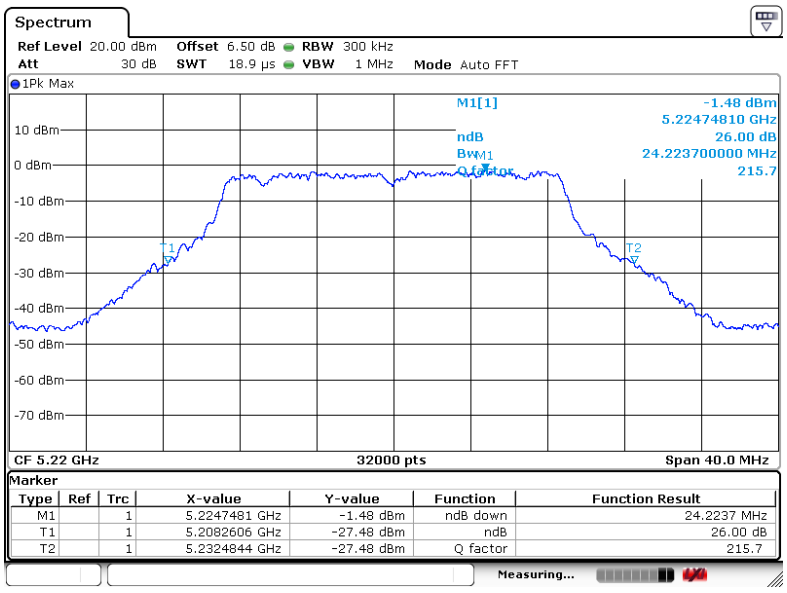

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -1.43 dBm
5.69459440 GHz
ndB 26.00 dB
Bw 24.471200000 MHz
Q factor 232.7
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6945944 GHz -1.43 dBm ndB down 24.4712 MHz
T1 1 5.6876094 GHz -27.43 dBm ndB 26.00 dB
T2 1 5.7120806 GHz -27.43 dBm Q factor 232.7
Measuring...

26dB BW 802.11ac20

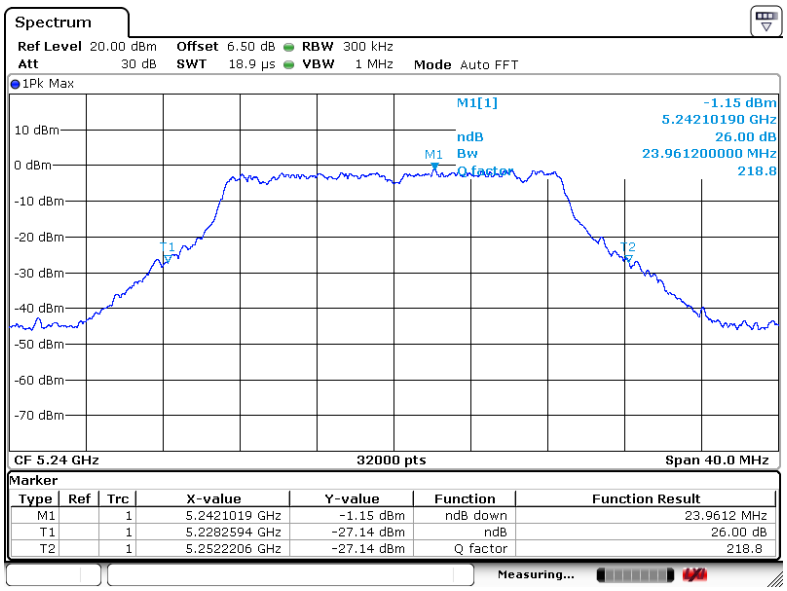
Channel: 36



Channel: 44

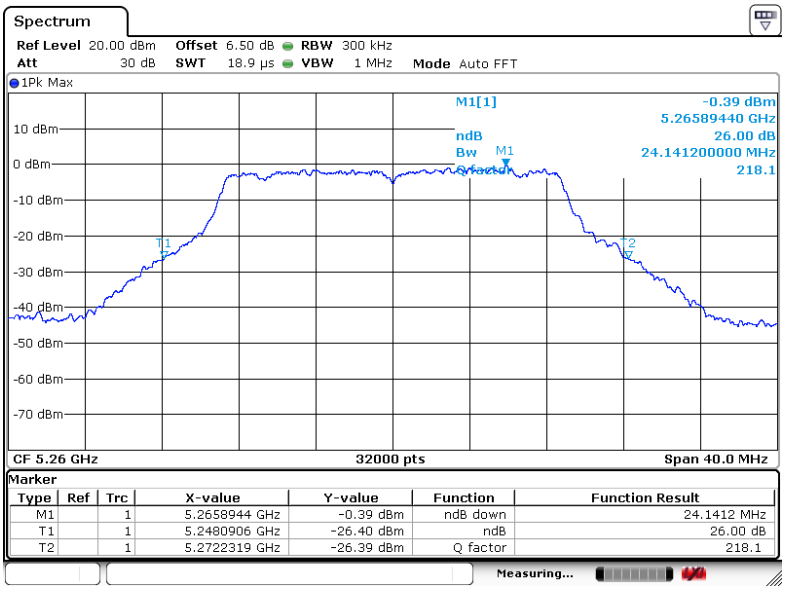


Channel: 48

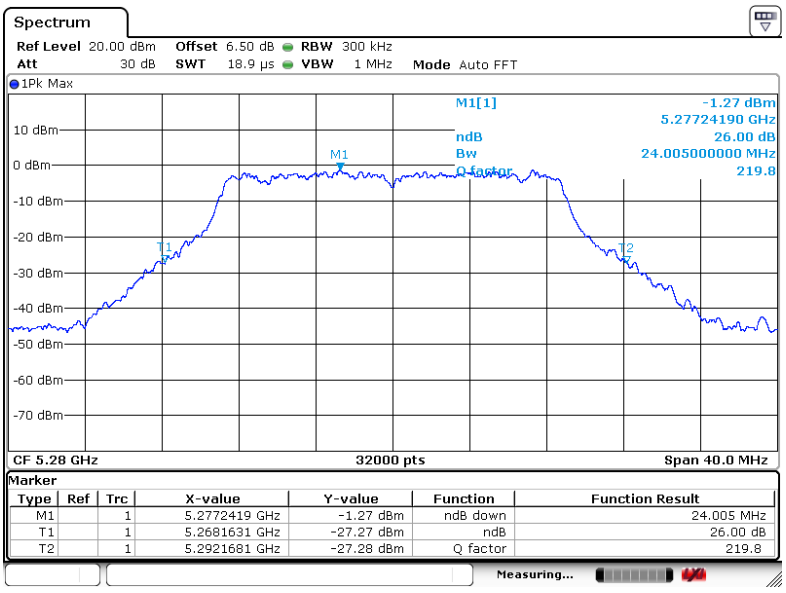

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -1.15 dBm
5.24210190 GHz
ndB 26.00 dB
M1 Bw 23.961200000 MHz
Q factor 218.8
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2421019 GHz -1.15 dBm ndB down 23.9612 MHz
T1 1 5.2282594 GHz -27.14 dBm ndB 26.00 dB
T2 1 5.2522206 GHz -27.14 dBm Q factor 218.8
Measuring...

26dB BW 802.11ac20

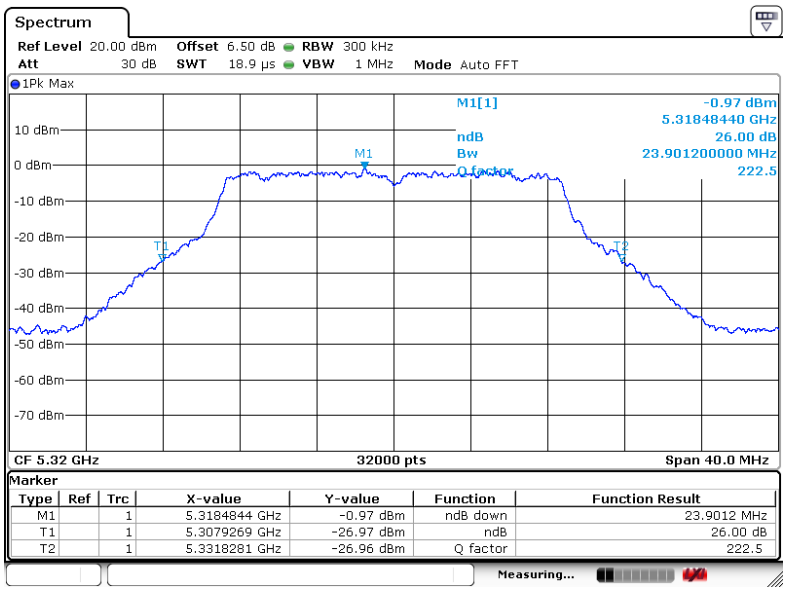
Channel: 52



Channel: 56

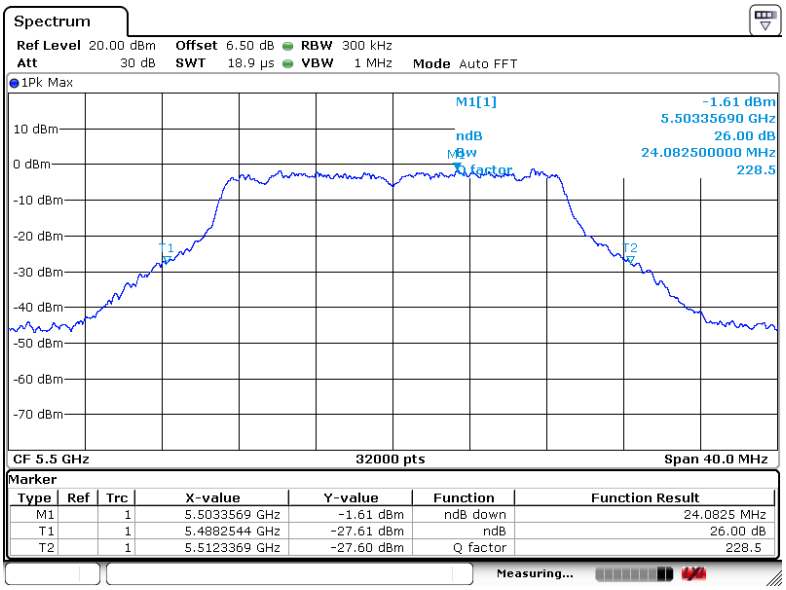


Channel: 64

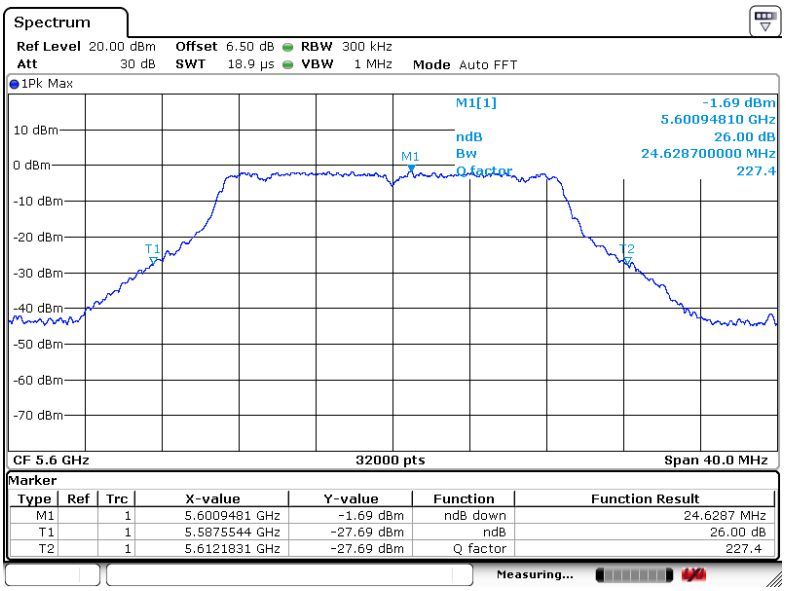

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -0.97 dBm
5.31848440 GHz
ndB 26.00 dB
Bw 23.901200000 MHz
Q factor 222.5
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3184844 GHz -0.97 dBm ndB down 23.9012 MHz
T1 1 5.3079269 GHz -26.97 dBm ndB 26.00 dB
T2 1 5.3318281 GHz -26.96 dBm Q factor 222.5
Measuring...

26dB BW 802.11ac20

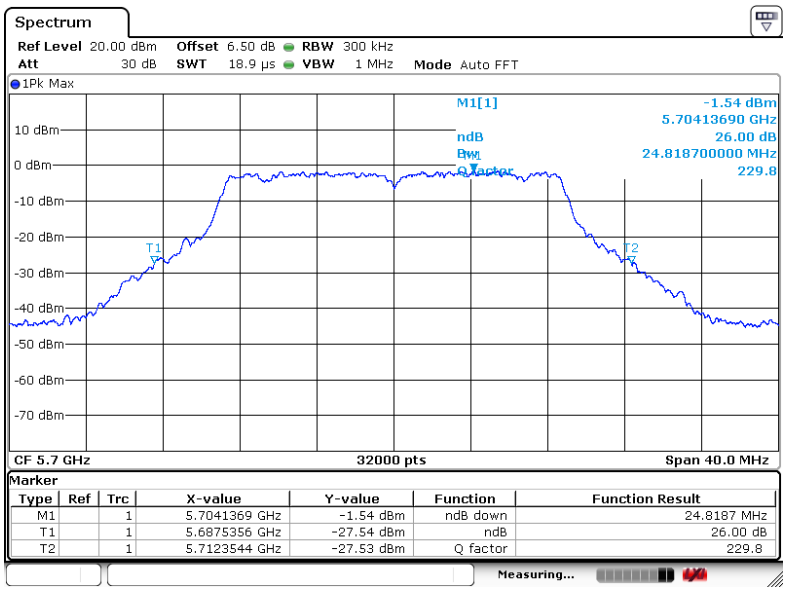
Channel: 100



Channel: 120

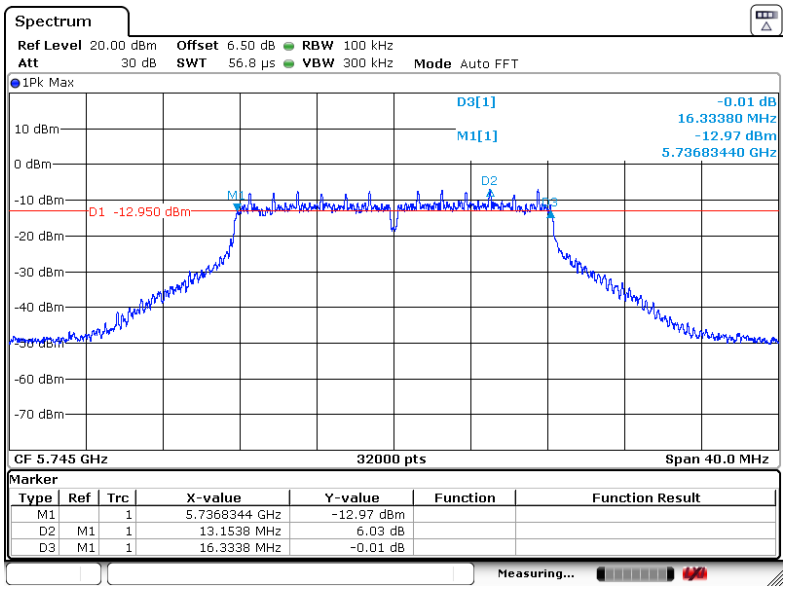


Channel: 140

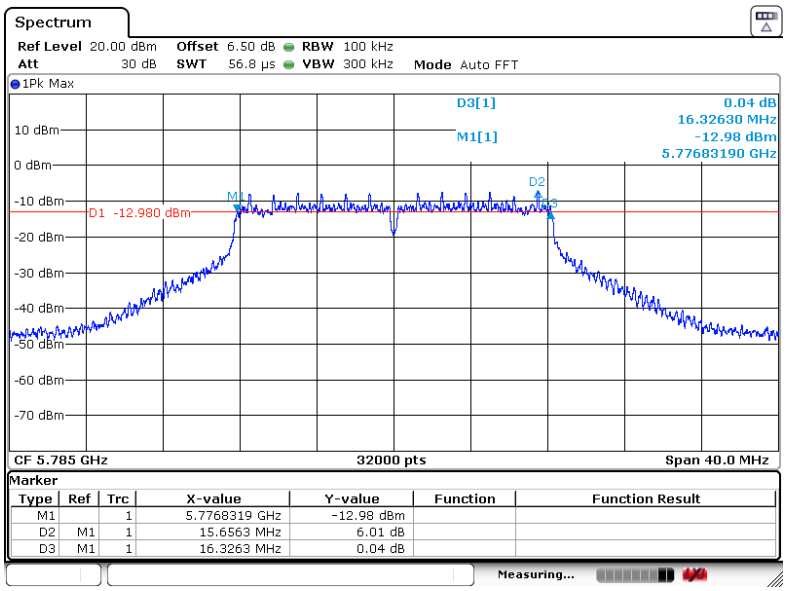

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1]
-1.54 dBm
5.70413690 GHz
ndB 26.00 dB
Bw1 24.818700000 MHz
Q factor 229.8
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7041369 GHz -1.54 dBm ndB down 24.8187 MHz
T1 1 5.6875356 GHz -27.54 dBm ndB 26.00 dB
T2 1 5.7123544 GHz -27.53 dBm Q factor 229.8
Measuring...

6dB BW 802.11a

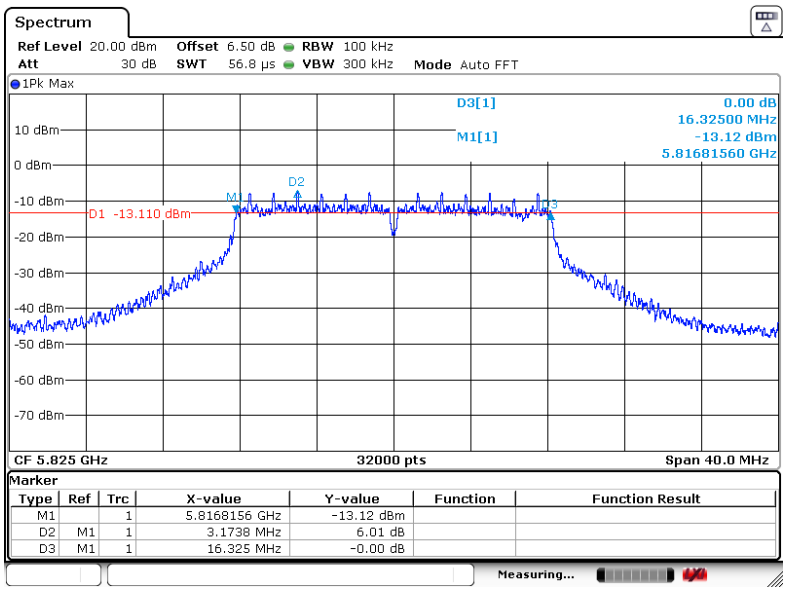
Channel: 149



Channel: 157

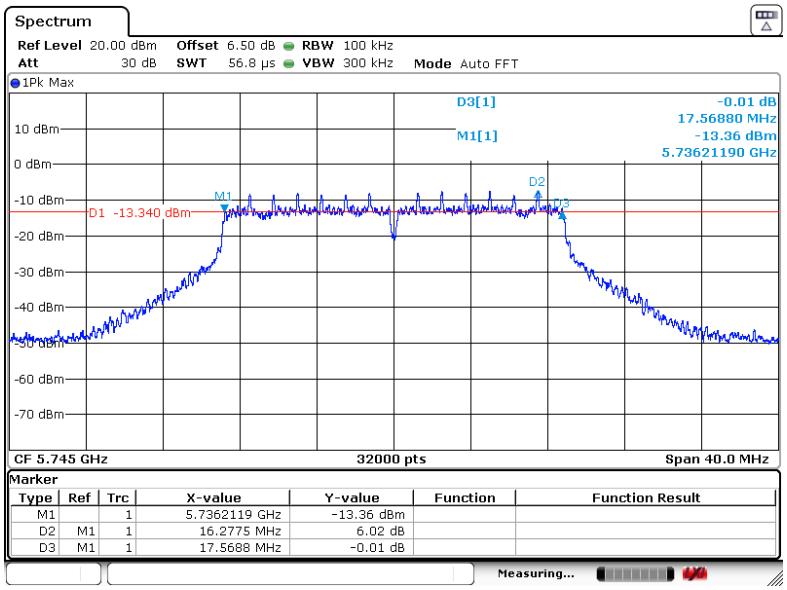


Channel: 165

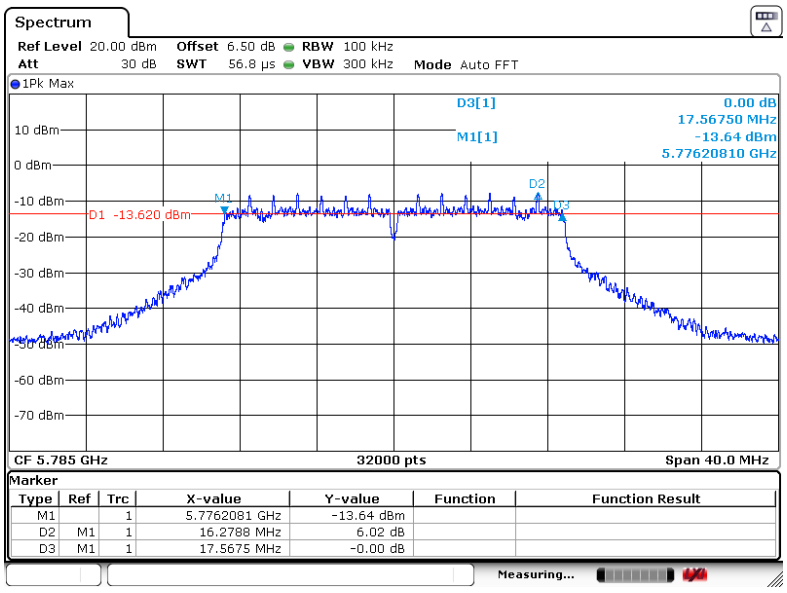

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.00 dB
16.32500 MHz
M1[1] -13.12 dBm
5.81681560 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -13.110 dBm
D2
M1
D3
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8168156 GHz -13.12 dBm
D2 M1 1 3.1738 MHz 6.01 dB
D3 M1 1 16.325 MHz -0.00 dB
Measuring...

6dB BW 802.11n20

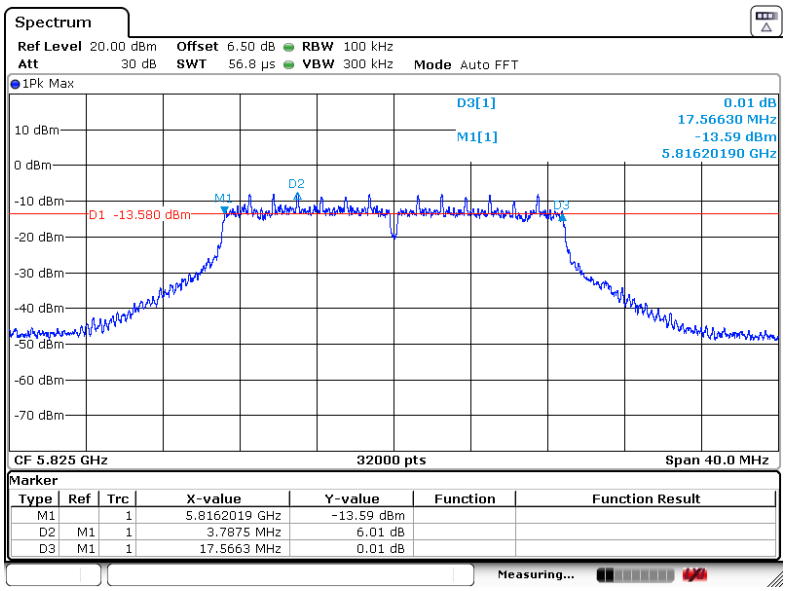
Channel: 149



Channel: 157

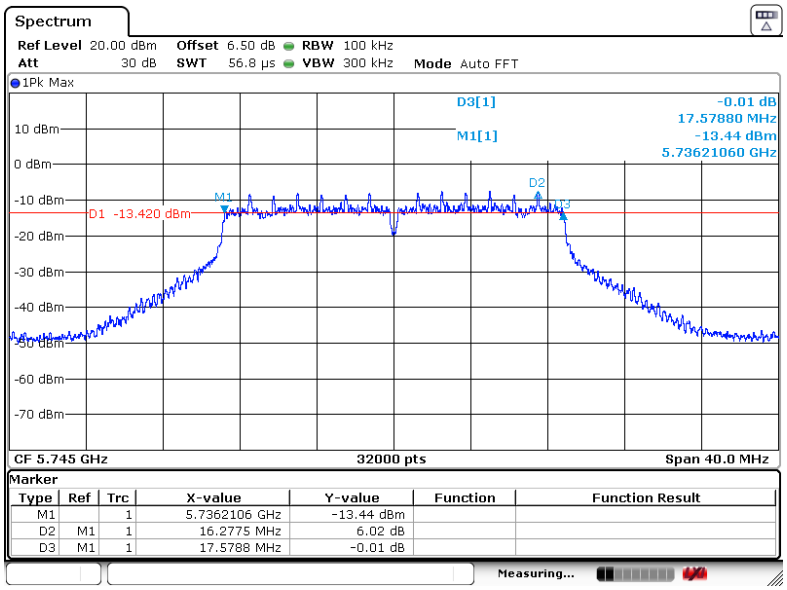


Channel: 165

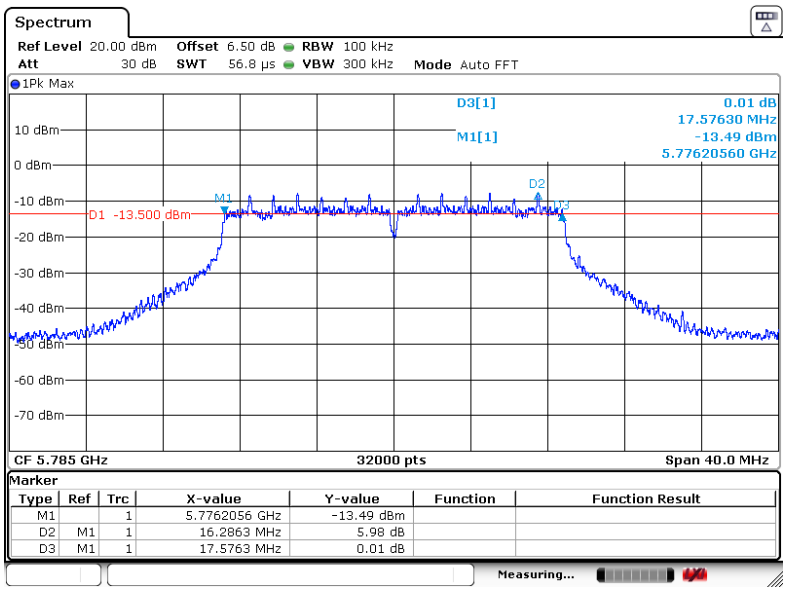

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.01 dB
17.56630 MHz
M1[1] -13.59 dBm
5.81620190 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -13.580 dBm
M1
D2
D3
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8162019 GHz -13.59 dBm
D2 M1 1 3.7875 MHz 6.01 dB
D3 M1 1 17.5663 MHz 0.01 dB
Measuring...

6dB BW 802.11ac20

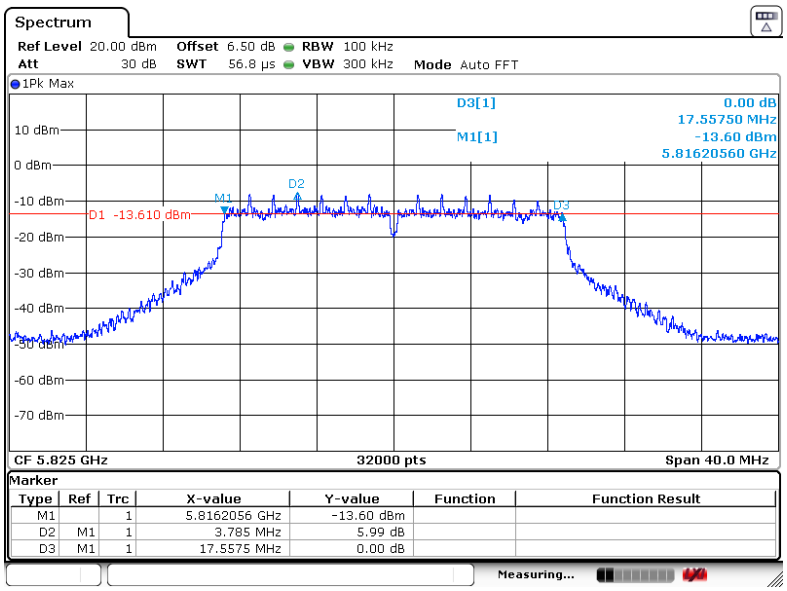
Channel: 149



Channel: 157

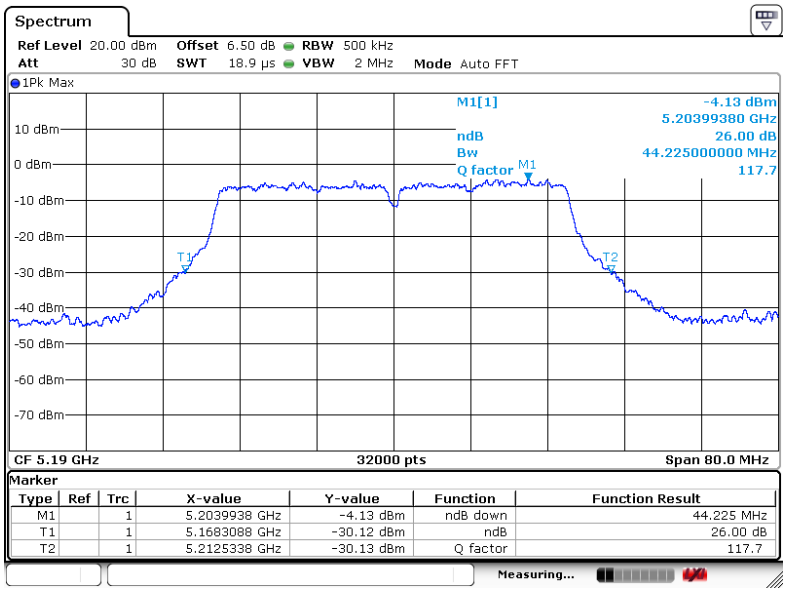


Channel: 165

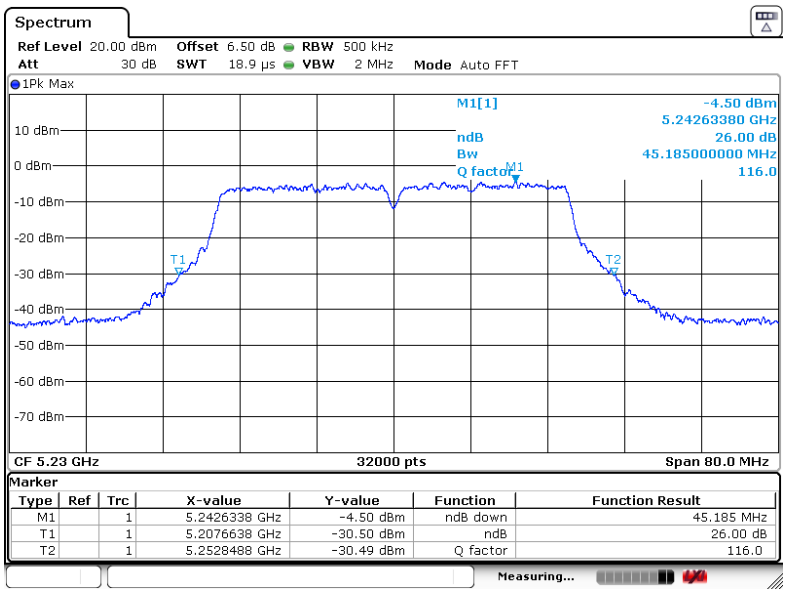

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.00 dB
17.55750 MHz
M1[1] -13.60 dBm
5.81620560 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -13.610 dBm
M1
D2
D3
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8162056 GHz -13.60 dBm
D2 M1 1 3.785 MHz 5.99 dB
D3 M1 1 17.5575 MHz 0.00 dB
Measuring...

26dB BW 802.11n40

Channel: 38

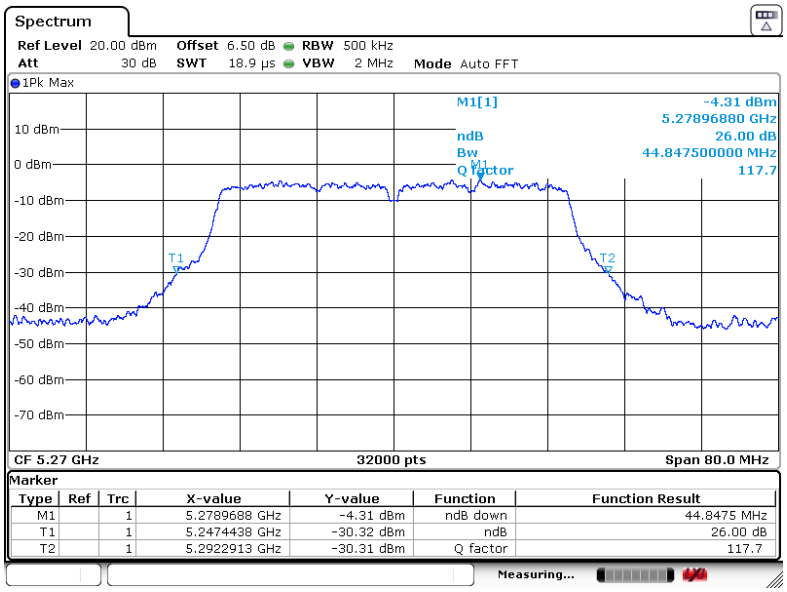


Channel: 46

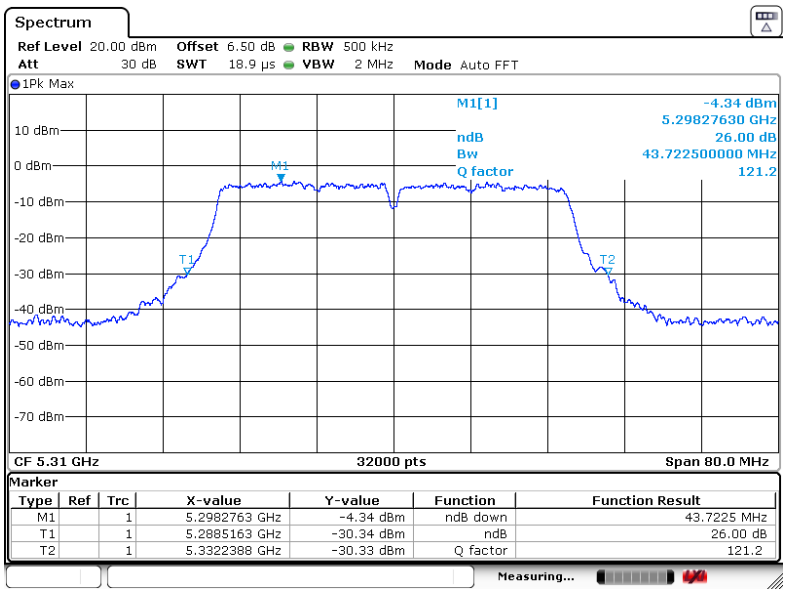


26dB BW 802.11n40

Channel: 54

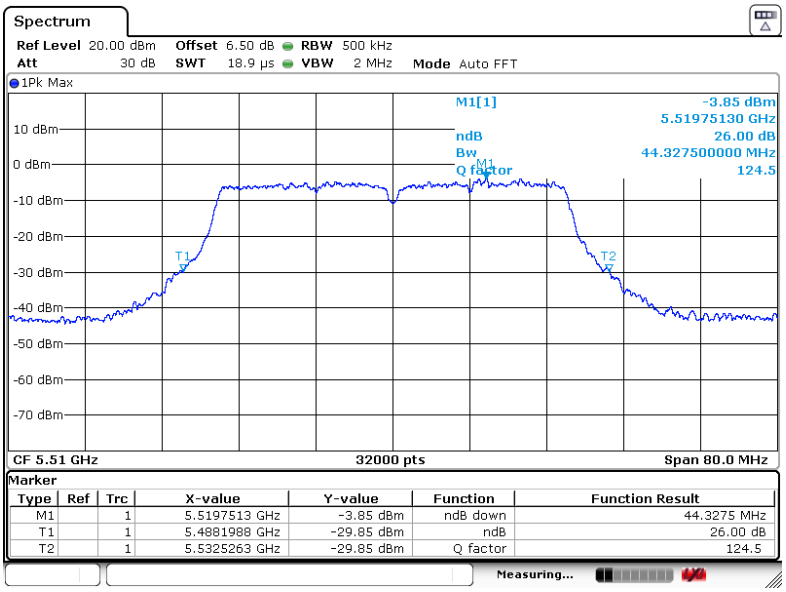


Channel: 62

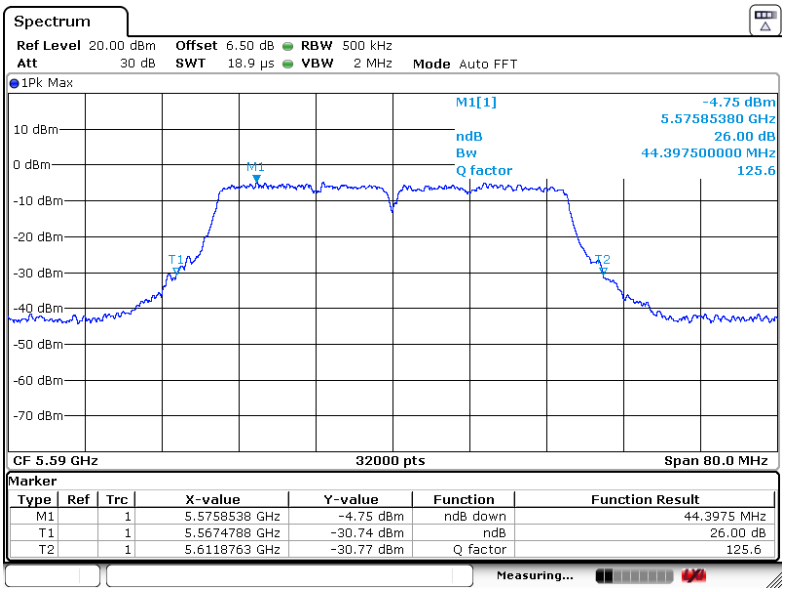


26dB BW 802.11n40

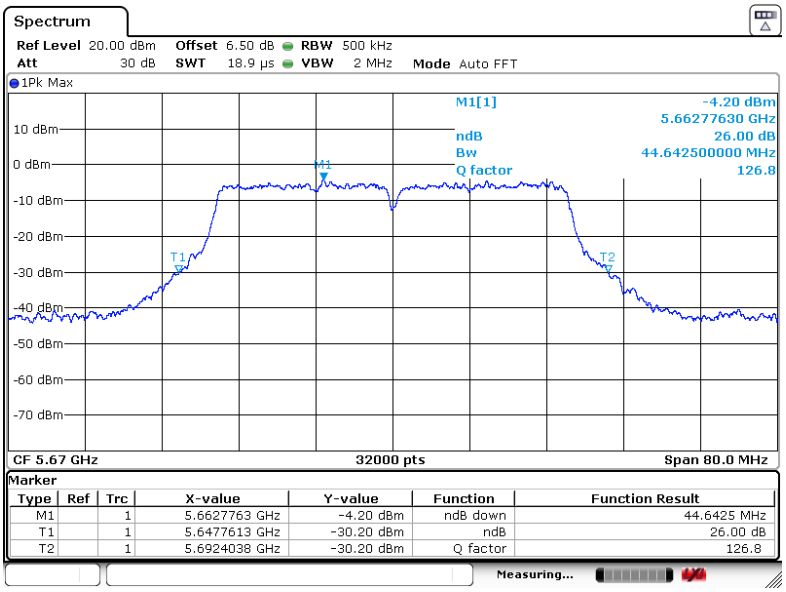
Channel: 102



Channel: 118

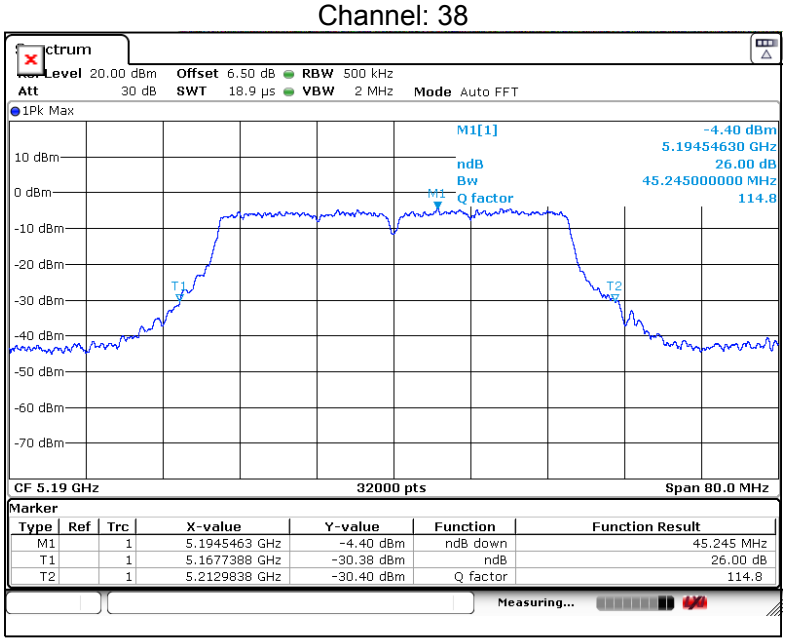


Channel: 134

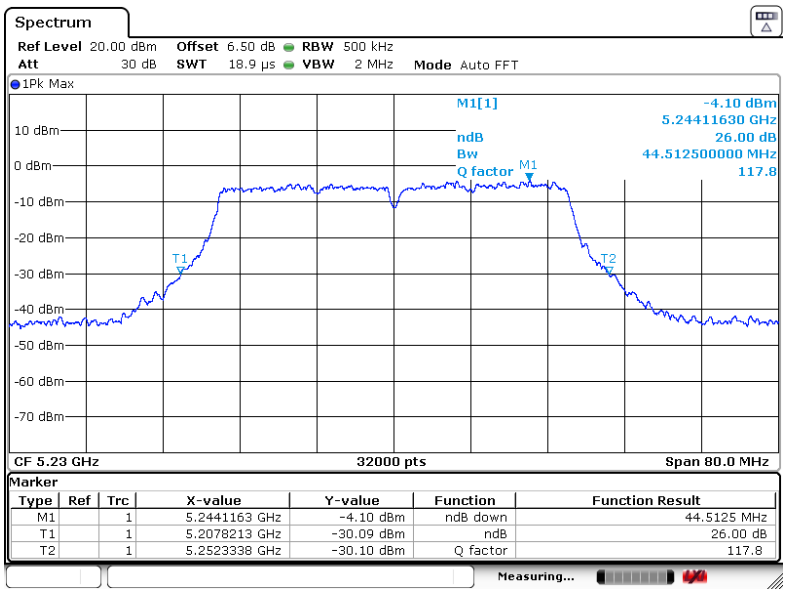

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 500 kHz
Att 30 dB SWT 18.9 µs VBW 2 MHz Mode Auto FFT
1Pk Max
M1[1] -4.20 dBm
5.66277630 GHz
ndB 26.00 dB
Bw 44.642500000 MHz
Q factor 126.8
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6627763 GHz -4.20 dBm ndB down 44.6425 MHz
T1 1 5.6477613 GHz -30.20 dBm ndB 26.00 dB
T2 1 5.6924038 GHz -30.20 dBm Q factor 126.8
Measuring...

26dB BW 802.11ac40

Channel: 38

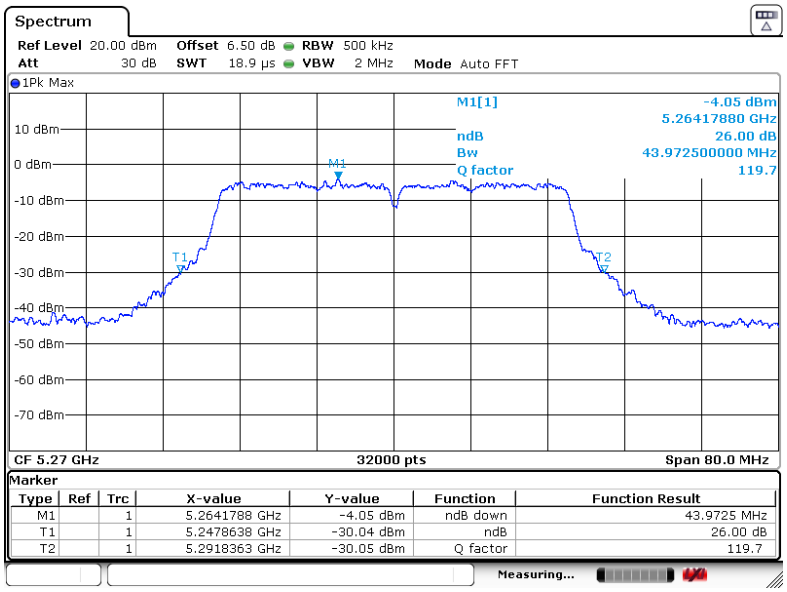


Channel: 46

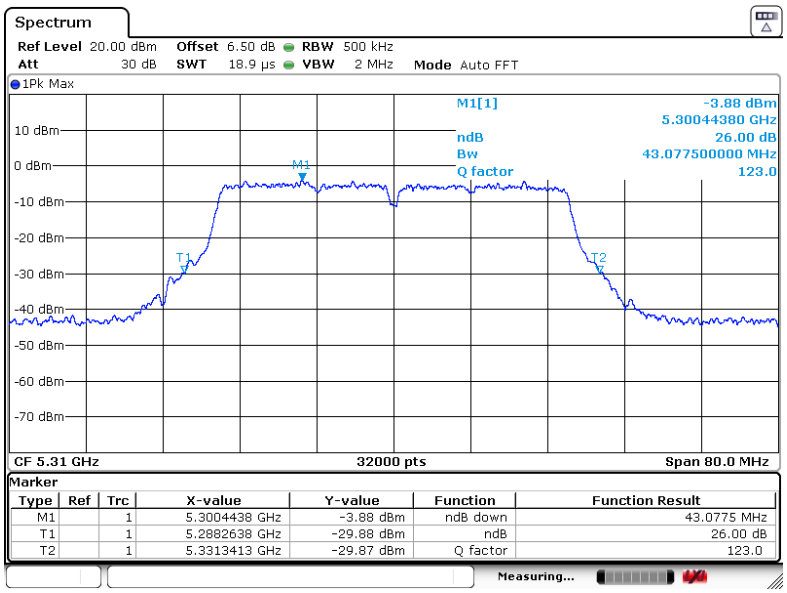


26dB BW 802.11ac40

Channel: 54

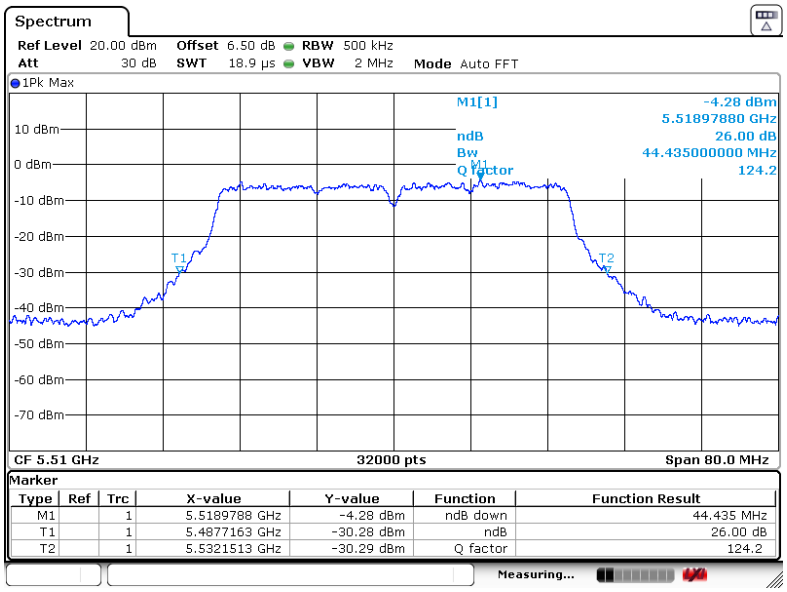


Channel: 62

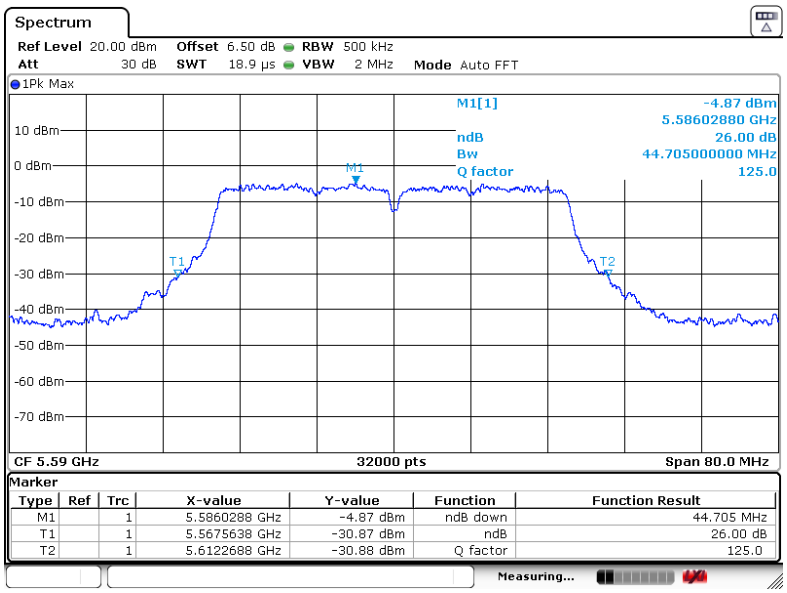


26dB BW 802.11ac40

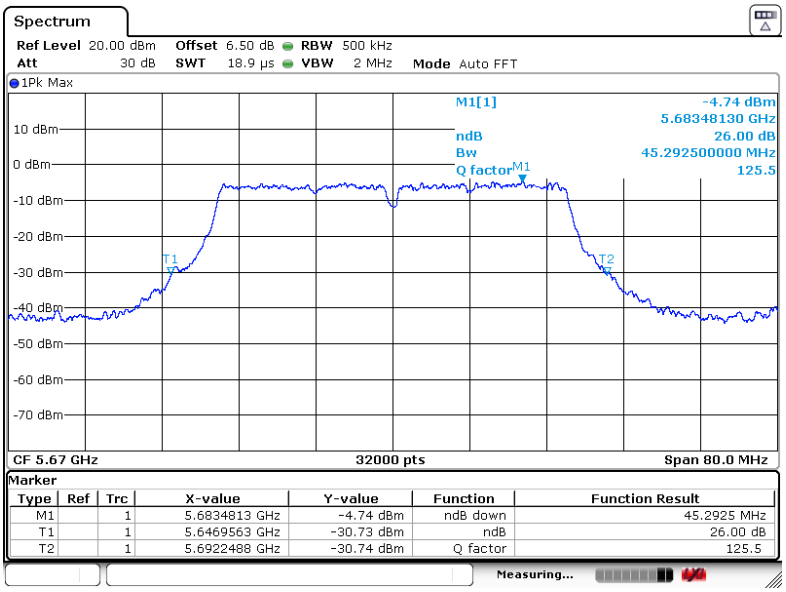
Channel: 102



Channel: 118

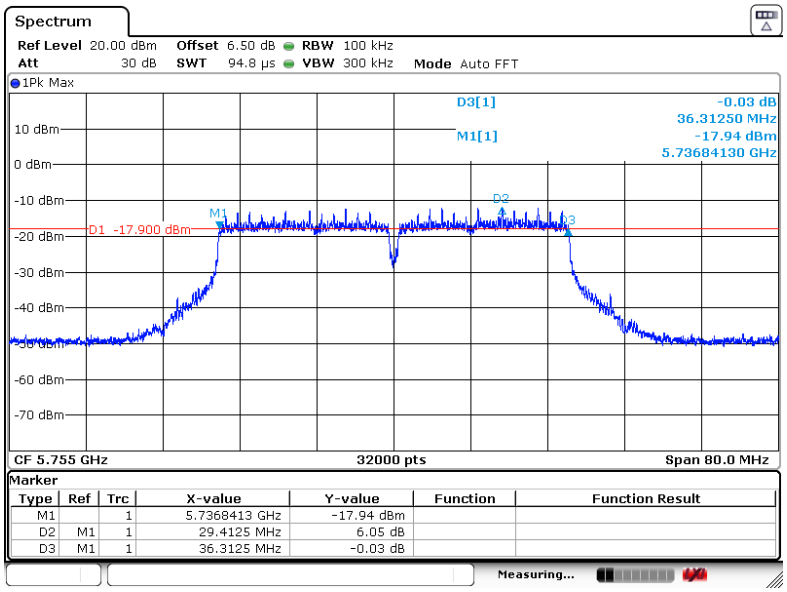


Channel: 134

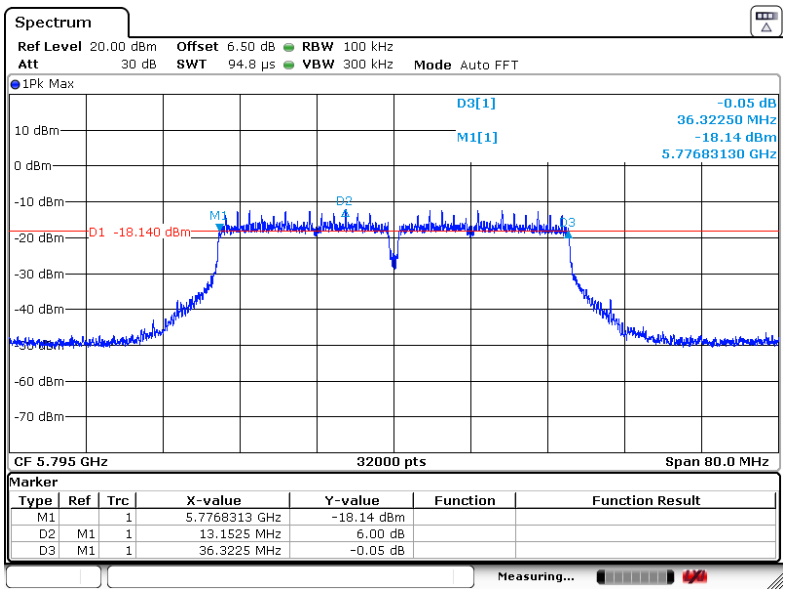

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 500 kHz
Att 30 dB SWT 18.9 µs VBW 2 MHz Mode Auto FFT
1Pk Max
M1[1] -4.74 dBm
5.68348130 GHz
ndB 26.00 dB
Bw 45.292500000 MHz
Q factor 125.5
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
M1
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6834813 GHz -4.74 dBm ndB down 45.2925 MHz
T1 1 5.6469563 GHz -30.73 dBm ndB 26.00 dB
T2 1 5.6922488 GHz -30.74 dBm Q factor 125.5
Measuring...

6dB BW 802.11n40

Channel: 151

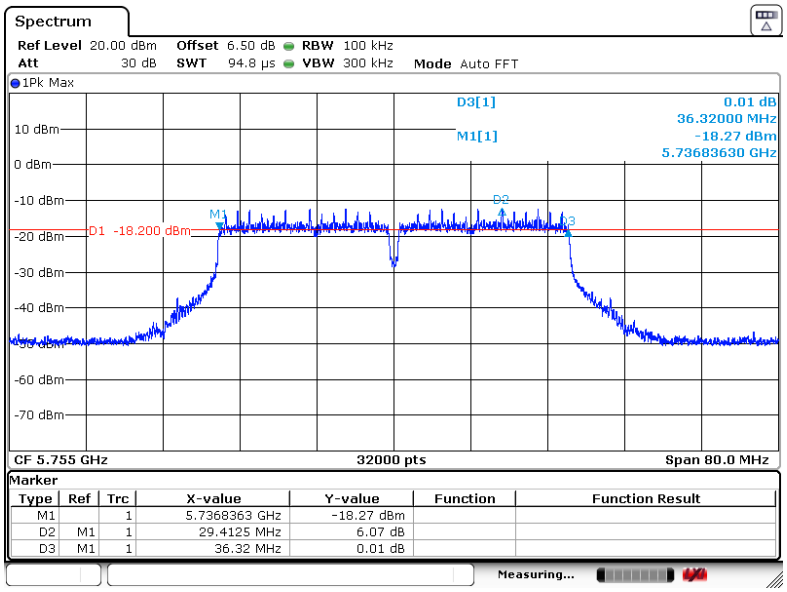


Channel: 159

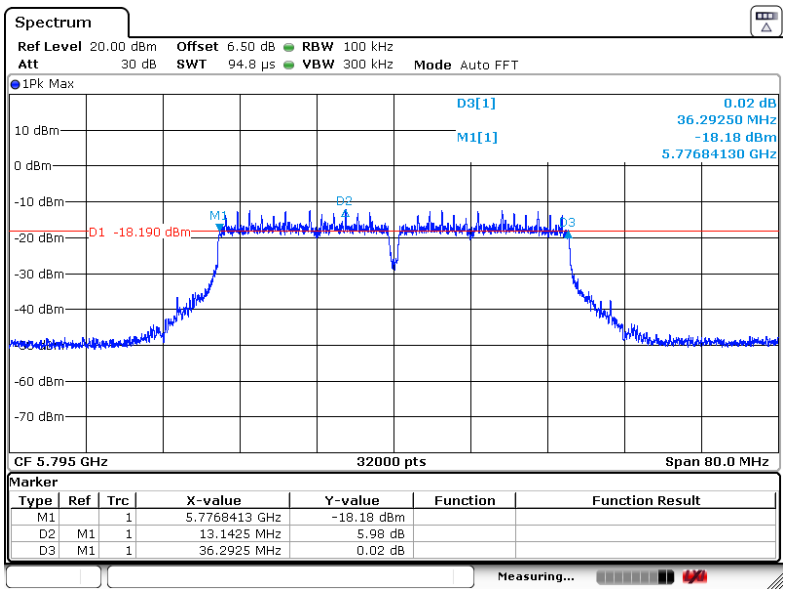


6dB BW 802.11ac40

Channel: 151

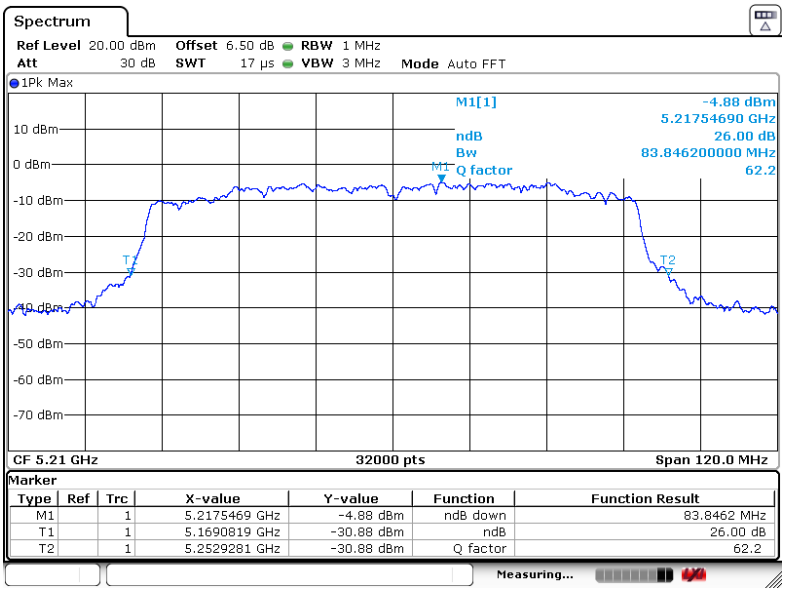


Channel: 159

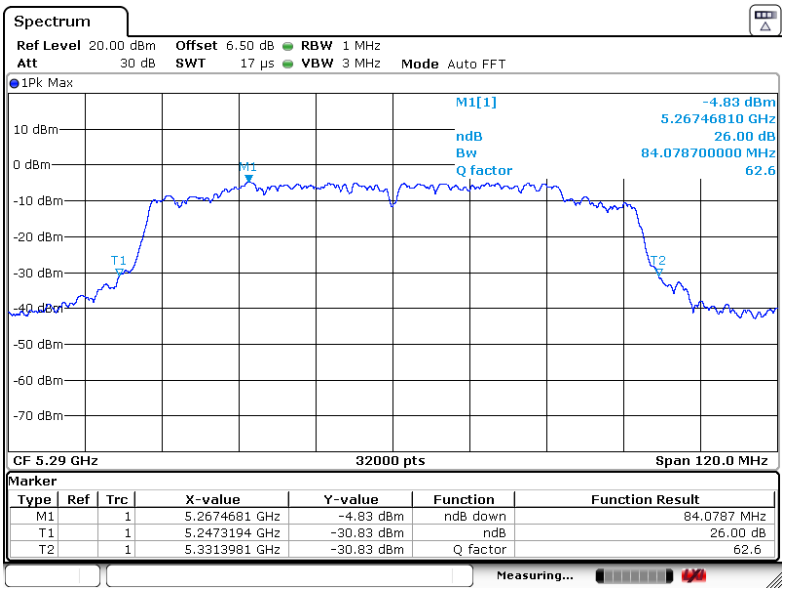


26dB BW 802.11ac80

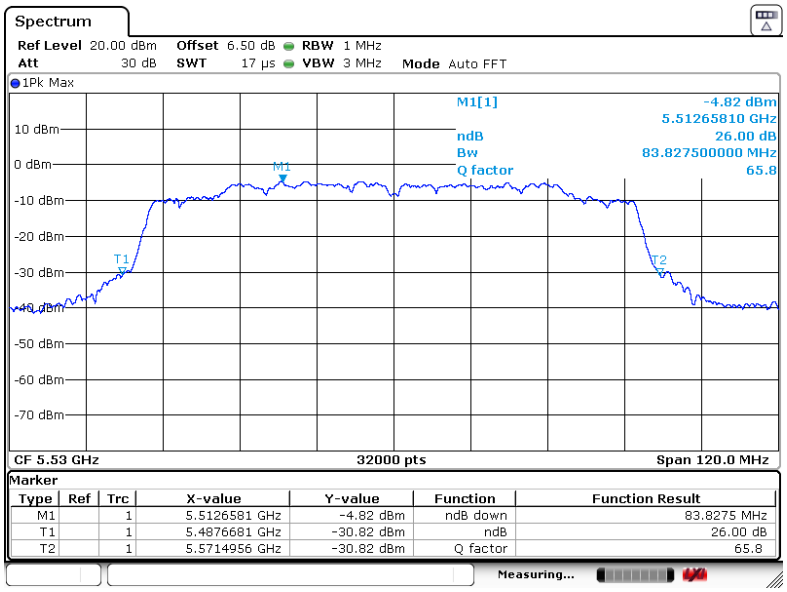
Channel:42



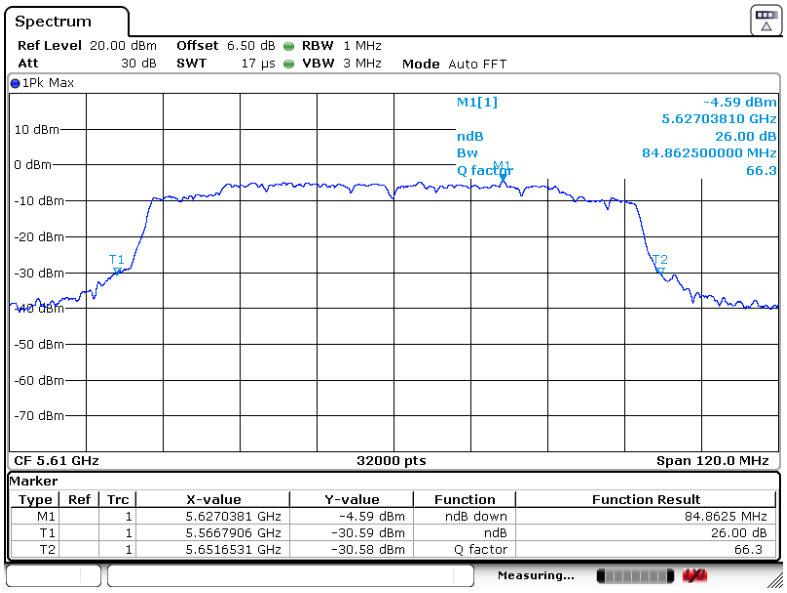
Channel: 58



Channel:106

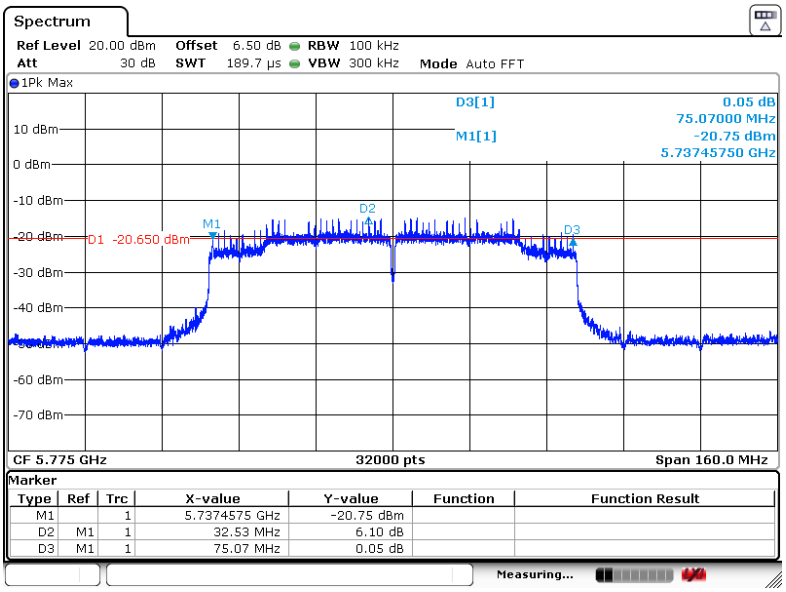


Channel: 122



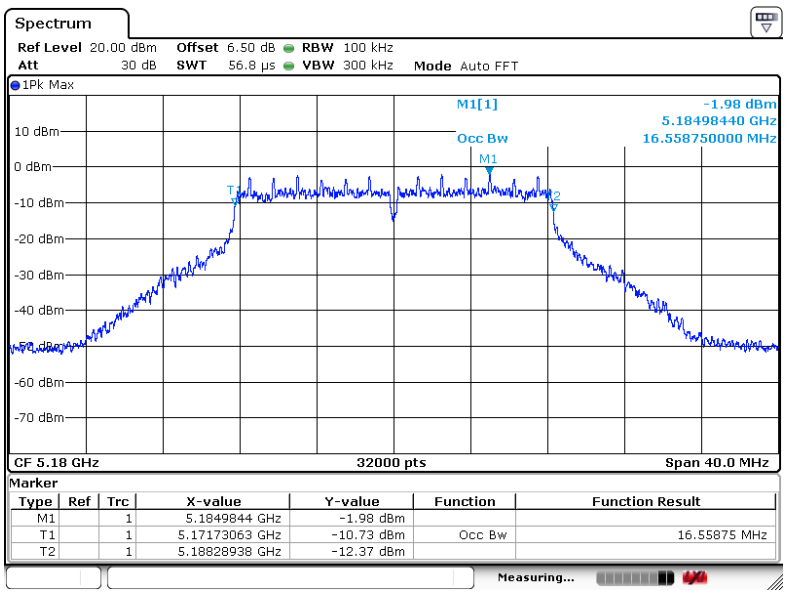
6dB BW 802.11ac80

Channel: 155

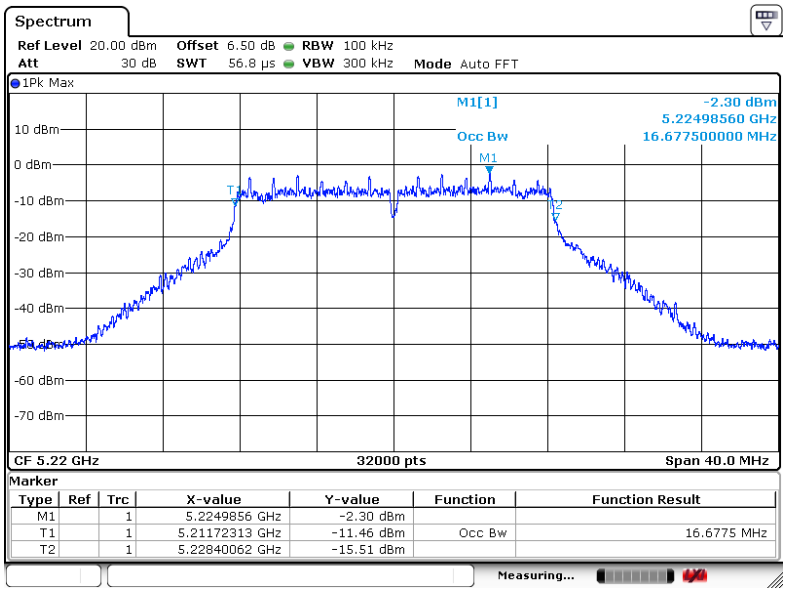


99% OBW 802.11a

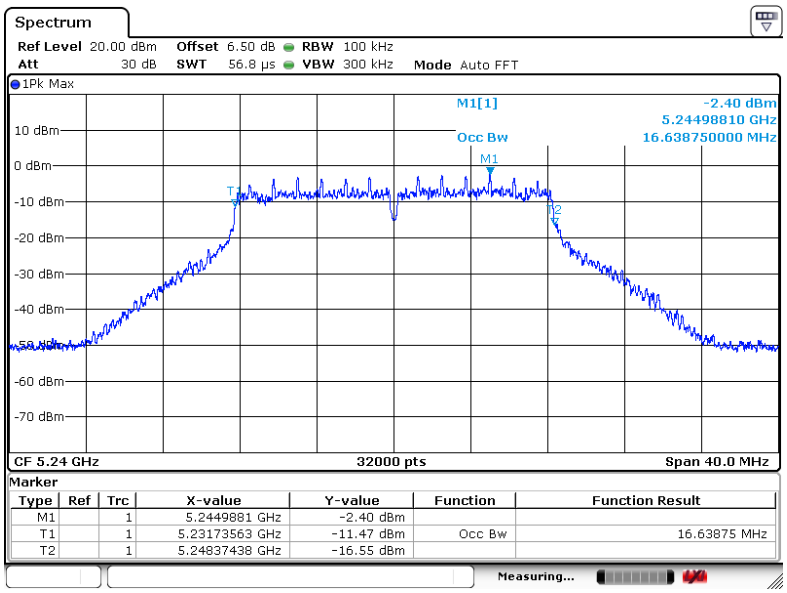
Channel: 36



Channel: 44

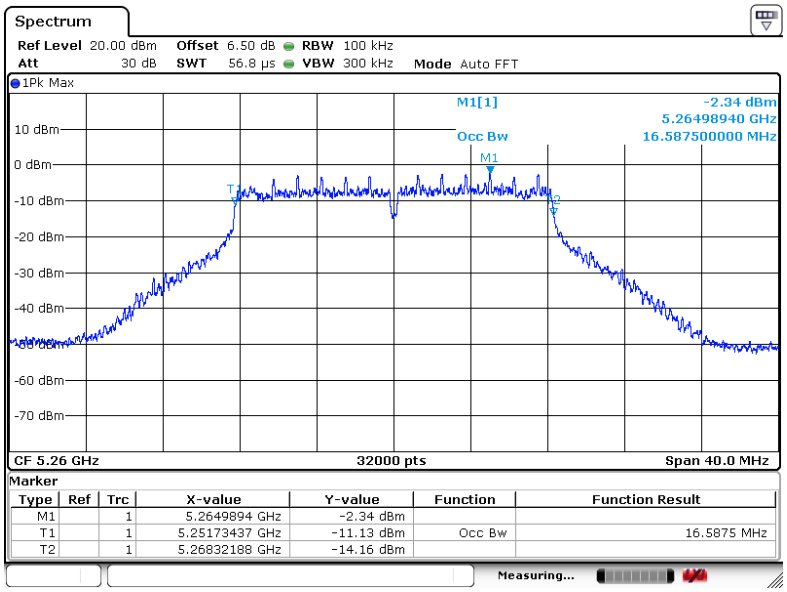


Channel: 48

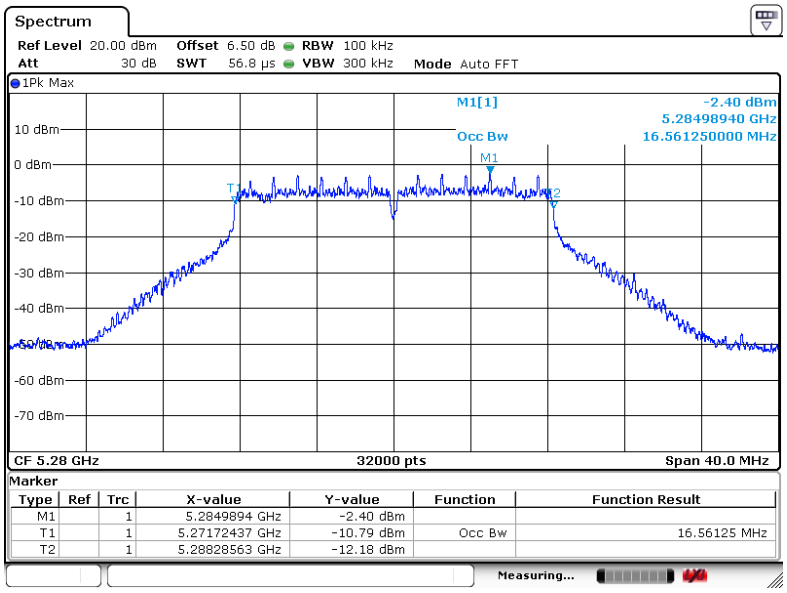

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.40 dBm
5.24498810 GHz
Occ Bw 16.638750000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2449881 GHz -2.40 dBm
T1 1 5.23173563 GHz -11.47 dBm Occ Bw 16.63875 MHz
T2 1 5.24837438 GHz -16.55 dBm
Measuring...

99% OBW 802.11a

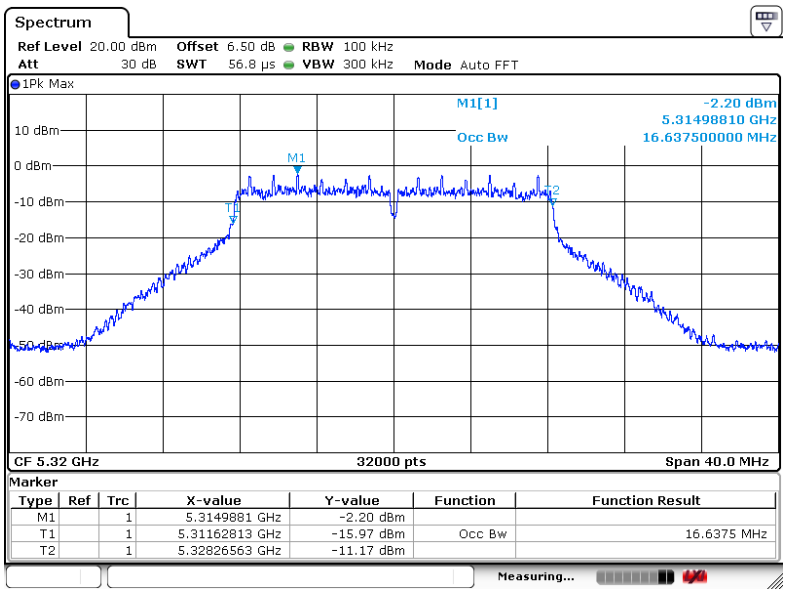
Channel: 52



Channel: 56

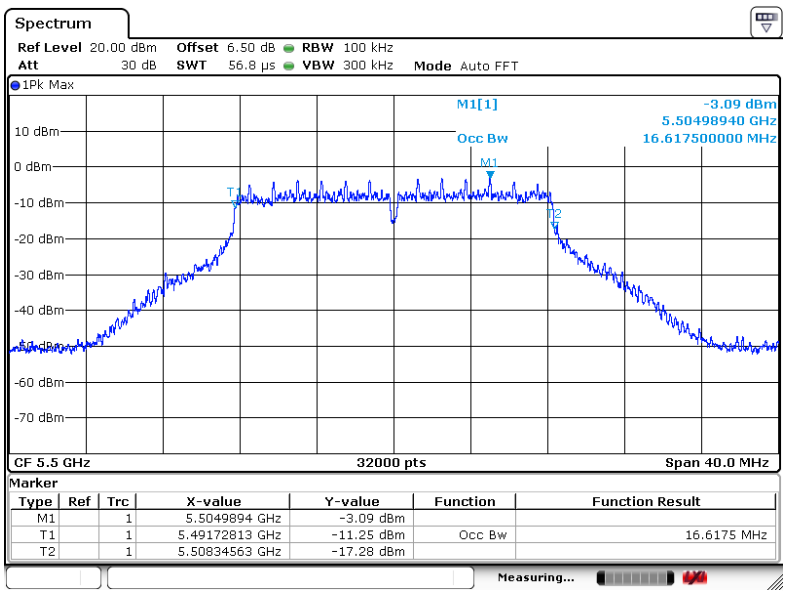


Channel: 64

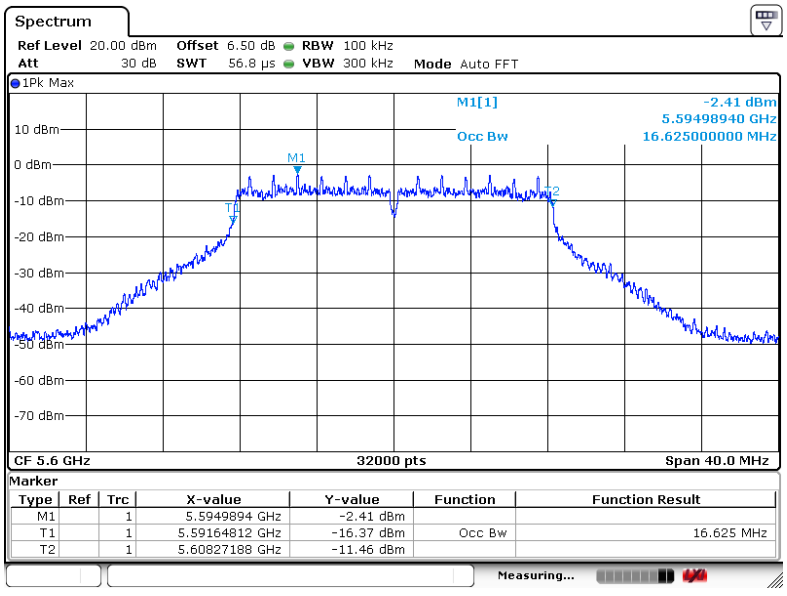

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.20 dBm
5.31498810 GHz
Occ Bw 16.637500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3149881 GHz -2.20 dBm
T1 1 5.31162813 GHz -15.97 dBm Occ Bw 16.6375 MHz
T2 1 5.32826563 GHz -11.17 dBm
Measuring...

99% OBW 802.11a

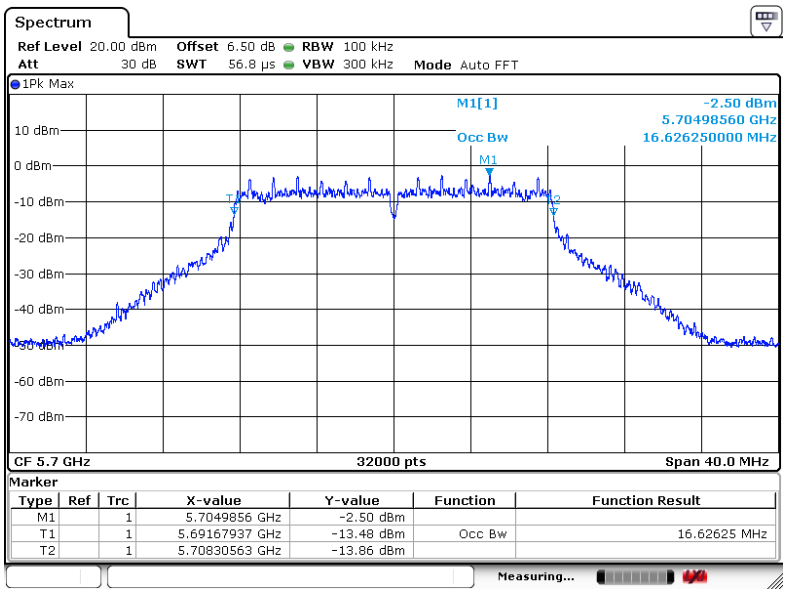
Channel: 100



Channel: 120

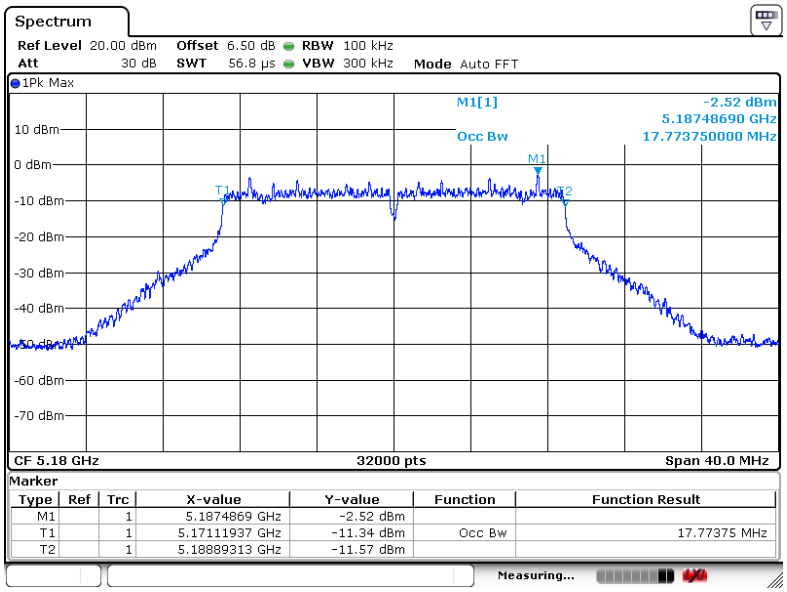


Channel: 140

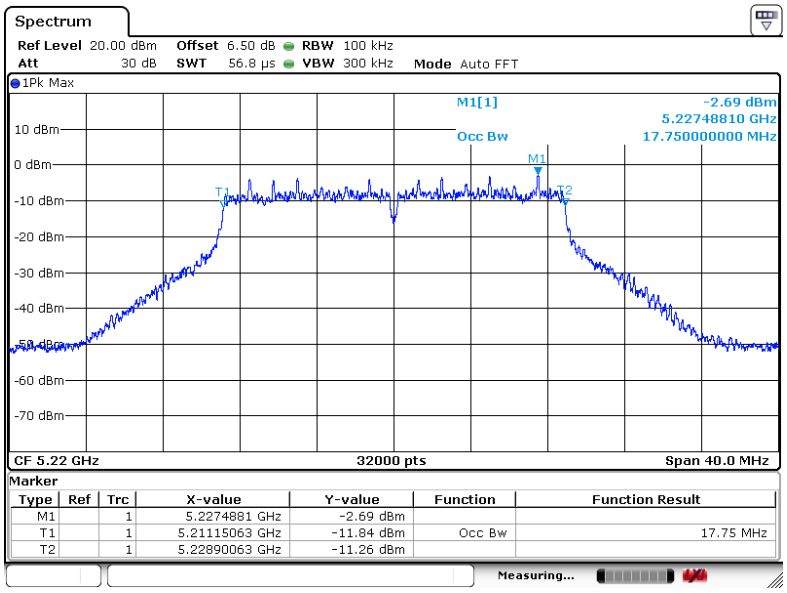

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.50 dBm
5.70498560 GHz
Occ Bw 16.626250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7049856 GHz -2.50 dBm
T1 1 5.69167937 GHz -13.48 dBm Occ Bw 16.62625 MHz
T2 1 5.70830563 GHz -13.86 dBm
Measuring...

99% OBW 802.11n20

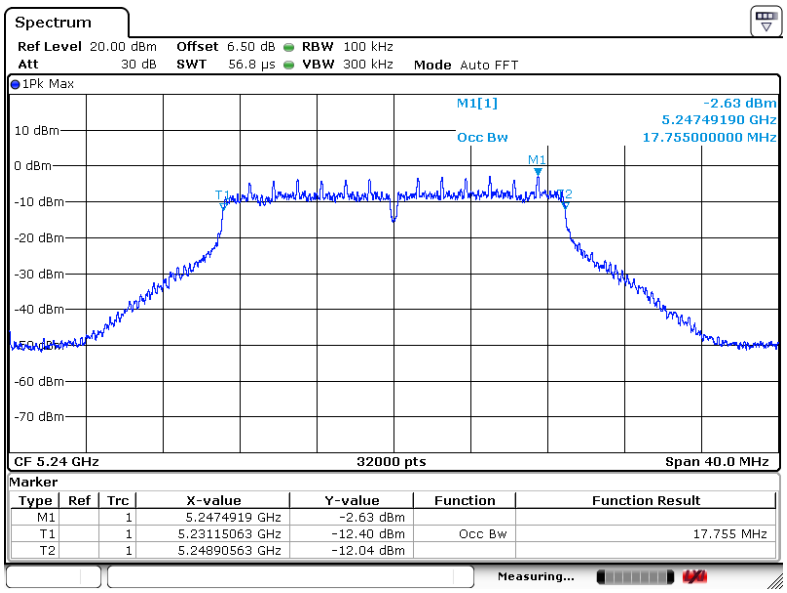
Channel: 36



Channel: 44

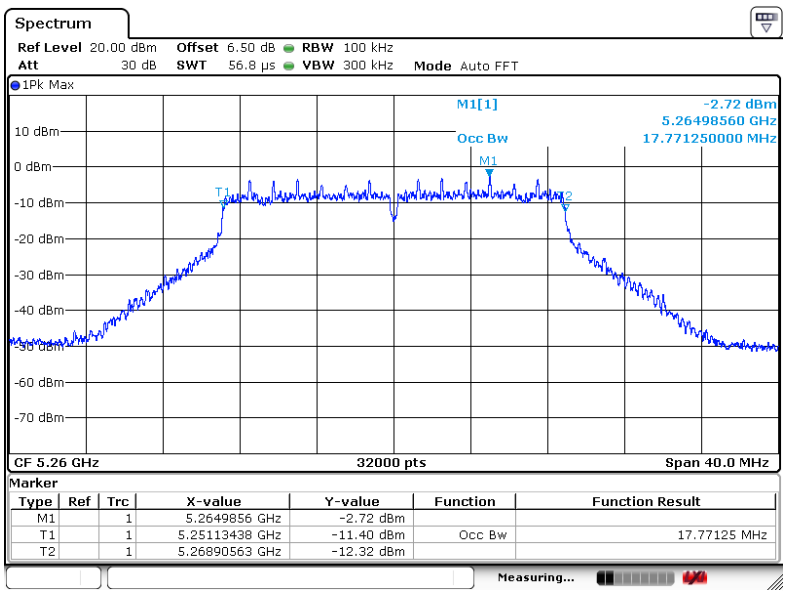


Channel: 48

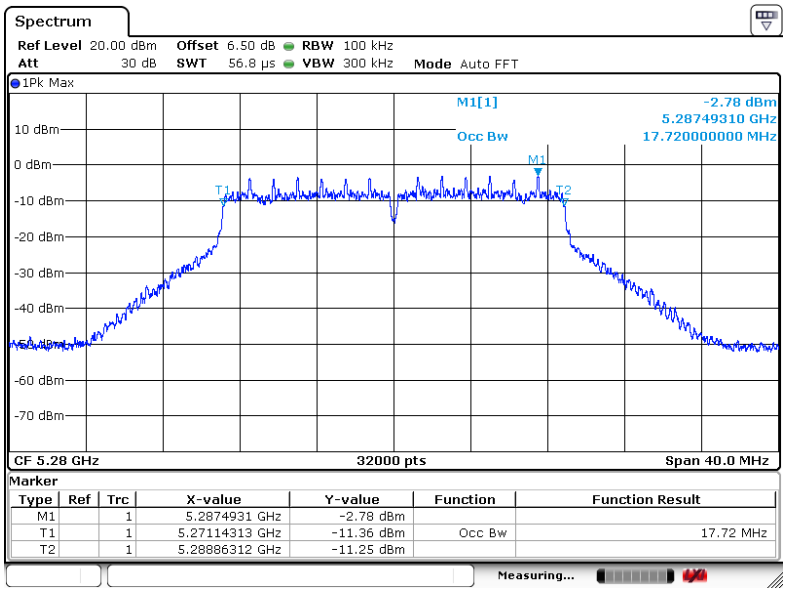

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.63 dBm
5.24749190 GHz
Occ Bw 17.755000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2474919 GHz -2.63 dBm
T1 1 5.23115063 GHz -12.40 dBm Occ Bw 17.755 MHz
T2 1 5.24890563 GHz -12.04 dBm
Measuring...

99% OBW 802.11n20

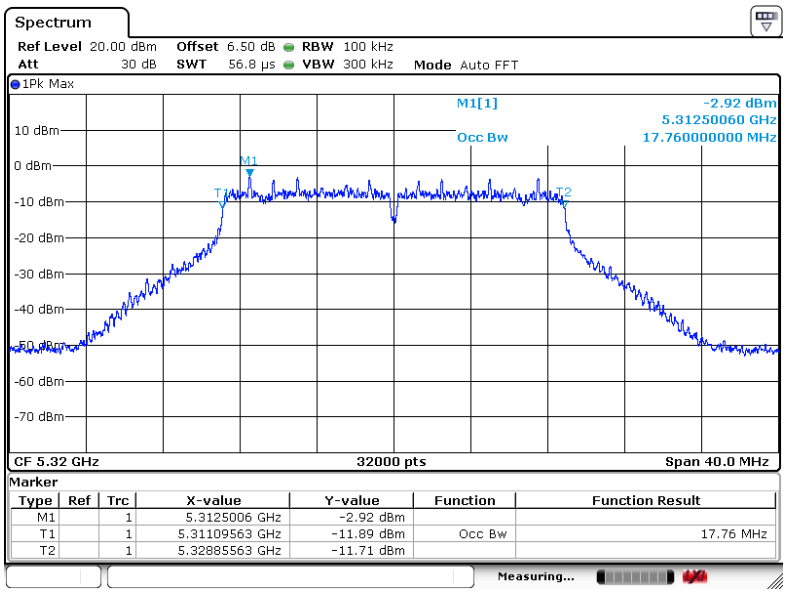
Channel: 52



Channel: 56

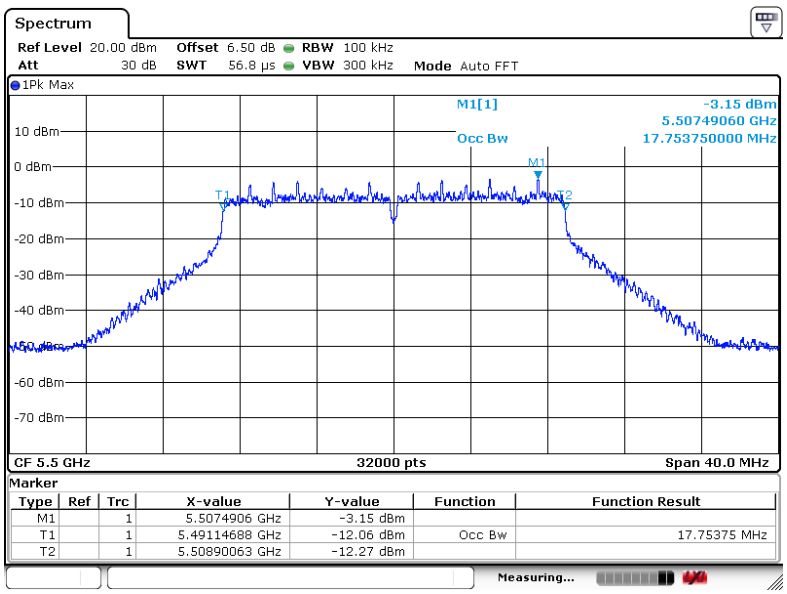


Channel: 64

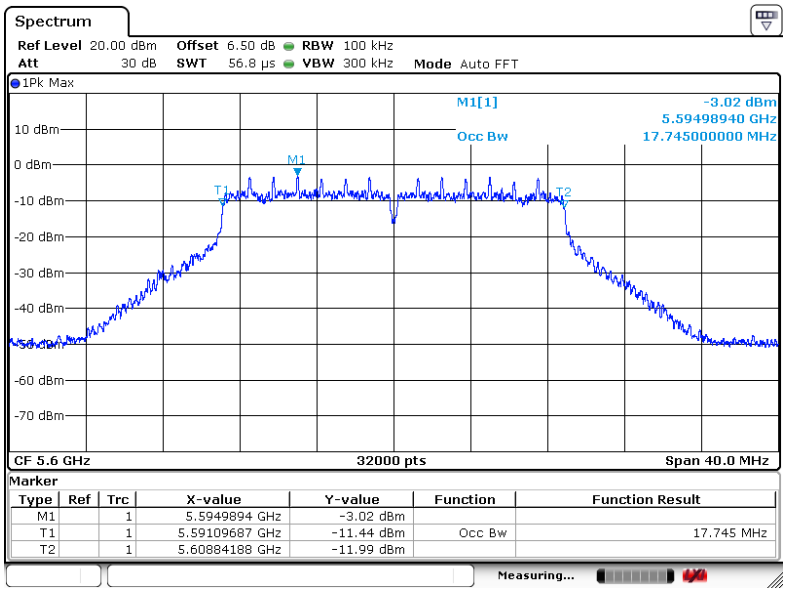

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.92 dBm
5.31250060 GHz
Occ Bw 17.760000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3125006 GHz -2.92 dBm
T1 1 5.31109563 GHz -11.89 dBm Occ Bw 17.76 MHz
T2 1 5.32885563 GHz -11.71 dBm
Measuring...

99% OBW 802.11n20

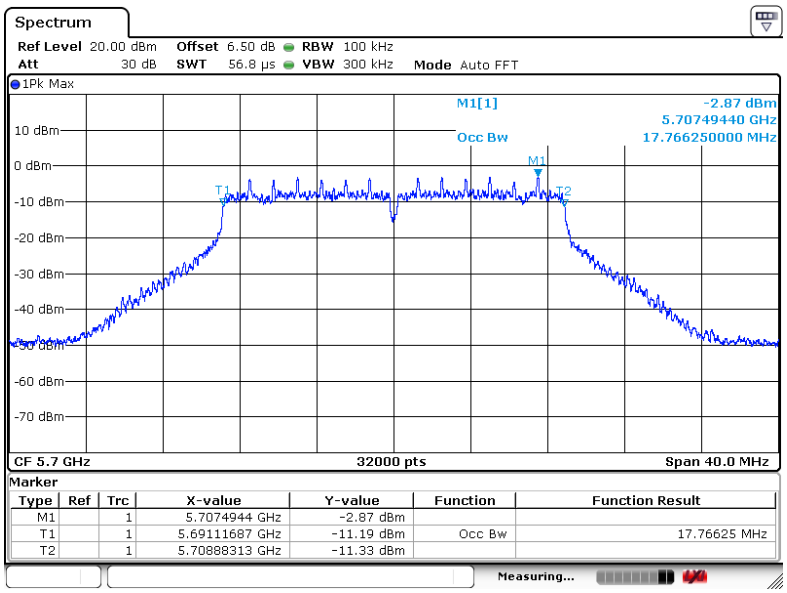
Channel: 100



Channel: 120

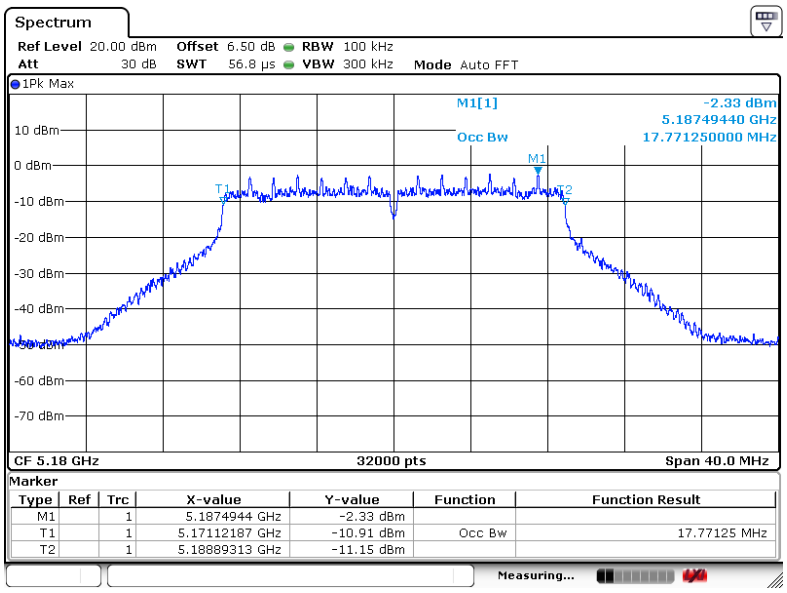


Channel: 140

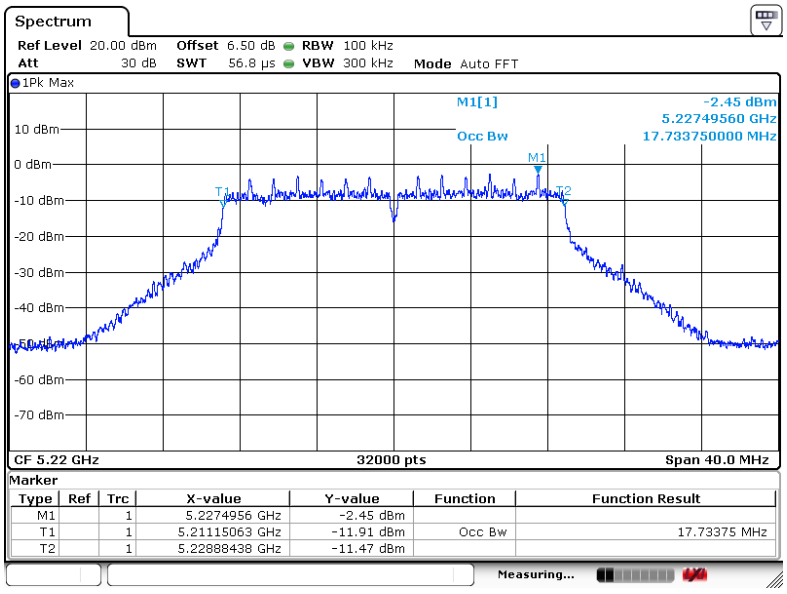

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.87 dBm
5.70749440 GHz
Occ Bw 17.766250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7074944 GHz -2.87 dBm
T1 1 5.69111687 GHz -11.19 dBm Occ Bw 17.76625 MHz
T2 1 5.70888313 GHz -11.33 dBm
Measuring...

99% OBW 802.11ac20

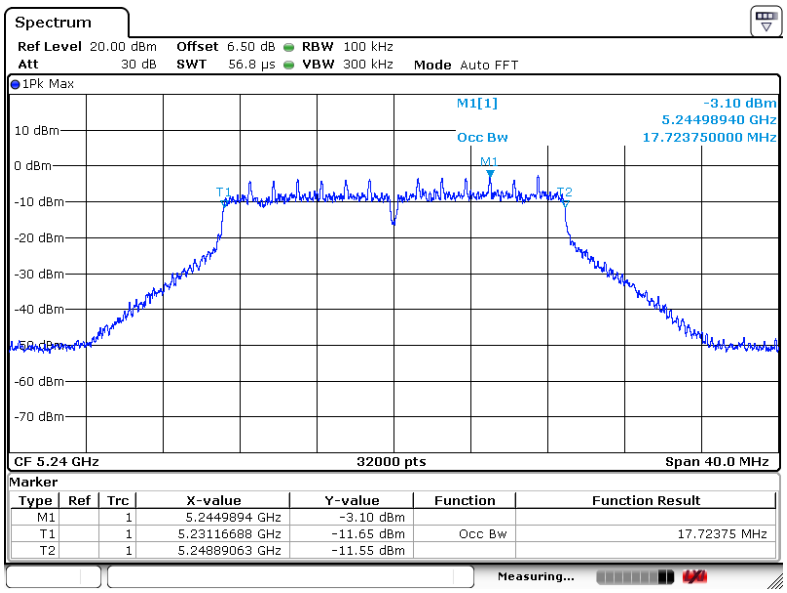
Channel: 36



Channel: 44

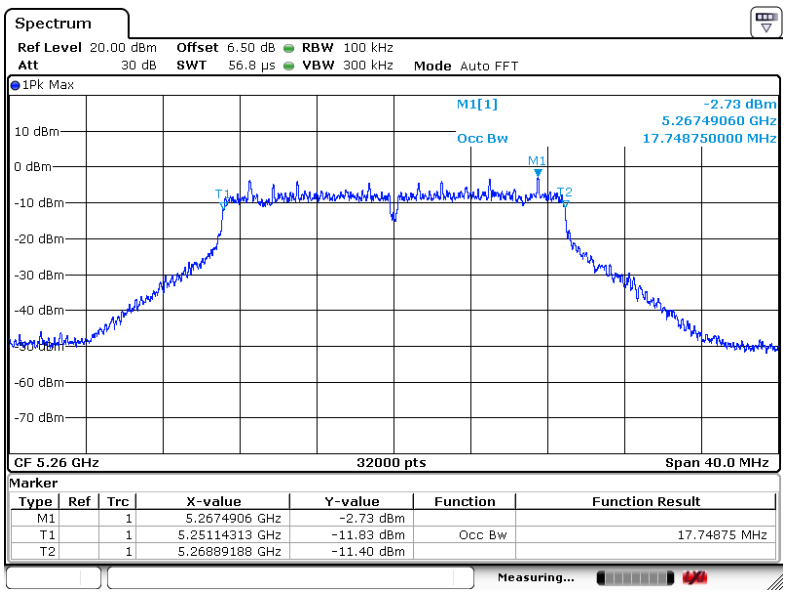


Channel: 48

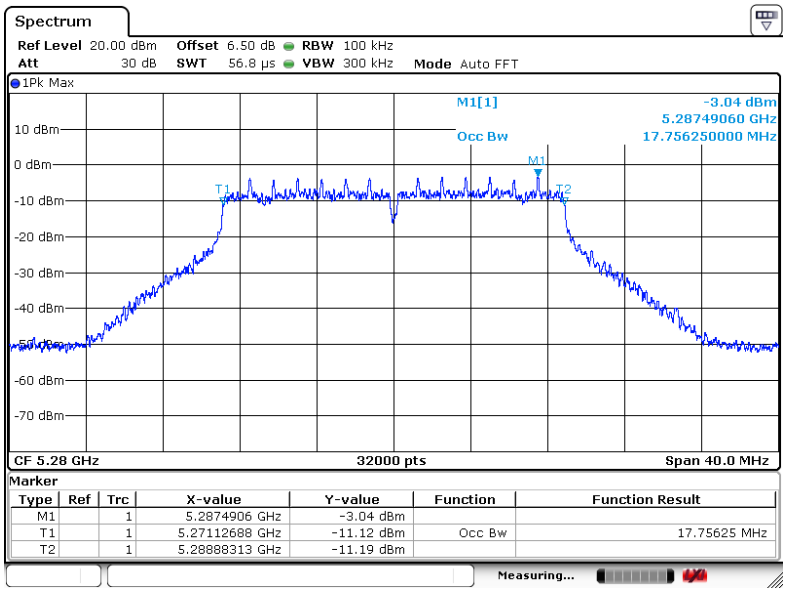

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -3.10 dBm
5.24498940 GHz
Occ Bw 17.723750000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2449894 GHz -3.10 dBm
T1 1 5.23116688 GHz -11.65 dBm Occ Bw 17.72375 MHz
T2 1 5.24889063 GHz -11.55 dBm
Measuring...

99% OBW 802.11ac20

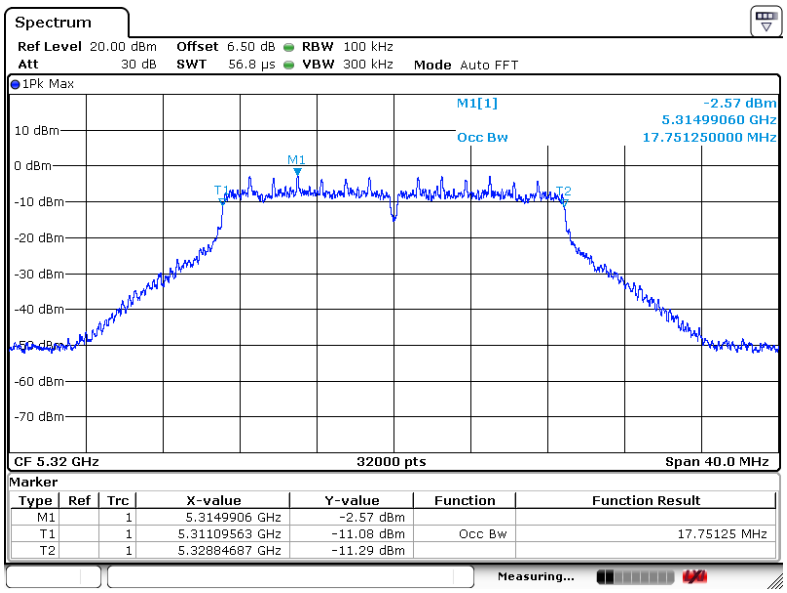
Channel: 52



Channel: 56

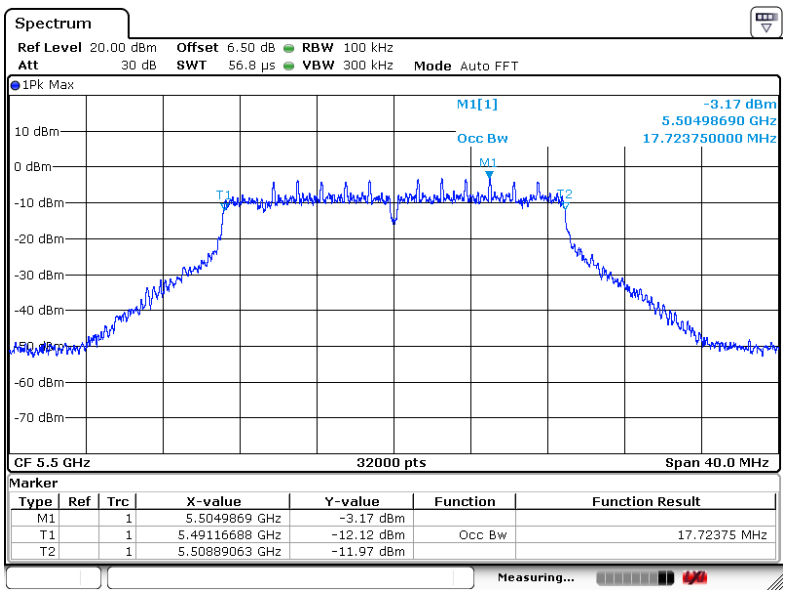


Channel: 64

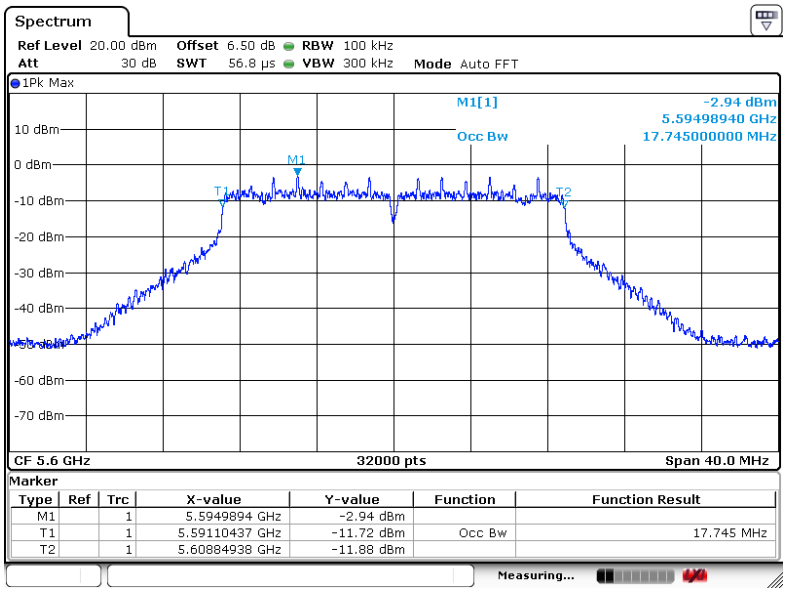

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.57 dBm
5.31499060 GHz
Occ Bw 17.751250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3149906 GHz -2.57 dBm
T1 1 5.31109563 GHz -11.08 dBm Occ Bw 17.75125 MHz
T2 1 5.32884687 GHz -11.29 dBm
Measuring...

99% OBW 802.11ac20

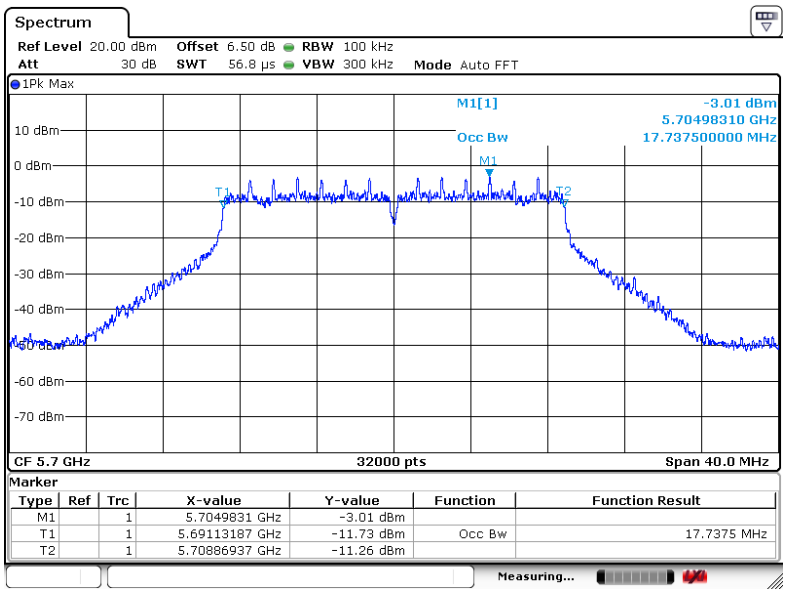
Channel: 100



Channel: 120

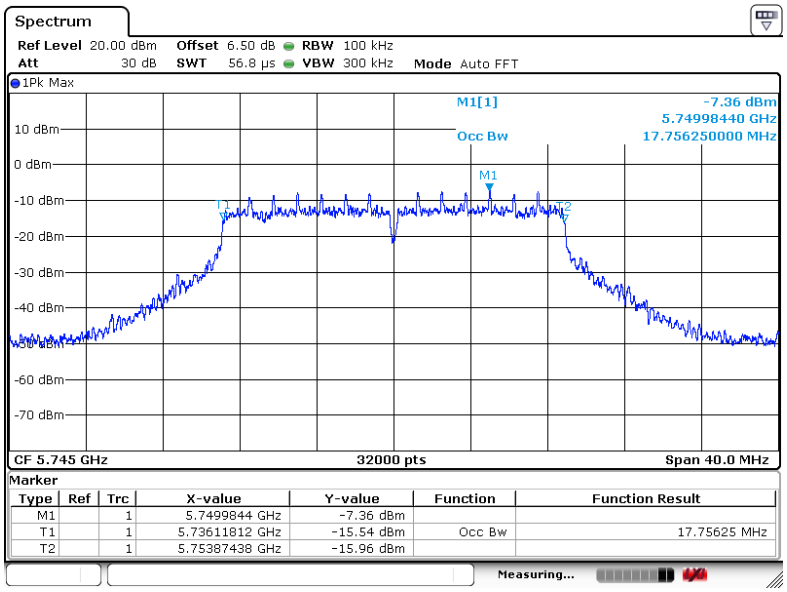


Channel: 140

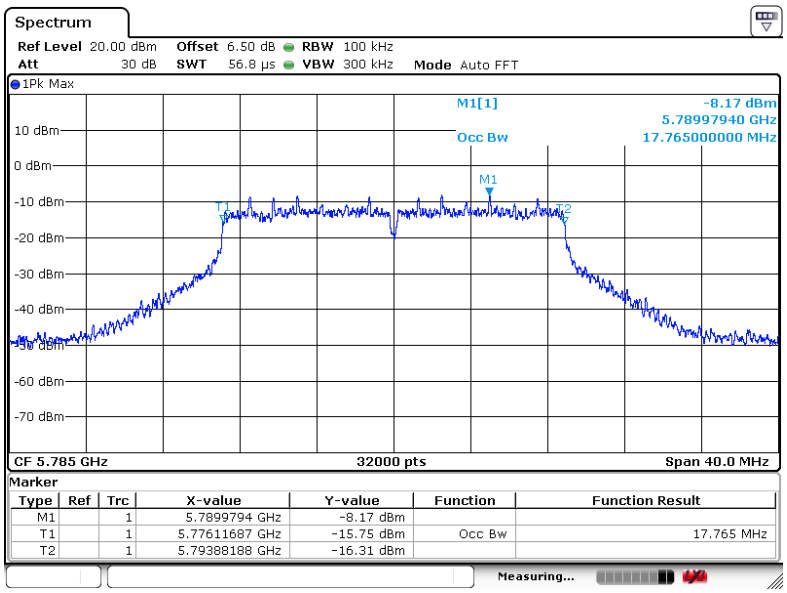

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -3.01 dBm
5.70498310 GHz
Occ Bw 17.737500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7049831 GHz -3.01 dBm
T1 1 5.69113187 GHz -11.73 dBm Occ Bw 17.7375 MHz
T2 1 5.70886937 GHz -11.26 dBm
Measuring...

99% OBW 802.11a

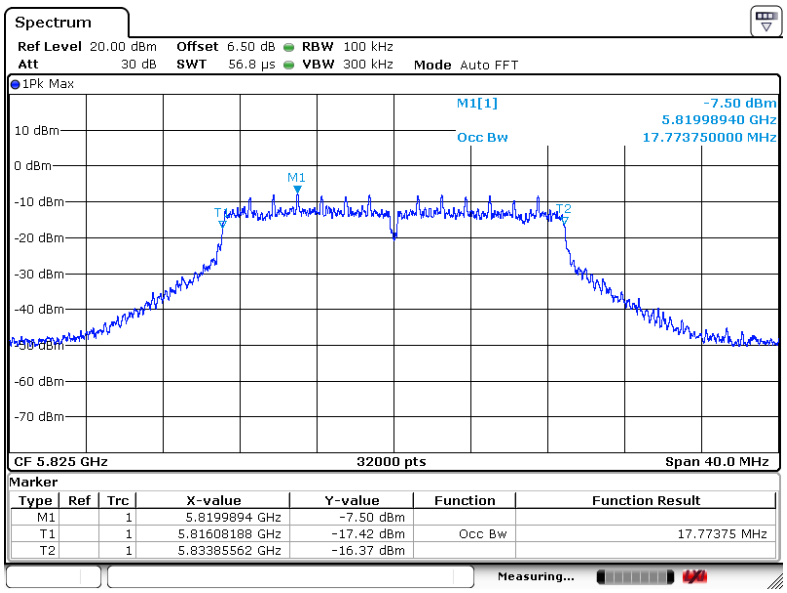
Channel: 149



Channel: 157

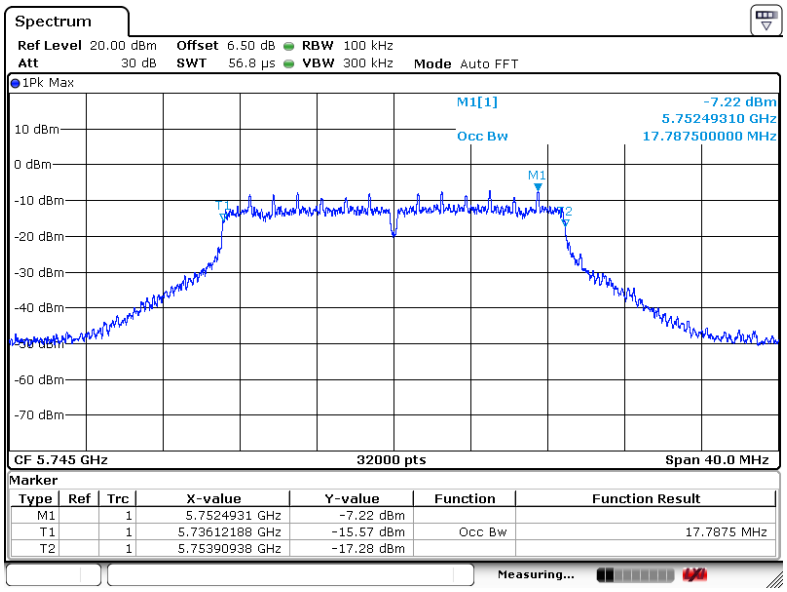


Channel: 165

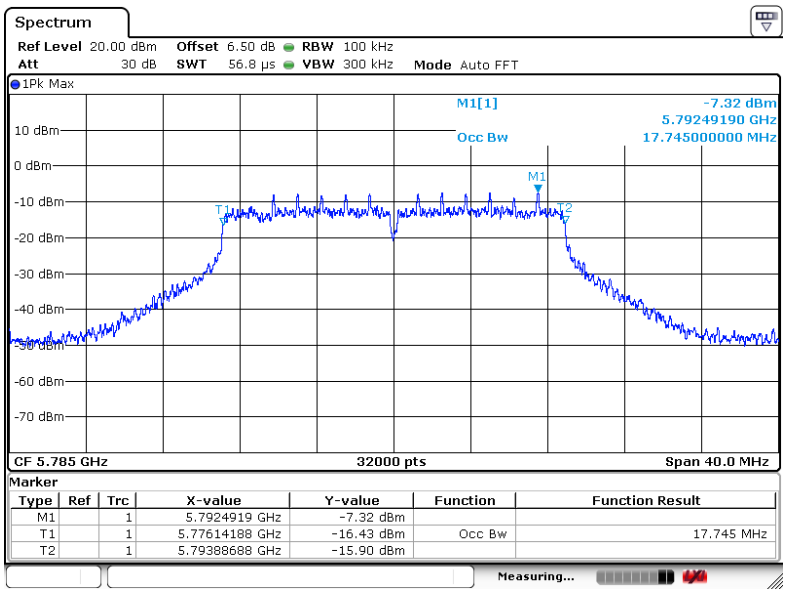

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1]
-7.50 dBm
5.81998940 GHz
Occ Bw
17.773750000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199894 GHz -7.50 dBm
T1 1 5.81608188 GHz -17.42 dBm Occ Bw 17.77375 MHz
T2 1 5.83385562 GHz -16.37 dBm
Measuring...

99% OBW 802.11n20

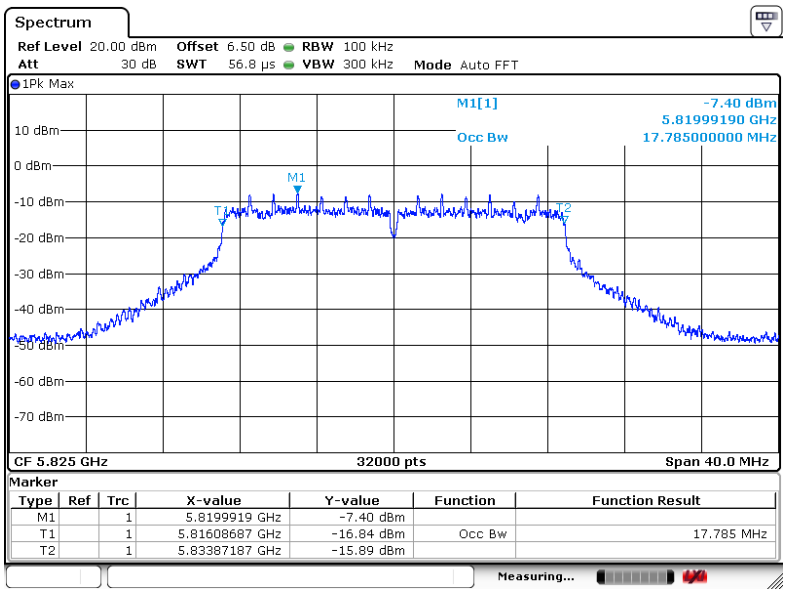
Channel: 149



Channel: 157

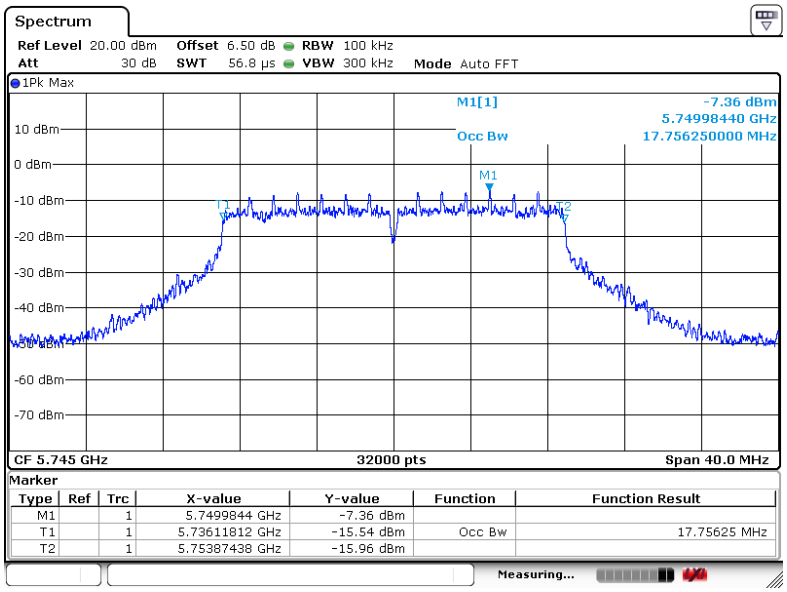


Channel: 165

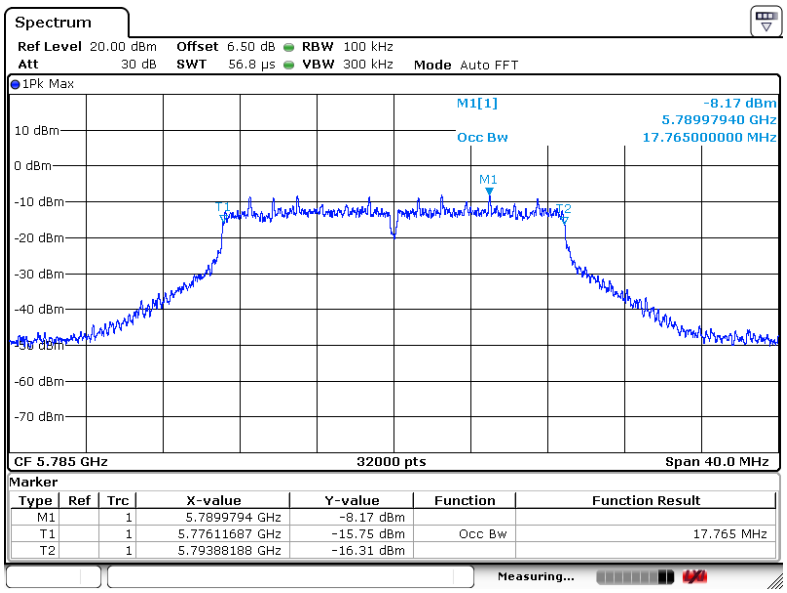

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -7.40 dBm
5.81999190 GHz
Occ Bw 17.785000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199919 GHz -7.40 dBm
T1 1 5.81608687 GHz -16.84 dBm Occ Bw 17.785 MHz
T2 1 5.83387187 GHz -15.89 dBm
Measuring...

99% OBW 802.11ac20

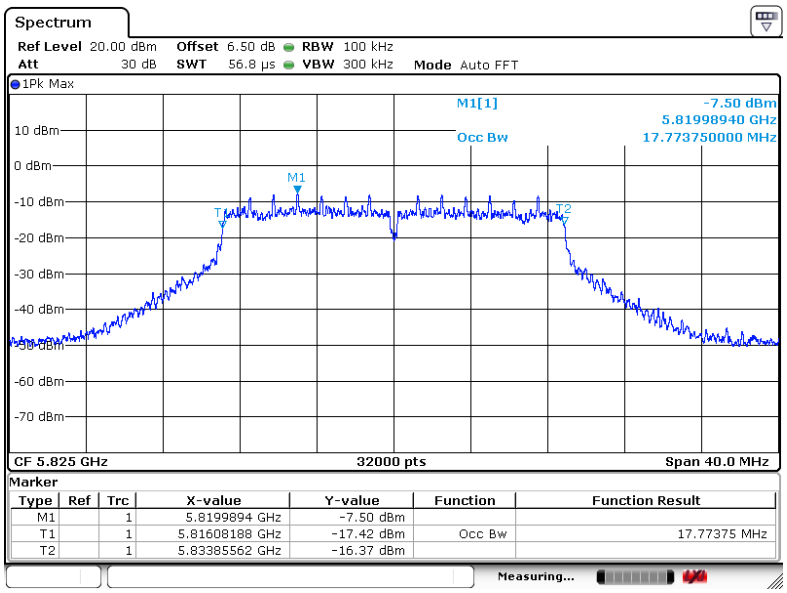
Channel: 149



Channel: 157

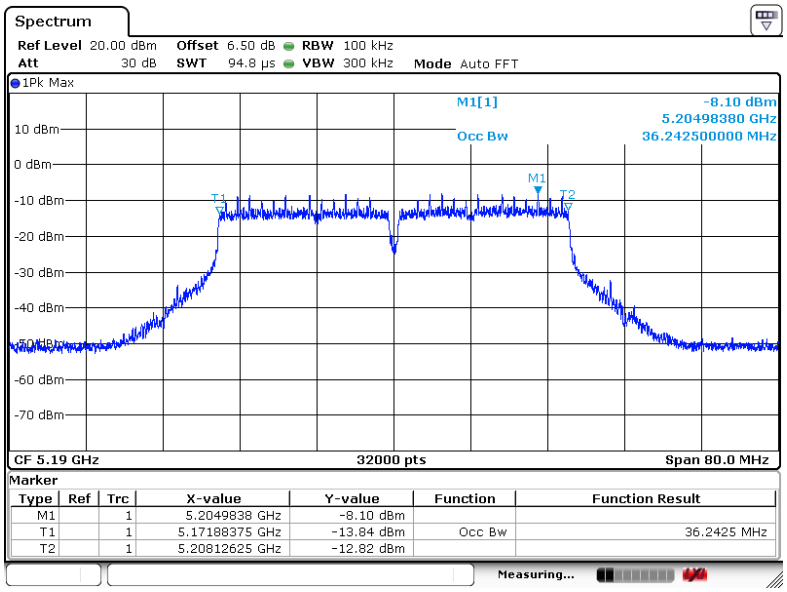


Channel: 165

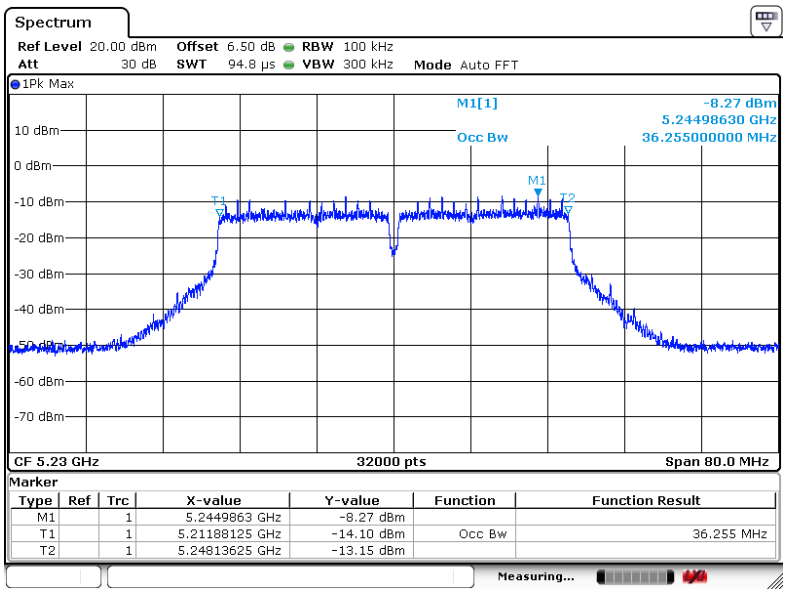

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -7.50 dBm
5.81998940 GHz
Occ Bw 17.773750000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199894 GHz -7.50 dBm
T1 1 5.81608188 GHz -17.42 dBm Occ Bw 17.77375 MHz
T2 1 5.83385562 GHz -16.37 dBm
Measuring...

99% OBW 802.11n40

Channel: 38

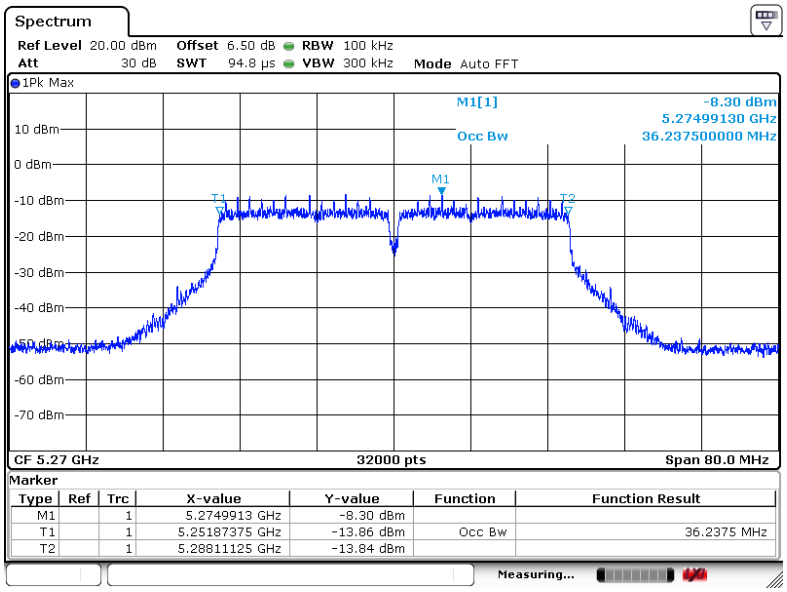


Channel: 46

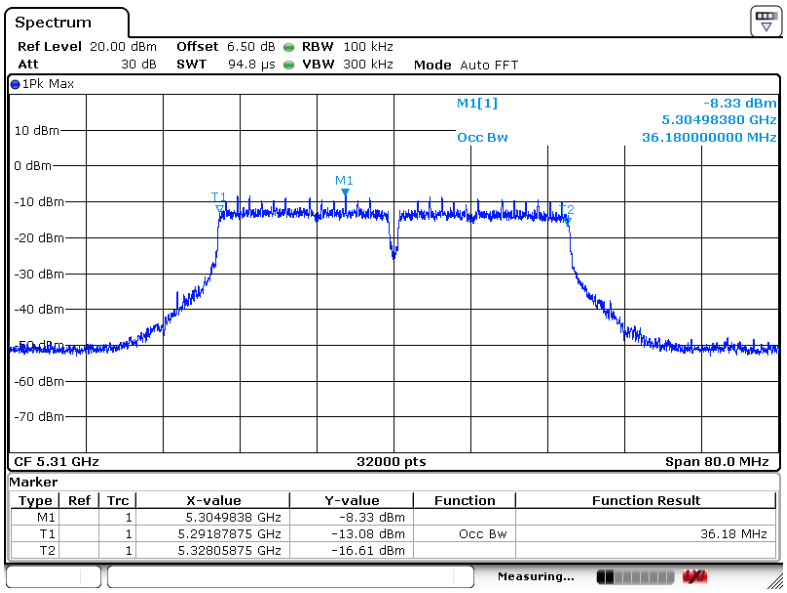


99% OBW 802.11n40

Channel: 54

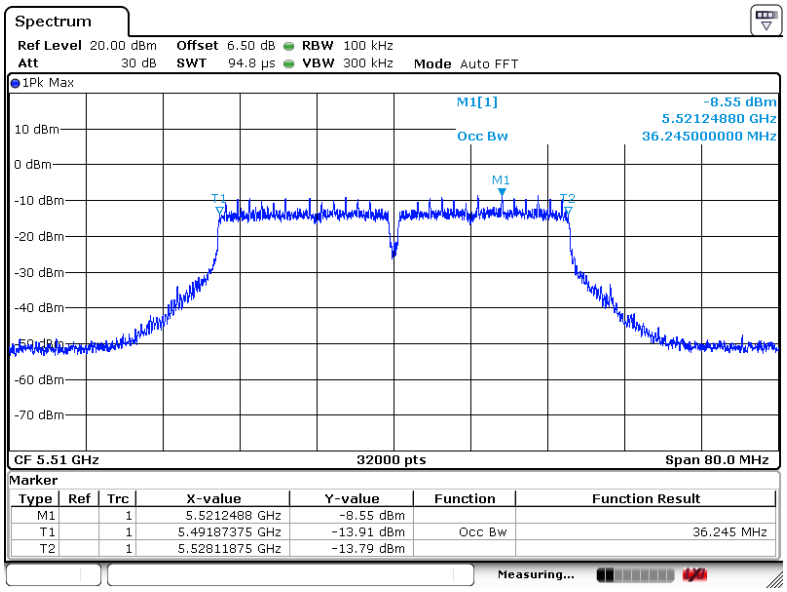


Channel: 62

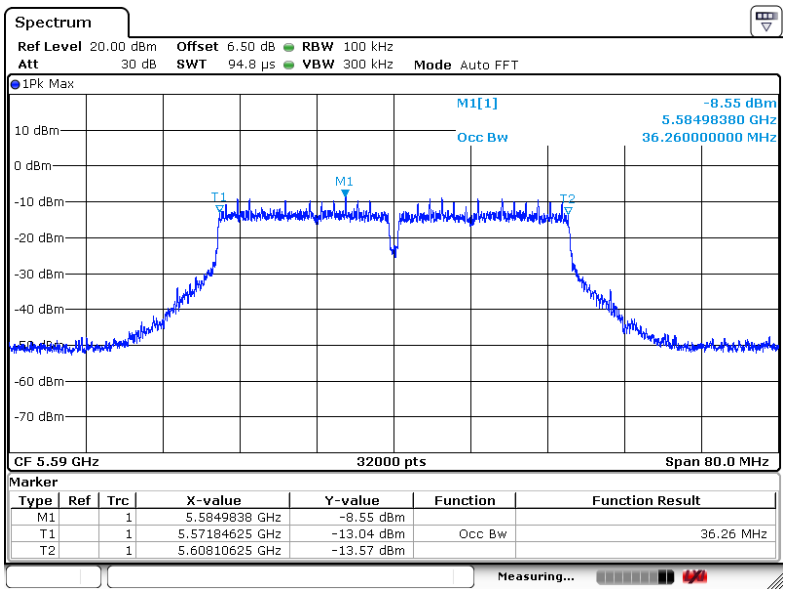


99% OBW 802.11n40

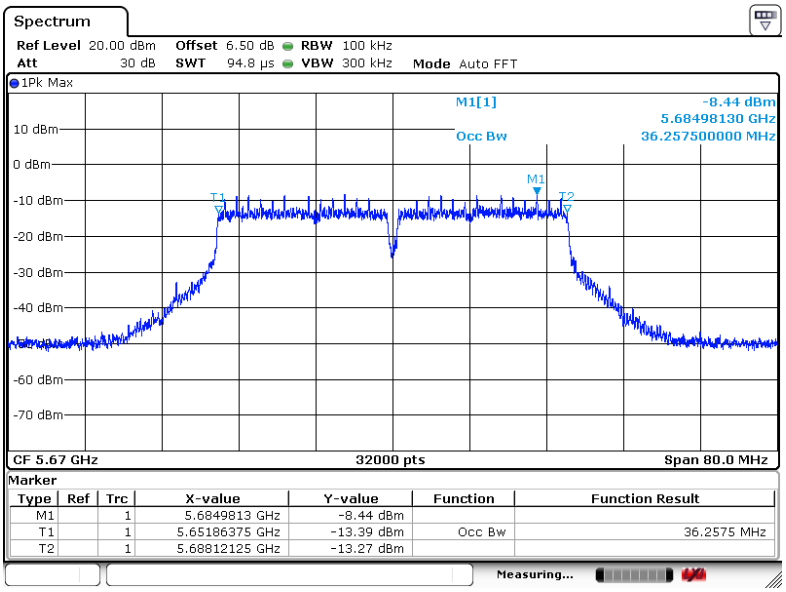
Channel: 102



Channel: 118

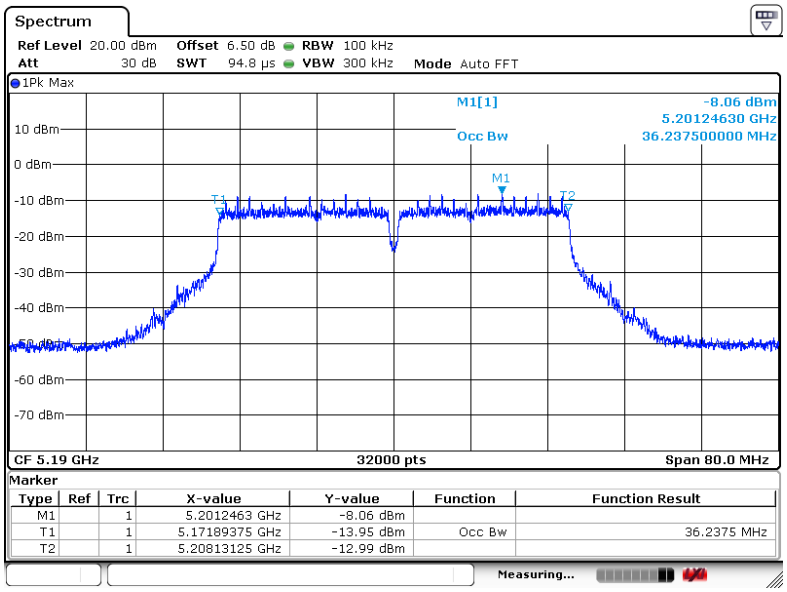


Channel: 134

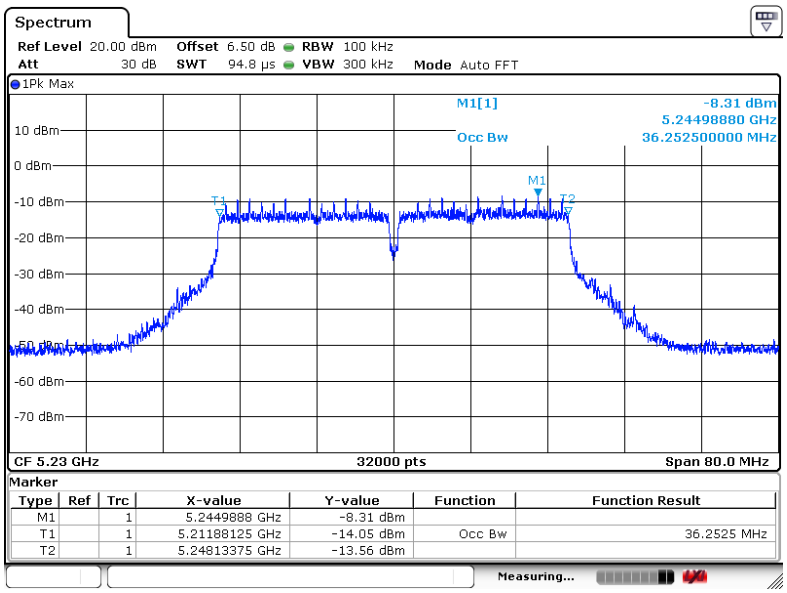

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -8.44 dBm
5.68498130 GHz
Occ Bw 36.257500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
T1
M1
T2
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6849813 GHz -8.44 dBm
T1 1 5.65186375 GHz -13.39 dBm Occ Bw 36.2575 MHz
T2 1 5.68812125 GHz -13.27 dBm
Measuring...

99% OBW 802.11ac40

Channel: 38

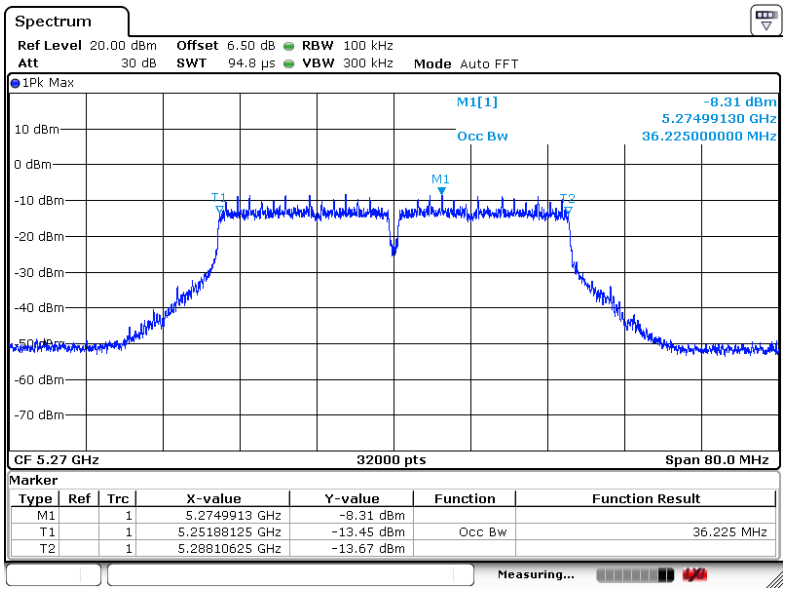


Channel: 46

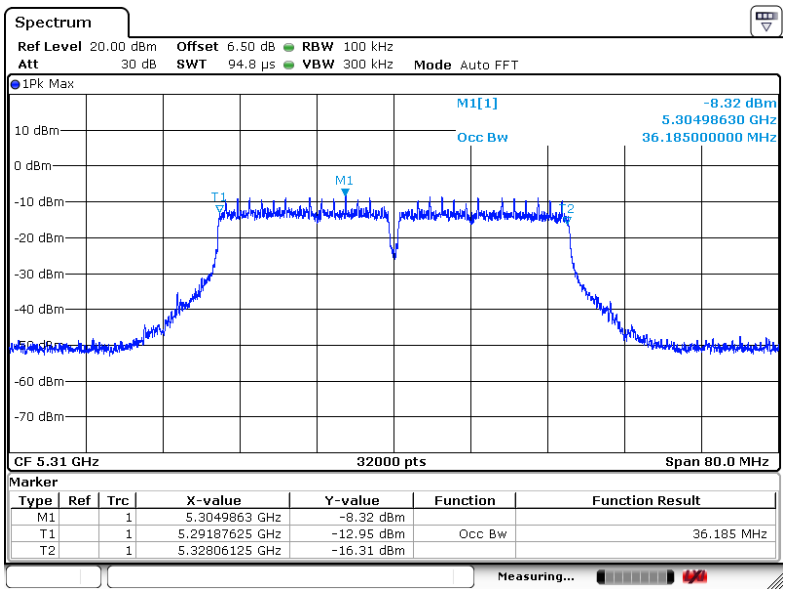


99% OBW 802.11ac40

Channel: 54

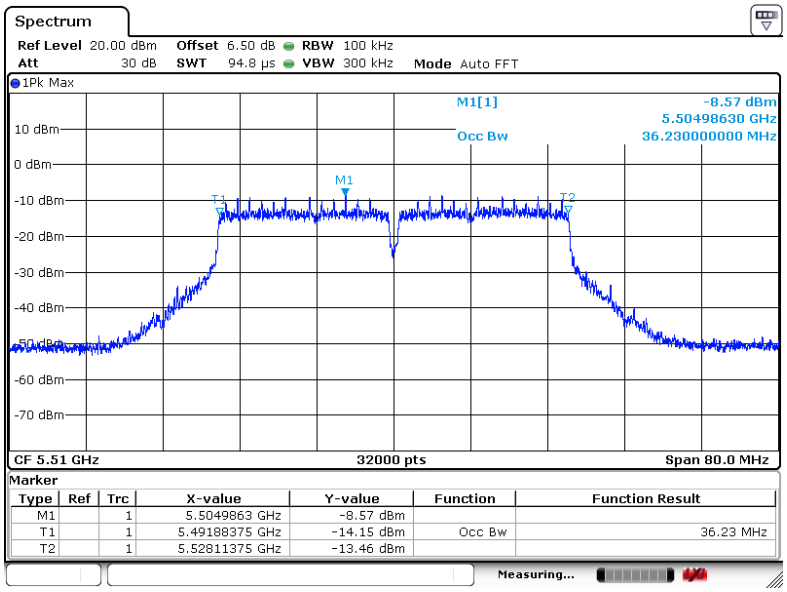


Channel: 62

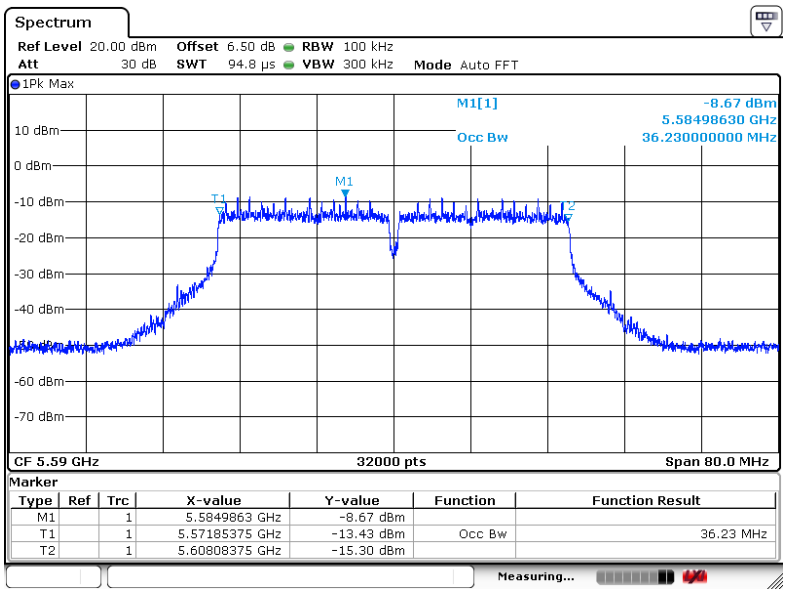


99% OBW 802.11ac40

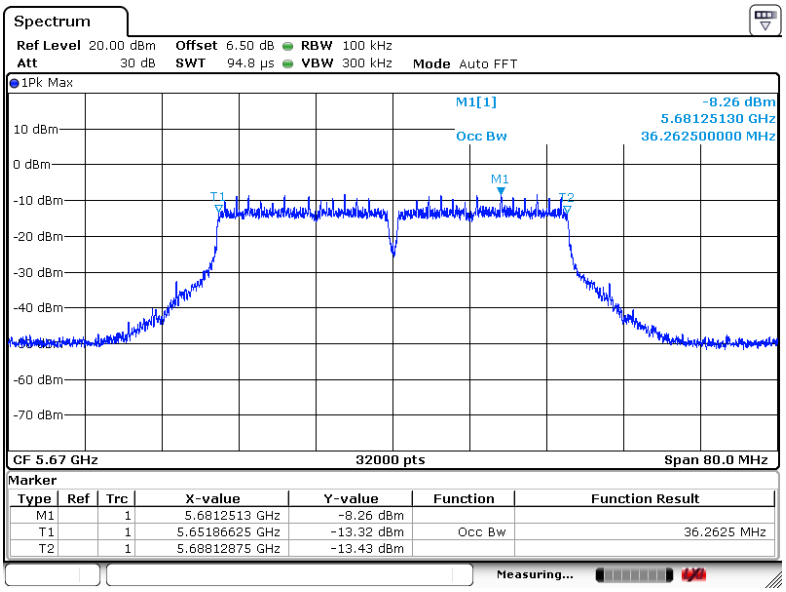
Channel: 102



Channel: 118

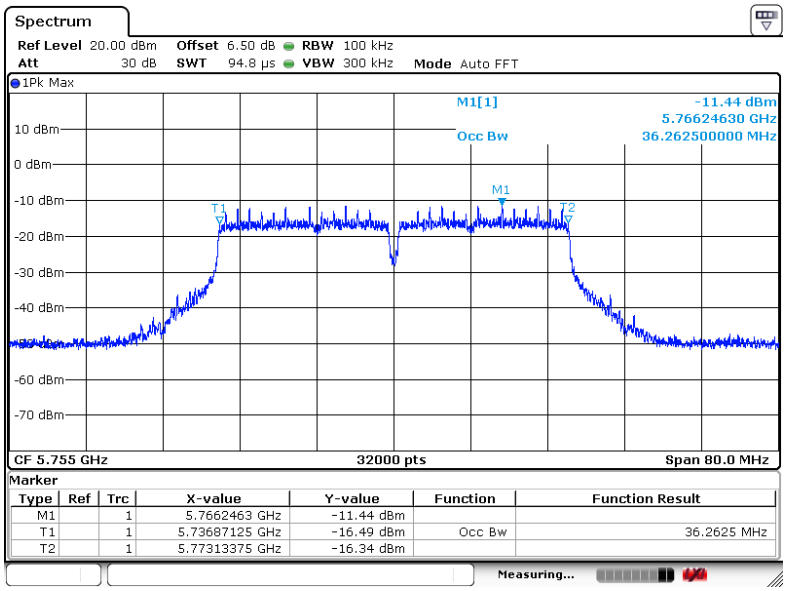


Channel: 134

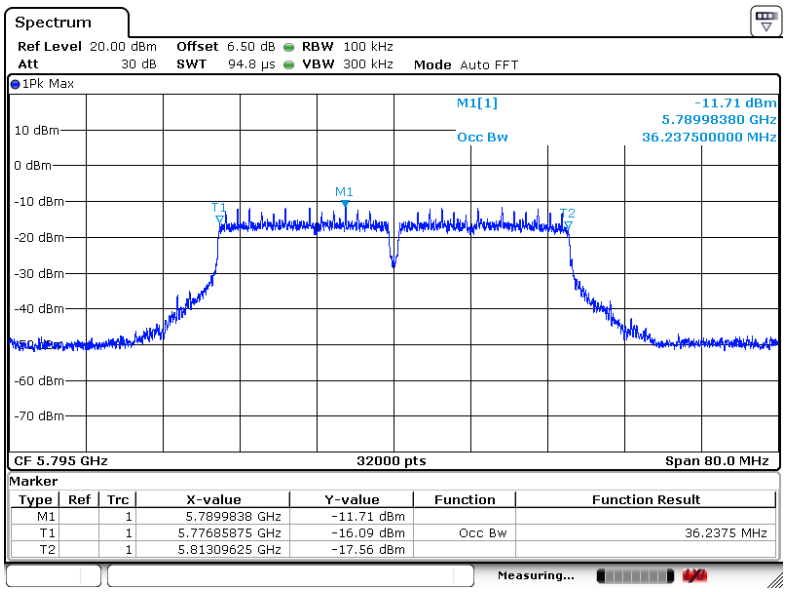

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -8.26 dBm
5.68125130 GHz
Occ Bw 36.262500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
T1
M1
T2
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6812513 GHz -8.26 dBm
T1 1 5.65186625 GHz -13.32 dBm Occ Bw 36.2625 MHz
T2 1 5.68812875 GHz -13.43 dBm
Measuring...

99% OBW 802.11n40

Channel: 151

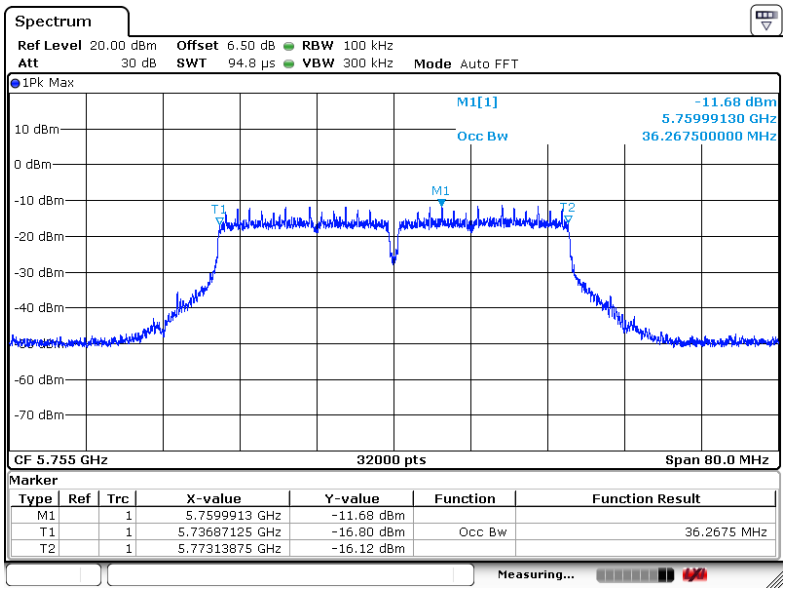


Channel: 159

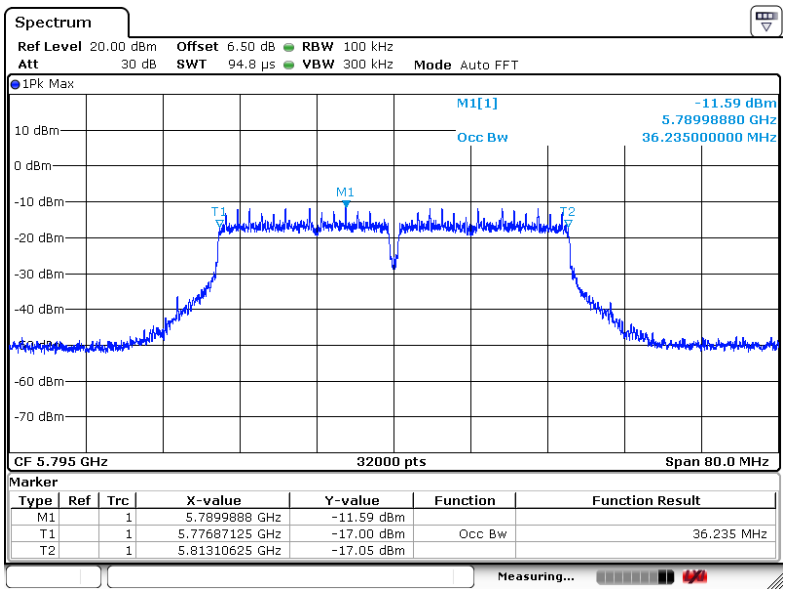


99% OBW 802.11ac40

Channel: 151

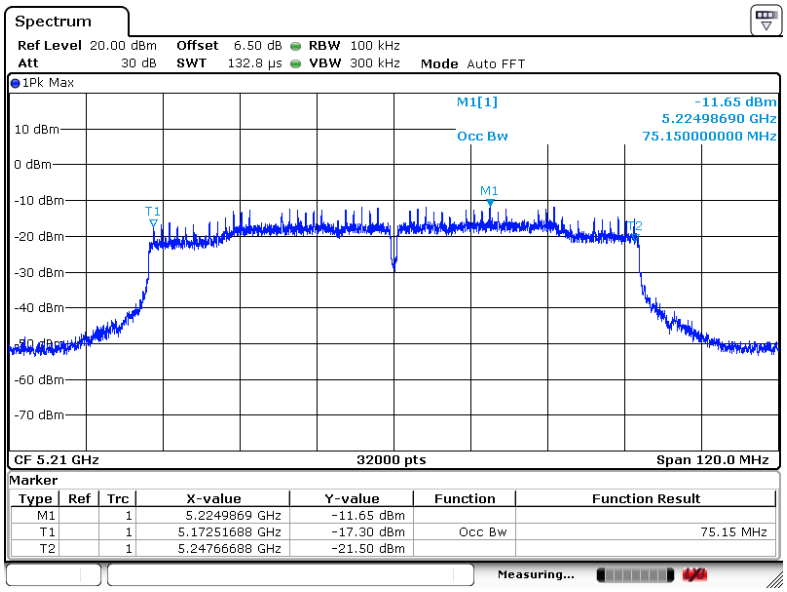


Channel: 159

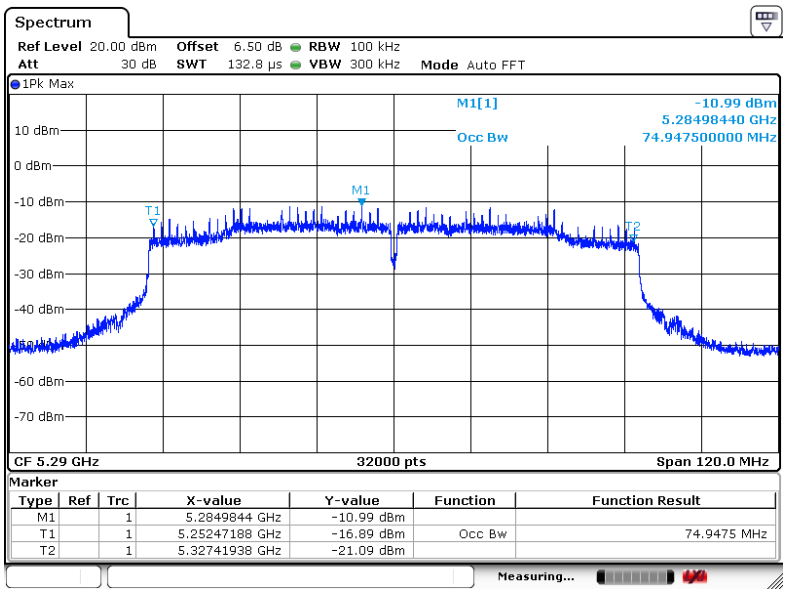


99% OBW 802.11ac80

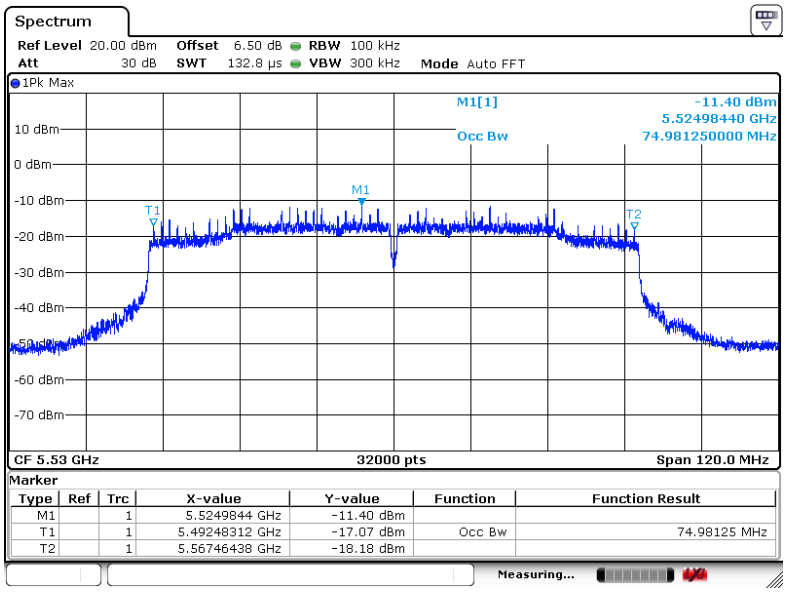
Channel:42



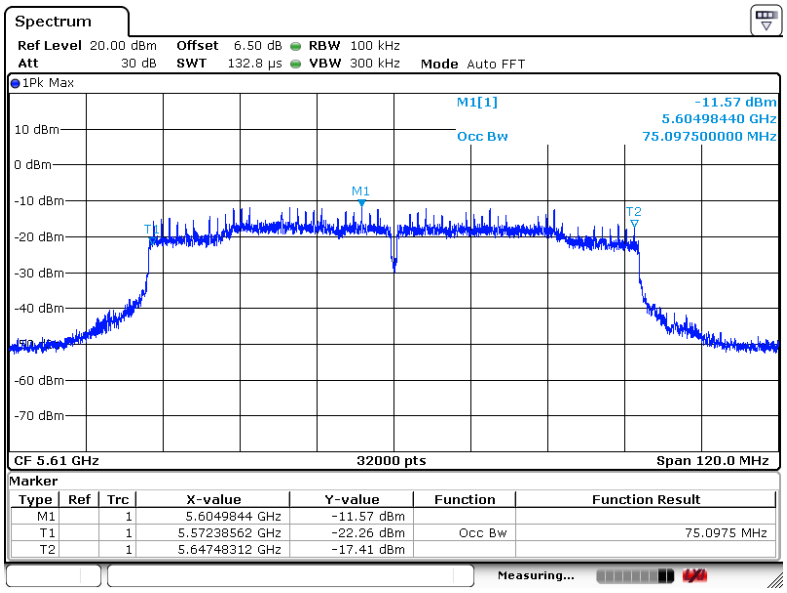
Channel: 58



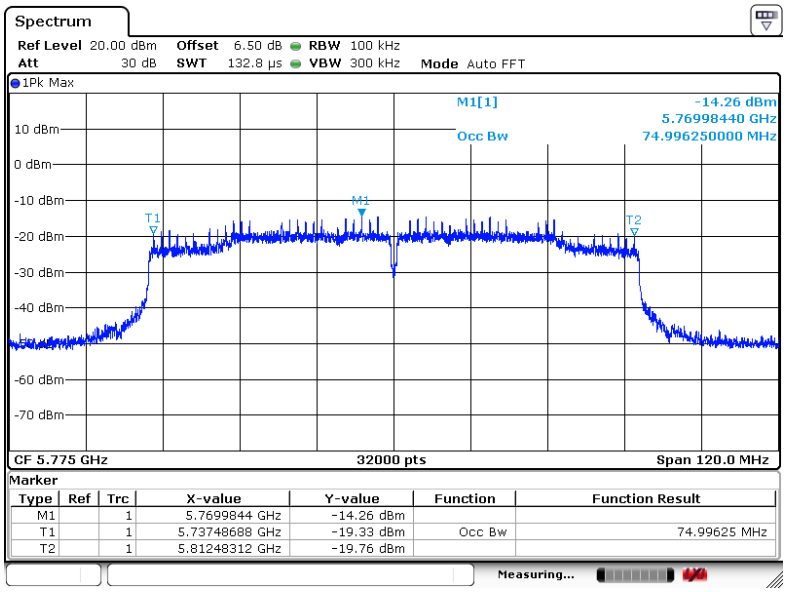
Channel:106



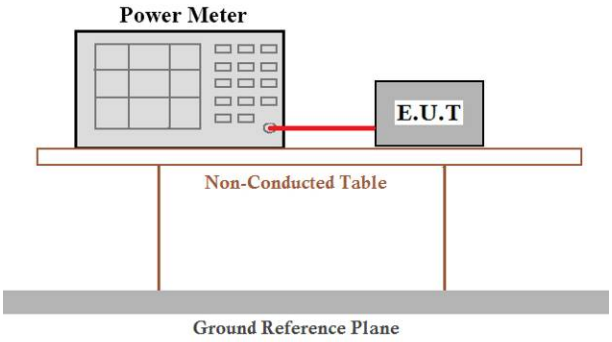
Channel: 122



Channel:155


Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 132.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -14.26 dBm
5.76998440 GHz
Occ Bw 74.996250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
T1
M1
T2
CF 5.775 GHz
32000 pts
Span 120.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7699844 GHz -14.26 dBm
T1 1 5.73748688 GHz -19.33 dBm Occ Bw 74.99625 MHz
T2 1 5.81248312 GHz -19.76 dBm
Measuring...

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	15.19	14.74	14.70	24	Pass
44	5220.00	15.23	14.58	14.55	24	Pass
48	5240.00	15.06	14.61	14.56	24	Pass
52	5260.00	14.97	13.86	13.78	24	Pass
56	5280.00	14.94	14.12	14.11	24	Pass
64	5320.00	15.10	14.07	14.04	24	Pass
100	5500.00	14.67	13.94	13.92	24	Pass
120	5600.00	14.78	13.86	13.81	24	Pass
140	5700.00	14.56	13.75	13.73	24	Pass
149	5745.00	10.34	10.14	10.09	30	Pass
157	5785.00	10.30	10.11	10.06	30	Pass
165	5825.00	10.23	10.09	10.09	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)		Limit(dBm)	Result
		802.11n(HT40)	802.11ac(VHT40)		
38	5190.00	14.52	14.50	24	Pass
46	5230.00	14.76	14.71	24	Pass
54	5270.00	14.62	14.57	24	Pass
62	5310.00	14.27	14.24	24	Pass
102	5510.00	14.19	14.15	24	Pass
118	5590.00	14.16	14.12	24	Pass
134	5670.00	14.25	14.18	24	Pass
151	5755.00	10.13	10.12	30	Pass
159	5795.00	10.10	10.07	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)	Limit(dBm)	Result
		802.11ac(VHT80)		
42	5210.00	13.24	24	Pass
58	5290.00	13.36	24	Pass
106	5530.00	13.18	24	Pass
122	5610.00	13.25	24	Pass
155	5775.00	9.98	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	15.15	14.65	14.61	24	Pass
44	5220.00	15.21	14.47	14.48	24	Pass
48	5240.00	15.03	14.56	14.49	24	Pass
52	5260.00	14.94	13.81	13.65	24	Pass
56	5280.00	14.91	14.08	14.05	24	Pass
64	5320.00	15.08	14.00	14.01	24	Pass
100	5500.00	14.59	13.89	13.87	24	Pass
120	5600.00	14.73	13.75	13.79	24	Pass
140	5700.00	14.48	13.68	13.73	24	Pass
149	5745.00	10.26	10.07	10.00	30	Pass
157	5785.00	10.24	10.05	9.96	30	Pass
165	5825.00	10.18	10.04	10.02	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)		Limit(dBm)	Result
		802.11n(HT40)	802.11ac(VHT40)		
38	5190.00	14.48	14.45	24	Pass
46	5230.00	14.72	14.64	24	Pass
54	5270.00	14.54	14.53	24	Pass
62	5310.00	14.19	14.17	24	Pass
102	5510.00	14.13	14.12	24	Pass
118	5590.00	14.11	14.08	24	Pass
134	5670.00	14.22	14.13	24	Pass
151	5755.00	10.08	10.06	30	Pass
159	5795.00	10.09	10.04	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)	Limit(dBm)	Result
		802.11ac(VHT80)		
42	5210.00	13.20	24	Pass
58	5290.00	13.33	24	Pass
106	5530.00	13.14	24	Pass
122	5610.00	13.19	24	Pass
155	5775.00	9.95	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:

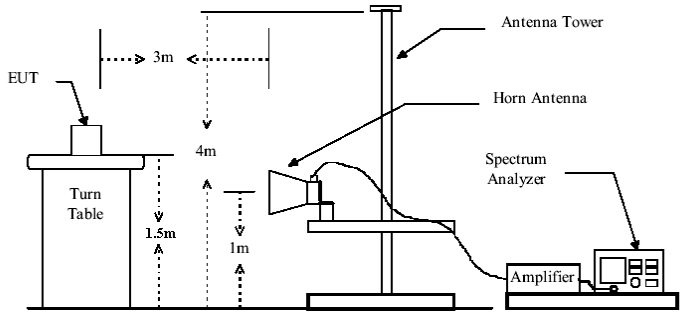
(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(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	46.75	7.18	53.93	68.2	-14.27	PK	H
5150	45.25	7.18	52.43	68.2	-15.77	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	43.87	7.2	51.07	68.2	-17.13	PK	H
5350	51.02	7.2	58.22	68.2	-9.98	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	48.14	7.18	55.32	68.2	-12.88	PK	H
5150	55.03	7.18	62.21	68.2	-5.99	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	44.59	7.2	51.79	68.2	-16.41	PK	H
5350	50.46	7.2	57.66	68.2	-10.54	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	43.29	7.18	50.47	68.2	-17.73	PK	H
5150	43.47	7.18	50.65	68.2	-17.55	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	45.03	7.2	52.23	68.2	-15.97	PK	H
5350	48.16	7.2	55.36	68.2	-12.84	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	46.34	7.18	53.52	68.2	-14.68	PK	H
5150	48.52	7.18	55.7	68.2	-12.50	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	46.29	7.2	53.49	68.2	-14.71	PK	H
5350	48.33	7.2	55.53	68.2	-12.67	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	41.59	8.79	50.38	74	-23.62	Horizontal
5741.35	82.57	8.57	91.14	N/A	N/A	Horizontal
5725	41.16	8.79	49.95	74	-24.05	Vertical
5741.35	84.85	8.57	93.42	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	30.24	8.79	39.03	54	-14.97	Horizontal
5741.35	72.36	8.57	80.93	N/A	N/A	Horizontal
5725	30.59	8.79	39.38	54	-14.62	Vertical
5741.35	75.11	8.57	83.68	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	78.53	8.79	87.32	N/A	N/A	Horizontal
5850	38.45	8.82	47.27	74	-26.73	Horizontal
5826.2	85.39	8.79	94.18	N/A	N/A	Vertical
5850	39.87	8.82	48.69	74	-25.31	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	70.16	8.79	78.95	N/A	N/A	Horizontal
5850	29.06	8.82	37.88	54	-16.12	Horizontal
5826.2	76.25	8.79	85.04	N/A	N/A	Vertical
5850	28.74	8.82	37.56	54	-16.44	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	39.02	8.79	47.81	74	-26.19	Horizontal
5742.19	77.85	8.57	86.42	N/A	N/A	Horizontal
5725	39.74	8.79	48.53	74	-25.47	Vertical
5742.19	84.16	8.57	92.73	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	28.53	8.79	37.32	54	-16.68	Horizontal
5742.19	68.49	8.57	77.06	N/A	N/A	Horizontal
5725	29.87	8.79	38.66	54	-15.34	Vertical
5742.19	75.63	8.57	84.2	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	77.42	8.79	86.21	N/A	N/A	Horizontal
5850	38.49	8.82	47.31	74	-26.69	Horizontal
5826.2	35.97	8.79	44.76	N/A	N/A	Vertical
5850	40.86	8.82	49.68	74	-24.32	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	68.45	8.79	77.24	N/A	N/A	Horizontal
5850	29.14	8.82	37.96	54	-16.04	Horizontal
5826.2	74.33	8.79	83.12	N/A	N/A	Vertical
5850	29.58	8.82	38.4	54	-15.6	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	39.42	8.52	47.94	74	-26.06	Horizontal
5745	75.34	8.57	83.91	N/A	N/A	Horizontal
5725	37.86	8.52	46.38	74	-27.62	Vertical
5745	84.39	8.57	92.96	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	30.77	8.52	39.29	54	-14.71	Horizontal
5745	68.94	8.57	77.51	N/A	N/A	Horizontal
5725	28.45	8.52	36.97	54	-17.03	Vertical
5745	75.49	8.57	84.06	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	78.36	8.68	87.04	N/A	N/A	Horizontal
5850	35.57	8.82	44.39	74	-29.61	Horizontal
5784.88	84.39	8.68	93.07	N/A	N/A	Vertical
5850	43.18	8.82	52	74	-22	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5784.88	71.46	8.68	80.14	N/A	N/A	Horizontal
5850	29.58	8.82	38.4	54	-15.6	Horizontal
5784.88	74.46	8.68	83.14	N/A	N/A	Vertical
5850	27.87	8.82	36.69	54	-17.31	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	38.45	8.52	46.97	74	-27.03	Horizontal
5778.180	78.36	8.68	87.04	N/A	N/A	Horizontal
5850.000	36.79	8.82	45.61	74	-28.39	Horizontal
5725.000	37.55	8.52	46.07	74	-27.93	Vertical
5778.180	82.59	8.68	91.27	N/A	N/A	Vertical
5850.000	40.54	8.82	49.36	74	-24.64	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.000	31.02	8.52	39.54	54	-14.46	Horizontal
5778.180	69.74	8.68	78.42	N/A	N/A	Horizontal
5850.000	28.59	8.82	37.41	54	-16.59	Horizontal
5725.000	29.31	8.52	37.83	54	-16.17	Vertical
5778.180	71.23	8.68	79.91	N/A	N/A	Vertical
5850.000	29.56	8.82	38.38	54	-15.62	Vertical

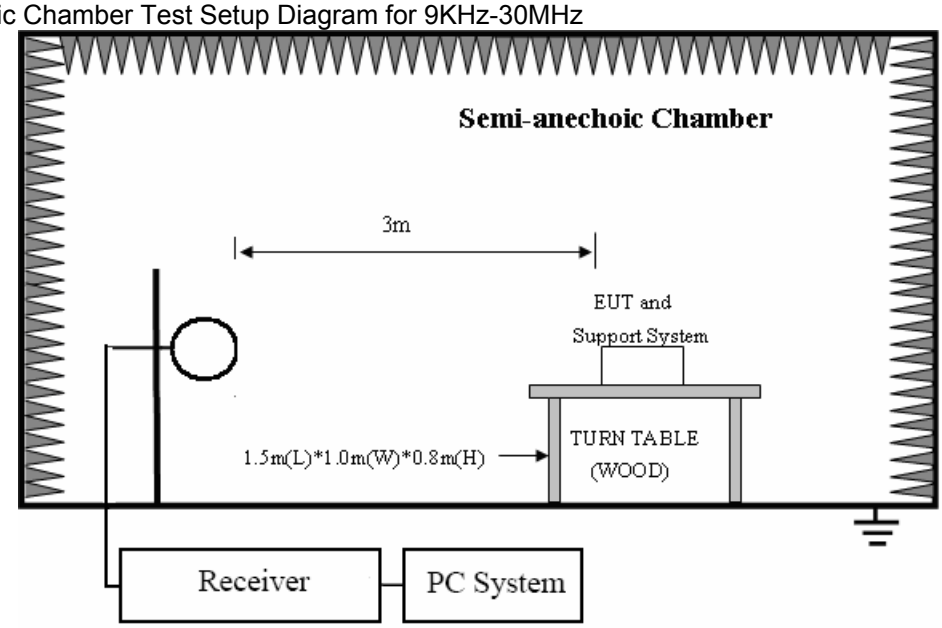
7. RADIATED EMISSION MEASUREMENT

7.1. Test equipment

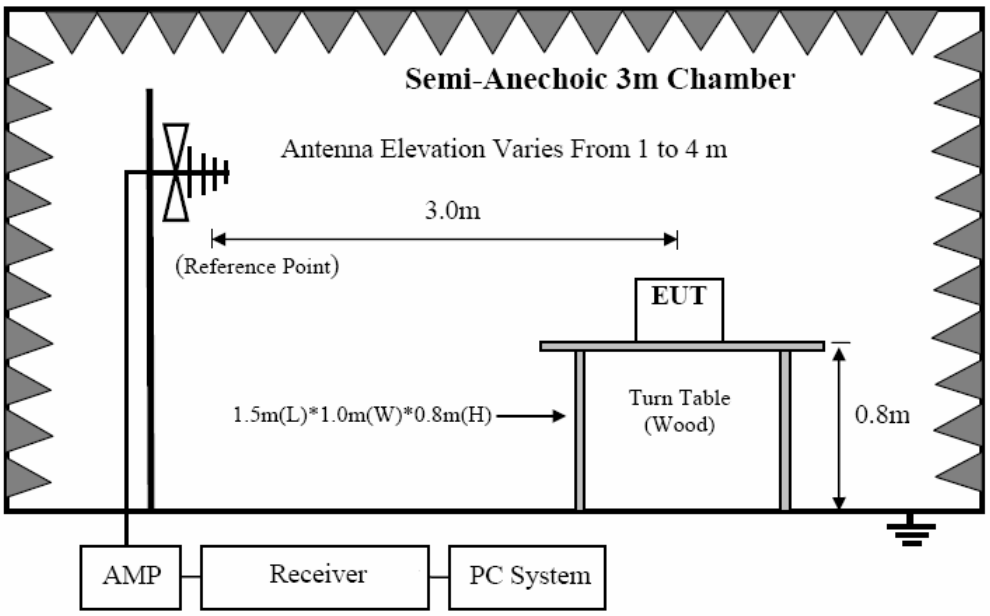
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	Calibrated Date
1	EMI Test Receiver	R&S	ESCI	101307	12/17/2020	12/18/2019
2	Spectrum analyzer	Agilent	E4407B	US40240708	07/04/2020	07/05/2019
3	Trilog Broadband Antenna	Schwarzbeck	VULB9168	VULB9168 -192	03/04/2020	03/05/2019
4	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D1065	100276	12/17/2020	12/18/2019
5	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D1065	100546	12/17/2020	12/18/2019
6	Dipole antenna	Schwarzbeck	UHAP	1101	12/17/2020	12/18/2019
7	Dipole antenna	Schwarzbeck	VHAP	1118	12/17/2020	12/18/2019
8	Pre-Amplifier	CY	EMC011830	980136	12/17/2020	12/18/2019
9	Pre-amplifier	HP	8447F	3113A05680	12/17/2020	12/18/2019
10	RF Cable	R&S	R01	10403	12/17/2020	12/18/2019
11	RF Cable	R&S	R02	10512	12/17/2020	12/18/2019
12	RF Cable	R&S	R01	10454	12/17/2020	12/18/2019
13	RF Cable	R&S	R02	10343	12/17/2020	12/18/2019
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	12/17/2020	12/18/2019

7.2. Block diagram of test setup

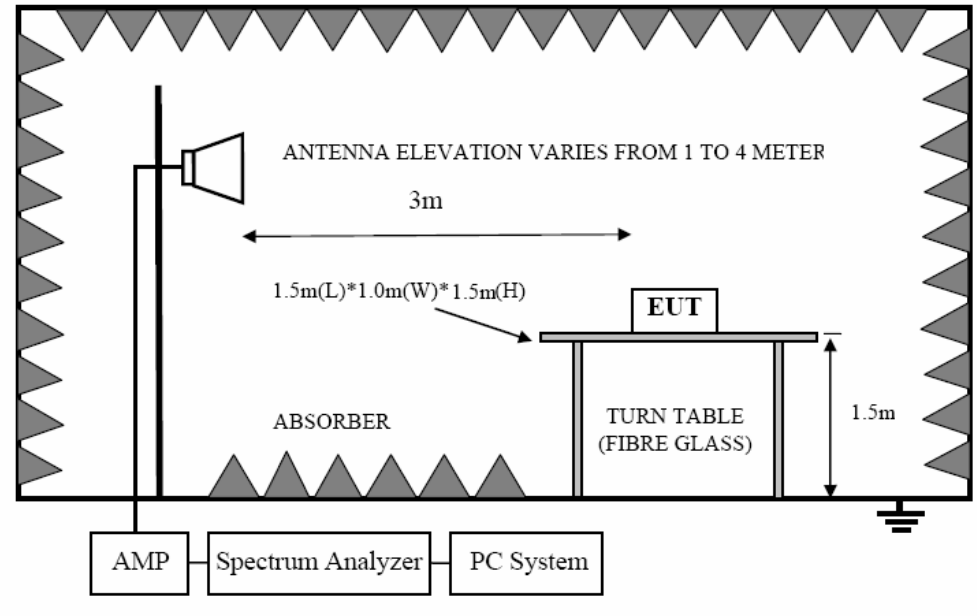
In 3m Anechoic Chamber Test Setup Diagram for 9KHz-30MHz



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:	Kano PC	**Model No.:**	1101
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.

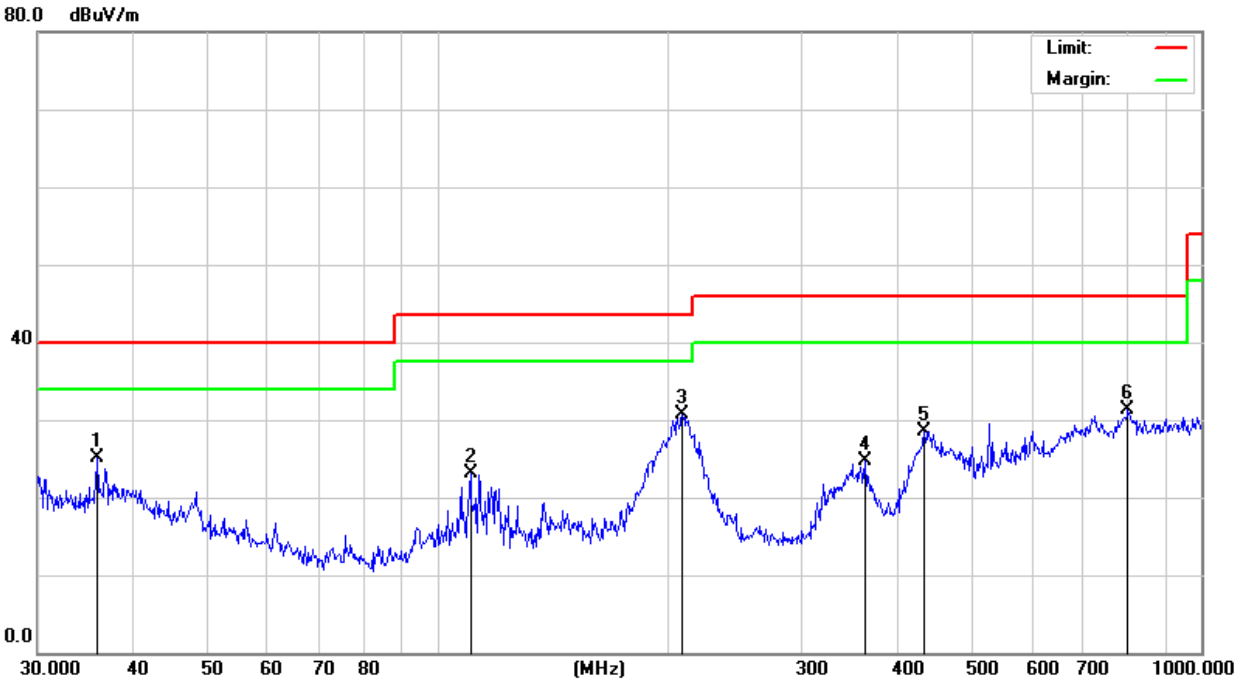
Distance extrapolation factor =20 log (specific distance/test distance)(dB);

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:	Kano PC	Model No.:	1101
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		

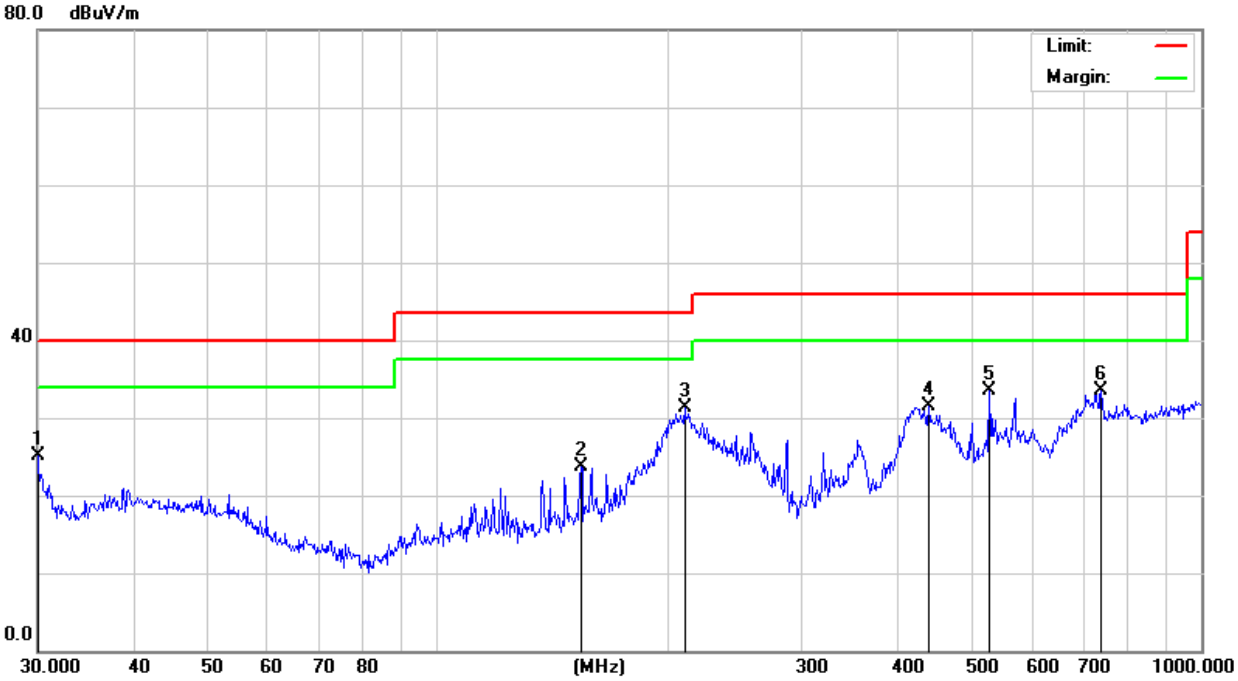


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		35.8746	29.76	-4.69	25.07	40.00	-14.93	peak
2		110.5687	30.79	-7.72	23.07	43.50	-20.43	peak
3	*	209.3129	34.58	-3.96	30.62	43.50	-12.88	peak
4		362.9844	28.97	-4.27	24.70	46.00	-21.30	peak
5		434.0650	32.08	-3.53	28.55	46.00	-17.45	peak
6		801.7862	23.64	7.67	31.31	46.00	-14.69	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:	Kano PC	Model No.:	1101
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		30.0000	29.22	-4.18	25.04	40.00	-14.96	peak
2		154.2786	30.39	-6.66	23.73	43.50	-19.77	peak
3	*	210.7860	38.36	-7.10	31.26	43.50	-12.24	peak
4		440.1963	32.24	-0.68	31.56	46.00	-14.44	peak
5		528.2458	29.64	3.83	33.47	46.00	-12.53	peak
6		739.6604	26.37	7.08	33.45	46.00	-12.55	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:	Kano PC	Model No.:	1101
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	34.70	12.56	47.26	74.00	-26.74	PEAK
	H	15540	35.72	16.45	52.17	74.00	-21.83	PEAK
	V	10360	35.60	12.56	48.16	74.00	-25.84	PEAK
	V	15540	36.30	16.45	52.75	74.00	-21.25	PEAK
802.11a-5220 MHz	H	10440	36.14	12.64	48.78	74.00	-25.22	PEAK
	H	15660	35.72	16.53	52.25	74.00	-21.75	PEAK
	V	10440	36.65	12.64	49.29	74.00	-24.71	PEAK
	V	15660	35.31	16.53	51.84	74.00	-22.16	PEAK
802.11a-5240 MHz	H	10480	33.47	12.68	46.15	74.00	-27.85	PEAK
	H	15720	35.06	16.54	51.60	74.00	-22.40	PEAK
	V	10480	35.87	12.68	48.55	74.00	-25.45	PEAK
	V	15720	34.57	16.54	51.11	74.00	-22.89	PEAK
802.11a-5745 MHz	H	11490	32.66	16.82	49.48	74.00	-24.52	PEAK
	H	17235	29.32	22.93	52.25	74.00	-21.75	PEAK
	V	11490	30.67	16.82	47.49	74.00	-26.51	PEAK
	V	17235	29.56	22.93	52.49	74.00	-21.51	PEAK
802.11a-5785 MHz	H	11570	31.88	16.71	48.59	74.00	-25.41	PEAK
	H	17355	27.40	24.37	51.77	74.00	-22.23	PEAK
	V	11570	30.39	16.71	47.10	74.00	-26.90	PEAK
	V	17355	28.45	24.37	52.82	74.00	-21.18	PEAK
802.11a-5825 MHz	H	11650	34.24	16.61	50.85	74.00	-23.15	PEAK
	H	17475	27.11	25.01	52.12	74.00	-21.88	PEAK
	V	11650	32.26	16.61	48.87	74.00	-25.13	PEAK
	V	17475	28.63	25.01	53.64	74.00	-20.36	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	32.83	12.56	45.39	74.00	-28.61	PEAK
	H	15540	35.31	16.45	51.76	74.00	-22.24	PEAK
	V	10360	35.44	12.56	48.00	74.00	-26.00	PEAK
	V	15540	36.11	16.45	52.56	74.00	-21.44	PEAK
802.11n HT20-5220MHz	H	10440	34.64	12.64	47.28	74.00	-26.72	PEAK
	H	15660	33.26	16.53	49.79	74.00	-24.21	PEAK
	V	10440	35.90	12.64	48.54	74.00	-25.46	PEAK
	V	15660	35.22	16.53	51.75	74.00	-22.25	PEAK
802.11n HT20-5240MHz	H	10480	35.15	12.68	47.83	74.00	-26.17	PEAK
	H	15720	32.16	16.54	48.70	74.00	-25.30	PEAK
	V	10480	34.63	12.68	47.31	74.00	-26.69	PEAK
	V	15720	33.96	16.54	50.50	74.00	-23.50	PEAK
802.11n HT20-5745MHz	H	11490	30.73	16.82	47.55	74.00	-26.45	PEAK
	H	17235	29.73	22.93	52.66	74.00	-21.34	PEAK
	V	11570	32.98	16.71	49.69	74.00	-24.31	PEAK
	V	17235	28.24	22.93	51.17	74.00	-22.83	PEAK
802.11n HT20-5785MHz	H	11570	30.42	16.71	47.13	74.00	-26.87	PEAK
	H	17355	28.04	24.37	52.41	74.00	-21.59	PEAK
	V	11570	33.04	16.71	49.75	74.00	-24.25	PEAK
	V	17355	29.59	24.37	53.96	74.00	-20.04	PEAK
802.11n HT20-5825MHz	H	11650	31.82	16.61	48.43	74.00	-25.57	PEAK
	H	17475	27.35	25.01	52.36	74.00	-21.64	PEAK
	V	11650	34.34	16.61	50.95	74.00	-23.05	PEAK
	V	17475	27.83	25.01	52.84	74.00	-21.16	PEAK
802.11n HT40-5190MHz	H	10380	35.98	12.58	48.56	74.00	-25.44	PEAK
	H	15570	34.54	16.48	51.02	74.00	-22.98	PEAK
	V	10380	36.70	12.58	49.28	74.00	-24.72	PEAK
	V	15570	32.67	16.48	49.15	74.00	-24.85	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	36.85	12.66	49.51	74.00	-24.49	PEAK
	H	15690	34.32	16.53	50.85	74.00	-23.15	PEAK
	V	10460	35.74	12.66	48.40	74.00	-25.60	PEAK
	V	15690	34.37	16.53	50.90	74.00	-23.10	PEAK
802.11n HT40-5755MHz	H	11510	31.75	16.78	48.53	74.00	-25.47	PEAK
	H	17265	27.66	23.29	50.95	74.00	-23.05	PEAK
	V	11510	33.86	16.78	50.64	74.00	-23.36	PEAK
	V	17265	29.10	23.29	52.39	74.00	-21.61	PEAK
802.11n HT40-5795MHz	H	11590	30.65	16.69	47.34	74.00	-26.66	PEAK
	H	17385	27.31	24.73	52.04	74.00	-21.96	PEAK
	V	11590	32.06	16.69	48.75	74.00	-25.25	PEAK
	V	17385	27.55	24.73	52.28	74.00	-21.72	PEAK
802.11ac HT20-5180MHz	H	10360	33.90	12.56	46.46	74.00	-27.54	PEAK
	H	15540	33.66	16.45	50.11	74.00	-23.89	PEAK
	V	10360	33.85	12.56	46.41	74.00	-27.59	PEAK
	V	15540	34.50	16.45	50.95	74.00	-23.05	PEAK
802.11ac HT20-5220MHz	H	10440	33.80	12.64	46.44	74.00	-27.56	PEAK
	H	15660	30.97	16.53	47.50	74.00	-26.50	PEAK
	V	10440	33.36	12.64	46.00	74.00	-28.00	PEAK
	V	15660	31.07	16.53	47.60	74.00	-26.40	PEAK
802.11ac HT20-5240MHz	H	10480	34.26	12.68	46.94	74.00	-27.06	PEAK
	H	15720	31.79	16.54	48.33	74.00	-25.67	PEAK
	V	10480	32.56	12.68	45.24	74.00	-28.76	PEAK
	V	15720	34.07	16.54	50.61	74.00	-23.39	PEAK
802.11ac HT20-5745MHz	H	11490	31.73	16.82	48.55	74.00	-25.45	PEAK
	H	17235	30.46	22.93	53.39	74.00	-20.61	PEAK
	V	11490	31.41	16.82	48.23	74.00	-25.77	PEAK
	V	17235	28.21	22.93	51.14	74.00	-22.86	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	33.12	16.71	49.83	74.00	-24.17	PEAK
	H	17355	27.03	24.37	51.40	74.00	-22.60	PEAK
	V	11570	31.35	16.71	48.06	74.00	-25.94	PEAK
	V	17355	27.54	24.37	51.91	74.00	-22.09	PEAK
802.11ac HT20-5825MHz	H	11650	32.21	16.61	48.82	74.00	-25.18	PEAK
	H	17475	26.10	25.01	51.11	74.00	-22.89	PEAK
	V	11650	31.99	16.61	48.60	74.00	-25.40	PEAK
	V	17475	27.84	25.01	52.85	74.00	-21.15	PEAK
802.11ac HT40-5190MHz	H	10380	33.27	12.58	45.85	74.00	-28.15	PEAK
	H	15570	34.42	16.48	50.90	74.00	-23.10	PEAK
	V	10380	34.98	12.58	47.56	74.00	-26.44	PEAK
	V	15570	32.60	16.48	49.08	74.00	-24.92	PEAK
802.11ac HT40-5230MHz	H	10460	33.99	12.66	46.65	74.00	-27.35	PEAK
	H	15690	31.65	16.53	48.18	74.00	-25.82	PEAK
	V	10460	34.04	12.66	46.70	74.00	-27.30	PEAK
	V	15690	33.34	16.53	49.87	74.00	-24.13	PEAK
802.11ac HT40-5755MHz	H	11510	31.07	16.78	47.85	74.00	-26.15	PEAK
	H	17265	27.38	23.29	50.67	74.00	-23.33	PEAK
	V	11510	31.50	16.78	48.28	74.00	-25.72	PEAK
	V	17265	26.90	23.29	50.19	74.00	-23.81	PEAK
802.11ac HT40-5795MHz	H	11590	32.15	16.69	48.84	74.00	-25.16	PEAK
	H	17385	26.70	24.73	51.43	74.00	-22.57	PEAK
	V	11590	30.31	16.69	47.00	74.00	-27.00	PEAK
	V	17385	27.72	24.73	52.45	74.00	-21.55	PEAK
802.11ac HT80-5210MHz	H	10420	33.58	12.62	46.20	74.00	-27.80	PEAK
	H	15630	32.65	16.52	49.17	74.00	-24.83	PEAK
	V	10420	33.79	12.62	46.41	74.00	-27.59	PEAK
	V	15630	32.16	16.52	48.68	74.00	-25.32	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	31.61	16.73	48.34	74.00	-25.66	PEAK
	H	17325	26.35	24.01	50.36	74.00	-23.64	PEAK
	V	11550	29.44	16.73	46.17	74.00	-27.83	PEAK
	V	17325	25.28	24.01	49.29	74.00	-24.71	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.

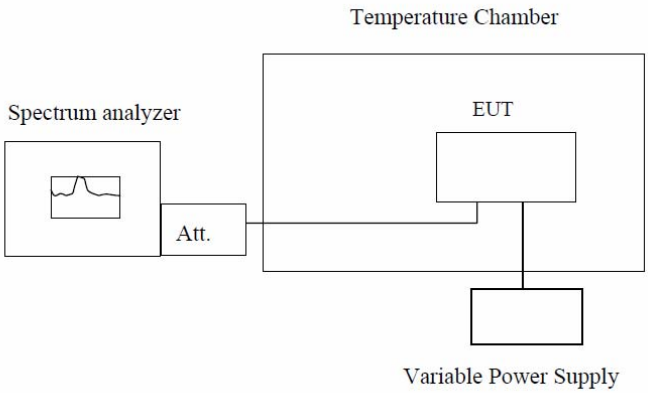
Average measurement was not performed if peak level lower than average limit.

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	5179.9932	5179.9915	5180.5750	5180.0423
	5200	5200.0478	5200.7173	5199.8621	5199.3427
	5220	5219.8392	5220.3202	5220.5359	5220.2135
	5240	5239.9814	5240.6475	5240.2208	5239.5926
	5745	5745.1818	5745.1571	5745.0612	5745.3626
	5785	5784.9755	5784.9448	5785.0233	5785.0963
	5825	5824.9782	5824.9955	5825.1467	5825.0036
-20	5180	5179.6325	5180.3403	5180.5916	5180.0485
	5200	5199.5896	5200.4899	5200.1239	5199.7060
	5220	5219.4776	5220.4866	5220.1457	5219.6014
	5240	5239.2498	5240.2380	5240.4195	5239.0432
	5745	5744.9889	5744.6829	5745.0474	5744.8722
	5785	5784.8774	5785.2196	5785.0640	5784.8338
	5825	5824.7635	5825.0969	5824.9494	5824.9691
-10	5180	5178.9246	5180.3002	5180.1767	5178.8254
	5200	5199.9458	5200.5881	5200.9152	5199.0840
	5220	5219.5812	5220.7621	5220.2745	5219.4631
	5240	5239.4648	5240.5411	5240.8931	5239.2820
	5745	5744.8606	5745.0271	5745.1070	5744.8356
	5785	5785.0668	5784.8751	5785.0855	5784.8146
	5825	5824.8882	5824.9428	5824.9980	5824.9605
0	5180	5180.2530	5180.6702	5180.5323	5179.3270
	5200	5199.5772	5200.6841	5200.5909	5199.8794
	5220	5219.1853	5219.8819	5220.1624	5219.9512
	5240	5239.4559	5240.7985	5240.3041	5239.5040
	5745	5744.9458	5745.0826	5744.9417	5745.1702
	5785	5785.0590	5785.0509	5784.9853	5784.8751
	5825	5825.0245	5825.0823	5824.9875	5825.0160

10	5180	5179.7734	5180.1119	5180.3166	5179.8418
	5200	5199.8349	5200.0454	5200.5086	5199.7647
	5220	5219.1962	5220.1864	5220.2314	5220.0196
	5240	5239.7794	5240.3787	5240.6959	5239.7183
	5745	5744.8468	5745.1131	5745.2703	5745.1737
	5785	5784.9911	5785.0025	5785.0662	5785.0071
	5825	5825.1226	5825.1454	5824.9415	5824.9645
20	5180	5179.8060	5180.0771	5180.3559	5179.4562
	5200	5199.6856	5200.2848	5200.9005	5199.3812
	5220	5219.4084	5220.9293	5220.3435	5219.4272
	5240	5239.1571	5240.8562	5240.3572	5239.3925
	5745	5744.9808	5744.8361	5745.1934	5744.8682
	5785	5784.8592	5784.7885	5784.7865	5785.0313
	5825	5824.9056	5824.8990	5825.2543	5824.9939
30	5180	5179.6539	5180.0672	5180.1646	5179.8566
	5200	5199.3127	5200.1970	5200.3401	5199.5408
	5220	5219.3409	5220.5131	5220.8271	5219.5826
	5240	5239.5355	5240.1784	5240.5278	5239.8029
	5745	5744.8820	5744.8157	5744.8689	5745.0472
	5785	5785.0769	5784.8516	5784.7310	5784.6978
	5825	5825.1113	5825.0660	5824.7598	5824.8984
40	5180	5179.7497	5180.7119	5180.2853	5180.0499
	5200	5199.3079	5200.5919	5200.8792	5199.7908
	5220	5219.3465	5220.6942	5220.7428	5219.9057
	5240	5239.2254	5240.9321	5240.9947	5240.0829
	5745	5745.1051	5745.0919	5745.1951	5745.1514
	5785	5784.9680	5785.0154	5785.0068	5785.1729
	5825	5825.1342	5825.0838	5824.9408	5824.8165
50	5180	5179.3929	5180.7604	5180.4220	5179.3258
	5200	5199.4338	5200.8473	5200.2329	5199.2257
	5220	5219.6007	5220.8244	5220.4937	5219.3629
	5240	5239.3907	5240.1044	5239.9948	5239.4370
	5745	5744.9062	5744.9967	5745.0956	5744.9635
	5785	5784.9225	5784.9368	5785.1326	5784.8386
	5825	5825.0043	5824.9350	5825.2998	5825.1202

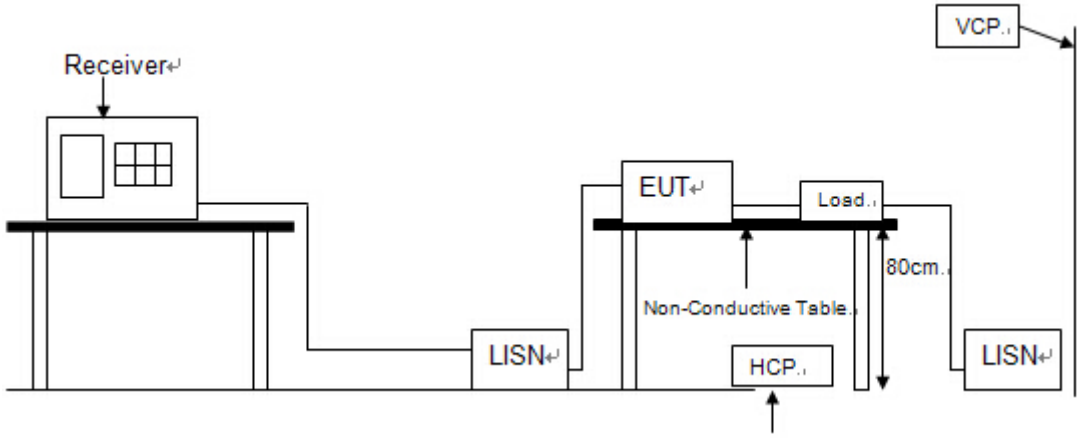
Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
6.9	5180	5180.0801	5179.9809	5180.1415	5180.0971
	5200	5200.0831	5200.0406	5199.7264	5199.9725
	5220	5220.0536	5220.4721	5219.9077	5219.9291
	5240	5240.8415	5240.8212	5239.9515	5239.3971
	5745	5745.0239	5745.0035	5744.9341	5745.2286
	5785	5784.7378	5785.0070	5784.9545	5785.1491
	5825	5824.9401	5824.7922	5824.8503	5824.9940
7.6	5180	5181.1117	5180.2874	5179.1176	5179.2663
	5200	5200.1982	5200.3847	5200.0247	5199.1865
	5220	5220.2530	5220.2738	5219.9208	5219.5473
	5240	5240.0201	5240.7852	5239.1178	5239.6837
	5745	5744.8397	5744.9011	5745.1457	5744.9222
	5785	5784.7837	5785.0393	5785.0922	5784.9322
	5825	5824.8175	5824.9195	5824.7607	5824.9126
8.4	5180	5180.1890	5180.5914	5179.1991	5179.1960
	5200	5200.2381	5200.4132	5199.1301	5199.1941
	5220	5219.9316	5220.7019	5218.9250	5219.1914
	5240	5240.6610	5240.3711	5239.5871	5239.1525
	5745	5744.7653	5744.8693	5745.0258	5744.8849
	5785	5784.6899	5784.8314	5784.8191	5784.9193
	5825	5824.7169	5824.9832	5824.6601	5824.9630

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	12/17/2020
2	EMI Test Receiver	R&S	ESCI	101308	12/17/2020
3	LISN	AFJ	LS16	16011103219	12/17/2020
4	LISN	Schwarzbeck	NSLK 8127	8127-432	12/17/2020
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.

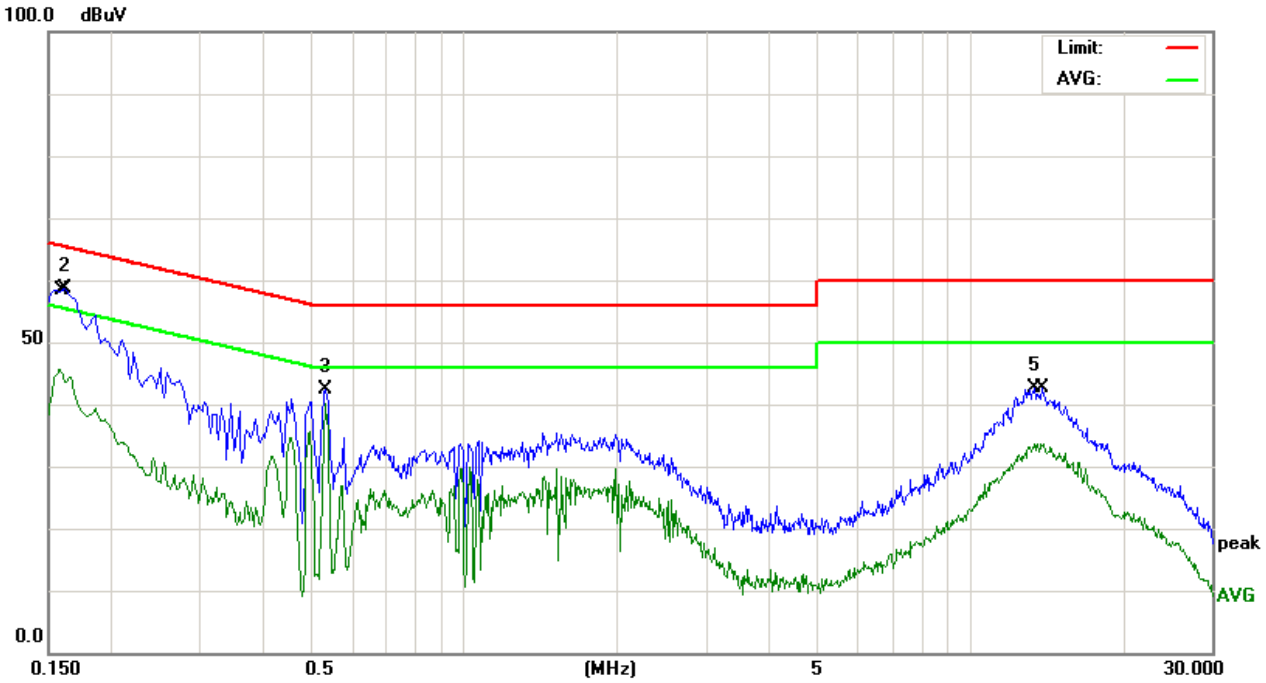
9.5 Test Result

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

EUT:	Table PC	Model No.:	1101
Temperature:	23℃	Relative Humidity:	52%
Probe:	N	Test Power:	AC 120V/60Hz
Test Time:	2019-12-27	Test Result:	Pass
Standard:	(CE)FCC PART 15 class B_QP		
Test Mode:	TX		
Note:			

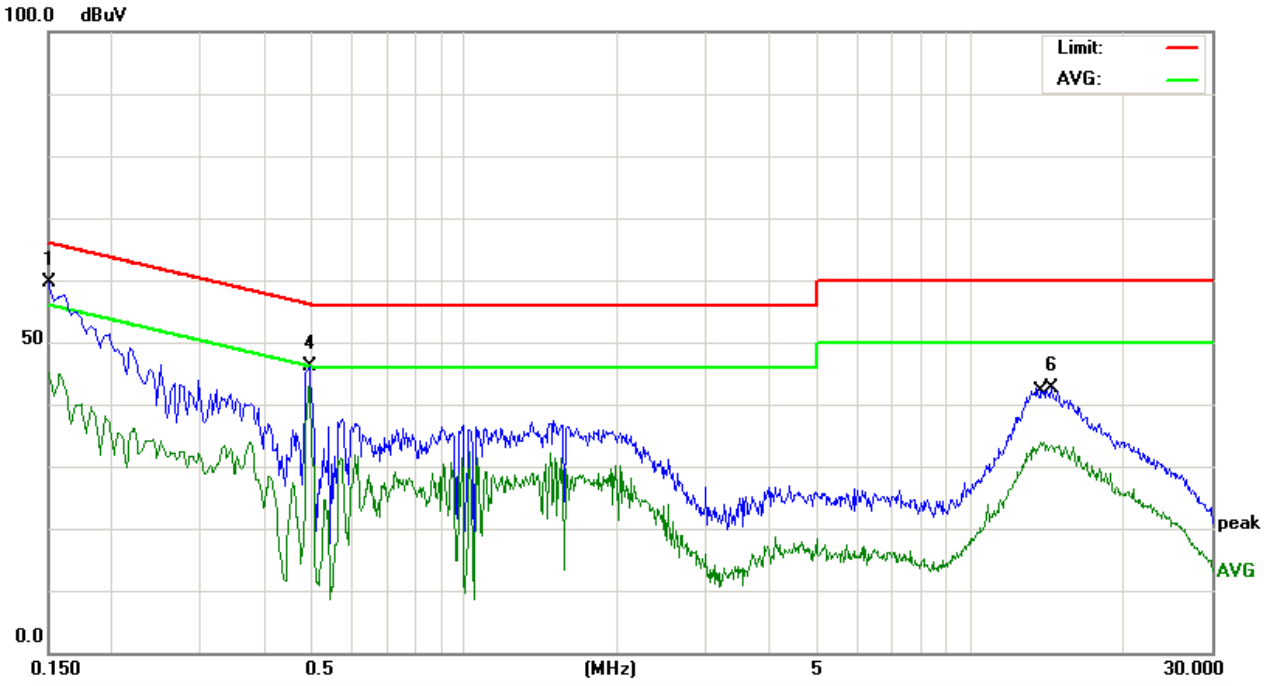


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1580	33.97	11.75	45.72	55.56	-9.84	AVG
2		0.1620	46.96	11.68	58.64	65.36	-6.72	peak
3		0.5299	32.34	10.01	42.35	56.00	-13.65	peak
4	*	0.5299	30.01	10.01	40.02	46.00	-5.98	AVG
5		13.3620	32.20	10.37	42.57	60.00	-17.43	peak
6		13.9300	23.35	10.38	33.73	50.00	-16.27	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.:	1101
Temperature:	23℃	Relative Humidity:	52%
Probe:	L1	Test Power:	AC 120V/60Hz
Test Time:	2019-12-27	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		0.1500	47.63	11.94	59.57	65.99	-6.42	peak
2		0.1500	33.12	11.94	45.06	55.99	-10.93	AVG
3	*	0.4900	32.81	10.02	42.83	46.17	-3.34	AVG
4		0.4940	36.00	10.02	46.02	56.10	-10.08	peak
5		13.9460	23.54	10.38	33.92	50.00	-16.08	AVG
6		14.5020	32.17	10.40	42.57	60.00	-17.43	peak

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

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 antennas used for this product are built-in undetachable FPCB antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 1.6 dBi. and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

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