FCC Test Report

Report No: FCS20200308007W01

Issued for

Applicant:	CASA DUARTE SRL
Address:	Socrates Nolasco No.2, Santo Domingo, República Dominicana.
Product Name:	netbook
Brand Name:	SAELITE
Model Name:	ES1AU11
Series Model:	YP11G-E
FCC ID:	2AVWN-ES1AU11

Issued By: Flux Compliance Service Laboratory

Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong yeWest Road Hi-Tech Industrial, Song shan lake Dongguan

Tel: 769-27280901 Fax:769-27280901 http://www.FCS-lab.com

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Revision History

Rev.	Issue Date	EFFECT PAGE	Contents
01	01 March 2020	All	Initial Issue

TEST RESULT CERTIFICATION

Applicant's Name .....:	CASA DUARTE SRL
Address .....:	Socrates Nolasco No.2, Santo Domingo, República Dominicana.
Manufacture's Name .....:	CASA DUARTE SRL
Address .....:	Socrates Nolasco No.2, Santo Domingo, República Dominicana.

Product Description

Product Name .....:	netbook
Brand Name .....:	SAELITE
Model Name .....:	ES1AU11
Series Model .....:	YP11G-E
Test Standards .....:	FCC Part 15E 15.407
Test Procedure .....:	ANSI C63.10-2013 and KDB 789033 D02 General UNII Test Procedures New Rules v02r01 .

This device described above has been tested FCS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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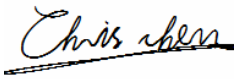
Date of Test.....:

Date (s) of performance of tests	09 January 2020 ~ 01 March 2020
Date of Issue.....:	01 March 2020
Test Result .....:	Pass

Prepared By : 

(Chris Chen)

Approved By :

(Andy Yue)

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

1.1 Test Laboratory

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

1.2 Measurement Uncertainty

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

	Items	Uncertainty
	RF output power, conducted	±0.71dB
	Unwanted Emissions, conducted	±2.988 dB
	Conducted Emission (9KHz-150KHz)	±4.13 dB
	Conducted Emission (150KHz-30MHz)	±4.74 dB
	All emissions,radiated(<1G) 30MHz-1000MHz	±5.2 dB
	All emissions,radiated(>1G) 1000MHz -3000MHz	±4.66 dB
	All emissions,radiated(<1G) 3000MHz -6000MHz	±5.31 dB

1.3 Test Environment Conditions

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

Temperature rang:	20-26℃
Humidity range:	40-65%
Pressure range:	86-106Kpa

2. GENERAL TEST INFORMATION

2.1. DESCRIPTION OF EUT

EUT* Name	:	netbook
Model Number	:	ES1AU11, YP11G-E
EUT function description	:	netbook with WiFi & BT function.
Power supply	:	Adapter:JK120250-S52US INPUT: 100-240V~ 50/60Hz 0.8A OUTPUT: DC 12V 2.5A
Adaptor		JK120250-S52US
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 :1.12dBi(Main) Antenna B : 1.08dBi(Aux)
Battery	:	N/A
Date of Receipt	:	2020/01/09
Sample Type	:	N/A
Connecting I/O Port(s)		Please refer to the User's Manual
Note: For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.		

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 JUKE ELECTRONICS CO.,LTD	JK120250-S52US	/

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.

2.1 Equipments List

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2019.05.31	2020.05.30
Signal Analyzer	R&S	FSV40-N	FCS-E012	2019.06.05	2020.06.04
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2019.10.11	2020.10.10
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2019.10.26	2020.10.25
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2019.05.31	2020.05.30
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2019.05.31	2020.05.30
Pre-Amplifier(0.1M-3 GHz)	EMCI	EM330N	FCS-E004	2019.05.31	2020.05.30
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2019.10.03	2020.10.02
Temperature & Humidity	HTC-1	victor	FCS-E005	2019.05.31	2020.05.30

Conduction Test equipment

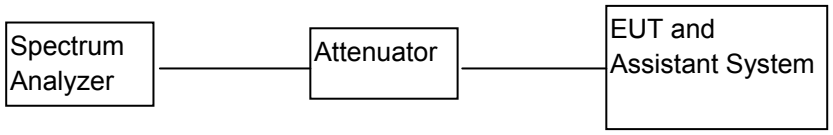
Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2019.05.31	2020.05.30
LISN	R&S	ENV216	FCS-E007	2019.05.15	2020.05.14
LISN	ETS	3810/2NM	FCS-E009	2019.10.15	2020.10.14
Temperature & Humidity	HTC-1	victor	FCS-E008	2019.05.31	2020.05.30

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
MXA SIGNAL Analyzer	Keysight	N9020A	FCS-E015	2019.10.02	2020.10.01

3. POWER SPECTRAL DENSITY TEST

3.1. BLOCK DIAGRAM OF TEST SETUP



3.2. 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..

3.3. 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.

3.4. 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	4.86	4.82	--	11	Pass
CH44	5220	4.96	4.90	--	11	Pass
CH48	5240	4.31	4.24	--	11	Pass
CH52	5260	4.32	4.16	--	11	Pass
CH56	5280	4.68	4.59	--	11	Pass
CH64	5230	4.36	4.23	--	11	Pass
CH100	5500	3.85	3.74	--	11	Pass
CH120	5600	4.70	4.58	--	11	Pass
CH140	5700	4.50	4.43	--	11	Pass
CH 149	5745	0.64	0.55	--	30	Pass
CH 157	5785	0.12	0.06	--	30	Pass
CH 165	5825	0.58	0.42	--	30	Pass
TX 802.11n20 Mode						
CH36	5180	4.26	4.16	--	11	Pass
CH44	5220	4.35	4.24	--	11	Pass
CH48	5240	3.78	3.69	--	11	Pass
CH52	5260	3.62	3.53	--	11	Pass
CH56	5280	3.86	3.77	--	11	Pass
CH64	5230	3.65	3.54	--	11	Pass
CH100	5500	3.16	3.08	--	11	Pass
CH120	5600	3.85	3.79	--	11	Pass
CH140	5700	3.65	3.51	--	11	Pass
CH 149	5745	-0.40	-0.56	--	30	Pass
CH 157	5785	-0.64	-0.74	--	30	Pass
CH 165	5825	-0.35	-0.49	--	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	0.02	0.00	--	11	Pass
CH46	5230	-0.26	-0.33	--	11	Pass
CH54	5270	-0.94	-1.12	--	11	Pass
CH62	5310	0.25	0.21	--	11	Pass
CH102	5510	-1.25	-1.39	--	11	Pass
CH118	5590	-1.29	-1.41	--	11	Pass
CH134	5670	-0.06	-0.13	--	11	Pass
CH151	5755	-5.33	-5.46	--	30	Pass
CH159	5795	-4.93	-5.12	--	30	Pass

CH. No.	Frequency	Power Density ANT A (dBm/MHz)	Power Density ANT B (dBm/MHz)	total power density (dBm/MHz)	Limit (dBm/MHz)	Result
TX 802.11 ac(VHT20) Mode						
CH36	5180	3.96	3.87	--	11	Pass
CH44	5220	3.98	3.86	--	11	Pass
CH48	5240	3.72	3.65	--	11	Pass
CH52	5260	3.53	3.45	--	11	Pass
CH56	5280	3.49	3.34	--	11	Pass
CH64	5230	3.81	3.72	--	11	Pass
CH100	5500	3.72	3.69	--	11	Pass
CH120	5600	3.55	3.42	--	11	Pass
CH140	5700	3.79	3.65	--	11	Pass
CH 149	5745	-0.59	-0.75	--	30	Pass
CH 157	5785	-0.66	-0.82	--	30	Pass
CH 165	5825	0.25	0.19	--	30	Pass

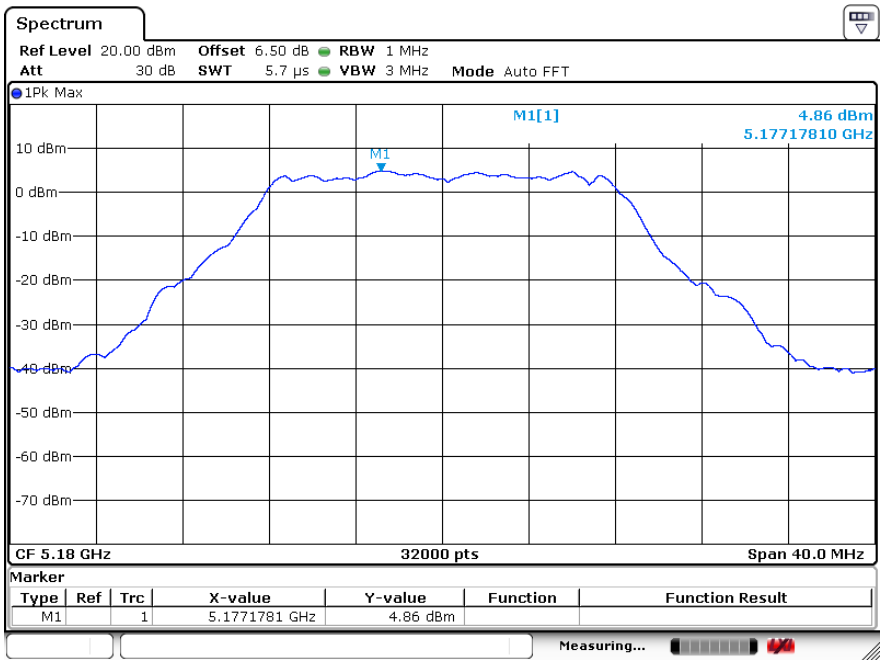
CH. No.	Frequency	Power Density ANT A (dBm/MHz)	Power Density ANT B (dBm/MHz)	total power density (dBm/MHz)	Limit (dBm/MHz)	Result
TX 802.11 ac(VHT40) Mode						
CH38	5190	-0.43	-0.57	--	11	Pass
CH46	5230	-0.53	-0.65	--	11	Pass
CH54	5270	-0.60	-0.71	--	11	Pass
CH62	5310	-0.98	-1.16	--	11	Pass
CH102	5510	-0.64	-0.79	--	11	Pass
CH118	5590	-0.43	-0.56	--	11	Pass
CH134	5670	-0.43	-0.54	--	11	Pass
CH151	5755	-4.63	-4.79	--	30	Pass
CH159	5795	-4.35	-4.44	--	30	Pass
TX 802.11 ac(VHT80) Mode						
CH42	5210	-3.08	-3.19	--	11	Pass
CH58	5290	-3.68	-3.76	--	11	Pass
CH106	5530	-3.60	-3.72	--	11	Pass
CH122	5610	-3.27	-3.39	--	11	Pass
CH155	5775	-7.01	-7.10	--	30	Pass

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

Test plots as followed: Antenna A

802.11a

Channel: 36



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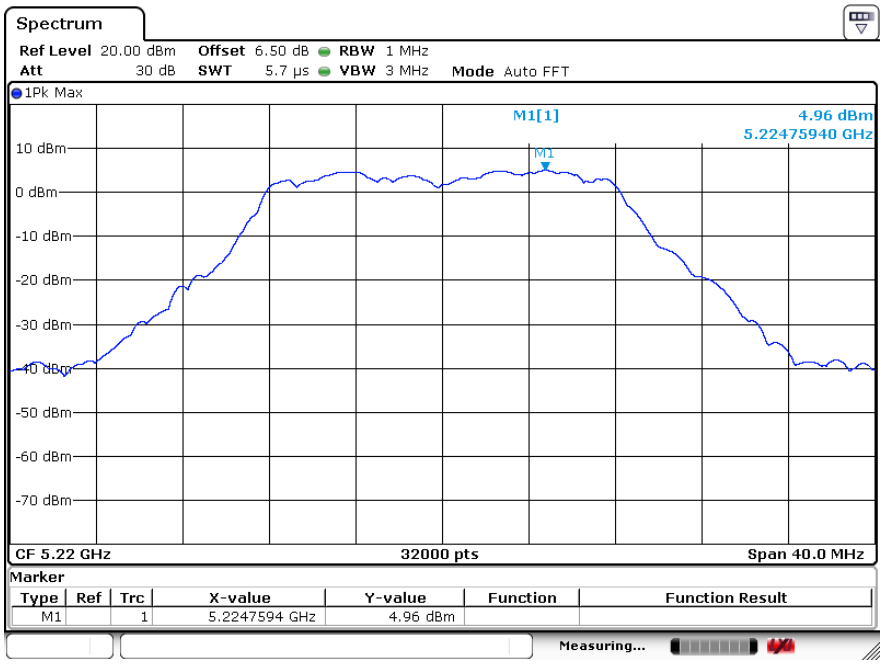
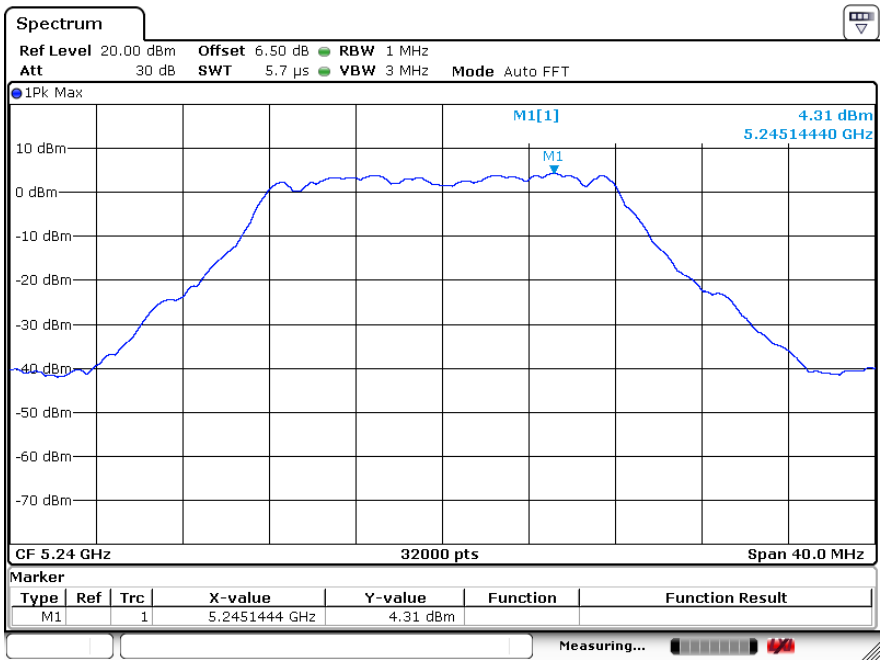
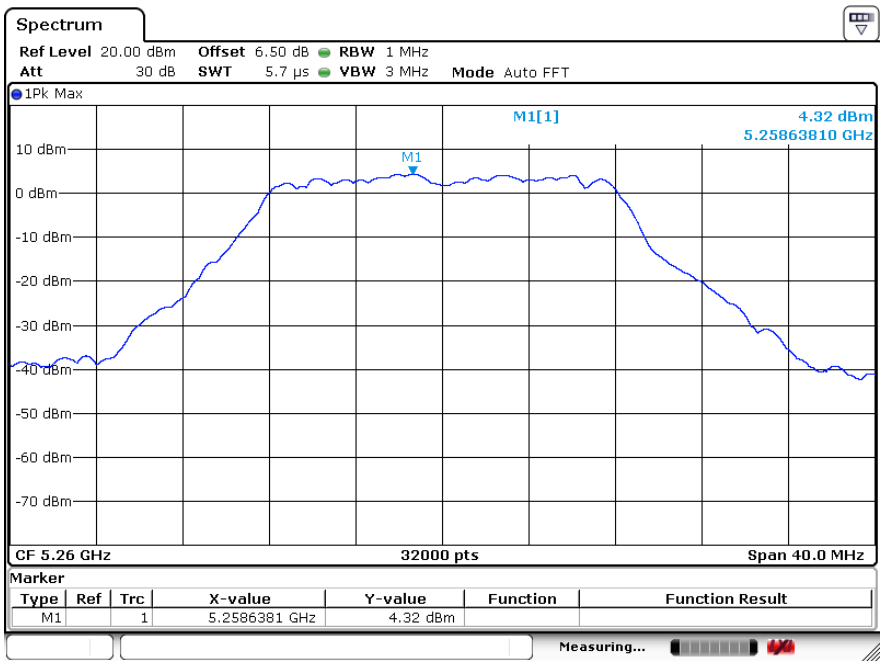


Channel: 48

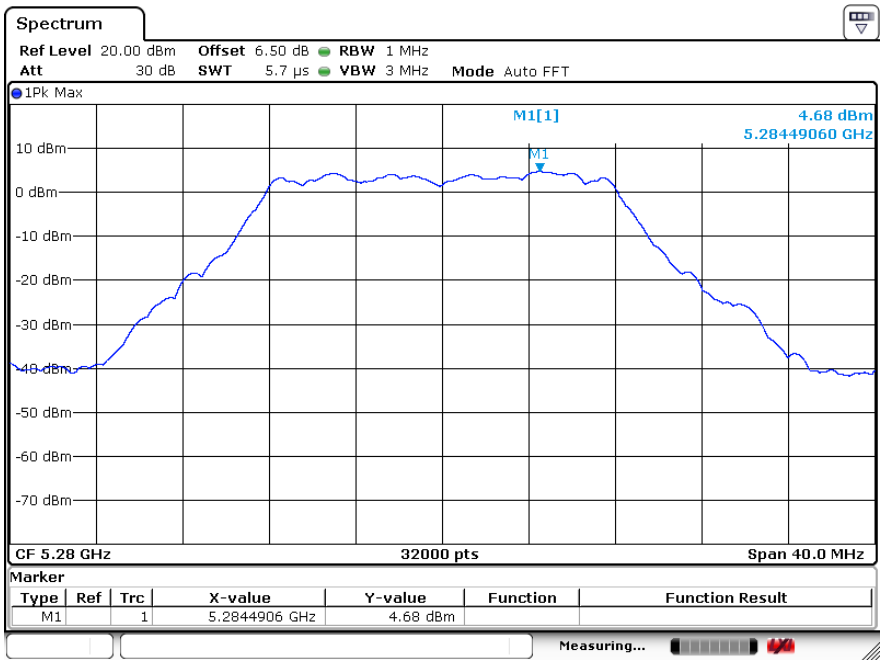

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 4.31 dBm
5.24514440 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2451444 GHz 4.31 dBm
Measuring...

802.11a

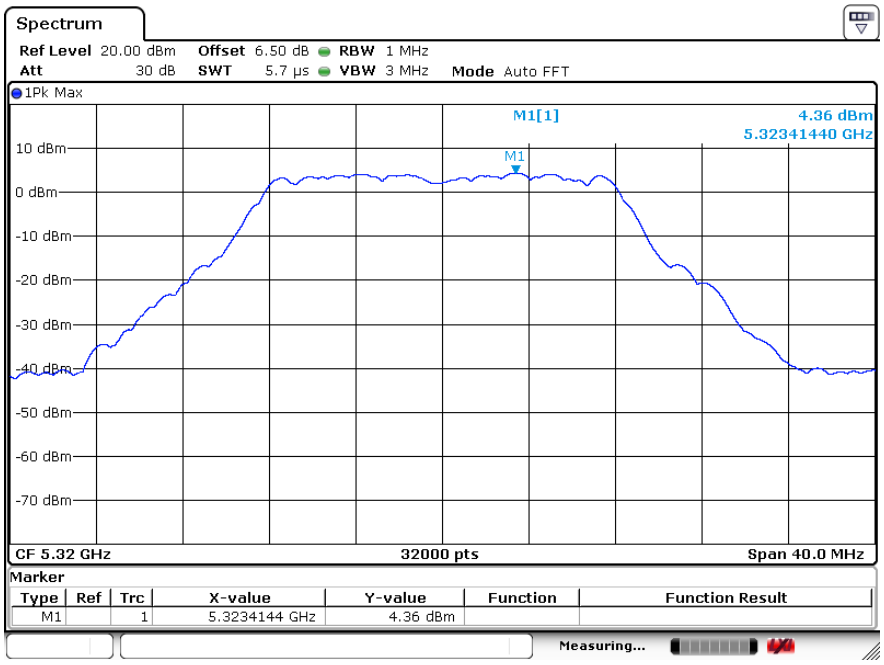
Channel: 52



Channel: 56

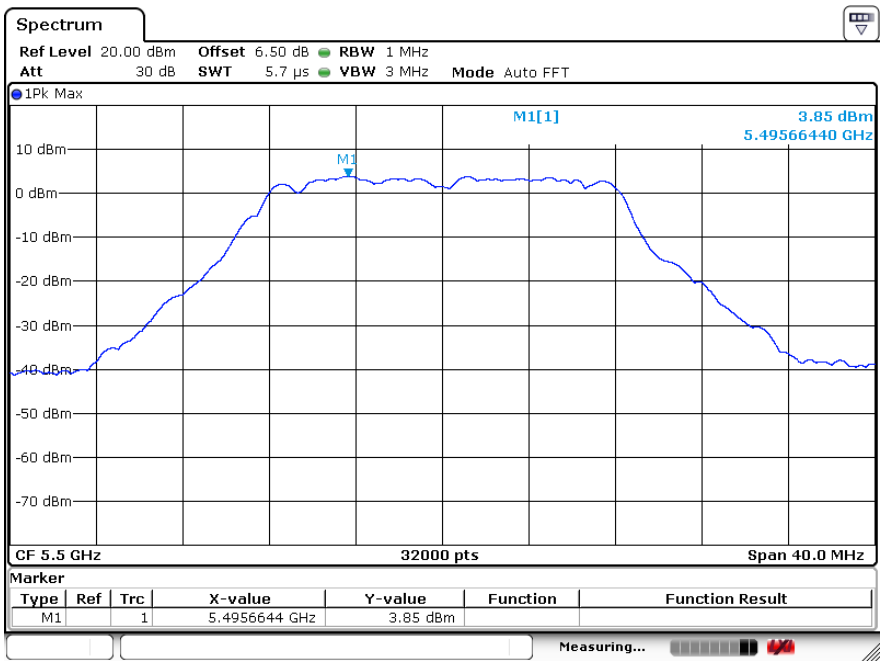


Channel: 64


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] 4.36 dBm
5.32341440 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.32 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3234144 GHz 4.36 dBm
Measuring...

802.11a

Channel: 100



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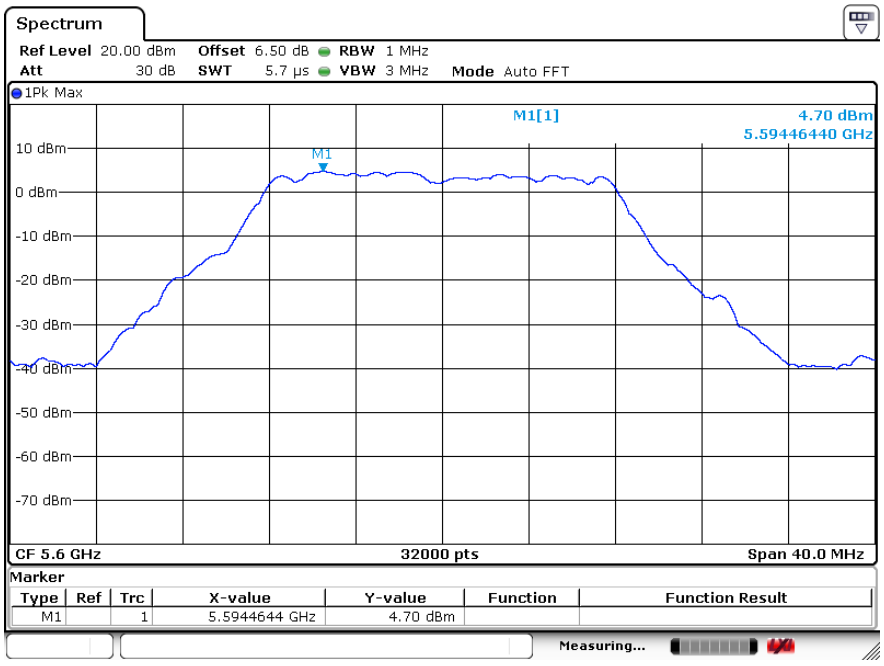

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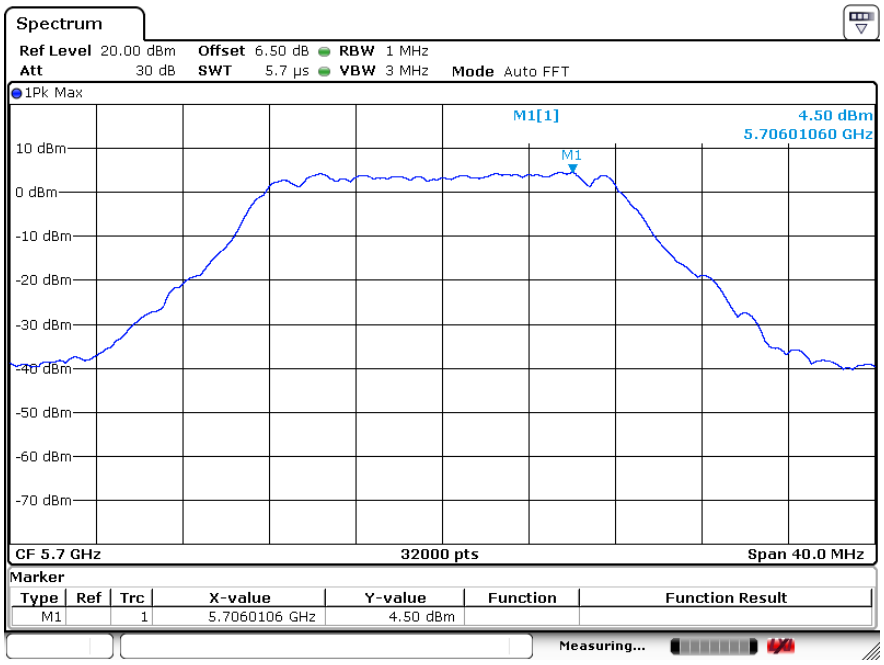
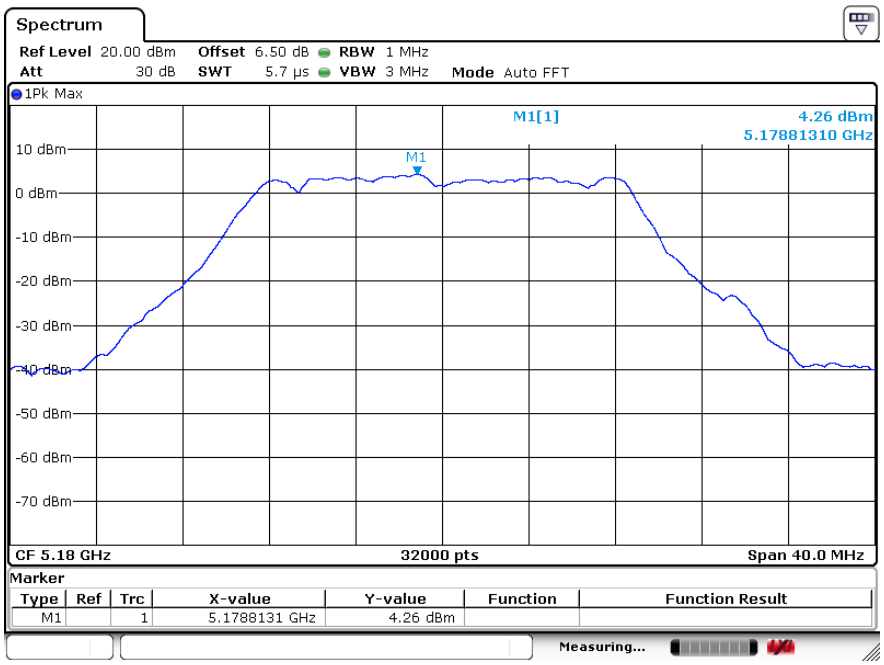
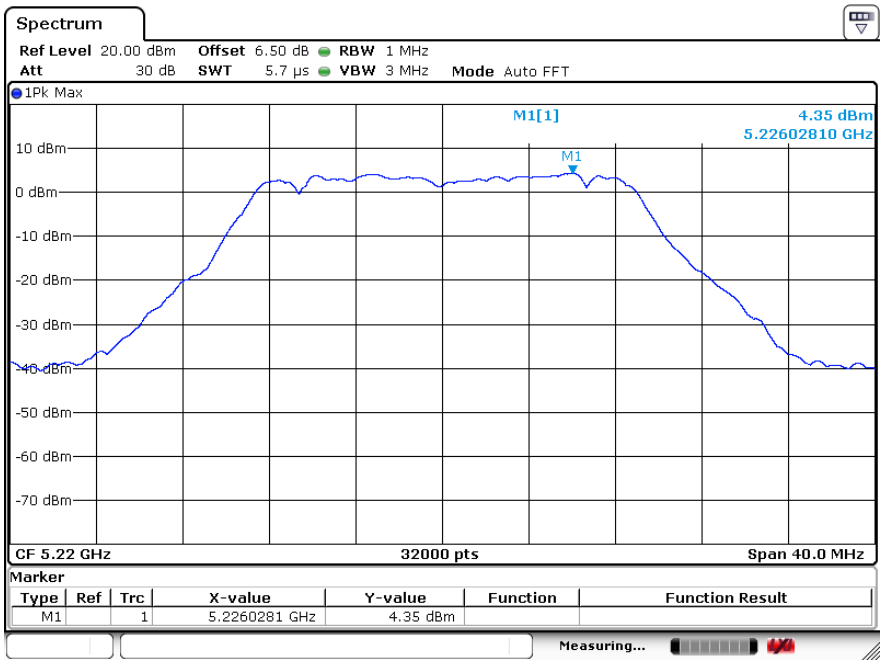

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 4.50 dBm
5.70601060 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7060106 GHz 4.50 dBm
Measuring...

802.11n20

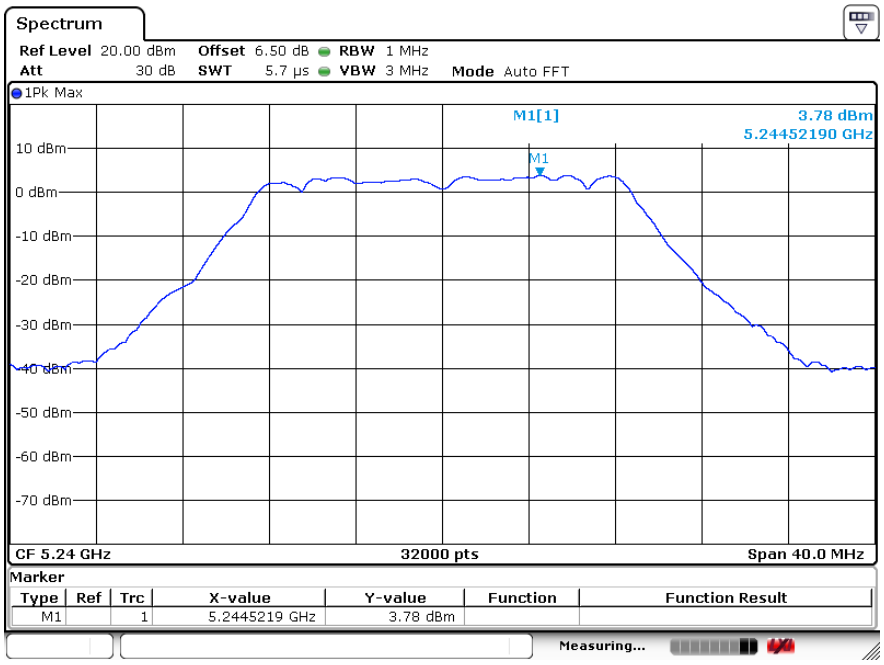
Channel: 36



Channel: 44

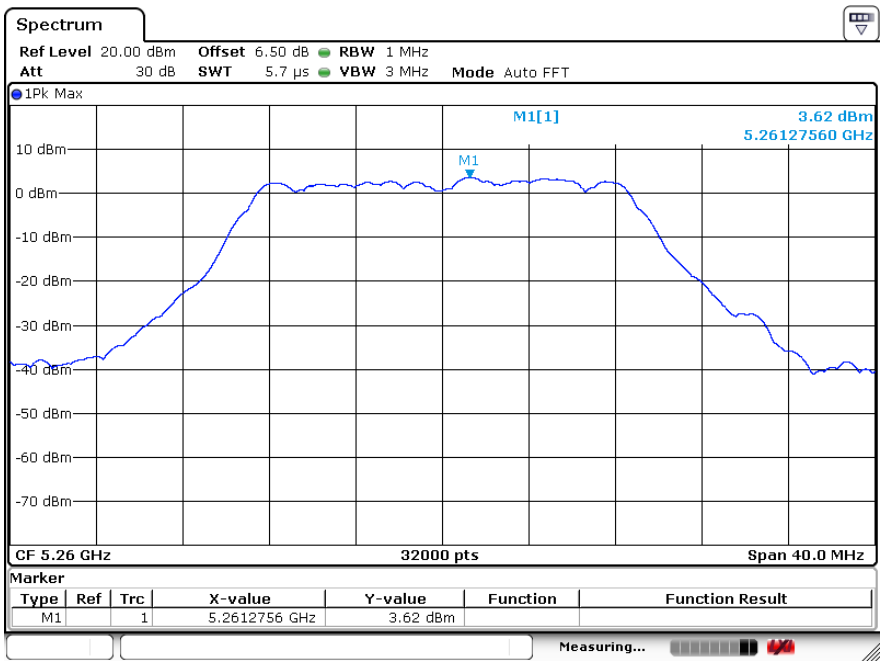


Channel: 48

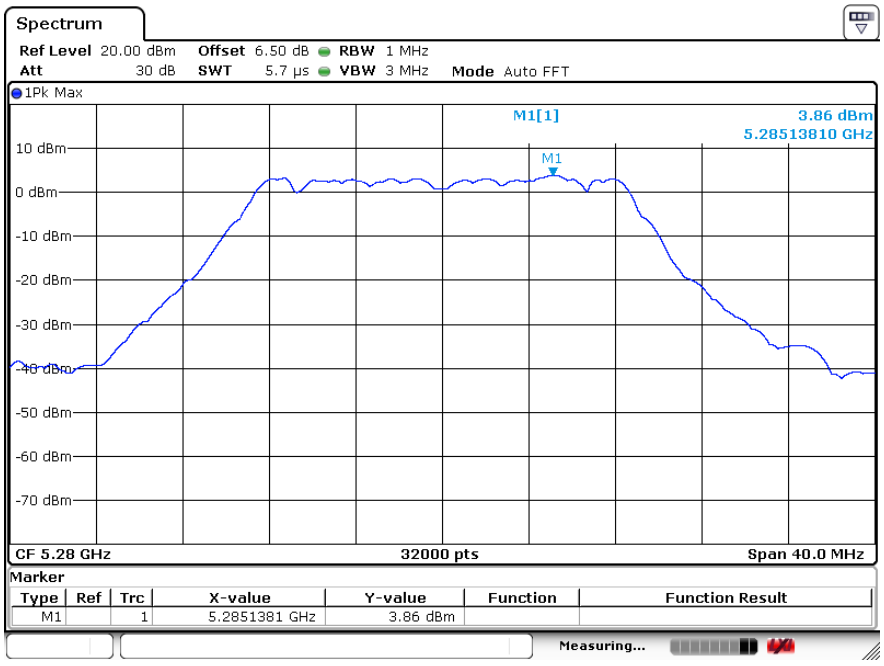

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.78 dBm
5.24452190 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.24 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2445219 GHz 3.78 dBm
Measuring...

802.11n20

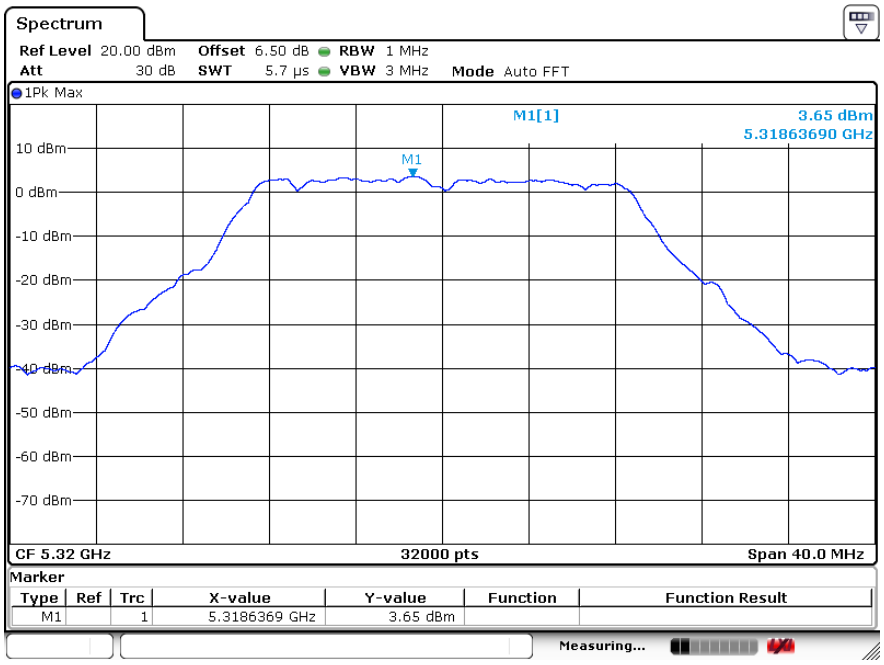
Channel: 52



Channel: 56

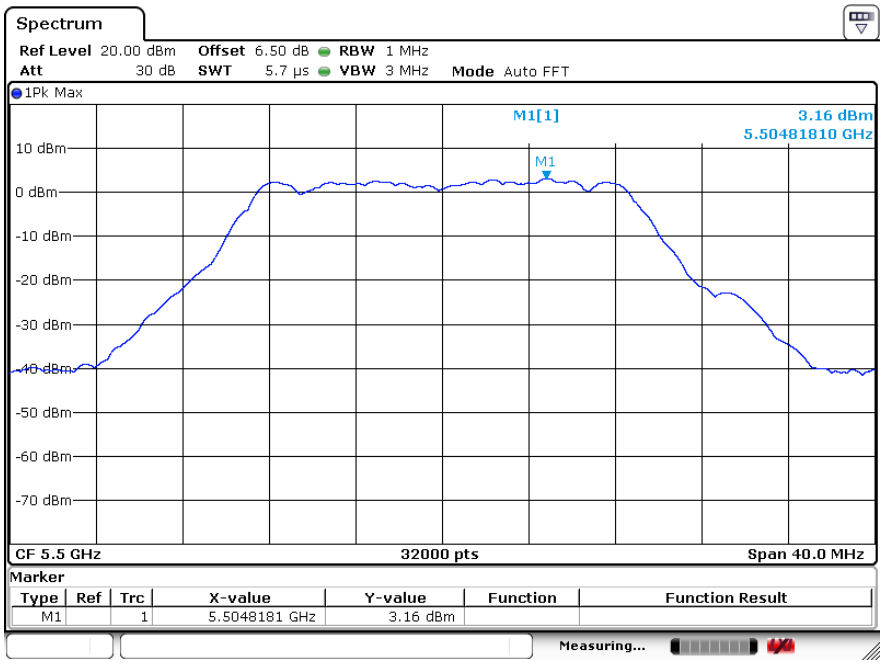


Channel: 64

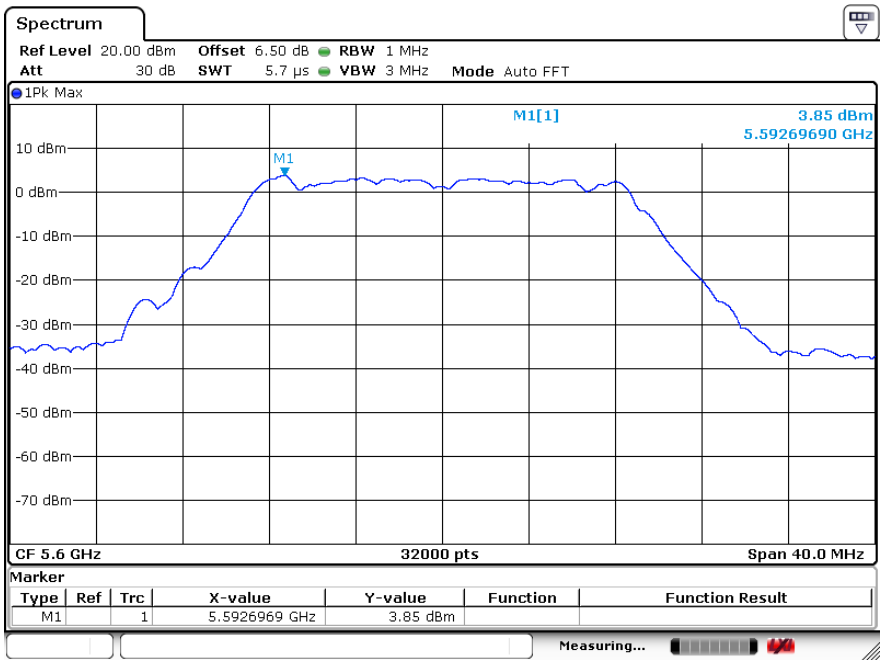

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.65 dBm
5.31863690 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.32 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3186369 GHz 3.65 dBm
Measuring...

802.11n20

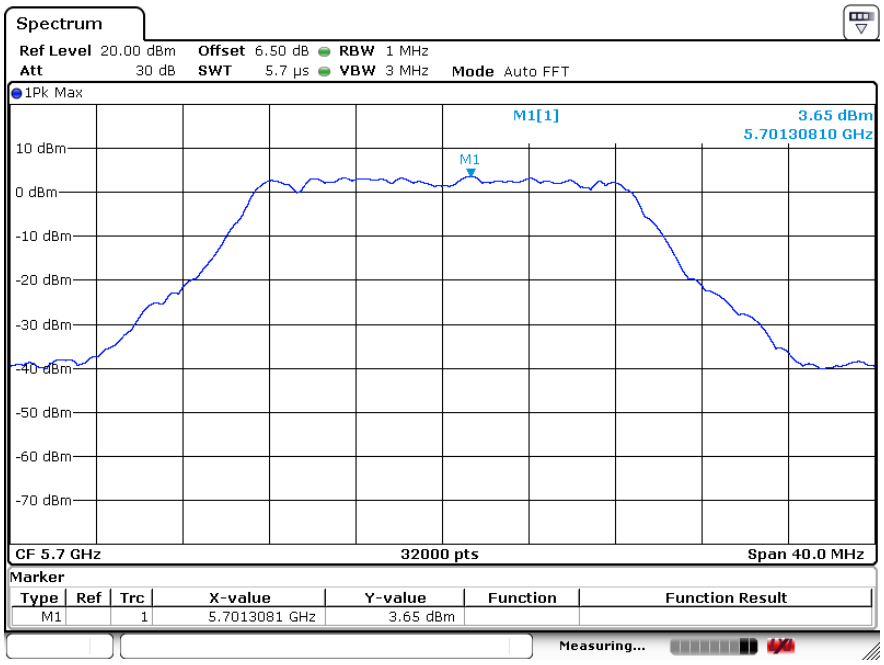
Channel: 100



Channel: 120

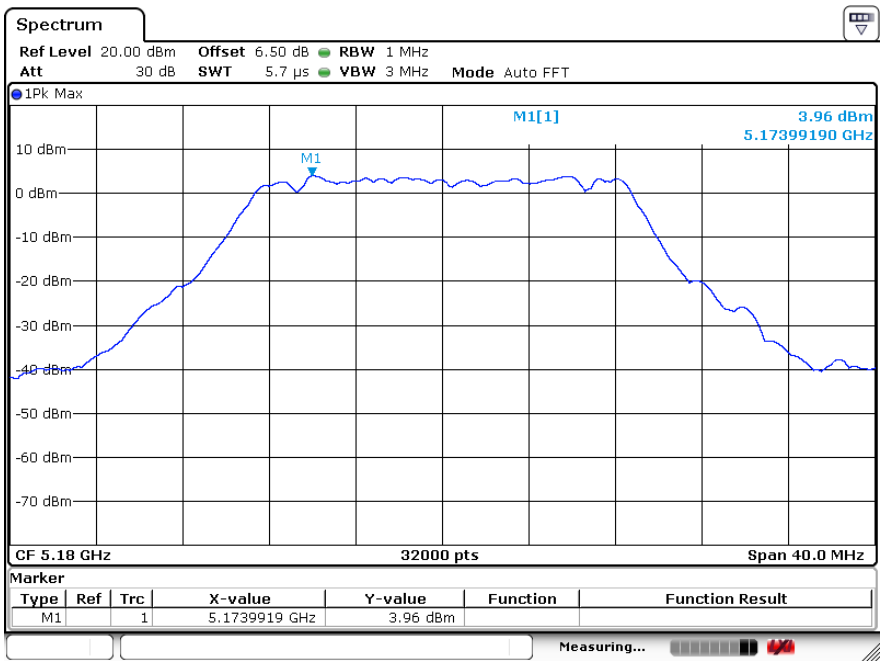


Channel: 140

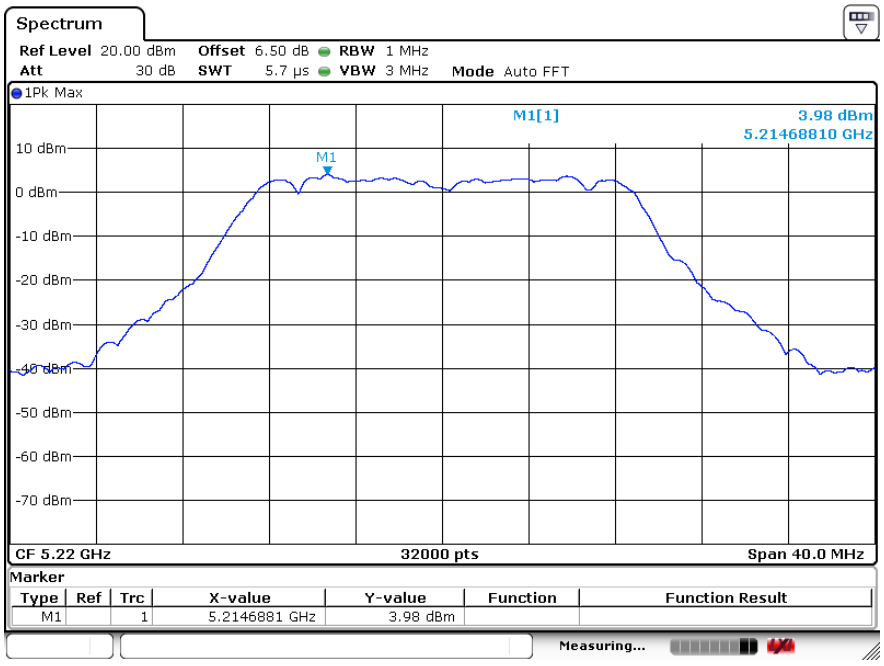

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.65 dBm
5.70130810 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.7 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7013081 GHz 3.65 dBm
Measuring...

802.11ac20

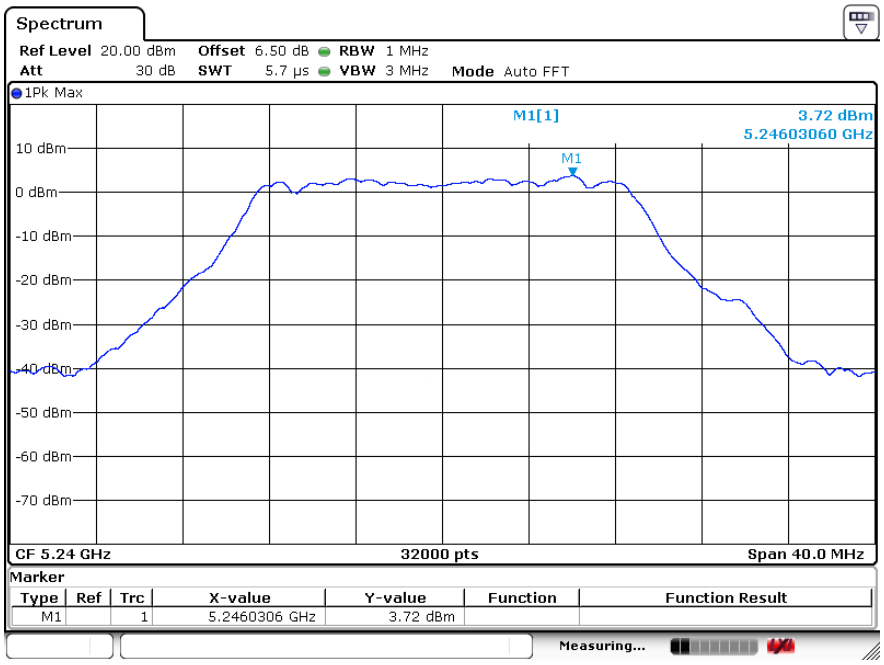
Channel: 36



Channel: 44

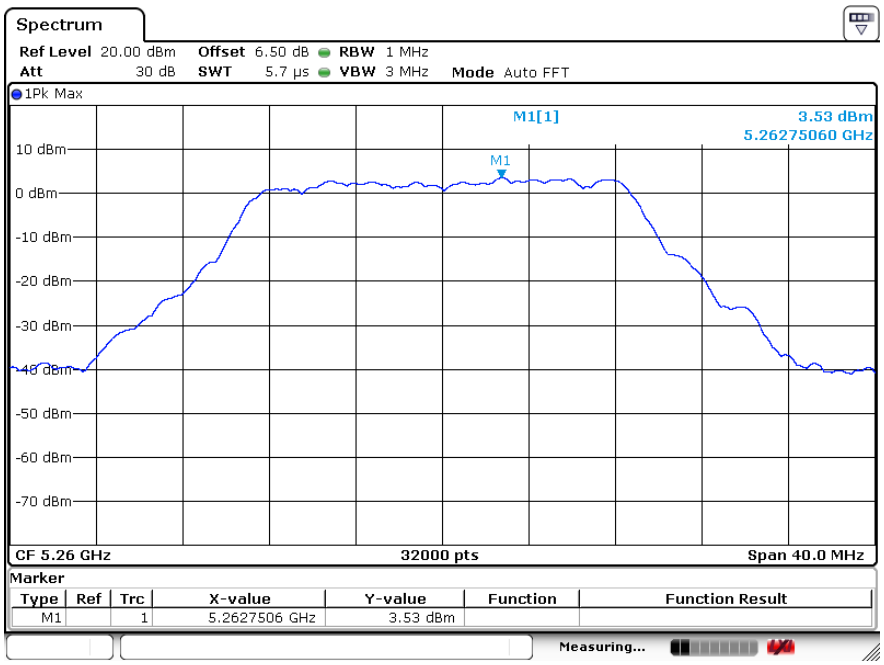


Channel: 48

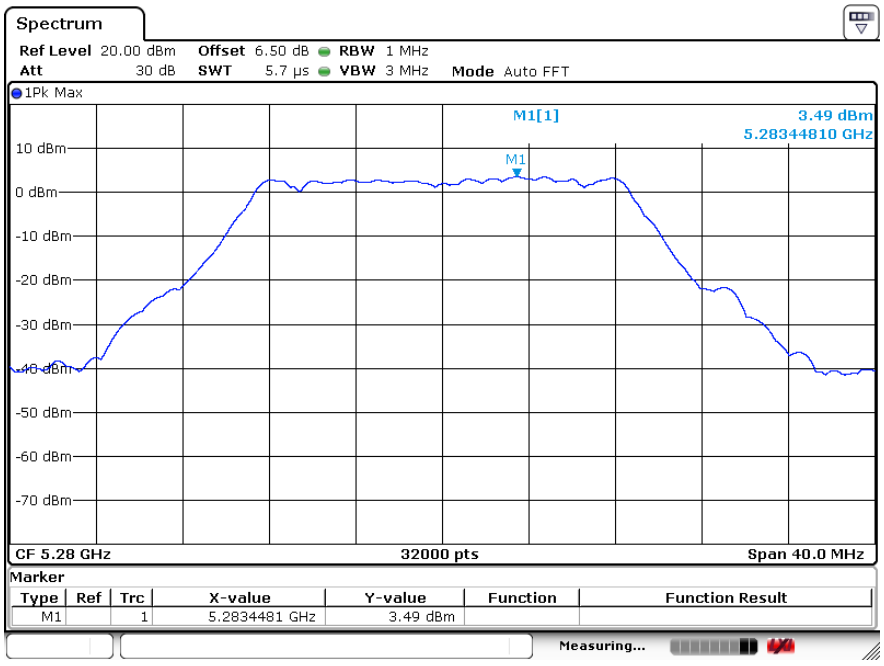

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.72 dBm
5.24603060 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2460306 GHz 3.72 dBm
Measuring...

802.11ac20

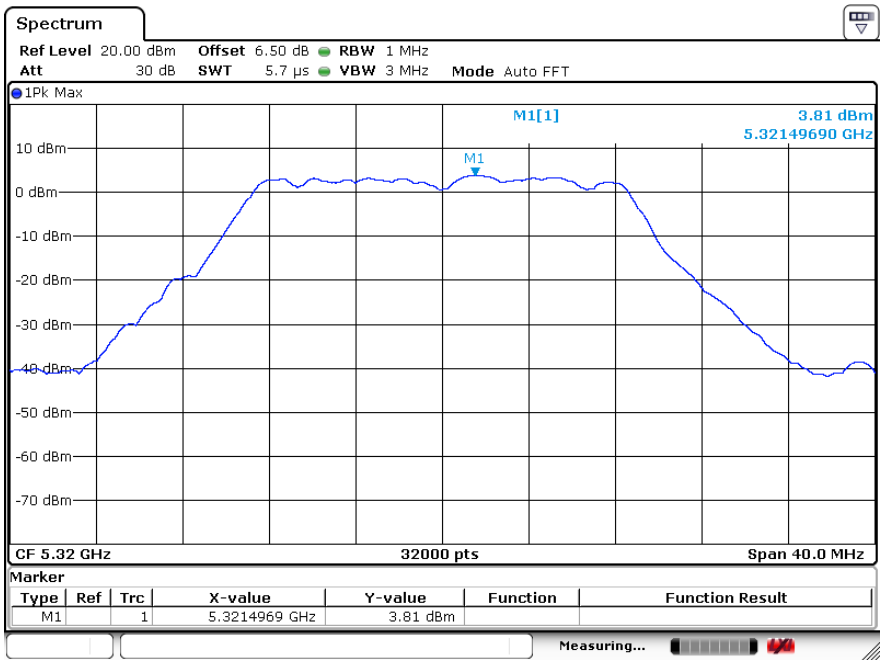
Channel: 52



Channel: 56

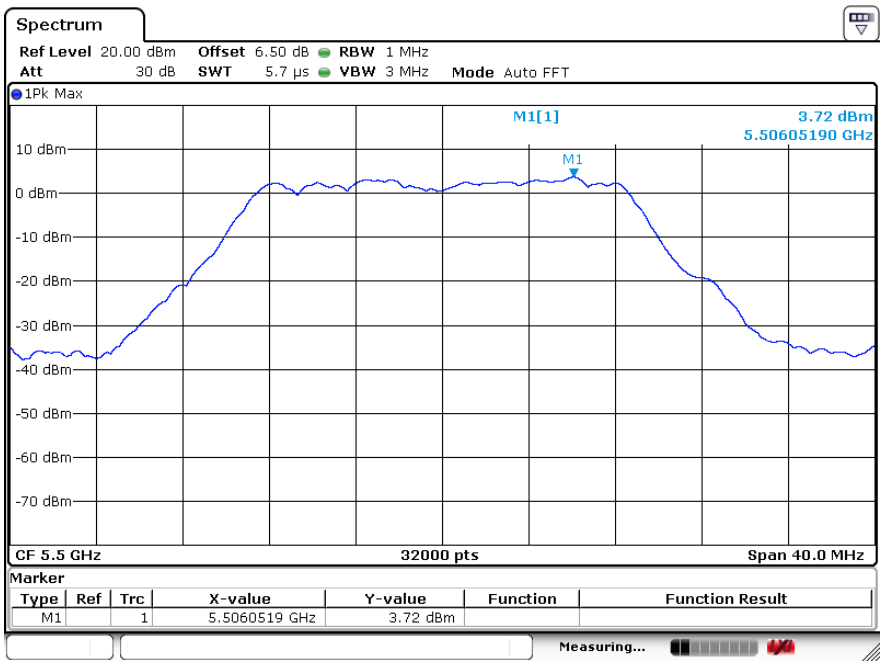


Channel: 64

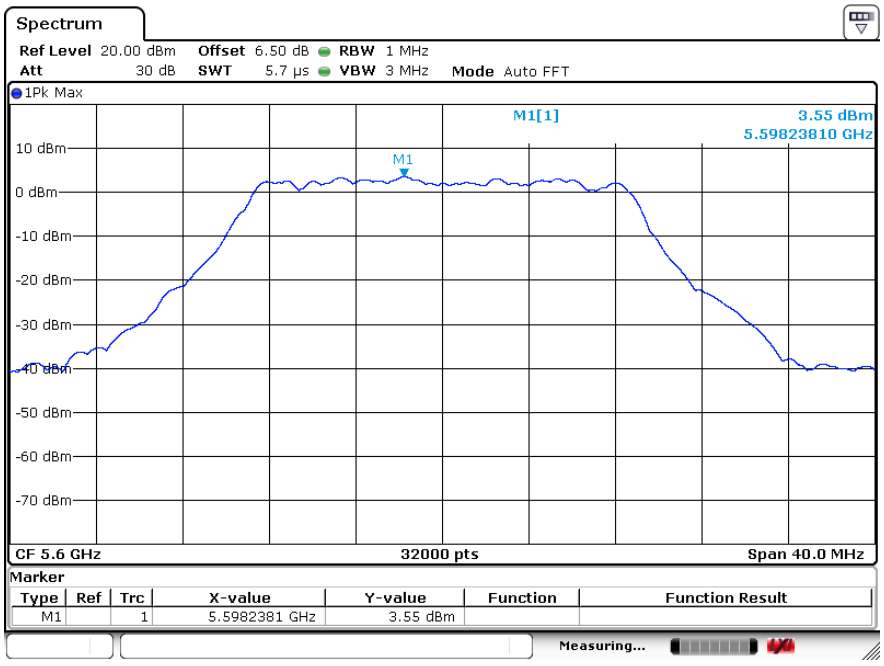

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.81 dBm
5.32149690 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.32 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3214969 GHz 3.81 dBm
Measuring...

802.11ac20

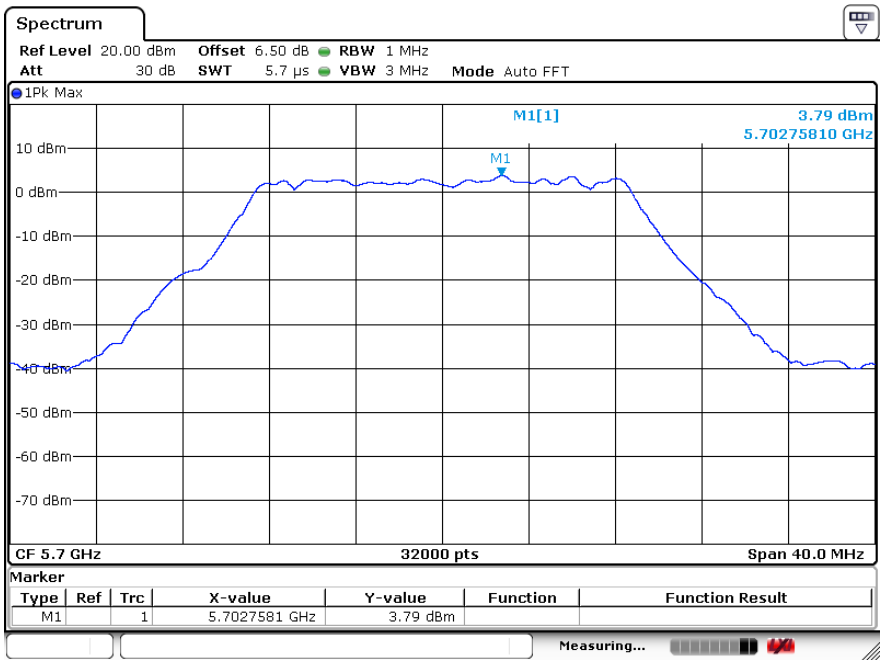
Channel: 100



Channel: 120

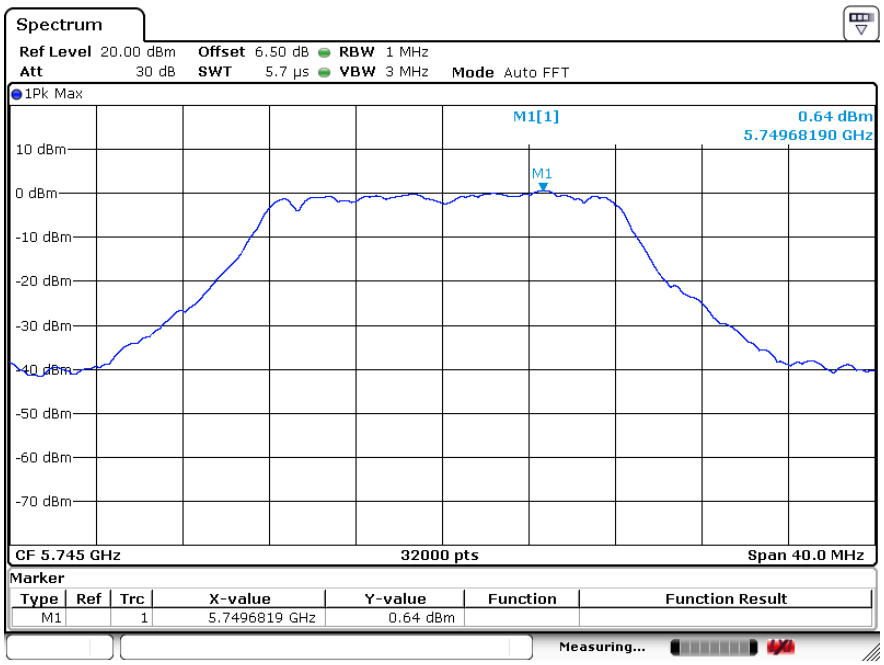


Channel: 140

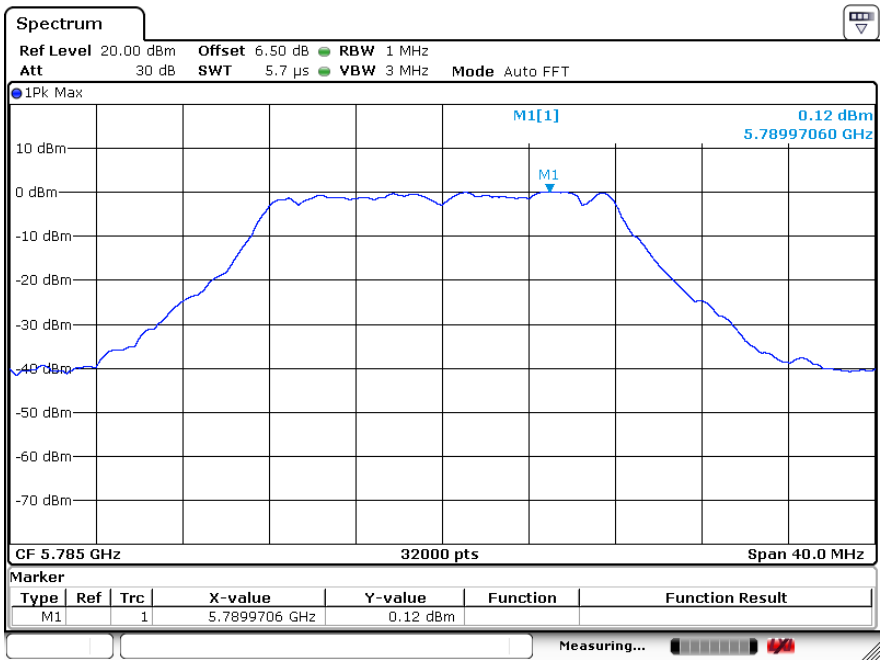

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 3.79 dBm
5.70275810 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7027581 GHz 3.79 dBm
Measuring...

802.11a

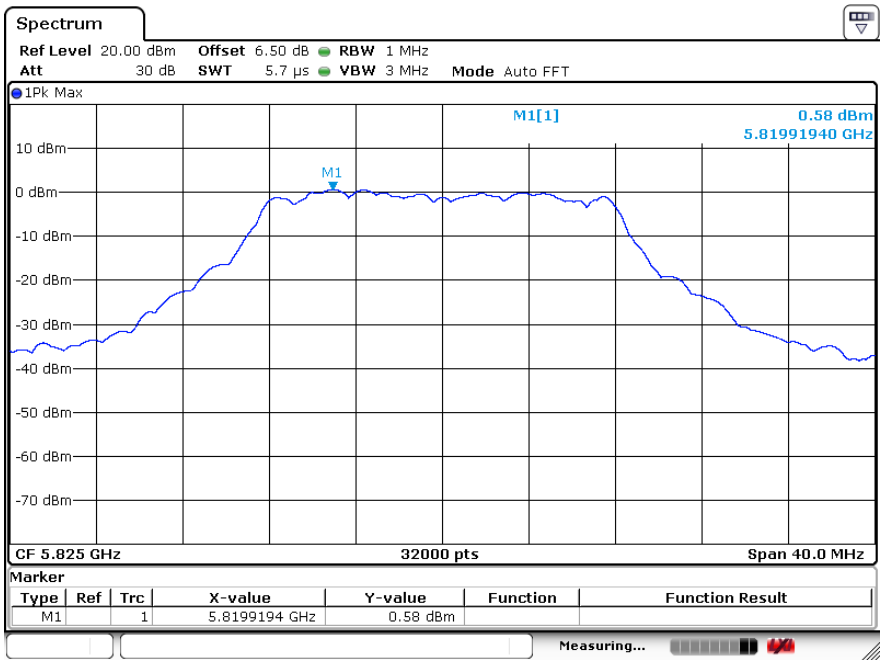
Channel: 149



Channel: 157

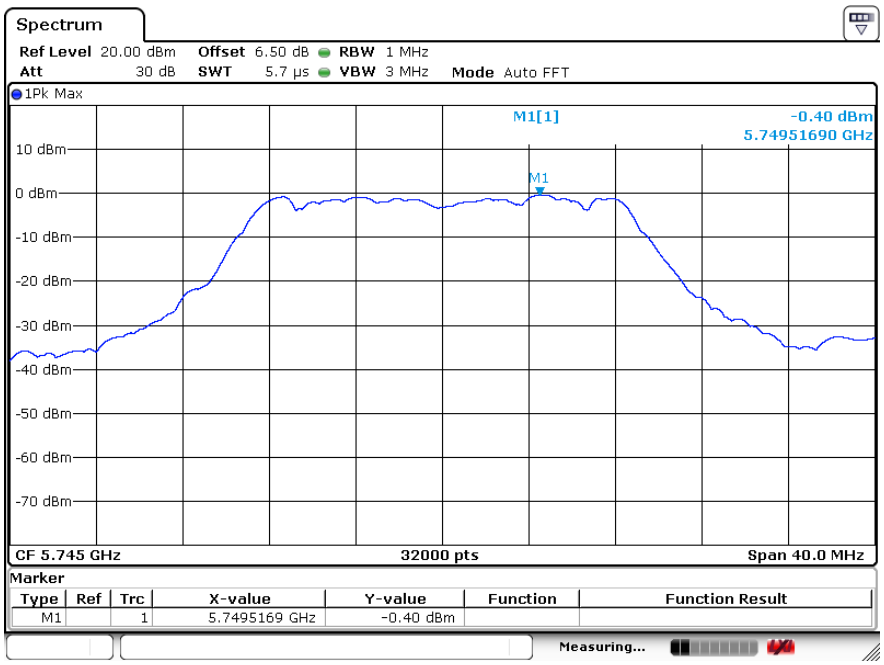


Channel: 165

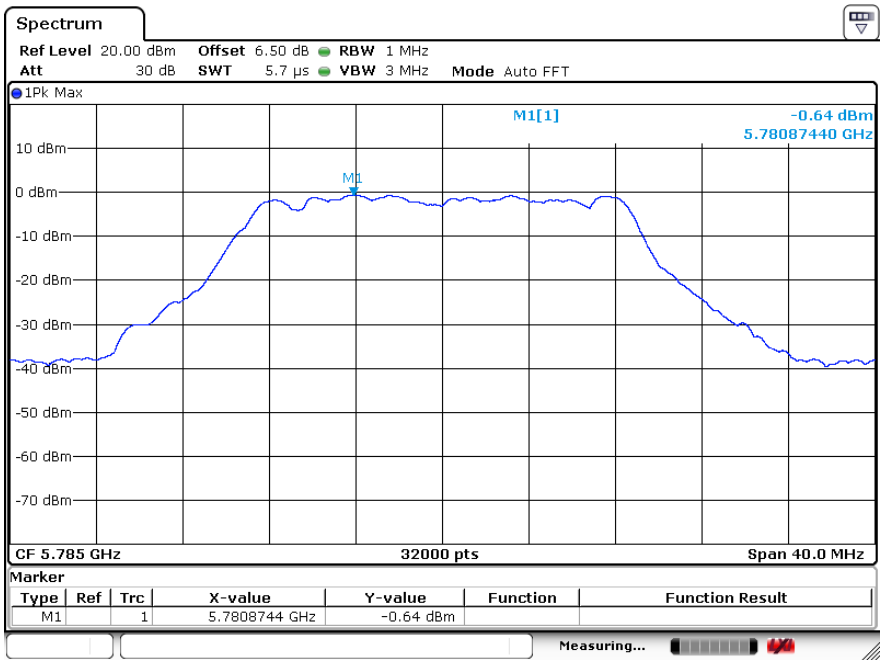

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1]
0.58 dBm
5.81991940 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199194 GHz 0.58 dBm
Measuring...

802.11n20

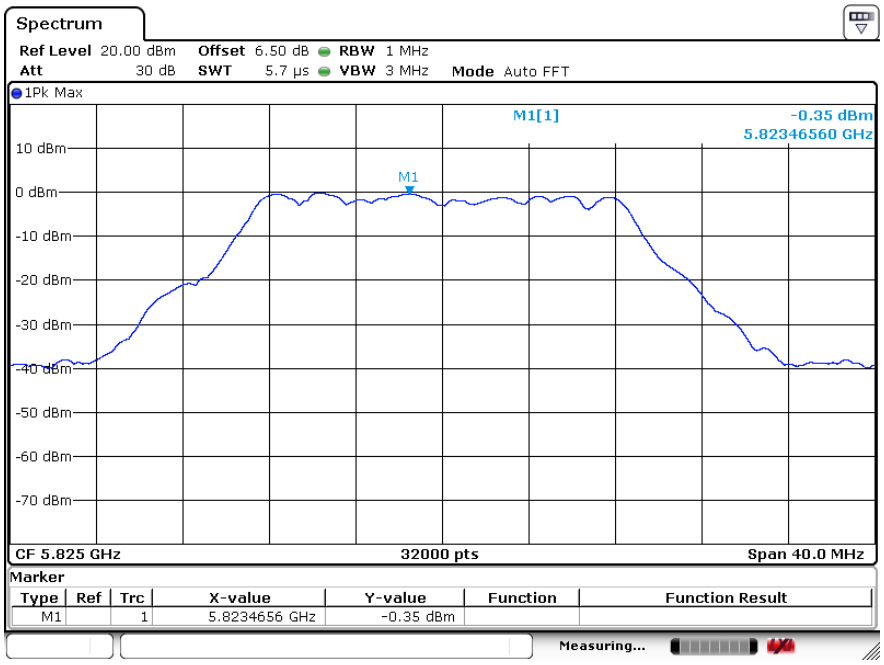
Channel: 149



Channel: 157

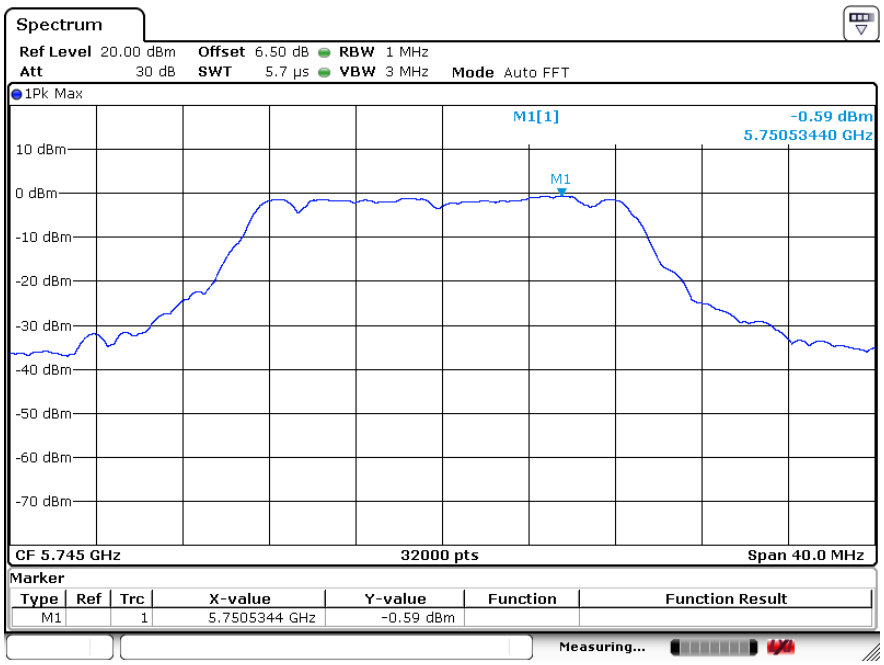


Channel: 165

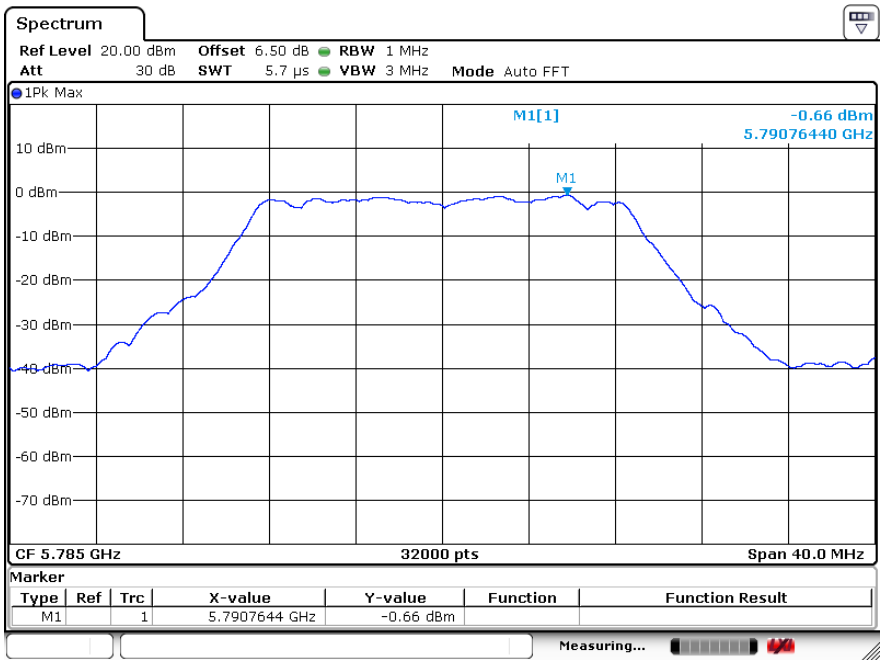

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -0.35 dBm
5.82346560 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8234656 GHz -0.35 dBm
Measuring...

802.11ac20

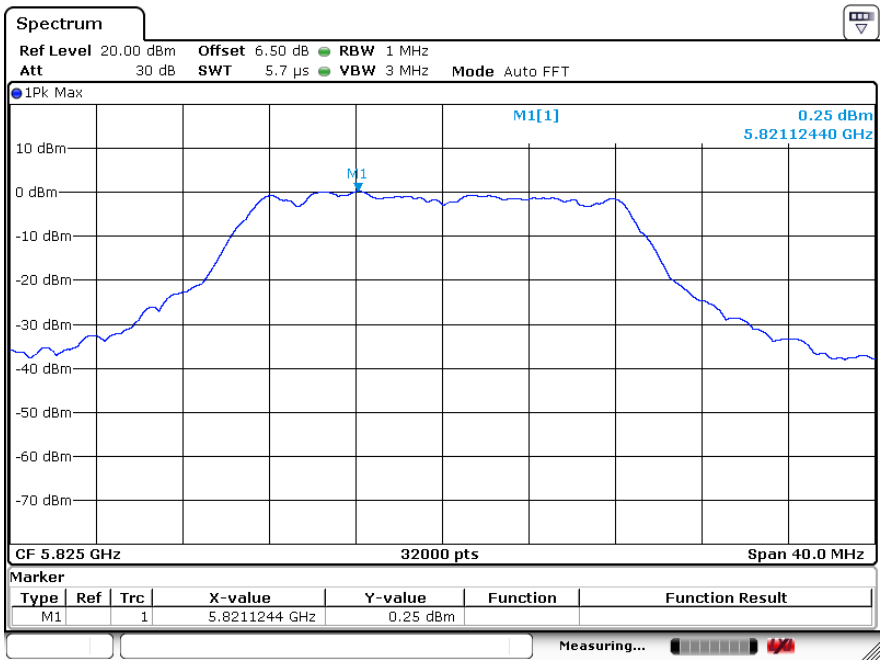
Channel: 149



Channel: 157

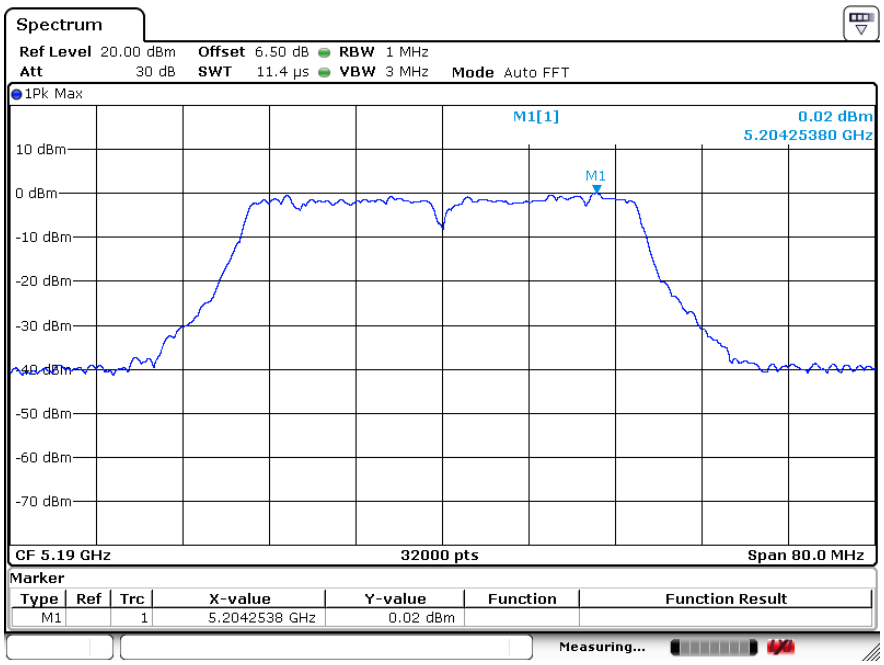


Channel: 165

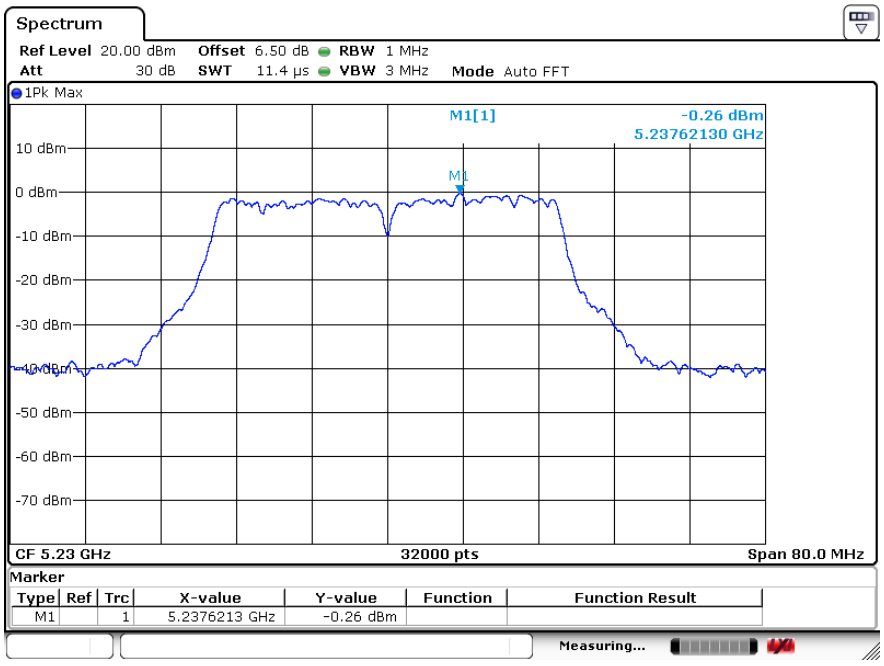

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 5.7 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] 0.25 dBm
5.82112440 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.825 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8211244 GHz 0.25 dBm
Measuring...

802.11n40

Channel: 38

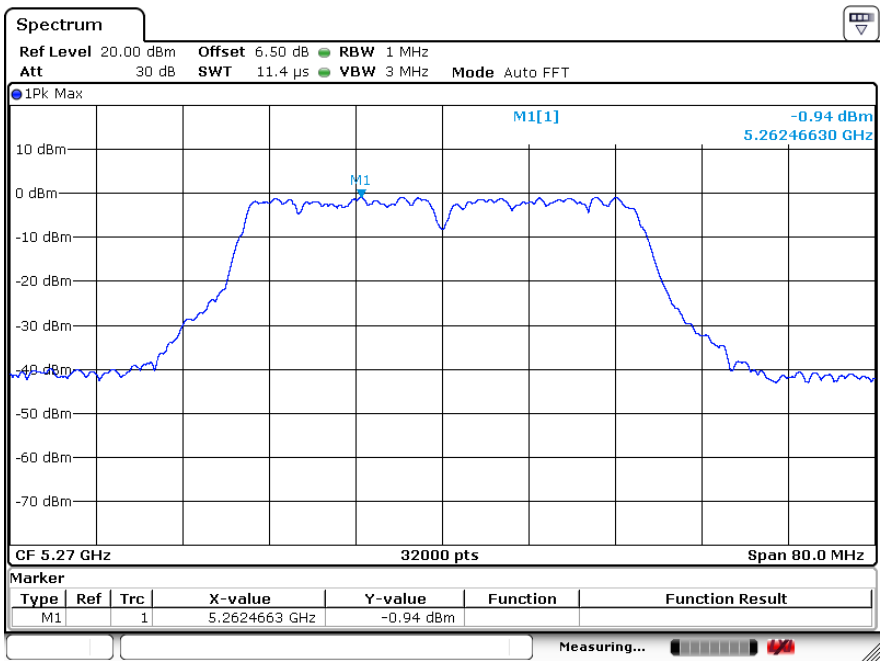


Channel: 46

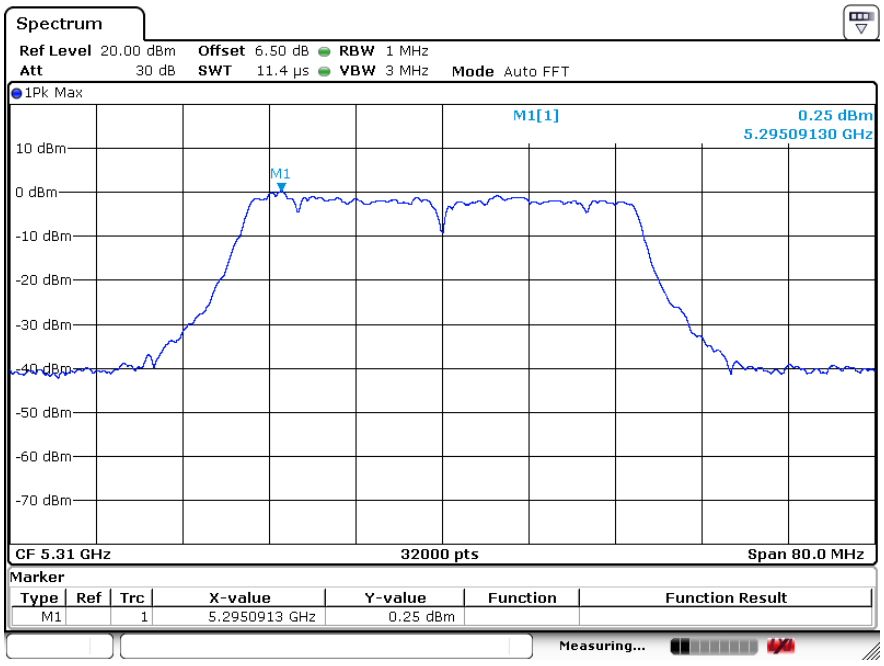


802.11n40

Channel: 54

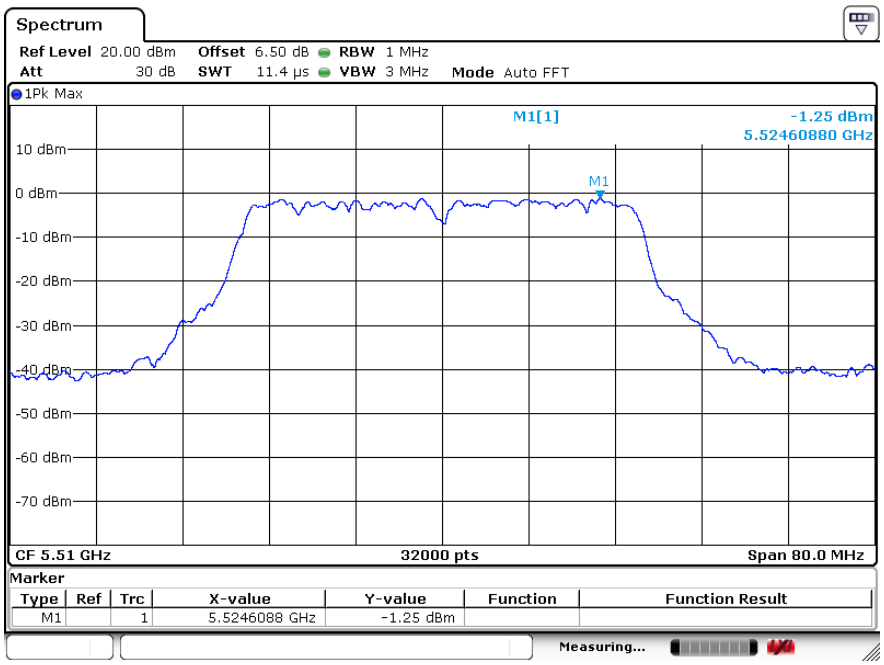


Channel: 62

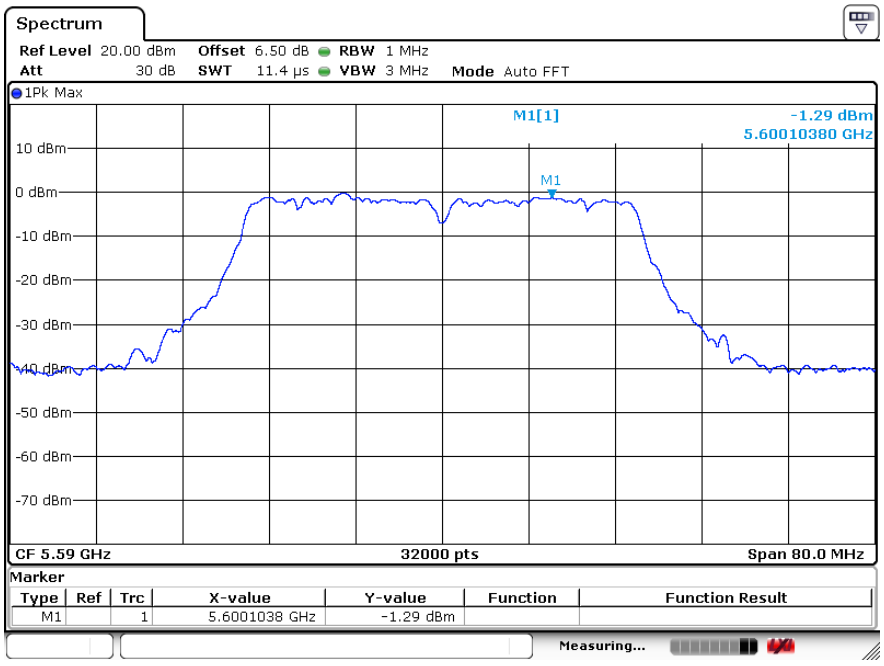


802.11n40

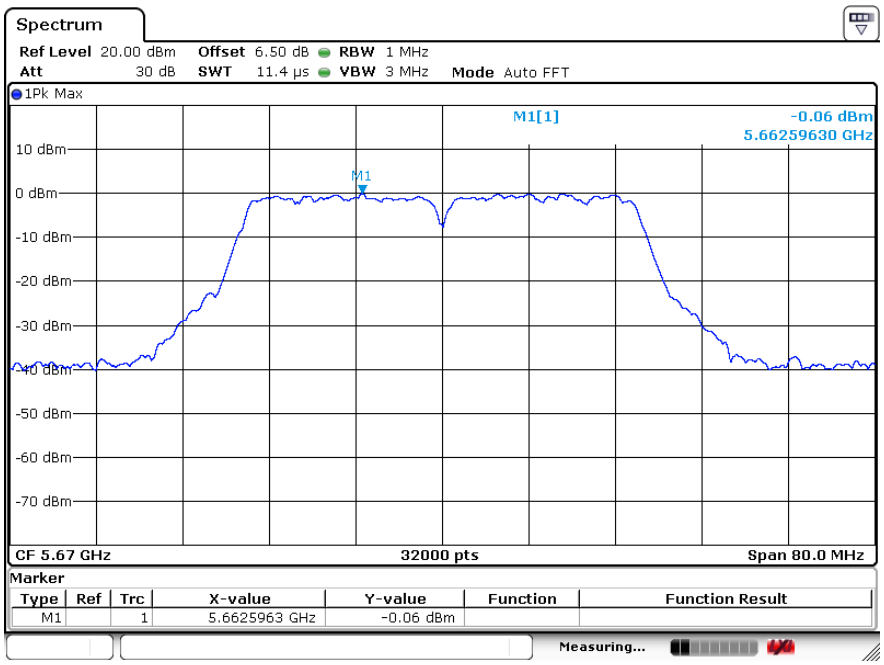
Channel: 102



Channel: 118

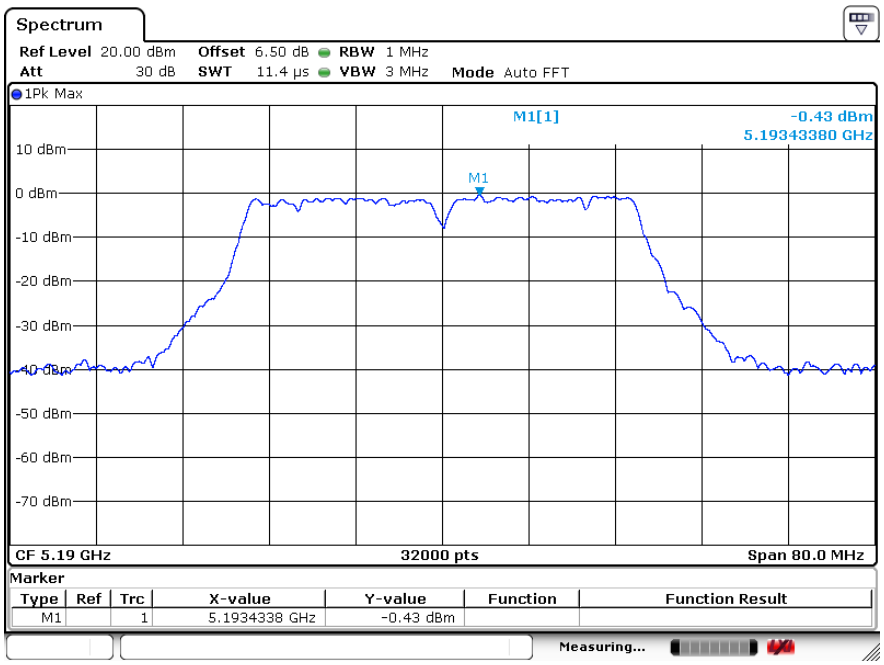


Channel: 134

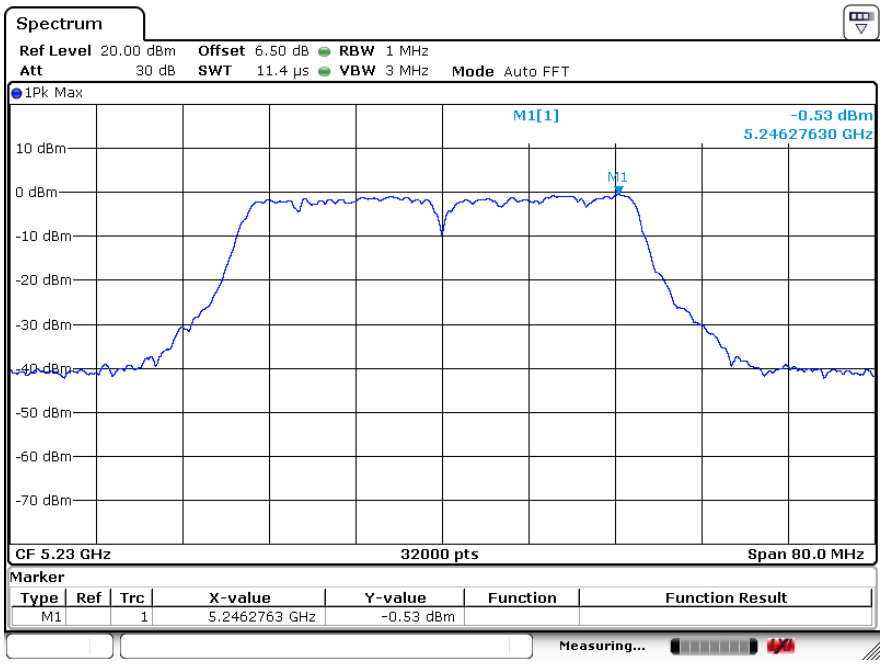

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 11.4 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -0.06 dBm
5.66259630 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.67 GHz 32000 pts Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6625963 GHz -0.06 dBm
Measuring...

802.11ac40

Channel: 38

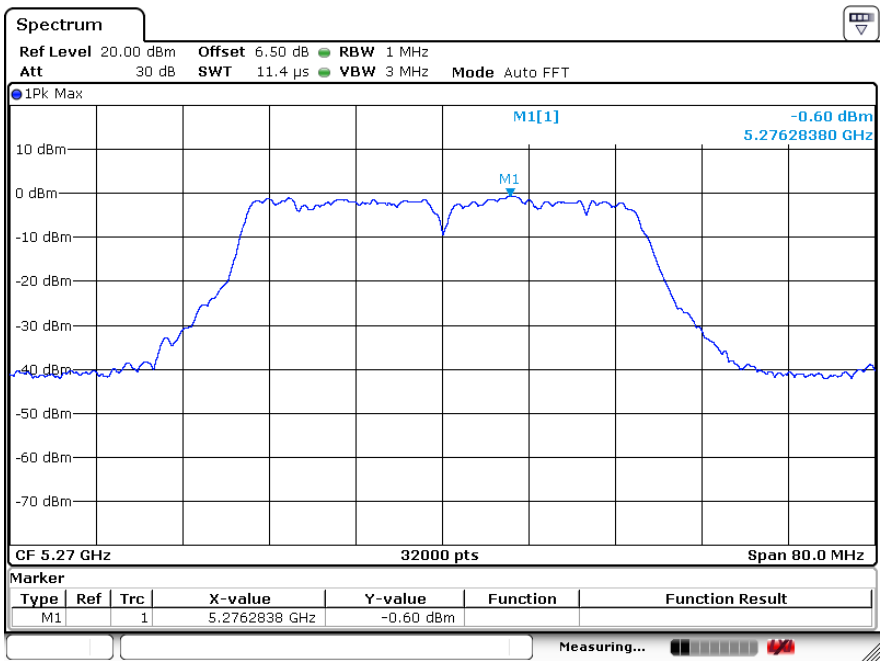


Channel: 46

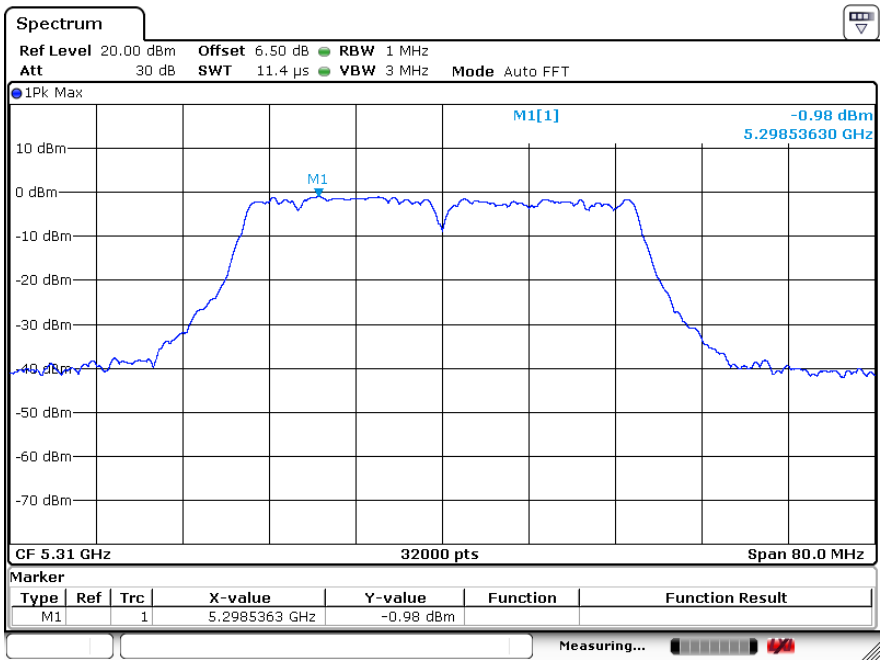


802.11ac40

Channel: 54

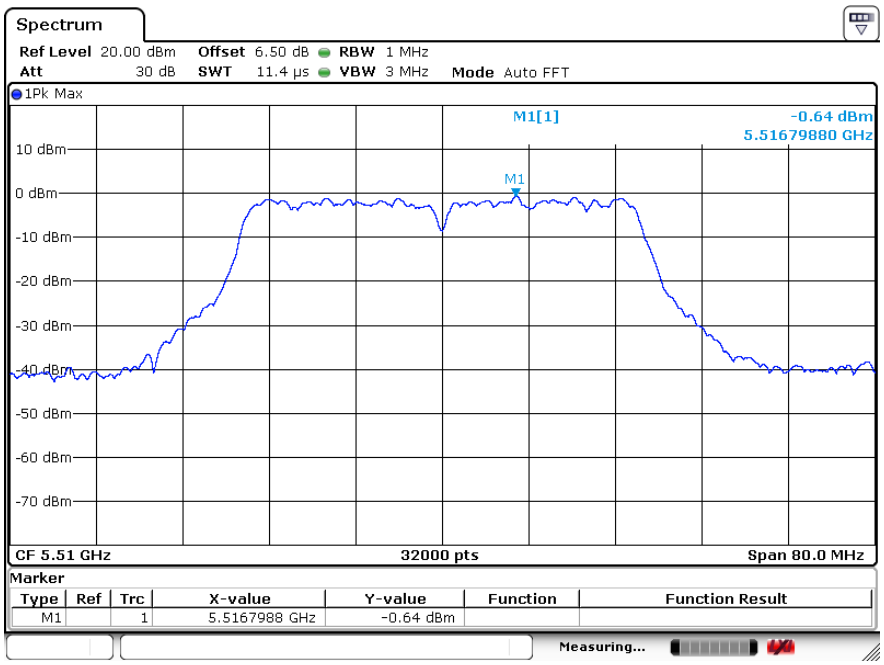


Channel: 62

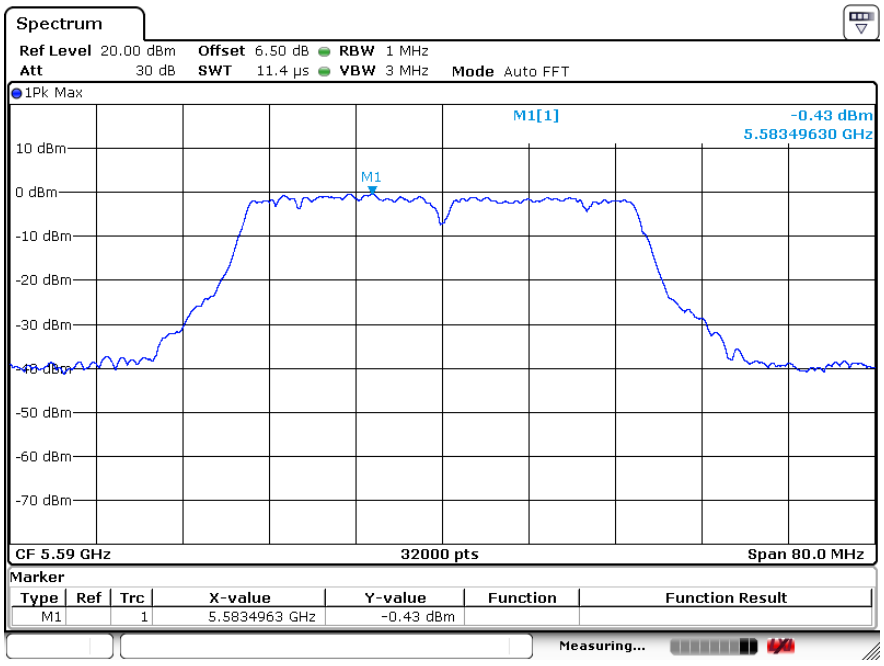


802.11ac40

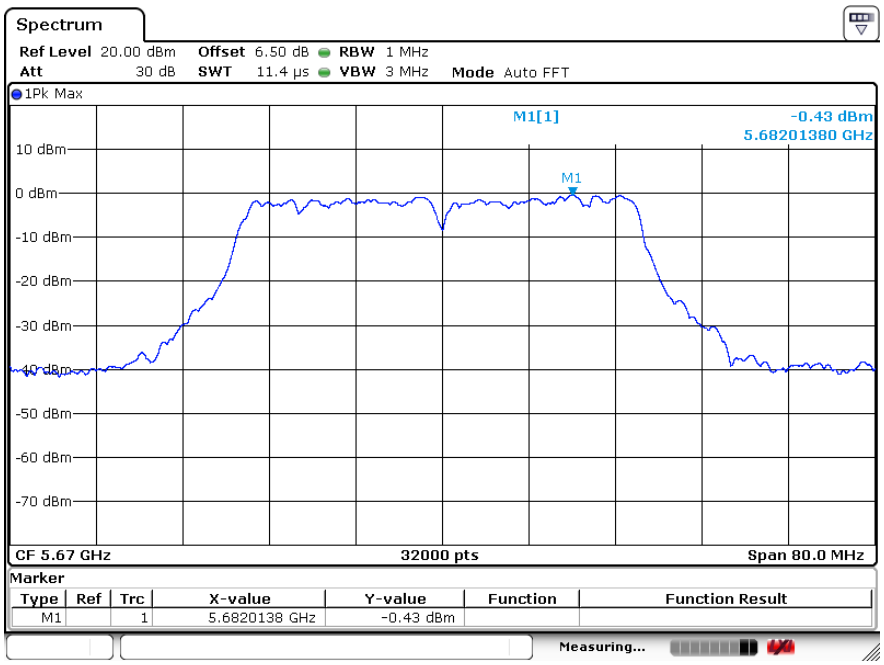
Channel: 102



Channel: 118

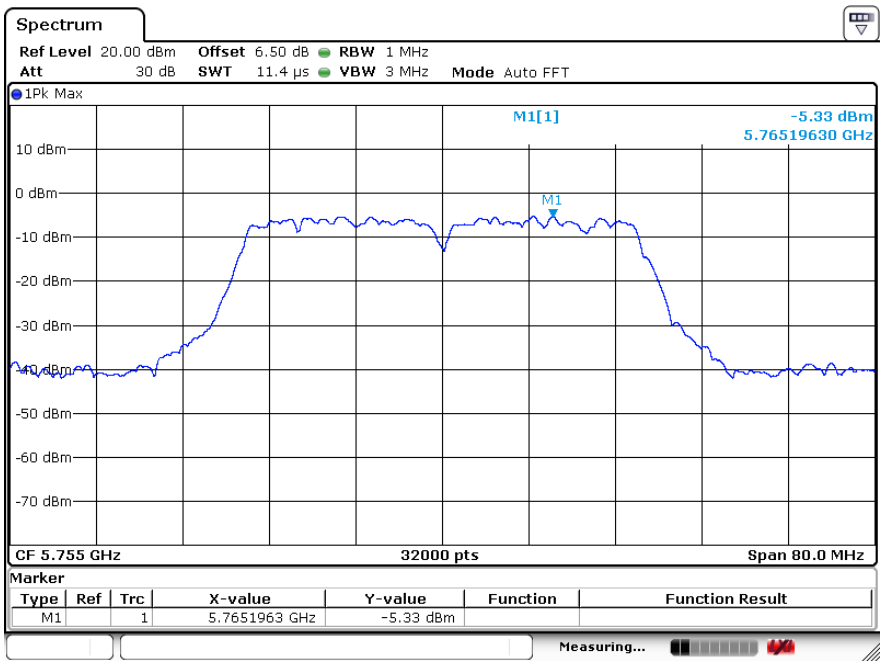


Channel: 134

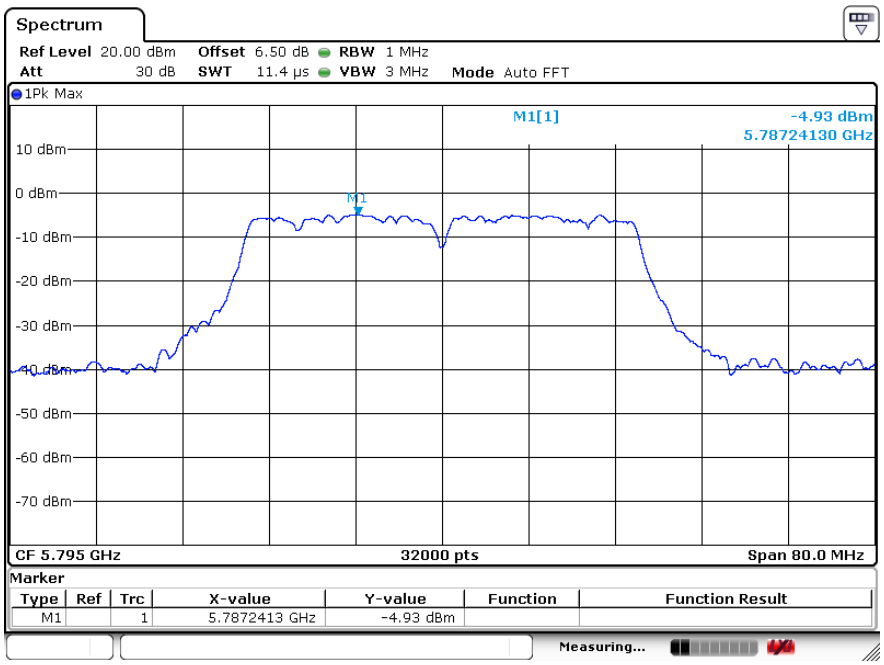

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 1 MHz
Att 30 dB SWT 11.4 µs VBW 3 MHz Mode Auto FFT
1Pk Max
M1[1] -0.43 dBm
5.68201380 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6820138 GHz -0.43 dBm
Measuring...

802.11n40

Channel: 151

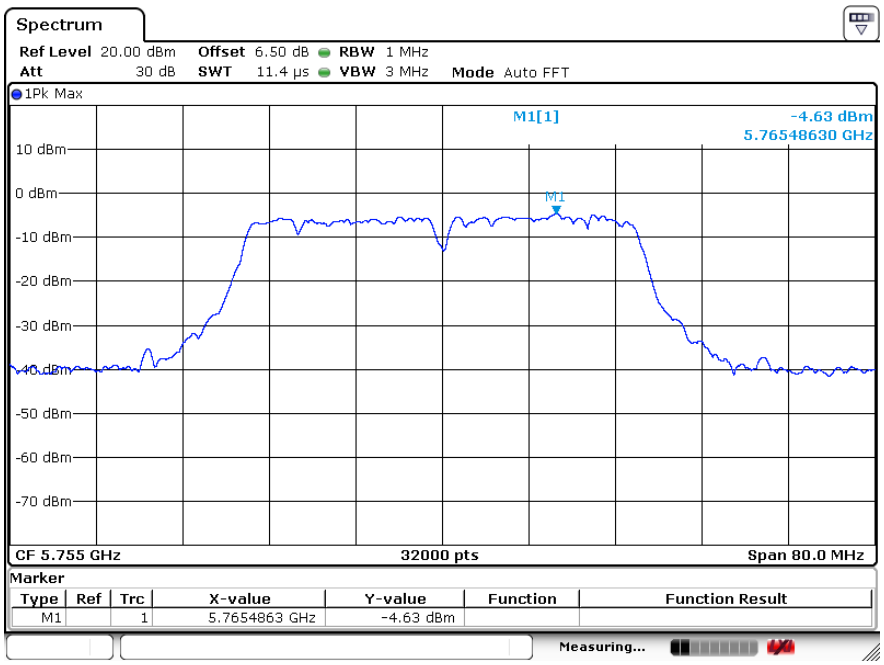


Channel: 159

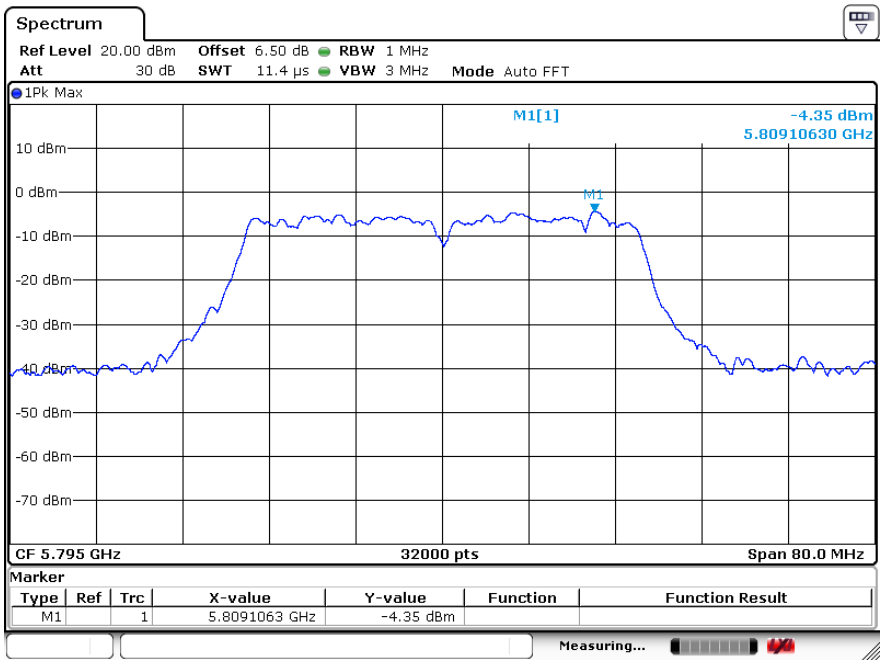


802.11ac40

Channel: 151

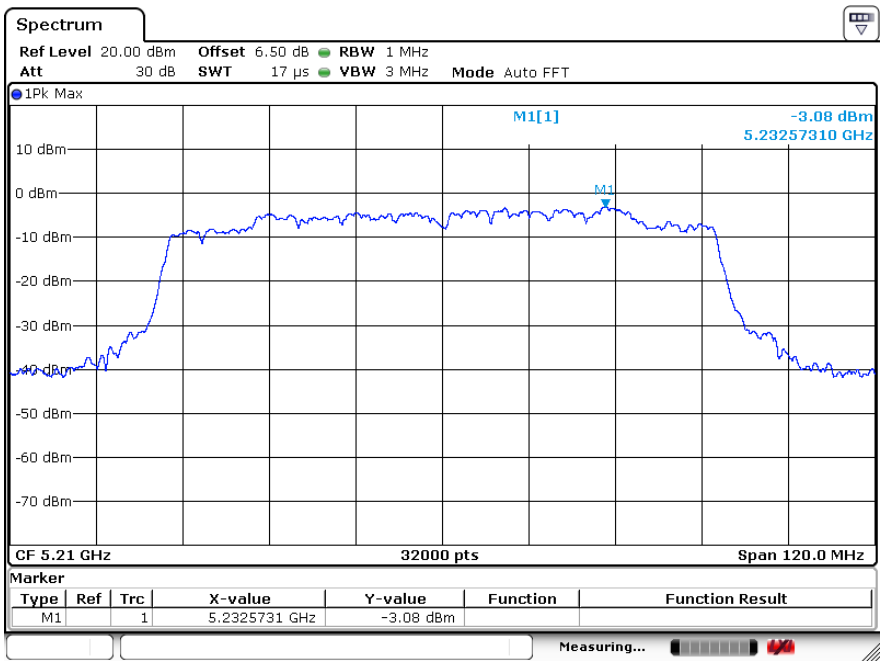


Channel: 159

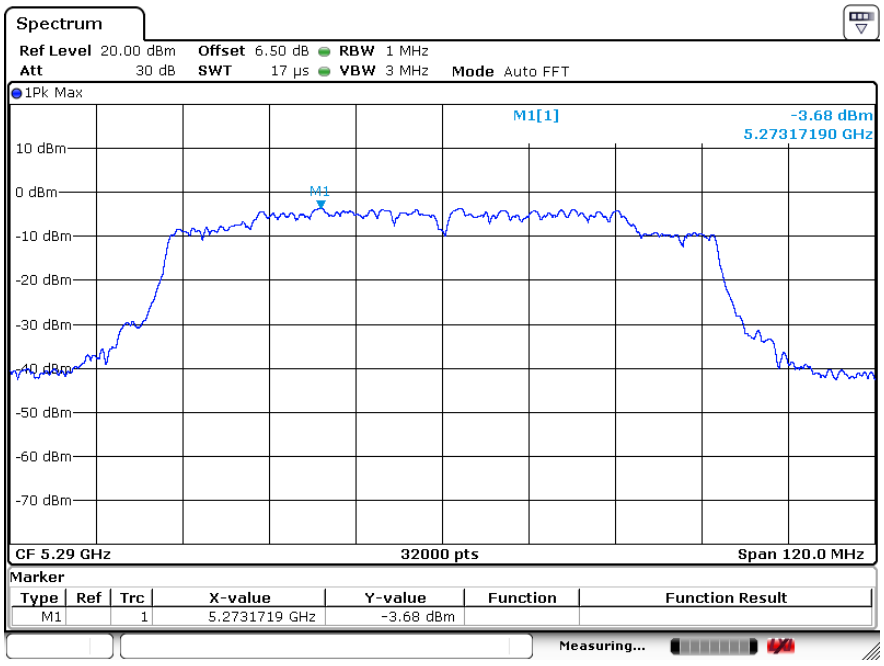


802.11ac80

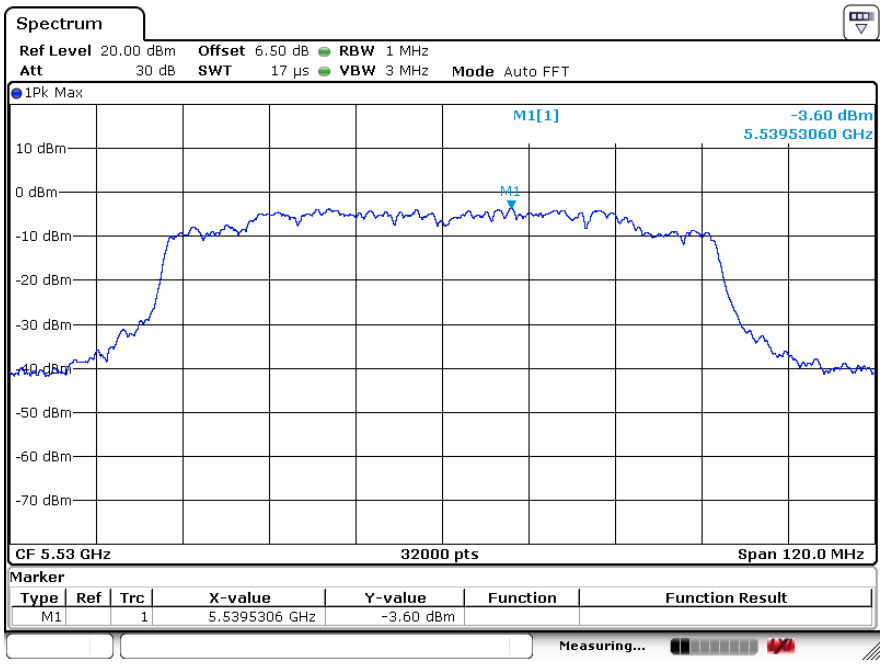
Channel:42



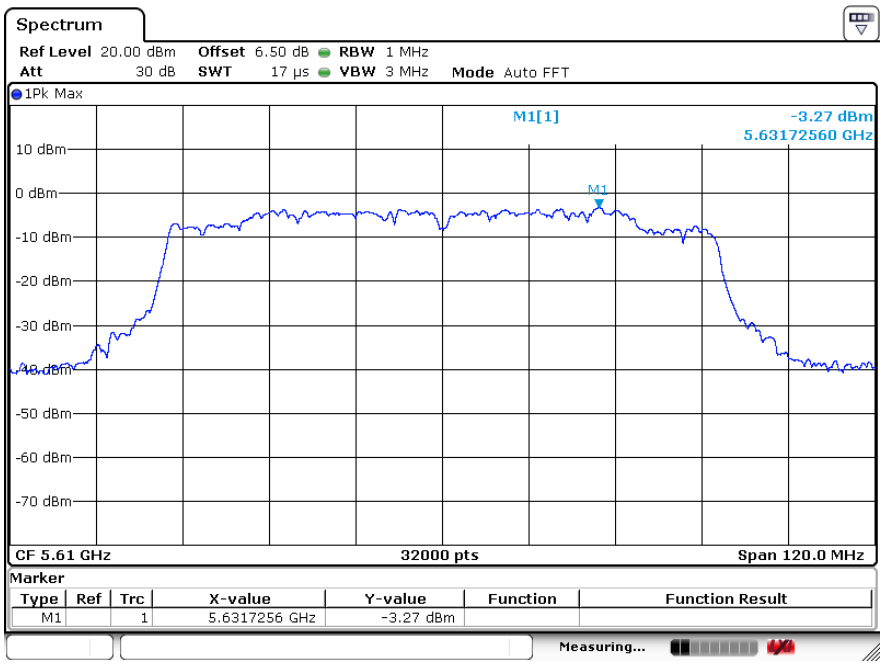
Channel: 58



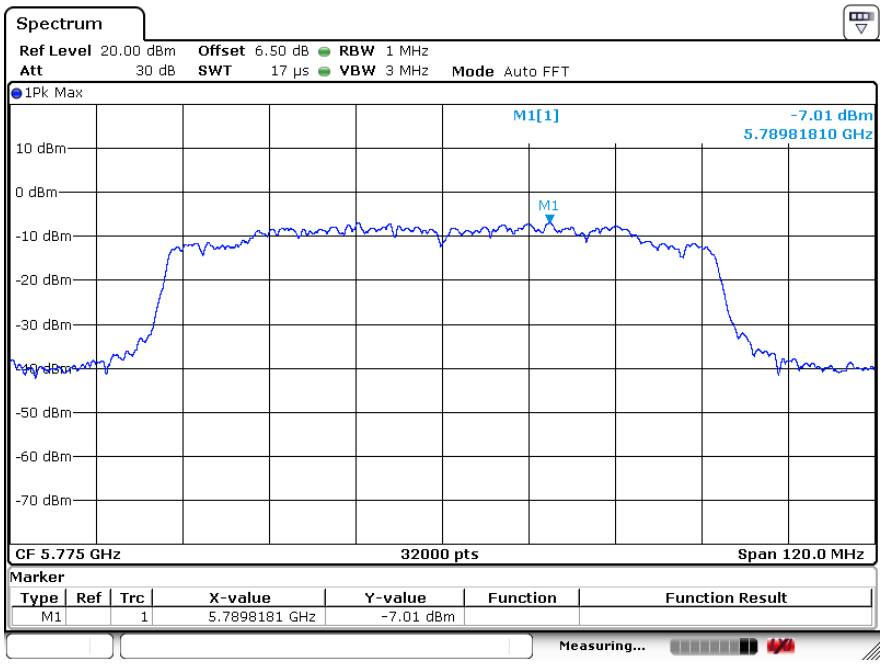
Channel:106



Channel: 122

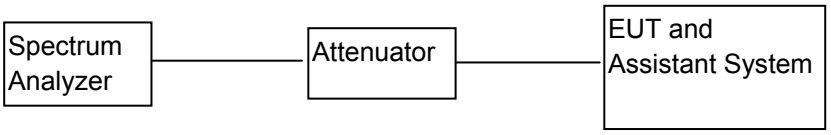


Channel: 155


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] -7.01 dBm
5.78981810 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 5.7898181 GHz -7.01 dBm
Measuring...

4. 26 dB & 99% Emission Bandwidth

4.1. BLOCK DIAGRAM OF TEST SETUP



4.2. 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.

4.3. 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.

4.4. 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	24.08	24.79	24.13	16.62	17.76	17.77
44	5220.00	23.95	24.03	24.19	16.65	17.78	17.76
48	5240.00	24.17	24.18	24.31	16.59	17.75	17.75
52	5260.00	23.64	24.01	24.08	16.66	17.78	17.75
56	5280.00	23.61	24.34	24.41	16.56	17.73	17.74
64	5320.00	23.77	24.44	24.42	16.58	17.76	17.75
100	5500.00	23.45	24.20	24.09	16.64	17.75	17.75
120	5600.00	23.60	24.22	24.13	16.59	17.73	17.72
140	5700.00	23.87	24.06	23.96	16.60	17.75	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	16.32	17.56	17.56	16.95	17.79	17.76
157	5785.00	16.33	17.57	17.57	16.72	17.76	17.74
165	5825.00	16.33	17.56	17.56	16.71	17.76	17.75

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	44.58	44.65	36.25	36.26
46	5230.00	44.93	44.52	36.24	36.25
54	5270.00	44..70	44.63	36.23	36.23
62	5310.00	42.95	43.41	36.19	36.19
102	5510.00	44.93	44.23	36.23	36.26
118	5590.00	44.54	44.43	36.26	36.25
134	5670.00	44.46	45.01	36.24	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	36.32	36.32	36.27	36.26
159	5795.00	36.33	36.26	36.25	36.24

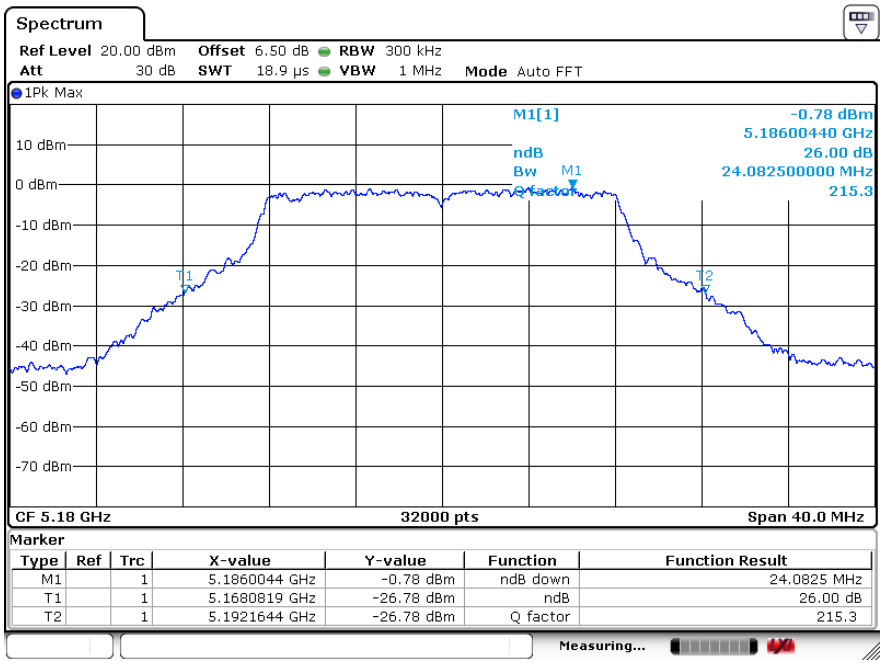
CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
		802.11ac(VHT80)	802.11ac(VHT80)
42	5210	83.50	75.10
58	5290	83.22	74.97
106	5530	83.45	74.99
122	5610	83.65	75.08
CH. No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz) 802.11ac(VHT80)	99% Occupied Bandwidth (MHz) 802.11ac(VHT80)
155	5775	75.06	75.08

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

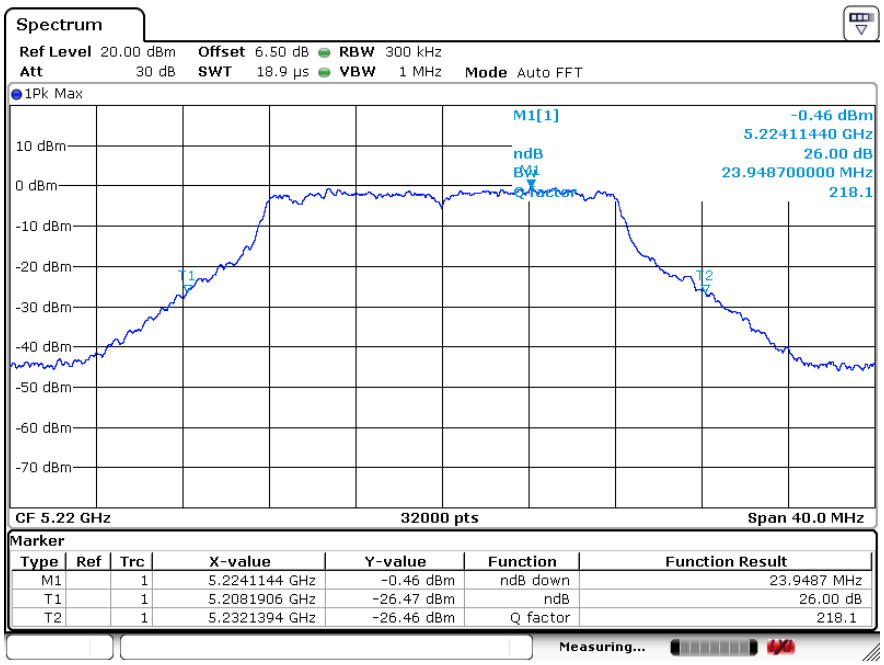
Test plots as followed: Antenna A

26dB BW 802.11a

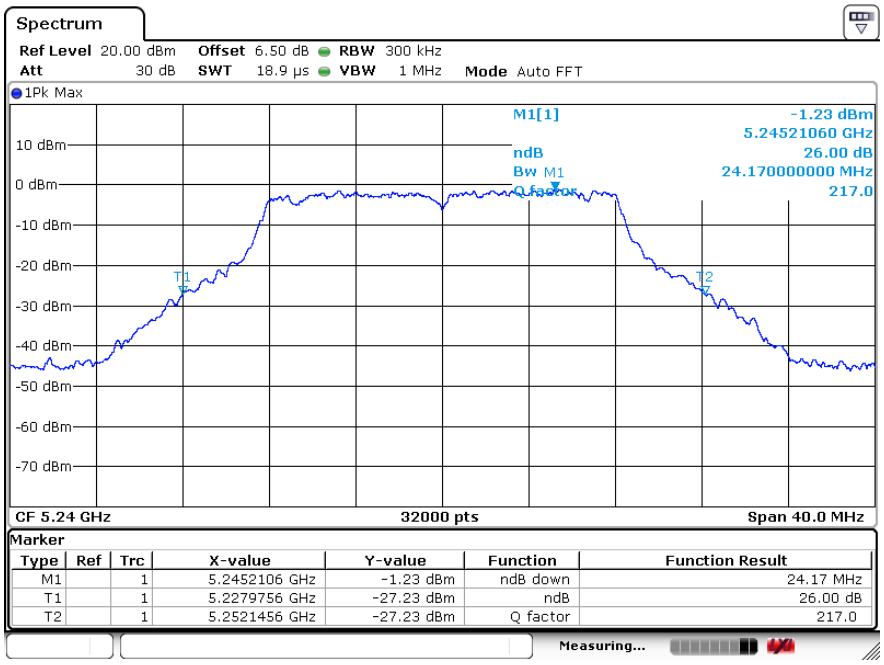
Channel: 36



Channel: 44

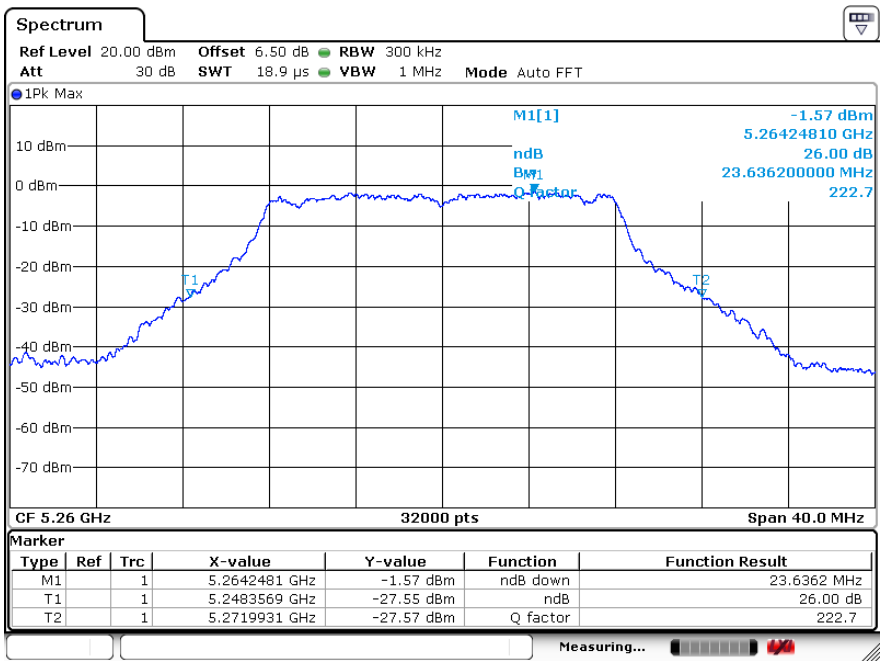


Channel: 48

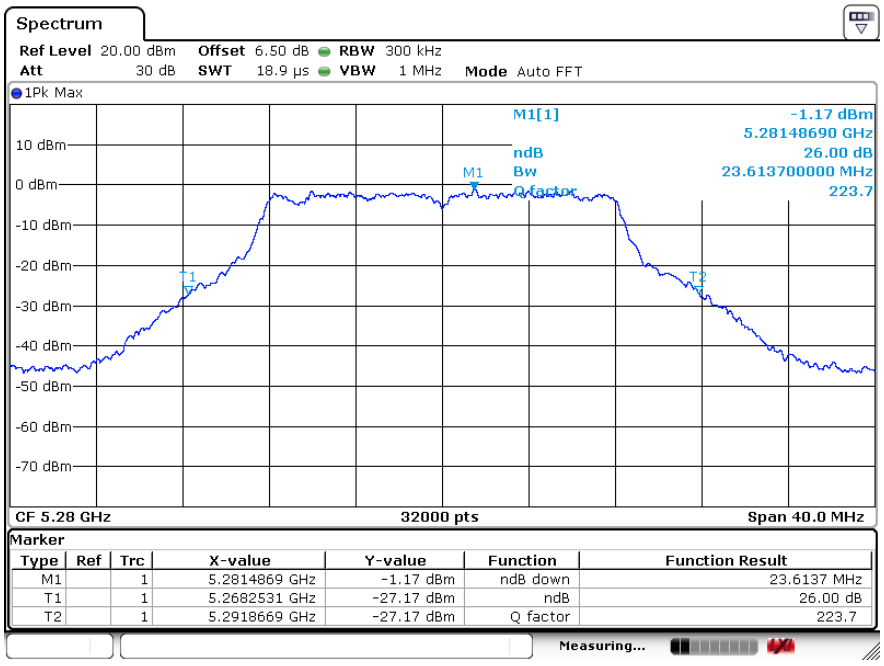

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -1.23 dBm
5.24521060 GHz
ndB 26.00 dB
Bw M1 24.170000000 MHz
Q factor 217.0
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2452106 GHz -1.23 dBm ndB down 24.17 MHz
T1 1 5.2279756 GHz -27.23 dBm ndB 26.00 dB
T2 1 5.2521456 GHz -27.23 dBm Q factor 217.0
Measuring...

26dB BW 802.11a

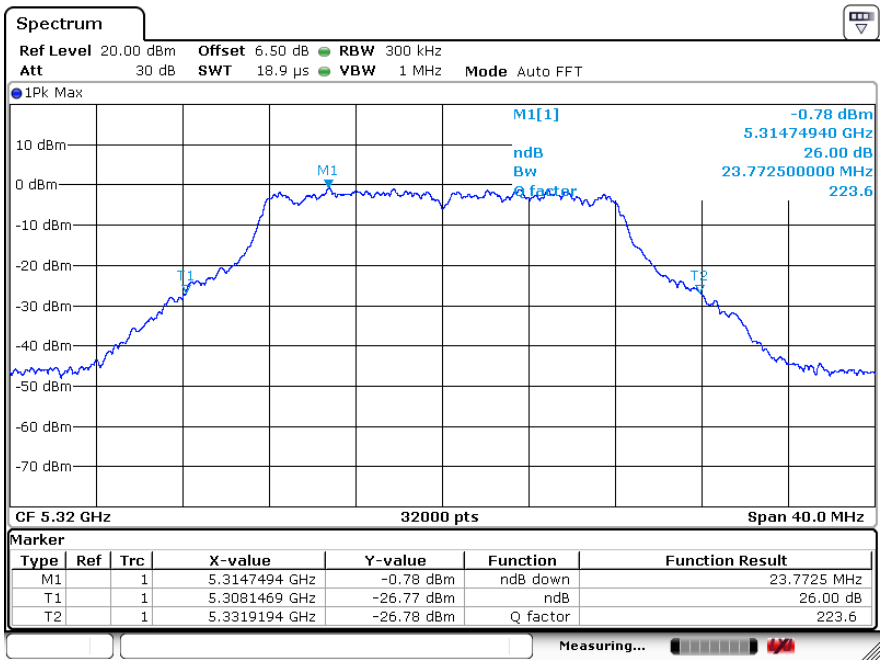
Channel: 52



Channel: 56

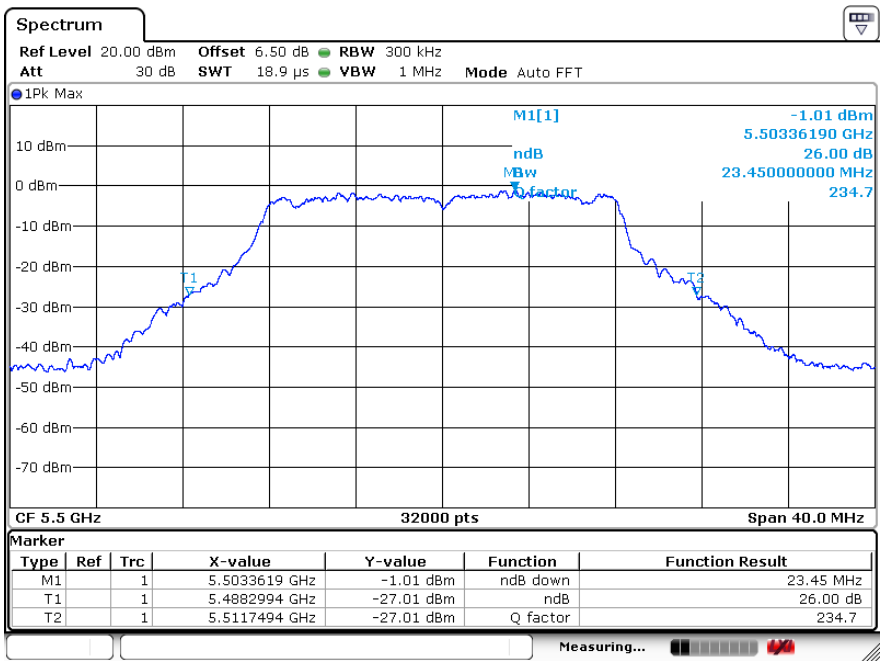


Channel: 64

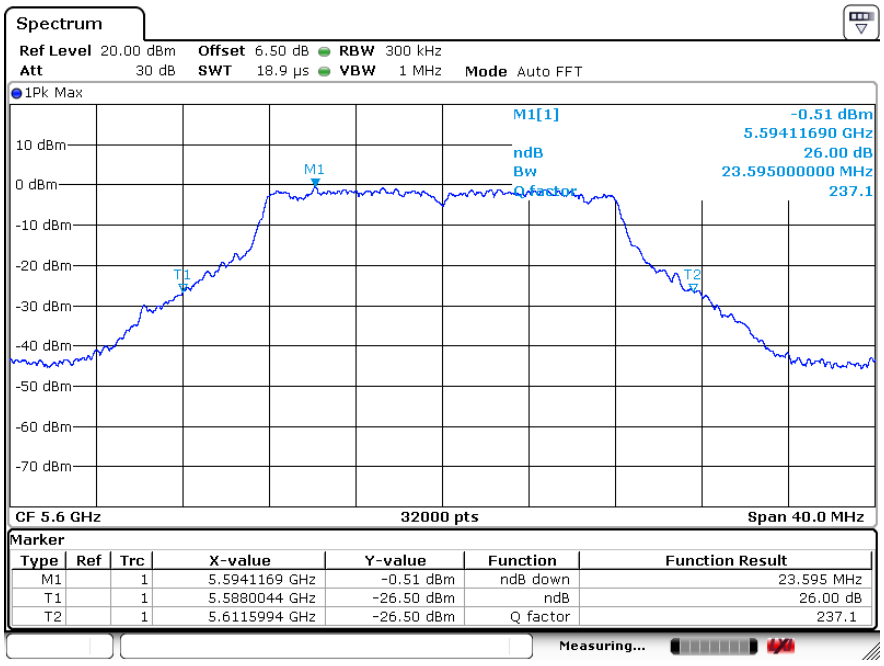

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -0.78 dBm
5.31474940 GHz
ndB 26.00 dB
Bw 23.772500000 MHz
Q factor 223.6
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3147494 GHz -0.78 dBm ndB down 23.7725 MHz
T1 1 5.3081469 GHz -26.77 dBm ndB 26.00 dB
T2 1 5.3319194 GHz -26.78 dBm Q factor 223.6
Measuring...

26dB BW 802.11a

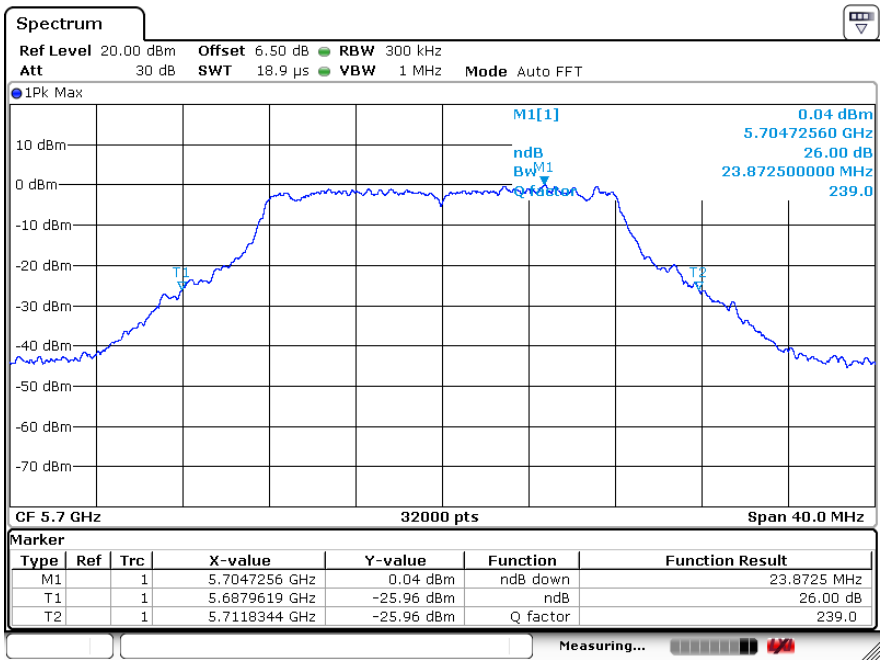
Channel: 100



Channel: 120

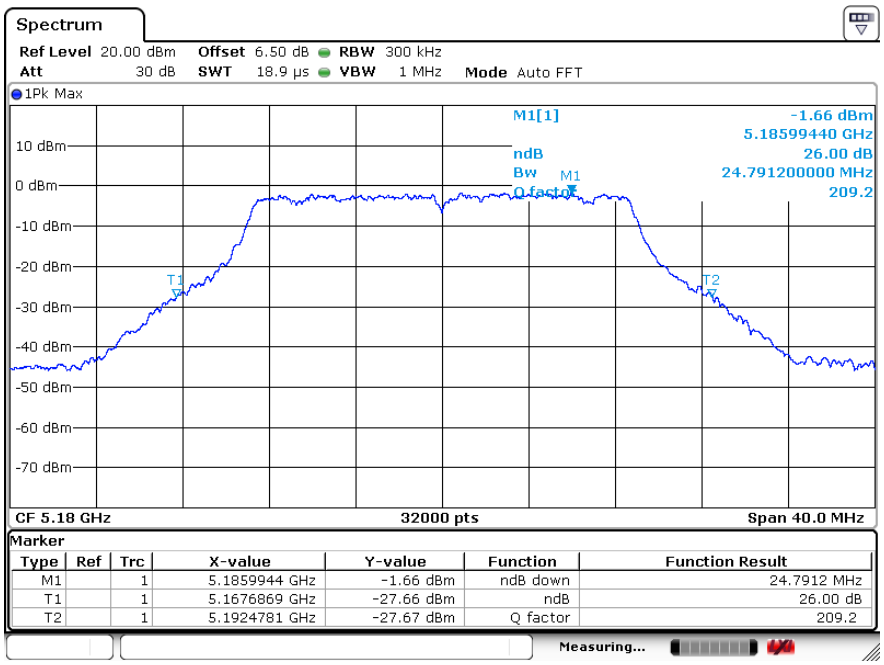


Channel: 140

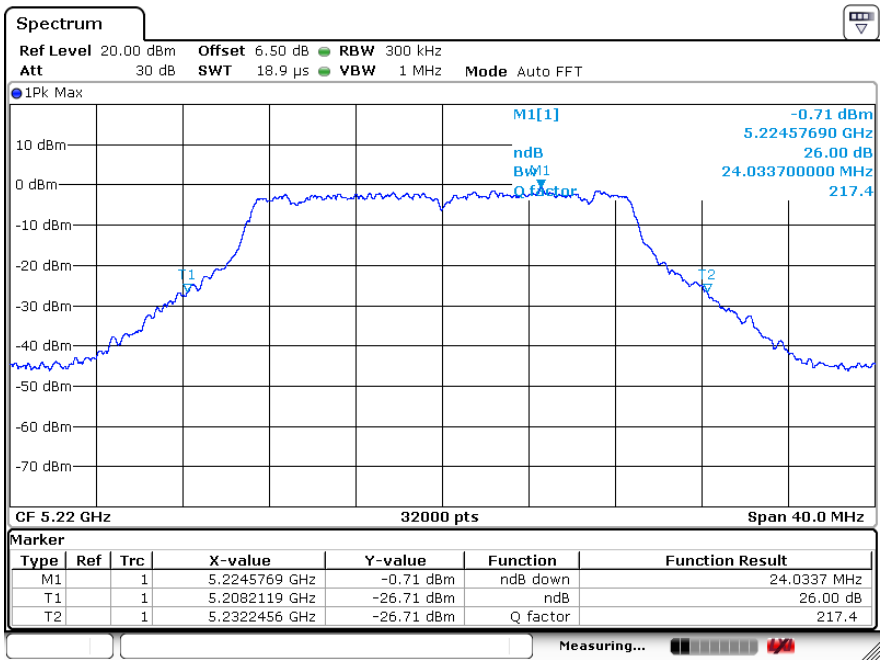

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1]
0.04 dBm
5.70472560 GHz
ndB
26.00 dB
BW
23.872500000 MHz
Q factor
239.0
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7047256 GHz 0.04 dBm ndB down 23.8725 MHz
T1 1 5.6879619 GHz -25.96 dBm ndB 26.00 dB
T2 1 5.7118344 GHz -25.96 dBm Q factor 239.0
Measuring...

26dB BW 802.11n20

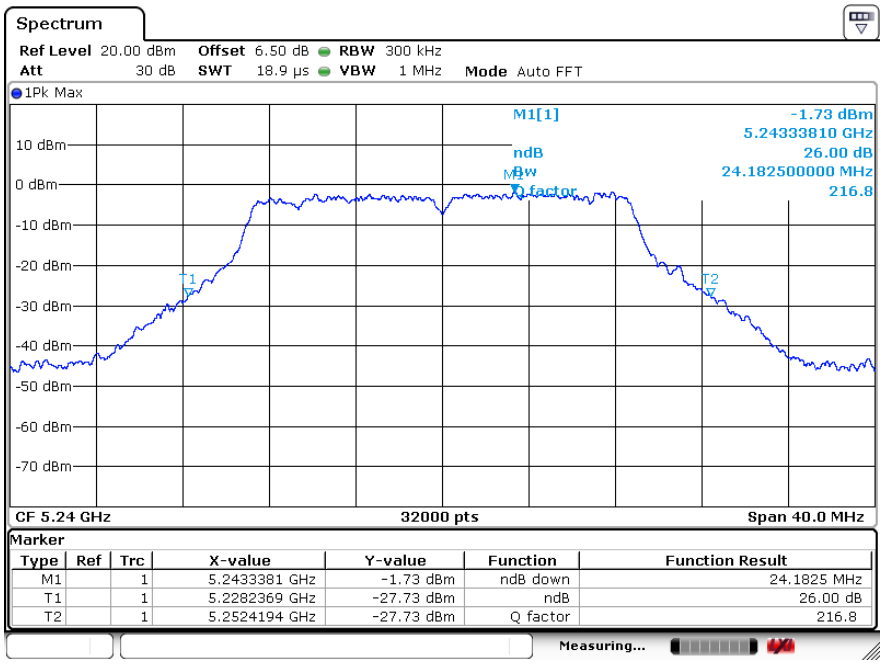
Channel: 36



Channel: 44

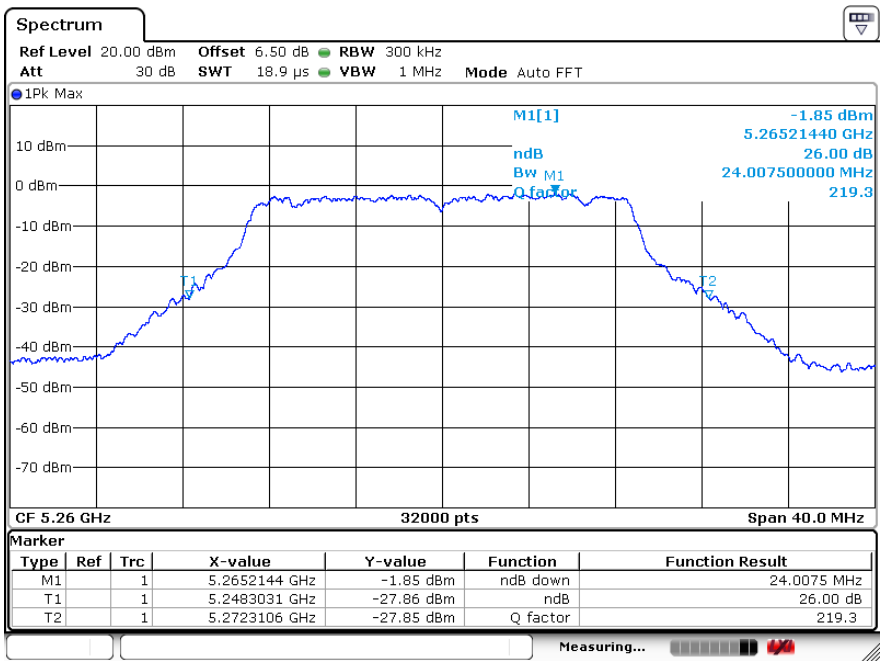


Channel: 48

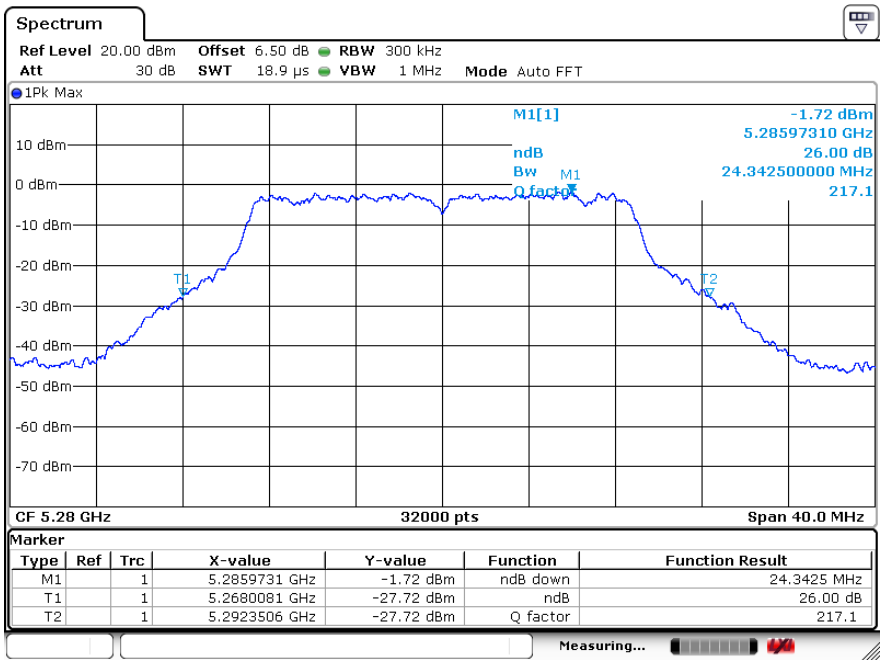

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1]
-1.73 dBm
5.24333810 GHz
ndB 26.00 dB
Bw 24.182500000 MHz
Q factor 216.8
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2433381 GHz -1.73 dBm ndB down 24.1825 MHz
T1 1 5.2282369 GHz -27.73 dBm ndB 26.00 dB
T2 1 5.2524194 GHz -27.73 dBm Q factor 216.8
Measuring...

26dB BW 802.11n20

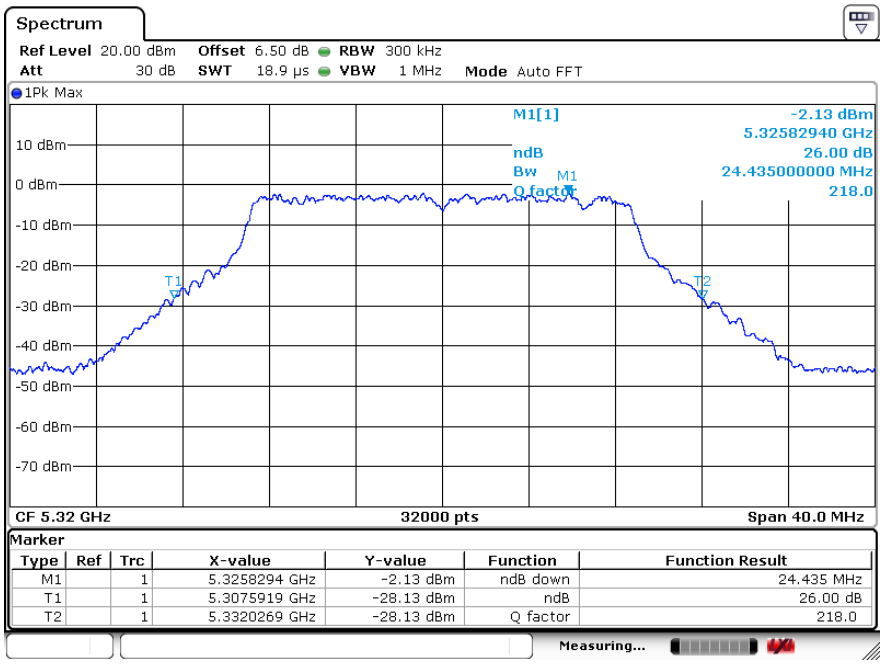
Channel: 52



Channel: 56

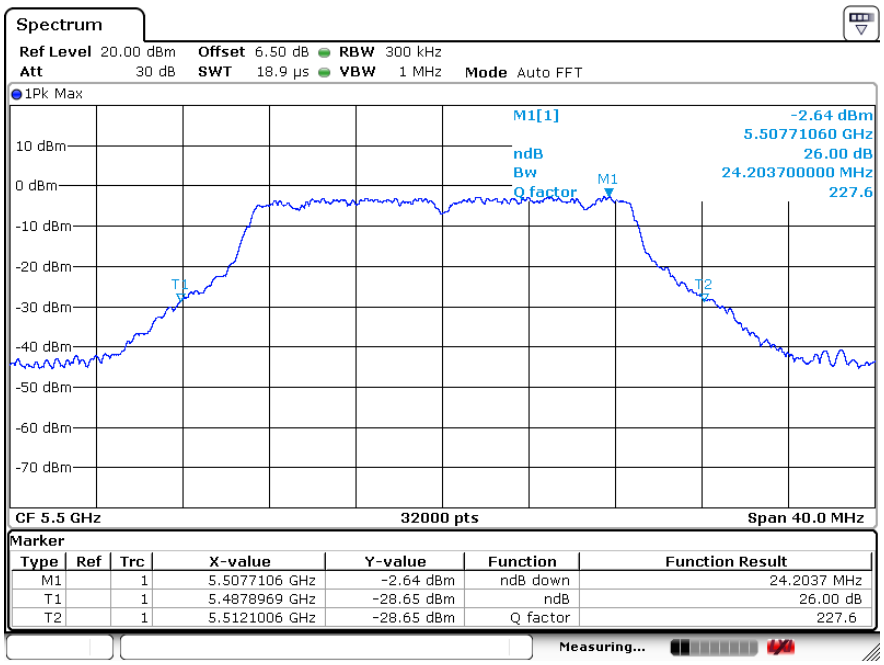


Channel: 64

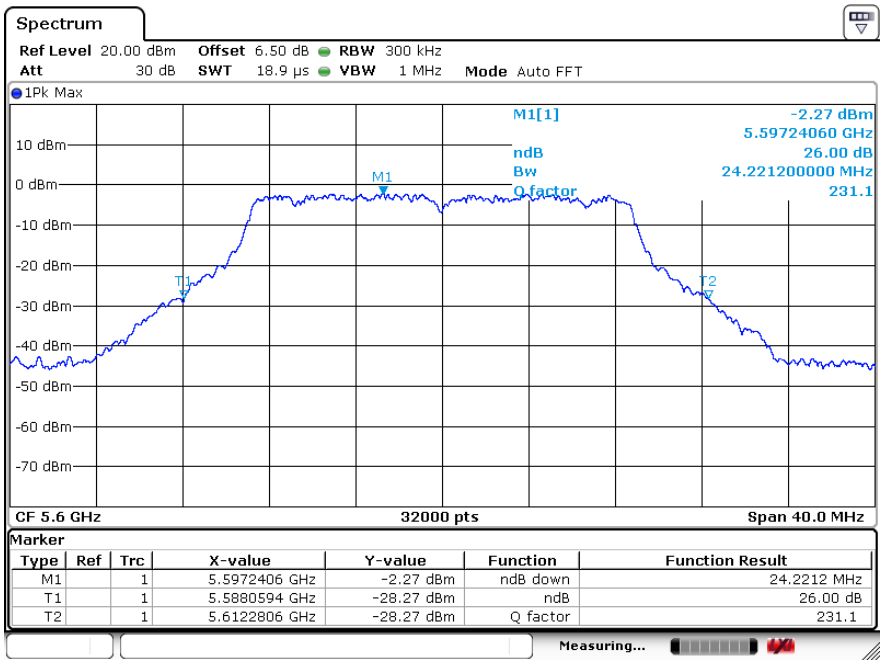

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -2.13 dBm
5.32582940 GHz
ndB 26.00 dB
Bw 24.435000000 MHz
Q factor 218.0
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
M1
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3258294 GHz -2.13 dBm ndB down 24.435 MHz
T1 1 5.3075919 GHz -28.13 dBm ndB 26.00 dB
T2 1 5.3320269 GHz -28.13 dBm Q factor 218.0
Measuring...

26dB BW 802.11n20

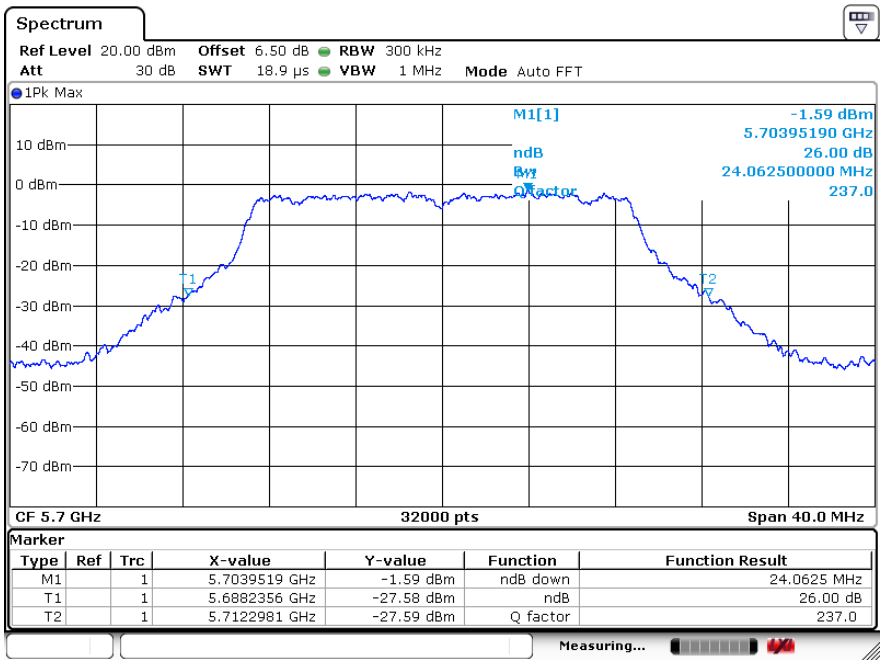
Channel: 100



Channel: 120

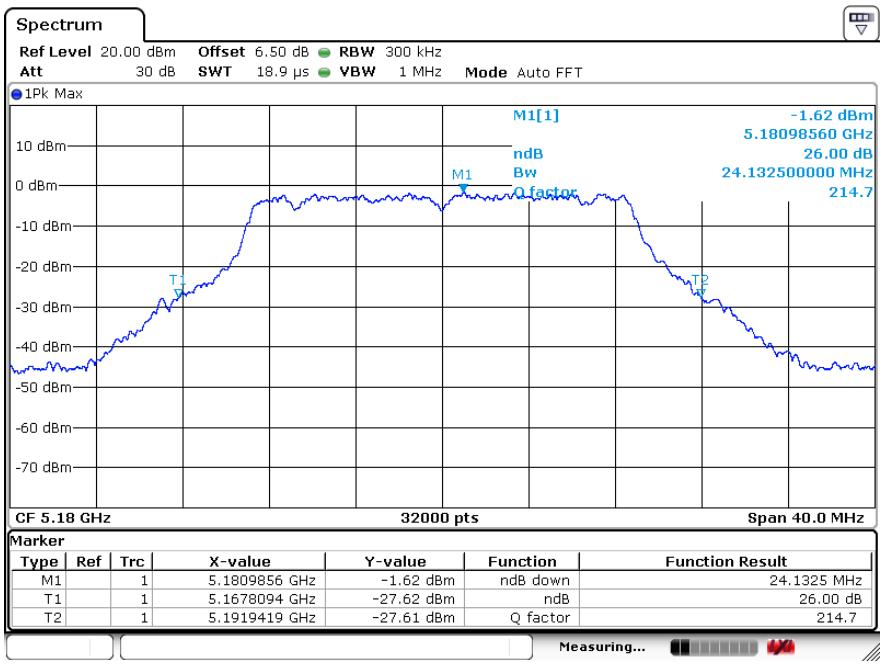


Channel: 140

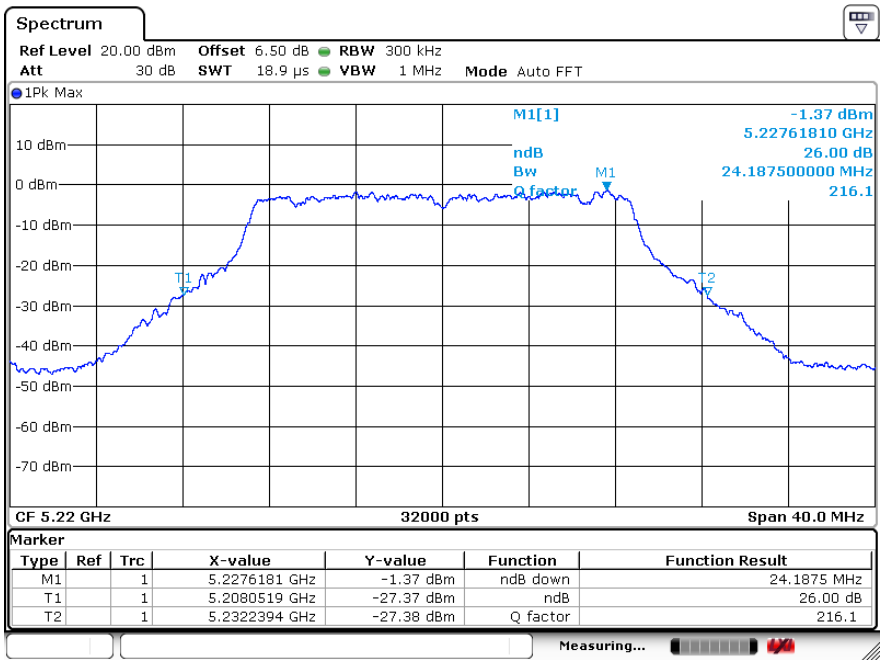

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1]
-1.59 dBm
5.70395190 GHz
ndB 26.00 dB
Bw 24.062500000 MHz
Q factor 237.0
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7039519 GHz -1.59 dBm ndB down 24.0625 MHz
T1 1 5.6882356 GHz -27.58 dBm ndB 26.00 dB
T2 1 5.7122981 GHz -27.59 dBm Q factor 237.0
Measuring...

26dB BW 802.11ac20

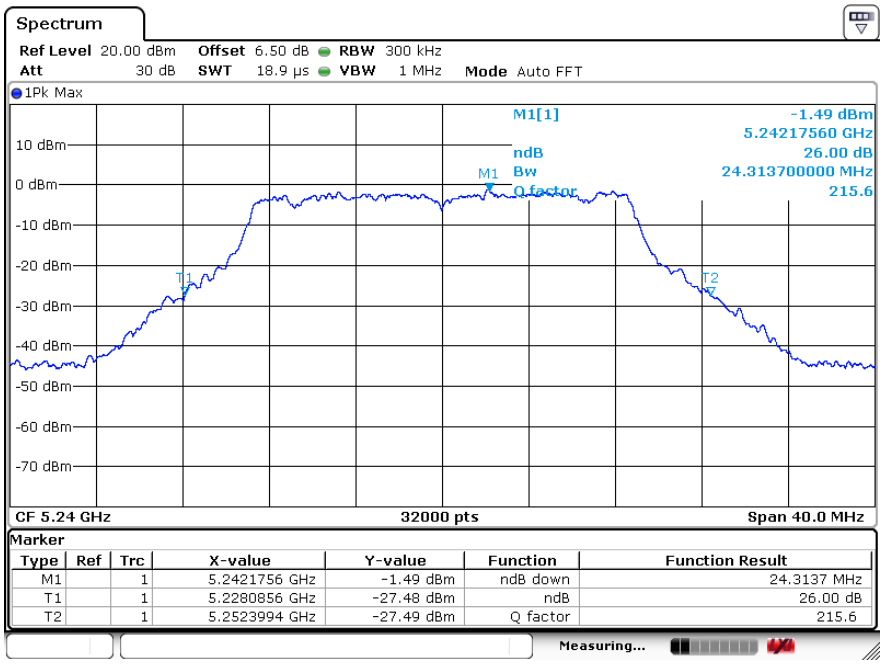
Channel: 36



Channel: 44

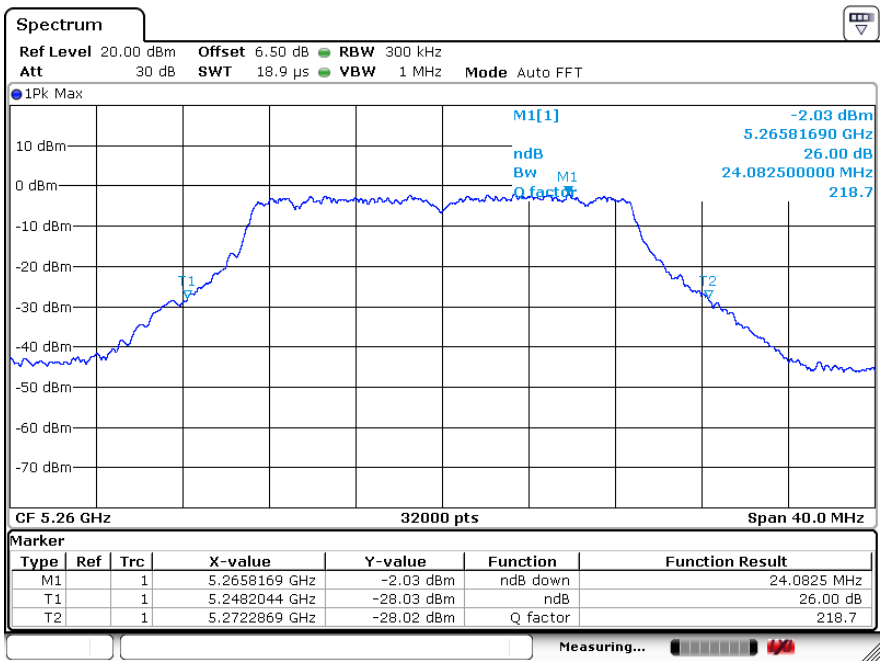


Channel: 48

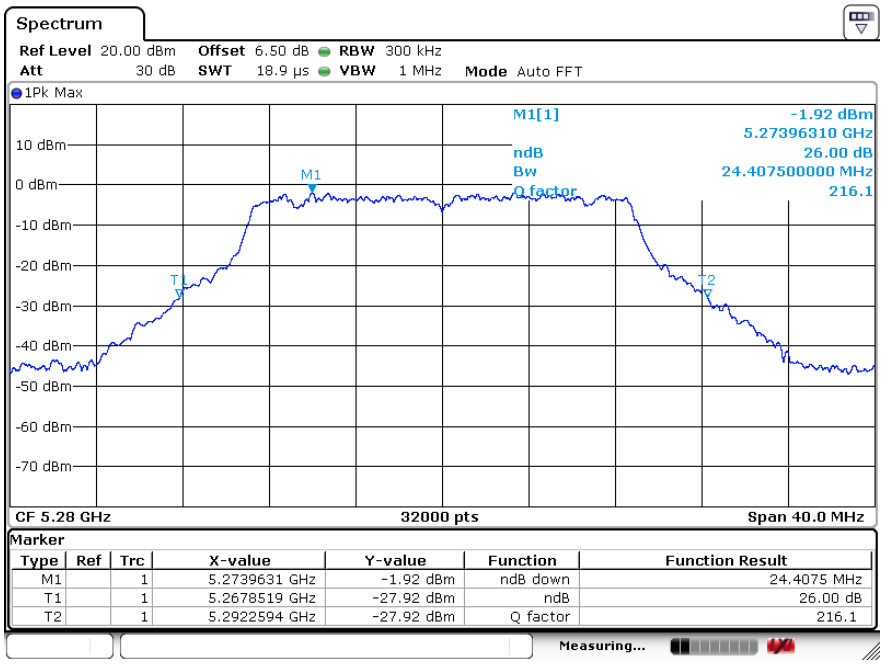

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -1.49 dBm
5.24217560 GHz
ndB 26.00 dB
Bw 24.313700000 MHz
Q factor 215.6
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2421756 GHz -1.49 dBm ndB down 24.3137 MHz
T1 1 5.2280856 GHz -27.48 dBm ndB 26.00 dB
T2 1 5.2523994 GHz -27.49 dBm Q factor 215.6
Measuring...

26dB BW 802.11ac20

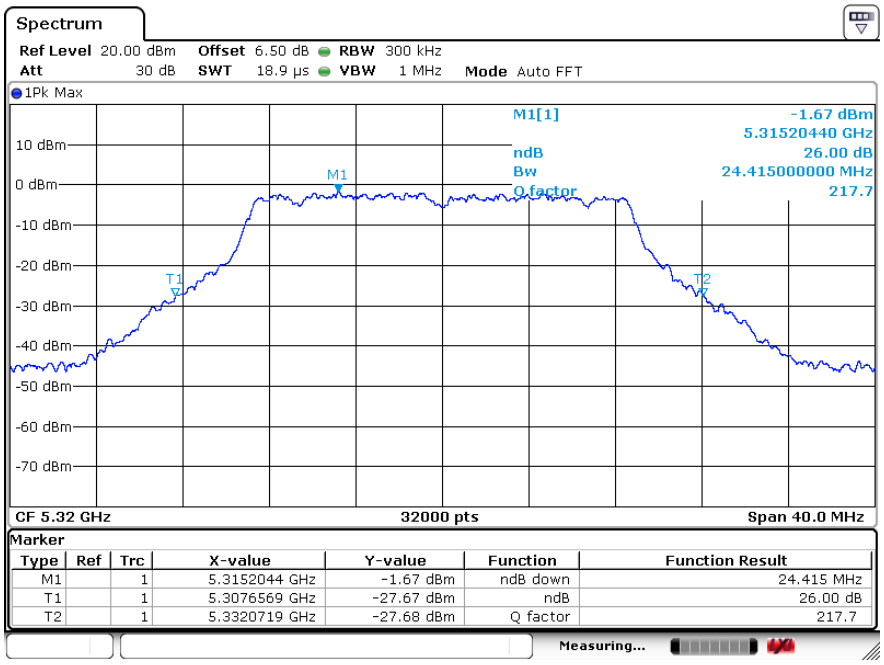
Channel: 52



Channel: 56

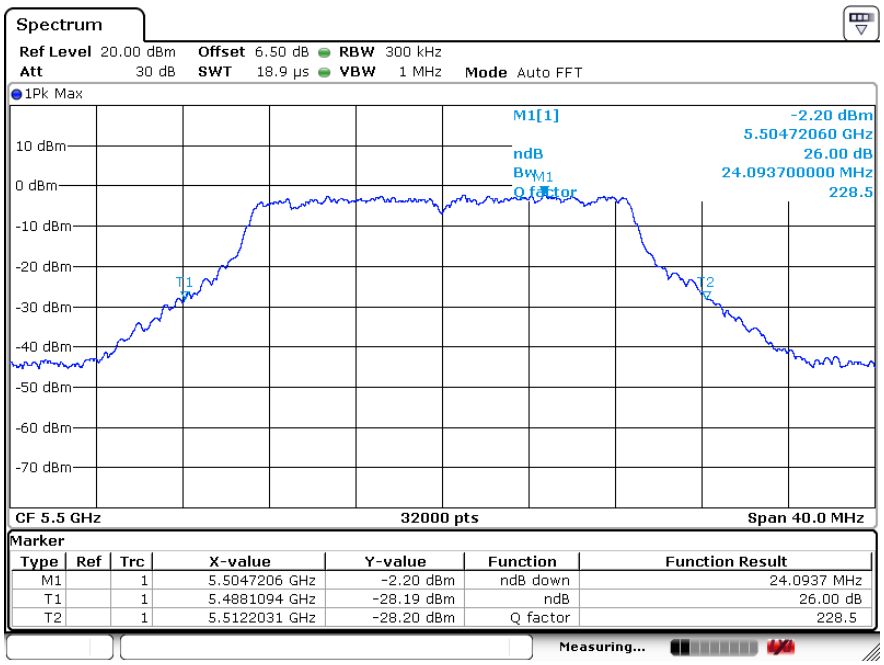


Channel: 64

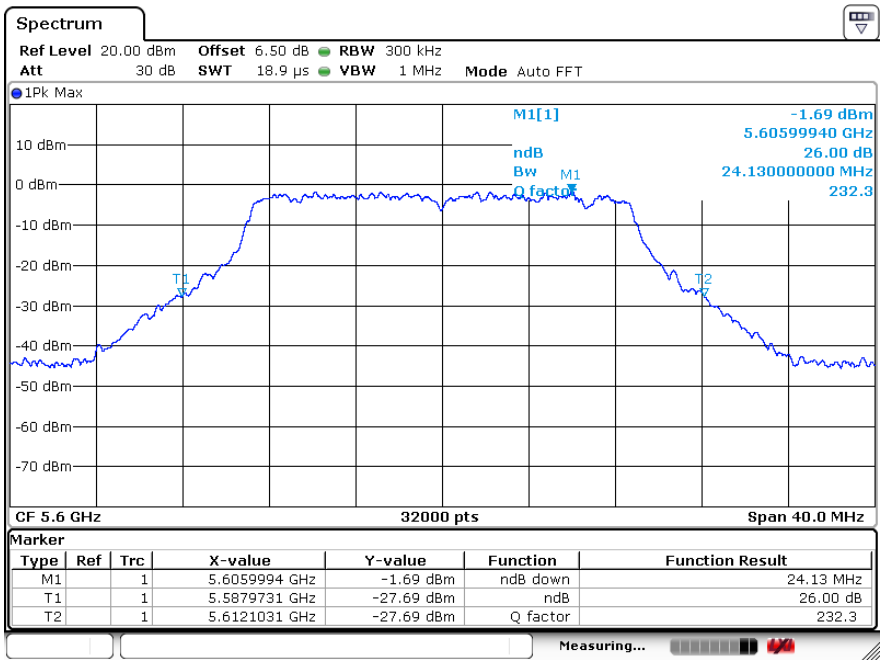

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -1.67 dBm
5.31520440 GHz
ndB 26.00 dB
Bw 24.415000000 MHz
Q factor 217.7
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3152044 GHz -1.67 dBm ndB down 24.415 MHz
T1 1 5.3076569 GHz -27.67 dBm ndB 26.00 dB
T2 1 5.3320719 GHz -27.68 dBm Q factor 217.7
Measuring...

26dB BW 802.11ac20

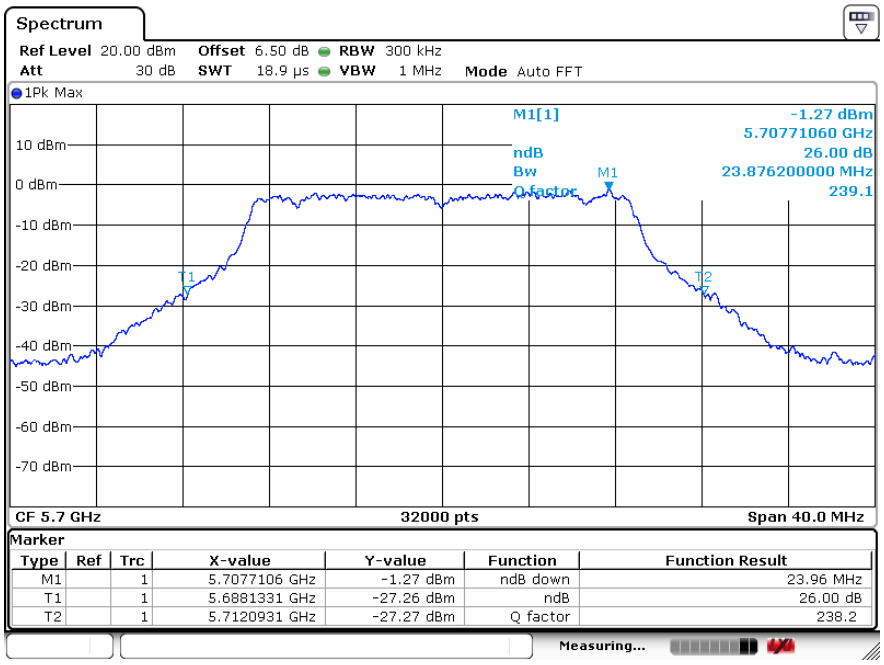
Channel: 100



Channel: 120

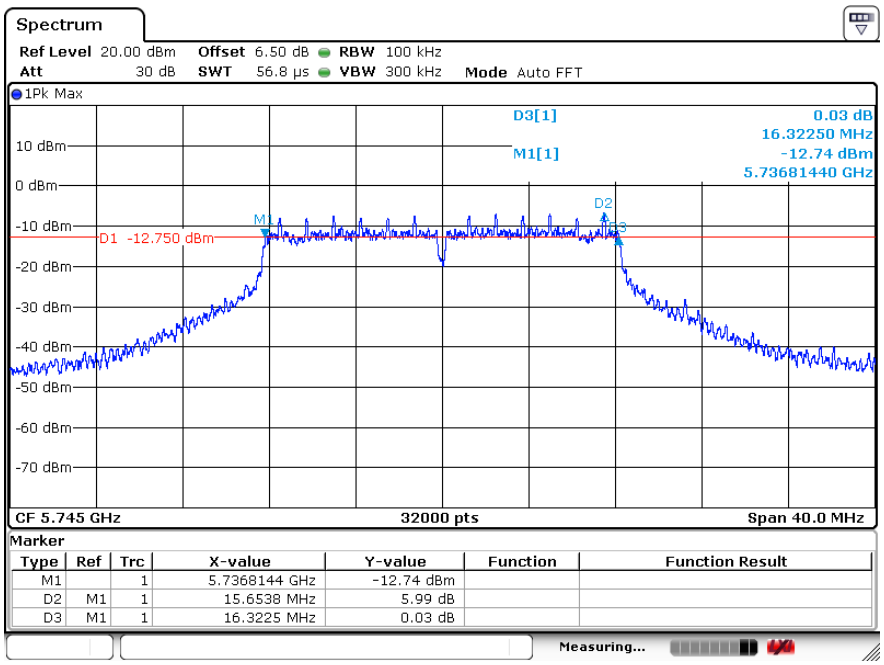


Channel: 140

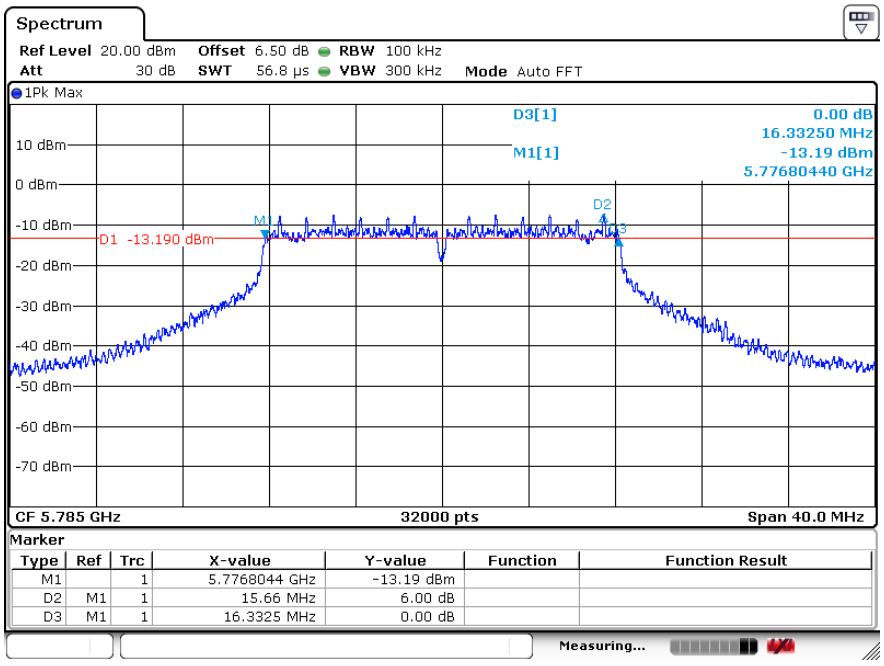

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 300 kHz
Att 30 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
1Pk Max
M1[1] -1.27 dBm
5.70771060 GHz
ndB 26.00 dB
Bw 23.876200000 MHz
Q factor 239.1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
T1
T2
M1
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7077106 GHz -1.27 dBm ndB down 23.96 MHz
T1 1 5.6881331 GHz -27.26 dBm ndB 26.00 dB
T2 1 5.7120931 GHz -27.27 dBm Q factor 238.2
Measuring...

6dB BW 802.11a

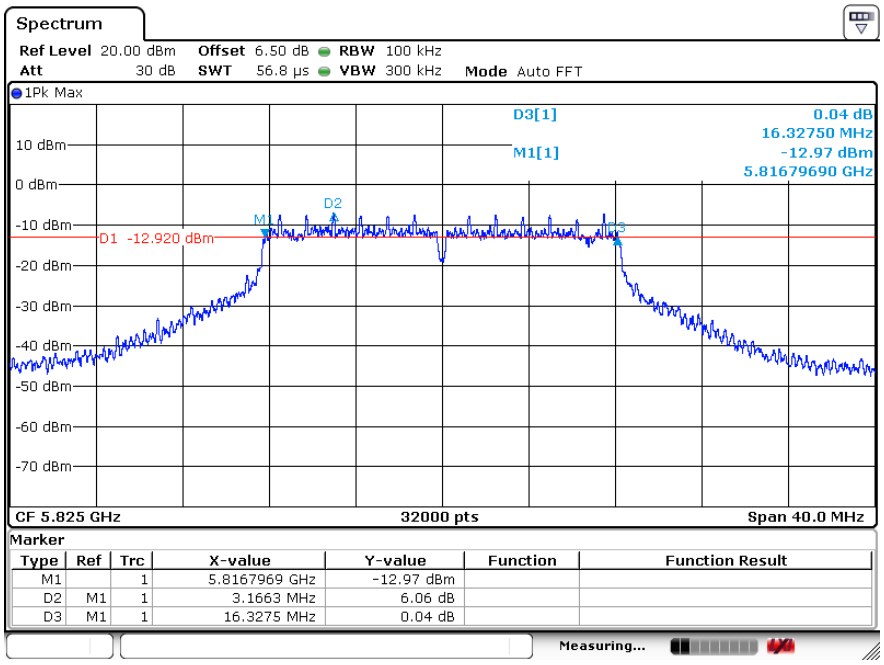
Channel: 149



Channel: 157

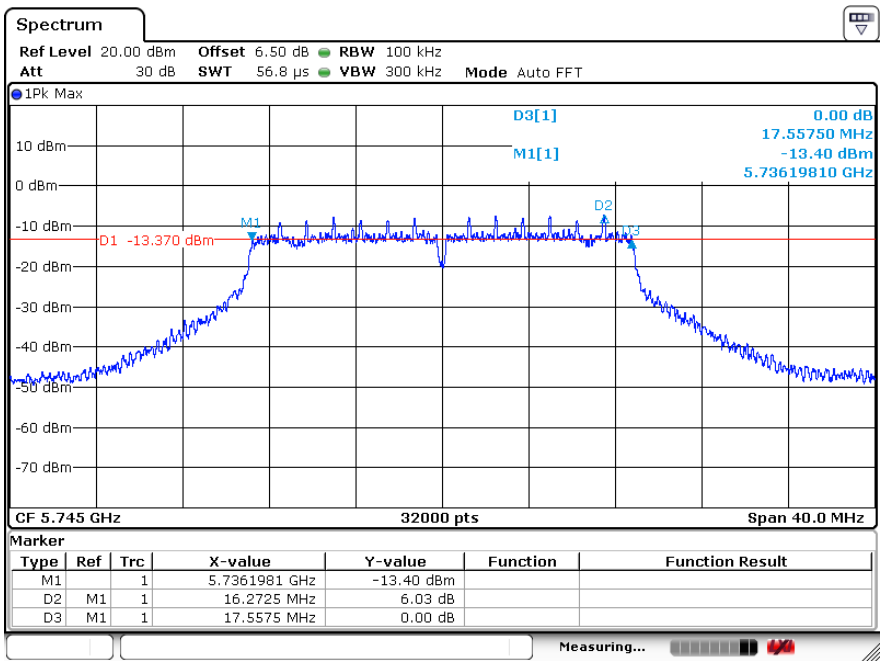


Channel: 165

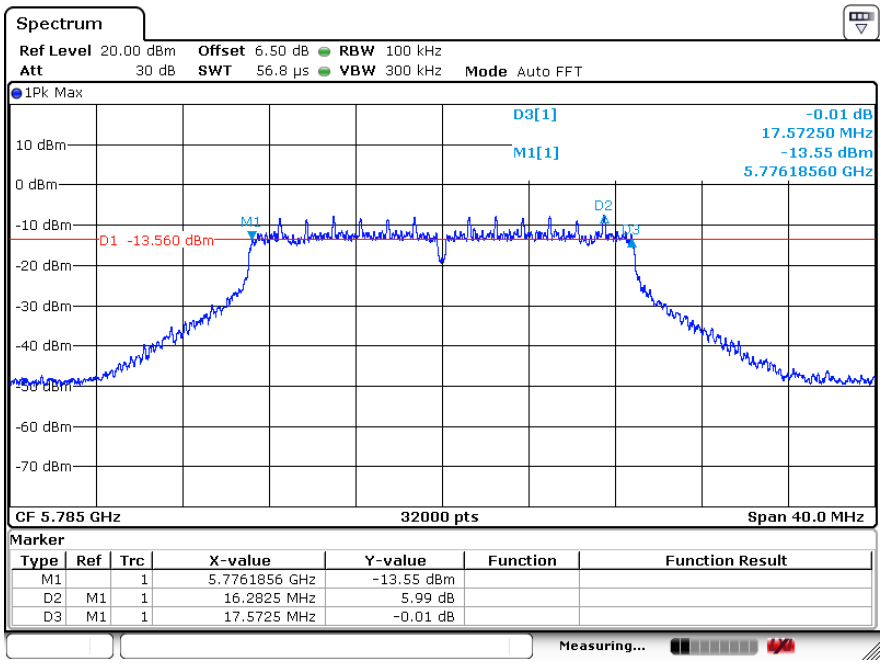

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.04 dB
16.32750 MHz
M1[1] -12.97 dBm
5.81679690 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -12.920 dBm
M1
D2
D3
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8167969 GHz -12.97 dBm
D2 M1 1 3.1663 MHz 6.06 dB
D3 M1 1 16.3275 MHz 0.04 dB
Measuring...

6dB BW 802.11n20

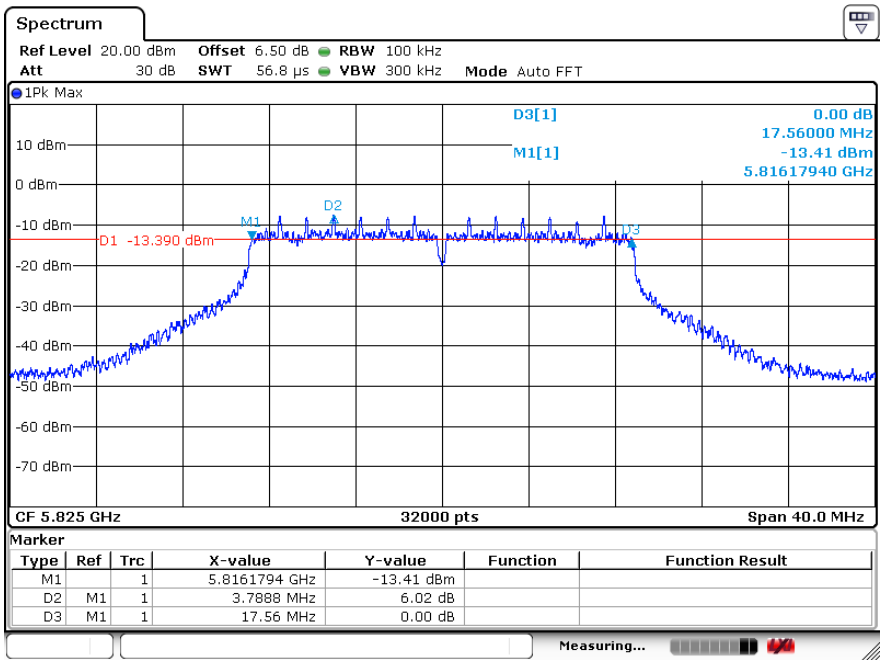
Channel: 149



Channel: 157

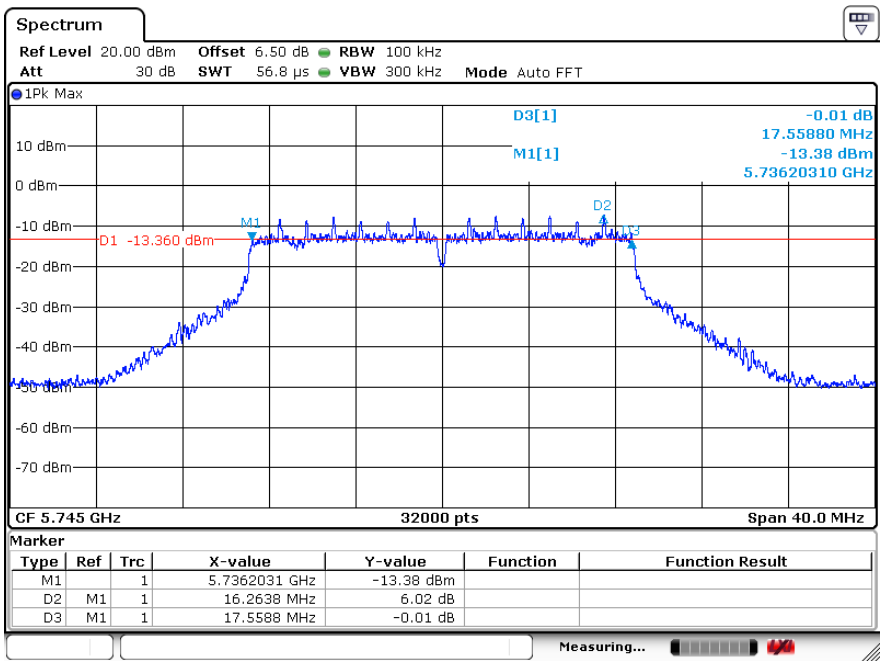


Channel: 165

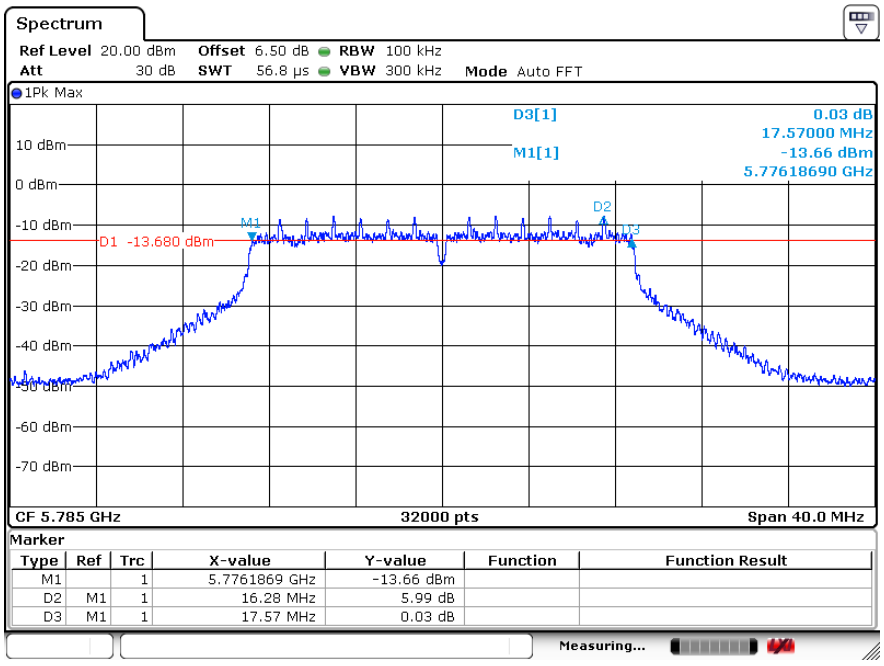

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.00 dB
17.56000 MHz
M1[1] -13.41 dBm
5.81617940 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -13.390 dBm
M1
D2
D3
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8161794 GHz -13.41 dBm
D2 M1 1 3.7888 MHz 6.02 dB
D3 M1 1 17.56 MHz 0.00 dB
Measuring...

6dB BW 802.11ac20

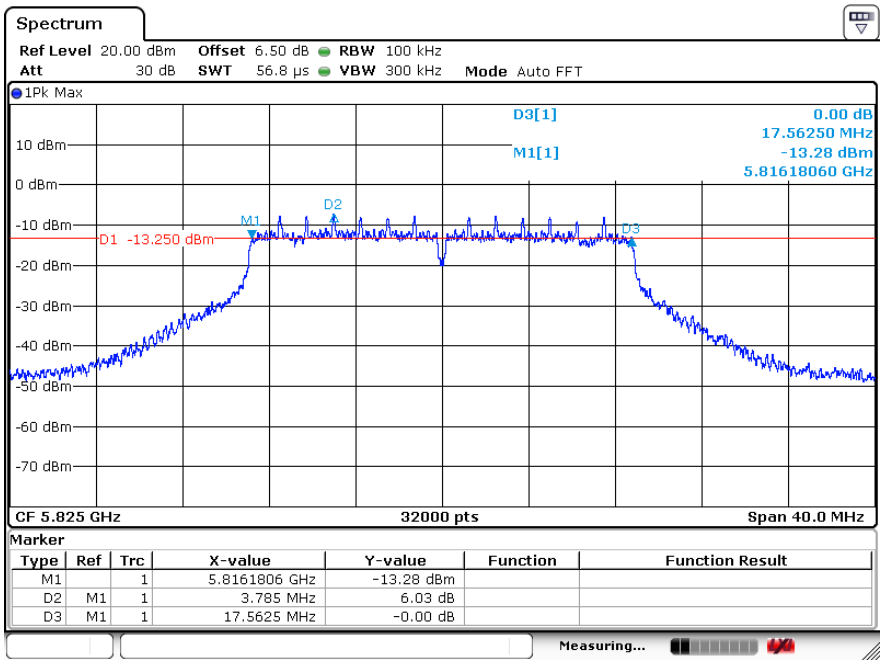
Channel: 149



Channel: 157

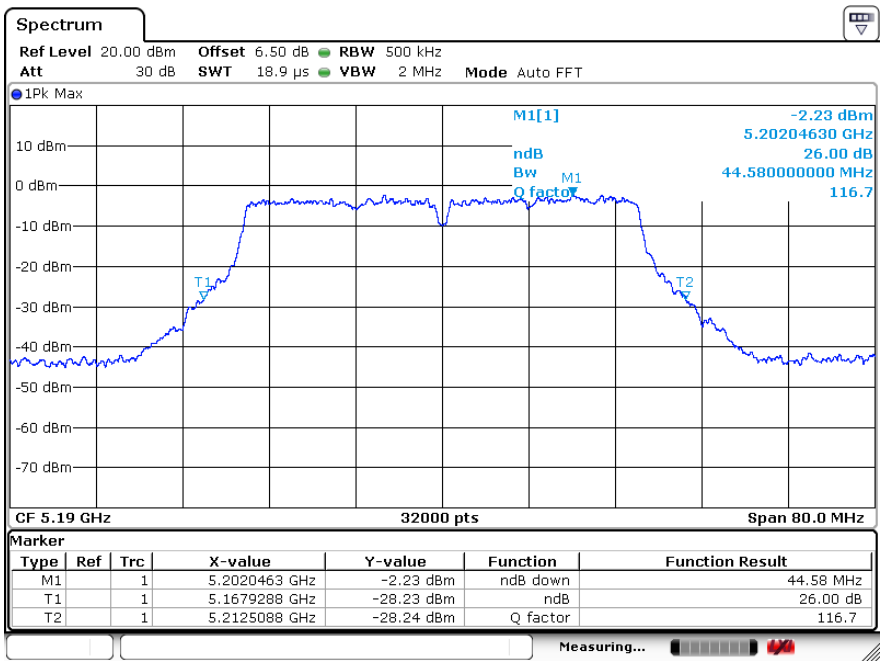


Channel: 165

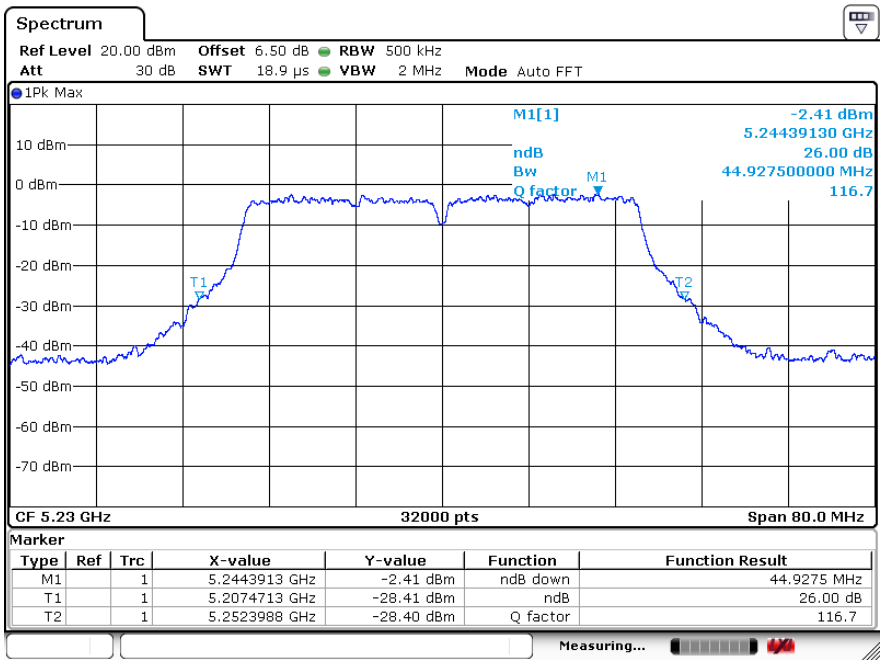

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D3[1] 0.00 dB
17.56250 MHz
M1[1] -13.28 dBm
5.81618060 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -13.250 dBm
M1
D2
D3
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8161806 GHz -13.28 dBm
D2 M1 1 3.785 MHz 6.03 dB
D3 M1 1 17.5625 MHz -0.00 dB
Measuring...

26dB BW 802.11n40

Channel: 38

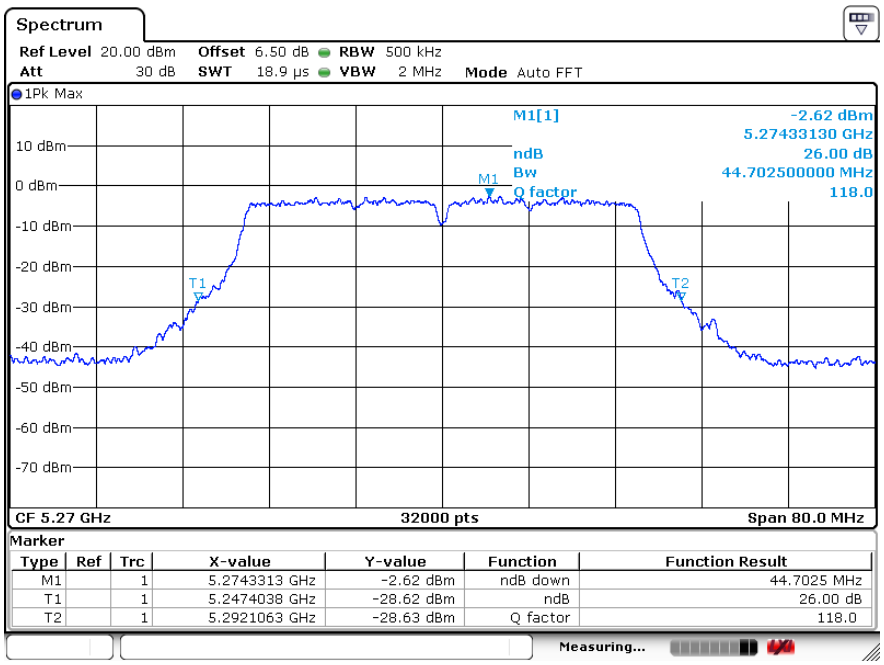


Channel: 46

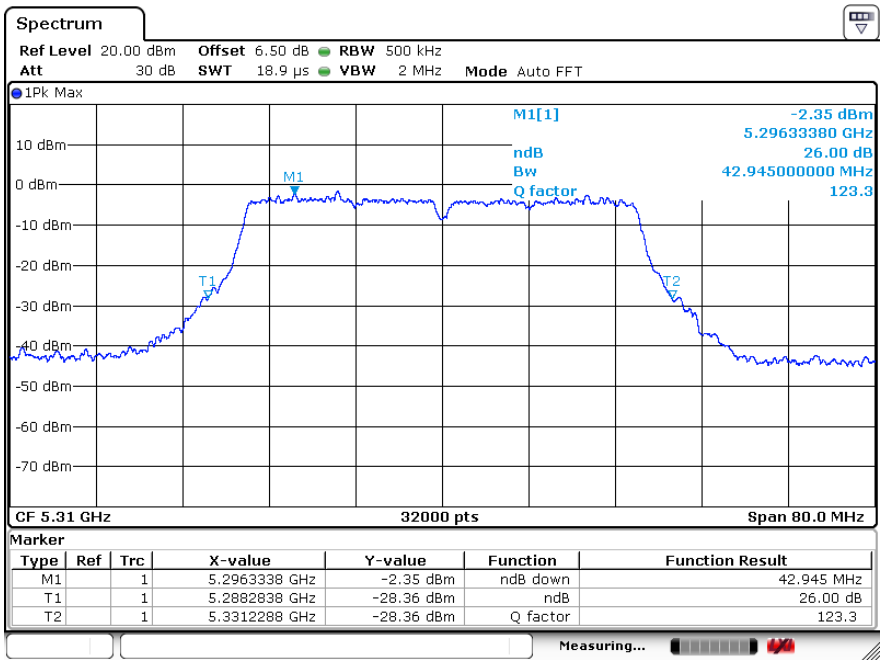


26dB BW 802.11n40

Channel: 54

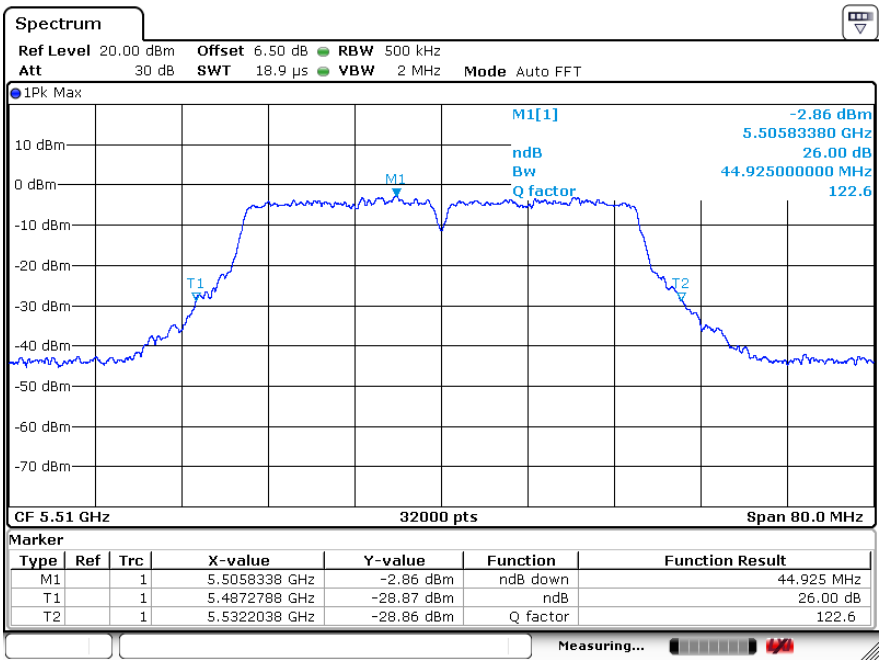


Channel: 62

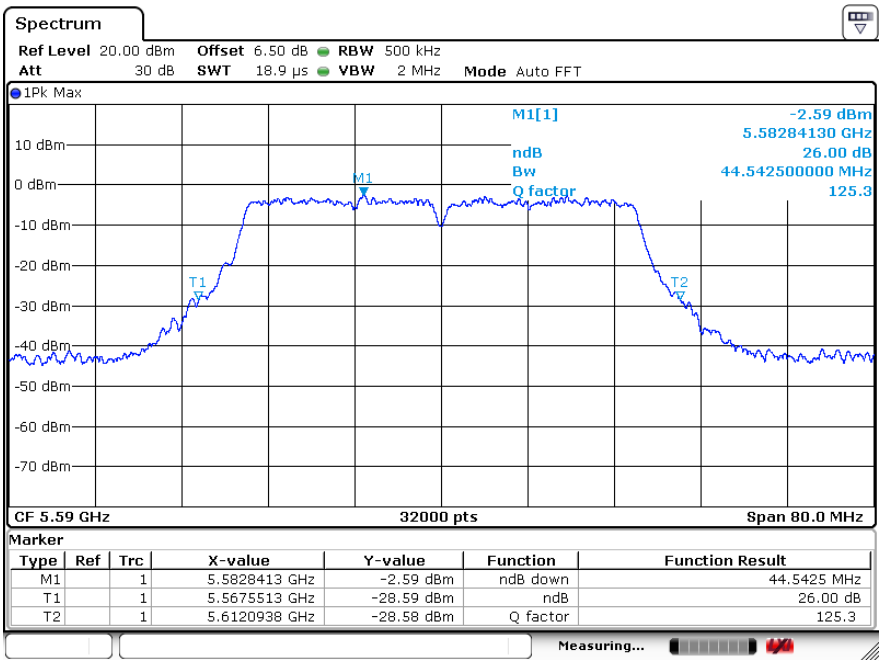


26dB BW 802.11n40

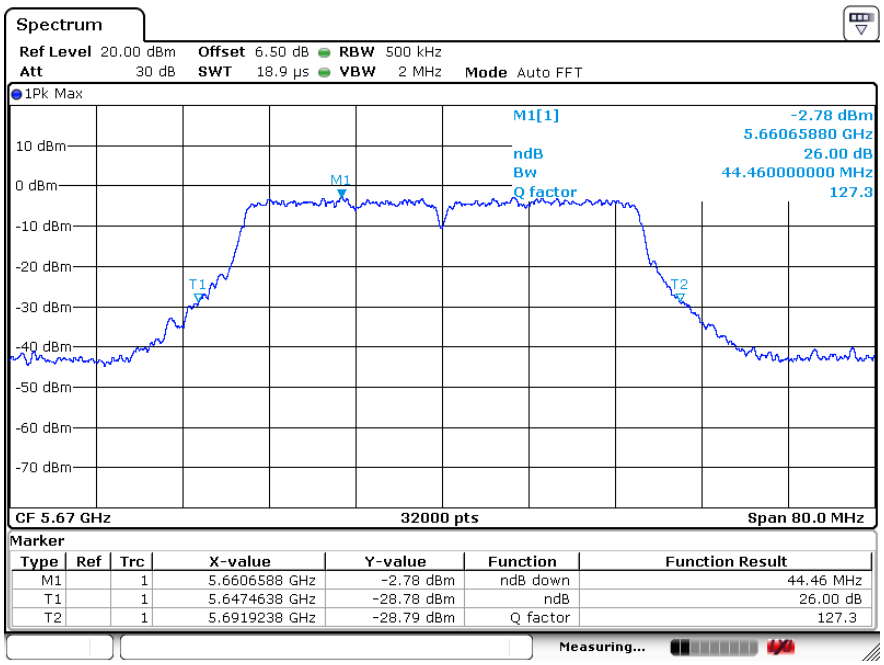
Channel: 102



Channel: 118

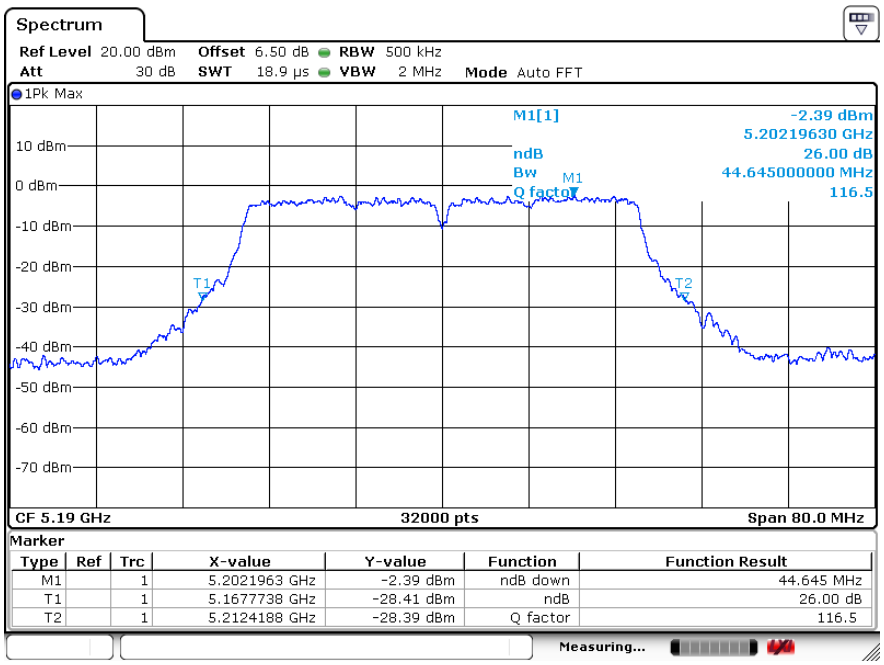


Channel: 134

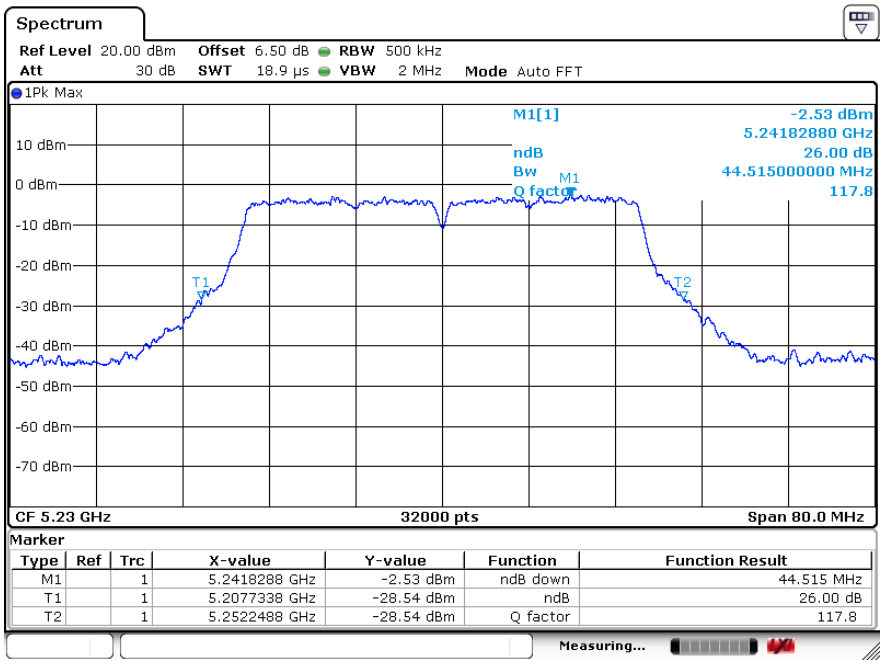

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 500 kHz
Att 30 dB SWT 18.9 µs VBW 2 MHz Mode Auto FFT
1Pk Max
M1[1] -2.78 dBm
5.66065880 GHz
ndB 26.00 dB
Bw 44.460000000 MHz
Q factor 127.3
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6606588 GHz -2.78 dBm ndB down 44.46 MHz
T1 1 5.6474638 GHz -28.78 dBm ndB 26.00 dB
T2 1 5.6919238 GHz -28.79 dBm Q factor 127.3
Measuring...

26dB BW 802.11ac40

Channel: 38

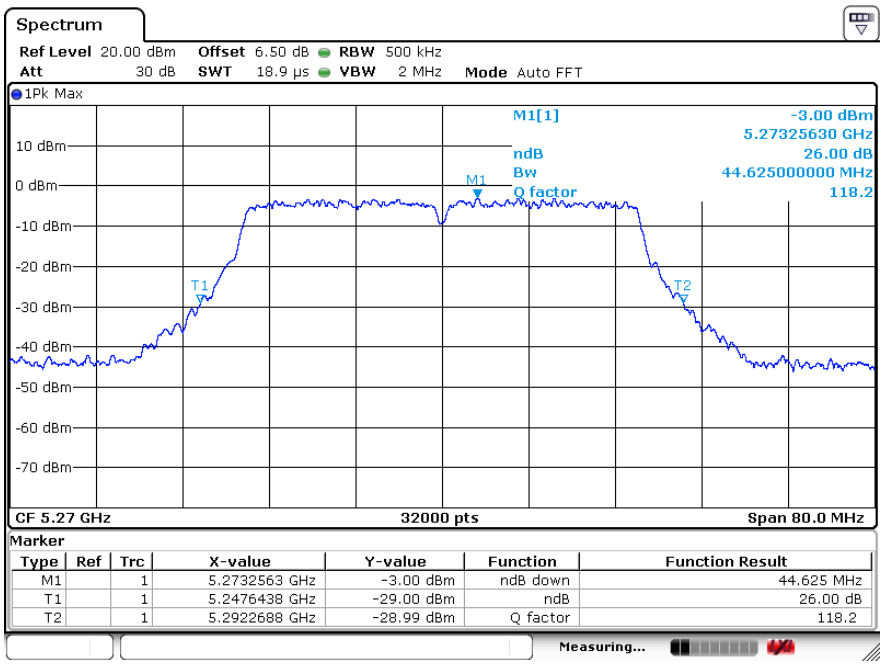


Channel: 46

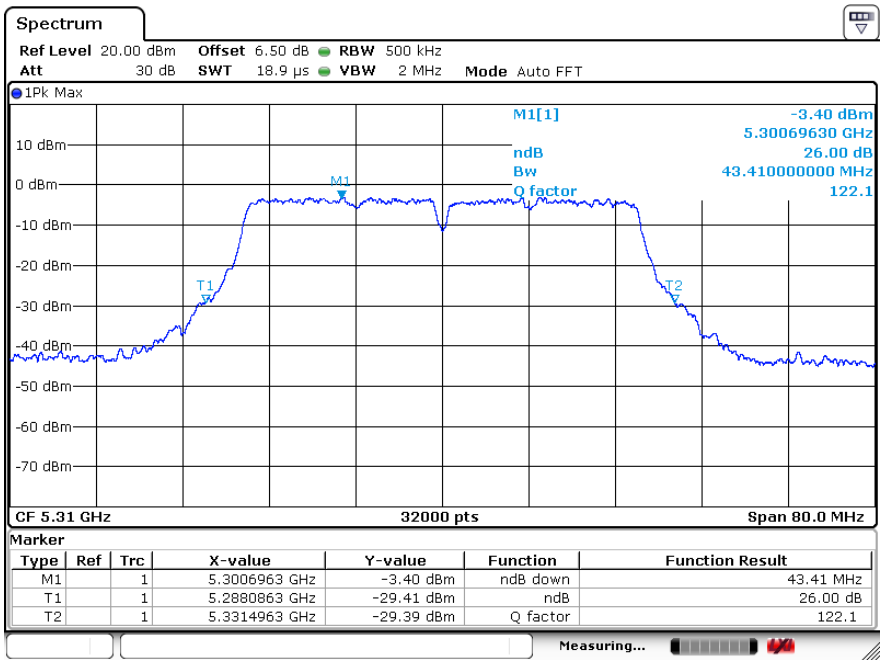


26dB BW 802.11ac40

Channel: 54

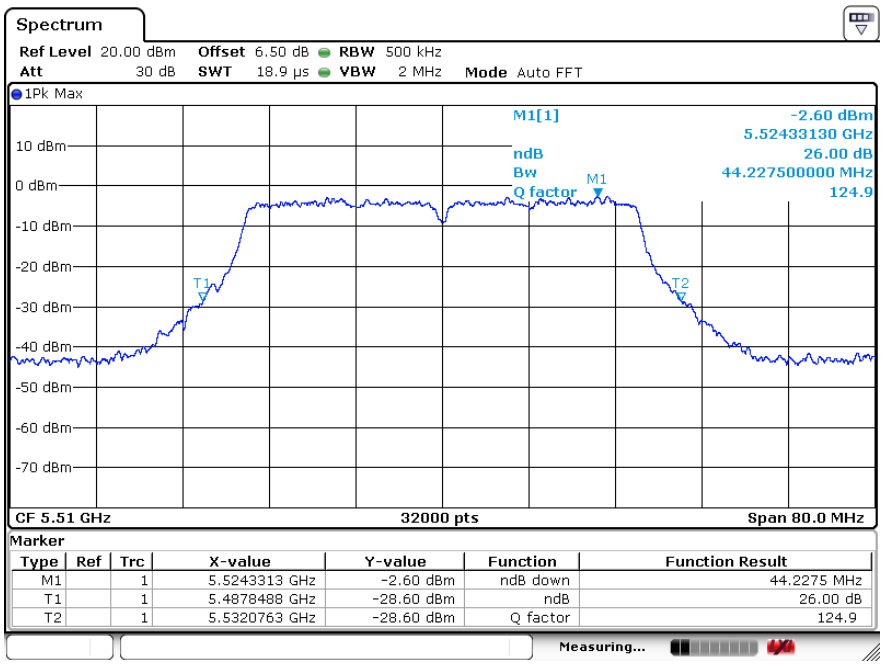


Channel: 62

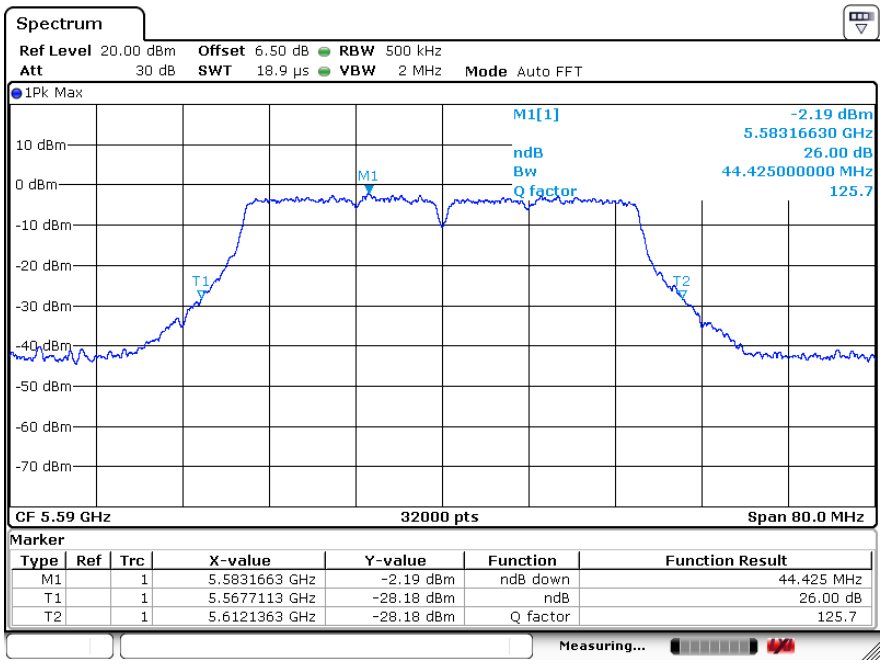


26dB BW 802.11ac40

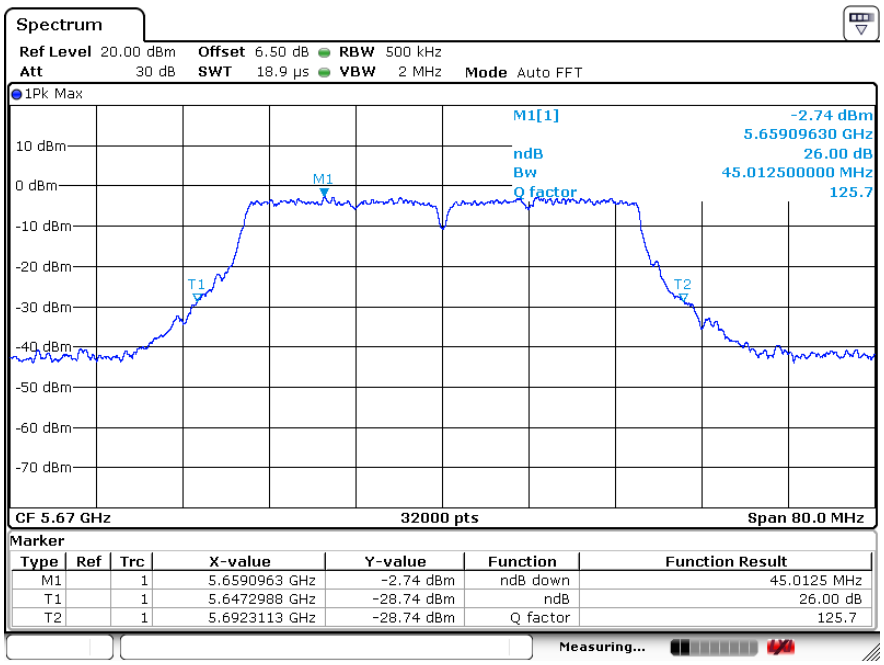
Channel: 102



Channel: 118

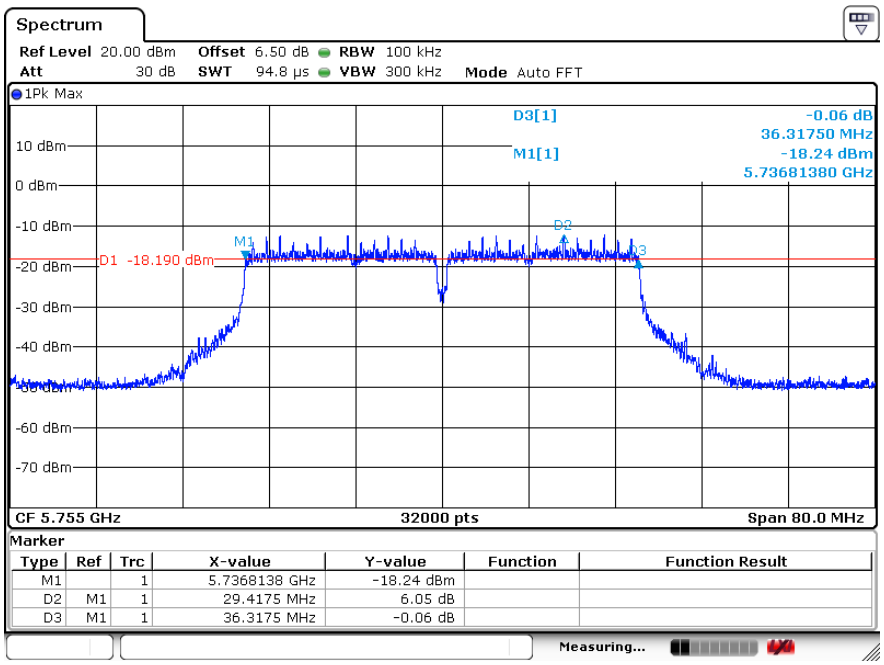


Channel: 134

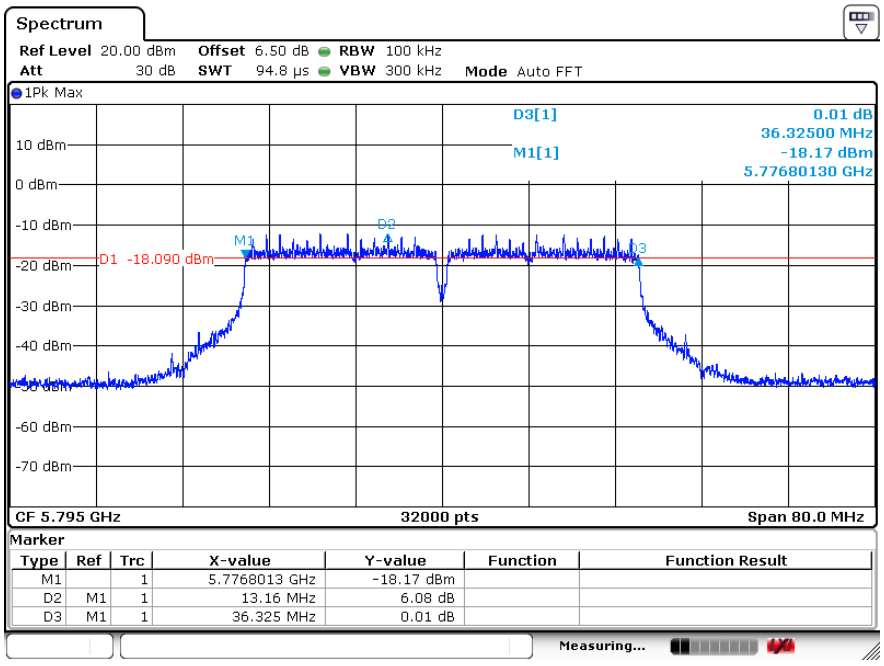

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 500 kHz
Att 30 dB SWT 18.9 µs VBW 2 MHz Mode Auto FFT
1Pk Max
M1[1] -2.74 dBm
5.65909630 GHz
ndB 26.00 dB
Bw 45.012500000 MHz
Q factor 125.7
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6590963 GHz -2.74 dBm ndB down 45.0125 MHz
T1 1 5.6472988 GHz -28.74 dBm ndB 26.00 dB
T2 1 5.6923113 GHz -28.74 dBm Q factor 125.7
Measuring...

6dB BW 802.11n40

Channel: 151

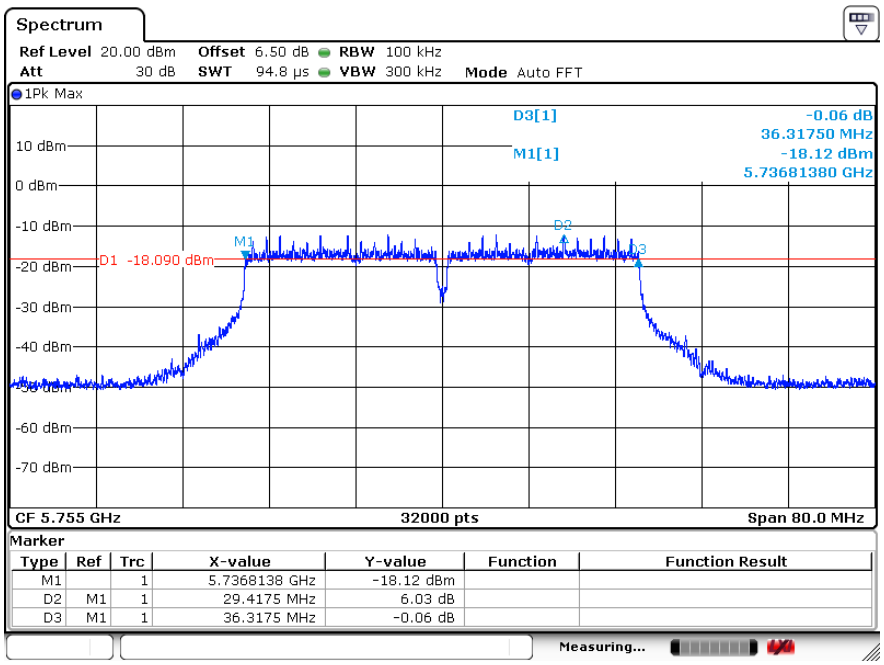


Channel: 159

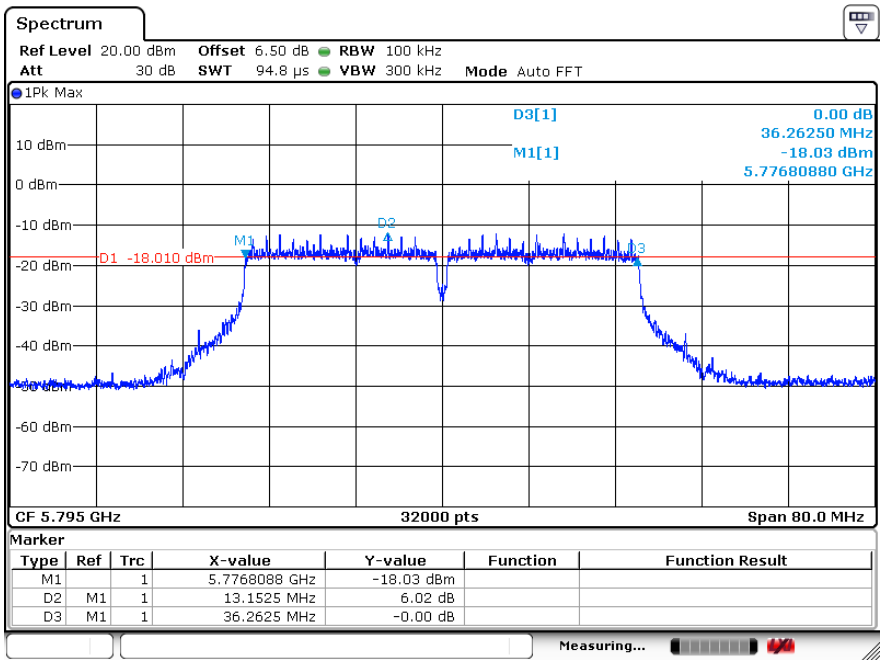


6dB BW 802.11ac40

Channel: 151

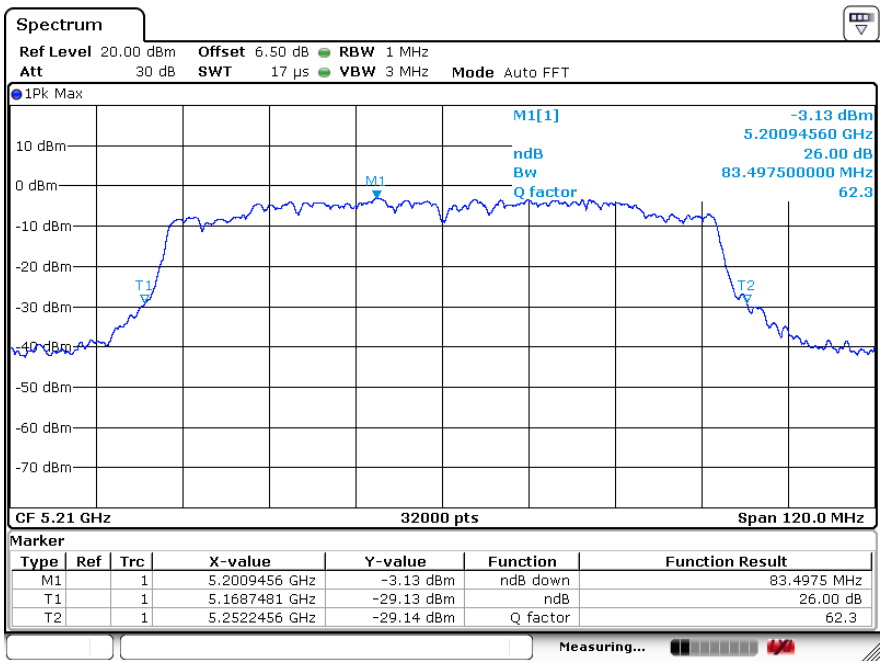


Channel: 159

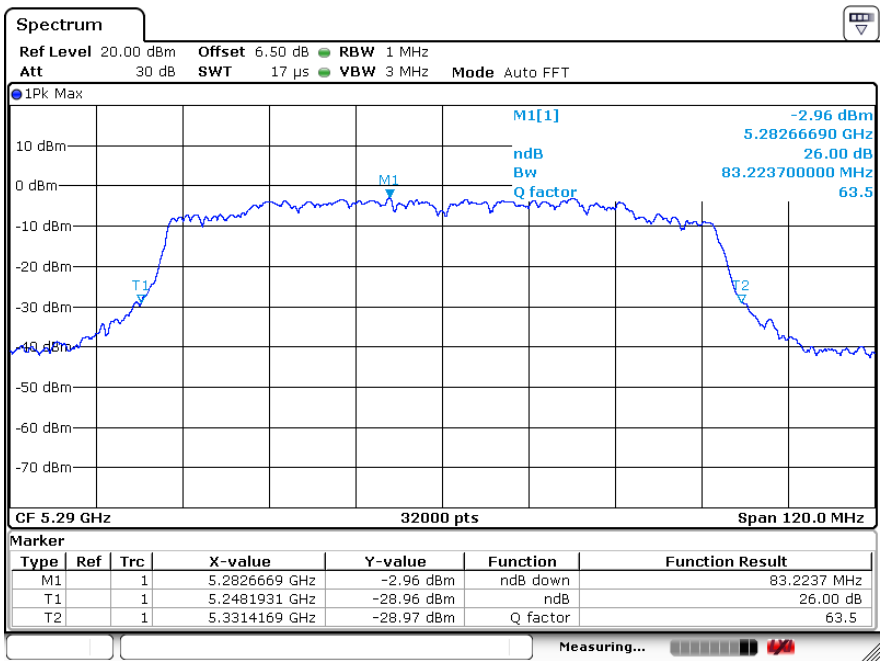


26dB BW 802.11ac80

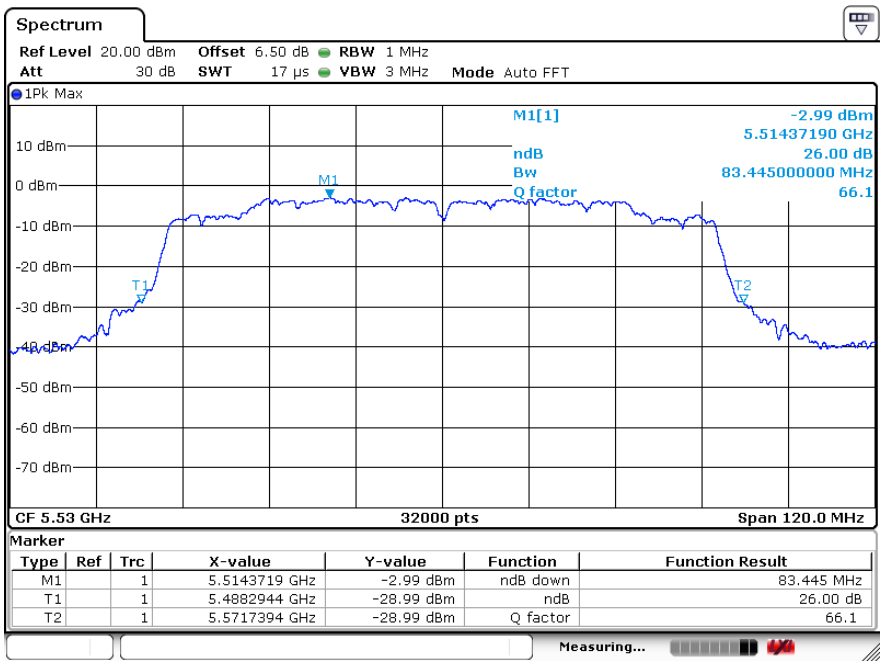
Channel:42



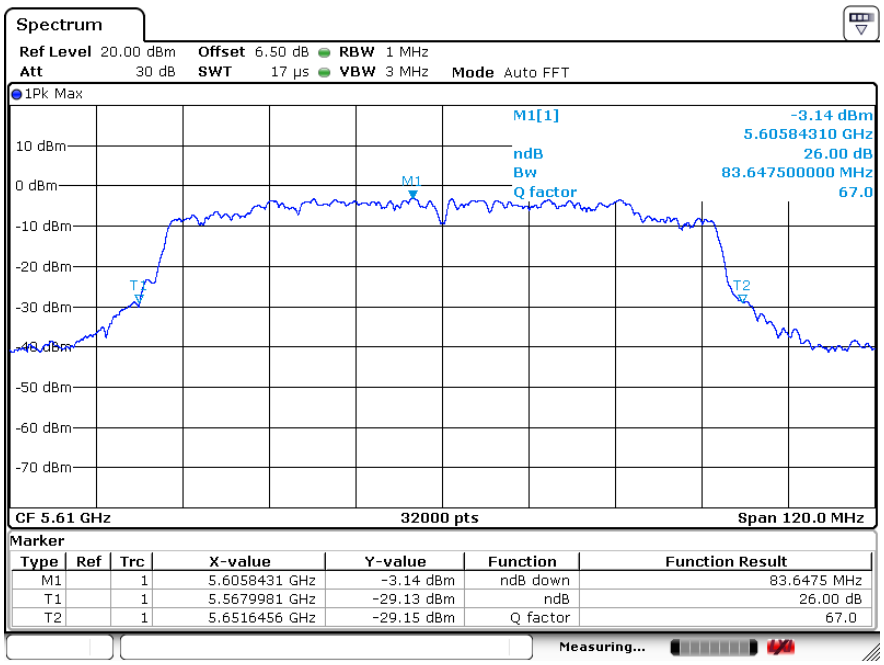
Channel: 58



Channel:106

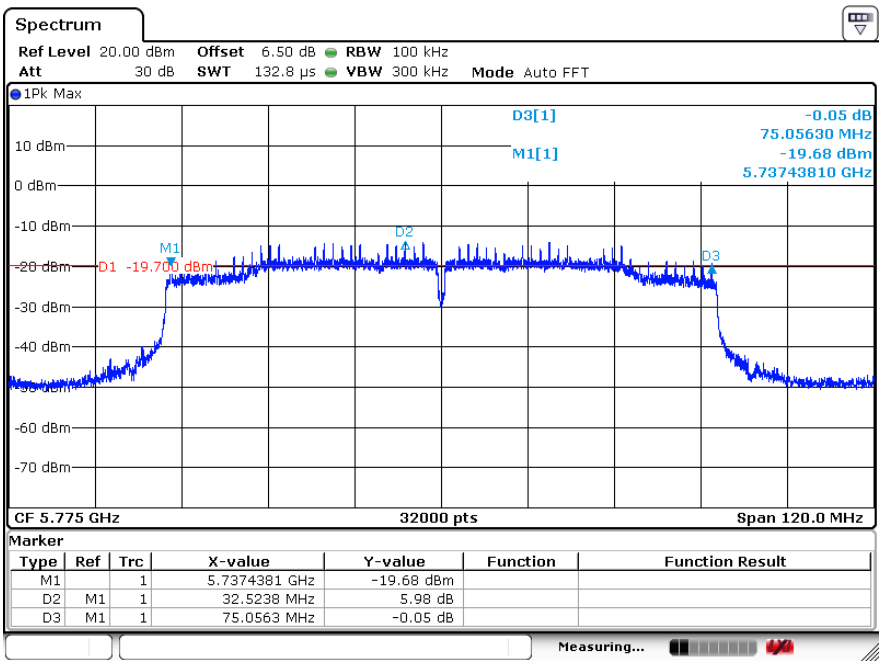


Channel: 122



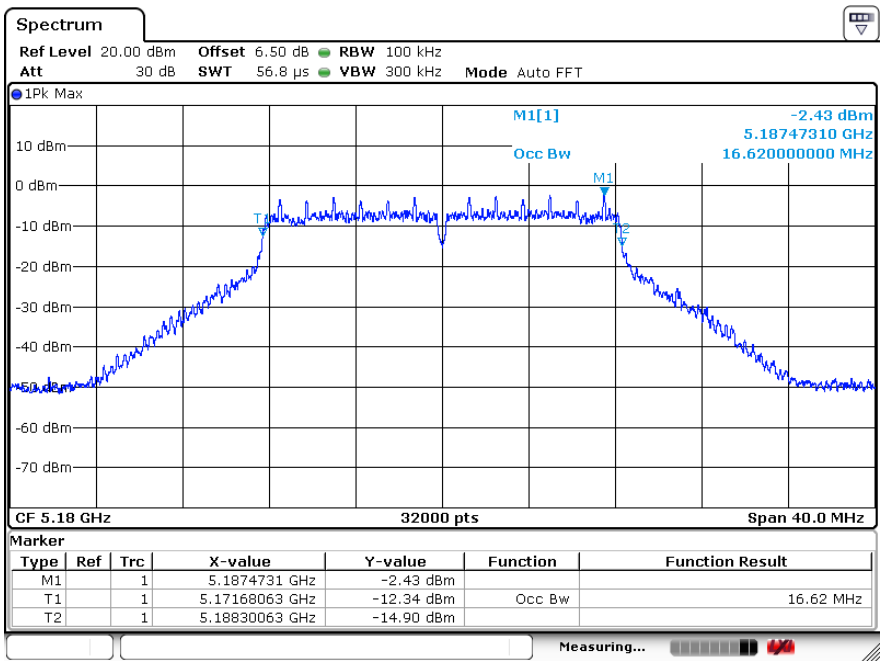
6dB BW 802.11ac80

Channel: 155

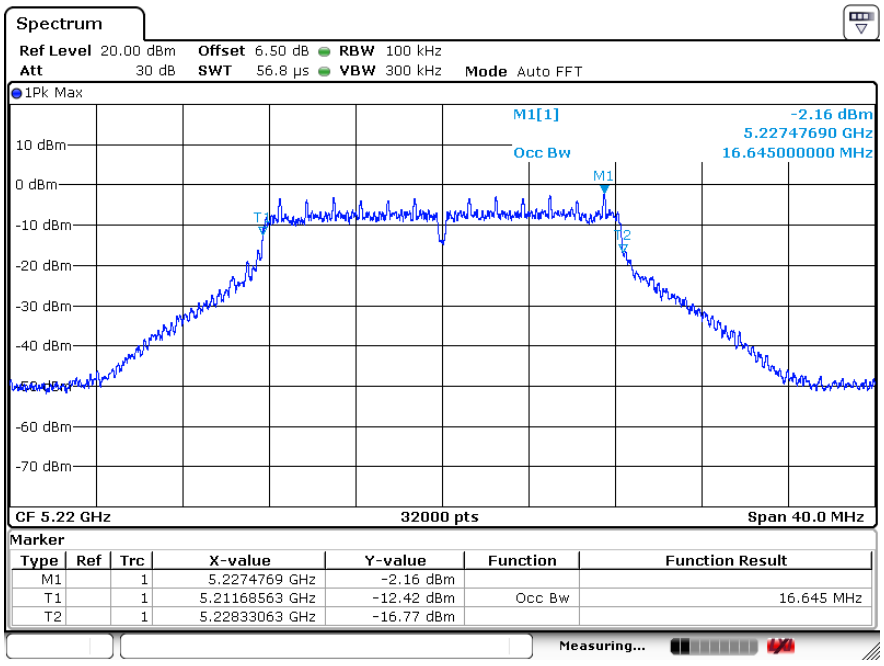


99% OBW 802.11a

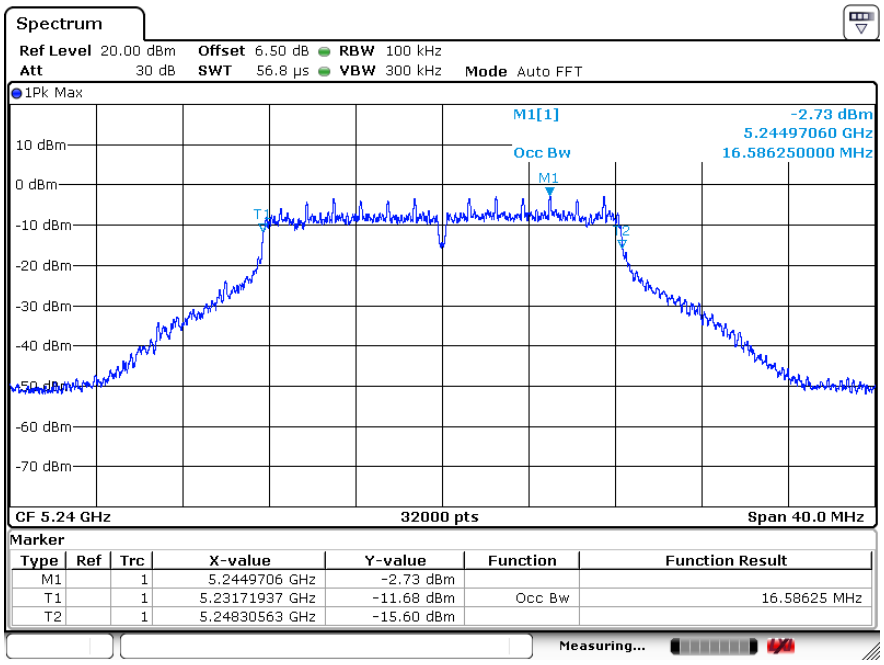
Channel: 36



Channel: 44

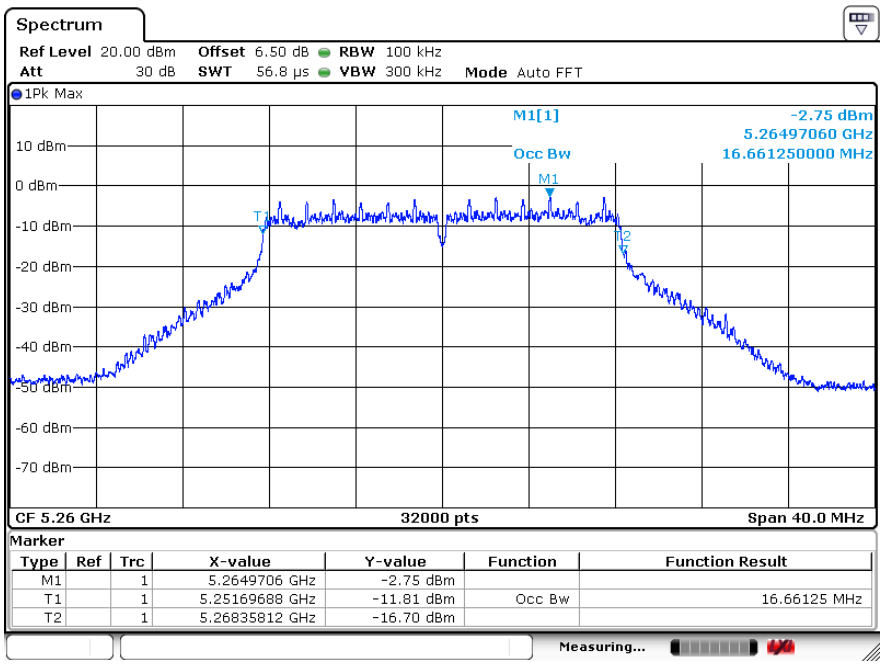


Channel: 48

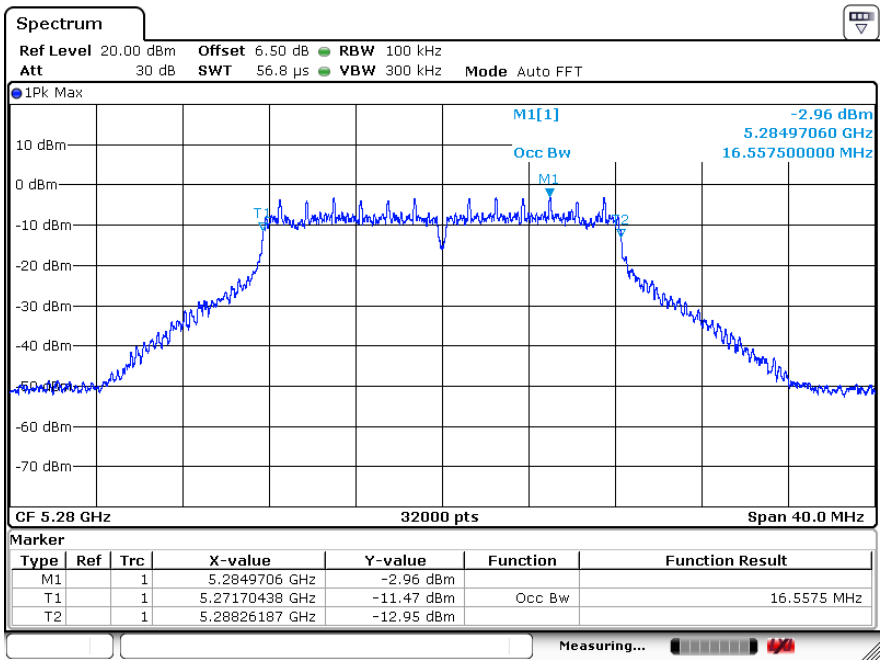

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.73 dBm
5.24497060 GHz
Occ Bw 16.586250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2449706 GHz -2.73 dBm
T1 1 5.23171937 GHz -11.68 dBm Occ Bw 16.58625 MHz
T2 1 5.24830563 GHz -15.60 dBm
Measuring...

99% OBW 802.11a

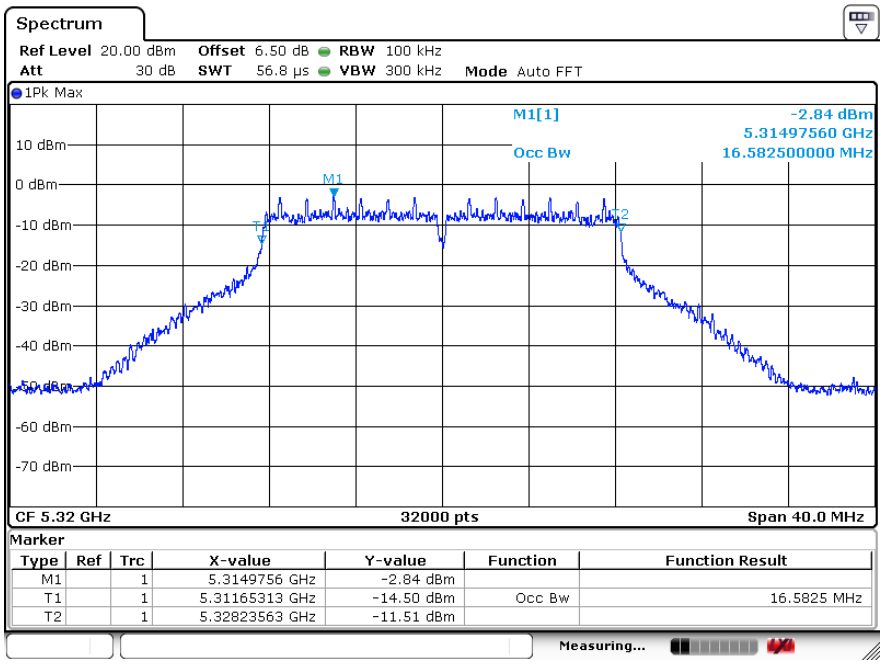
Channel: 52



Channel: 56

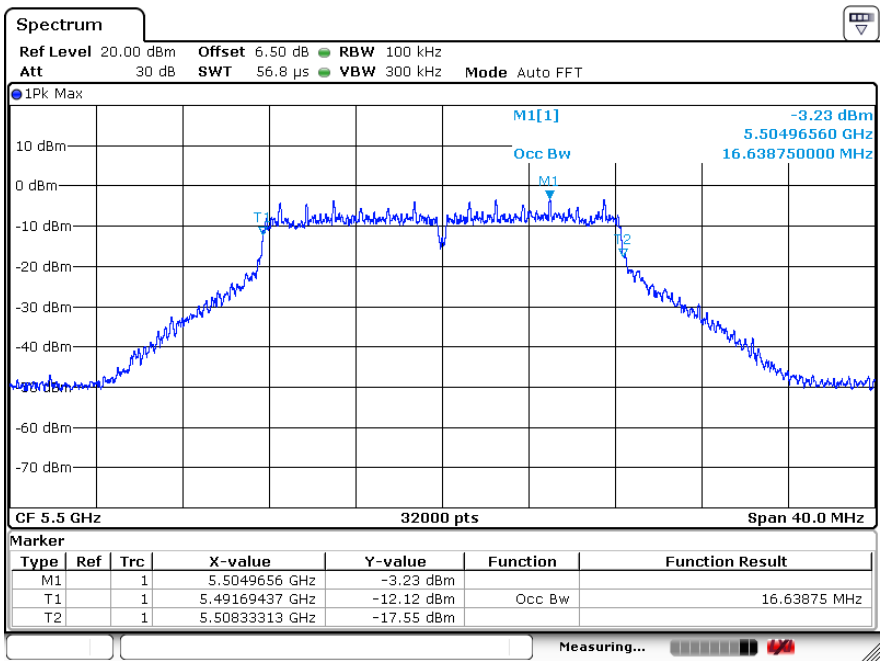


Channel: 64

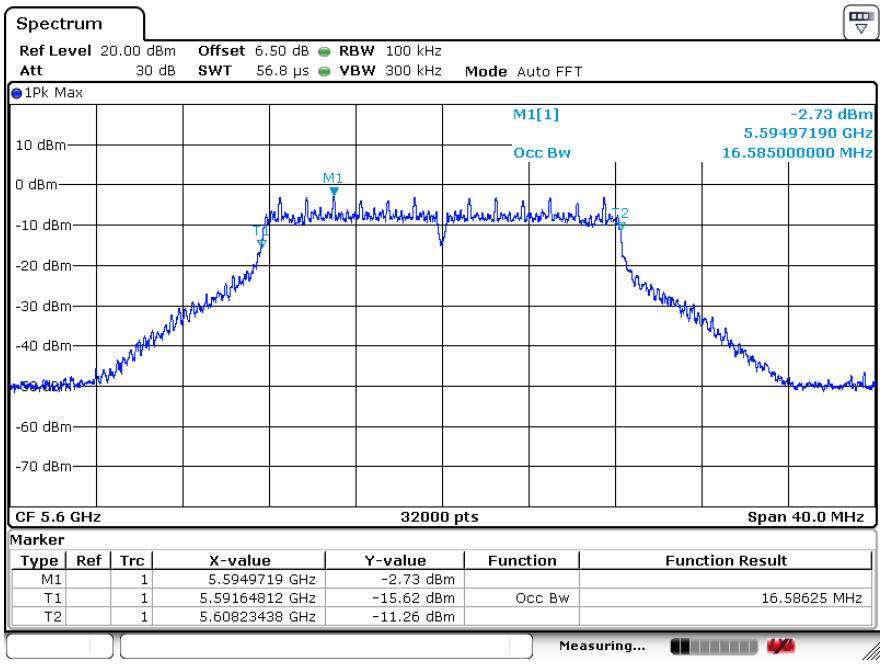

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.84 dBm
5.31497560 GHz
Occ Bw 16.582500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3149756 GHz -2.84 dBm
T1 1 5.31165313 GHz -14.50 dBm Occ Bw 16.5825 MHz
T2 1 5.32823563 GHz -11.51 dBm
Measuring...

99% OBW 802.11a

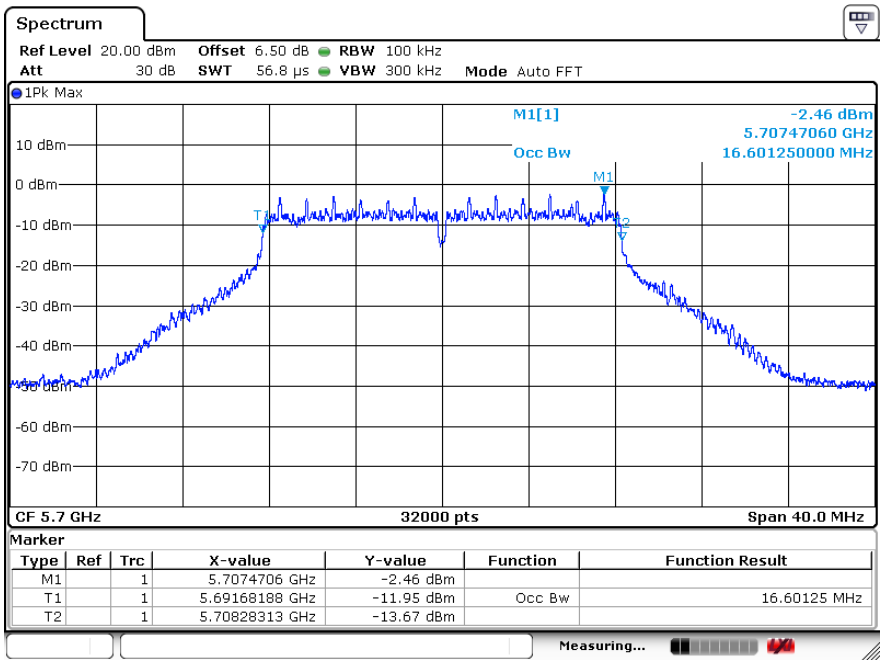
Channel: 100



Channel: 120

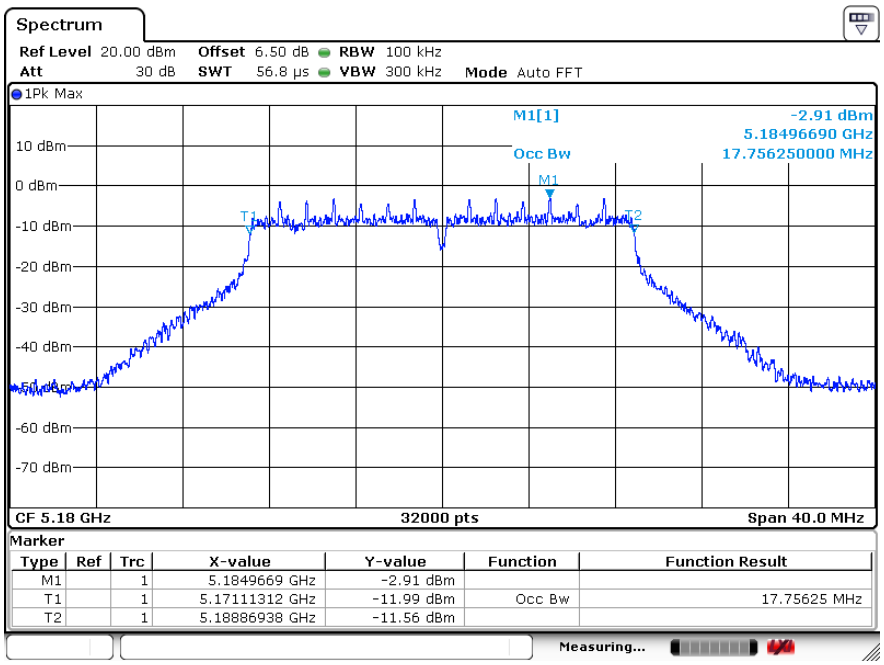


Channel: 140

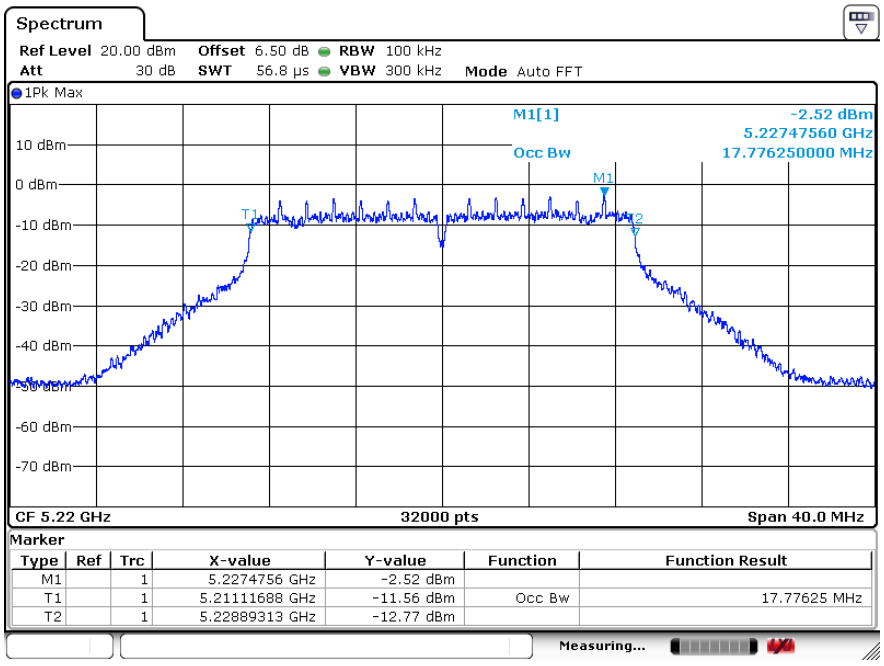

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.46 dBm
5.70747060 GHz
Occ Bw 16.601250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7074706 GHz -2.46 dBm
T1 1 5.69168188 GHz -11.95 dBm Occ Bw 16.60125 MHz
T2 1 5.70828313 GHz -13.67 dBm
Measuring...

99% OBW 802.11n20

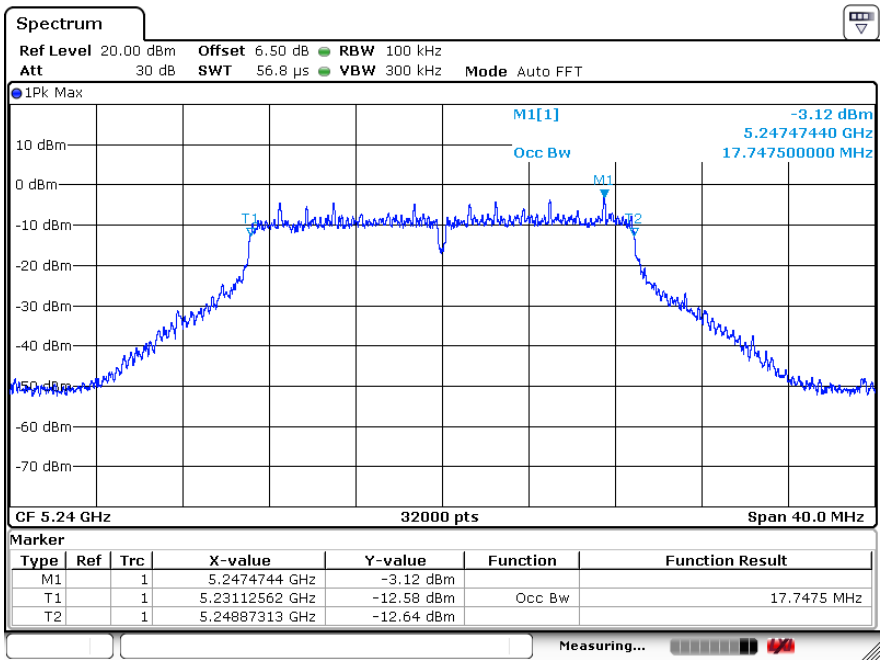
Channel: 36



Channel: 44

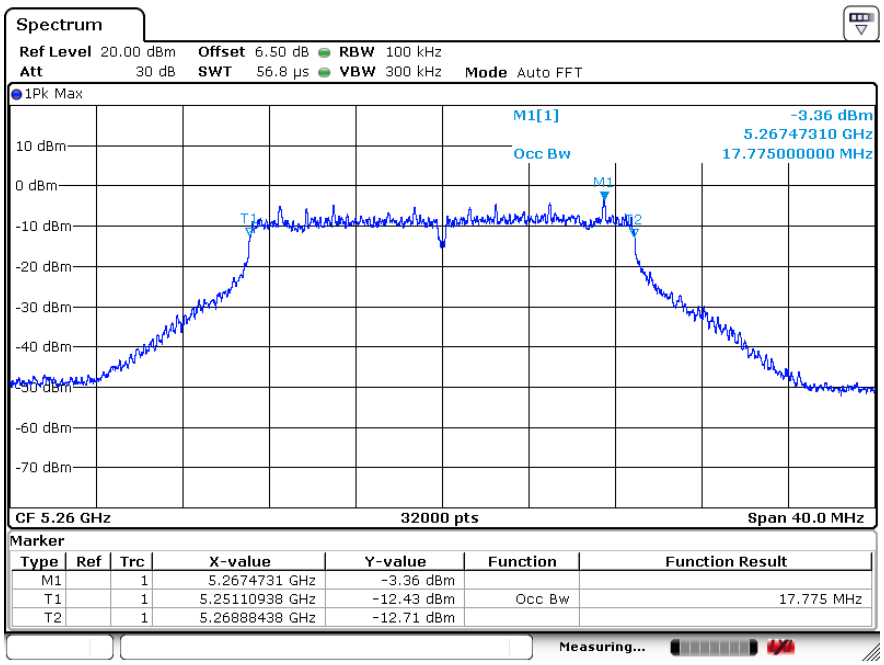


Channel: 48

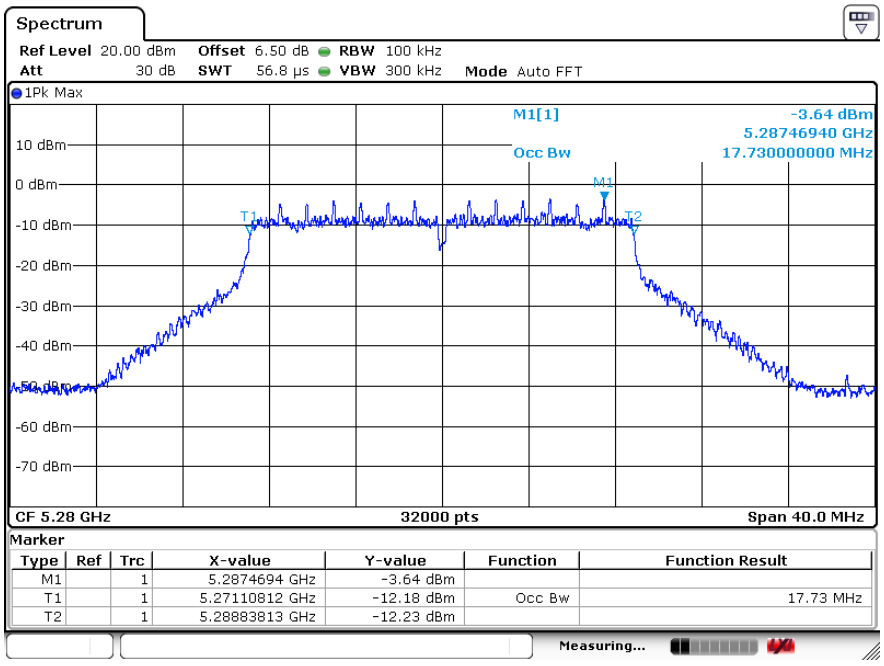

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -3.12 dBm
5.24747440 GHz
Occ Bw 17.747500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2474744 GHz -3.12 dBm
T1 1 5.23112562 GHz -12.58 dBm Occ Bw 17.7475 MHz
T2 1 5.24887313 GHz -12.64 dBm
Measuring...

99% OBW 802.11n20

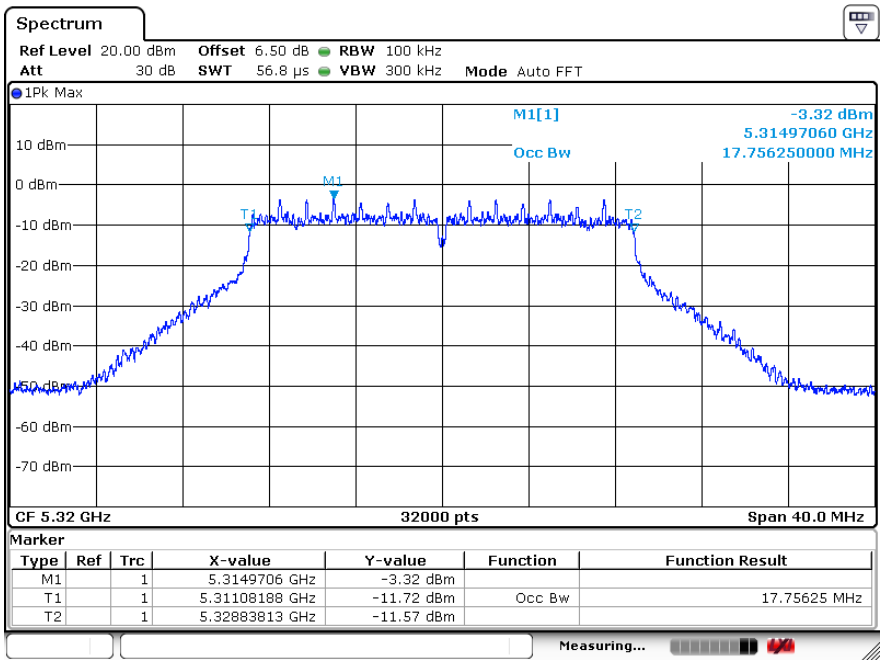
Channel: 52



Channel: 56

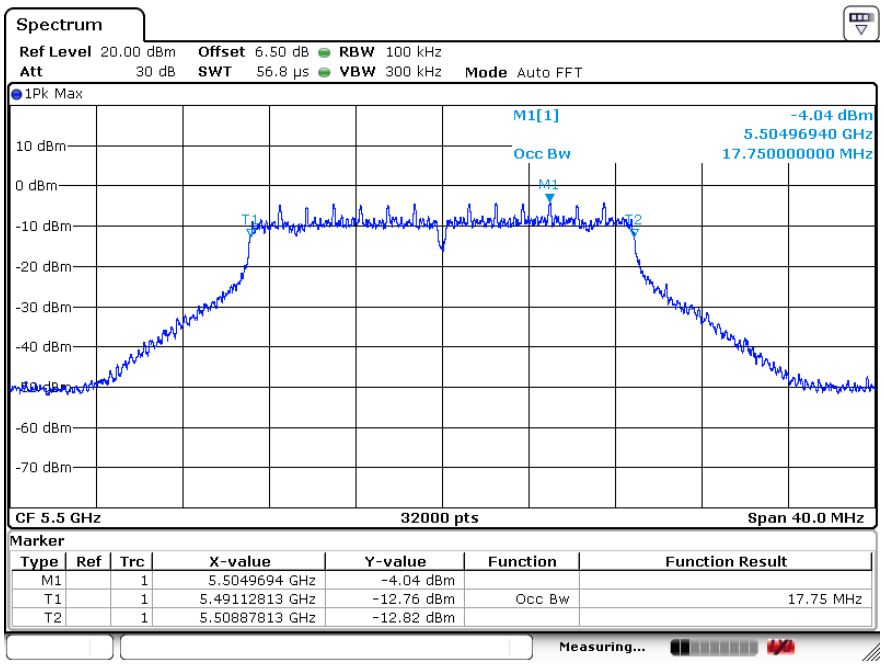


Channel: 64

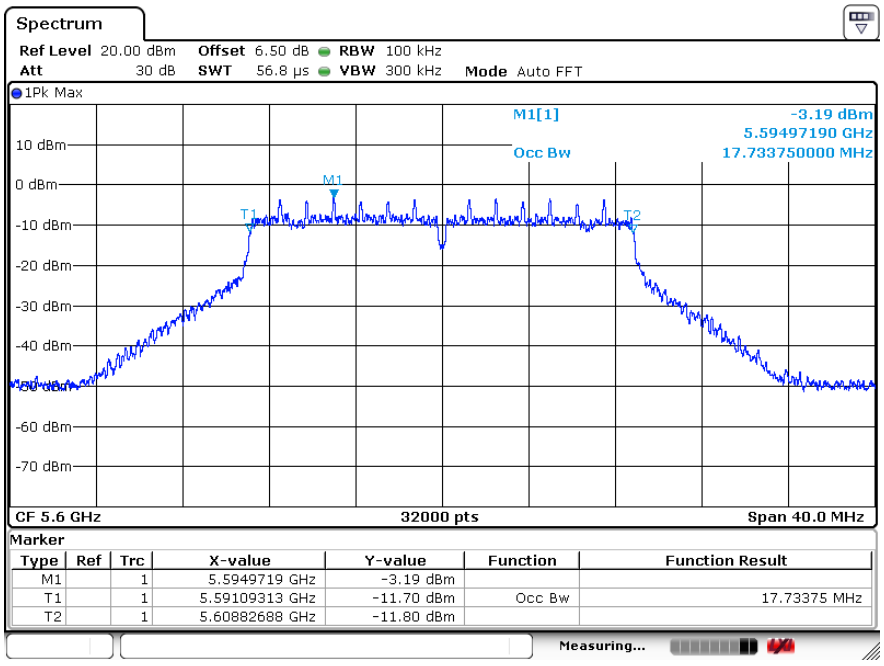

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -3.32 dBm
5.31497060 GHz
Occ Bw 17.756250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3149706 GHz -3.32 dBm
T1 1 5.31108188 GHz -11.72 dBm Occ Bw 17.75625 MHz
T2 1 5.32883813 GHz -11.57 dBm
Measuring...

99% OBW 802.11n20

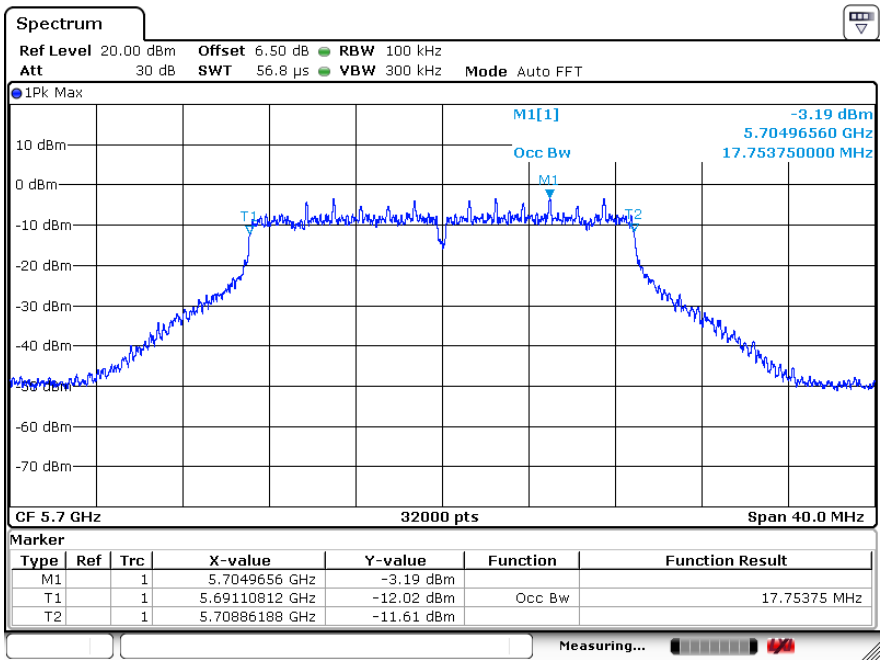
Channel: 100



Channel: 120

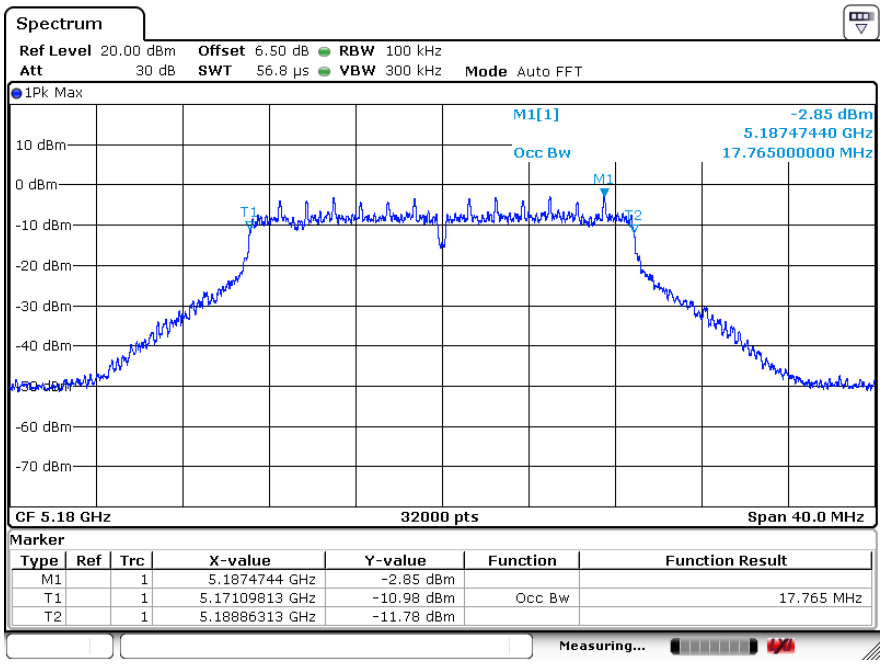


Channel: 140

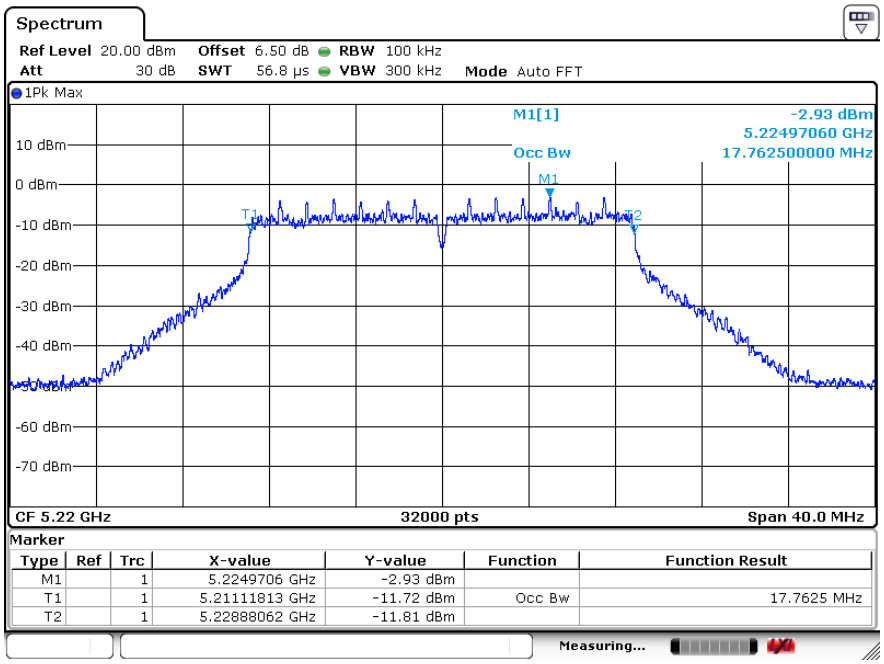

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -3.19 dBm
5.70496560 GHz
Occ Bw 17.753750000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7049656 GHz -3.19 dBm
T1 1 5.69110812 GHz -12.02 dBm Occ Bw 17.75375 MHz
T2 1 5.70886188 GHz -11.61 dBm
Measuring...

99% OBW 802.11ac20

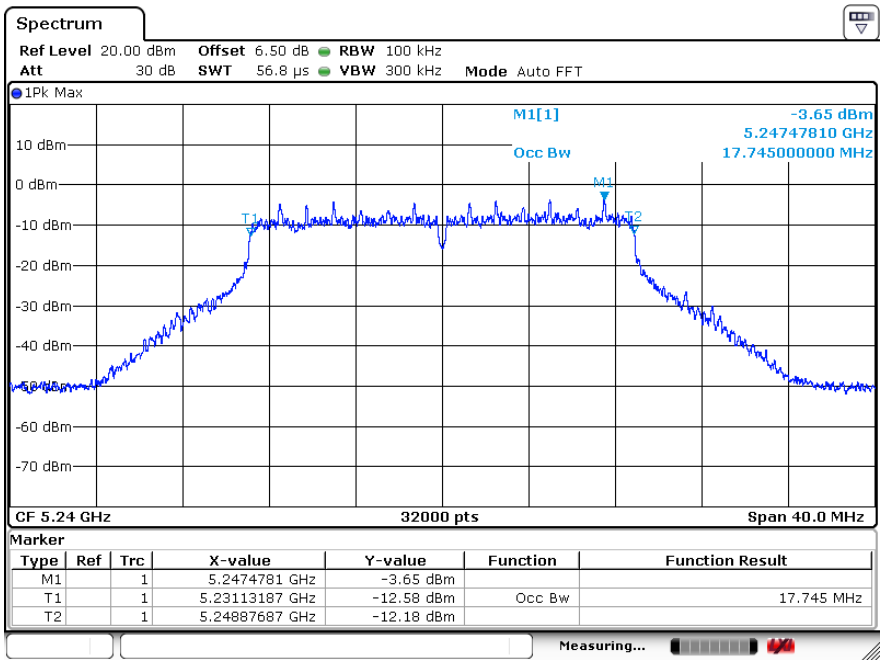
Channel: 36



Channel: 44

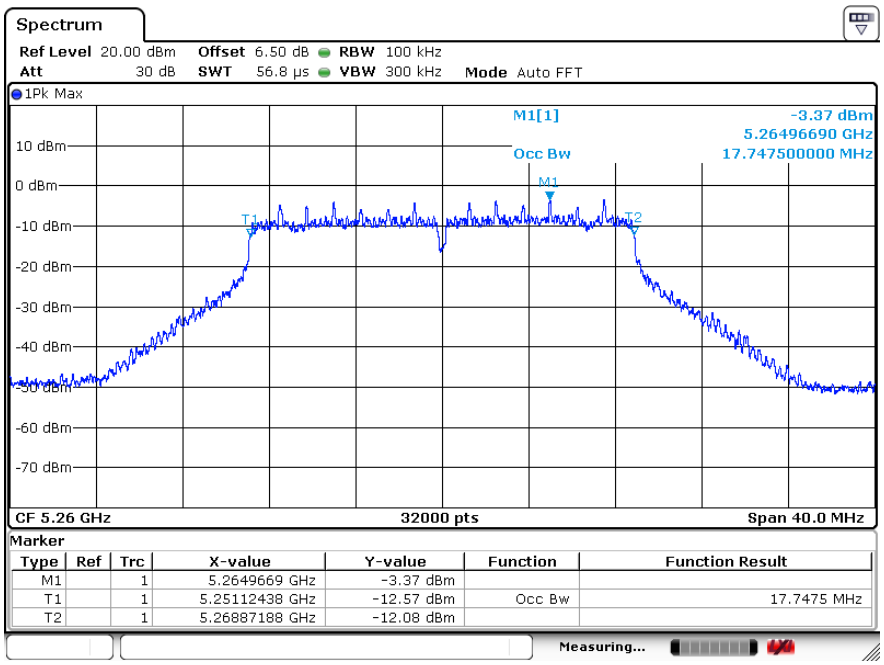


Channel: 48

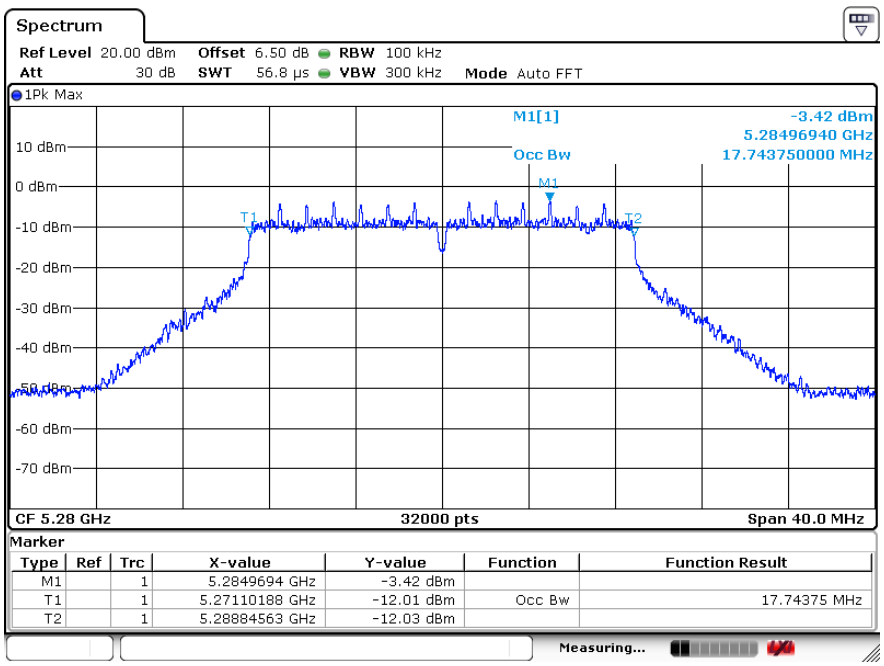

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -3.65 dBm
5.24747810 GHz
Occ Bw 17.745000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.24 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.2474781 GHz -3.65 dBm
T1 1 5.23113187 GHz -12.58 dBm Occ Bw 17.745 MHz
T2 1 5.24887687 GHz -12.18 dBm
Measuring...

99% OBW 802.11ac20

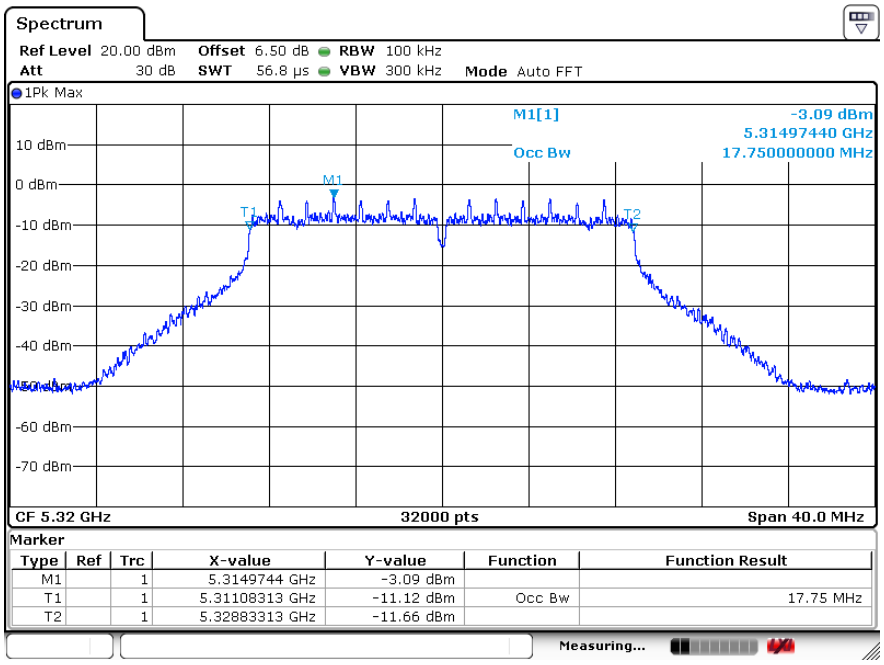
Channel: 52



Channel: 56

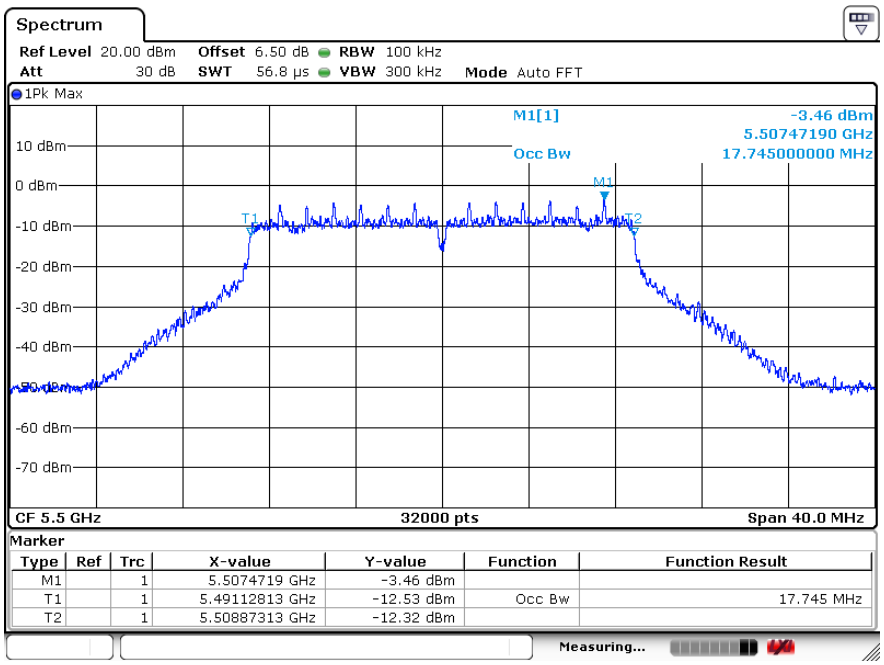


Channel: 64

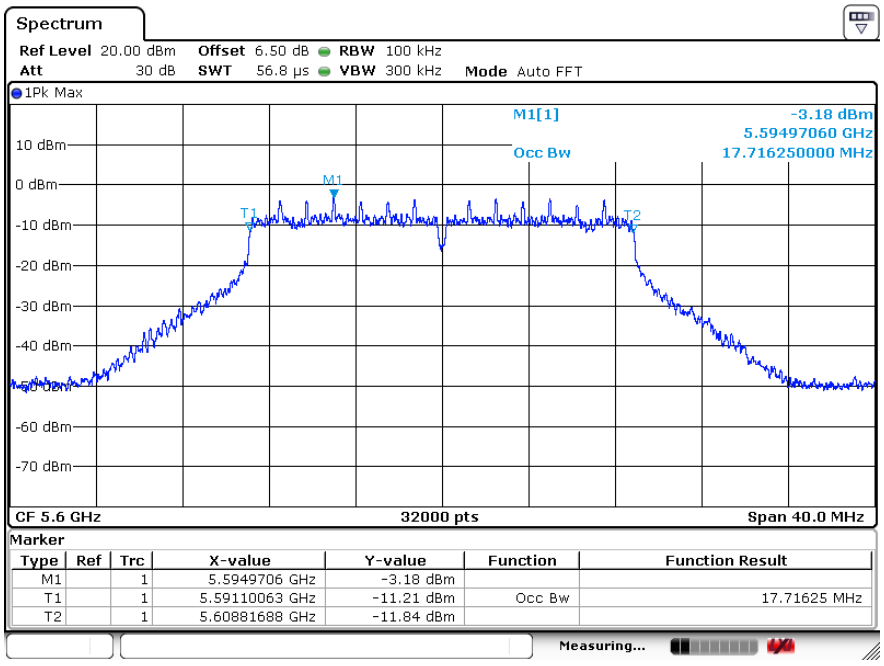

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -3.09 dBm
5.31497440 GHz
Occ Bw 17.750000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.32 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.3149744 GHz -3.09 dBm
T1 1 5.31108313 GHz -11.12 dBm Occ Bw 17.75 MHz
T2 1 5.32883313 GHz -11.66 dBm
Measuring...

99% OBW 802.11ac20

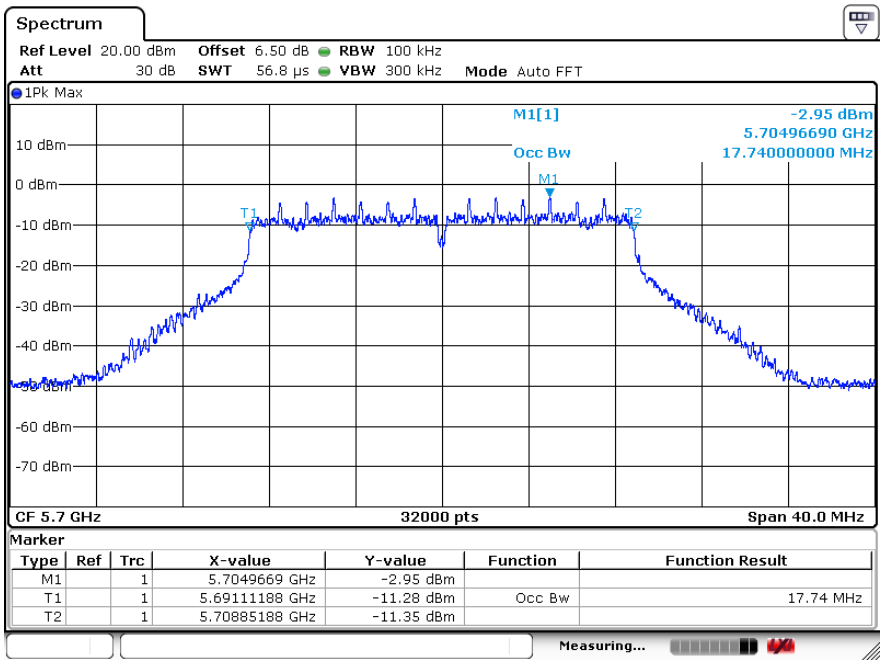
Channel: 100



Channel: 120

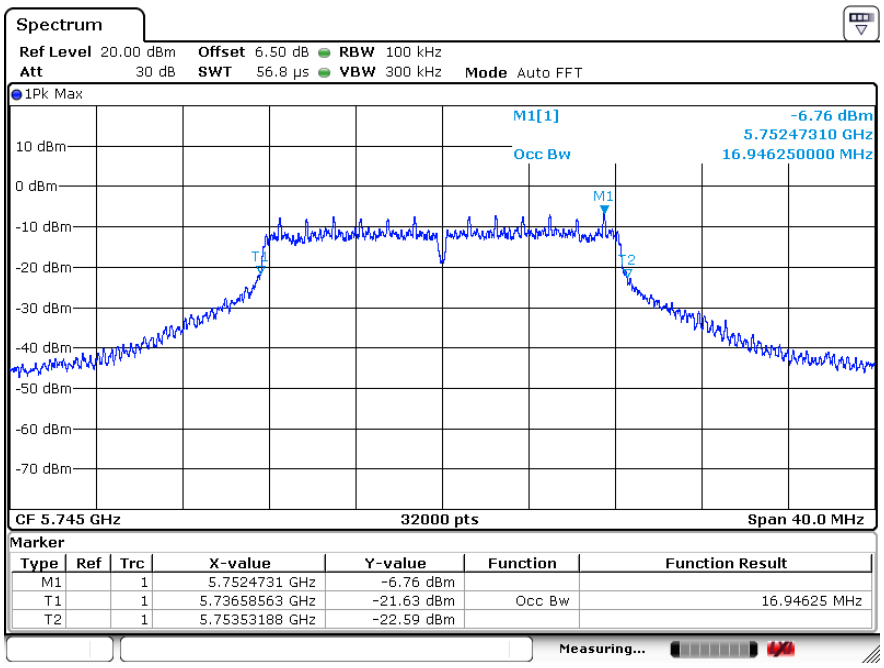


Channel: 140

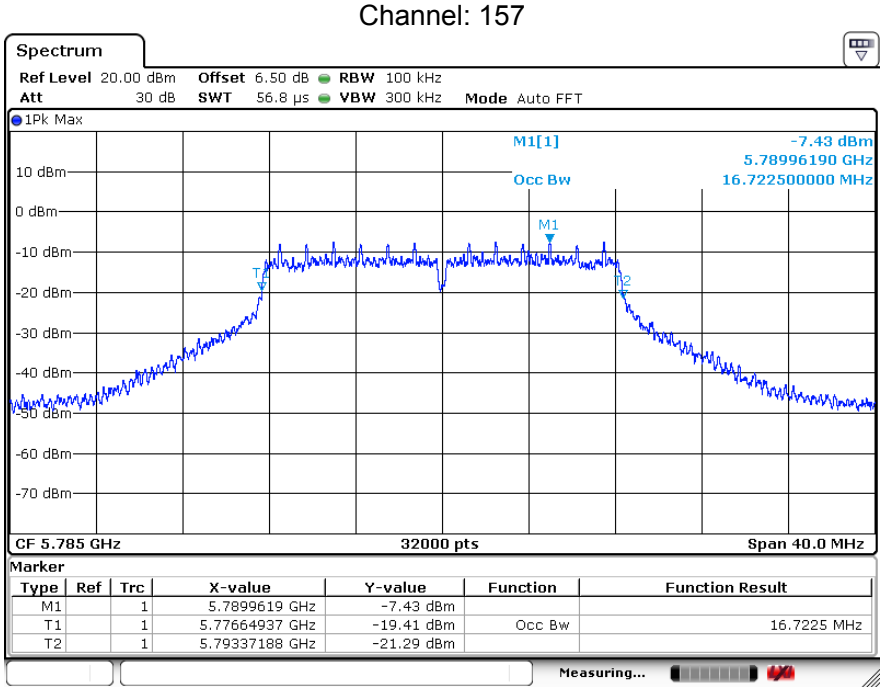

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -2.95 dBm
5.70496690 GHz
Occ Bw 17.740000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.7 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7049669 GHz -2.95 dBm
T1 1 5.69111188 GHz -11.28 dBm Occ Bw 17.74 MHz
T2 1 5.70885188 GHz -11.35 dBm
Measuring...

99% OBW 802.11a

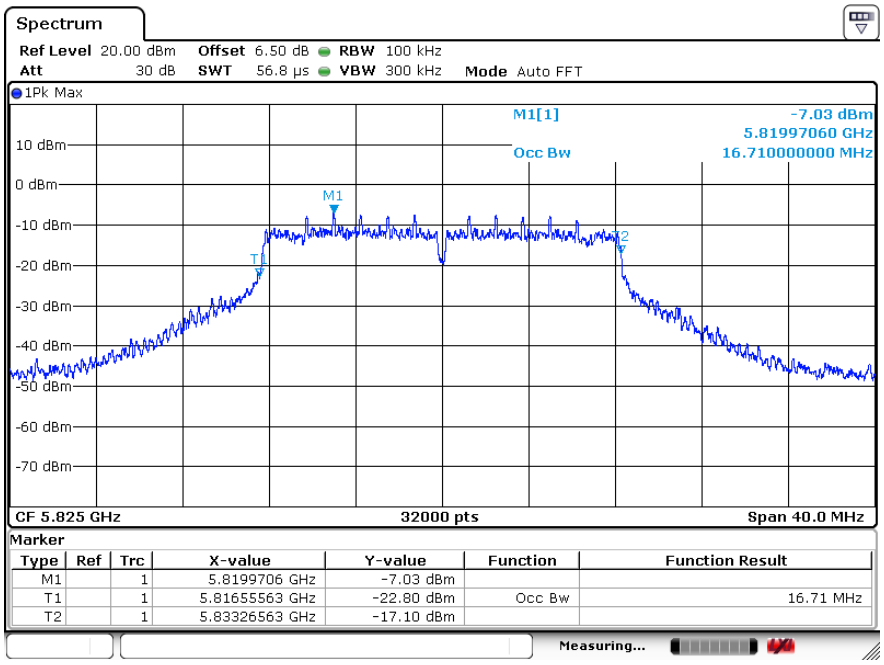
Channel: 149



Channel: 157

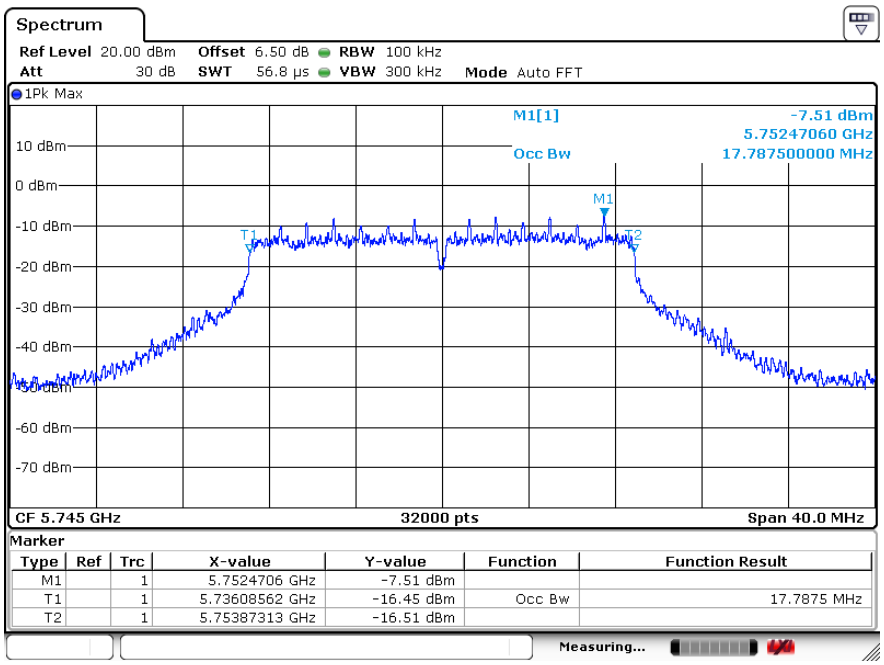


Channel: 165

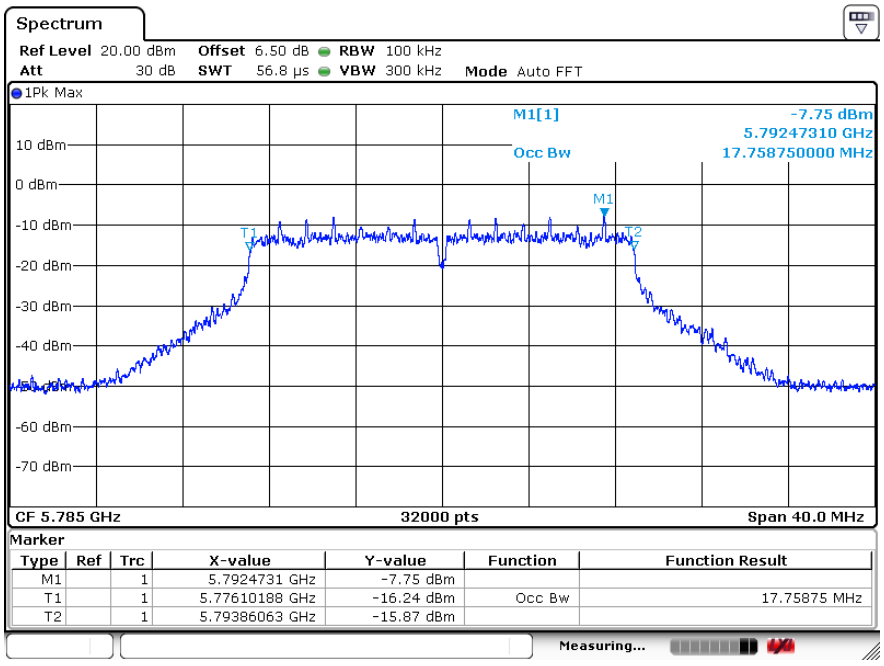

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -7.03 dBm
5.81997060 GHz
Occ Bw 16.710000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz 32000 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199706 GHz -7.03 dBm
T1 1 5.81655563 GHz -22.80 dBm Occ Bw 16.71 MHz
T2 1 5.83326563 GHz -17.10 dBm
Measuring...

99% OBW 802.11n20

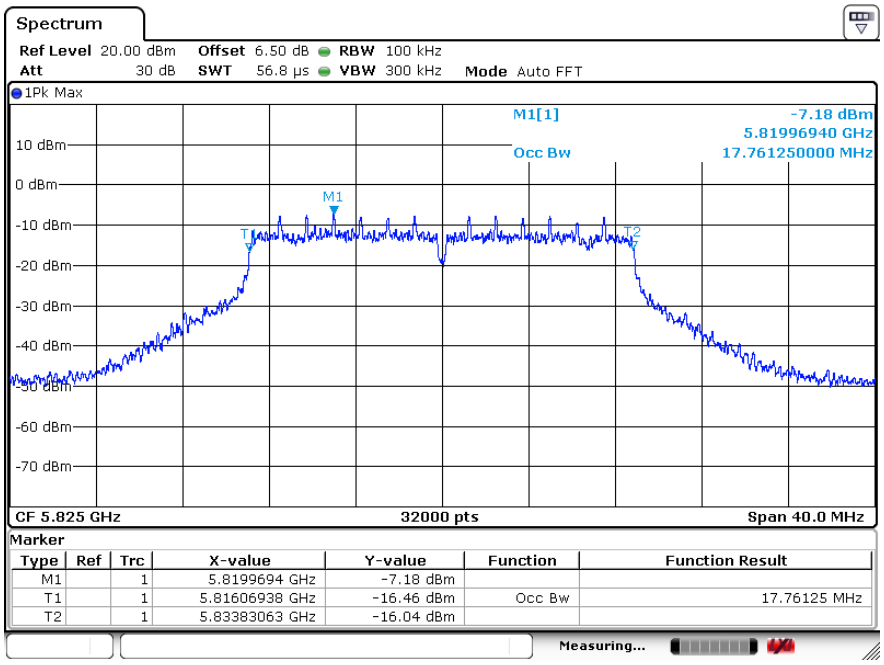
Channel: 149



Channel: 157

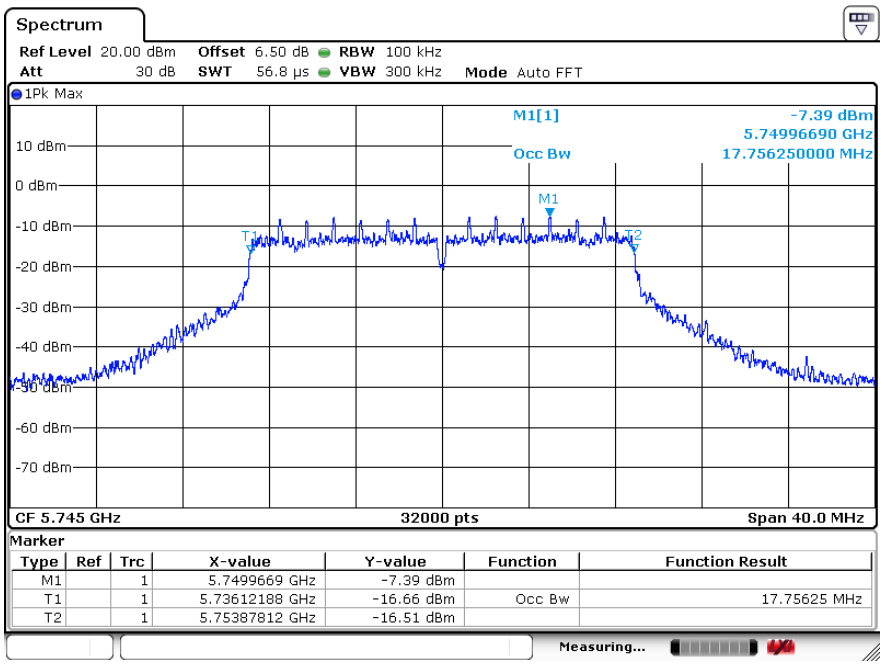


Channel: 165

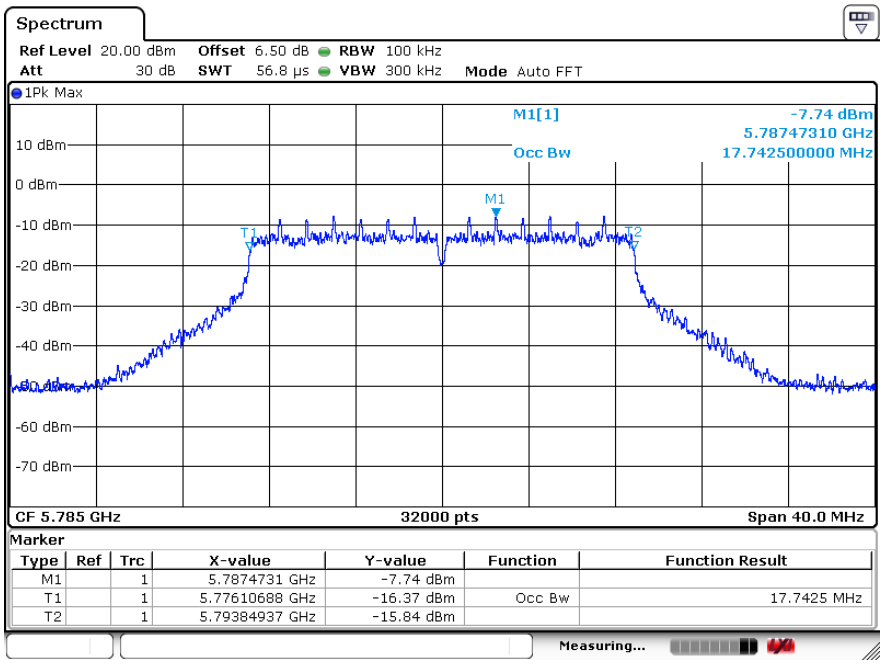

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -7.18 dBm
5.81996940 GHz
Occ Bw 17.761250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199694 GHz -7.18 dBm
T1 1 5.81606938 GHz -16.46 dBm Occ Bw 17.76125 MHz
T2 1 5.83383063 GHz -16.04 dBm
Measuring...

99% OBW 802.11ac20

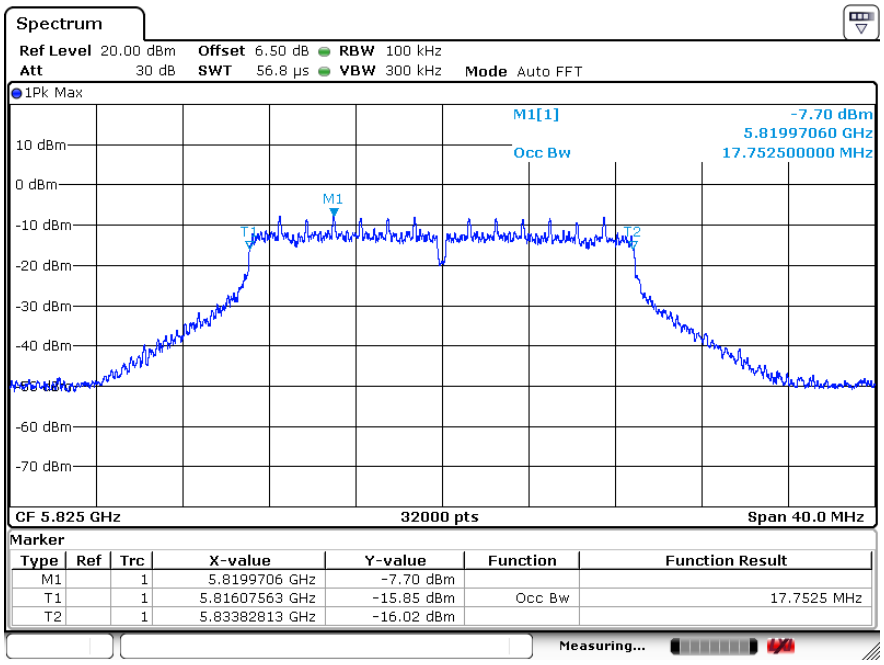
Channel: 149



Channel: 157

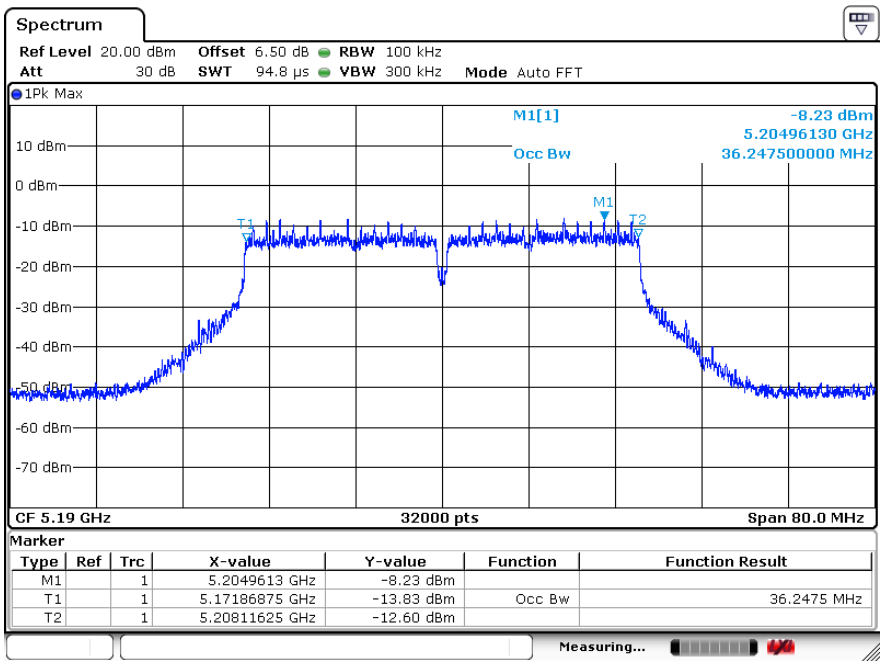


Channel: 165

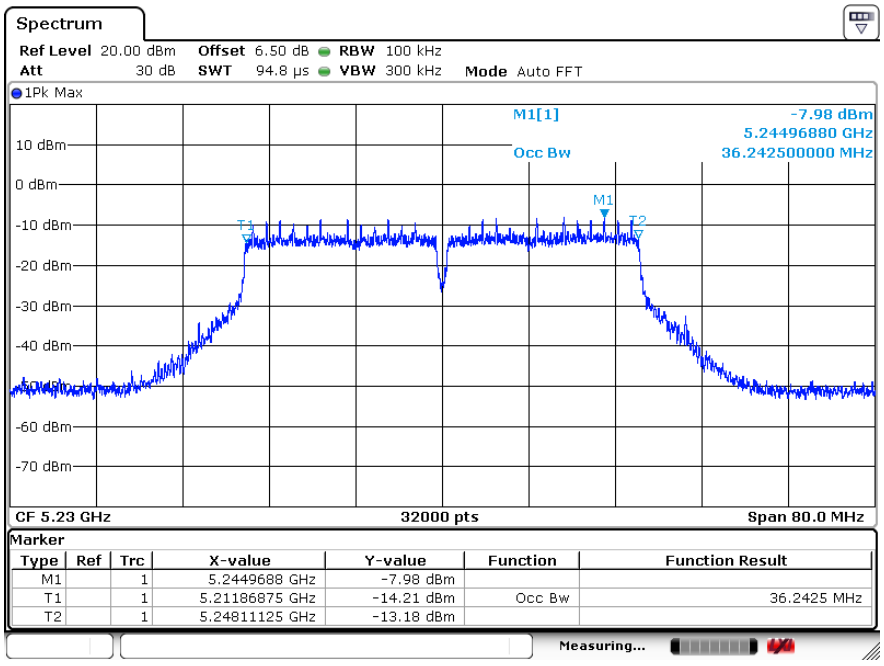

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -7.70 dBm
5.81997060 GHz
Occ Bw 17.752500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.825 GHz
32000 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.8199706 GHz -7.70 dBm
T1 1 5.81607563 GHz -15.85 dBm Occ Bw 17.7525 MHz
T2 1 5.83382813 GHz -16.02 dBm
Measuring...

99% OBW 802.11n40

Channel: 38

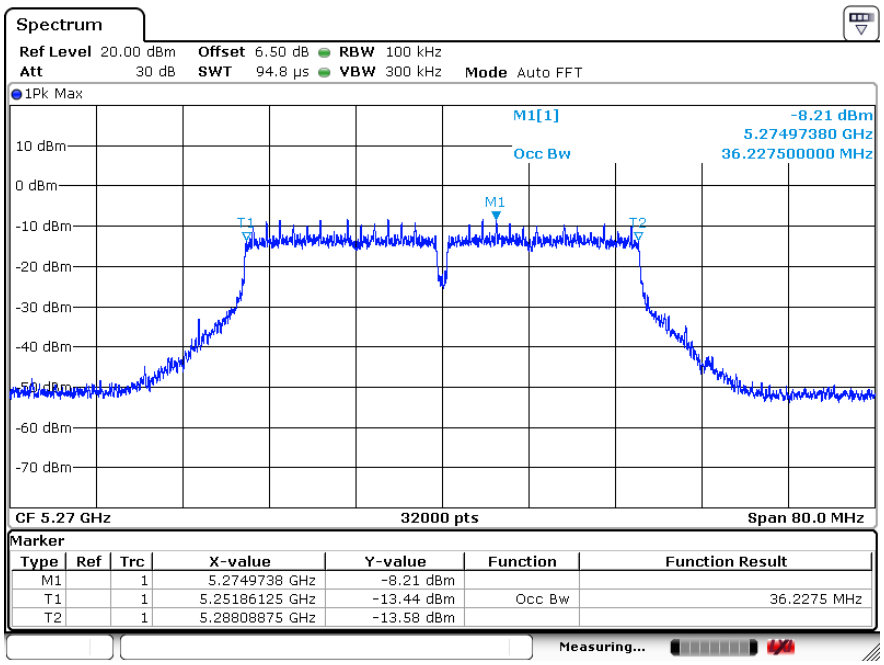


Channel: 46

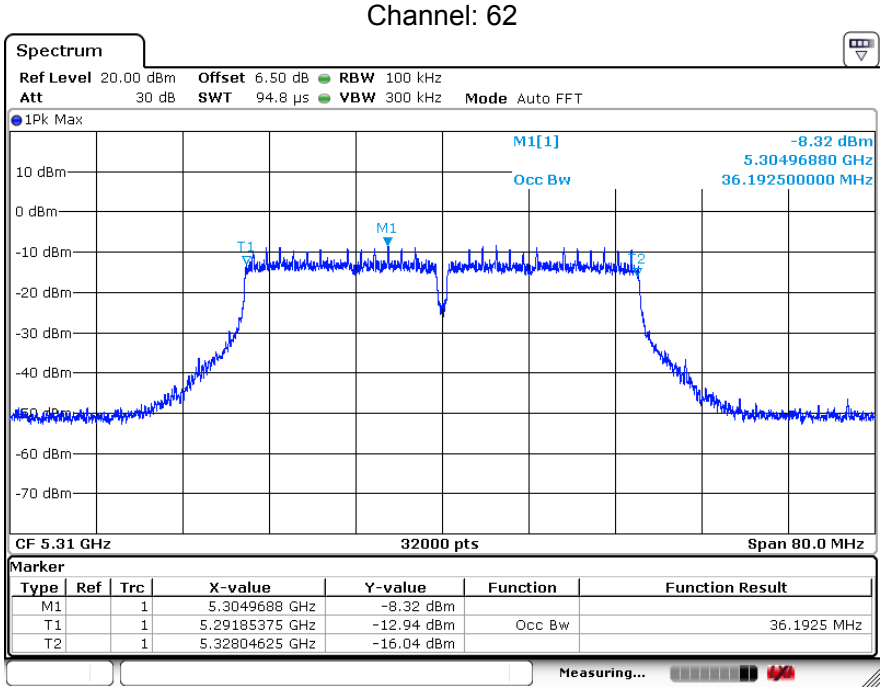


99% OBW 802.11n40

Channel: 54

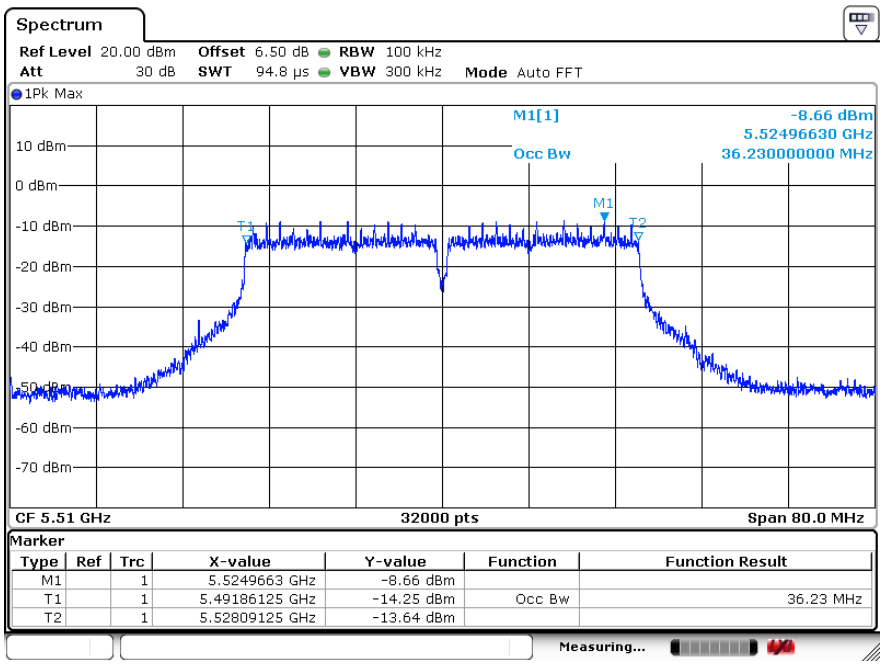


Channel: 62

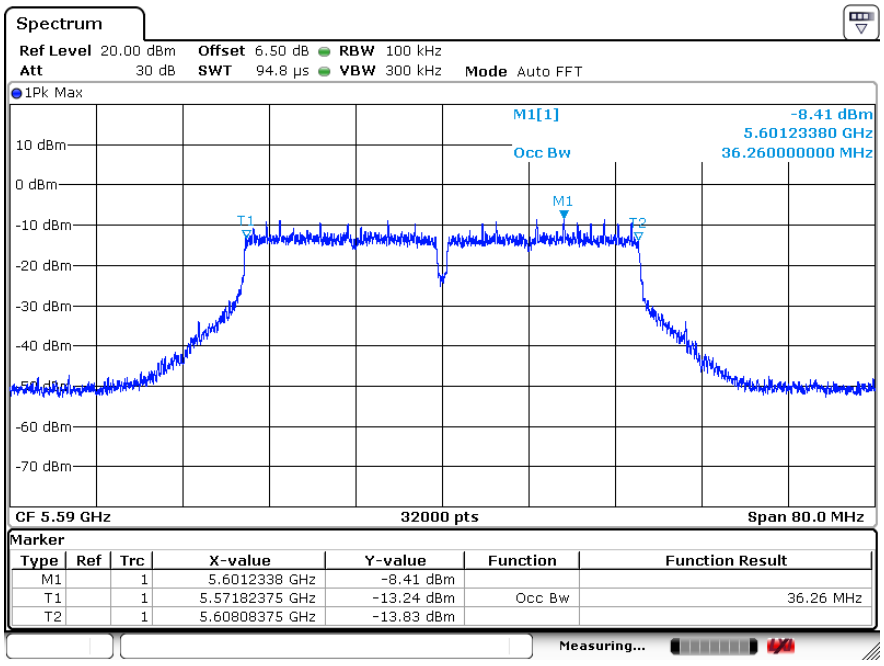


99% OBW 802.11n40

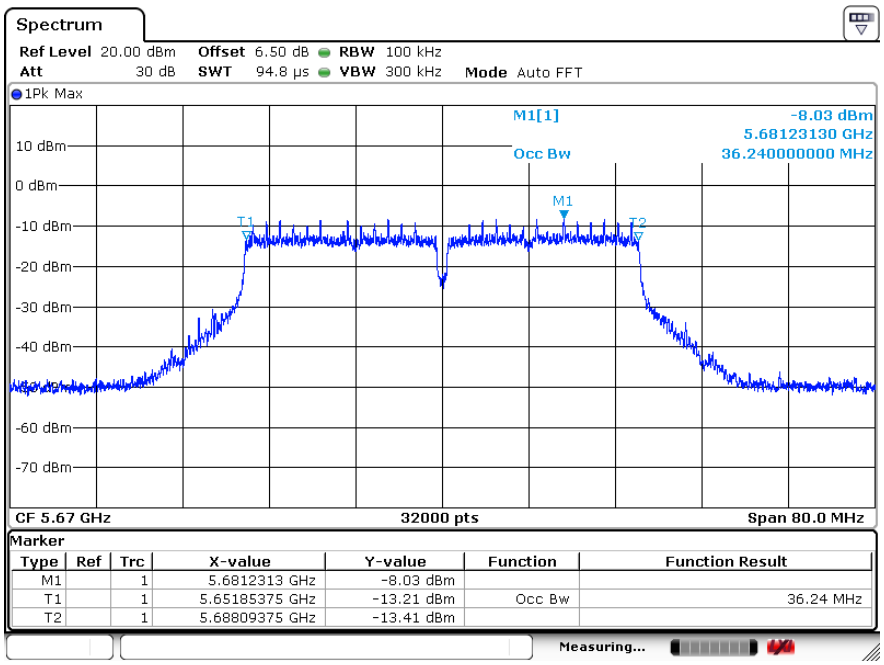
Channel: 102



Channel: 118

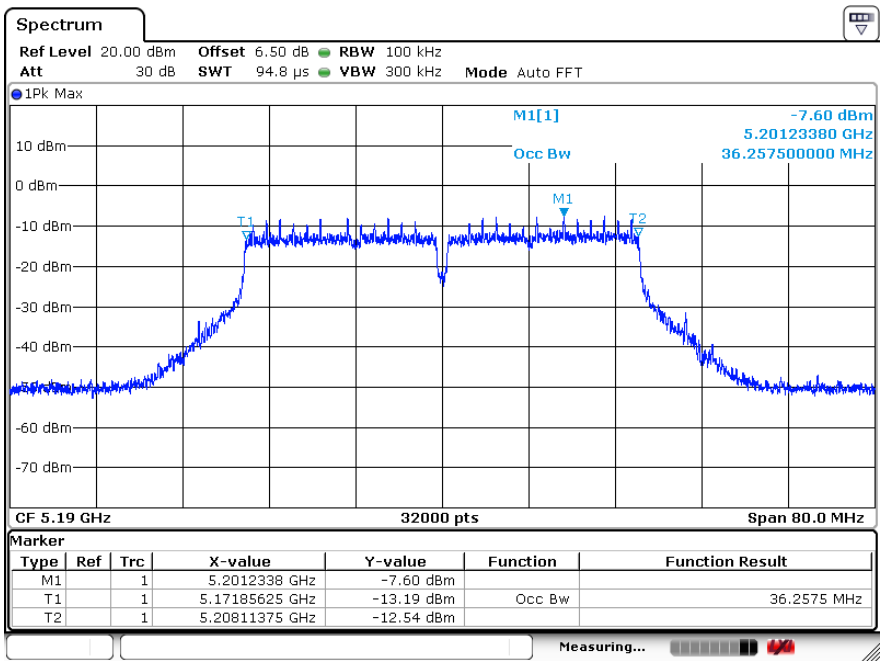


Channel: 134

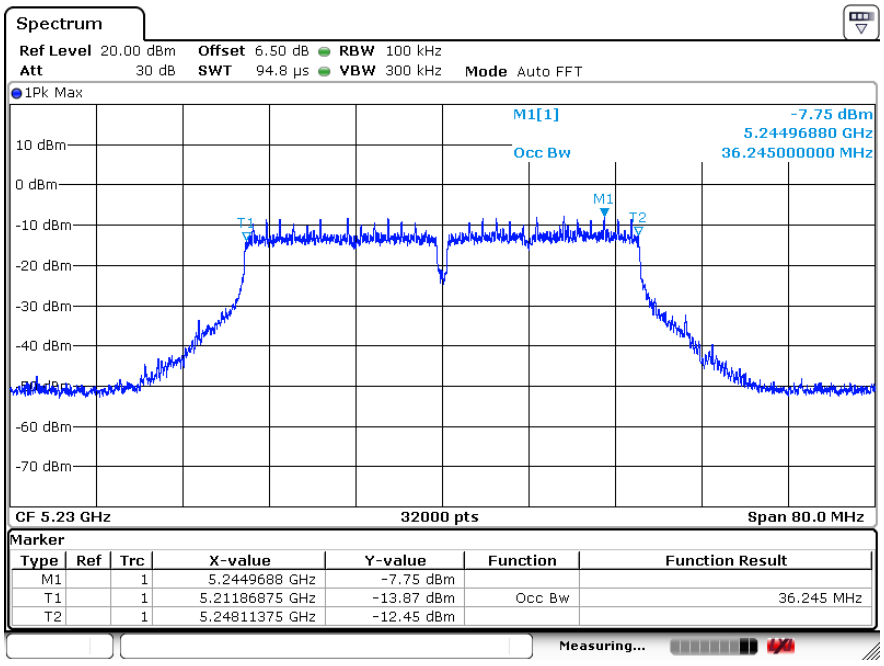

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -8.03 dBm
5.68123130 GHz
Occ Bw 36.240000000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
T1
M1
T2
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6812313 GHz -8.03 dBm
T1 1 5.65185375 GHz -13.21 dBm Occ Bw 36.24 MHz
T2 1 5.68809375 GHz -13.41 dBm
Measuring...

99% OBW 802.11ac40

Channel: 38

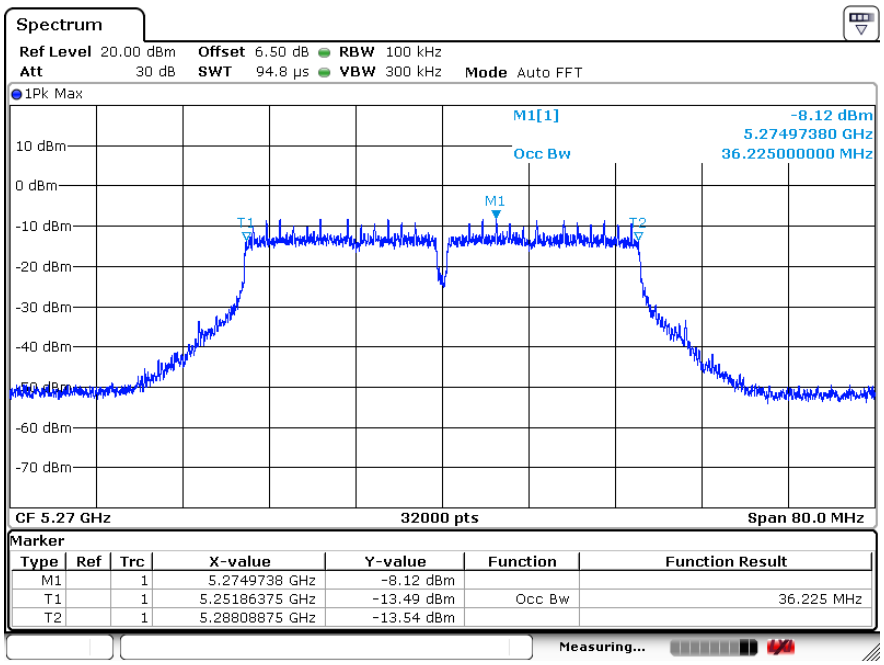


Channel: 46

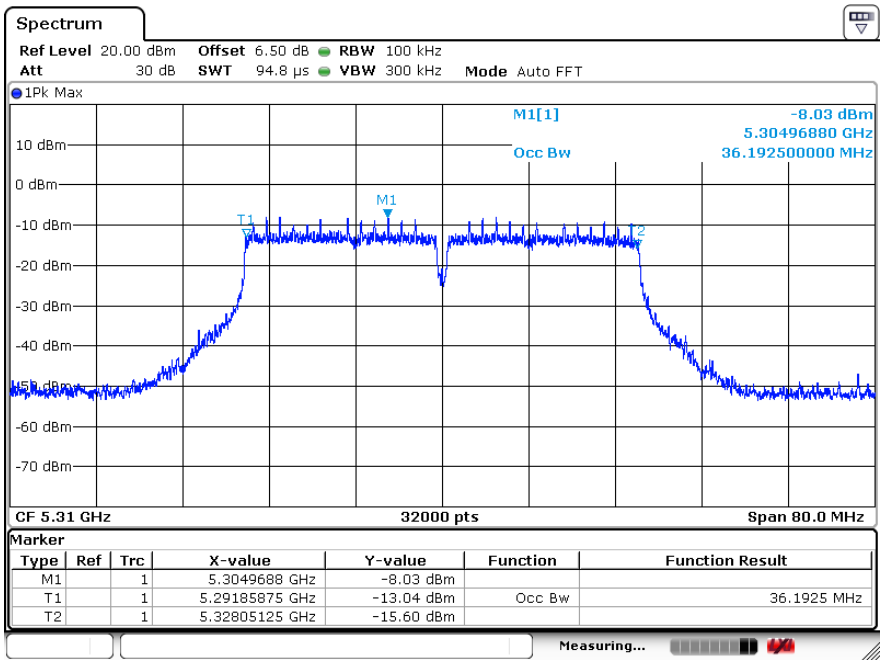


99% OBW 802.11ac40

Channel: 54

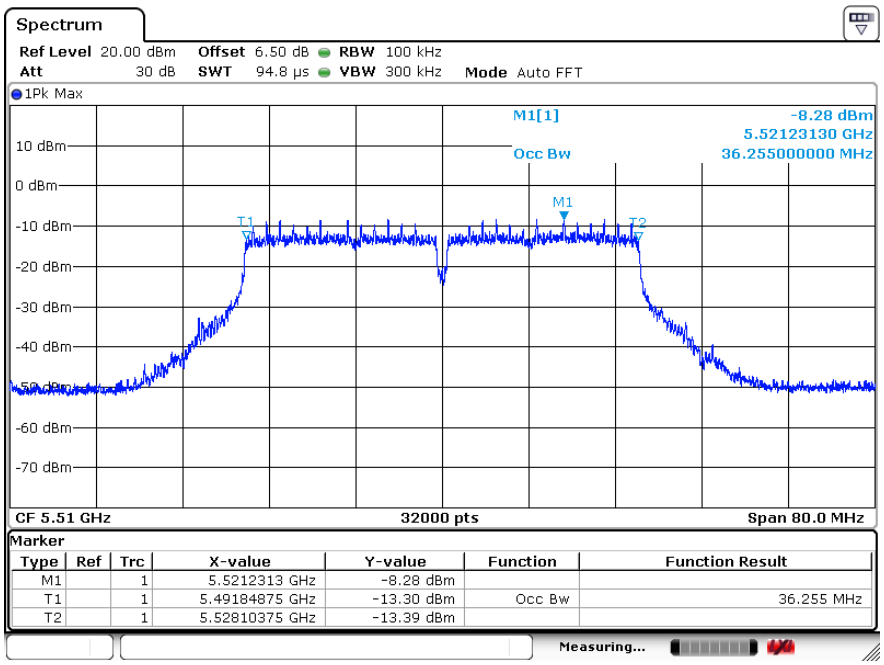


Channel: 62

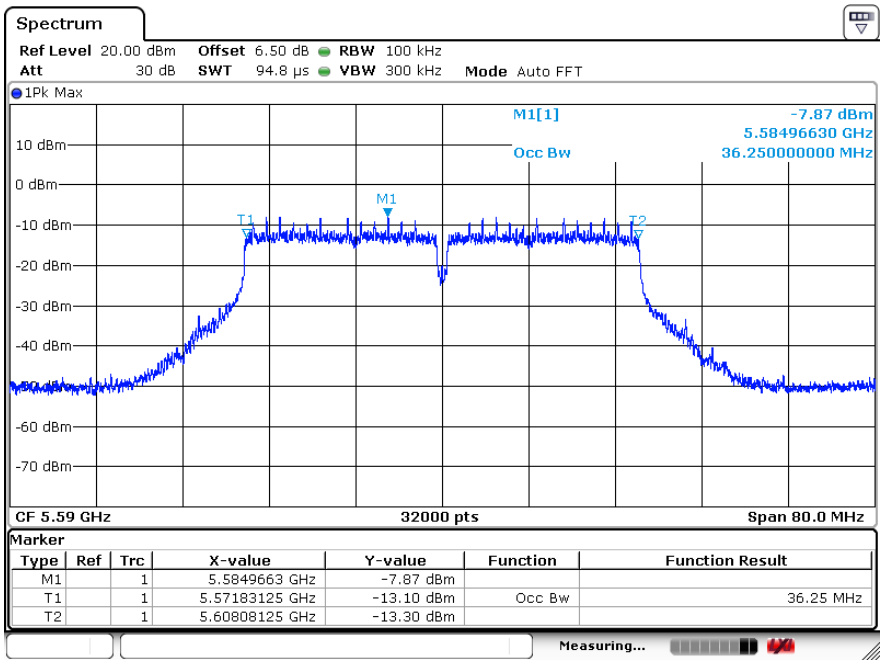


99% OBW 802.11ac40

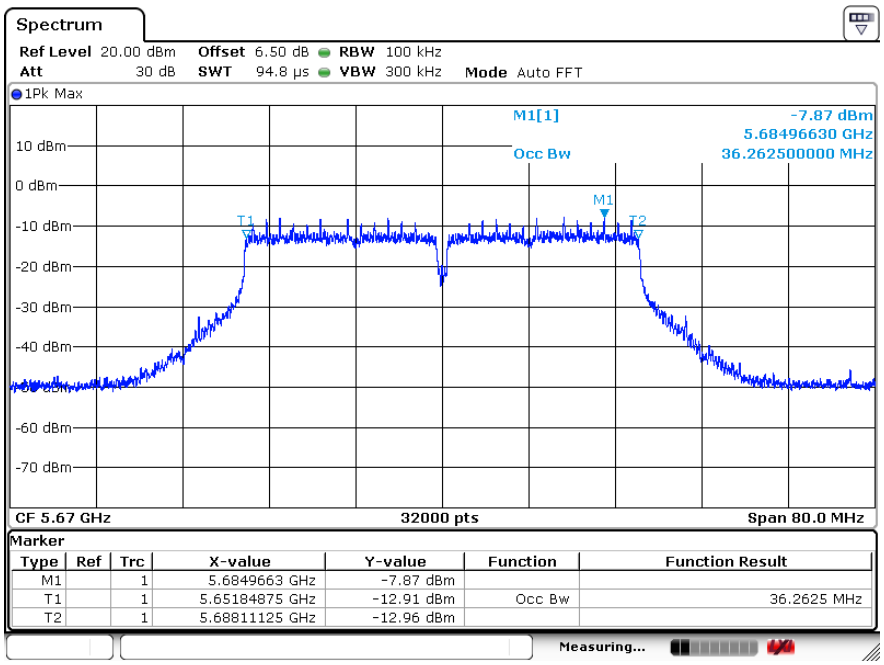
Channel: 102



Channel: 118

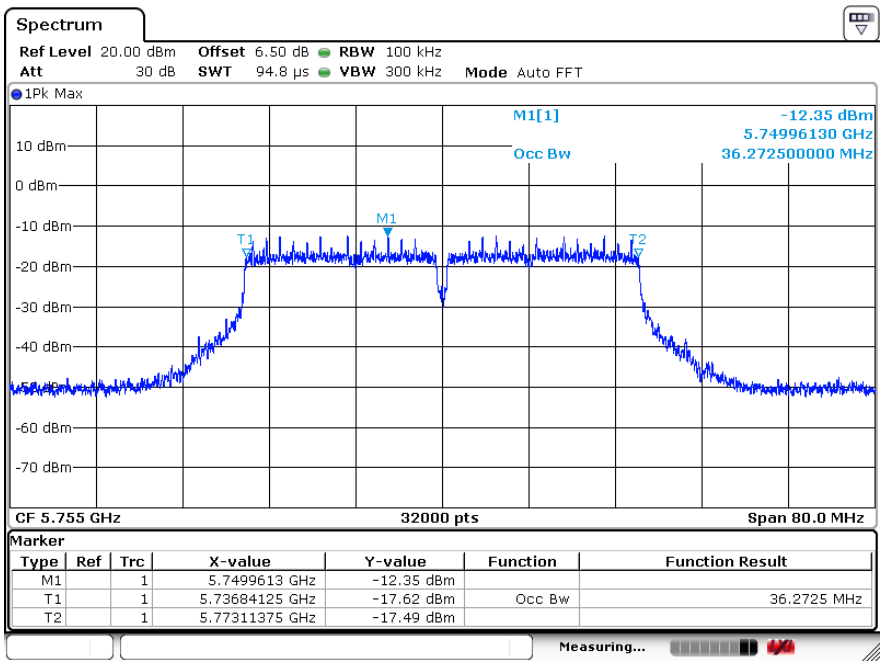


Channel: 134

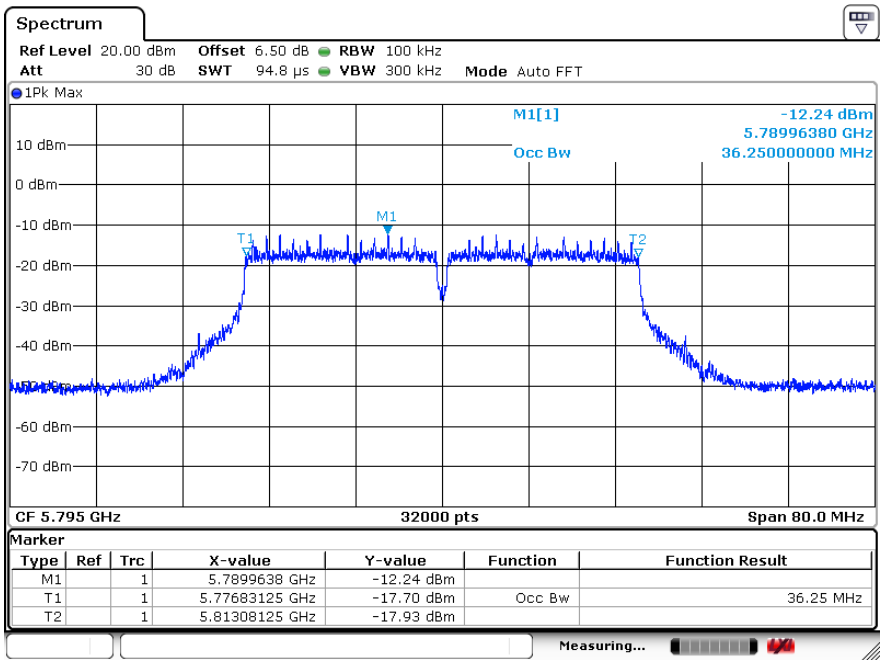

Spectrum
Ref Level 20.00 dBm Offset 6.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -7.87 dBm
5.68496630 GHz
Occ Bw 36.262500000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
T1
M1
T2
CF 5.67 GHz
32000 pts
Span 80.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.6849663 GHz -7.87 dBm
T1 1 5.65184875 GHz -12.91 dBm Occ Bw 36.2625 MHz
T2 1 5.68811125 GHz -12.96 dBm
Measuring...

99% OBW 802.11n40

Channel: 151

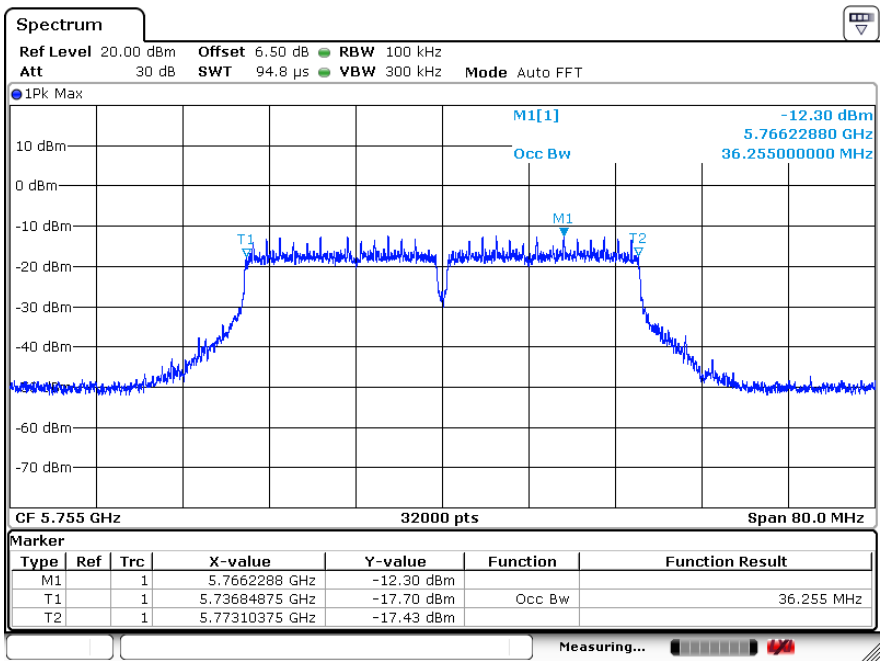


Channel: 159

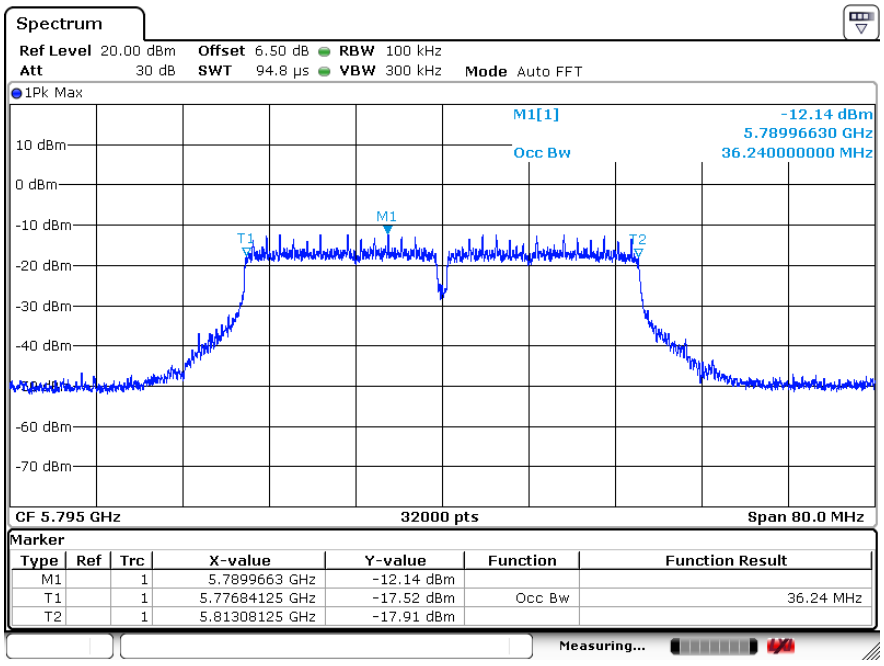


99% OBW 802.11ac40

Channel: 151

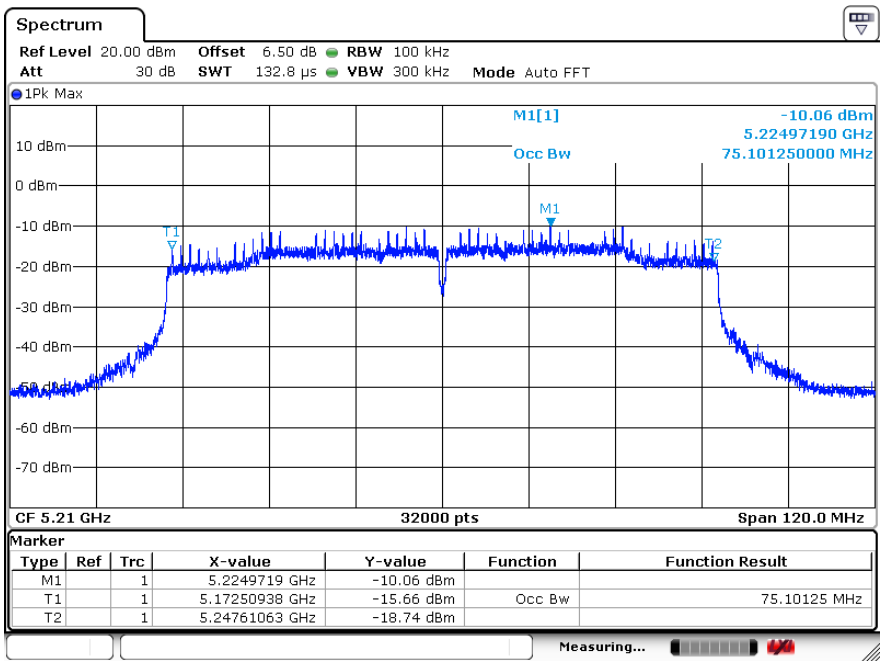


Channel: 159

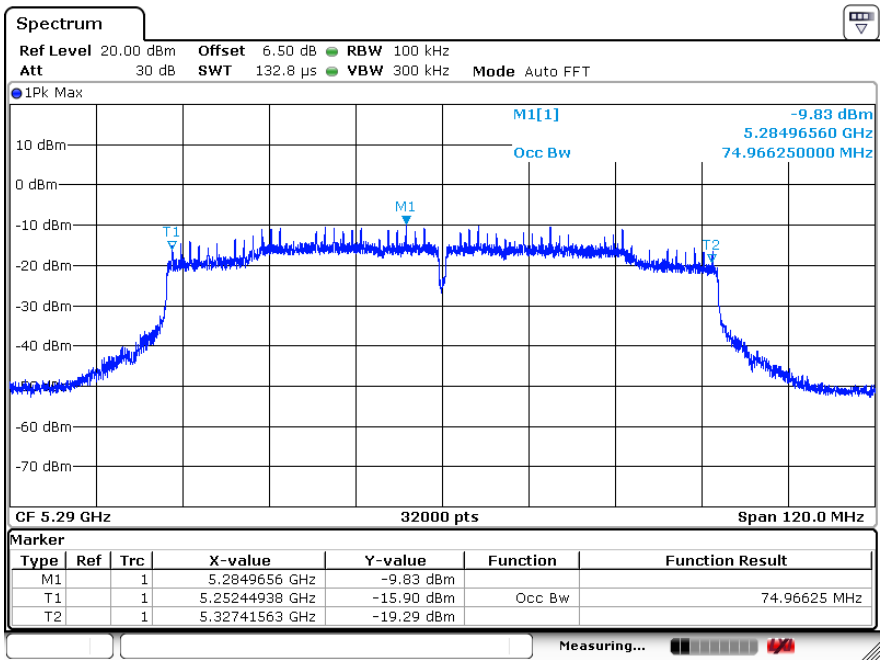


99% OBW 802.11ac80

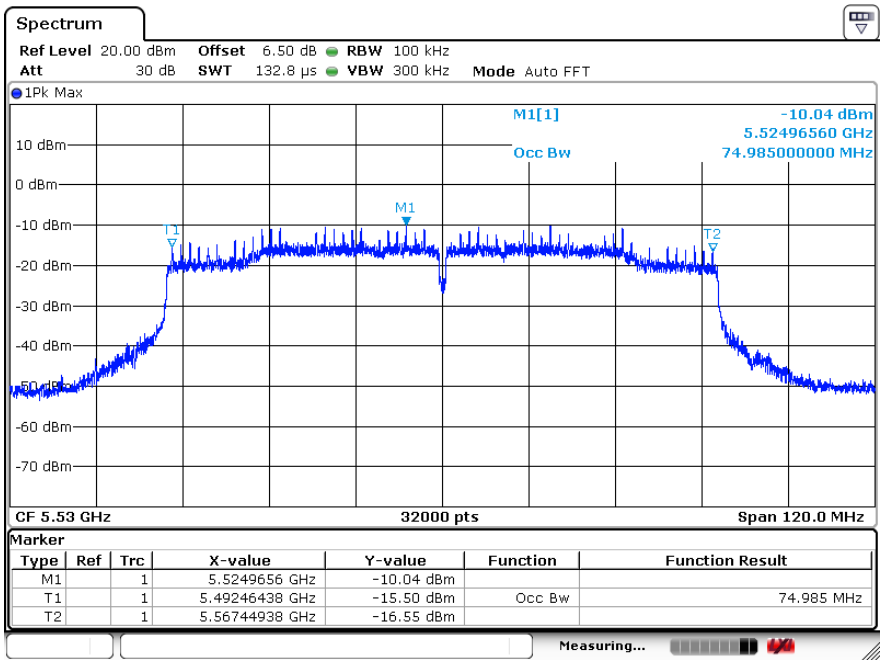
Channel:42



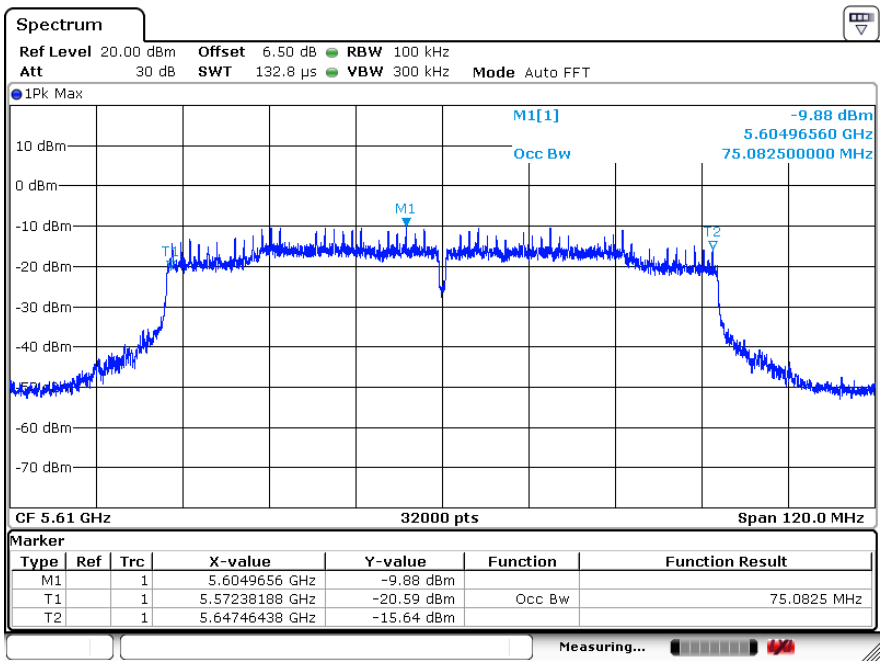
Channel: 58



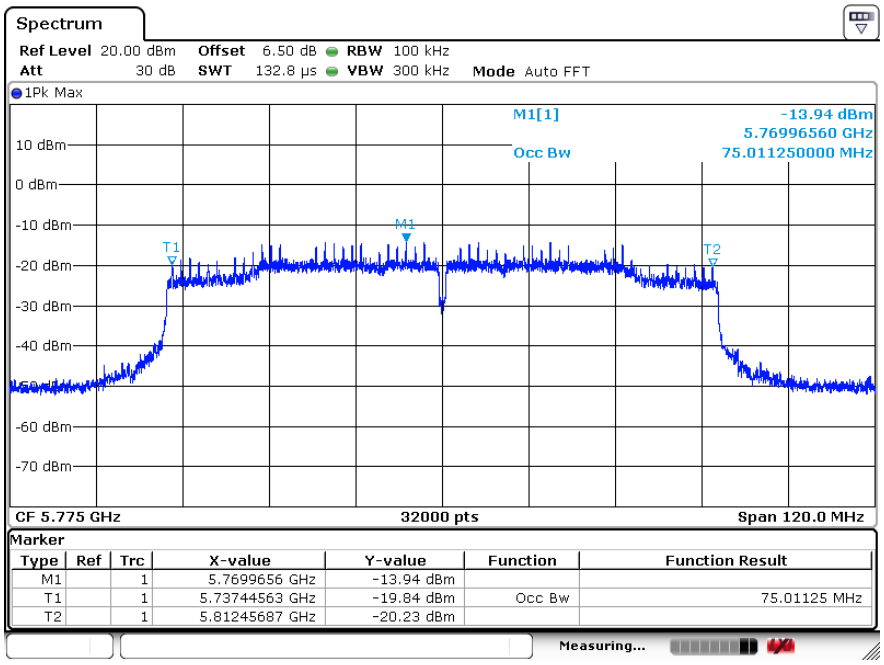
Channel:106



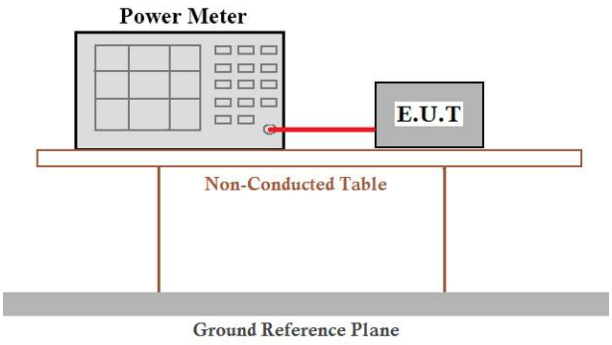
Channel: 122



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] -13.94 dBm
5.76996560 GHz
Occ Bw 75.011250000 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 5.775 GHz 32000 pts Span 120.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.7699656 GHz -13.94 dBm
T1 1 5.73744563 GHz -19.84 dBm Occ Bw 75.01125 MHz
T2 1 5.81245687 GHz -20.23 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	15.10	14.56	14.54	24	Pass
44	5220.00	14.96	14.48	14.47	24	Pass
48	5240.00	14.74	14.23	14.20	24	Pass
52	5260.00	14.53	14.04	14.02	24	Pass
56	5280.00	14.51	14.06	14.05	24	Pass
64	5320.00	14.74	14.11	14.10	24	Pass
100	5500.00	14.39	13.97	13.95	24	Pass
120	5600.00	14.67	14.02	14.01	24	Pass
140	5700.00	14.83	14.35	14.34	24	Pass
149	5745.00	10.28	10.00	9.98	30	Pass
157	5785.00	10.27	10.03	10.00	30	Pass
165	5825.00	10.33	10.08	10.06	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)		Limit(dBm)	Result
		802.11n(HT40)	802.11ac(VHT40)		
38	5190.00	14.06	14.05	24	Pass
46	5230.00	14.00	14.00	24	Pass
54	5270.00	13.85	13.84	24	Pass
62	5310.00	13.87	13.85	24	Pass
102	5510.00	13.70	13.67	24	Pass
118	5590.00	13.80	13.79	24	Pass
134	5670.00	14.06	14.04	24	Pass
151	5755.00	10.00	9.97	30	Pass
159	5795.00	10.07	10.05	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)	Limit(dBm)	Result
		802.11ac(VHT80)		
42	5210.00	13.60	24	Pass
58	5290.00	13.32	24	Pass
106	5530.00	13.20	24	Pass
122	5610.00	13.49	24	Pass
155	5775.00	9.73	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	15.05	14.52	14.49	24	Pass
44	5220.00	14.89	14.43	14.43	24	Pass
48	5240.00	14.72	14.19	14.16	24	Pass
52	5260.00	14.50	14.00	13.95	24	Pass
56	5280.00	14.47	14.03	14.00	24	Pass
64	5320.00	14.69	14.10	14.02	24	Pass
100	5500.00	14.34	13.94	13.89	24	Pass
120	5600.00	14.58	14.00	13.98	24	Pass
140	5700.00	14.78	14.31	14.29	24	Pass
149	5745.00	10.23	9.96	9.96	30	Pass
157	5785.00	10.21	10.00	9.97	30	Pass
165	5825.00	10.30	10.02	10.00	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)		Limit(dBm)	Result
		802.11n(HT40)	802.11ac(VHT40)		
38	5190.00	14.00	13.99	24	Pass
46	5230.00	13.95	13.98	24	Pass
54	5270.00	13.80	13.79	24	Pass
62	5310.00	13.81	13.80	24	Pass
102	5510.00	13.68	13.63	24	Pass
118	5590.00	13.76	13.74	24	Pass
134	5670.00	14.02	13.95	24	Pass
151	5755.00	9.96	9.92	30	Pass
159	5795.00	10.01	10.00	30	Pass

CH. No.	Frequency (MHz)	Output Power (dBm)	Limit(dBm)	Result
		802.11ac(VHT80)		
42	5210.00	13.52	24	Pass
58	5290.00	13.25	24	Pass
106	5530.00	13.16	24	Pass
122	5610.00	13.41	24	Pass
155	5775.00	9.68	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.

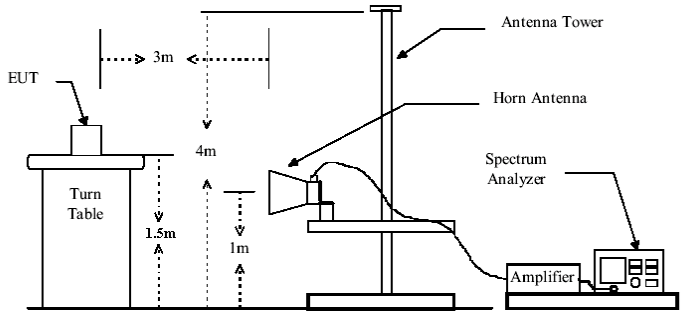
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

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	47.98	7.18	55.16	68.2	-13.04	PK	H
5150	35.75	7.18	42.93	54	-11.07	Avg	H
5150	46.32	7.18	53.5	68.2	-14.7	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	44.29	7.2	51.49	68.2	-16.71	PK	H
5350	52.03	7.2	59.23	68.2	-8.97	PK	V
5350	40.36	7.2	47.56	54	-6.44	Avg	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	49.16	7.18	56.34	68.2	-11.86	PK	H
5150	37.45	7.18	44.63	54	-9.37	Avg	H
5150	55.87	7.18	63.05	68.2	-5.15	PK	V
5150	42.87	7.18	50.05	54	-3.95	Avg	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	46.03	7.2	53.23	68.2	-14.97	PK	H
5350	51.29	7.2	58.49	68.2	-9.71	PK	V
5350	40.52	7.2	47.72	54	-6.28	Avg	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	44.31	7.18	51.49	68.2	-16.71	PK	H
5150	43.25	7.18	50.43	68.2	-17.77	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	48.29	7.2	55.49	68.2	-12.71	PK	H
5350	37.43	7.2	44.63	54	-9.37	Avg	H
5350	46.35	7.2	53.55	68.2	-14.65	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	48.46	7.18	55.64	68.2	-12.56	PK	H
5150	36.69	7.18	43.87	54	-10.13	Avg	H
5150	47.05	7.18	54.23	68.2	-13.97	PK	V
5150	38.01	7.18	45.19	54	-8.81	Avg	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	47.96	7.2	55.16	68.2	-13.04	PK	H
5350	37.33	7.2	44.53	54	-9.47	Avg	H
5350	45.83	7.2	53.03	68.2	-15.17	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	42.44	8.79	51.23	74	-22.77	Horizontal
5741.35	82.35	8.57	90.92	N/A	N/A	Horizontal
5725	42.17	8.79	50.96	74	-23.04	Vertical
5741.35	85.03	8.57	93.6	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	31.16	8.79	39.95	54	-14.05	Horizontal
5741.35	72.53	8.57	81.1	N/A	N/A	Horizontal
5725	30.68	8.79	39.47	54	-14.53	Vertical
5741.35	75.49	8.57	84.06	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	79.25	8.79	88.04	N/A	N/A	Horizontal
5850	38.97	8.82	47.79	74	-26.21	Horizontal
5826.2	85.76	8.79	94.55	N/A	N/A	Vertical
5850	39.89	8.82	48.71	74	-25.29	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	71.02	8.79	79.81	N/A	N/A	Horizontal
5850	30.13	8.82	38.95	54	-15.05	Horizontal
5826.2	76.28	8.79	85.07	N/A	N/A	Vertical
5850	29.16	8.82	37.98	54	-16.02	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	39.24	8.79	48.03	74	-25.97	Horizontal
5742.19	78.06	8.57	86.63	N/A	N/A	Horizontal
5725	40.05	8.79	48.84	74	-25.16	Vertical
5742.19	84.26	8.57	92.83	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	28.87	8.79	37.66	54	-16.34	Horizontal
5742.19	68.69	8.57	77.26	N/A	N/A	Horizontal
5725	30.14	8.79	38.93	54	-15.07	Vertical
5742.19	75.97	8.57	84.54	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	77.84	8.79	86.63	N/A	N/A	Horizontal
5850	39.15	8.82	47.97	74	-26.03	Horizontal
5826.2	36.24	8.79	45.03	N/A	N/A	Vertical
5850	40.93	8.82	49.75	74	-24.25	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5826.2	68.94	8.79	77.73	N/A	N/A	Horizontal
5850	30.12	8.82	38.94	54	-15.06	Horizontal
5826.2	74.89	8.79	83.68	N/A	N/A	Vertical
5850	30.06	8.82	38.88	54	-15.12	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	39.88	8.52	48.4	74	-25.6	Horizontal
5745	75.64	8.57	84.21	N/A	N/A	Horizontal
5725	38.15	8.52	46.67	74	-27.33	Vertical
5745	84.73	8.57	93.3	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	31.19	8.52	39.71	54	-14.29	Horizontal
5745	69.24	8.57	77.81	N/A	N/A	Horizontal
5725	29.35	8.52	37.87	54	-16.13	Vertical
5745	75.69	8.57	84.26	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	78.69	8.68	87.37	N/A	N/A	Horizontal
5850	36.14	8.82	44.96	74	-29.04	Horizontal
5784.88	85.03	8.68	93.71	N/A	N/A	Vertical
5850	43.97	8.82	52.79	74	-21.21	Vertical

Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5784.88	71.54	8.68	80.22	N/A	N/A	Horizontal
5850	30.46	8.82	39.28	54	-14.72	Horizontal
5784.88	74.58	8.68	83.26	N/A	N/A	Vertical
5850	28.66	8.82	37.48	54	-16.52	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	39.06	8.52	47.58	74	-26.42	Horizontal
5778.180	78.48	8.68	87.16	N/A	N/A	Horizontal
5850.000	37.12	8.82	45.94	74	-28.06	Horizontal
5725.000	38.26	8.52	46.78	74	-27.22	Vertical
5778.180	82.97	8.68	91.65	N/A	N/A	Vertical
5850.000	40.85	8.82	49.67	74	-24.33	Vertical

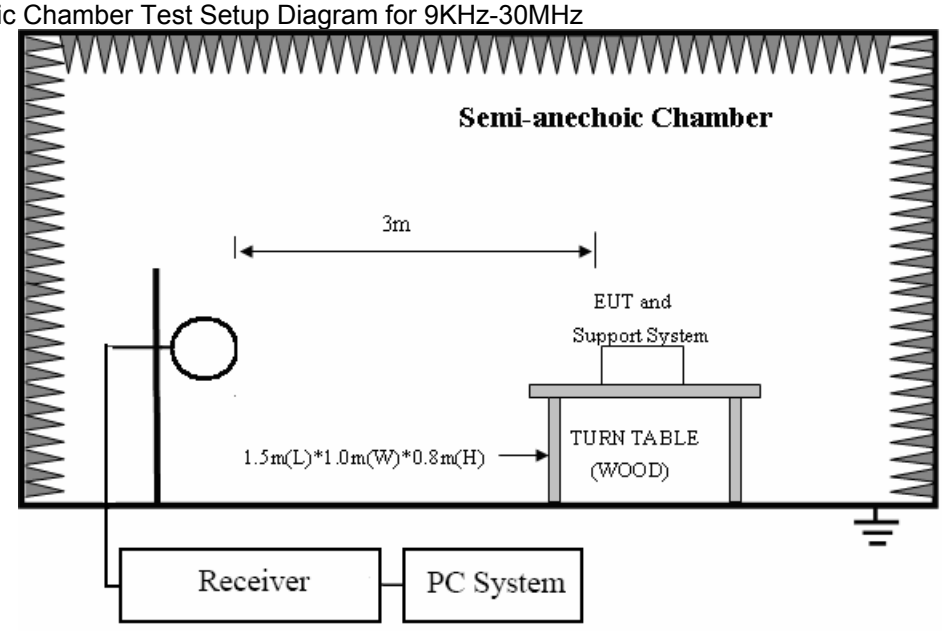
Average

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.000	31.96	8.52	40.48	54	-13.52	Horizontal
5778.180	70.05	8.68	78.73	N/A	N/A	Horizontal
5850.000	28.76	8.82	37.58	54	-16.42	Horizontal
5725.000	29.84	8.52	38.36	54	-15.64	Vertical
5778.180	72.69	8.68	81.37	N/A	N/A	Vertical
5850.000	30.02	8.82	38.84	54	-15.16	Vertical

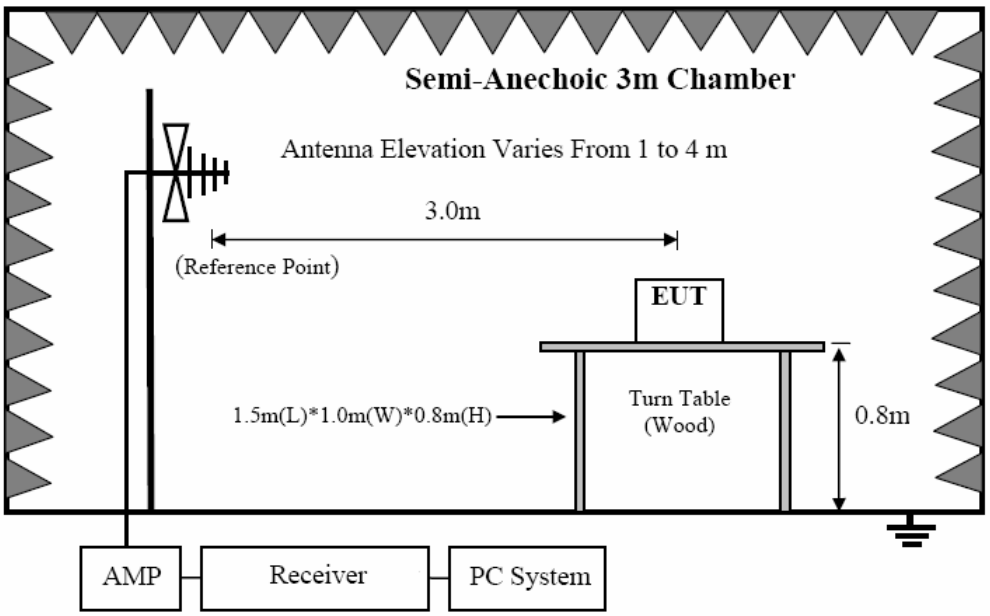
7. RADIATED EMISSION MEASUREMENT

7.1. Block diagram of test setup

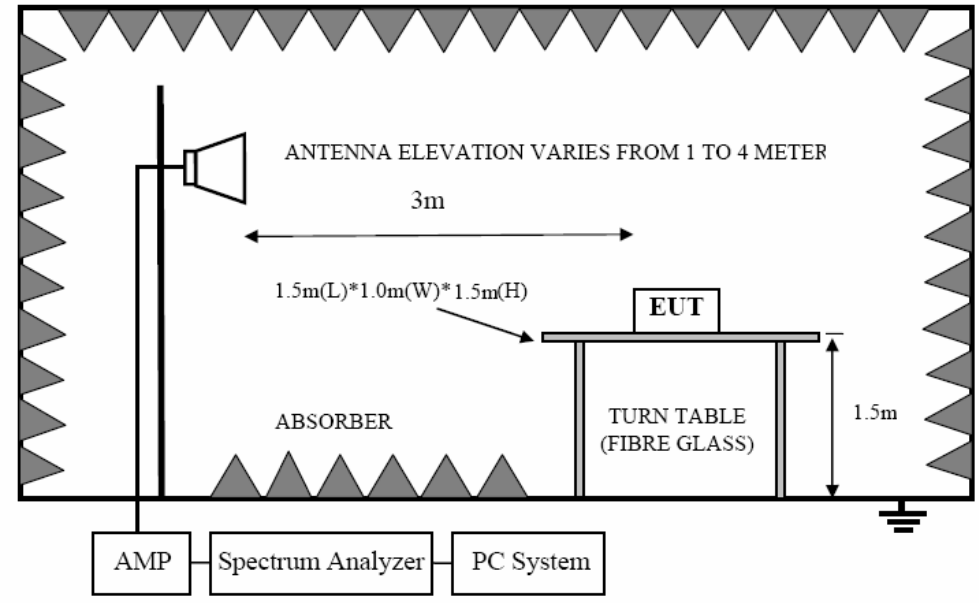
In 3m Anechoic Chamber Test Setup Diagram for 9KHz-30MHz



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.

7.2. 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.

7.3. 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.

7.4. Test result(Below 30MHz)

EUT:	netbook	**Model No.:**	ES1AU11
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.

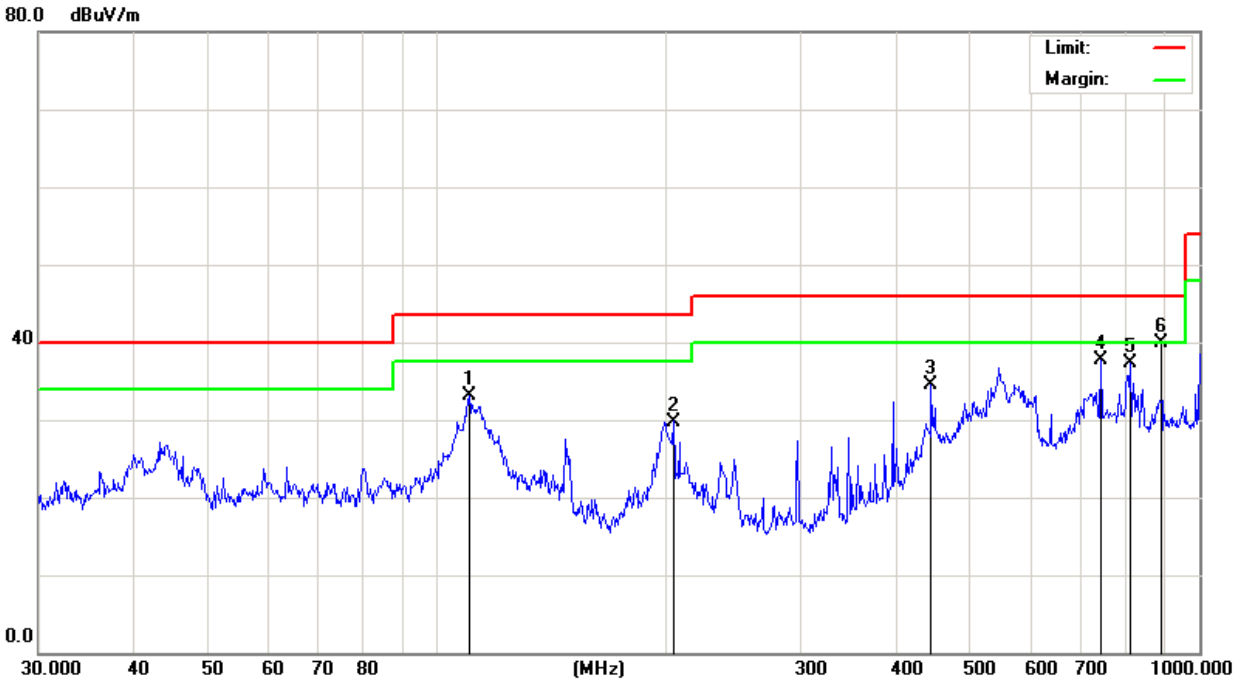
Distance extrapolation factor =20 log (specific distance/test distance)(dB);

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:	netbook	Model No.:	ES1AU11
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		110.1816	40.73	-7.66	33.07	43.50	-10.43	peak
2		204.2375	35.36	-5.56	29.80	43.50	-13.70	peak
3		444.8514	37.79	-3.36	34.43	46.00	-11.57	peak
4		742.2586	32.55	5.13	37.68	46.00	-8.32	peak
5		810.2653	29.85	7.45	37.30	46.00	-8.70	peak
6	*	890.7278	34.11	5.83	39.94	46.00	-6.06	peak

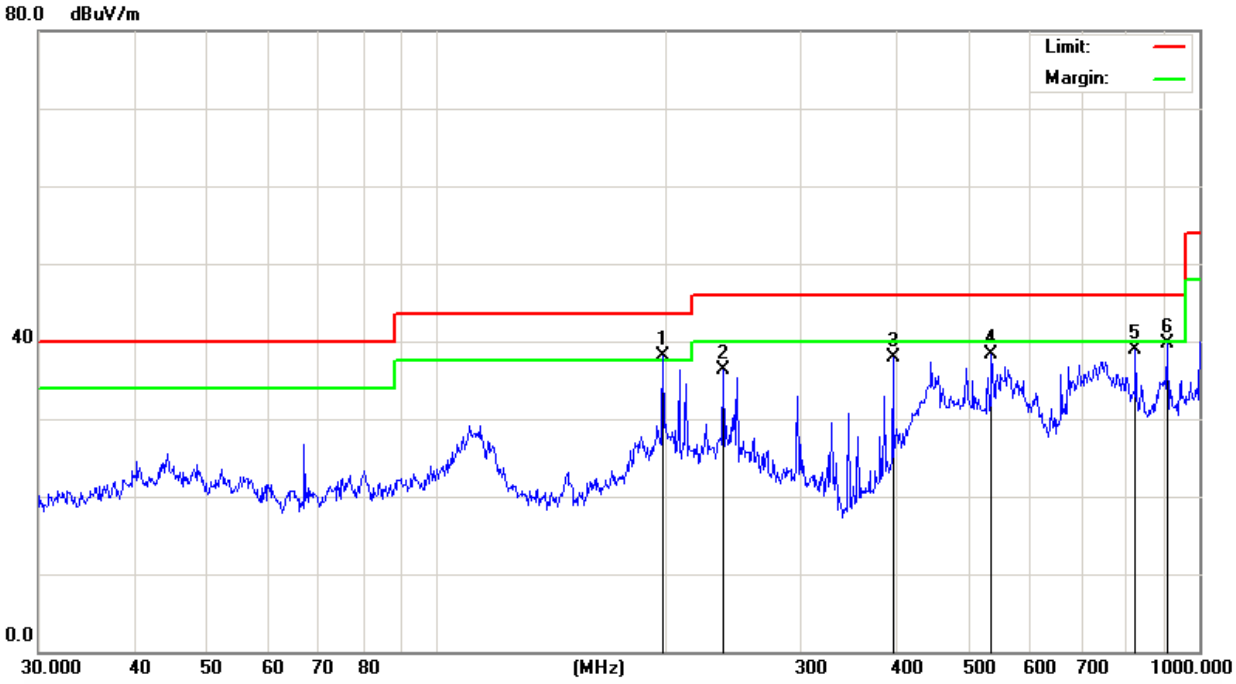
The test result is calculated as the following:

(1) Result = Reading + Correct Factor

(2) Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain + Attenuator

(3) Margin = Result - Limit

EUT:	netbook	Model No.:	ES1AU11
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	*	197.8925	45.43	-7.42	38.01	43.50	-5.49	peak
2		237.4757	43.05	-6.74	36.31	46.00	-9.69	peak
3		396.2412	40.99	-3.13	37.86	46.00	-8.14	peak
4		533.8318	34.06	4.23	38.29	46.00	-7.71	peak
5		824.5968	32.08	6.84	38.92	46.00	-7.08	peak
6		906.4823	32.25	7.45	39.70	46.00	-6.30	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:	netbook	Model No.:	ES1AU11
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	34.79	12.56	47.35	74.00	-26.65	PEAK
	H	15540	36.07	16.45	52.52	74.00	-21.48	PEAK
	V	10360	35.21	12.56	47.77	74.00	-26.23	PEAK
	V	15540	36.64	16.45	53.09	74.00	-20.91	PEAK
802.11a-5220 MHz	H	10440	35.23	12.64	47.87	74.00	-26.13	PEAK
	H	15660	35.72	16.53	52.25	74.00	-21.75	PEAK
	V	10440	36.89	12.64	49.53	74.00	-24.47	PEAK
	V	15660	34.99	16.53	51.52	74.00	-22.48	PEAK
802.11a-5240 MHz	H	10480	33.63	12.68	46.31	74.00	-27.69	PEAK
	H	15720	34.59	16.54	51.13	74.00	-22.87	PEAK
	V	10480	36.59	12.68	49.27	74.00	-24.73	PEAK
	V	15720	33.88	16.54	50.42	74.00	-23.58	PEAK
802.11a-5745 MHz	H	11490	33.00	16.82	49.82	74.00	-24.18	PEAK
	H	17235	29.64	22.93	52.57	74.00	-21.43	PEAK
	V	11490	31.23	16.82	48.05	74.00	-25.95	PEAK
	V	17235	29.61	22.93	52.54	74.00	-21.46	PEAK
802.11a-5785 MHz	H	11570	31.53	16.71	48.24	74.00	-25.76	PEAK
	H	17355	27.46	24.37	51.83	74.00	-22.17	PEAK
	V	11570	30.24	16.71	46.95	74.00	-27.05	PEAK
	V	17355	28.78	24.37	53.15	74.00	-20.85	PEAK
802.11a-5825 MHz	H	11650	34.42	16.61	51.03	74.00	-22.97	PEAK
	H	17475	27.02	25.01	52.03	74.00	-21.97	PEAK
	V	11650	32.93	16.61	49.54	74.00	-24.46	PEAK
	V	17475	28.71	25.01	53.72	74.00	-20.28	PEAK

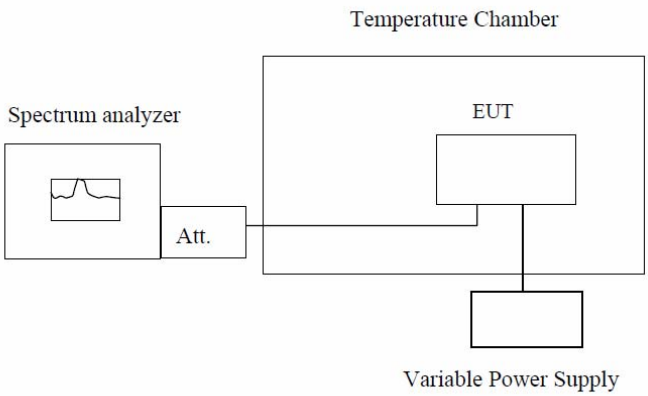
Mode	Polar (H/V)	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
802.11n HT20-5180MHz	H	10360	32.72	12.56	45.28	74.00	-28.72	PEAK
	H	15540	34.75	16.45	51.20	74.00	-22.80	PEAK
	V	10360	35.49	12.56	48.05	74.00	-25.95	PEAK
	V	15540	36.39	16.45	52.84	74.00	-21.16	PEAK
802.11n HT20-5220MHz	H	10440	34.48	12.64	47.12	74.00	-26.88	PEAK
	H	15660	33.26	16.53	49.79	74.00	-24.21	PEAK
	V	10440	36.09	12.64	48.73	74.00	-25.27	PEAK
	V	15660	35.48	16.53	52.01	74.00	-21.99	PEAK
802.11n HT20-5240MHz	H	10480	35.25	12.68	47.93	74.00	-26.07	PEAK
	H	15720	31.63	16.54	48.17	74.00	-25.83	PEAK
	V	10480	34.09	12.68	46.77	74.00	-27.23	PEAK
	V	15720	33.31	16.54	49.85	74.00	-24.15	PEAK
802.11n HT20-5745MHz	H	11490	30.37	16.82	47.19	74.00	-26.81	PEAK
	H	17235	30.05	22.93	52.98	74.00	-21.02	PEAK
	V	11570	32.65	16.71	49.36	74.00	-24.64	PEAK
	V	17235	27.65	22.93	50.58	74.00	-23.42	PEAK
802.11n HT20-5785MHz	H	11570	30.04	16.71	46.75	74.00	-27.25	PEAK
	H	17355	28.43	24.37	52.80	74.00	-21.20	PEAK
	V	11570	32.35	16.71	49.06	74.00	-24.94	PEAK
	V	17355	29.43	24.37	53.80	74.00	-20.20	PEAK
802.11n HT20-5825MHz	H	11650	32.68	16.61	49.29	74.00	-24.71	PEAK
	H	17475	27.29	25.01	52.30	74.00	-21.70	PEAK
	V	11650	34.92	16.61	51.53	74.00	-22.47	PEAK
	V	17475	27.47	25.01	52.48	74.00	-21.52	PEAK
802.11n HT40-5190MHz	H	10380	35.51	12.58	48.09	74.00	-25.91	PEAK
	H	15570	34.10	16.48	50.58	74.00	-23.42	PEAK
	V	10380	37.24	12.58	49.82	74.00	-24.18	PEAK
	V	15570	33.26	16.48	49.74	74.00	-24.26	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	36.83	12.66	49.49	74.00	-24.51	PEAK
	H	15690	35.22	16.53	51.75	74.00	-22.25	PEAK
	V	10460	35.98	12.66	48.64	74.00	-25.36	PEAK
	V	15690	34.23	16.53	50.76	74.00	-23.24	PEAK
802.11n HT40-5755MHz	H	11510	31.85	16.78	48.63	74.00	-25.37	PEAK
	H	17265	27.31	23.29	50.60	74.00	-23.40	PEAK
	V	11510	33.94	16.78	50.72	74.00	-23.28	PEAK
	V	17265	29.09	23.29	52.38	74.00	-21.62	PEAK
802.11n HT40-5795MHz	H	11590	31.13	16.69	47.82	74.00	-26.18	PEAK
	H	17385	26.64	24.73	51.37	74.00	-22.63	PEAK
	V	11590	32.37	16.69	49.06	74.00	-24.94	PEAK
	V	17385	27.15	24.73	51.88	74.00	-22.12	PEAK
802.11ac HT20-5180MHz	H	10360	33.88	12.56	46.44	74.00	-27.56	PEAK
	H	15540	34.08	16.45	50.53	74.00	-23.47	PEAK
	V	10360	33.56	12.56	46.12	74.00	-27.88	PEAK
	V	15540	35.15	16.45	51.60	74.00	-22.40	PEAK
802.11ac HT20-5220MHz	H	10440	34.71	12.64	47.35	74.00	-26.65	PEAK
	H	15660	31.00	16.53	47.53	74.00	-26.47	PEAK
	V	10440	33.28	12.64	45.92	74.00	-28.08	PEAK
	V	15660	31.28	16.53	47.81	74.00	-26.19	PEAK
802.11ac HT20-5240MHz	H	10480	33.34	12.68	46.02	74.00	-27.98	PEAK
	H	15720	32.17	16.54	48.71	74.00	-25.29	PEAK
	V	10480	32.01	12.68	44.69	74.00	-29.31	PEAK
	V	15720	34.21	16.54	50.75	74.00	-23.25	PEAK
802.11ac HT20-5745MHz	H	11490	32.15	16.82	48.97	74.00	-25.03	PEAK
	H	17235	30.35	22.93	53.28	74.00	-20.72	PEAK
	V	11490	31.18	16.82	48.00	74.00	-26.00	PEAK
	V	17235	28.30	22.93	51.23	74.00	-22.77	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	33.09	16.71	49.80	74.00	-24.20	PEAK
	H	17355	27.09	24.37	51.46	74.00	-22.54	PEAK
	V	11570	31.15	16.71	47.86	74.00	-26.14	PEAK
	V	17355	28.25	24.37	52.62	74.00	-21.38	PEAK
802.11ac HT20-5825MHz	H	11650	32.17	16.61	48.78	74.00	-25.22	PEAK
	H	17475	26.06	25.01	51.07	74.00	-22.93	PEAK
	V	11650	32.02	16.61	48.63	74.00	-25.37	PEAK
	V	17475	28.38	25.01	53.39	74.00	-20.61	PEAK
802.11ac HT40-5190MHz	H	10380	33.70	12.58	46.28	74.00	-27.72	PEAK
	H	15570	34.72	16.48	51.20	74.00	-22.80	PEAK
	V	10380	34.81	12.58	47.39	74.00	-26.61	PEAK
	V	15570	32.55	16.48	49.03	74.00	-24.97	PEAK
802.11ac HT40-5230MHz	H	10460	34.22	12.66	46.88	74.00	-27.12	PEAK
	H	15690	31.95	16.53	48.48	74.00	-25.52	PEAK
	V	10460	34.19	12.66	46.85	74.00	-27.15	PEAK
	V	15690	32.51	16.53	49.04	74.00	-24.96	PEAK
802.11ac HT40-5755MHz	H	11510	31.39	16.78	48.17	74.00	-25.83	PEAK
	H	17265	27.03	23.29	50.32	74.00	-23.68	PEAK
	V	11510	32.32	16.78	49.10	74.00	-24.90	PEAK
	V	17265	27.68	23.29	50.97	74.00	-23.03	PEAK
802.11ac HT40-5795MHz	H	11590	32.23	16.69	48.92	74.00	-25.08	PEAK
	H	17385	26.19	24.73	50.92	74.00	-23.08	PEAK
	V	11590	30.79	16.69	47.48	74.00	-26.52	PEAK
	V	17385	27.68	24.73	52.41	74.00	-21.59	PEAK
802.11ac HT80-5210MHz	H	10420	32.68	12.62	45.30	74.00	-28.70	PEAK
	H	15630	32.84	16.52	49.36	74.00	-24.64	PEAK
	V	10420	33.02	12.62	45.64	74.00	-28.36	PEAK
	V	15630	32.08	16.52	48.60	74.00	-25.40	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	32.11	16.73	48.84	74.00	-25.16	PEAK
	H	17325	26.18	24.01	50.19	74.00	-23.81	PEAK
	V	11550	29.52	16.73	46.25	74.00	-27.75	PEAK
	V	17325	25.51	24.01	49.52	74.00	-24.48	PEAK
The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:								
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.								
Average measurement was not performed if peak level lower than average limit. No any other emissions level very low which are attenuated less than 20dB below the limit. According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part. Hence there no other emissions have been reported.								

8. FREQUENCY STABILITY

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

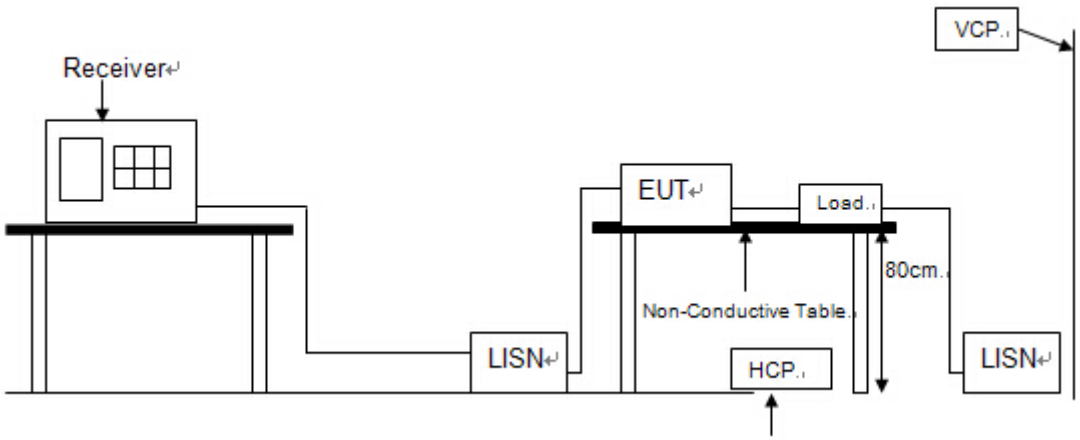
Frequency stability versus Temp.					
Power Supply: DC 7.6V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5180.0741	5180.1003	5180.6396	5180.1138
	5200	5200.0016	5200.6935	5199.8476	5199.4308
	5220	5219.9560	5220.3314	5220.6368	5220.2346
	5240	5239.8988	5240.7358	5240.2505	5239.5316
	5745	5745.1951	5745.0849	5745.0600	5745.3571
	5785	5784.9732	5784.9559	5784.9277	5785.1768
	5825	5824.9918	5825.0540	5825.1739	5824.9597
-20	5180	5179.7222	5180.4064	5180.6126	5180.0461
	5200	5199.6713	5200.4477	5200.2234	5199.7106
	5220	5219.4031	5220.4425	5220.1452	5219.5743
	5240	5239.1662	5240.2516	5240.4572	5239.0524
	5745	5744.9611	5744.7567	5744.9584	5744.8238
	5785	5784.8864	5785.2259	5785.0144	5784.9259
	5825	5824.8172	5825.1680	5824.9868	5824.9708
-10	5180	5178.9318	5180.3327	5180.0977	5178.7347
	5200	5199.8544	5200.6695	5200.8979	5198.9866
	5220	5219.5675	5220.7760	5220.2163	5219.5399
	5240	5239.4569	5240.5718	5240.8737	5239.2252
	5745	5744.8572	5744.9181	5745.1034	5744.9029
	5785	5784.9643	5784.8683	5785.0422	5784.8565
	5825	5824.7686	5824.9003	5824.9056	5824.9408
0	5180	5180.2786	5180.6219	5180.4852	5179.3642
	5200	5199.5399	5200.6439	5200.5586	5199.8575
	5220	5219.2974	5219.8583	5220.1338	5219.8785
	5240	5239.5457	5240.8078	5240.3454	5239.5746
	5745	5744.9279	5745.1077	5744.9533	5745.1306
	5785	5785.0899	5784.9652	5784.9094	5784.8332
	5825	5824.9910	5825.1512	5824.9429	5824.9450

10	5180	5179.8899	5180.1371	5180.2616	5179.9041
	5200	5199.8938	5200.1108	5200.5087	5199.6980
	5220	5219.1821	5220.2817	5220.1951	5220.0177
	5240	5239.8240	5240.4470	5240.5999	5239.6507
	5745	5744.8184	5745.1999	5745.3272	5745.1565
	5785	5784.9161	5784.9683	5785.0183	5784.9398
	5825	5825.2121	5825.0638	5824.9222	5825.0564
20	5180	5179.8680	5180.1503	5180.3635	5179.4424
	5200	5199.6200	5200.2287	5200.8115	5199.3721
	5220	5219.3339	5220.8365	5220.3664	5219.5081
	5240	5239.1761	5240.7809	5240.3058	5239.4878
	5745	5744.8771	5744.8885	5745.0890	5744.8472
	5785	5784.8495	5784.8356	5784.7591	5785.0136
	5825	5824.9306	5824.8237	5825.2508	5824.9761
30	5180	5179.6487	5179.9847	5180.1294	5179.9039
	5200	5199.3387	5200.2560	5200.4051	5199.5070
	5220	5219.3633	5220.4973	5220.8949	5219.5145
	5240	5239.5025	5240.1858	5240.4442	5239.8201
	5745	5744.7758	5744.8915	5744.9314	5745.0106
	5785	5785.1106	5784.7558	5784.8084	5784.6477
	5825	5825.0301	5825.1138	5824.8015	5824.8222
40	5180	5179.6910	5180.7786	5180.3793	5180.1246
	5200	5199.2990	5200.5808	5200.9571	5199.8512
	5220	5219.3532	5220.6480	5220.8130	5219.9912
	5240	5239.1903	5241.0182	5240.9592	5240.0860
	5745	5745.1557	5745.2019	5745.2657	5745.2473
	5785	5785.0044	5785.0899	5785.0415	5785.0923
	5825	5825.1575	5825.0004	5824.9834	5824.8148
50	5180	5179.3208	5180.7290	5180.4393	5179.3510
	5200	5199.5120	5200.9150	5200.2636	5199.2294
	5220	5219.6864	5220.8810	5220.4108	5219.3029
	5240	5239.3662	5240.0957	5240.0020	5239.3777
	5745	5744.9629	5744.8923	5745.0692	5744.9316
	5785	5784.9347	5785.0086	5785.0750	5784.8147
	5825	5825.0144	5824.8309	5825.3839	5825.0750

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	5180.0014	5180.0714	5180.2093	5180.2102
	5200	5200.1501	5199.9972	5199.7702	5200.0537
	5220	5220.0080	5220.5778	5219.9127	5219.9987
	5240	5240.7779	5240.8652	5240.0121	5239.4609
	5745	5745.1286	5744.9834	5744.8558	5745.2375
	5785	5784.6586	5784.9451	5784.9139	5785.0708
	5825	5824.8746	5824.7585	5824.8137	5825.0972
7.6	5180	5181.1700	5180.2065	5179.1541	5179.2397
	5200	5200.1663	5200.4451	5199.9692	5199.1768
	5220	5220.2920	5220.2298	5219.9485	5219.4548
	5240	5239.9241	5240.8256	5239.1443	5239.5998
	5745	5744.8042	5744.9345	5745.1449	5744.8599
	5785	5784.6803	5784.9506	5785.1807	5784.8611
	5825	5824.9064	5824.9286	5824.8314	5824.9739
8.4	5180	5180.0900	5180.5843	5179.2346	5179.2616
	5200	5200.2717	5200.3681	5199.1390	5199.1198
	5220	5219.8272	5220.6265	5218.9904	5219.1188
	5240	5240.6987	5240.4365	5239.5912	5239.2127
	5745	5744.6883	5744.8120	5744.9913	5744.8250
	5785	5784.6551	5784.7476	5784.8370	5784.8582
	5825	5824.7470	5825.0200	5824.6991	5824.9760

9. POWER LINE CONDUCTED EMISSION

9.1 Block diagram of test setup



9.2 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.

9.3 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.

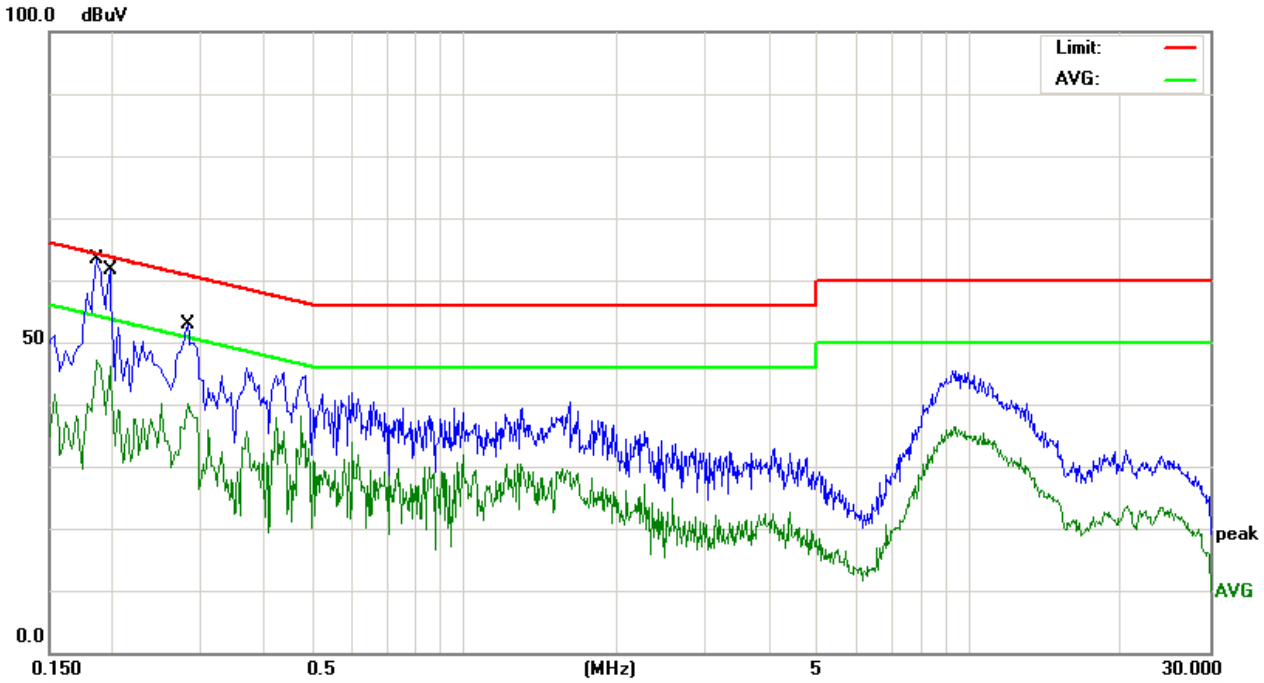
9.4 Test Result

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:	netbook	Model No.:	ES1AU11
Temperature:	23℃	Relative Humidity:	52%
Probe:	N	Test Power:	AC 120V/60Hz
Test Time:	2020-02-20	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	*	0.1864	49.38	11.30	60.68	64.19	-3.51	QP
2		0.1864	35.79	11.30	47.09	54.19	-7.10	AVG
3		0.1976	46.08	11.17	57.25	63.71	-6.46	QP
4		0.1976	27.67	11.17	38.84	53.71	-14.87	AVG
5		0.2829	38.56	10.70	49.26	60.73	-11.47	QP
6		0.2829	27.89	10.70	38.59	50.73	-12.14	AVG

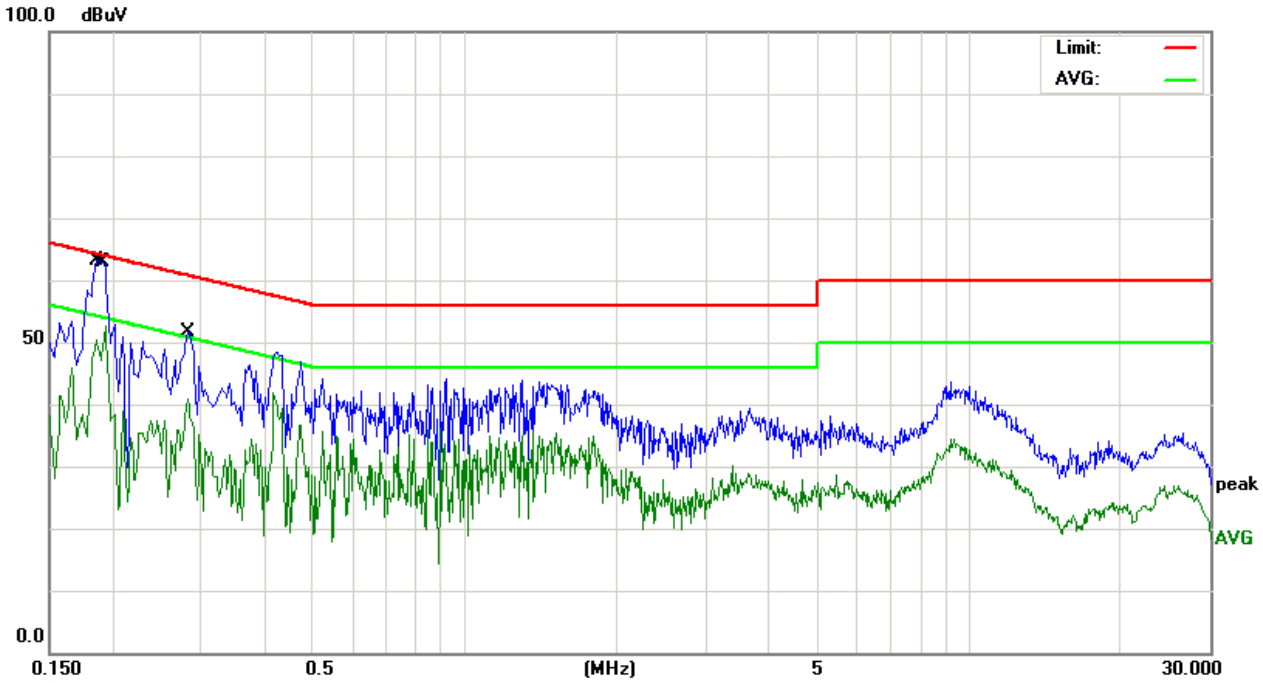
The test result is calculated as the following:

(1) Result = Reading + Correct Factor

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

(3) Margin = Result - Limit

EUT:	netbook	Model No.:	ES1AU11
Temperature:	23℃	Relative Humidity:	52%
Probe:	L1	Test Power:	AC 120V/60Hz
Test Time:	2020-02-20	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	*	0.1867	49.22	11.30	60.52	64.18	-3.66	QP
2		0.1867	35.69	11.30	46.99	54.18	-7.19	AVG
3		0.1924	46.77	11.23	58.00	63.93	-5.93	QP
4		0.1940	32.99	11.21	44.20	53.86	-9.66	AVG
5		0.2824	38.33	10.72	49.05	60.74	-11.69	QP
6		0.2824	27.45	10.72	38.17	50.74	-12.57	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

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 1.12 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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