REPORT No.: SZ16120062W10

FCC RF TEST REPORT

APPLICANT	:	Beijing LLVision Technology Co., ltd
PRODUCT NAME	:	Smart Glass Host
MODEL NAME	:	GLXSS Pro
TRADE NAME	:	GLXSS
BRAND NAME	:	GLXSS
FCC ID	:	2AKLNG20A1
STANDARD(S)	:	47 CFR Part 15 Subpart E
ISSUE DATE	:	2017-02-08

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2017-02-08	First edition

TEST REPORT DECLARATION

Applicant	Beijing LLVision Technology Co., ltd
Applicant Address	Room903, Unit A, The Spaces International Center, No.8 Dongdaqiao Road, Chaoyang District, Beijing, P.R. China
Manufacturer	Huizhou BYD Electronic Company Limited
Manufacturer Address	Xiang shui River Daya Bay Economic Development Zone Huizhou Guangdong
Product Name	Smart Glass Host
Model Name	GLXSS Pro
Brand Name	GLXSS
HW Version	B2
SW Version	G20A_V03.1201
Test Standards	47 CFR Part 15 Subpart E
Test Date	2016-12-20 to 2017-02-08
Test Result	PASS

Tested by : Li Jingzong
Li Jingzong

Reviewed by : Qiu Xiaojun
Qiu Xiaojun

Approved by : Peng Huarui
Peng Huarui

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type.....:	Smart Glass Host
Serial No. .....:	(n.a, marked #1 by test site)
Hardware Version.....:	B2
Software Version.....:	G20A_V03.1201
Applicant.....:	Beijing LLVision Technology Co., ltd Room903, Unit A, The Spaces International Center, No.8 Dongdaqiao Road, Chaoyang District, Beijing, P.R. China
Manufacturer .....:	Huizhou BYD Electronic Company Limited Xiang shui River Daya Bay Economic Development Zone Huizhou Guangdong
Frequency Range.....:	802.11b/g/n: 2.400GHz - 2.4835GHz 802.11a/n: 5.150GHz- 5.250GHz 5.25 GHz -5.35 GHz 5.47 GHz -5.725 GHz 5.725GHz- 5.850GHz
Channel Number .....:	Refer Note(2)
Modulation Type.....:	DSSS, OFDM
Antenna Type.....:	Ceramic Antenna
Antenna Gain.....:	1.66 dBi

Note 1: The U-NII band is applicable to this report, another bands of operation (2.4GHz) is documented in a separate report.

Note 2 : The following tables are the channel number and frequency of the EUT, the black bold channels were selected for test.

20MHz Bandwidth:

Frequency Range	5150~5250MHz				5250~5350MHz			
Channel Number	**36**	40	**44**	**48**	**52**	56	**60**	**64**
Frequency (MHz)	**5180**	5200	**5220**	**5240**	**5260**	5280	**5300**	**5320**

Frequency Range	5470~5725MHz										
Channel Number	**100**	105	108	112	116	**120**	124	128	132	136	**140**
Frequency (MHz)	**5500**	5520	5540	5560	5580	**5600**	5620	5640	5660	5680	**5700**

Frequency Range	5725~5850MHz				
Channel Number	**149**	153	**157**	161	**165**
Frequency (MHz)	**5745**	5765	**5785**	5805	**5825**

40MHz Bandwidth:

Frequency Range	5150~5250 MHz		5250~5350 MHz	
Channel Number	**38**	**46**	**54**	**62**
Frequency (MHz)	**5190**	**5230**	**5270**	**5310**

Frequency Range	5470~5725MHz					
Channel Number	**102**	110	118	**126**	134	**142**
Frequency (MHz)	**5510**	5550	5590	**5630**	5670	**5710**

Frequency Range	5725~5850 MHz	
Channel Number	**151**	**159**
Frequency (MHz)	**5755**	**5795**

Note 3: During test, the duty cycle of the EUT was setting to 100%.

Note 4: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 5: The antenna connector of EUT is designed with permanent attachment and no consideration of replacement.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart E (UNII band) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 (5-1-14 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.203	Antenna Requirement	**PASS**
2	15.407(a) (e)	Emission Bandwidth	**PASS**
3	15.407(a)	Maximum conducted output Power	**PASS**
4	15.407(a)	Peak Power spectral density	**PASS**
5	15.407(b)	Restricted Frequency Bands	**PASS**
6	15.407(g)	Frequency Stability	**PASS**
7	15.407(h)	TPC and DFS	**PASS** (Note)
8	15.207	Conducted Emission	**PASS**
9	15.407(b)	Radiated Emission	**PASS**
10	15.407(f)	RF exposure evaluation	**PASS**
Note: EUT is a Client Device Without Radar Detection, WIFI hotspot does not support U-NII band; A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.			

The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2013.

These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 v01r02 (08/04/2016) and KDB905462 D07 v01r01 (08/04/2016).

1.3 Test Environment Conditions

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

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR PART 15E REQUIREMENTS

2.1 Antenna requirement

2.1.1 Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

2.1.2 Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

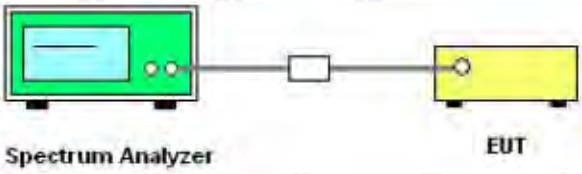
2.2 Emission Bandwidth

2.2.1 Requirement

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement. Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

2.2.2 Test Description

A. Test Set:



The EUT which is powered by the battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

B. Test Procedure

1. KDB 789033 Section C) 1) Emission Bandwidth was used in order to prove compliance

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

2) Set the VBW > RBW.

3) Detector = Peak.

4) Trace mode = max hold.

5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. KDB 789033 Section C) 2) minimum emission bandwidth for the band 5.725-5.85GHz was used in order to prove compliance.

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

2.2.3 Test Result

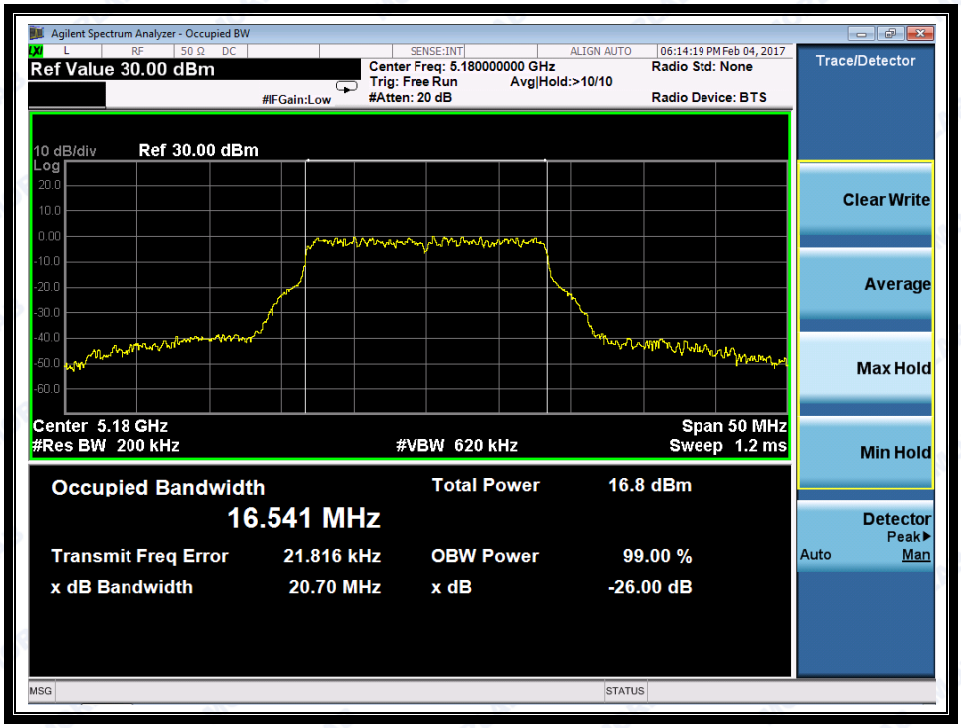
The lowest, middle and highest channels are selected to perform testing to record the 26 dB bandwidth of the Module.

2.2.3.1 802.11a-20MHz Test mode

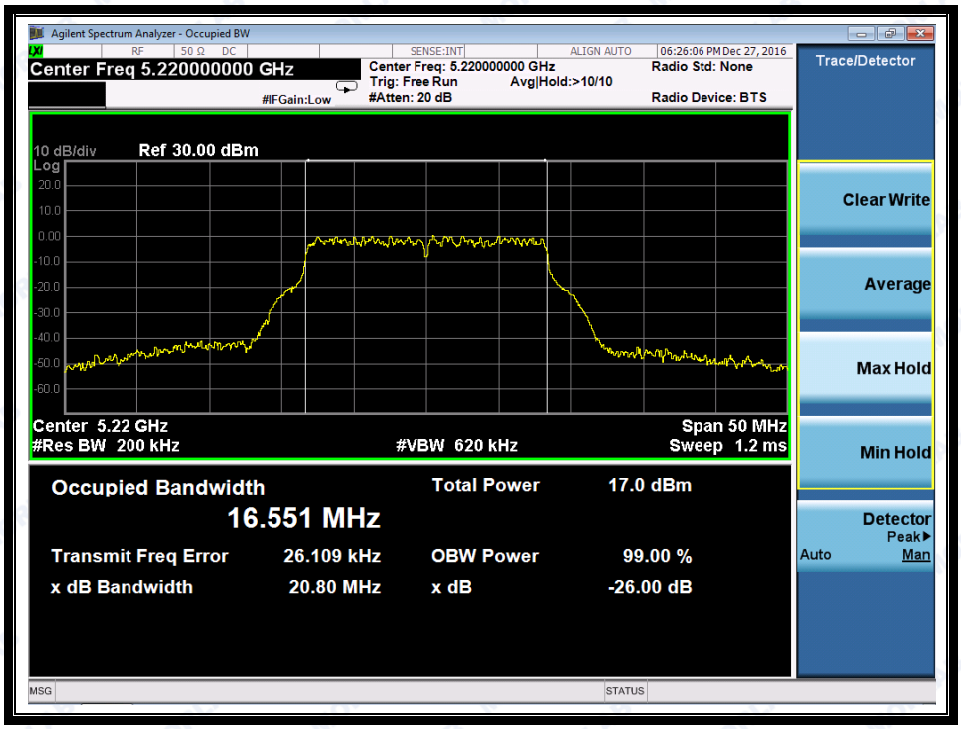
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	20.70
44	5220	20.80
48	5240	20.81
52	5260	20.67
60	5300	20.71
64	5320	20.80
100	5500	20.89
120	5600	20.88
140	5700	20.98
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	16.58
157	5785	16.58
165	5825	16.58

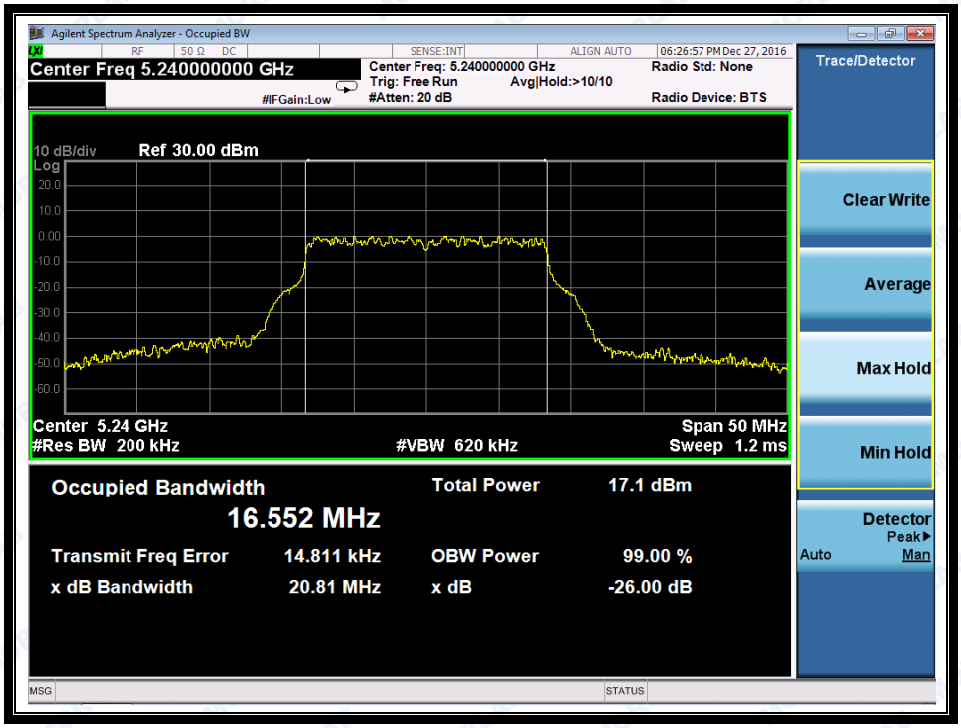
B. Test Plots



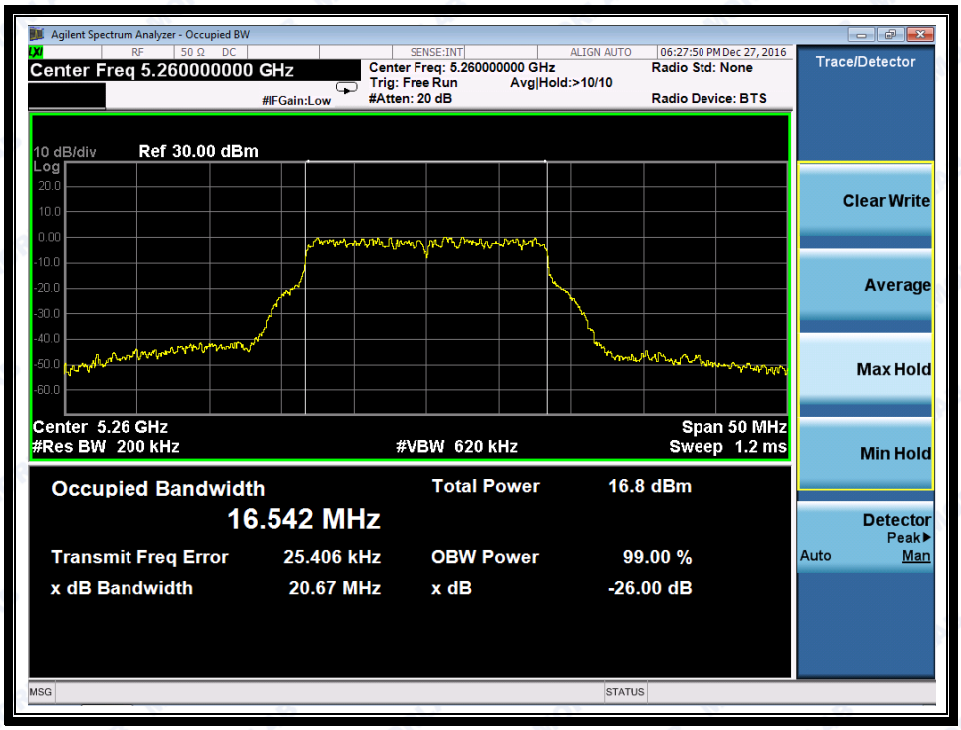
(Channel 36: 5180MHz @ 802.11a)



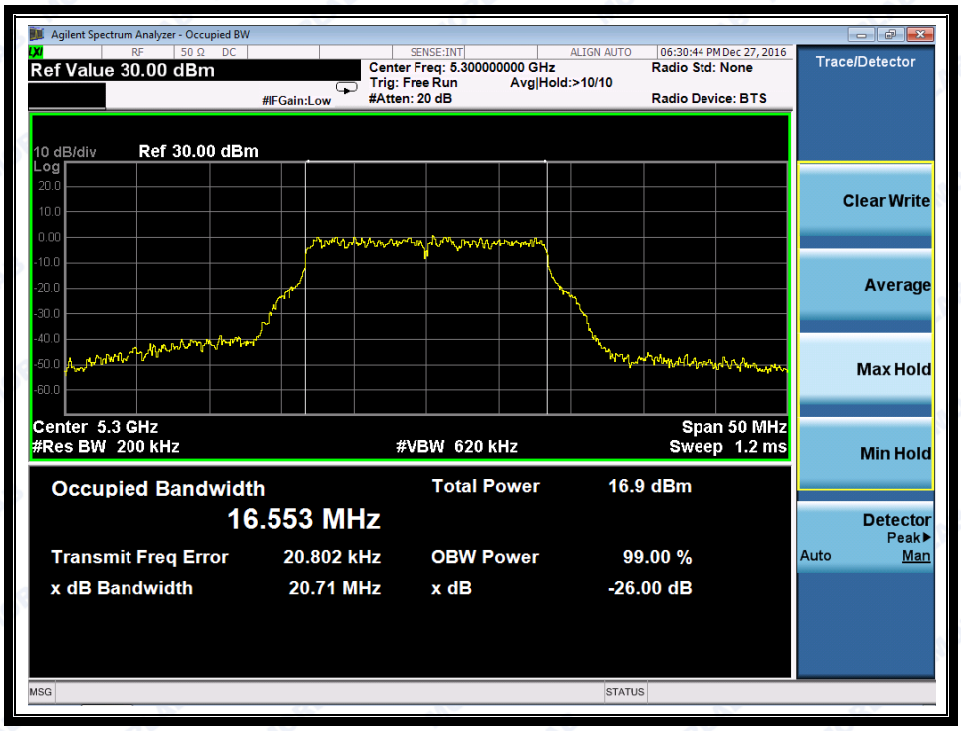
(Channel 44: 5220 MHz @ 802.11a)



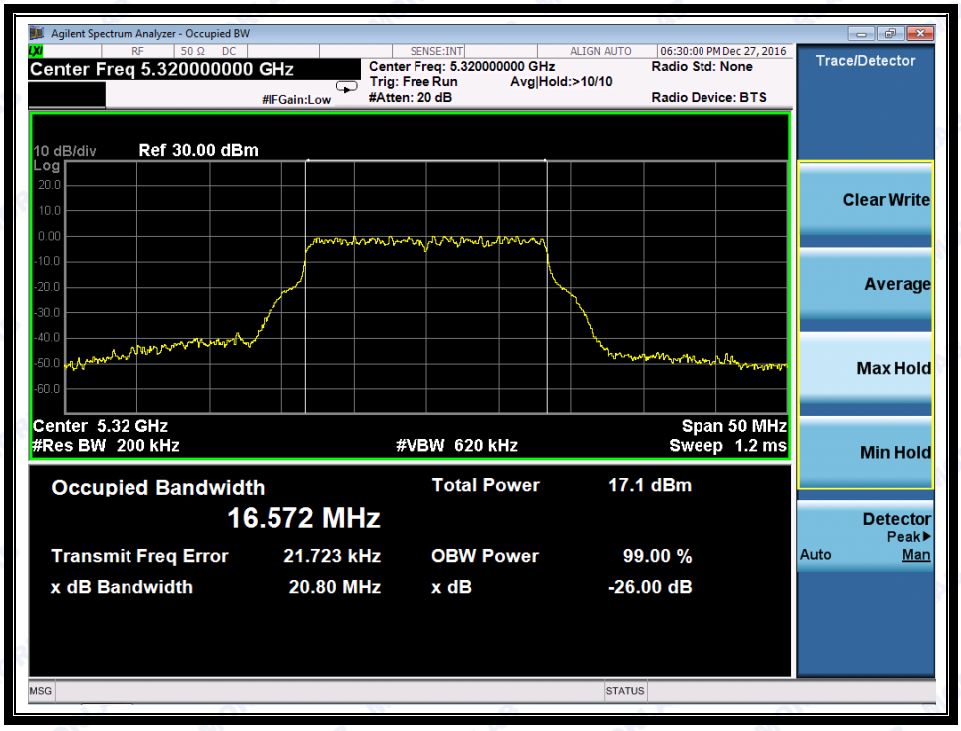
(Channel 48: 5240MHz @ 802.11a)



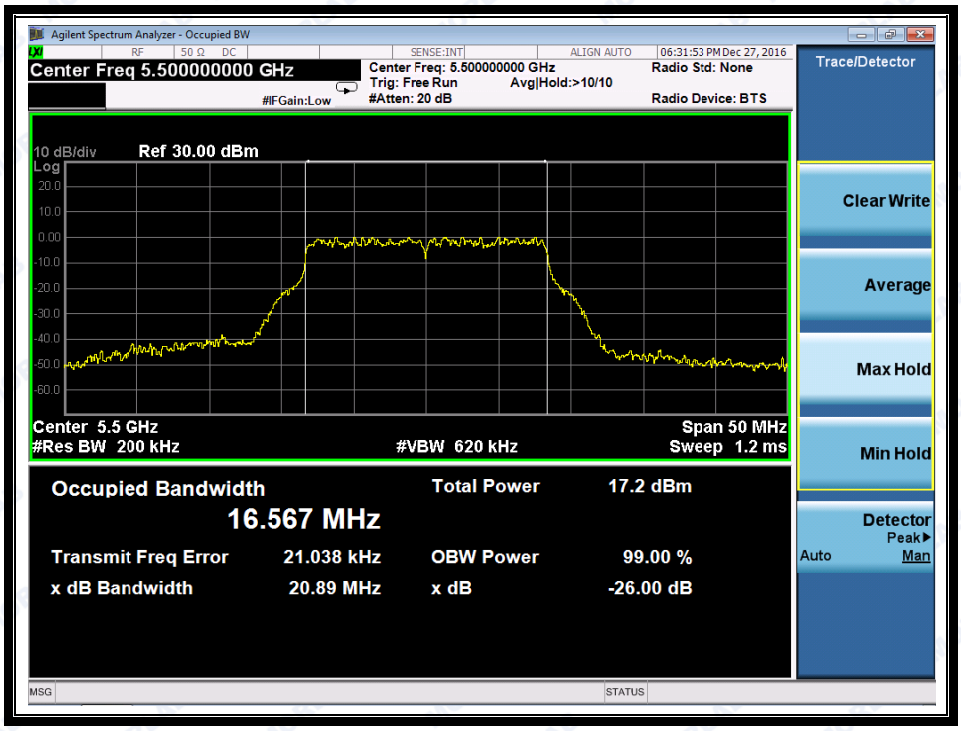
(Channel 52: 5260MHz @ 802.11a)



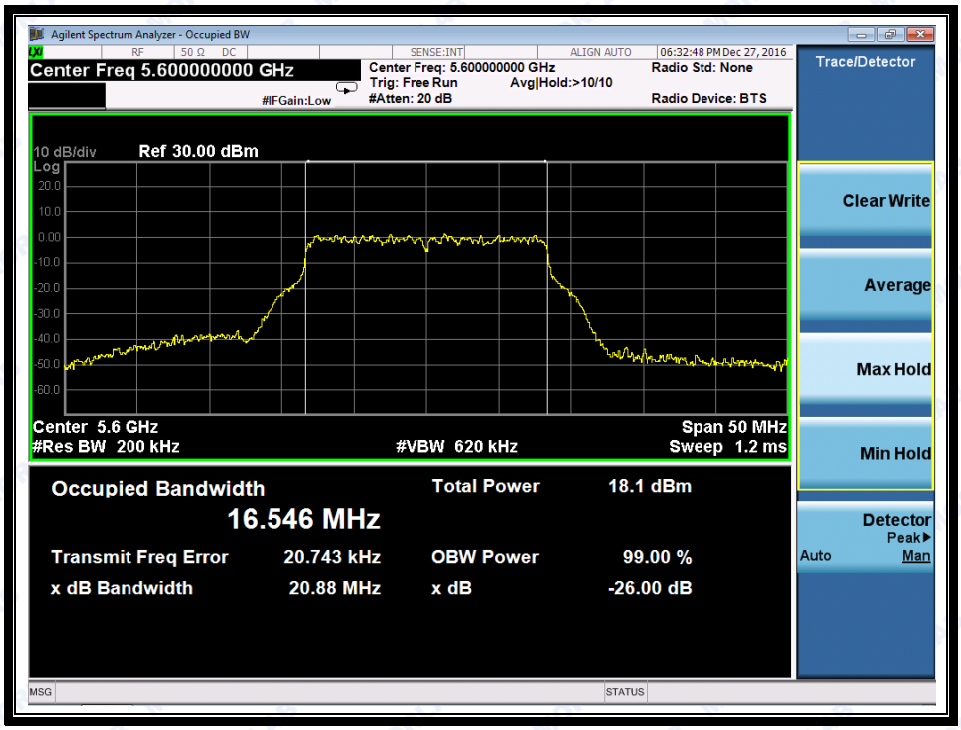
(Channel 60: 5300MHz @ 802.11a)



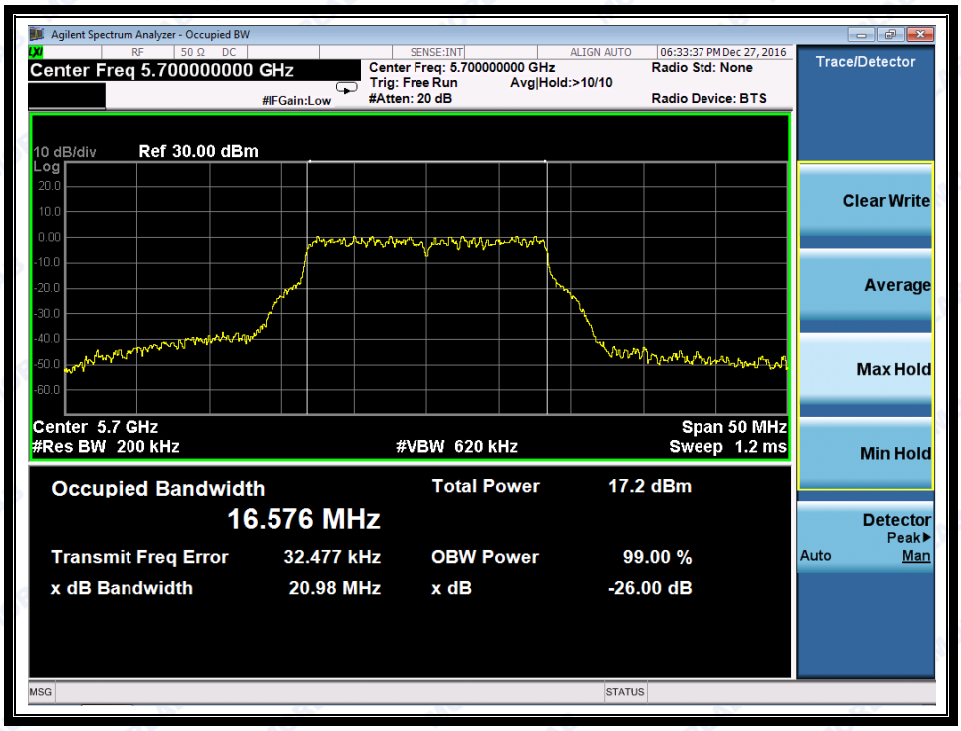
(Channel 64: 5320MHz @ 802.11a)



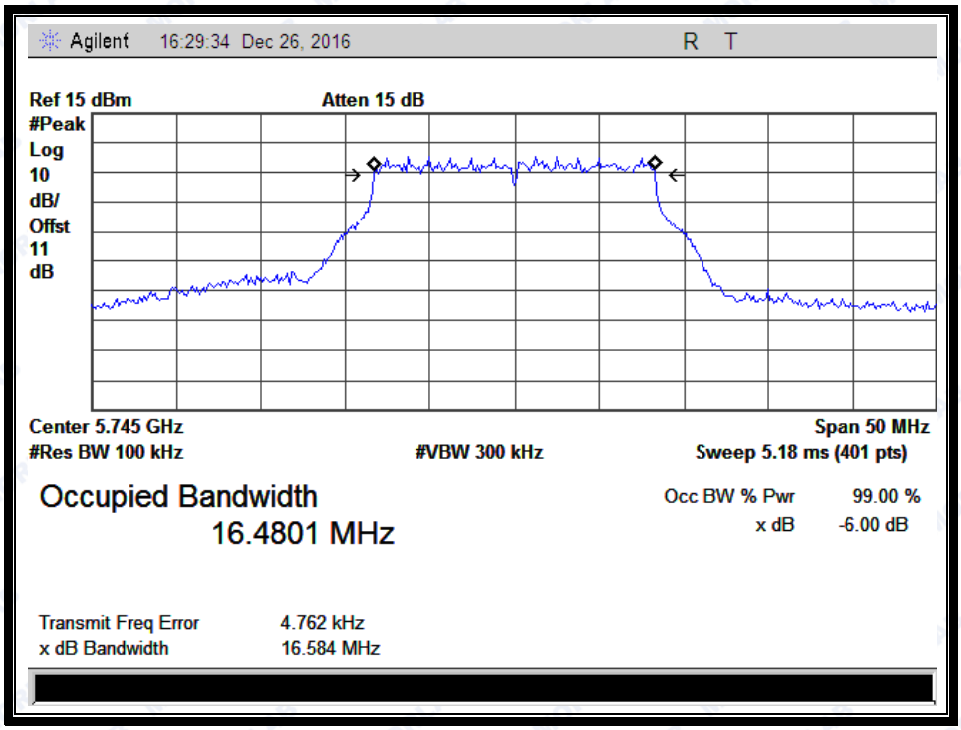
(Channel 100: 5500MHz @ 802.11a)



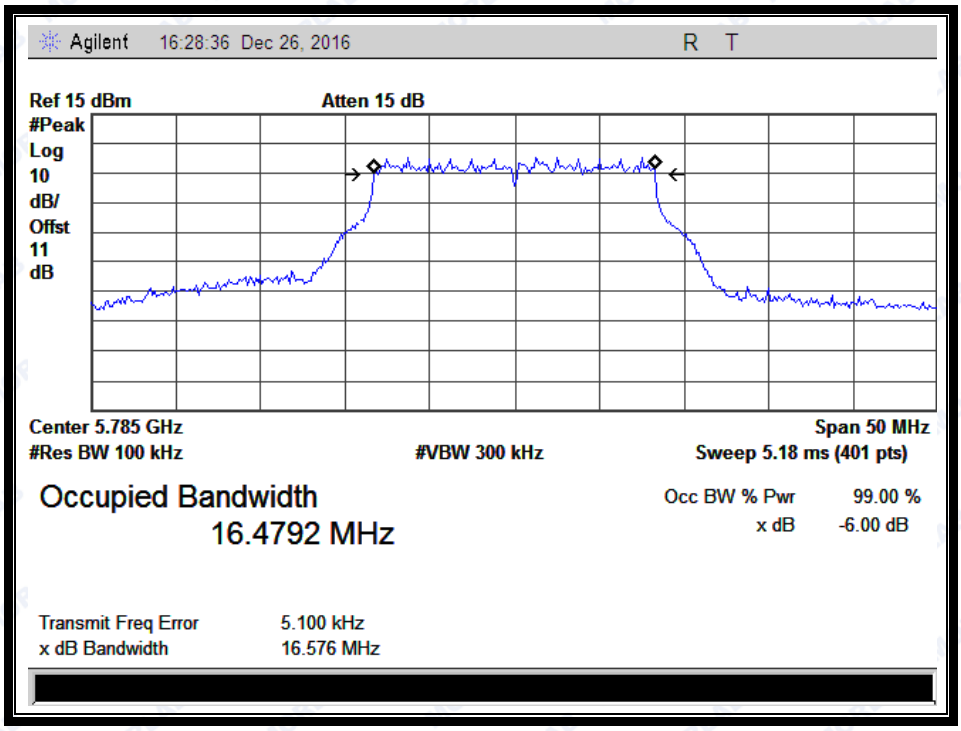
(Channel 120: 5600MHz @ 802.11a)



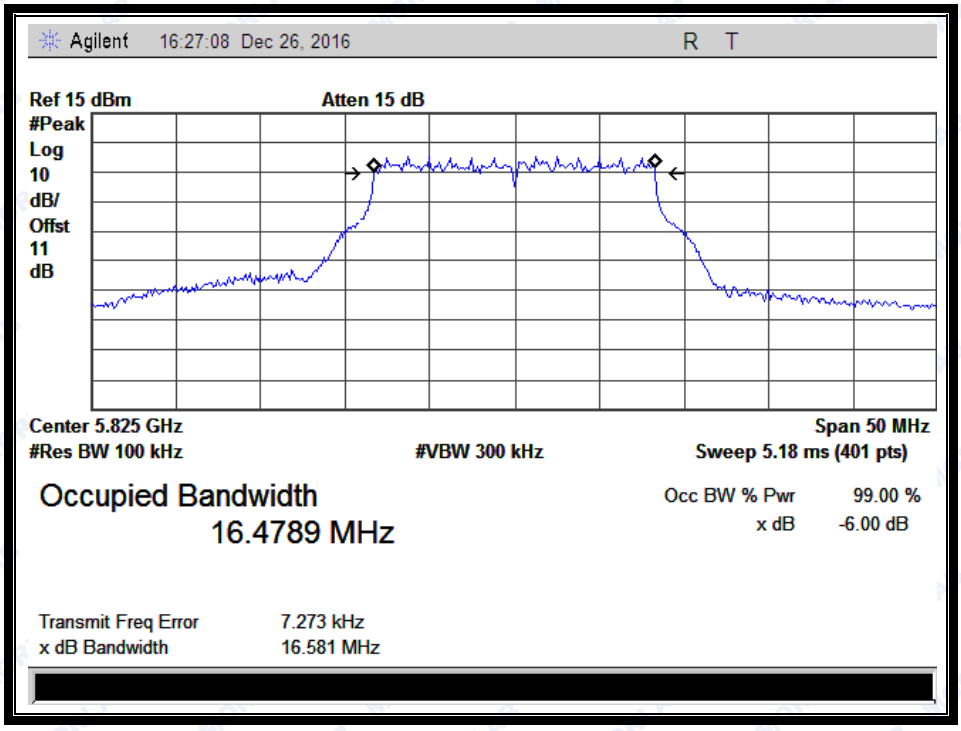
(Channel 140: 5700MHz @ 802.11a)



(Channel 149: 5745MHz @ 802.11a)



(Channel 157: 5785MHz @ 802.11a)



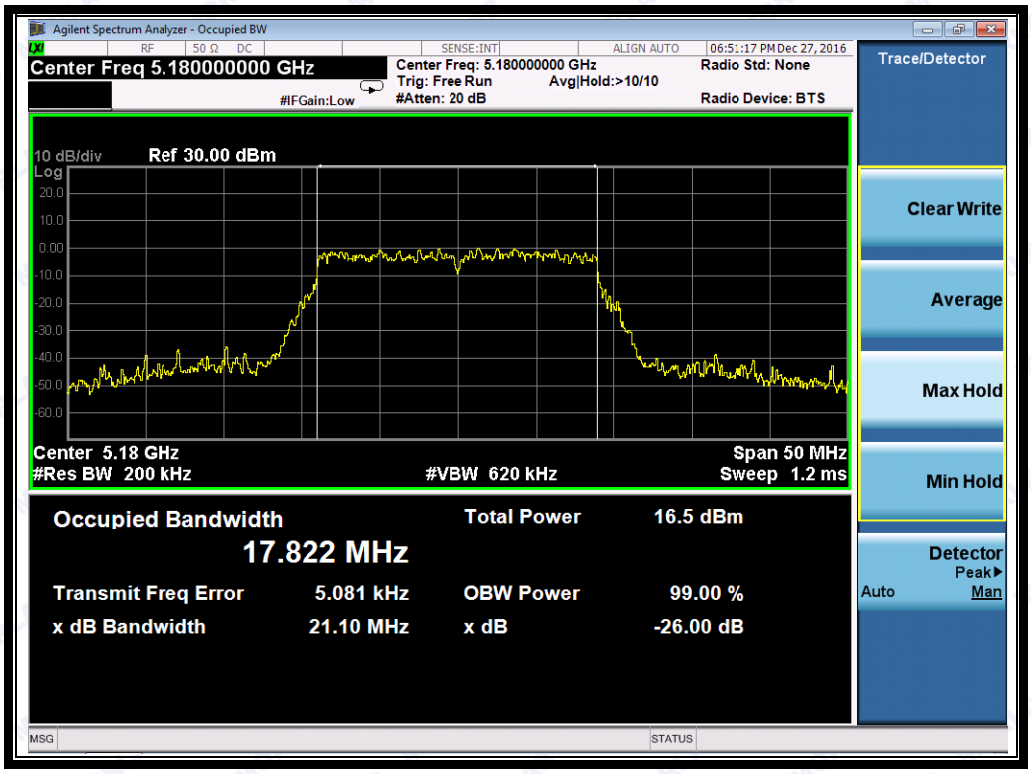
(Channel 165: 5825MHz @ 802.11a)

2.2.3.2 802.11n-20MHz Test mode

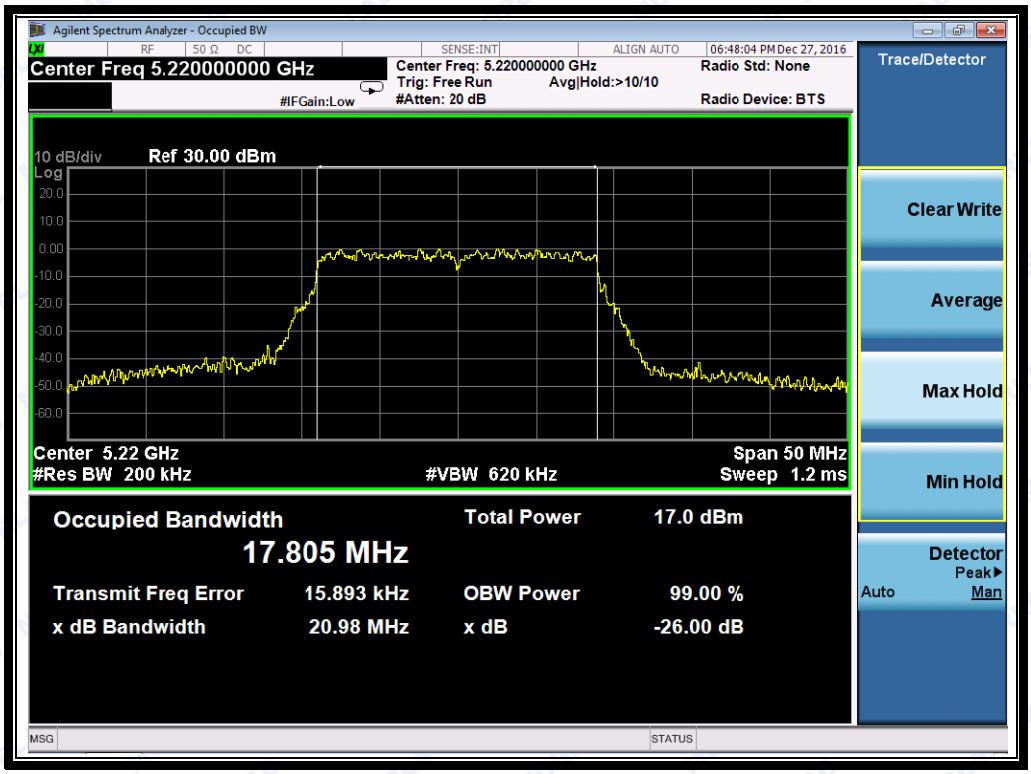
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	21.10
44	5220	20.98
48	5240	21.42
52	5260	21.28
60	5300	21.14
64	5320	20.99
100	5500	21.38
120	5600	21.12
140	5700	21.13
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	17.87
157	5785	17.78
165	5825	17.79

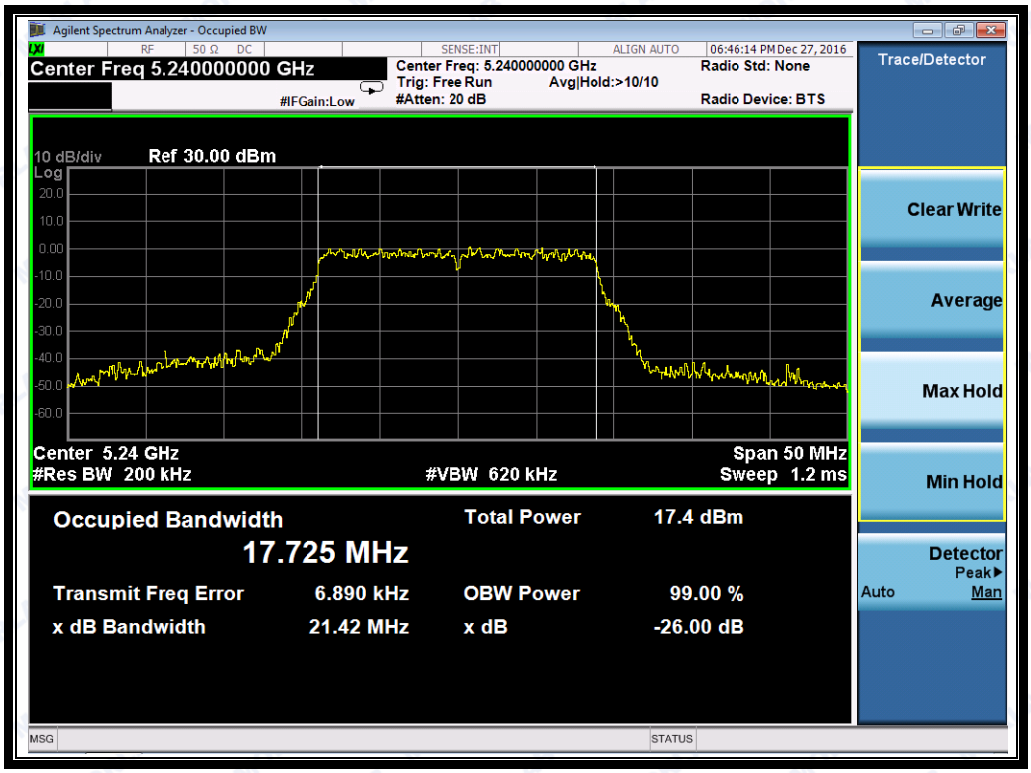
B. Test Plots



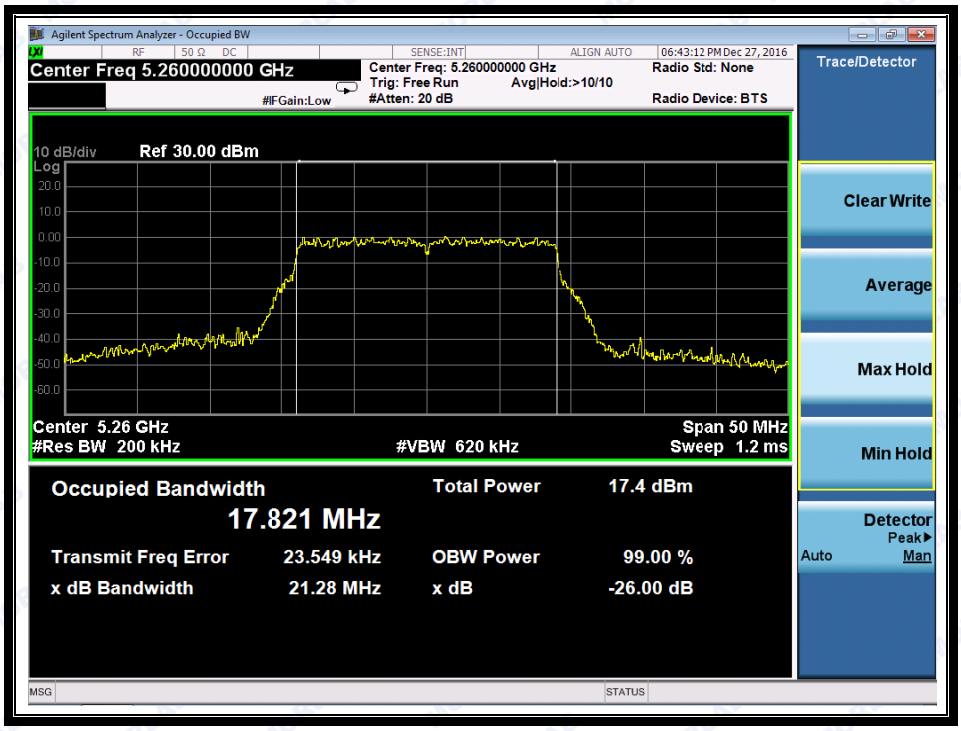
(Channel 36: 5180MHz @ 802.11n-20MHz)



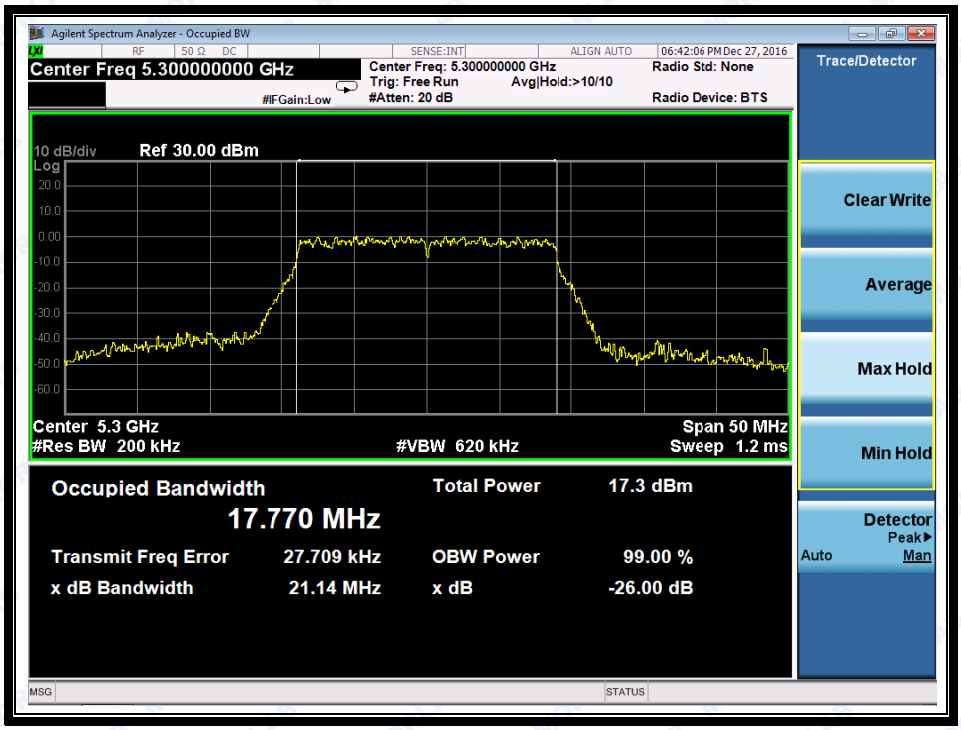
(Channel 44: 5220 MHz @ 802.11n-20MHz)



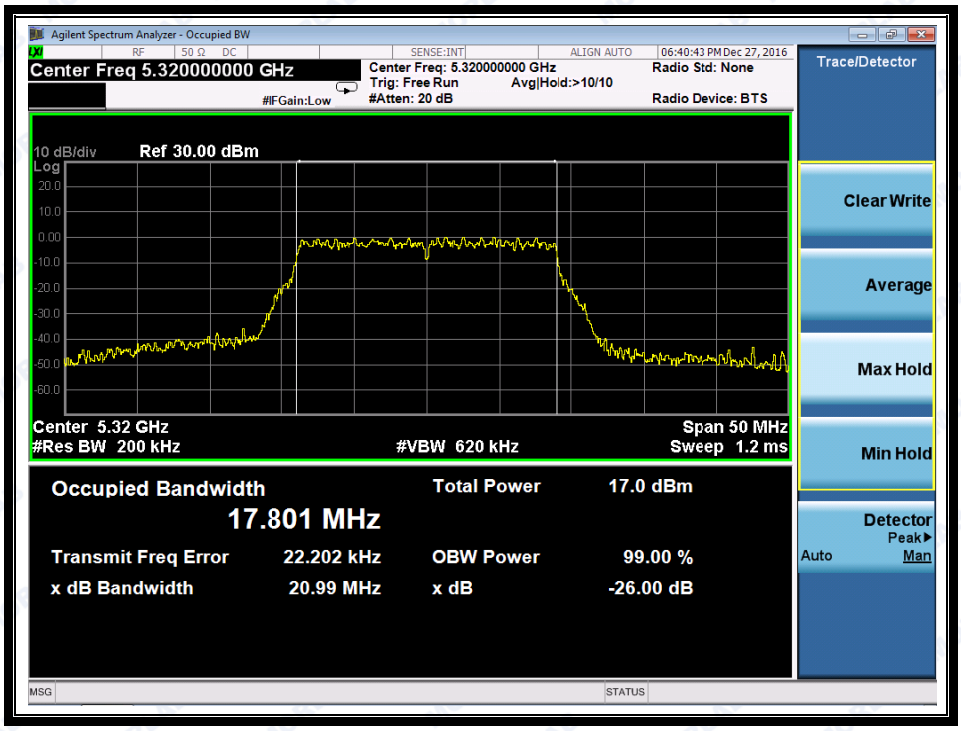
(Channel 48: 5240MHz @ 802.11n-20MHz)



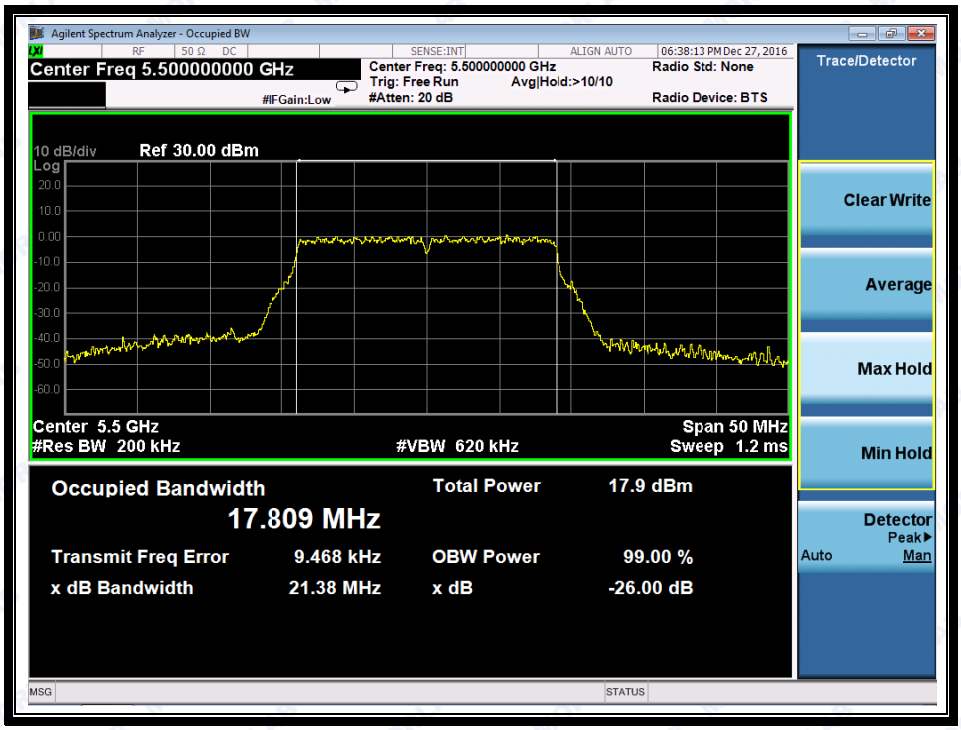
(Channel 52: 5260MHz @ 802.11n-20MHz)



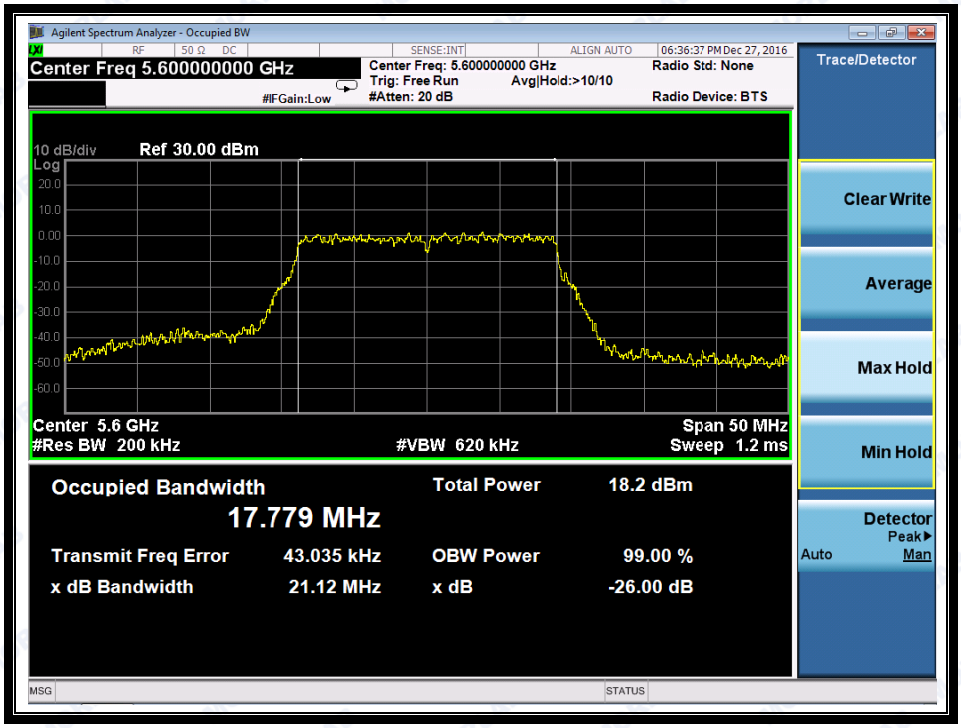
(Channel 60: 5300MHz @ 802.11n-20MHz)



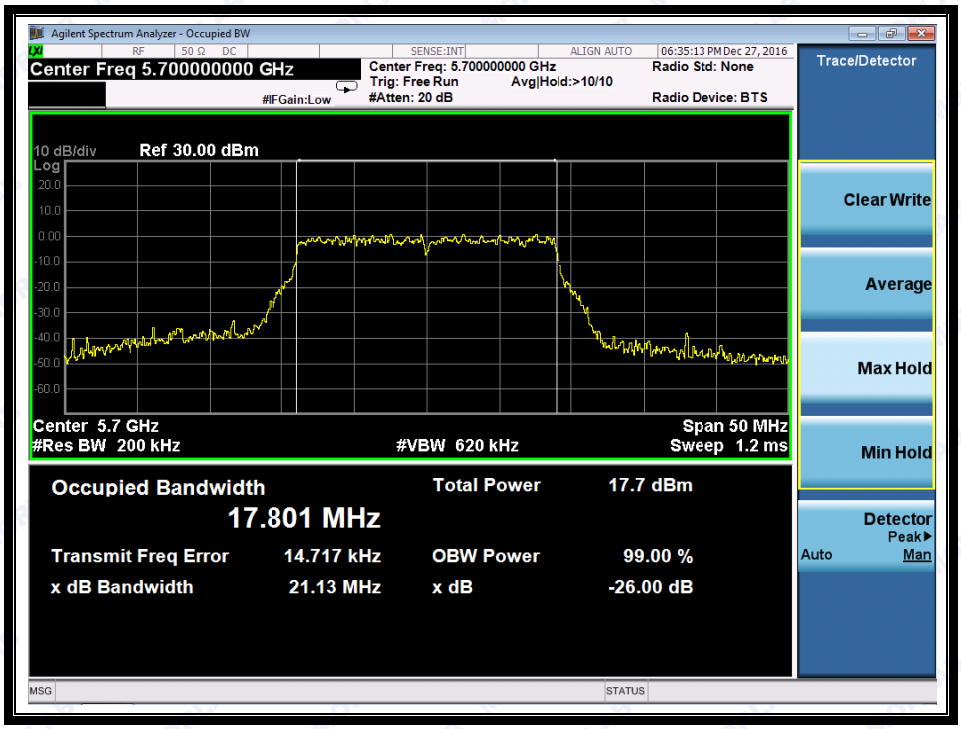
(Channel 64: 5320MHz @ 802.11n-20MHz)



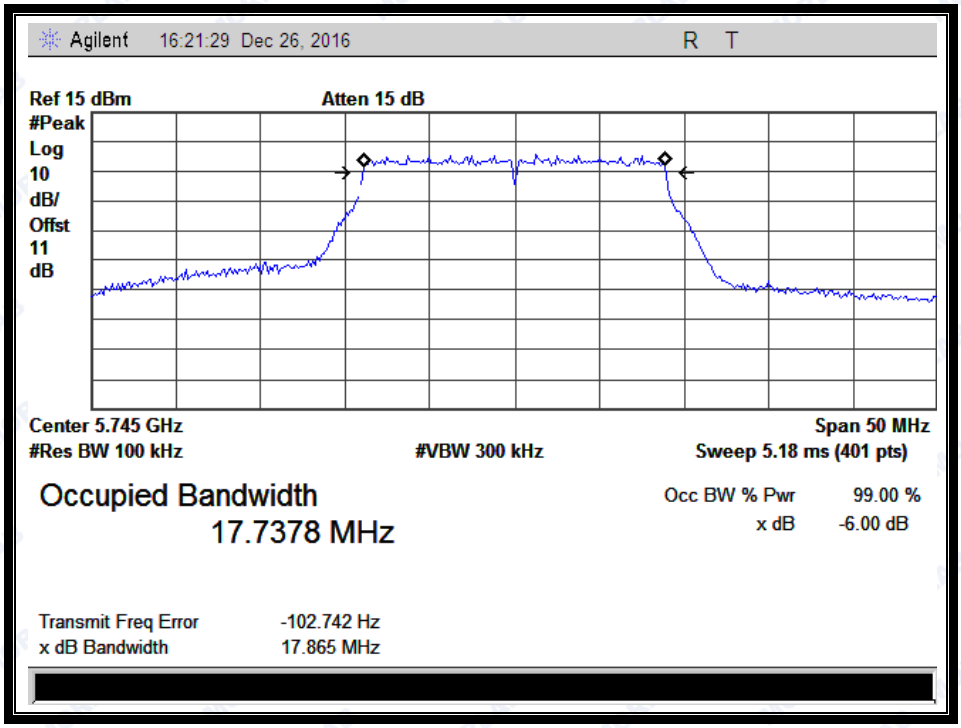
(Channel 100: 5500MHz @ 802.11n-20MHz)



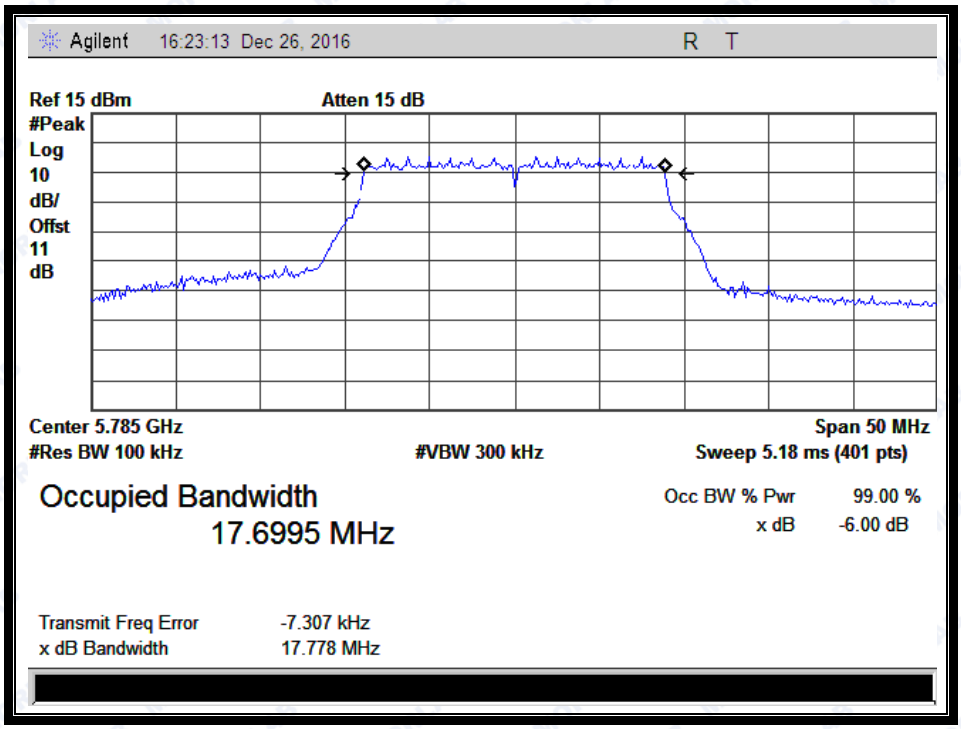
(Channel 120: 5600MHz @ 802.11n-20MHz)



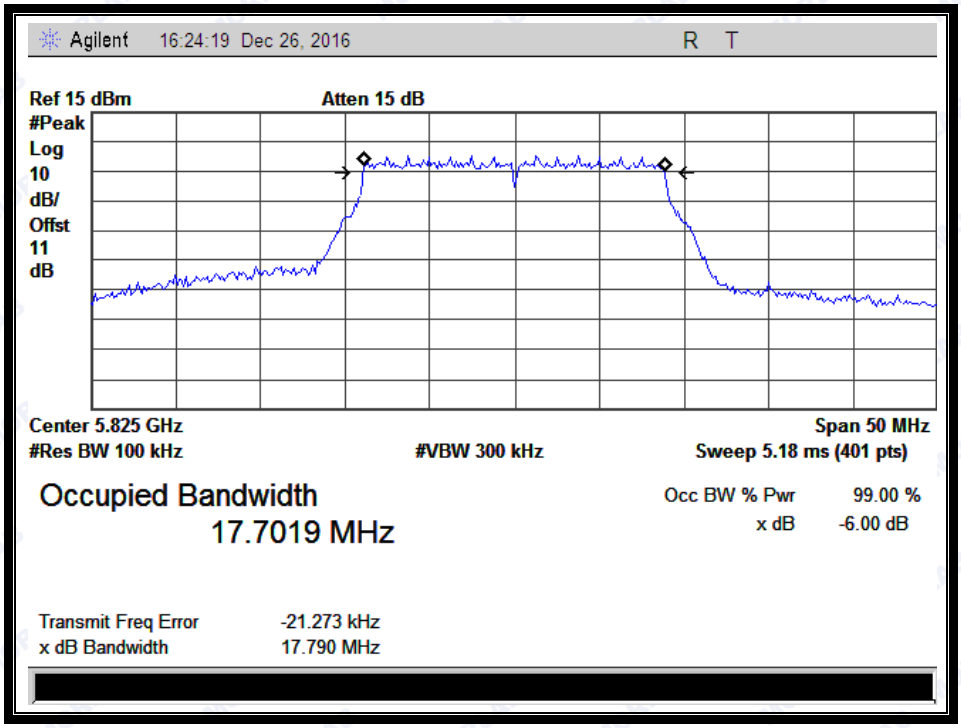
(Channel 140: 5700MHz @ 802.11n-20MHz)



(Channel 149: 5745MHz @ 802.11n-20MHz)



(Channel 157: 5785MHz @802.11n-20MHz)



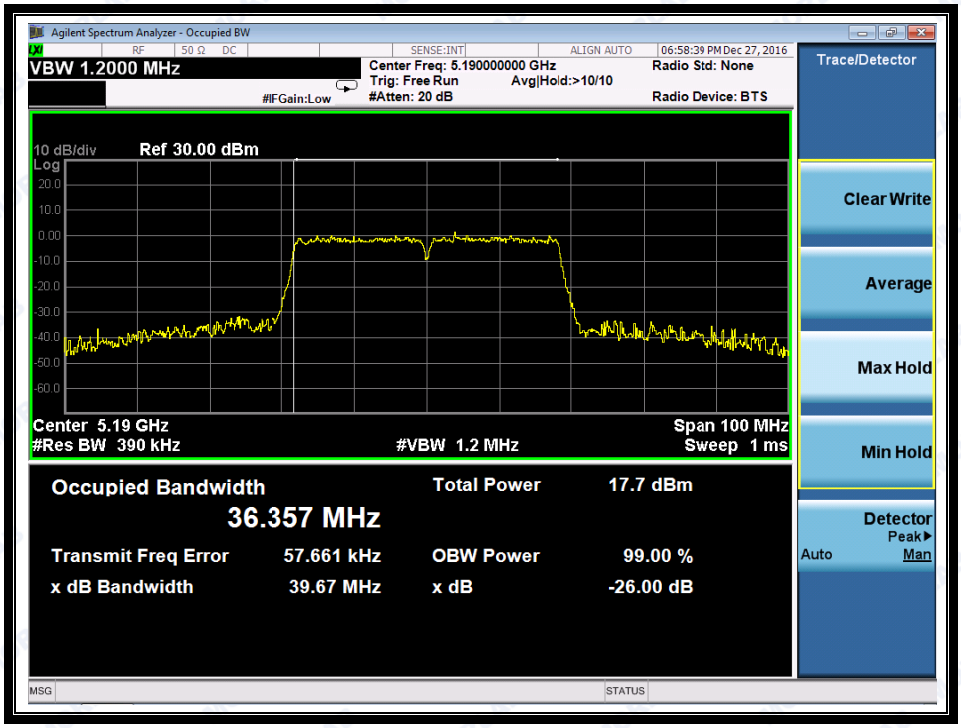
(Channel 165: 5825MHz @ 802.11n-20MHz)

2.2.3.3 802.11n-40MHz Test mode

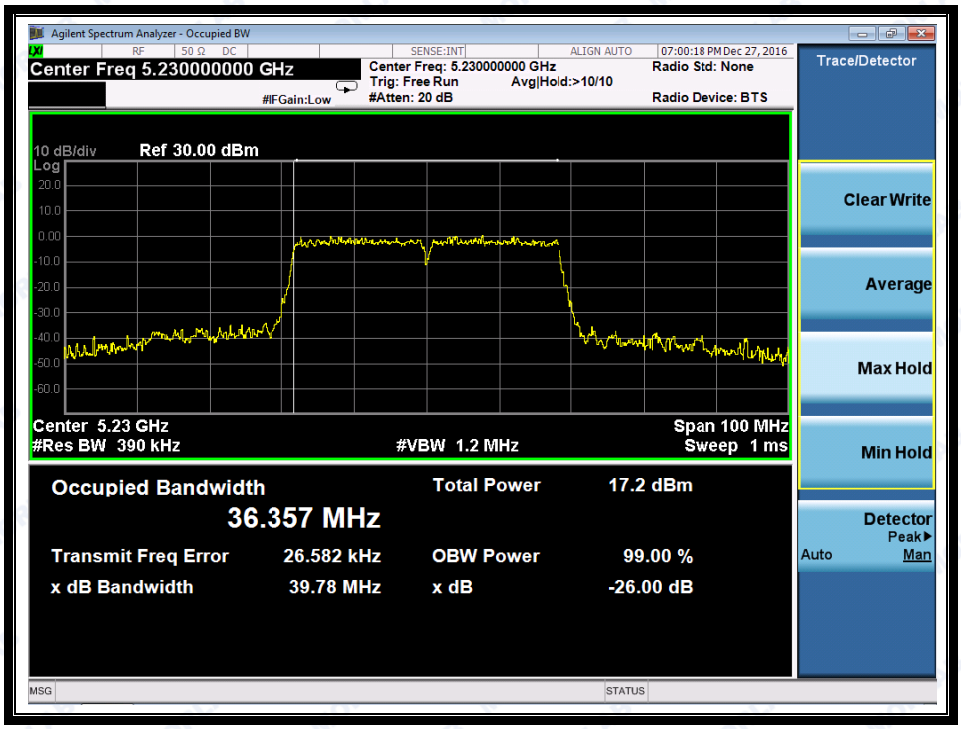
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	39.67
46	5230	39.78
54	5270	39.33
62	5310	39.49
102	5510	39.49
126	5630	39.58
142	5710	39.52
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
151	5755	36.62
159	5795	36.72

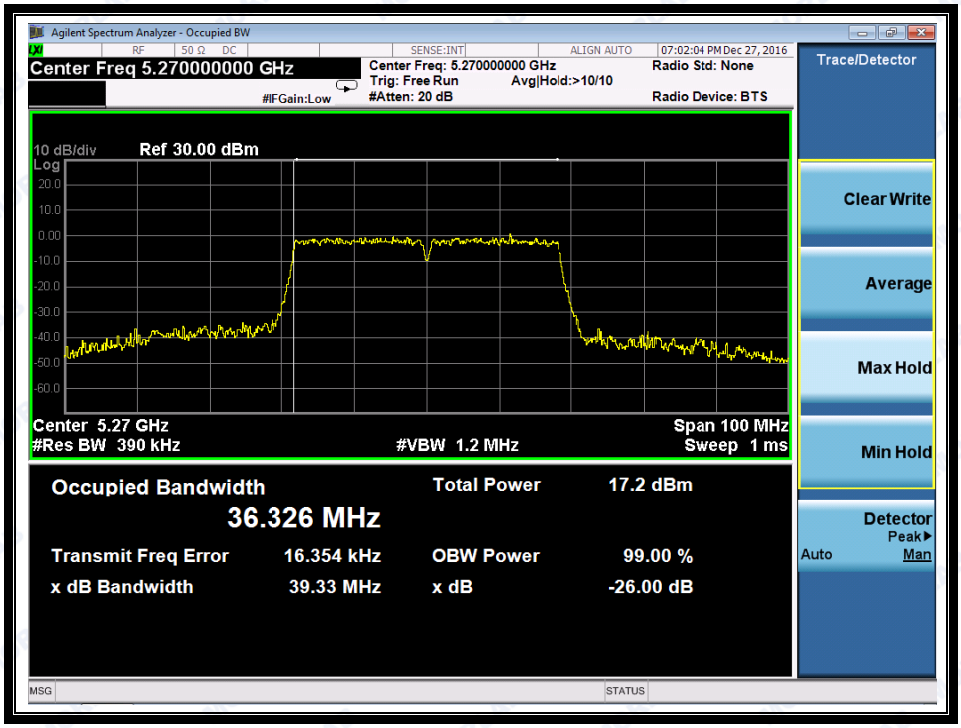
B. Test Plots



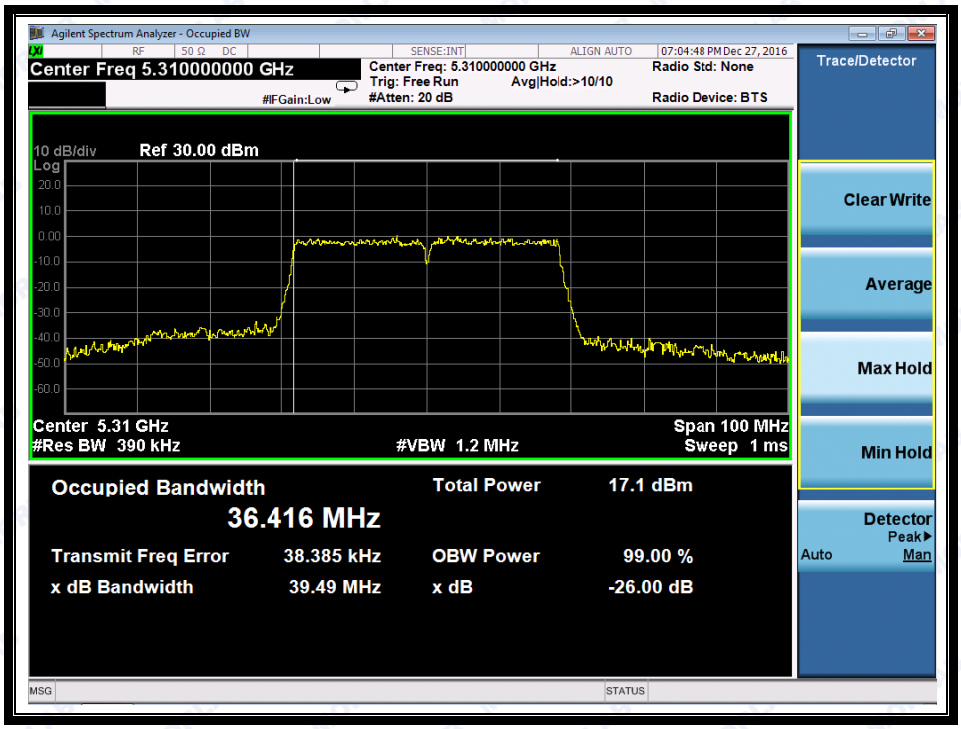
(Channel 38: 5190MHz @ 802.11n-40MHz)



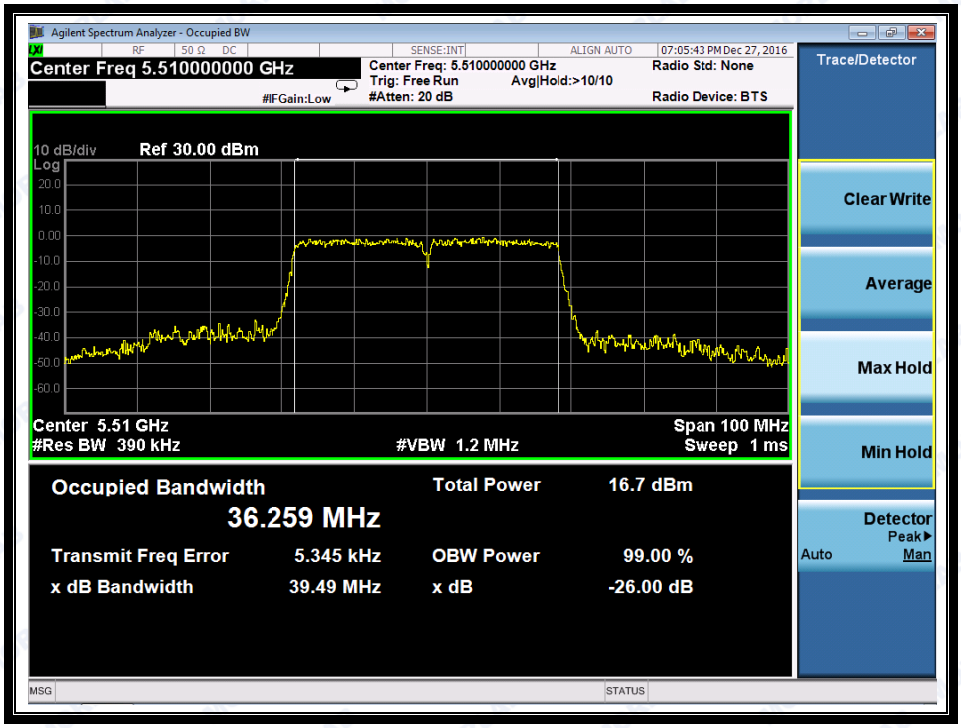
(Channel 46: 5230 MHz @ 802.11n-40MHz)



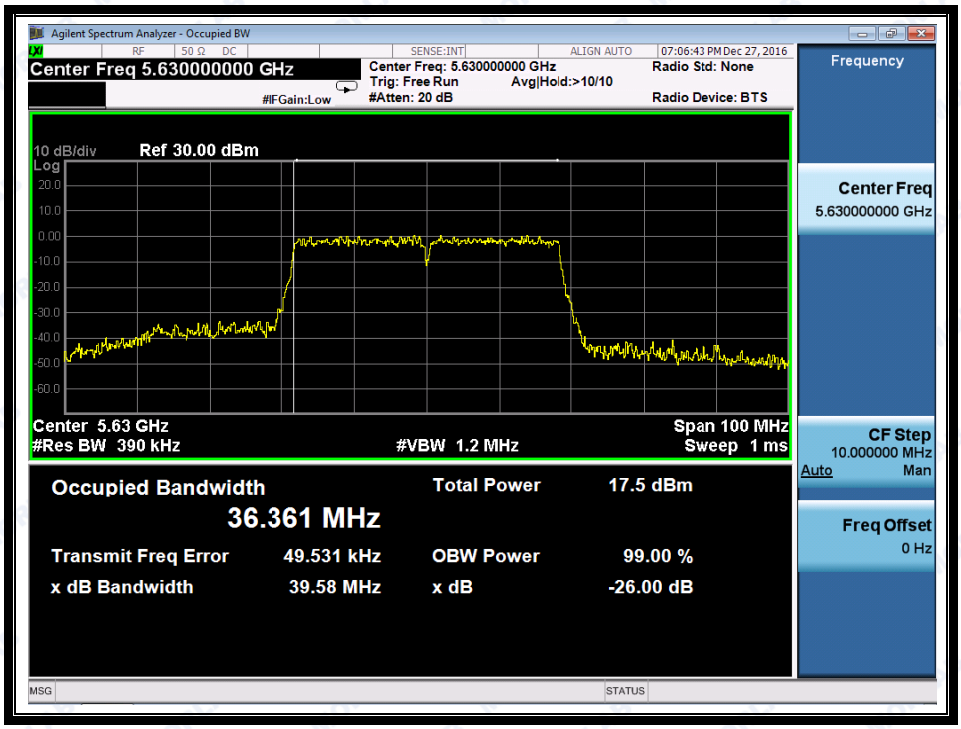
(Channel 54: 5270MHz @802.11n-40MHz)



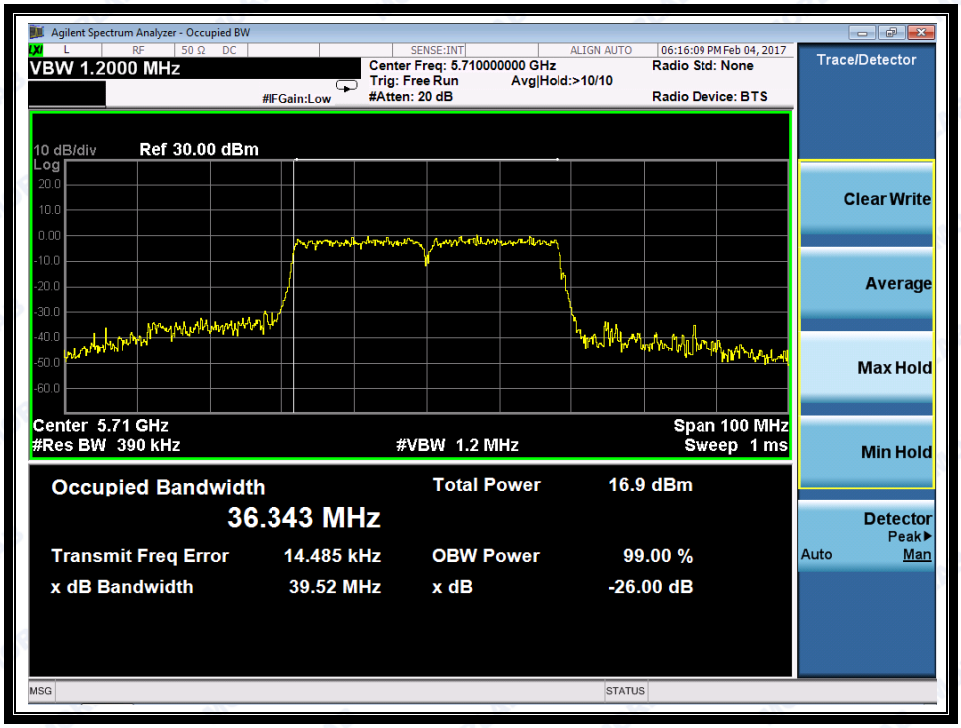
(Channel 62: 5310MHz @ 802.11n-40MHz)



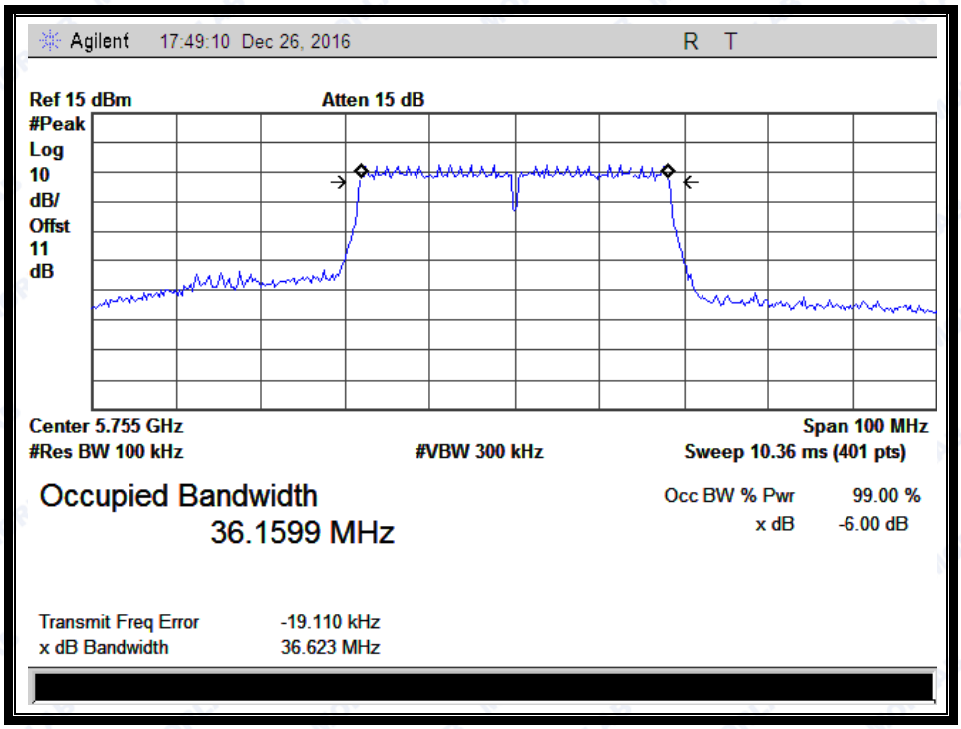
(Channel 102: 5510MHz @802.11n-40MHz)



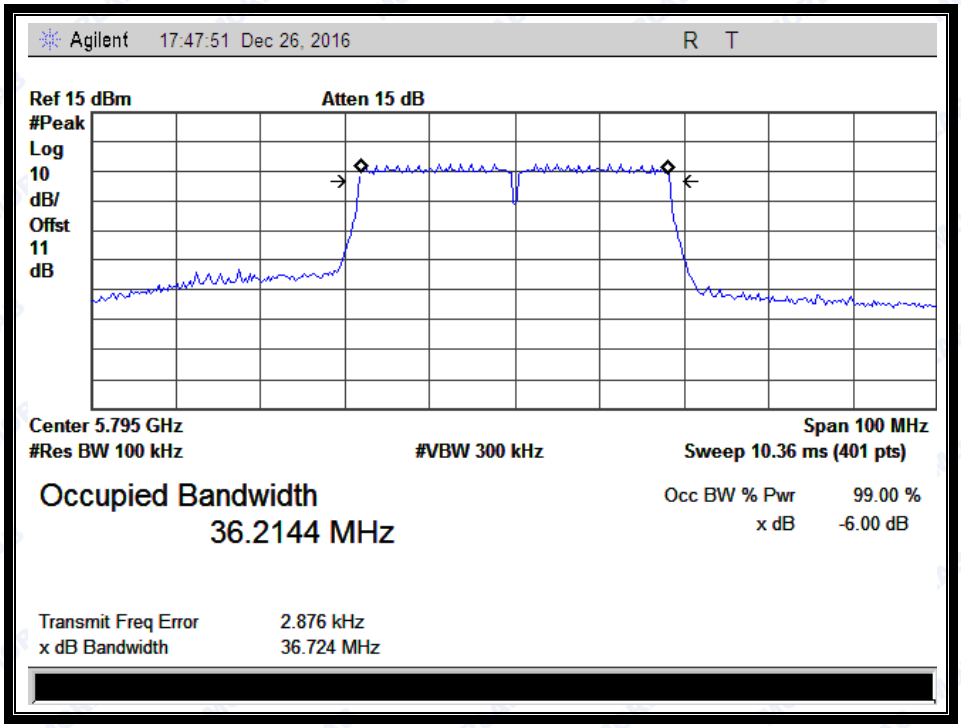
(Channel 126: 5630MHz @ 802.11n-40MHz)



(Channel 142: 5710MHz @ 802.11n-40MHz)



(Channel 151: 5755MHz @ 802.11n-40MHz)



(Channel 159: 5795MHz @802.11n-40MHz)

2.3 Maximum conducted output power

2.3.1 Requirement

(1) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

(2) For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10log B, where B is the 26 dB emission bandwidth in megahertz.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.3.2 Test Description

Section E) 3) of KDB 789033 defines a methodology using an RF average power meter.

A. Test Setup:

The EUT (Equipment under the test) which is powered by the Battery is coupled to the Power Meter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in power meter.

2.3.3 Test Result

2.3.3.1 802.11a-20MHz Test mode

Channel	Frequency (MHz)	Measured Output Power(dBm)	Limit (dBm)	Verdict
36	5180	17.45	24	PASS
44	5220	17.71		
48	5240	18.15		
52	5260	18.10		
60	5300	18.69		
64	5320	18.46		
100	5500	18.27		
120	5600	18.54		
140	5700	18.25		
149	5745	18.20	30	
157	5785	18.44		
165	5825	18.24		

2.3.3.2 802.11n-20MHz Test mode

Channel	Frequency (MHz)	Measured Output Power(dBm)	Limit (dBm)	Verdict
36	5180	18.17	24	PASS
44	5220	18.85		
48	5240	18.83		
52	5260	18.87		
60	5300	18.76		
64	5320	18.91		
100	5500	18.96		
120	5600	18.88		
140	5700	19.1		
149	5745	18.83	30	
157	5785	19.06		
165	5825	19.08		

2.3.3.3 802.11n-40MHz Test mode

Channel	Frequency (MHz)	Measured Output Power(dBm)	Limit (dBm)	Verdict
38	5190	18.05	24	PASS
46	5230	17.66		
54	5270	17.99		
62	5310	18.04		
102	5510	17.92		
126	5630	18.06		
142	5710	17.91		
151	5755	17.84	30	
159	5795	18.03		

2.4 Peak Power spectral density

2.4.1 Requirement

(1) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(2) For the 5.25–5.35 GHz and 5.47–5.725GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500KHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

2.4.2 Test Description

A. Test Set:

The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

B. Test Procedure

KDB 789033 Section F) Maximum Power Spectral Density (PSD) Method SA-1 was used in order to prove compliance

1) Set span to encompass the entire 26-dB emission bandwidth
2) Set RBW = 1 MHz. Set VBW ≥ 3 MHz.
3) Number of points in sweep ≥ 2 Span / RBW. Sweep time = auto.
4) Detector = RMS (i.e., power averaging)
5) Trace average at least 100 traces in power averaging (i.e., RMS) mode
6) Record the max value

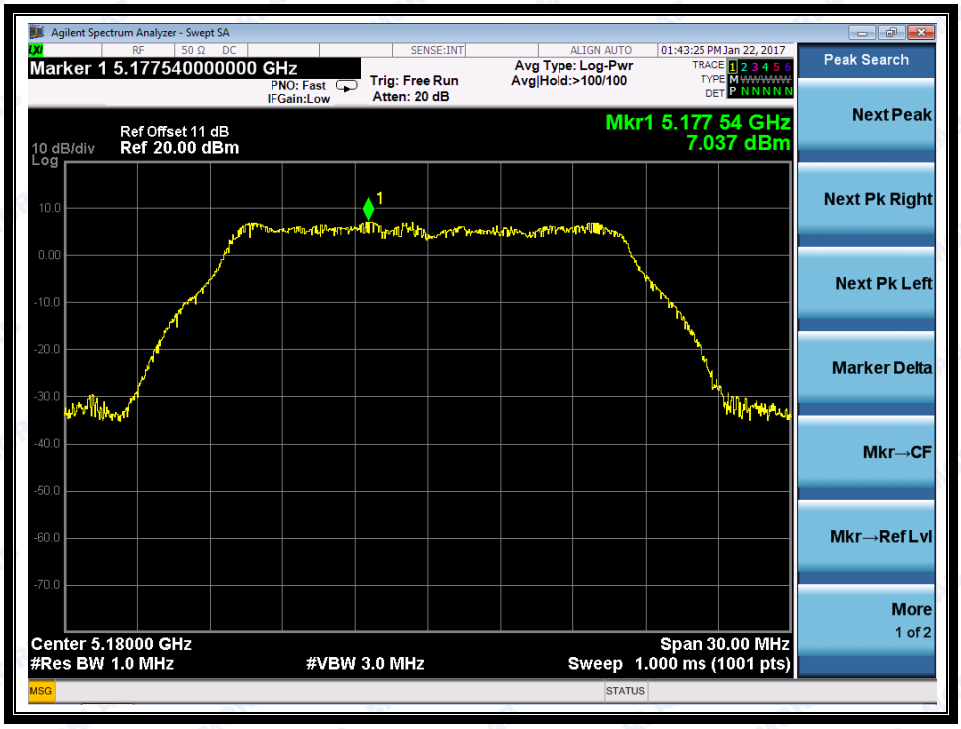
2.4.3 Test Result

2.4.3.1 802.11a Test mode

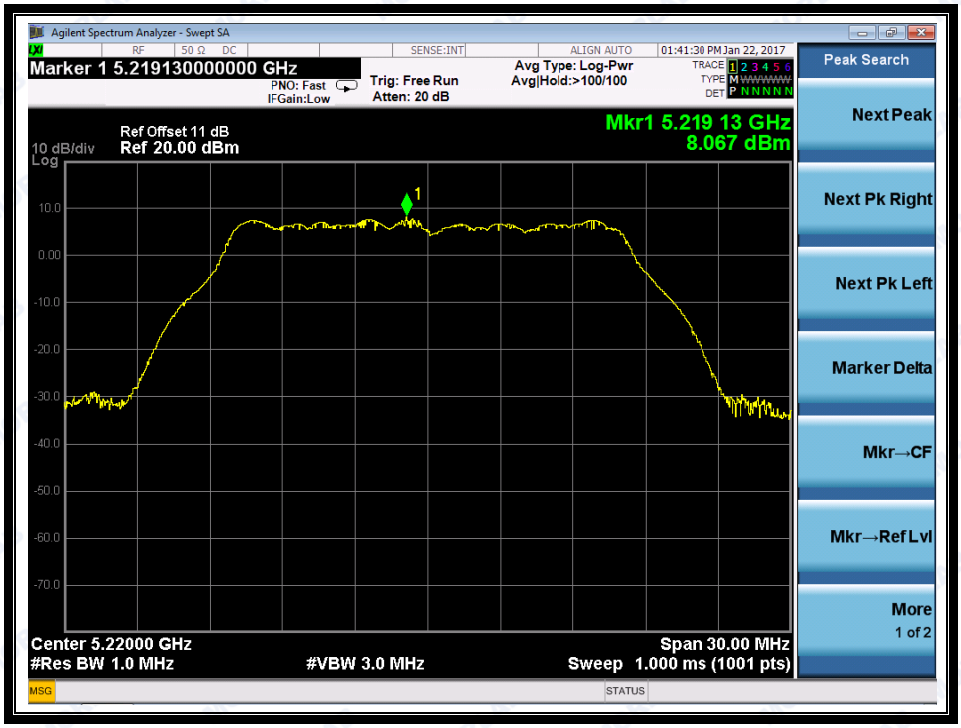
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	7.04	11	PASS
44	5220	8.07		
48	5240	7.92		
52	5260	7.70		
60	5300	7.69		
64	5320	7.41		
100	5500	7.60		
120	5600	8.10		
140	5700	7.93		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	4.58	30	PASS
157	5785	4.59		
165	5825	5.04		

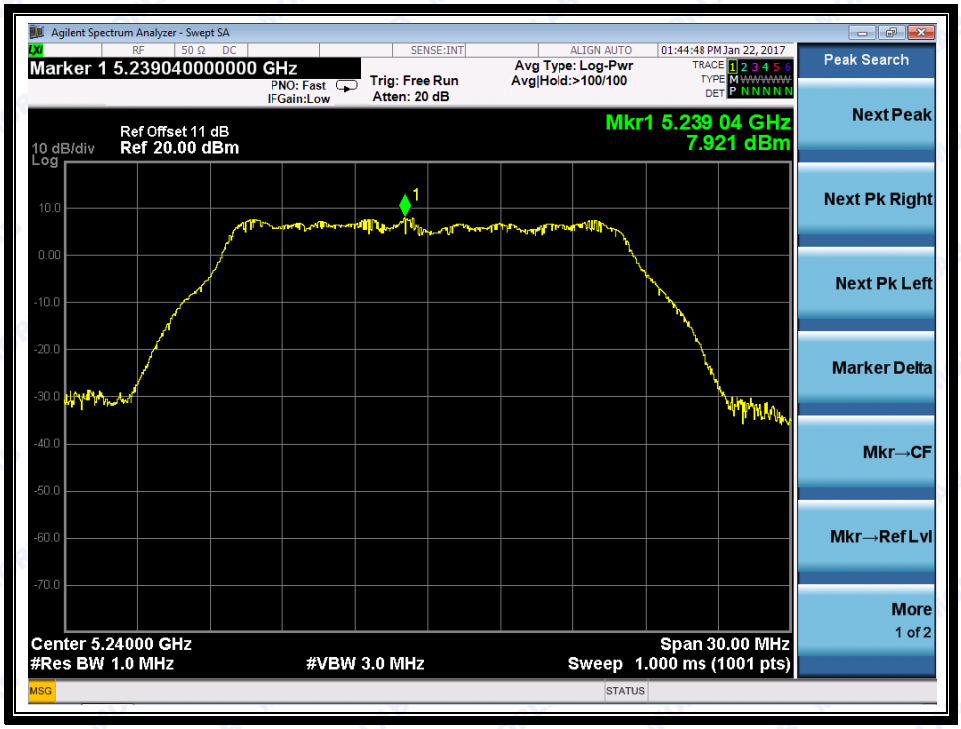
A. Test Plots



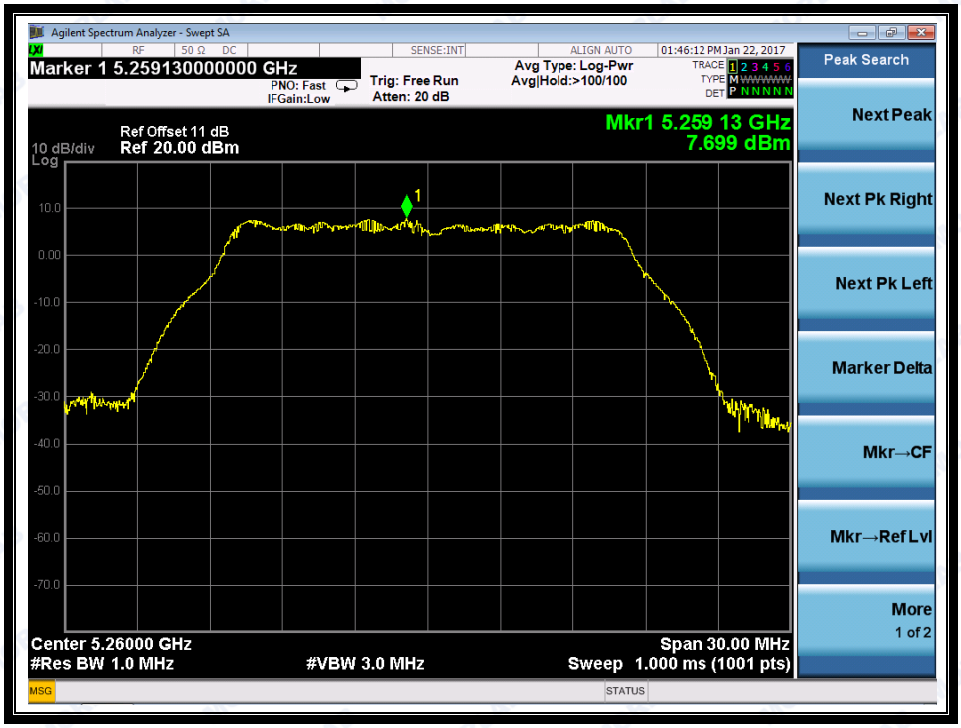
(Channel 36: 5180MHz @ 802.11a)



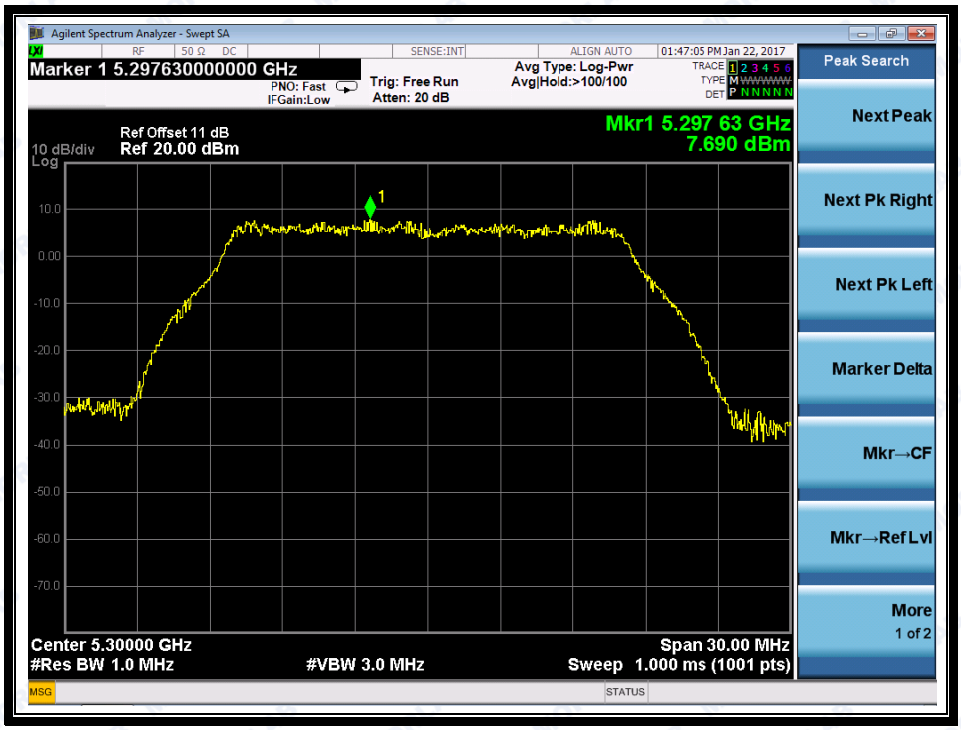
(Channel 44: 5220 MHz @802.11a)



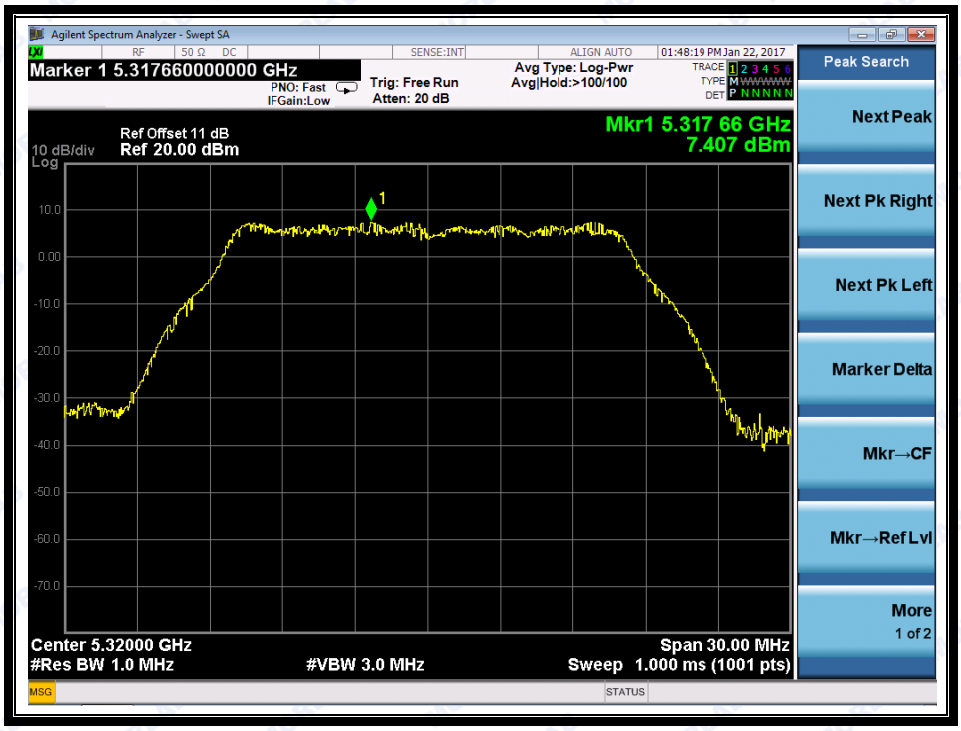
(Channel 48: 5240MHz @802.11a)



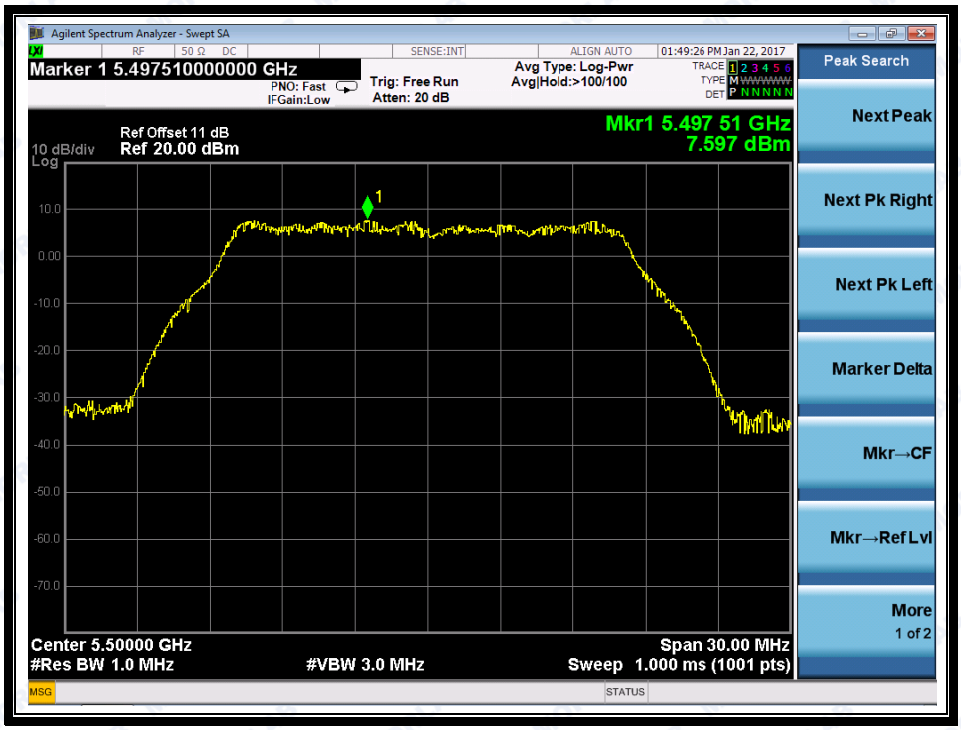
(Channel 52: 5260MHz @ 802.11a)



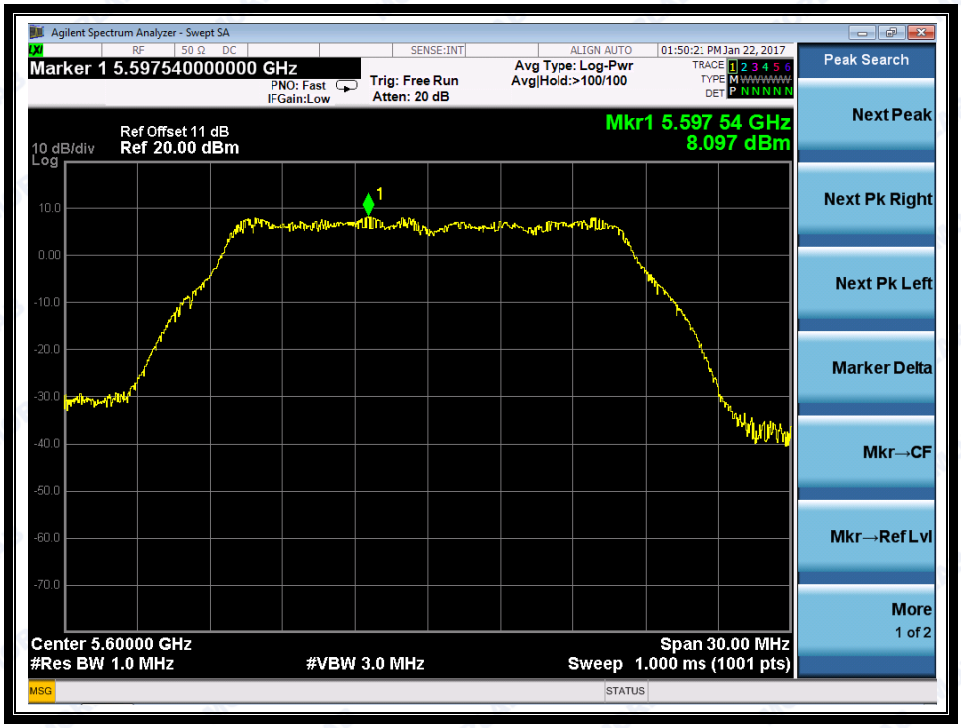
(Channel 60: 5300MHz @ 802.11a)



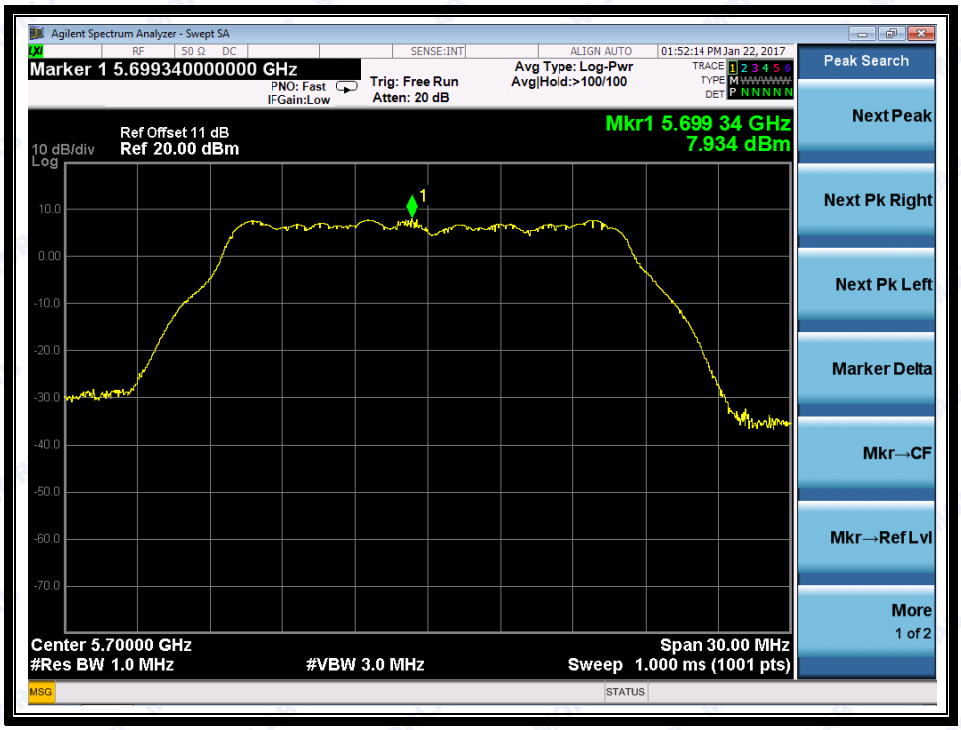
(Channel 64: 5320MHz @ 802.11a)



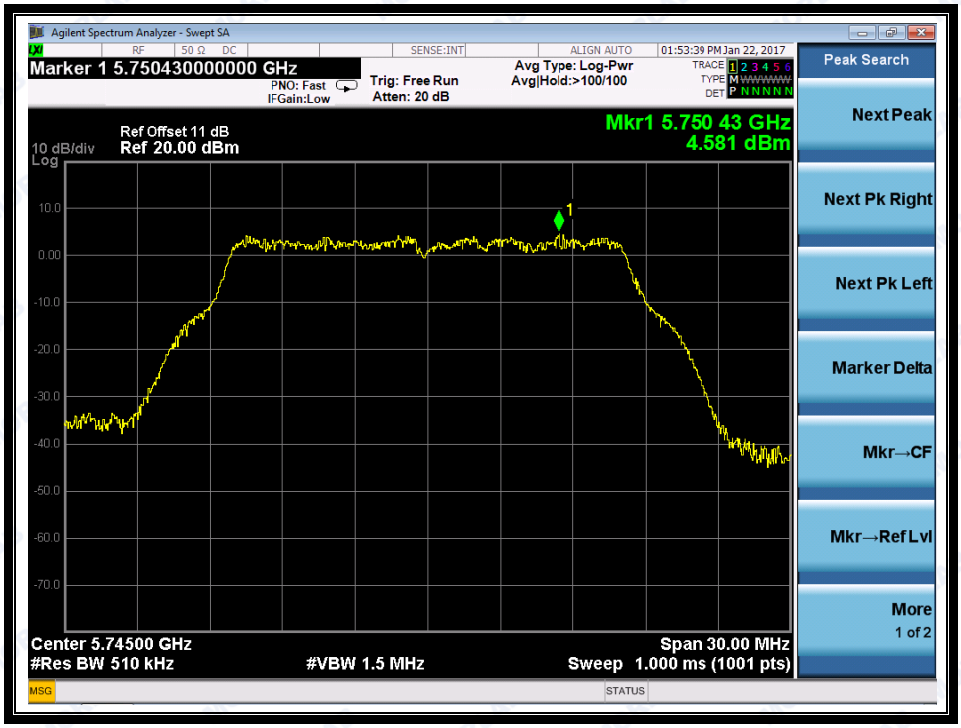
(Channel 100: 5500MHz @ 802.11a)



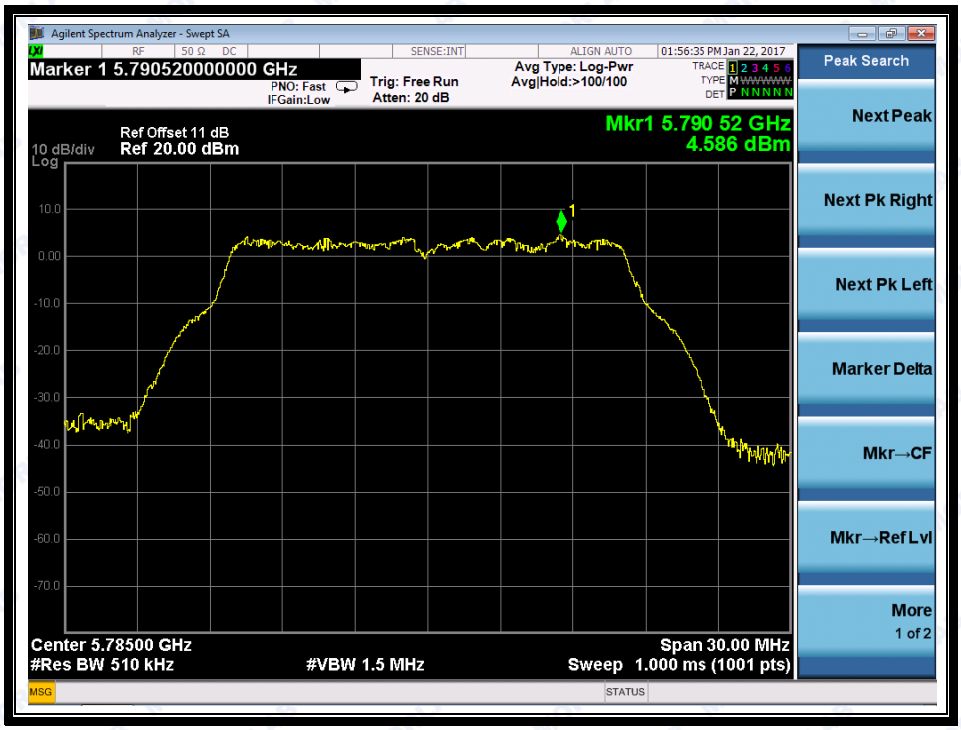
(Channel 120: 5600 MHz @ 802.11a)



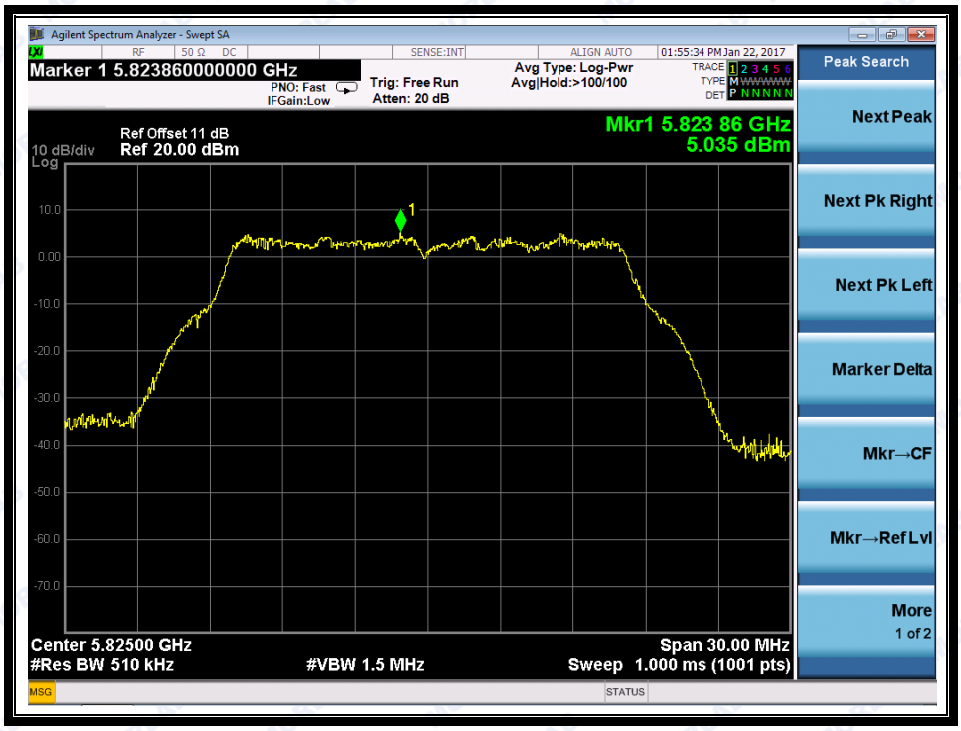
(Channel 140: 5700MHz @ 802.11a)



(Channel 149: 5745MHz @ 802.11a)



(Channel 157: 5785MHz @ 802.11a)



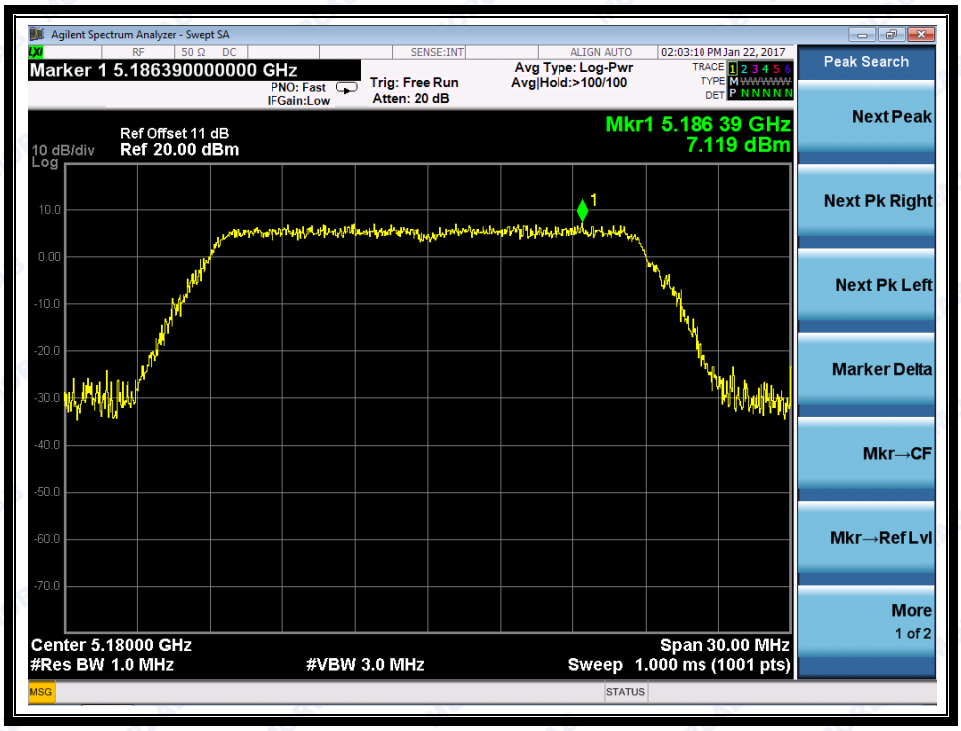
(Channel 165: 5825MHz @ 802.11a)

2.4.3.2 802.11n-20MHz Test mode

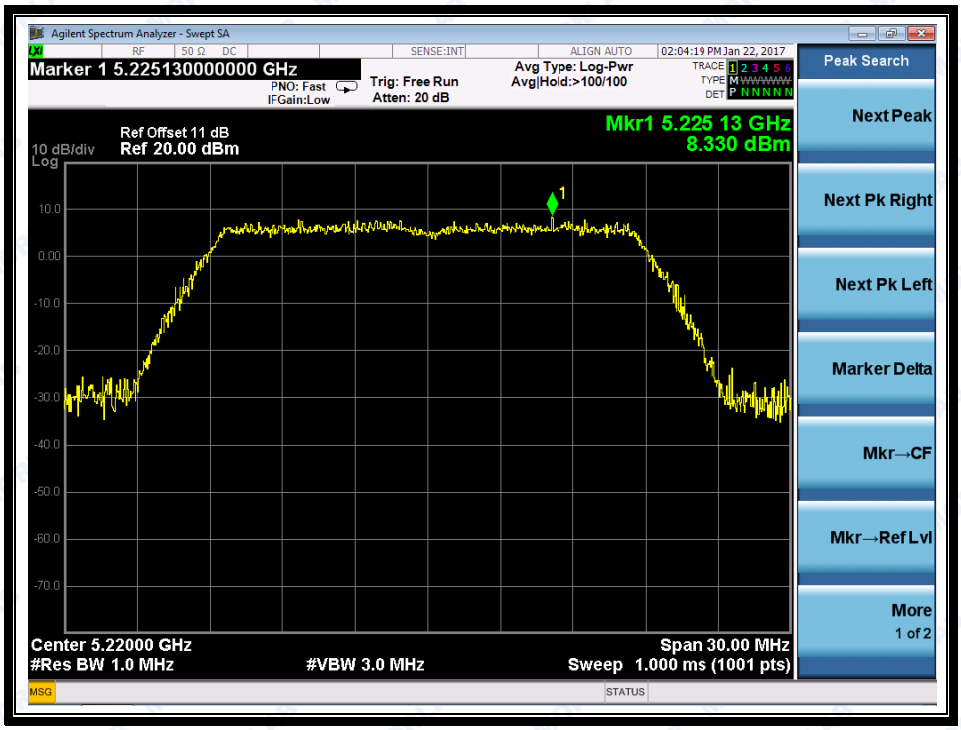
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	7.12	11	PASS
44	5220	8.33		
48	5240	7.81		
52	5260	7.33		
60	5300	8.25		
64	5320	7.51		
100	5500	8.13		
120	5600	8.06		
140	5700	7.62		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	4.79	30	PASS
157	5785	5.63		
165	5825	5.65		

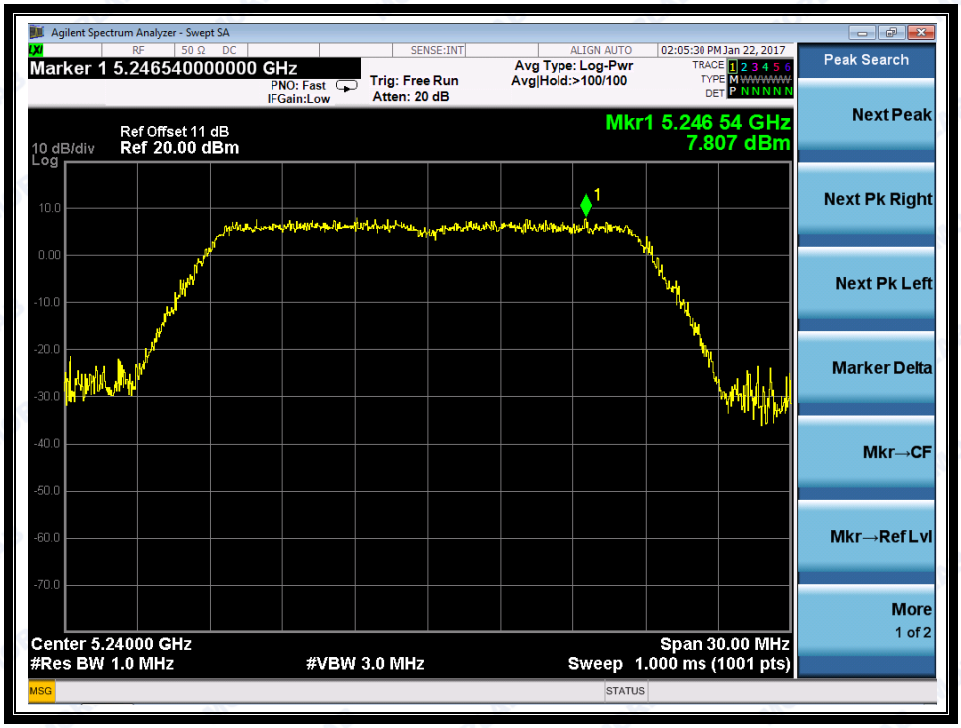
B. Test Plots



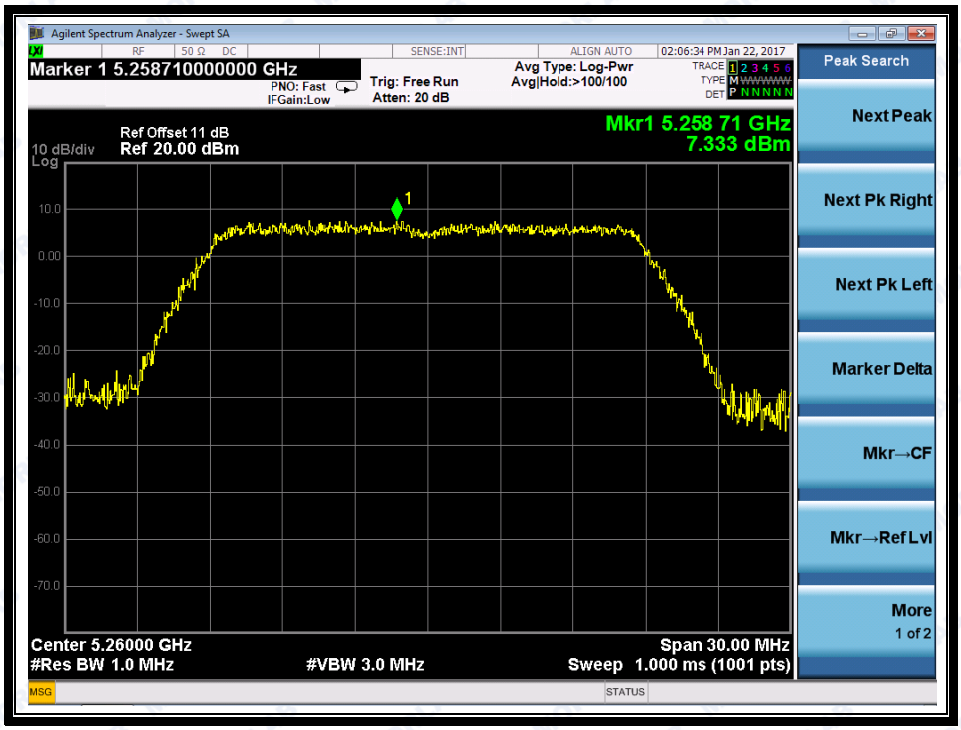
(Channel 36: 5180MHz @ 802.11n-20MHz)



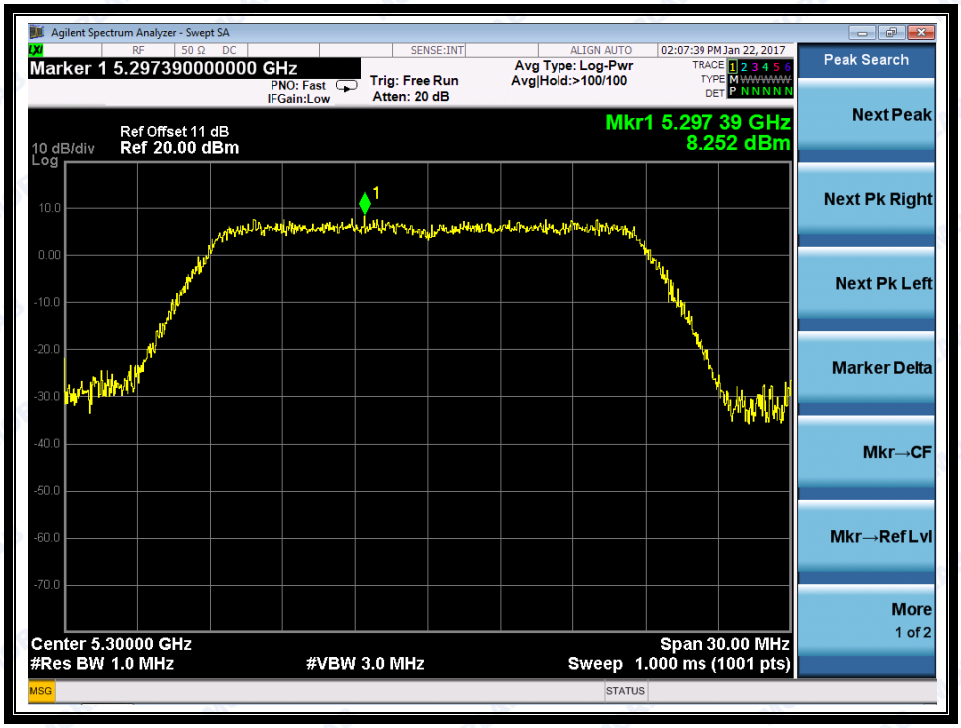
(Channel 44: 5220 MHz @ 802.11n-20MHz)



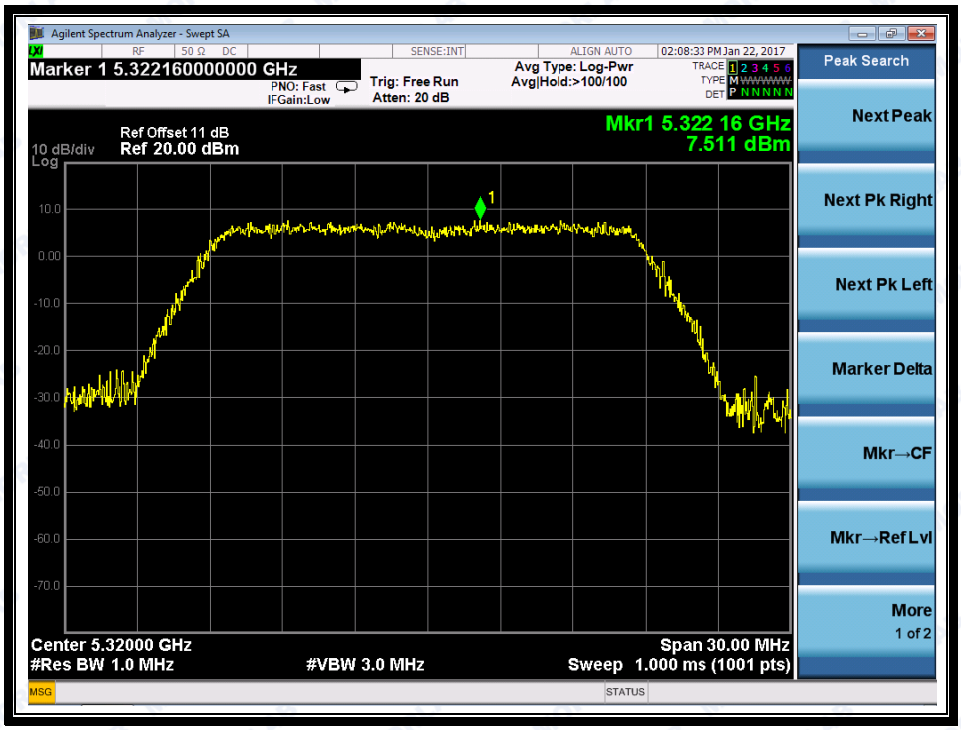
(Channel 48: 5240MHz @ 802.11n-20MHz)



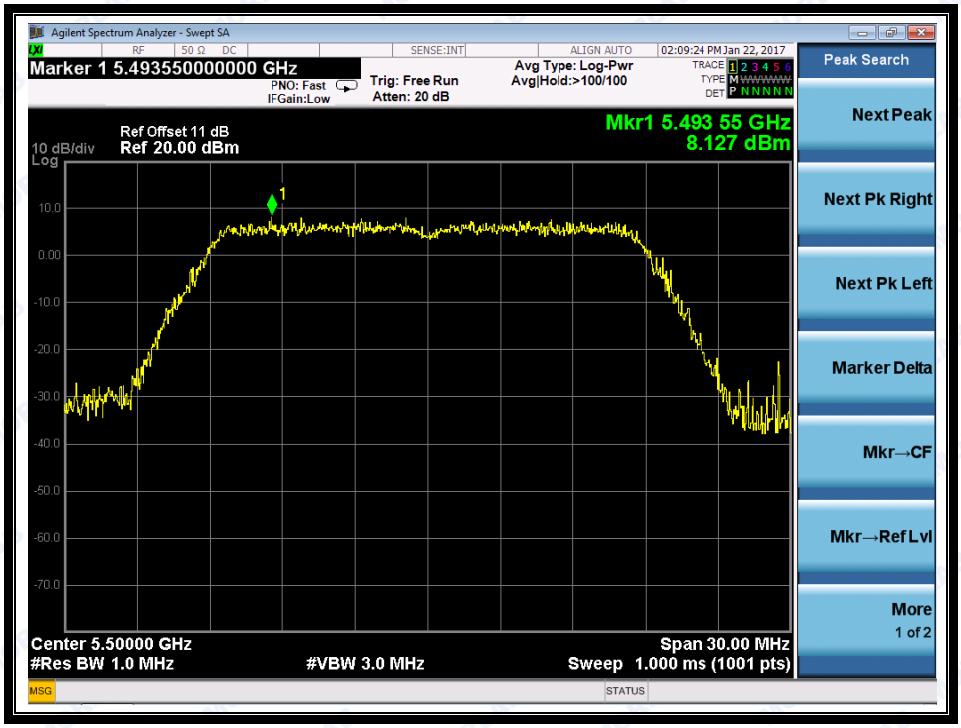
(Channel 52: 5260MHz @ 802.11n-20MHz)



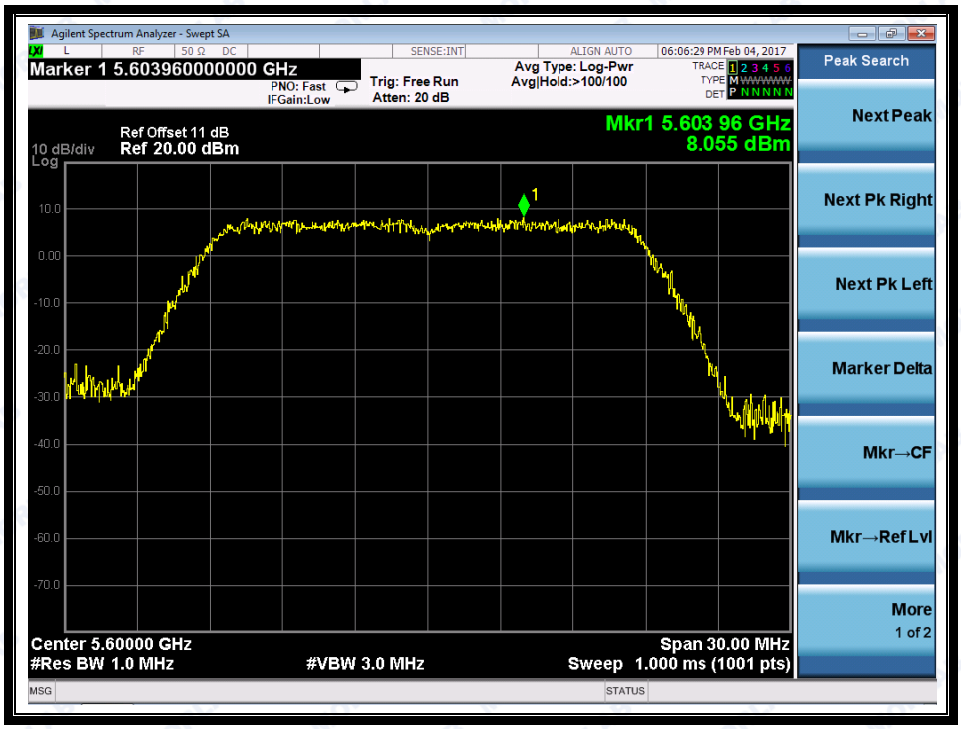
(Channel 60: 5300MHz @ 802.11n-20MHz)



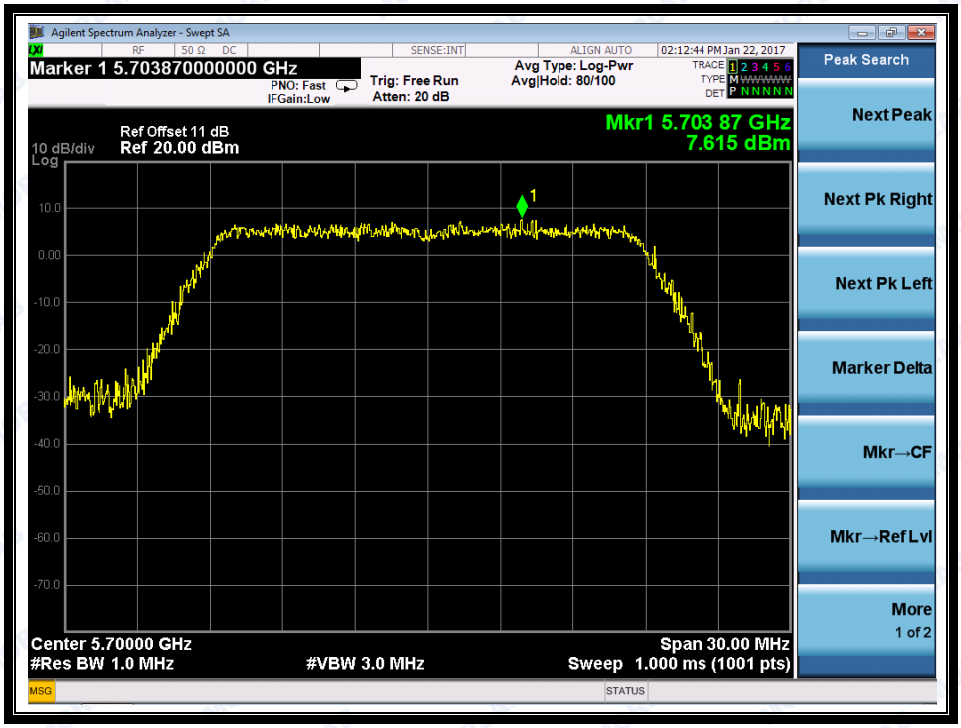
(Channel 64: 5320MHz @ 802.11n-20MHz)



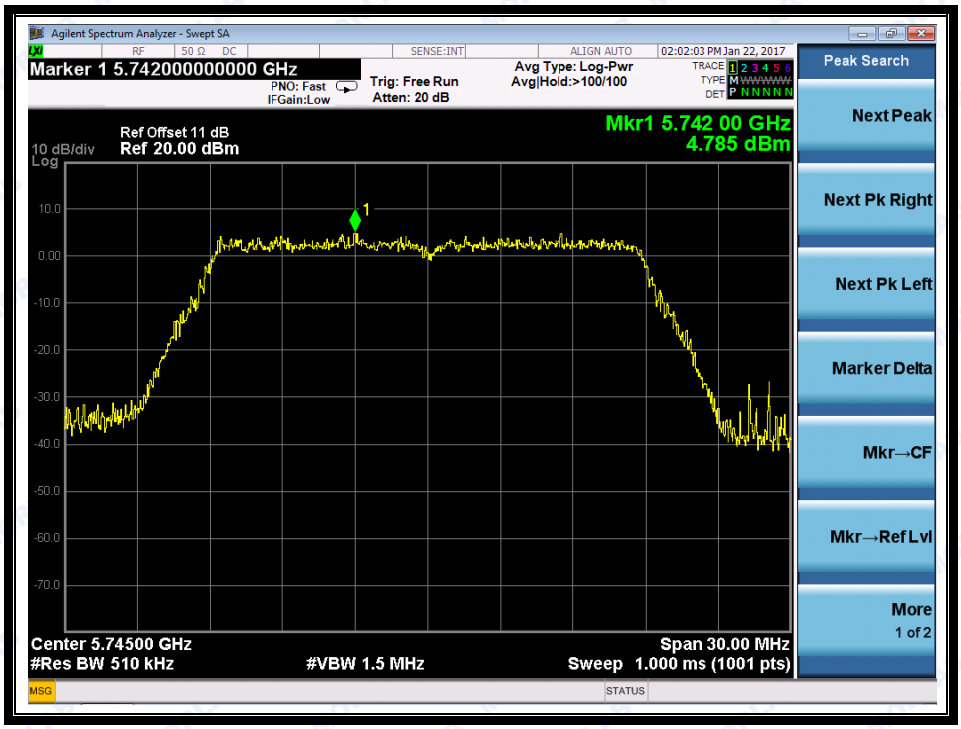
(Channel 100: 5500MHz @ 802.11n-20MHz)



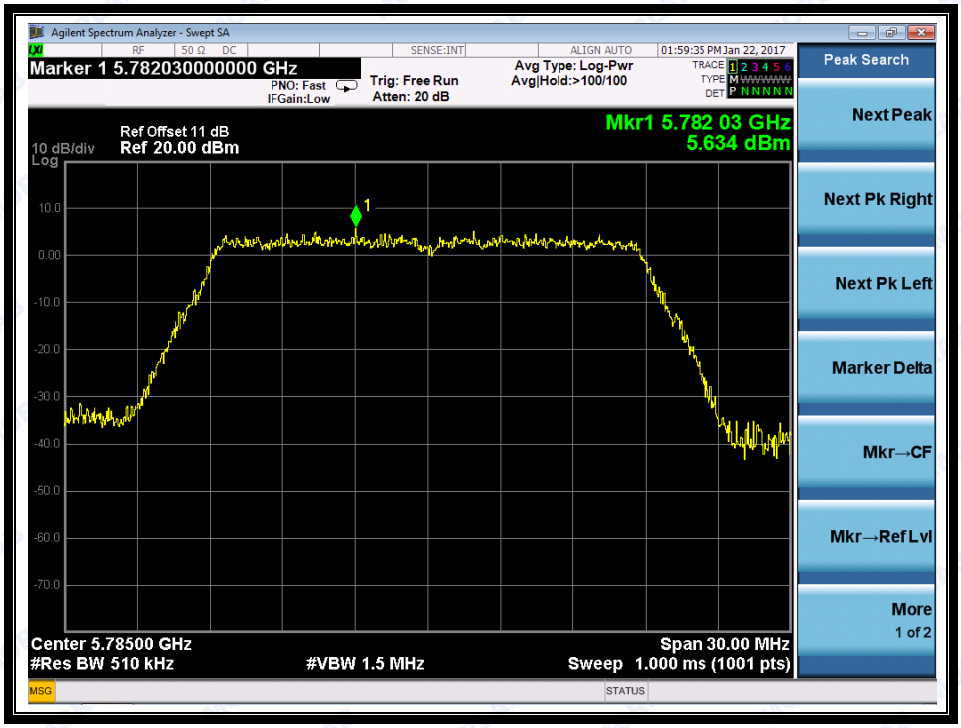
(Channel 120: 5600MHz @ 802.11n-20MHz)



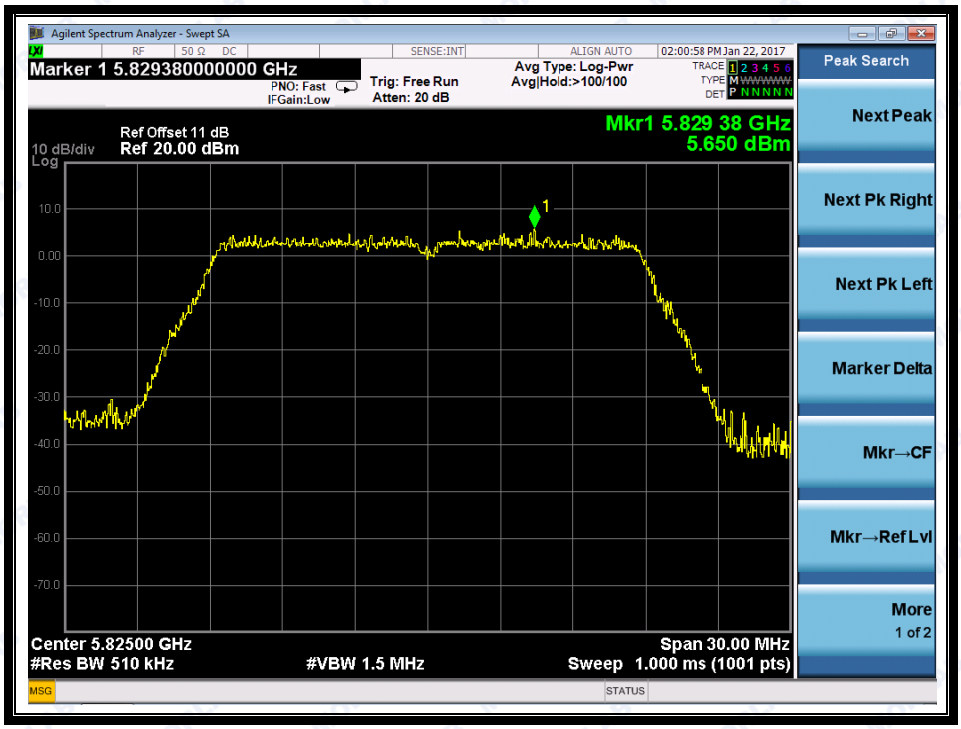
(Channel 140: 5700MHz @ 802.11n-20MHz)



(Channel 149: 5745MHz @ 802.11n-20MHz)



(Channel 157: 5785MHz @802.11n-20MHz)



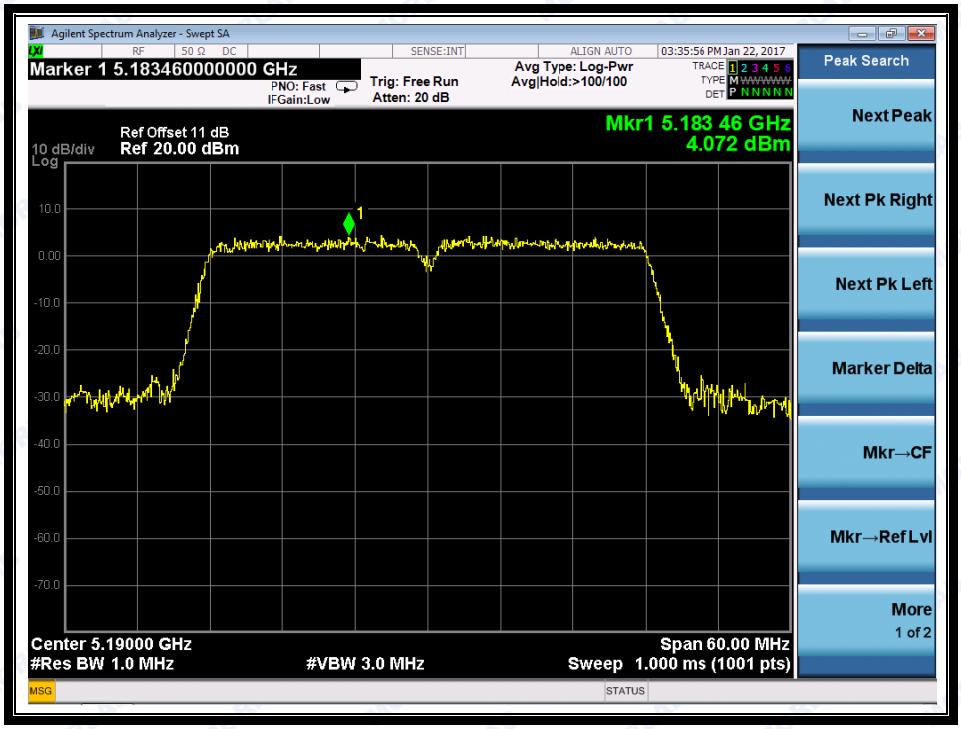
(Channel 165: 5825MHz @ 802.11n-20MHz)

2.4.3.3 802.11n-40MHz Test mode

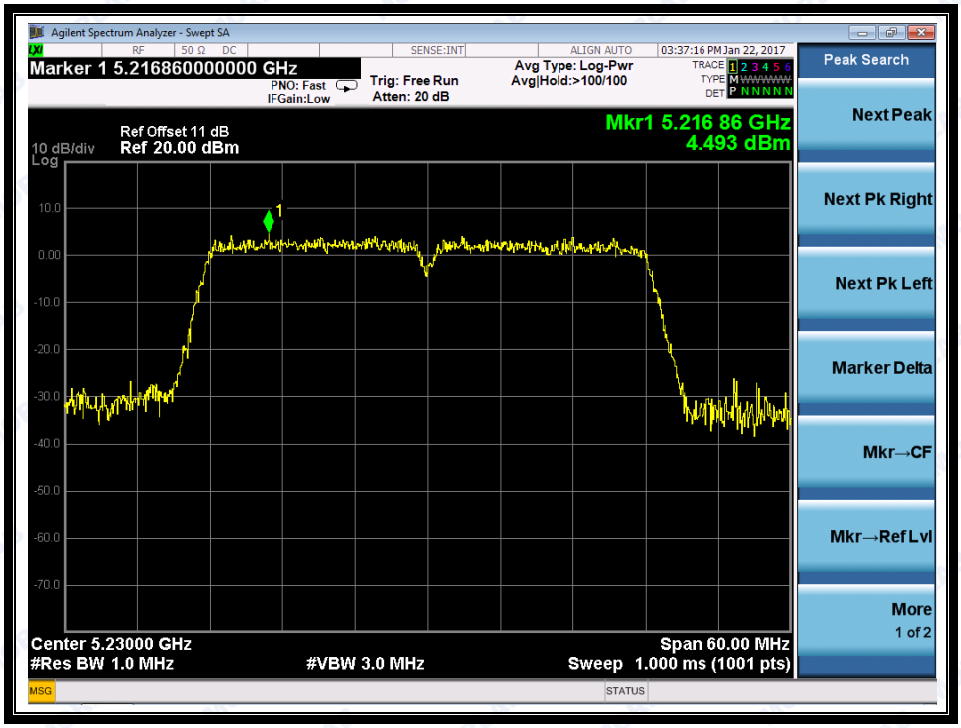
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz))	Verdict
38	5190	4.07	11	PASS
46	5230	4.49		
54	5270	4.35		
62	5310	4.06		
102	5510	5.28		
126	5630	6.07		
142	5710	6.00		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/MHz)	Verdict
151	5755	2.16	30	PASS
159	5795	2.65		

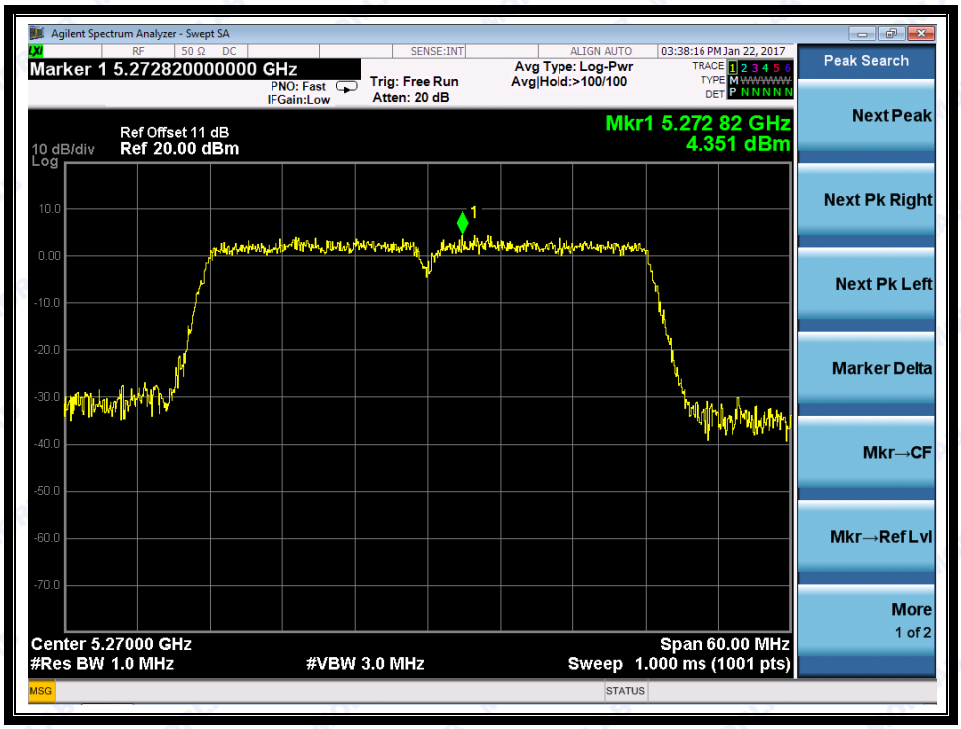
B. Test Plots



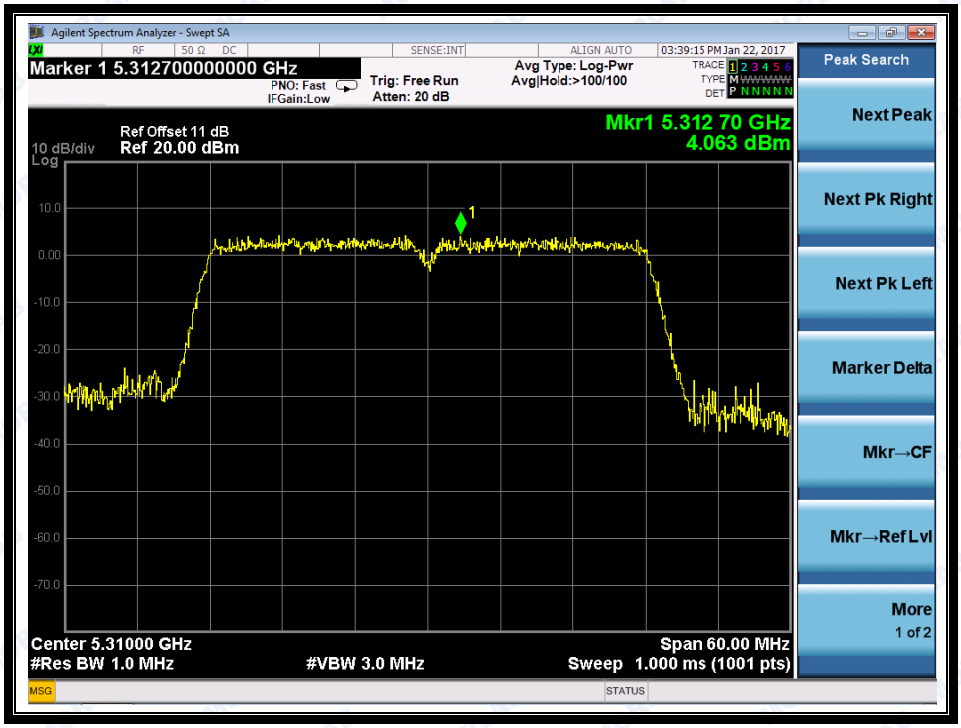
(Channel 38: 5190MHz @ 802.11n-40MHz)



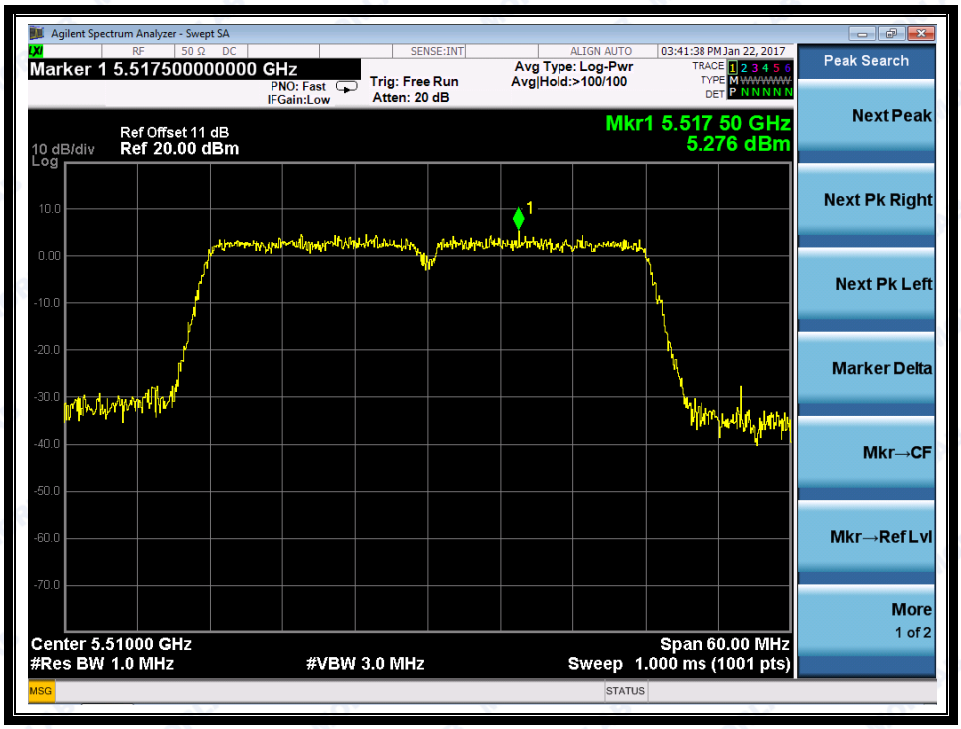
(Channel 46: 5230 MHz @ 802.11n-40MHz)



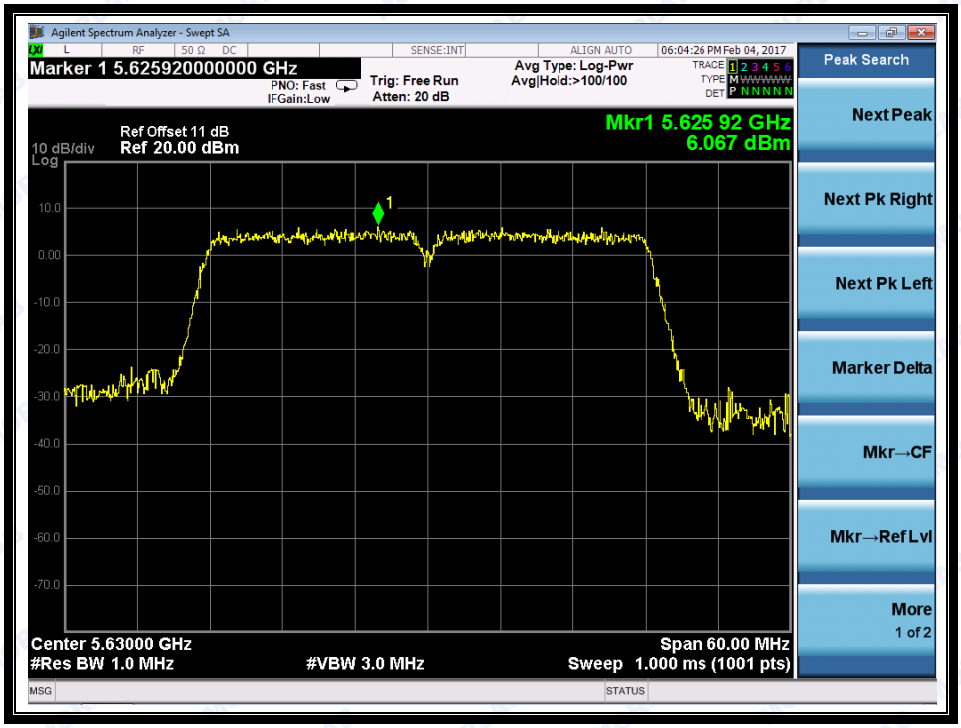
(Channel 54: 5270MHz @802.11n-40MHz)



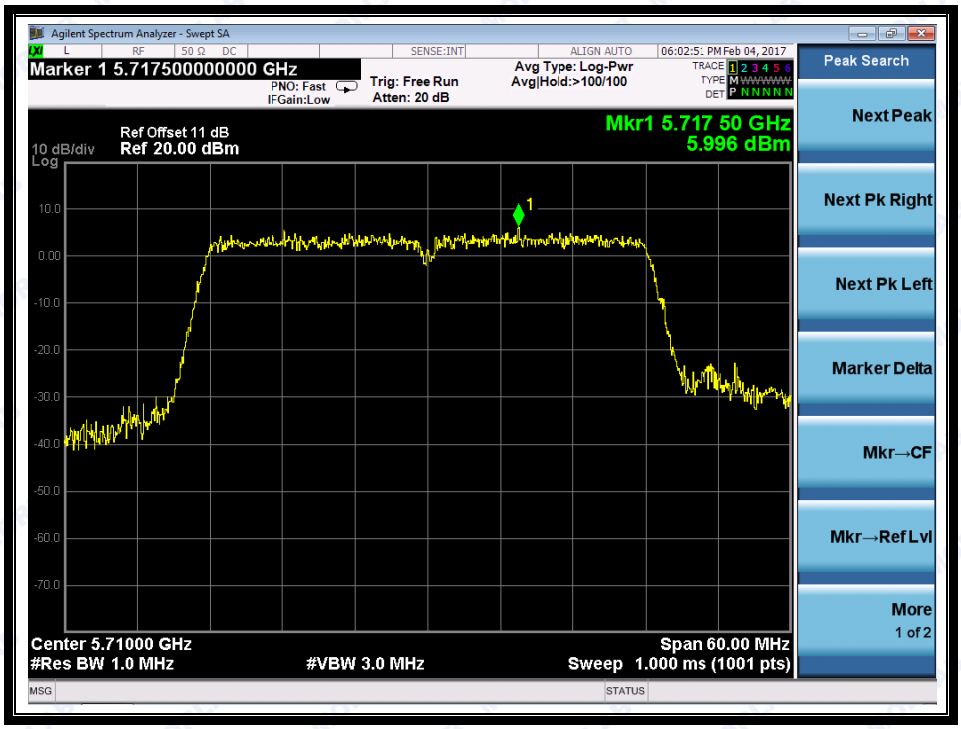
(Channel 62: 5310MHz @ 802.11n-40MHz)



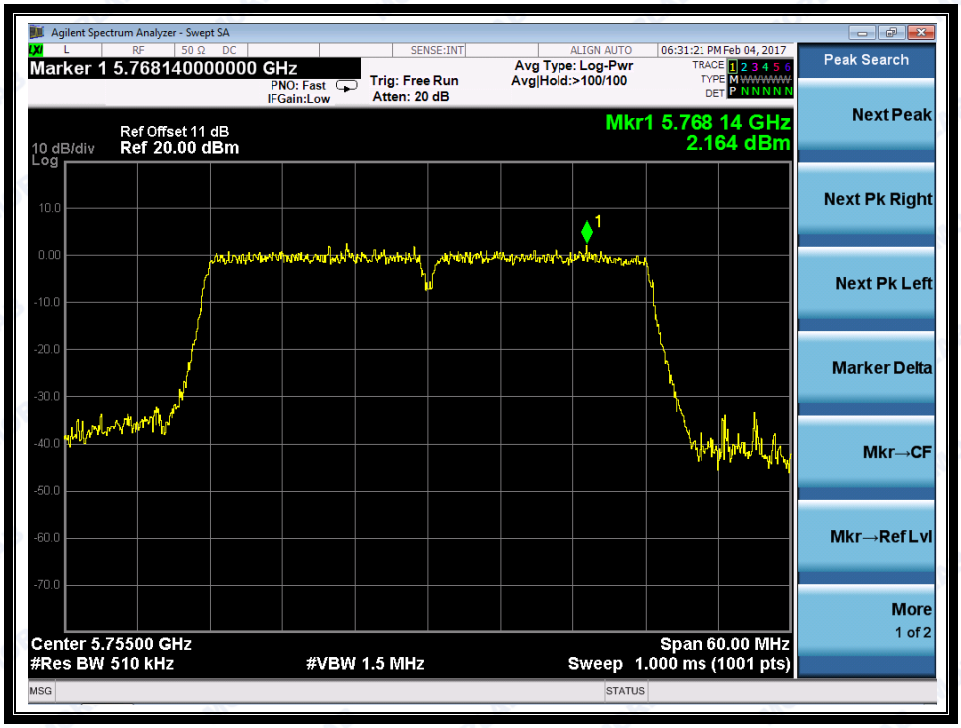
(Channel 102: 5510MHz @802.11n-40MHz)



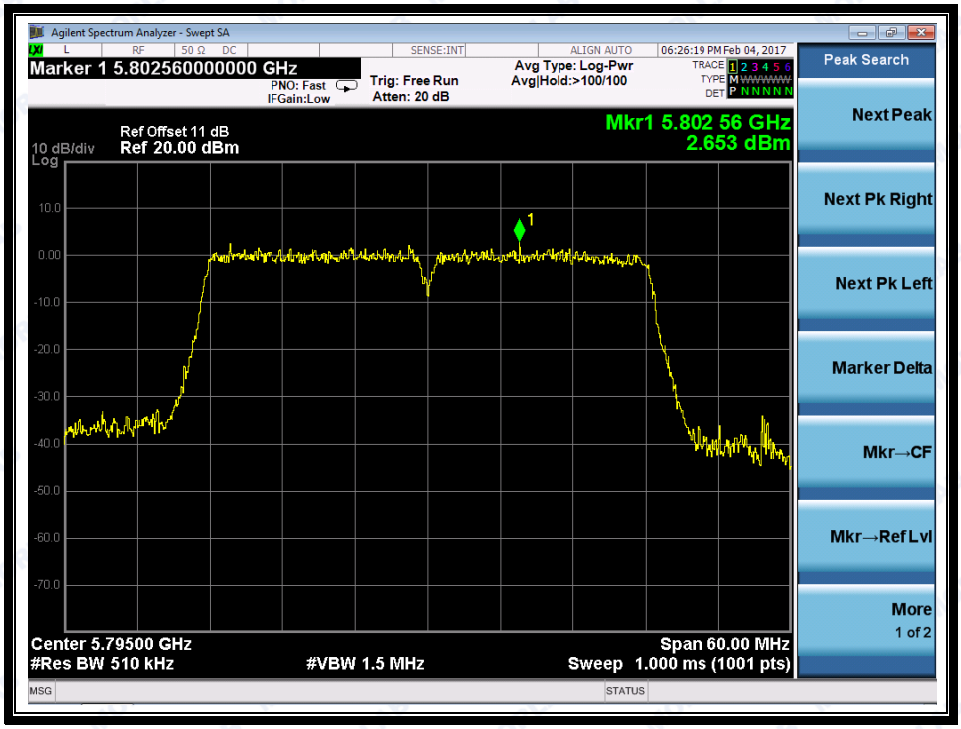
(Channel 126: 5630MHz @ 802.11n-40MHz)



(Channel 142: 5710MHz @ 802.11n-40MHz)



(Channel 151: 5755MHz @ 802.11n-40MHz)



(Channel 159: 5795MHz @802.11n-40MHz)