

Report on the RF Testing of:

KYOCERA Corporation
Mobile Phone, Model: EB1157
FCC ID: JOYEB1157

In accordance with FCC Part15 Subpart E

Prepared for: KYOCERA Corporation
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Document Number: JPD-TR-23080-0

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	2023.08.18

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

EXECUTIVE SUMMARY – Result: Complied

A sample of this product was tested and the result above was confirmed in accordance with FCC Part15 Subpart E.



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Contents

1	Summary of Test	3
1.1	Modification history of the test report.....	3
1.2	Standards.....	3
1.3	Test methods.....	3
1.4	Deviation from standards.....	3
1.5	List of applied test(s) of the EUT.....	3
1.6	Test information.....	3
1.7	Test set up.....	3
1.8	Test period.....	3
2	Equipment Under Test	4
2.1	EUT information.....	4
2.2	Modification to the EUT.....	5
2.3	Variation of family model(s).....	5
2.4	Operating channels and frequencies.....	6
2.5	Description of test mode.....	7
2.6	Operating flow.....	8
3	Configuration of Equipment	9
3.1	Equipment used.....	9
3.2	Cable(s) used.....	9
3.3	System configuration.....	9
4	Test Result	10
4.1	26dB Bandwidth and 99% Occupied Bandwidth.....	10
4.2	Maximum Conducted Output Power.....	42
4.3	Peak Power Spectral Density.....	79
4.4	Radiated Emissions (Restricted Bands of Operation).....	112
4.5	Frequency Stability.....	182
4.6	AC Power Line Conducted Emissions.....	187
4.7	Duty Cycle.....	192
5	Antenna requirement	200
6	Measurement uncertainty	201
7	Laboratory Information	202
	Appendix A. Test Equipment	203

1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-23080-0	First Issue	Refer to the cover page

1.2 Standards

CFR47 FCC Part 15 Subpart E

1.3 Test methods

ANSI C63.10-2013
 KDB662911 D01 Multiple Transmitter Output v02r01
 KDB789033 D02 General U-NII Test Procedures New Rules v02r01

1.4 Deviation from standards

None

1.5 List of applied test(s) of the EUT

Test item section	Test item	Condition	Result	Remark
15.407(a)	26dB Bandwidth	Conducted	Reporting Purposes only	-
15.407(a)	Maximum Conducted Output Power	Conducted	PASS	-
15.407(a)	Peak Power Spectral Density	Conducted	PASS	-
15.407(b) 15.205 15.209	Radiated emissions (Restricted Bands of Operation)	Radiated	PASS	-
15.407(g)	Frequency Stability	Conducted	PASS	-
15.207	AC Power Line Conducted Emissions	Conducted	PASS	-
ANSI C63.10, Section 12.2	Duty Cycle	Conducted	Reporting Purposes only	

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

6-July-2023 - 28-July-2023

2 Equipment Under Test

All information in this chapter was provided by the applicant.

2.1 EUT information

Applicant	KYOCERA Corporation Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment Under Test (EUT)	Mobile Phone
Model number	EB1157
Serial number	358018240001198, 358018240001065
Trade name	Kyocera
Number of sample(s)	2
EUT condition	Pre-Production
Power rating	Battery: DC 3.87 V
Size	(W) 75 mm x (D) 14.6 mm x (H) 154 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 °C to 60 °C
Hardware version	Pre-Production
Software version	0.130RI
Firmware version	Not applicable
RF Specification	
Protocol	IEEE802.11a, IEEE802.11n (HT20), IEEE802.11n (HT40) IEEE802.11ac (VHT20), IEEE802.11ac (VHT40), IEEE802.11ac (VHT80)
Frequency range	IEEE802.11a/n (HT20) / IEEE802.11ac (VHT20): 5180 MHz-5320 MHz, 5500 MHz-5720 MHz IEEE802.11n (HT40) / IEEE802.11ac (VHT40): 5190 MHz-5310 MHz, 5510 MHz-5710 MHz IEEE802.11ac (VHT80): 5210 MHz, 5290 MHz, 5530 MHz, 5610 MHz, 5690MHz
Number of RF Channels	IEEE802.11a/n (HT20) / IEEE802.11ac (VHT20): 20 Channels IEEE802.11n (HT40) / IEEE802.11ac (VHT40): 10 Channels IEEE802.11ac (VHT80): 5 Channels
Modulation type	IEEE802.11a/n/ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)



Data rate	IEEE802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE802.11n (HT20 LGI): 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78, 86.5Mbps IEEE802.11n (HT20 SGI): 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2, 86.7, 96.1Mbps IEEE802.11ac (VHT20 LGI): 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78, 86.5Mbps IEEE802.11ac (VHT20 SGI): 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2, 86.6, 96.1Mbps IEEE802.11n (HT40 LGI): 13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 180Mbps IEEE802.11n (HT40 SGI): 15, 30, 45, 60, 90, 120, 135, 150, 180, 200Mbps IEEE802.11ac (VHT40 LGI): 13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 180Mbps IEEE802.11ac (VHT40 SGI): 15, 30, 45, 60, 90, 120, 135, 150, 180, 200Mbps IEEE802.11ac (VHT80 LGI): 29.5, 58.5, 87.8, 117, 175.5, 234, 263.3, 292.5, 351, 390Mbps IEEE802.11ac (VHT80 SGI): 32.5, 65, 97.5, 130, 195, 260, 292.5, 325, 390, 433.3Mbps
Channel separation	IEEE802.11a/n(HT20) / IEEE802.11ac (VHT20): 20 MHz IEEE802.11n (HT40) / IEEE802.11ac (VHT40): 40 MHz IEEE802.11ac (VHT80): 80 MHz
Conducted power	14.256 mW (IEEE802.11a) 12.503 mW (IEEE802.11n: HT20) 13.428 mW (IEEE802.11n: HT40) 15.276 mW (IEEE802.11ac: VHT80)
Antenna type	Internal antenna
Antenna gain	[Chain 0] 5.15-5.35 GHz band: 2.2 dBi 5.47-5.725 GHz band: 3.2 dBi [Chain 1] 5.15-5.35 GHz band: 0.6 dBi 5.47-5.725 GHz band: 1.9 dBi

2.2 Modification to the EUT

The table below details modifications made to the EUT during the test project.

Modification State	Description of Modification	Modification fitted by	Date of Modification
Model: EB1157, Serial Number: 358018240001198, 358018240001065			
0	As supplied by the applicant	Not Applicable	Not Applicable

2.3 Variation of family model(s)

2.3.1 List of family model(s)

Not applicable

2.3.2 Reason for selection of EUT

Not applicable

2.4 Operating channels and frequencies

[IEEE802.11a/n (HT20) / IEEE802.11ac (VHT20)]

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
144	5720

[IEEE802.11n (HT40) / IEEE802.11ac (VHT40)]

Channel	Frequency [MHz]
38	5190
46	5230
54	5270
62	5310
102	5510
110	5550
118	5590
126	5630
134	5670
142	5710

[IEEE802.11ac (VHT80)]

Channel	Frequency [MHz]
42	5210
58	5290
106	5530
122	5610
138	5690

2.5 Description of test mode

The EUT had been tested under operating condition.
There are three channels have been tested as following:

Band	IEEE802.11a/n (HT20) IEEE802.11ac (VHT20)		IEEE802.11n (HT40) IEEE802.11ac (VHT40)		IEEE802.11ac (HT80)	
	Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]
5.2 GHz Band	36	5180	38	5190	42	5210
	40	5200	-	-	-	-
	48	5240	46	5230	-	-
5.3 GHz Band	52	5260	54	5270	58	5290
	56	5280	-	-	-	-
	64	5320	62	5310	-	-
5.6 GHz Band	100	5500	102	5510	106	5530
	116	5580	110	5550	122	5610
	140	5700	134	5670	138	5690
	144	5720	142	5710	-	-

The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

Band	Modulation Type	Data Rate
5.2 GHz Band	IEEE802.11a: OFDM	6Mbps
	IEEE802.11n (HT20): OFDM	MCS0 (6.5Mbps)
	IEEE802.11n (HT40): OFDM	MCS0 (13.5Mbps)
	IEEE802.11ac (VHT80): OFDM	MCS0 (29.5Mbps)
5.3 GHz Band	IEEE802.11a: OFDM	6Mbps
	IEEE802.11n (HT20): OFDM	MCS0 (6.5Mbps)
	IEEE802.11n (HT40): OFDM	MCS0 (13.5Mbps)
	IEEE802.11ac (VHT80): OFDM	MCS0 (29.5Mbps)
5.6 GHz Band	IEEE802.11a: OFDM	6Mbps
	IEEE802.11n (HT20): OFDM	MCS0 (6.5Mbps)
	IEEE802.11n (HT40): OFDM	MCS0 (13.5Mbps)
	IEEE802.11ac (VHT80): OFDM	MCS0 (29.5Mbps)

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.

The worst emission was found in X-axis, Chain Both and the worst case recorded.

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.



Japan

2.6 Operating flow

- Tx mode

- i) Test program setup to the Software
- ii) Select a Test mode
Operating frequency: 5.2GHz Band, 5.3GHz Band, 5.6GHz Band
- iii) Start test mode

- Rx mode

- i) Test program setup to the Software
- ii) Select a Test mode
Operating frequency: 5.2GHz Band, 5.3GHz Band, 5.6GHz Band
- iii) Start test mode

3 Configuration of Equipment

Numbers assigned to equipment on the diagram in “3.3 System configuration” correspond to the lists in “3.1 Equipment used” and “3.2 Cable(s) used”.

This test configuration is based on the manufacture’s instruction.

Cabling and setup(s) were taken into consideration and test data was taken under worse case condition.

3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	Mobile Phone	KYOCERA	EB1157	358018240001198 358018240001065	JOYEB1157	EUT
2	AC Adapter	KDDI	0602PQA	N/A	N/A	*

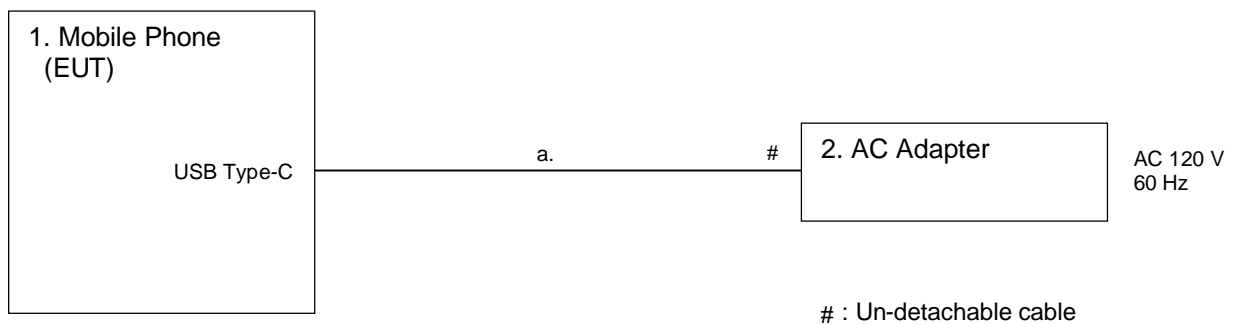
*: AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment
a	USB cable (for AC Adapter)	1.5	No	Plastic	*

*: AC power line Conducted Emission Test.

3.3 System configuration





4 Test Result

4.1 26dB Bandwidth and 99% Occupied Bandwidth

4.1.1 Measurement procedure

[FCC 15.407(a), KDB 789033 D02, Section C, D]

The 26dB bandwidth and 99% occupied bandwidth is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- RBW=200 kHz/430 kHz/820 kHz, VBW=620 kHz/1.3 MHz/2.4 MHz, Span=40 MHz/80 MHz/160 MHz
- Sweep=auto, Detector=Peak, Trace mode=Max hold

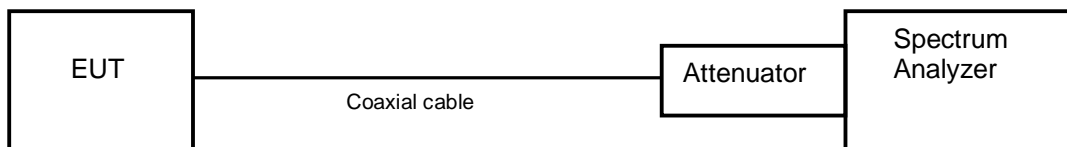
The EUT was set to operate with following conditions.

- 5.2 GHz Band, 5.3 GHz Band, 5.6 GHz Band, 5.8 GHz Band

The test mode of EUT is as follows.

- Tx mode

- Test configuration



4.1.2 Limit

None

4.1.3 Measurement result

Date : 14-July-2023
 Temperature : 23.7 [°C]
 Humidity : 55.7 [%]
 Test place : Shielded room No.4

Test engineer : Kazunori Saito

Date : 19-July-2023
 Temperature : 23.3 [°C]
 Humidity : 59.6 [%]
 Test place : Shielded room No.4

Test engineer : Kazunori Saito



[Chain 0]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11a	5.2GHz Band	36	5180	19.858	16.3396
		40	5200	19.811	16.3402
		48	5240	19.783	16.3357
	5.3GHz Band	52	5260	19.917	16.3408
		56	5280	19.813	16.3372
		64	5320	19.848	16.3395
	5.6GHz Band	100	5500	19.866	16.3326
		116	5580	19.847	16.3409
		140	5700	19.780	16.3409
		144	5720	19.861	16.3389

[Chain 0]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11n (20MHz)	5.2GHz Band	36	5180	20.614	17.5438
		40	5200	20.673	17.5423
		48	5240	20.224	17.5706
	5.3GHz Band	52	5260	20.727	17.5790
		56	5280	20.397	17.5460
		64	5320	20.599	17.5673
	5.6GHz Band	100	5500	20.600	17.5660
		116	5580	20.625	17.5707
		140	5700	20.519	17.5785
		144	5720	20.350	17.5554

[Chain 0]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11n (40MHz)	5.2GHz Band	38	5190	40.037	36.0137
		46	5230	40.085	36.0219
	5.3GHz Band	54	5270	39.718	36.0088
		62	5310	39.919	35.9890
	5.6GHz Band	102	5510	40.134	35.9968
		110	5550	39.872	36.0255
		134	5670	39.830	36.0095
		142	5710	40.245	36.0625



[Chain 0]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11ac (80MHz)	5.2GHz Band	42	5210	82.081	75.2819
	5.3GHz Band	58	5290	81.934	75.2835
	5.6GHz Band	106	5530	82.296	75.2949
		122	5610	81.473	75.3002
		138	5690	81.754	75.3119

[Chain 1]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11a	5.2GHz Band	36	5180	19.784	16.3315
		40	5200	19.077	16.3407
		48	5240	19.834	16.3428
	5.3GHz Band	52	5260	19.821	16.3502
		56	5280	19.827	16.3521
		64	5320	19.925	16.3494
	5.6GHz Band	100	5500	19.704	16.3516
		116	5580	19.838	16.3463
		140	5700	19.843	16.3491
		144	5720	19.729	16.3666

[Chain 1]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11n (20MHz)	5.2GHz Band	36	5180	20.433	17.5467
		40	5200	20.490	17.5462
		48	5240	20.599	17.5639
	5.3GHz Band	52	5260	20.864	17.5562
		56	5280	20.756	17.5585
		64	5320	20.669	17.5560
	5.6GHz Band	100	5500	20.600	17.5594
		116	5580	20.544	17.5509
		140	5700	20.561	17.5445
		144	5720	20.724	17.5523

[Chain 1]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11n (40MHz)	5.2GHz Band	38	5190	39.750	35.9947
		46	5230	39.900	35.9810
	5.3GHz Band	54	5270	40.457	36.0428
		62	5310	39.833	36.0204
	5.6GHz Band	102	5510	39.652	36.0071
		110	5550	39.888	36.0035
		134	5670	39.931	36.0053
		142	5710	40.369	36.0210

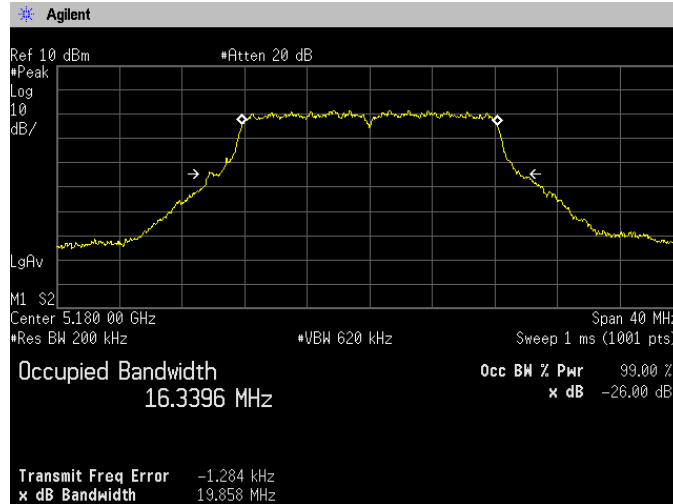
[Chain 1]

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11ac (80MHz)	5.2GHz Band	42	5210	81.590	75.1722
	5.3GHz Band	58	5290	82.164	75.1792
	5.6GHz Band	106	5530	82.079	75.2268
		122	5610	81.212	75.1764
		138	5690	81.579	75.1573

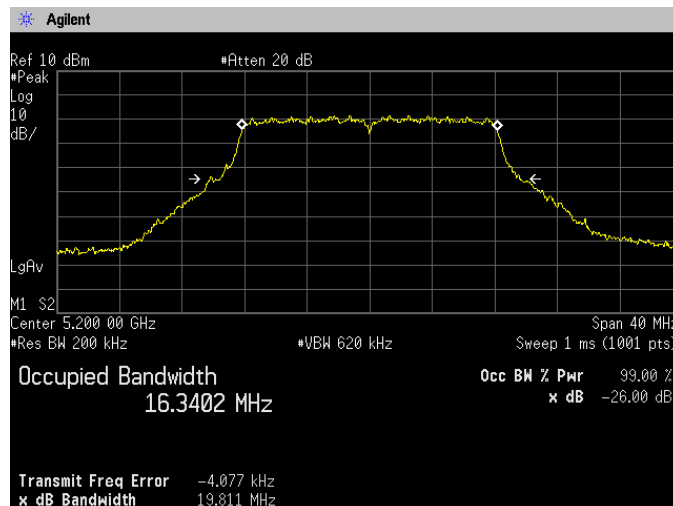


4.1.4 Trace data

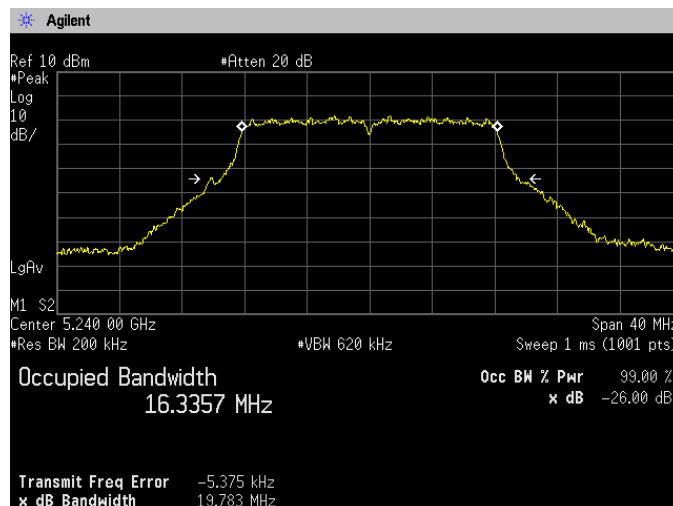
[IEEE802.11a]
 (5.2 GHz Band)
 Channel: 36[Chain 0]



Channel: 40[Chain 0]

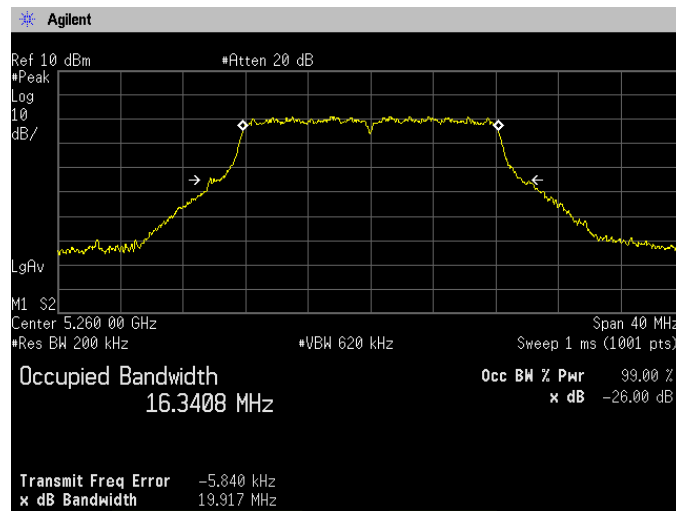


Channel: 48[Chain 0]

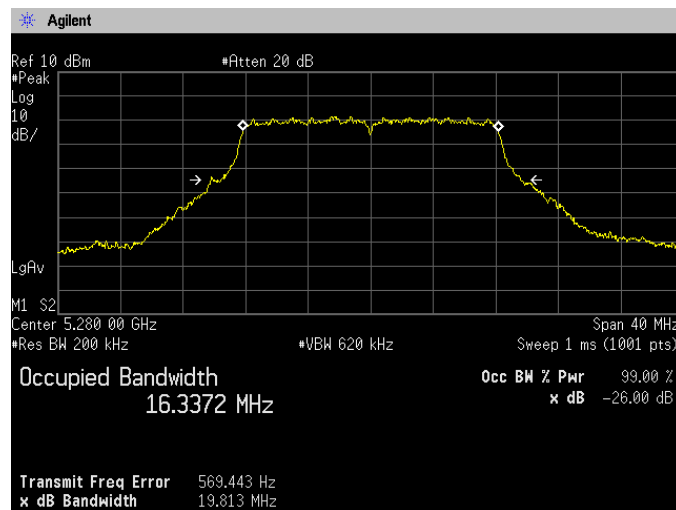




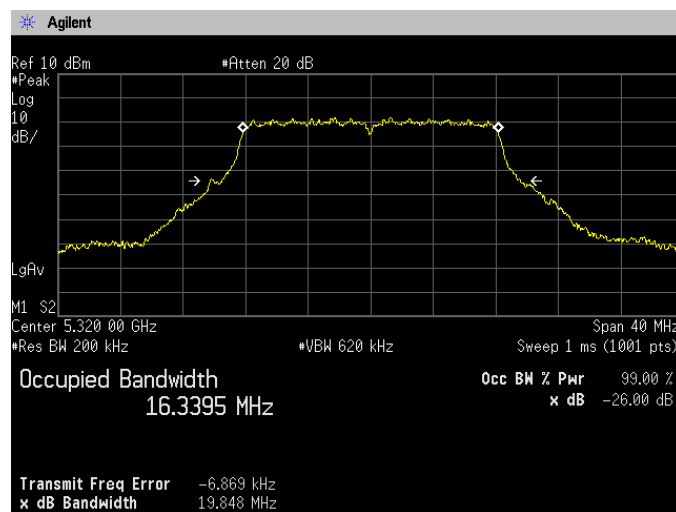
**(5.3 GHz Band)
Channel: 52[Chain 0]**



Channel: 56[Chain 0]

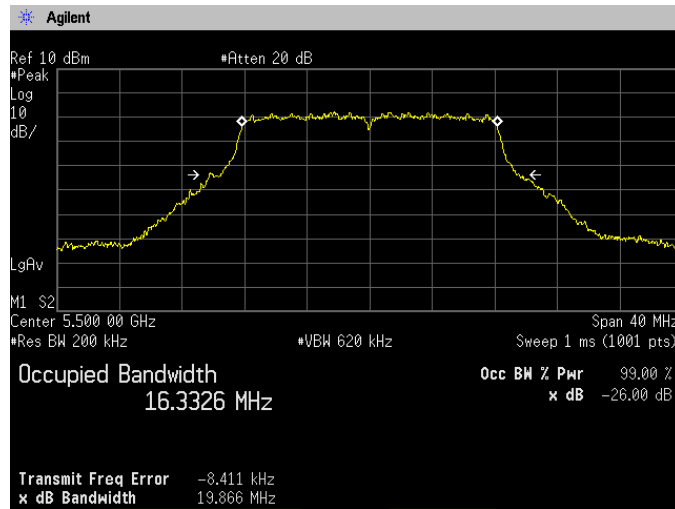


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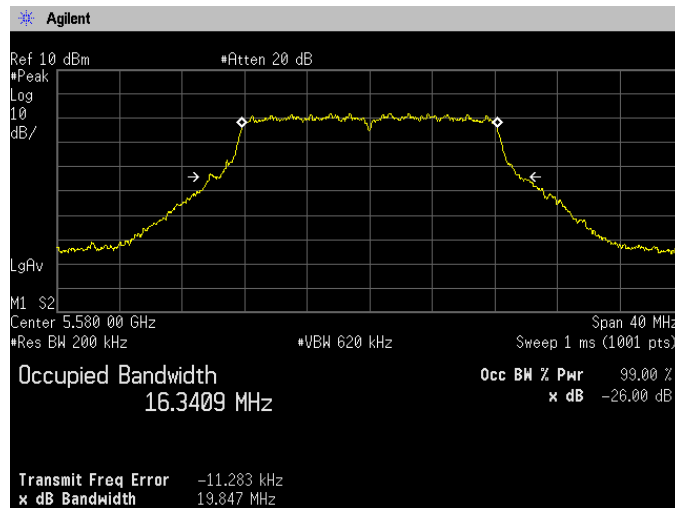




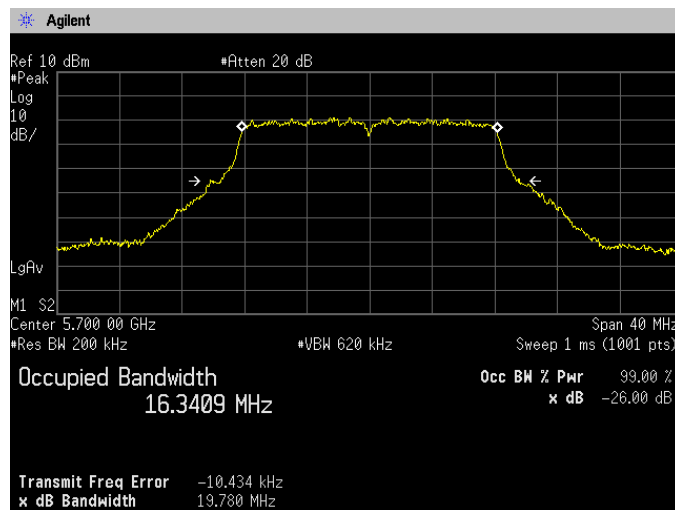
**(5.6 GHz Band)
Channel: 100[Chain 0]**



Channel: 116[Chain 0]



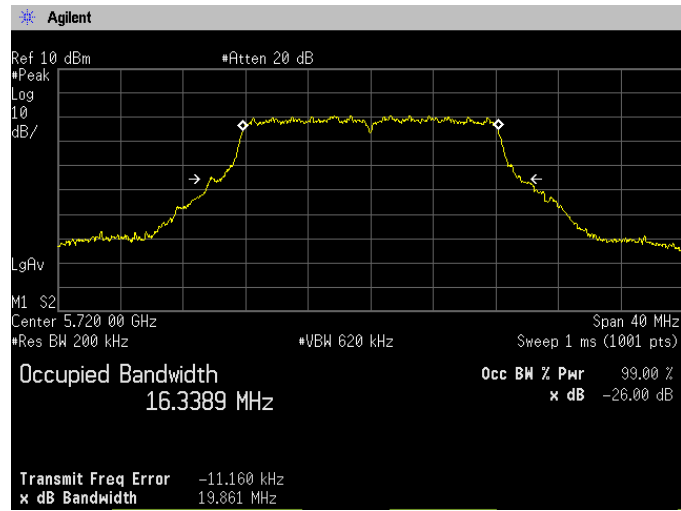
Channel: 140[Chain 0]



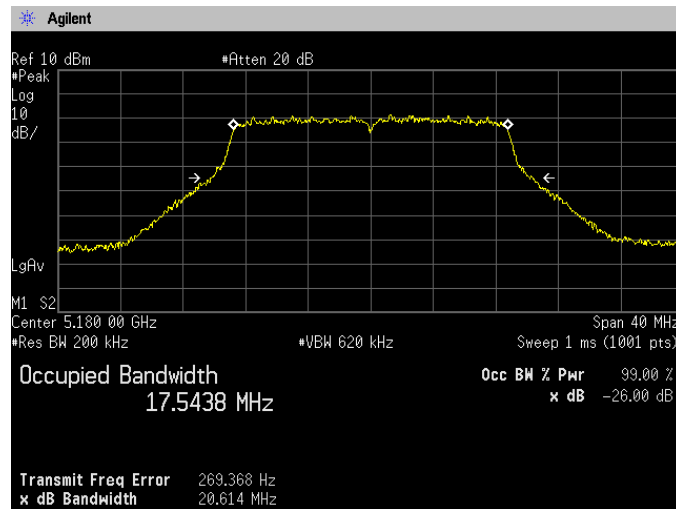


Japan

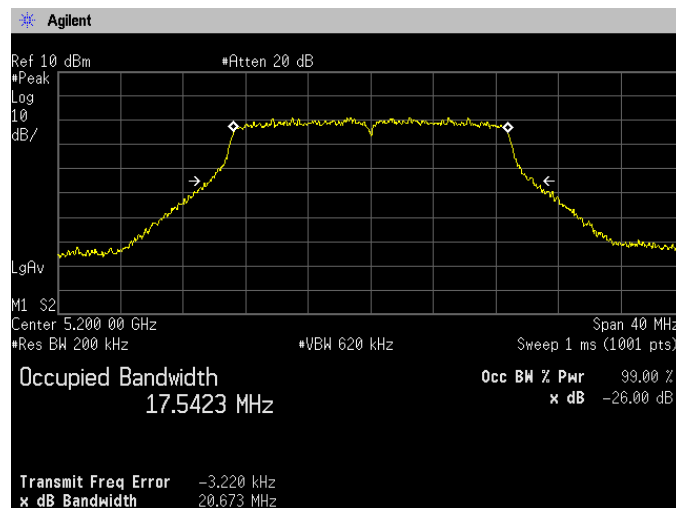
**(5.6 GHz Band)
Channel: 144[Chain 0]**



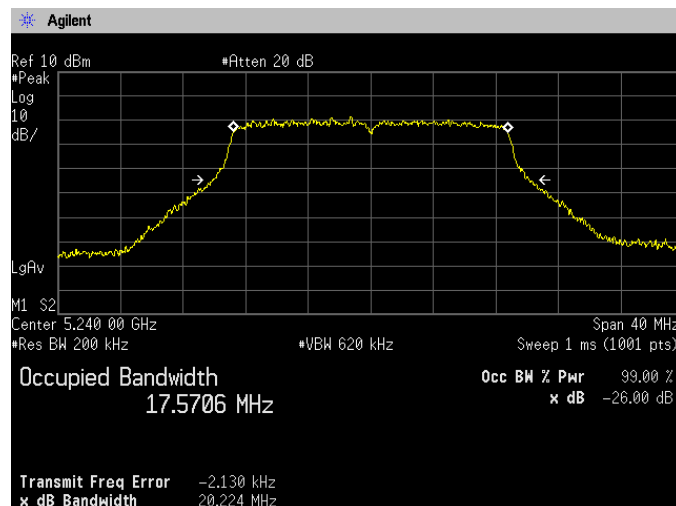
**[IEEE802.11n (HT20)]
(5.2 GHz Band)
Channel: 36[Chain 0]**



Channel: 40[Chain 0]

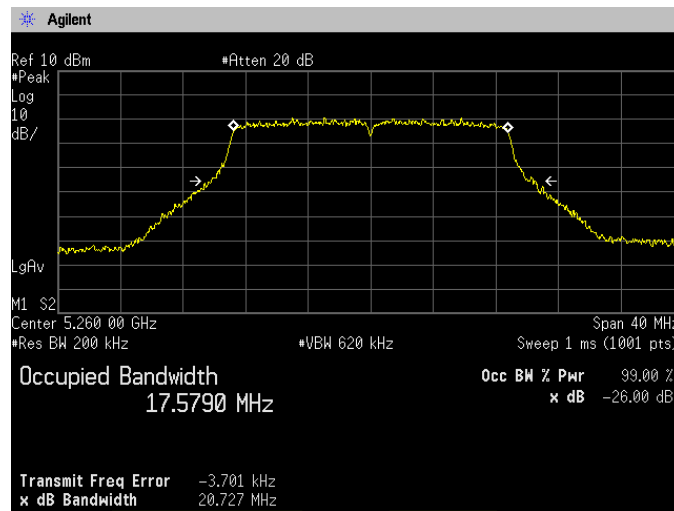


Channel: 48[Chain 0]

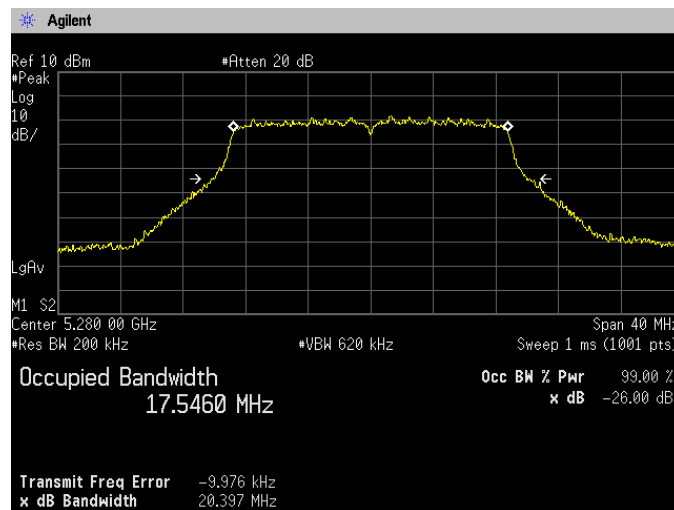




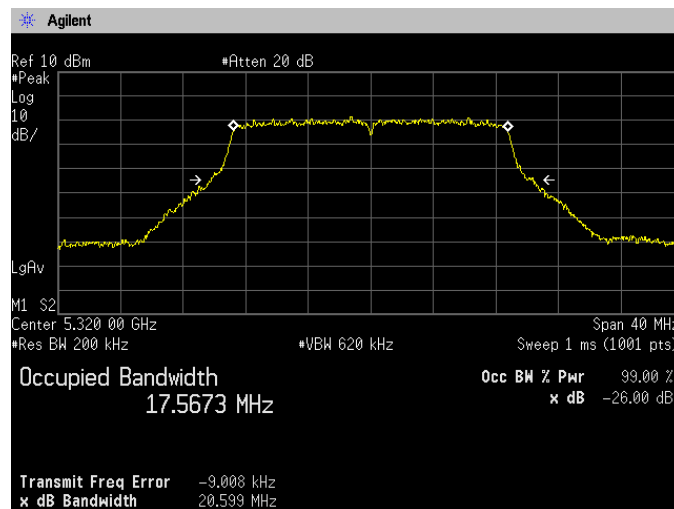
**(5.3 GHz Band)
Channel: 52[Chain 0]**



Channel: 56[Chain 0]

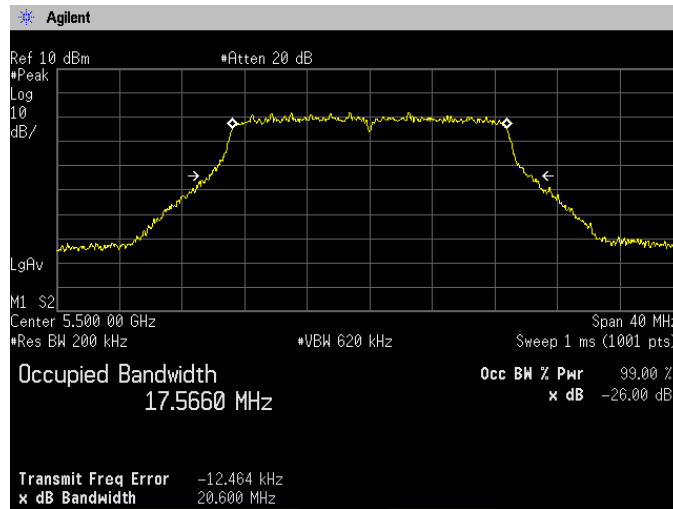


Channel: 64[Chain 0]

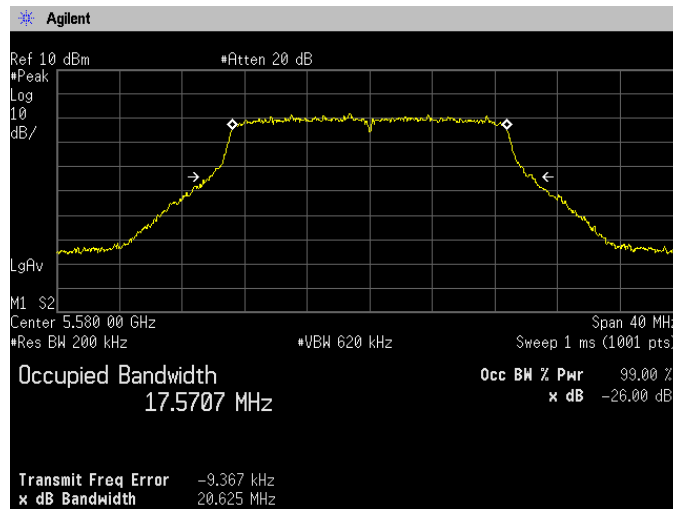




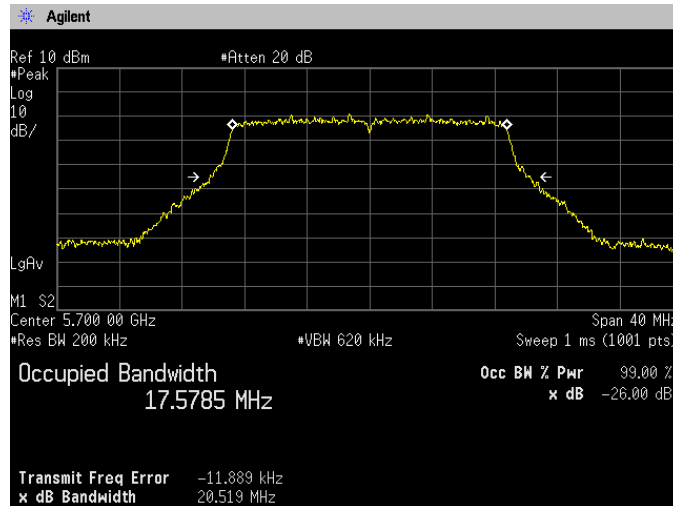
**(5.6 GHz Band)
Channel: 100[Chain 0]**



Channel: 116[Chain 0]

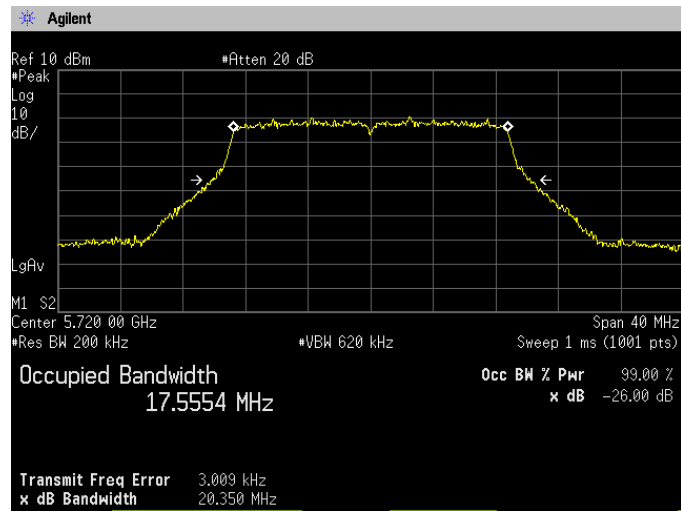


Channel: 140[Chain 0]



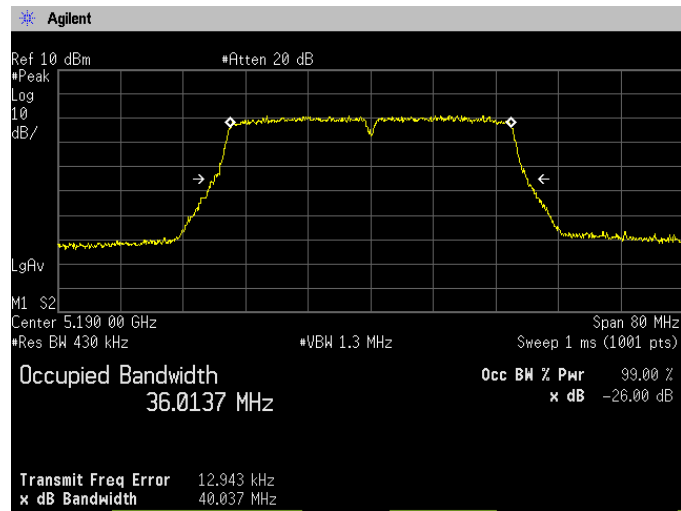
(5.6 GHz Band)

Channel: 144[Chain 0]

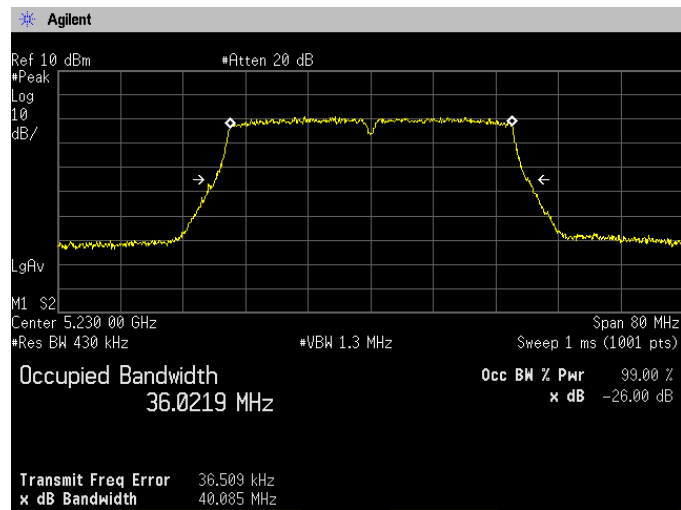




**[IEEE802.11n (HT40)]
(5.2 GHz Band)
Channel: 38[Chain 0]**

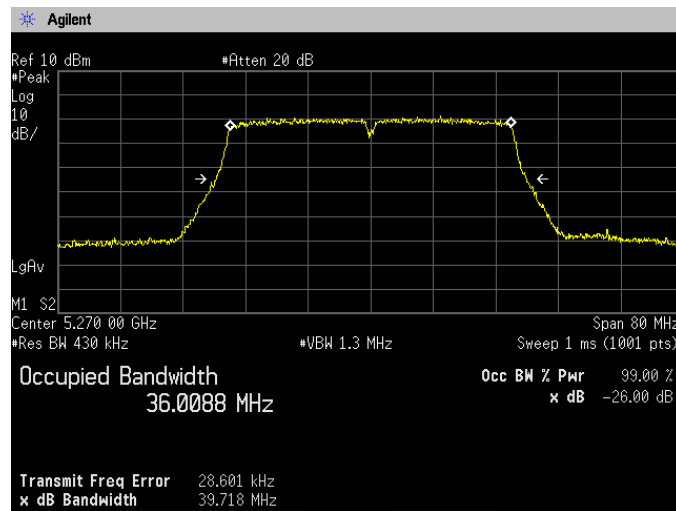


Channel: 46[Chain 0]

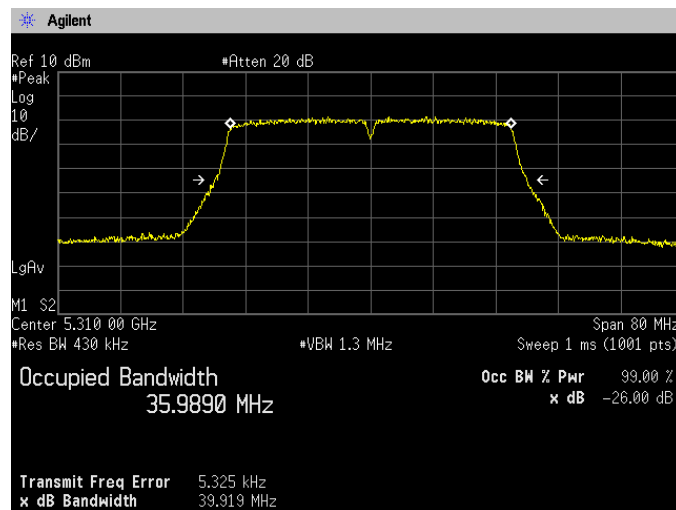




**(5.3 GHz Band)
Channel: 54[Chain 0]**

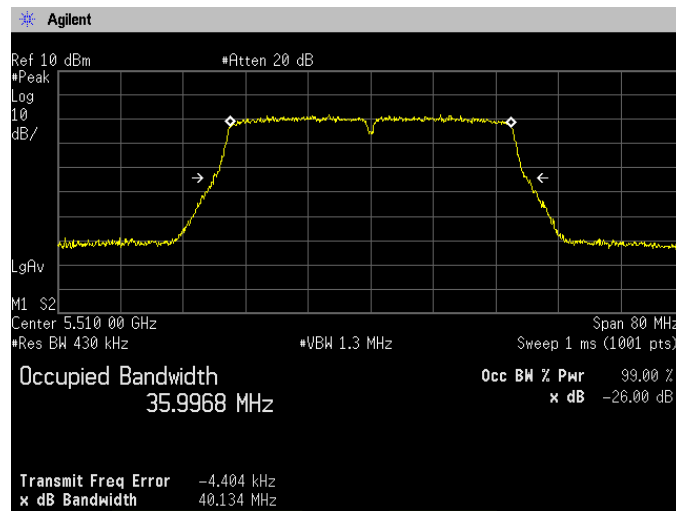


Channel: 62[Chain 0]

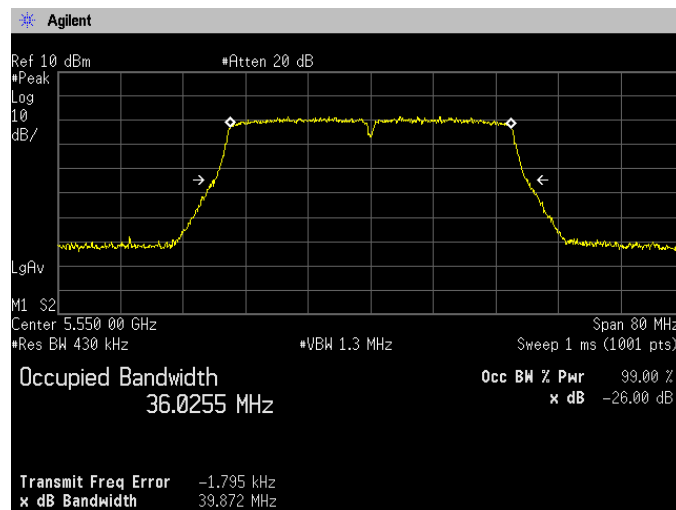




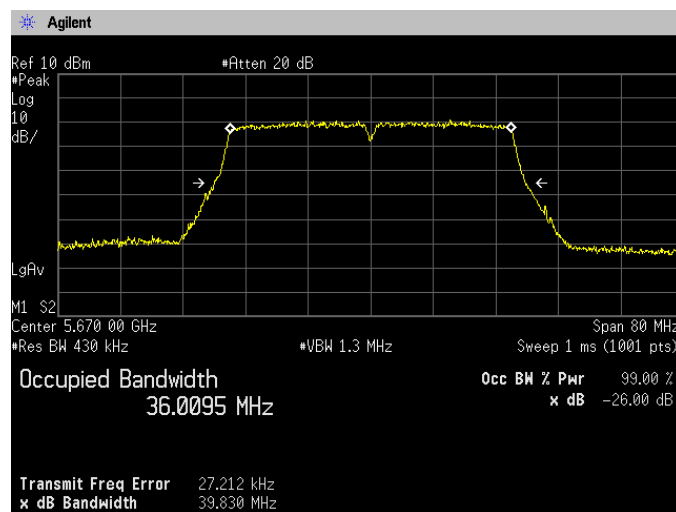
**(5.6 GHz Band)
Channel: 102[Chain 0]**



Channel: 110[Chain 0]

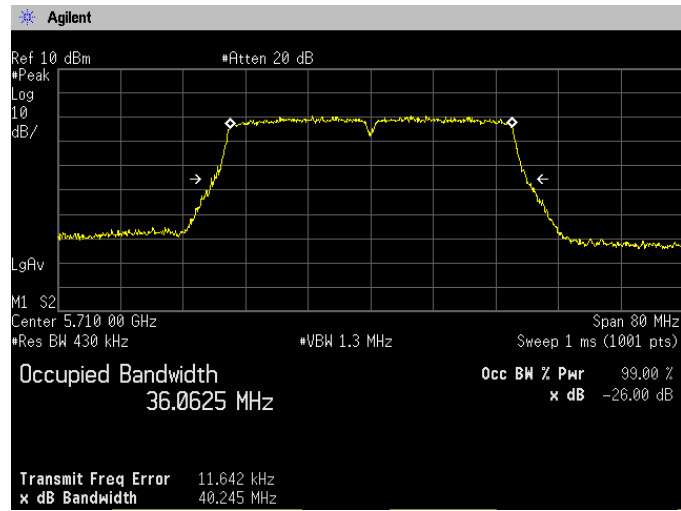


Channel: 134[Chain 0]



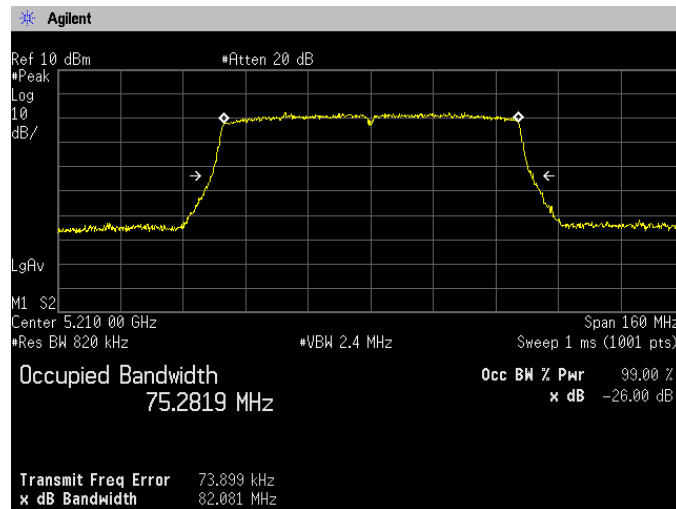


**(5.6 GHz Band)
Channel: 142[Chain 0]**

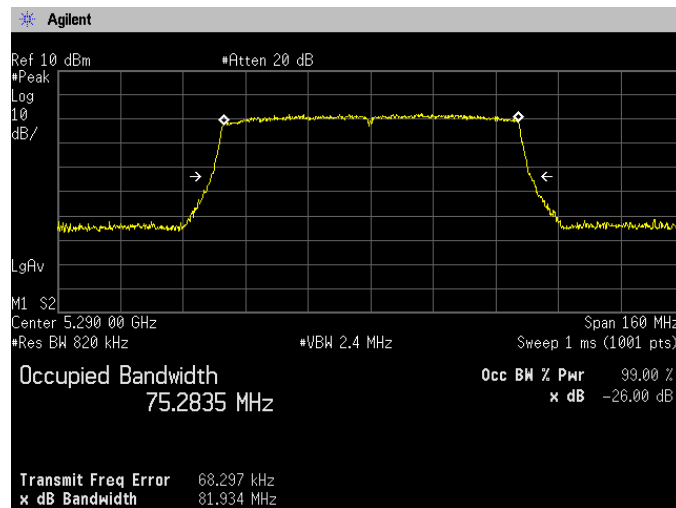




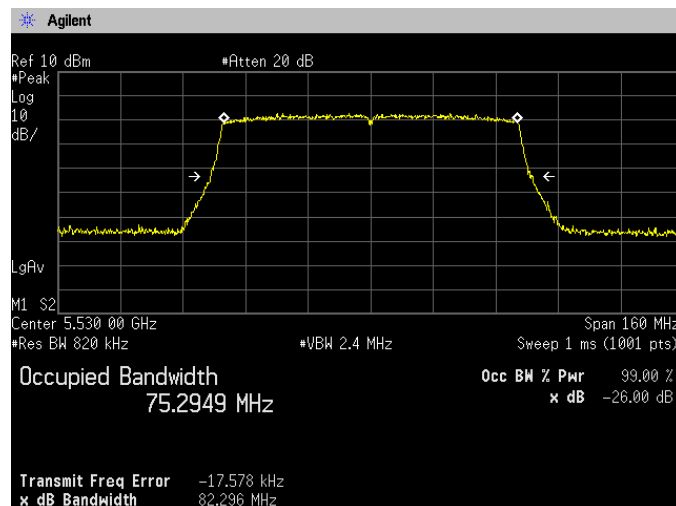
**[IEEE802.11ac (HT80)]
(5.2 GHz Band)
Channel: 42[Chain 0]**



**(5.3GHz Band)
Channel: 58[Chain 0]**

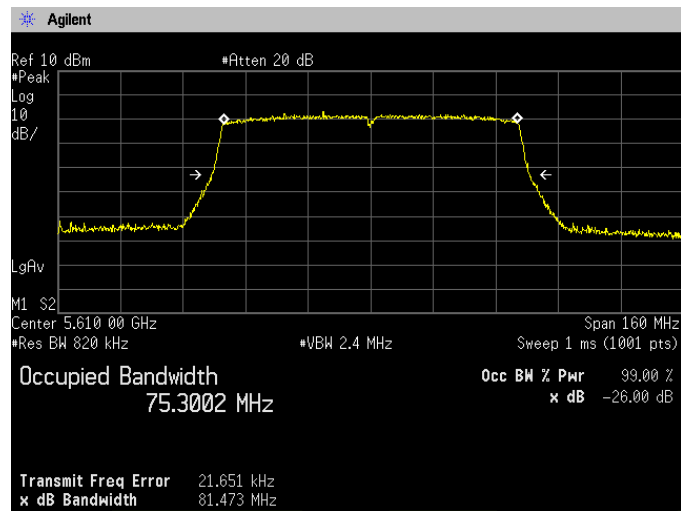


**(5.6 GHz Band)
Channel: 106[Chain 0]**

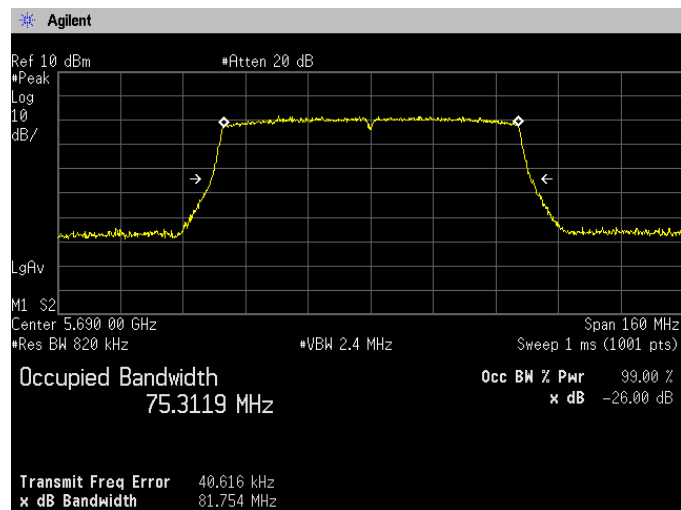




**(5.6 GHz Band)
Channel: 122[Chain 0]**

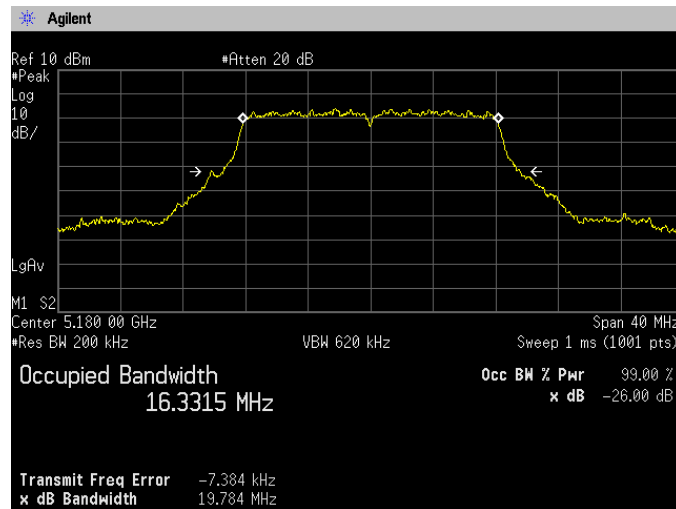


Channel: 138[Chain 0]

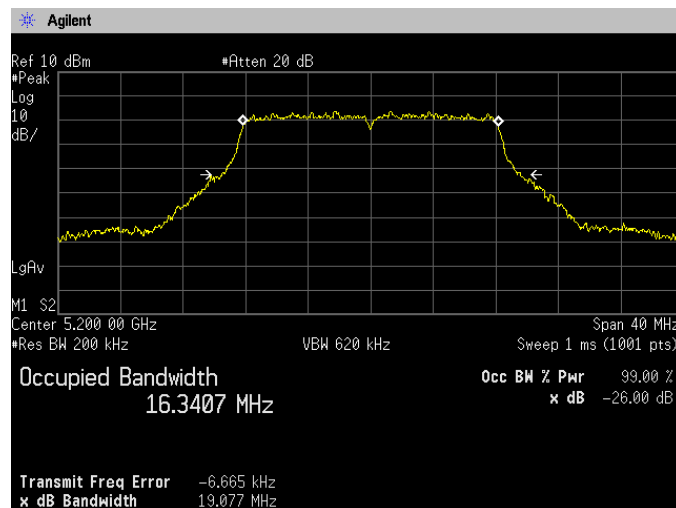




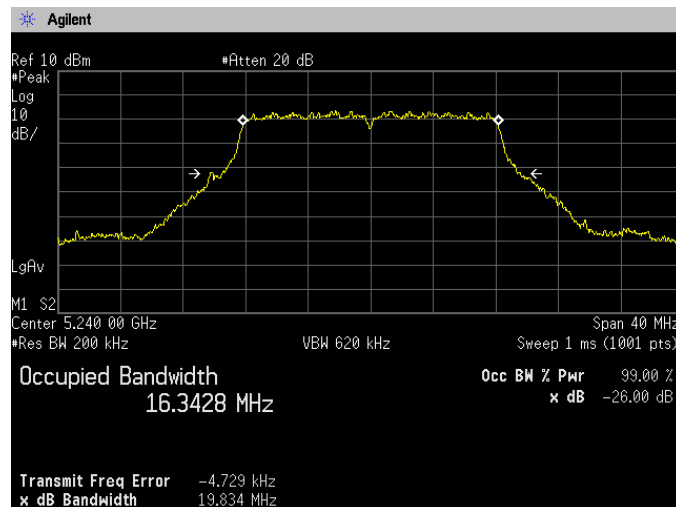
**[IEEE802.11a]
(5.2 GHz Band)
Channel: 36[Chain 1]**



Channel: 40[Chain 1]

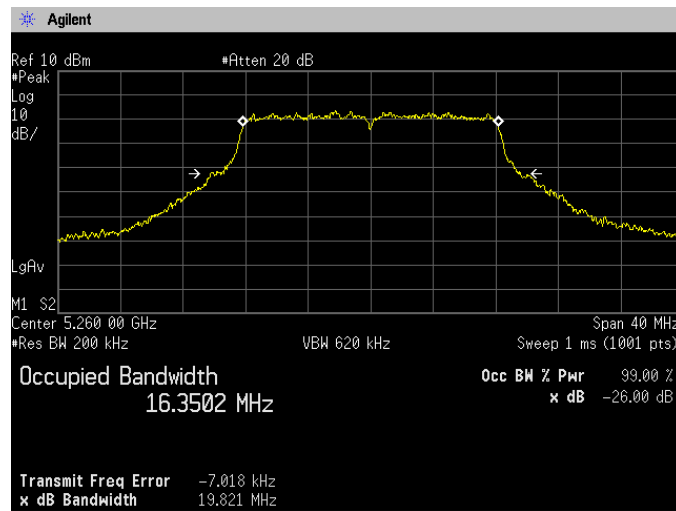


Channel: 48[Chain 1]

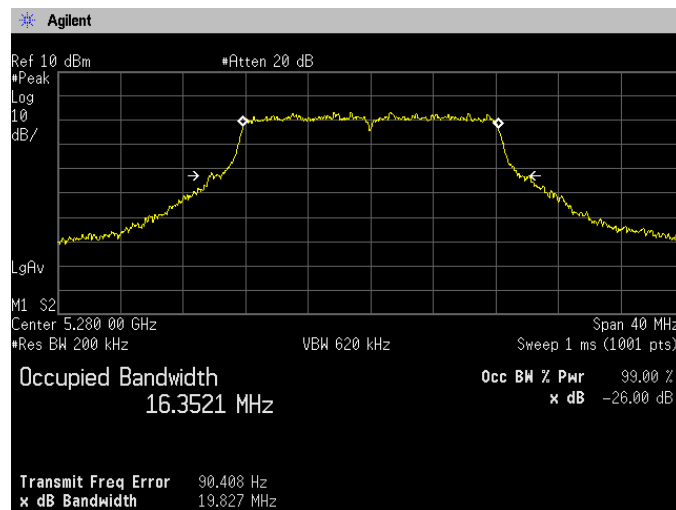




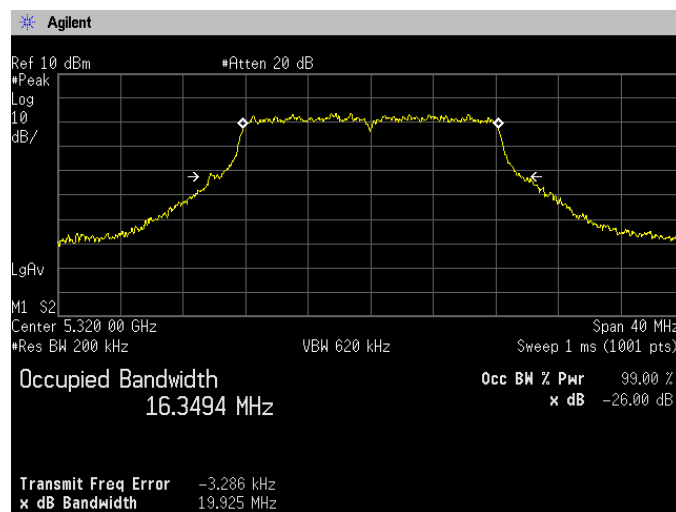
**(5.3 GHz Band)
Channel: 52[Chain 1]**



Channel: 56[Chain 1]

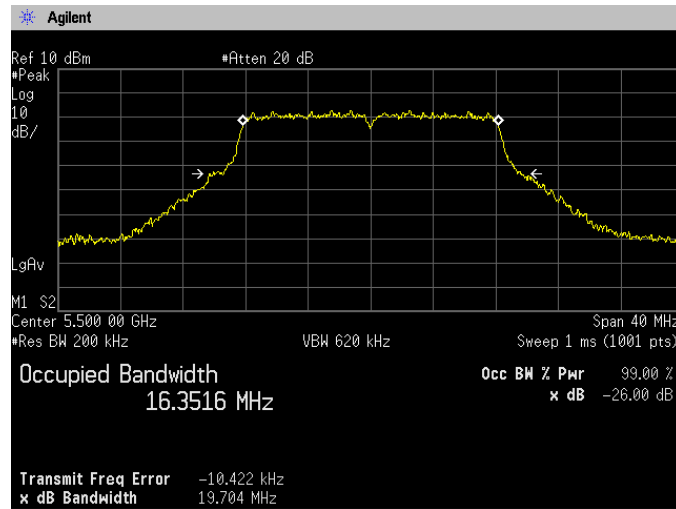


Channel: 64[Chain 1]

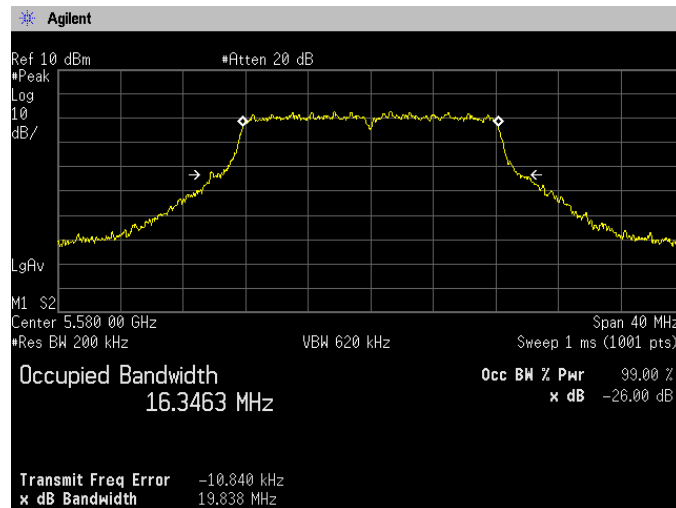




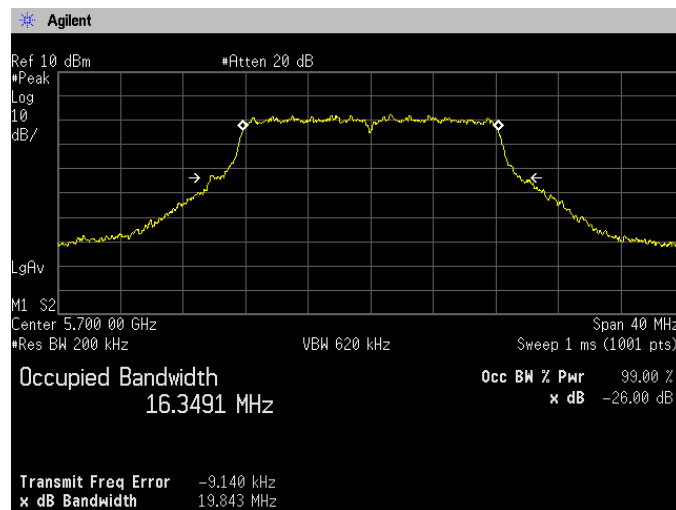
**(5.6 GHz Band)
Channel: 100[Chain 1]**



Channel: 116[Chain 1]



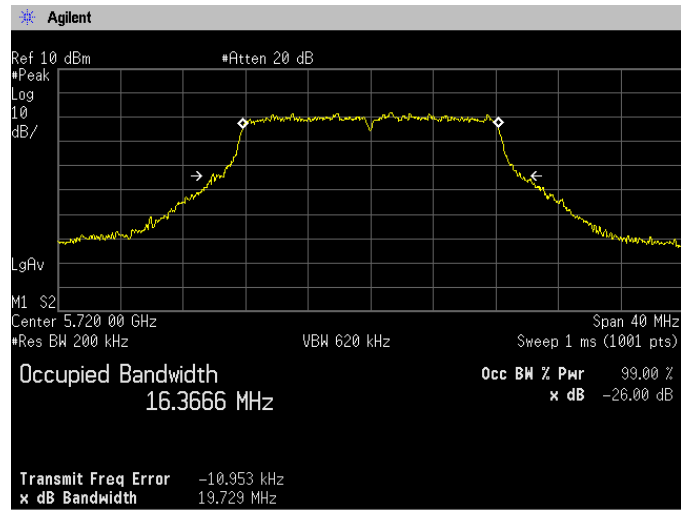
Channel: 140[Chain 1]





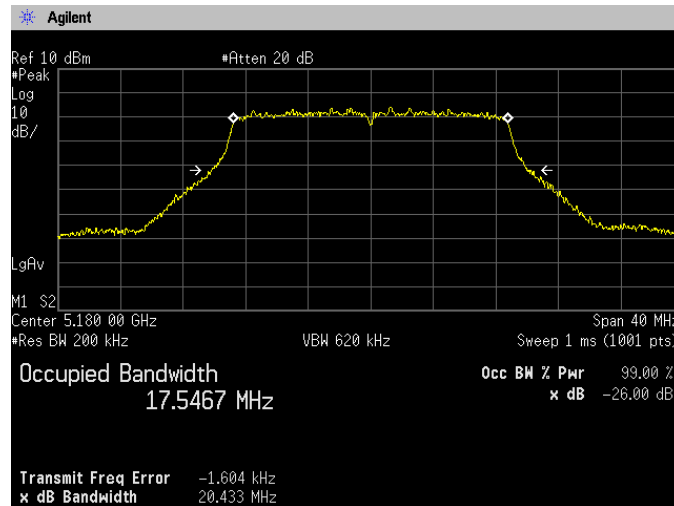
Japan

**(5.6 GHz Band)
Channel: 144[Chain 1]**

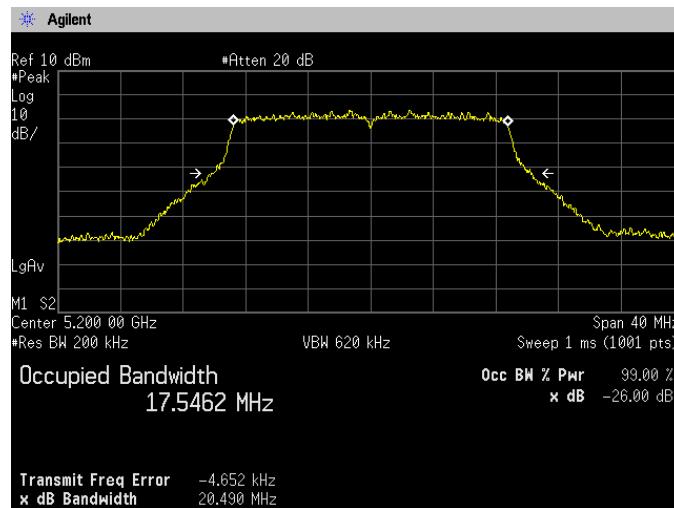




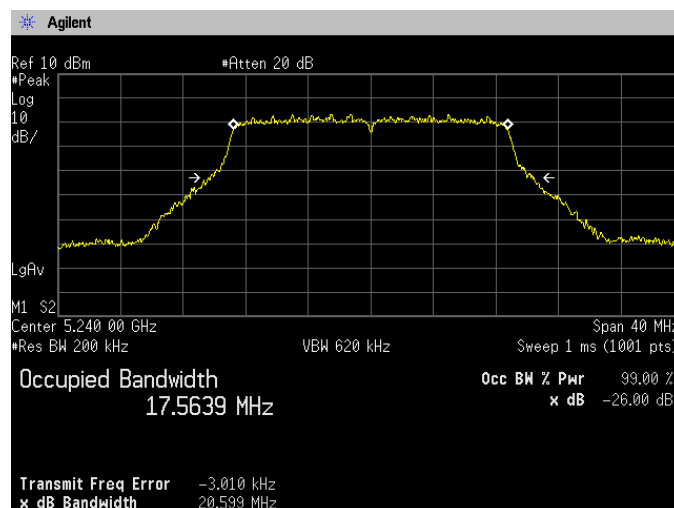
**[IEEE802.11n (HT20)]
(5.2 GHz Band)
Channel: 36[Chain 1]**



Channel: 40[Chain 1]

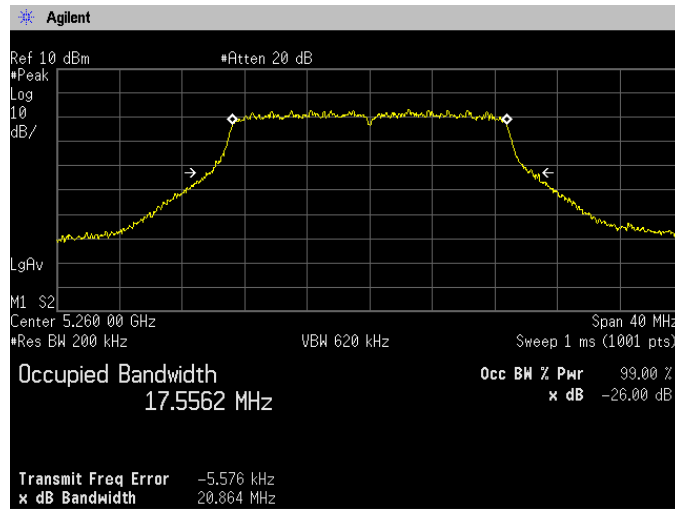


Channel: 48[Chain 1]

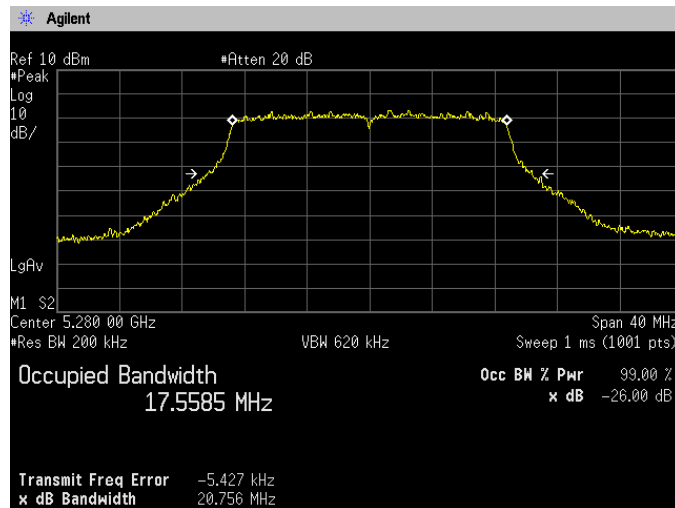




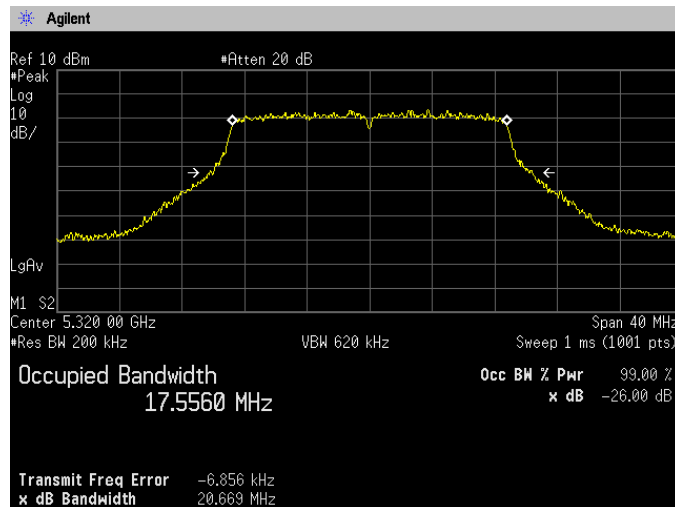
**(5.3 GHz Band)
Channel: 52[Chain 1]**



Channel: 56[Chain 1]

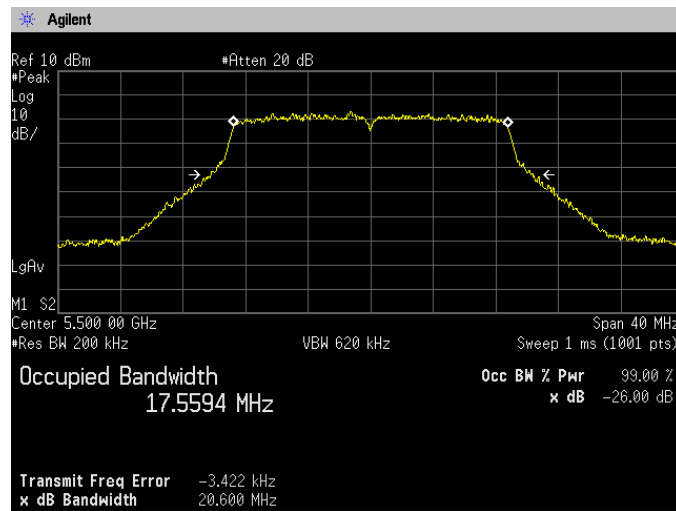


Channel: 64[Chain 1]

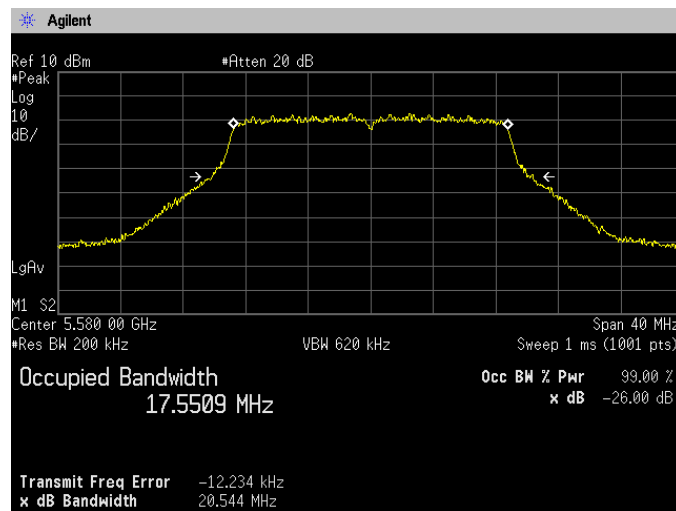




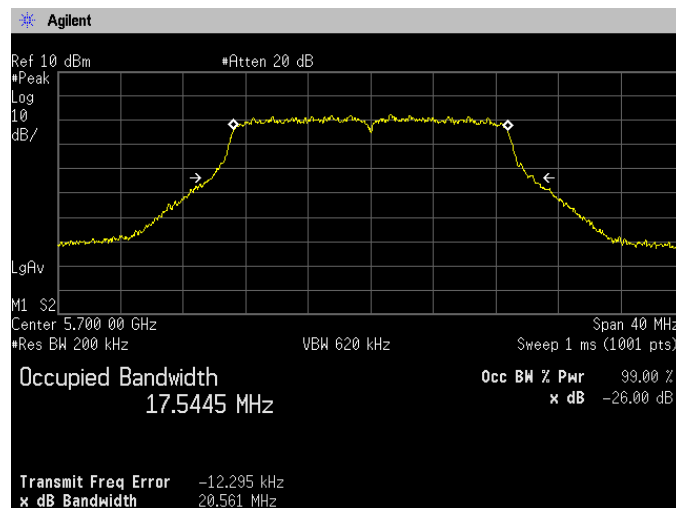
**(5.6 GHz Band)
Channel: 100[Chain 1]**



Channel: 116[Chain 1]

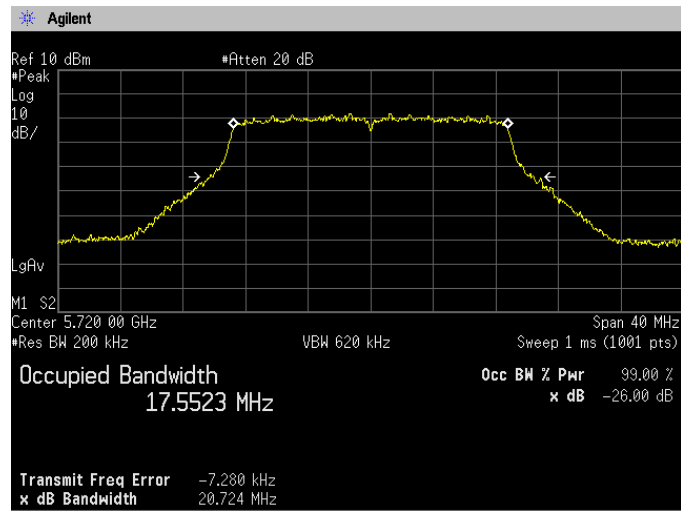


Channel: 140[Chain 1]



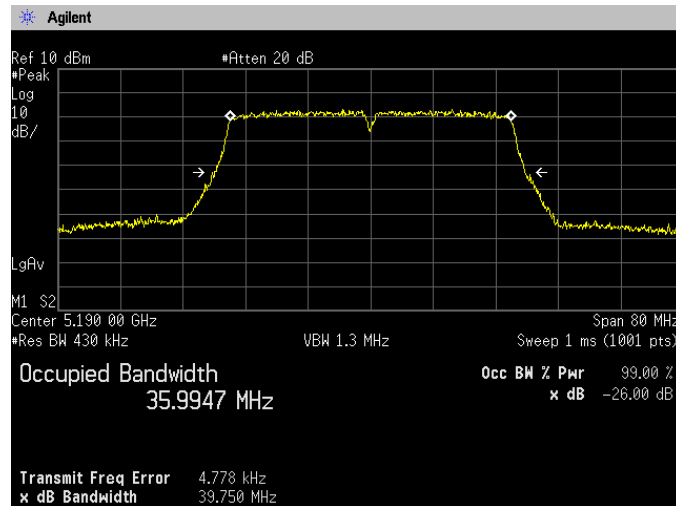
(5.6 GHz Band)

Channel: 144[Chain 1]

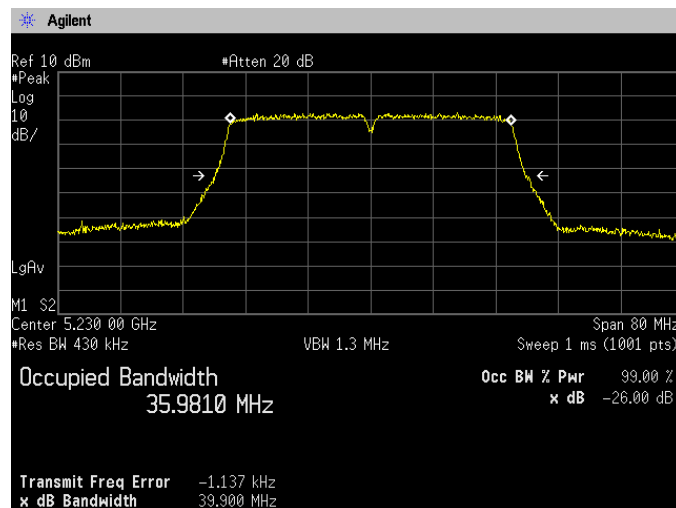




**[IEEE802.11n (HT40)]
(5.2 GHz Band)
Channel: 38[Chain 1]**

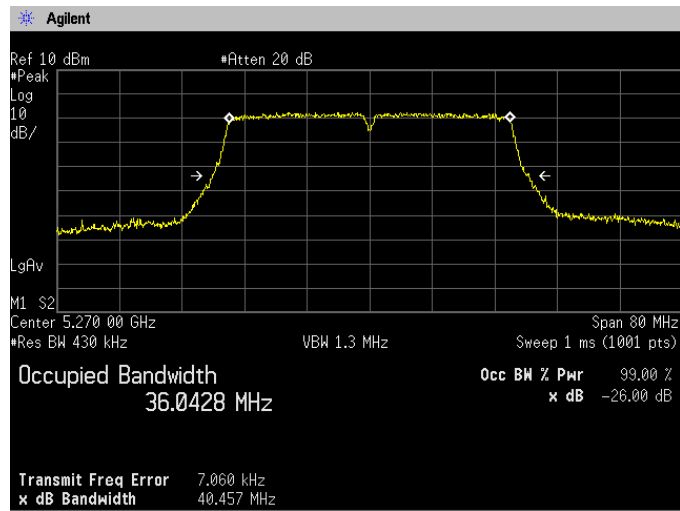


Channel: 46[Chain 1]

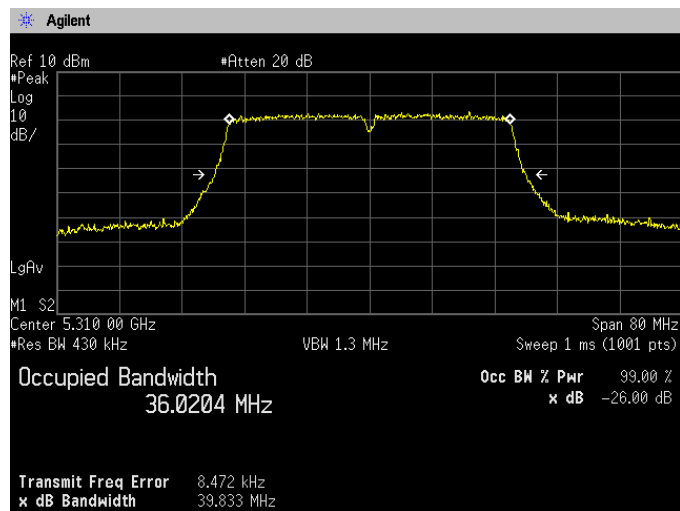




**(5.3 GHz Band)
Channel: 54[Chain 1]**

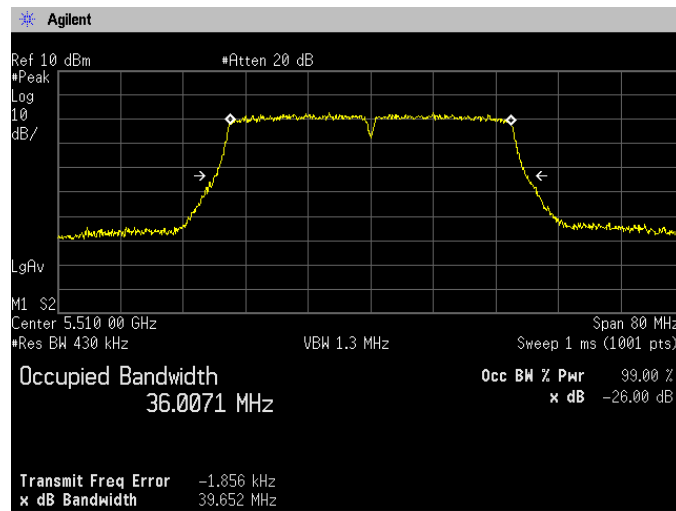


Channel: 62[Chain 1]

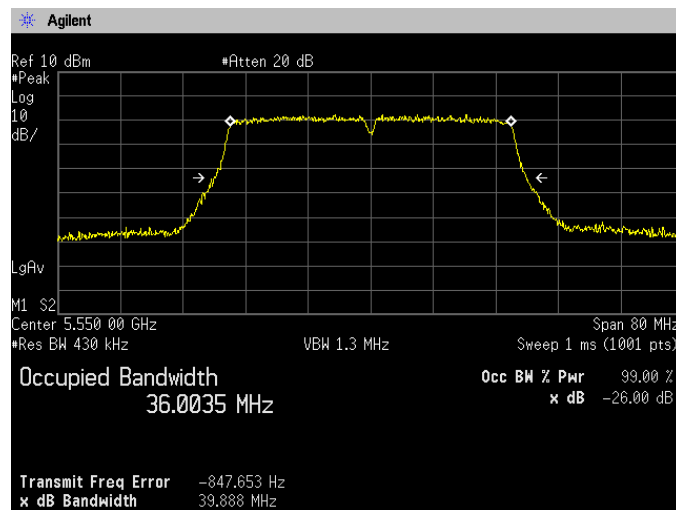




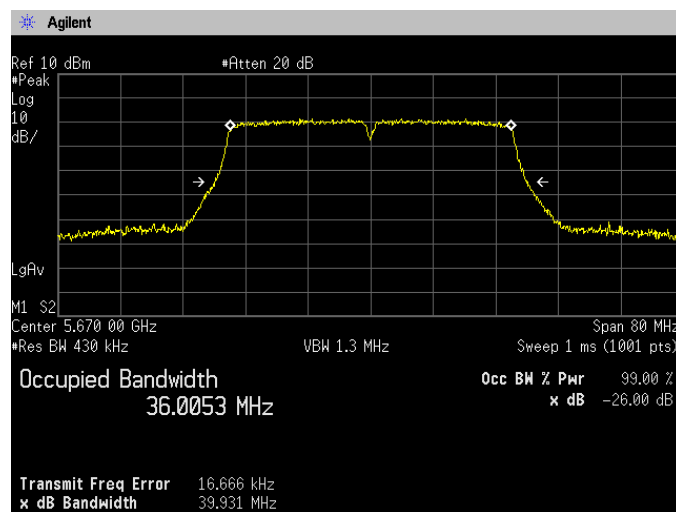
**(5.6 GHz Band)
Channel: 102[Chain 1]**



Channel: 110[Chain 1]



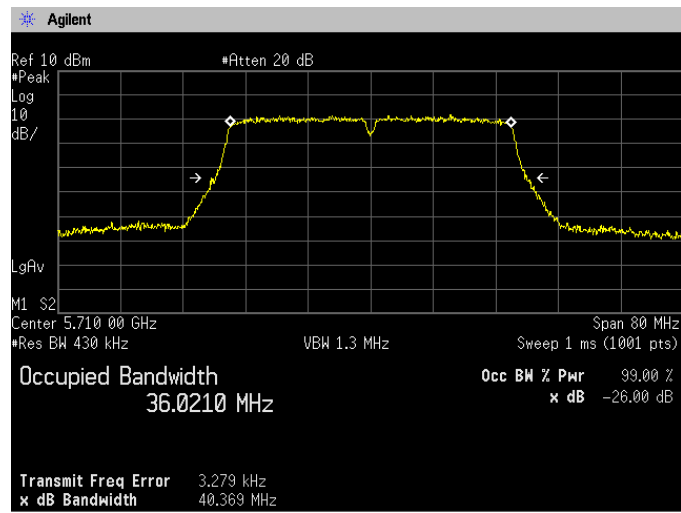
Channel: 134[Chain 1]





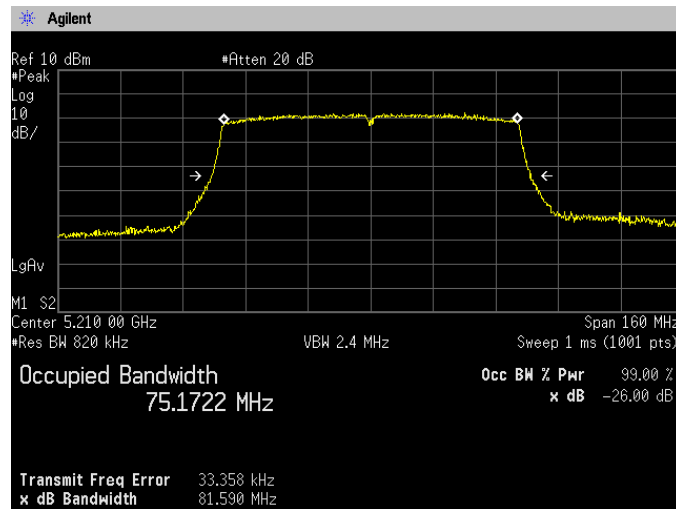
Japan

**(5.6 GHz Band)
Channel: 142[Chain 1]**

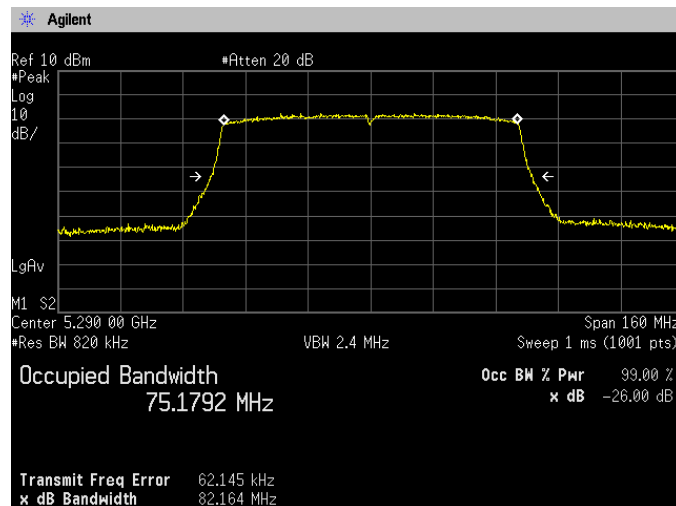




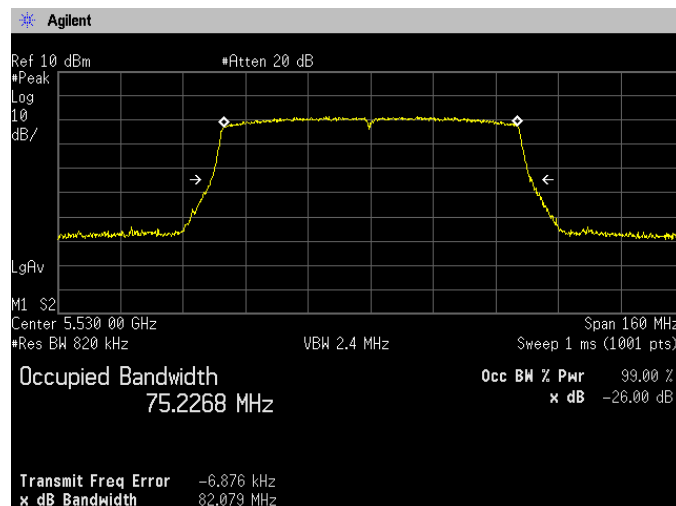
**[IEEE802.11ac (HT80)]
(5.2 GHz Band)
Channel: 42[Chain 1]**



**(5.3GHz Band)
Channel: 58[Chain 1]**

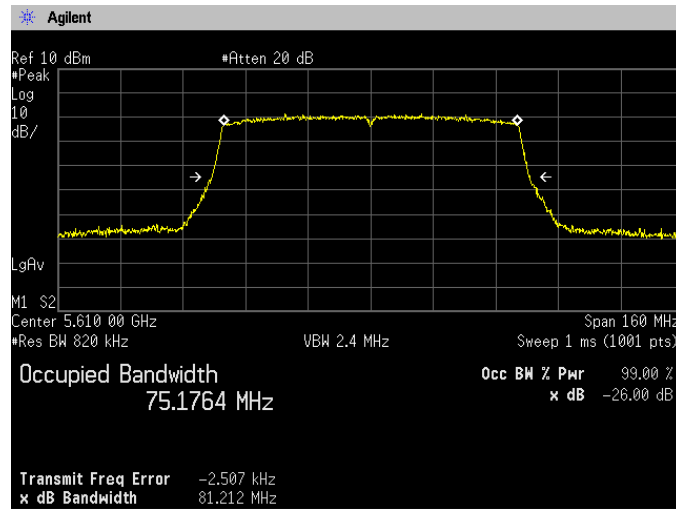


**(5.6 GHz Band)
Channel: 106[Chain 1]**

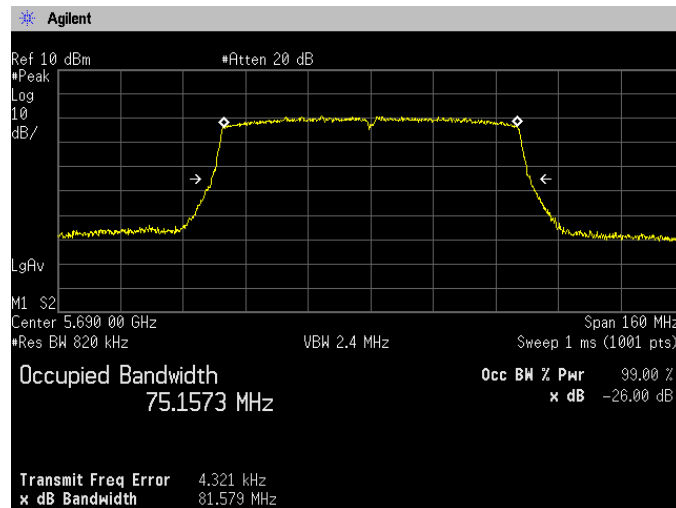




**(5.6 GHz Band)
Channel: 122[Chain 1]**



Channel: 138[Chain 1]



4.2 Maximum Conducted Output Power

4.2.1 Measurement procedure

[FCC 15.407(a), KDB 789033 D02, Section E.2.b) Method SA-1, d) Method SA-2]

The peak power is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- RBW=1MHz, VBW=3MHz, Span=35MHz/70MHz/140MHz, Sweep=auto, Detector=RMS, Trace mode=Averaging

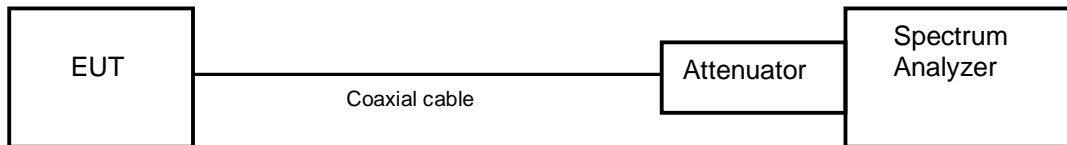
The EUT was set to operate with following conditions.

- 5.2GHz Band, 5.3GHz Band, 5.6GHz Band

The test mode of EUT is as follows.

- Tx mode

- Test configuration



4.2.2 Limit

- (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 250mW 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 band of operation shall not exceed the lesser of 250mW or $11\text{dBm} + 10\log B$, where B is the 26dB emission bandwidth in megahertz.
- (3) For the 5.725-5.85 GHz bands, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

4.2.3 DIRECTIONAL ANTENNA GAIN

Tx chains are uncorrelated for power and correlated for PSD due to the device supporting OFDMA in all MIMO modes. The directional gains are as follows:

Band	Chain 0 Gain (dBi)	Chain 1 Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.2 GHz Band	2.2	0.6	1.47	4.45
5.3 GHz Band	2.2	0.6	1.47	4.45
5.6 GHz Band	3.2	1.9	2.60	5.58

Note: 802.11a does not support MIMO.



<Output Power Limit Calculation[Chain 0]>

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.2GHz Band	802.11a	250	23.97	2.2	23.97
	802.11n HT20				
	802.11n HT20				
	802.11ac HT80				

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
		Least 26dBc BW (MHz)			
5.3GHz Band	802.11a	250	23.97	2.2	23.97
		19.813	23.97		
	802.11n HT20	250	23.97		23.97
		20.397	24.10		
	802.11n HT20	250	23.97		23.97
		39.718	26.99		
	802.11ac HT80	250	23.97		23.97
		81.934	30.13		

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
		Least 26dBc BW (MHz)			
5.6GHz Band	802.11a	250	23.97	3.2	23.97
		19.780	23.96		
	802.11n HT20	250	23.97		23.97
		20.519	24.12		
	802.11n HT20	250	23.97		23.97
		39.830	27.00		
	802.11ac HT80	250	23.97		23.97
		81.473	30.11		

<Output Power Limit Calculation[Chain 1]>

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.2GHz Band	802.11a	250	23.97	0.6	23.97
	802.11n HT20				
	802.11n HT20				
	802.11ac HT80				

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
		Least 26dBc BW (MHz)			
5.3GHz Band	802.11a	250	23.97	0.6	23.97
		19.821	23.97		
	802.11n HT20	250	23.97		23.97
		20.669	24.15		
	802.11n HT20	250	23.97		23.97
		39.833	27.00		
	802.11ac HT80	250	23.97		23.97
		82.164	30.15		

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
		Least 26dBc BW (MHz)			
5.6GHz Band	802.11a	250	23.97	1.9	23.97
		19.704	23.95		
	802.11n HT20	250	23.97		23.97
		20.544	24.13		
	802.11n HT20	250	23.97		23.97
		39.652	26.98		
	802.11ac HT80	250	23.97		23.97
		81.212	30.10		



<Output Power Limit Calculation[Chain 0+1]>

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.2GHz Band	802.11a	MIMO is not supported.			
	802.11n HT20	250	23.97	1.47	23.97
	802.11n HT20				
	802.11ac HT80				

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
		Least 26dBc BW (MHz)			
5.3GHz Band	802.11a	250	23.97	1.47	23.97
		19.813	23.97		
	802.11n HT20	250	23.97		23.97
		20.397	24.10		
	802.11n HT20	250	23.97		23.97
		39.718	26.99		
	802.11ac HT80	250	23.97		23.97
		81.934	30.13		

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
		Least 26dBc BW (MHz)			
5.6GHz Band	802.11a	250	23.97	2.60	23.95
		19.704	23.95		
	802.11n HT20	250	23.97		23.97
		20.519	24.12		
	802.11n HT20	250	23.97		23.97
		39.652	26.98		
	802.11ac HT80	250	23.97		23.97
		81.212	30.10		



4.2.4 Measurement result

Date : 14-July-2023
 Temperature : 23.7 [°C]
 Humidity : 55.7 [%]
 Test place : Shielded room No.4
 Test engineer : Kazunori Saito

[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11a	36	5180	8.90	2.095	2.113	0.991	0	8.900	7.762
	40	5200	9.34					9.340	8.590
	58	5240	9.08					9.080	8.091
	52	5260	8.91	2.095	2.113	0.991	0	8.910	7.780
	56	5280	9.08					9.080	8.091
	64	5320	9.43					9.430	8.770
	100	5500	9.96	2.095	2.113	0.991	0	9.960	9.908
	116	5580	9.83					9.830	9.616
	140	5700	8.68					8.680	7.379
	144	5720	8.45					8.450	6.998

[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11n (20MHz)	36	5180	8.63	5.429	5.449	0.996	0	8.630	7.295
	40	5200	8.98					8.980	7.907
	58	5240	8.64					8.640	7.311
	52	5260	5.36	5.429	5.449	0.996	0	5.360	3.436
	56	5280	8.59					8.590	7.228
	64	5320	8.78					8.780	7.551
	100	5500	9.49	5.429	5.449	0.996	0	9.490	8.892
	116	5580	9.02					9.020	7.980
	140	5700	8.10					8.100	6.457
	144	5720	8.17					8.170	6.561

Note1: $X = \text{On time} / (\text{On} + \text{Off time})$, $\text{DCF} = 10 \log (1/x)$

Note2: $\text{Test Result} = \text{Reading} + \text{DCF}$



[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11n (40MHz)	38	5190	9.31	5.429	5.442	0.998	0	9.310	8.531
	46	5230	9.24					9.240	8.395
	54	5270	9.22	5.429	5.442	0.998	0	9.220	8.356
	62	5310	9.16					9.160	8.241
	102	5510	9.64	5.429	5.442	0.998	0	9.640	9.204
	110	5550	9.22					9.220	8.356
	134	5670	8.73					8.730	7.464
	142	5710	8.41					8.410	6.934

[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11ac (80MHz)	42	5210	9.96	5.429	5.442	0.998	0	9.960	9.908
	58	5290	10.04	5.429	5.442	0.998	0	10.040	10.093
	106	5530	10.34	5.429	5.442	0.998	0	10.340	10.814
	122	5610	10.33	5.429	5.442	0.998	0	10.330	10.789
	138	5690	9.46	5.429	5.442	0.998	0	9.460	8.831

Note1: X = On time / (On + Off time), DCF=10log (1/x)

Note2: Test Result=Reading + DCF



[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11a	36	5180	11.54	2.095	2.113	0.991	0	11.540	14.256
	40	5200	11.23					11.230	13.274
	58	5240	11.20					11.200	13.183
	52	5260	10.70	2.095	2.113	0.991	0	10.700	11.749
	56	5280	10.72					10.720	11.803
	64	5320	11.45					11.450	13.964
	100	5500	10.56	2.095	2.113	0.991	0	10.560	11.376
	116	5580	10.19					10.190	10.447
	140	5700	9.63					9.630	9.183
	144	5720	9.56					9.560	9.036

[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11n (20MHz)	36	5180	10.97	5.429	5.449	0.996	0	10.970	12.503
	40	5200	10.80					10.800	12.023
	58	5240	10.64					10.640	11.588
	52	5260	10.51	5.429	5.449	0.996	0	10.510	11.246
	56	5280	10.53					10.530	11.298
	64	5320	10.83					10.830	12.106
	100	5500	10.31	5.429	5.449	0.996	0	10.310	10.740
	116	5580	9.87					9.870	9.705
	140	5700	9.36					9.360	8.630
	144	5720	9.30					9.300	8.511

Note1: X = On time / (On + Off time), DCF=10log (1/x)

Note2: Test Result=Reading + DCF



[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11n (40MHz)	38	5190	11.28	5.429	5.442	0.998	0	11.280	13.428
	46	5230	10.99					10.990	12.560
	54	5270	10.98	5.429	5.442	0.998	0	10.980	12.531
	62	5310	11.20					11.200	13.183
	102	5510	10.70	5.429	5.442	0.998	0	10.700	11.749
	110	5550	10.37					10.370	10.889
	134	5670	9.81					9.810	9.572
	142	5710	9.67					9.670	9.268

[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)	Test Result (mW)
				On Time(ms)	On+Off Time(ms)	X			
802.11ac (80MHz)	42	5210	11.80	5.429	5.442	0.998	0	11.800	15.136
	58	5290	11.84	5.429	5.442	0.998	0	11.840	15.276
	106	5530	11.12	5.429	5.442	0.998	0	11.120	12.942
	122	5610	10.77	5.429	5.442	0.998	0	10.770	11.940
	138	5690	10.43	5.429	5.442	0.998	0	10.430	11.041

Note1: X = On time / (On + Off time), DCF=10log (1/x)
 Note2: Test Result=Reading + DCF

[Chain 0+1]

Mode	Channel	Frequency (MHz)	Test Result (dBm)		Total Test Result (dBm)	Total Test Result (mW)
			Chain 0	Chain 1		
802.11n (20MHz)	36	5180	8.630	10.970	12.966	19.797
	40	5200	8.980	10.800	12.995	19.929
	58	5240	8.640	10.640	12.764	18.899
	52	5260	5.360	10.510	11.668	14.682
	56	5280	8.590	10.530	12.678	18.526
	64	5320	8.780	10.830	12.935	19.657
	100	5500	9.490	10.310	12.930	19.632
	116	5580	9.020	9.870	12.476	17.685
	140	5700	8.100	9.360	11.786	15.086
	144	5720	8.170	9.300	11.782	15.073

[Chain 0+1]

Mode	Channel	Frequency (MHz)	Test Result (dBm)		Total Test Result (dBm)	Total Test Result (mW)
			Chain 0	Chain 1		
802.11n (40MHz)	38	5190	9.310	11.280	13.416	21.959
	46	5230	9.240	10.990	13.213	20.955
	54	5270	9.220	10.980	13.199	20.887
	62	5310	9.160	11.200	13.309	21.424
	102	5510	9.640	10.700	13.213	20.953
	110	5550	9.220	10.370	12.843	19.245
	134	5670	8.730	9.810	12.314	17.036
	142	5710	8.410	9.670	12.096	16.203

Note1: $X = \text{On time} / (\text{On} + \text{Off time})$, $\text{DCF} = 10 \log (1/x)$

Note2: $\text{Test Result} = \text{Reading} + \text{DCF}$

[Chain 0+1]

Mode	Channel	Frequency (MHz)	Test Result (dBm)		Total Test Result (dBm)	Total Test Result (mW)
			Chain 0	Chain 1		
802.11ac (80MHz)	42	5210	9.960	11.800	13.987	25.044
	58	5290	10.040	11.840	14.043	25.368
	106	5530	10.340	11.120	13.758	23.756
	122	5610	10.330	10.770	13.566	22.729
	138	5690	9.460	10.430	12.982	19.872

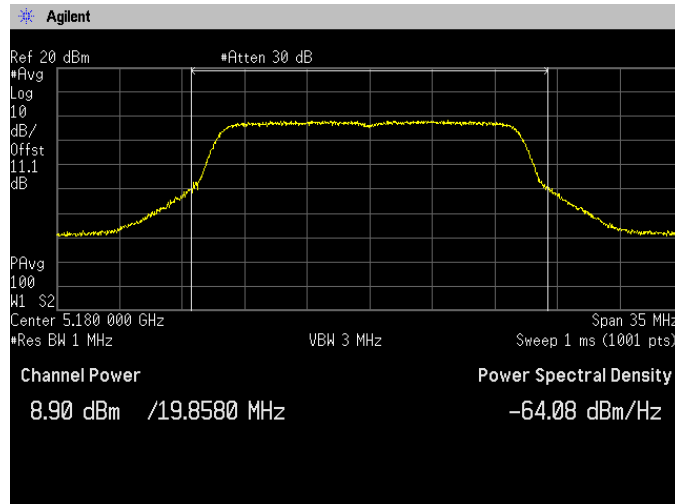
Note1: $X = \text{On time} / (\text{On} + \text{Off time})$, $\text{DCF} = 10 \log (1/x)$

Note2: $\text{Test Result} = \text{Reading} + \text{DCF}$

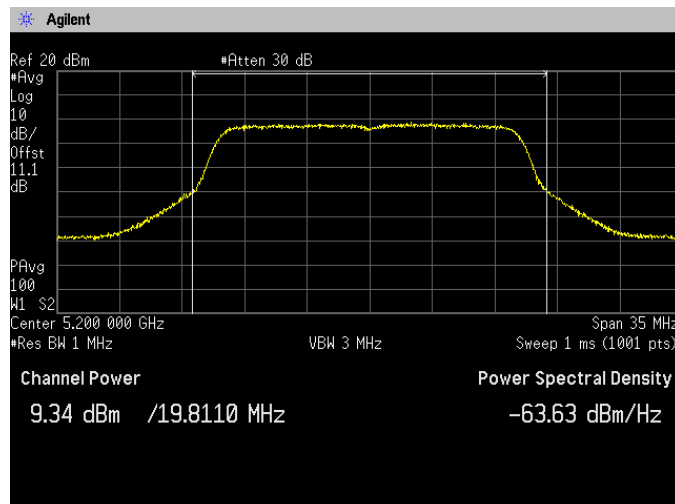
Note: 802.11a does not support MIMO.

4.2.5 Trace data

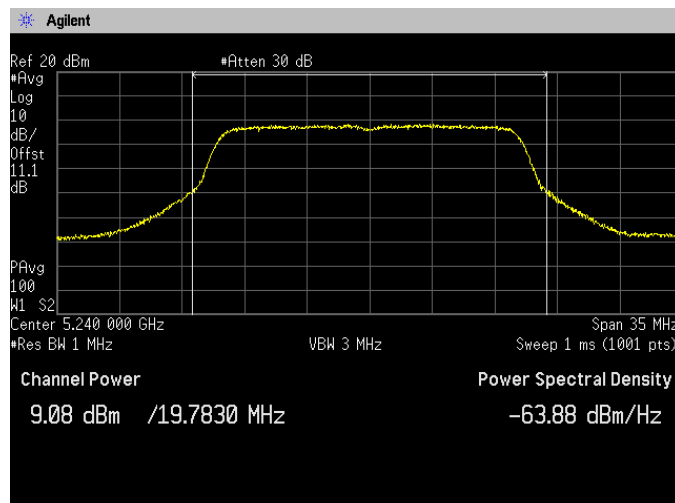
[IEEE802.11a]
(5.2 GHz Band)
Channel: 36[Chain 0]



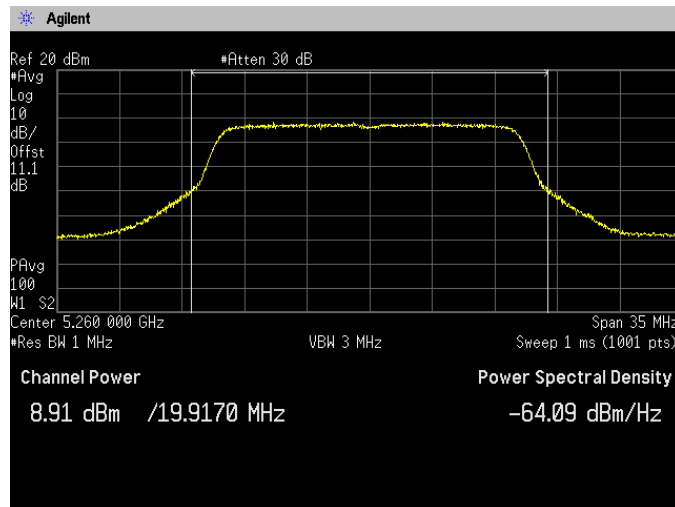
Channel: 40[Chain 0]



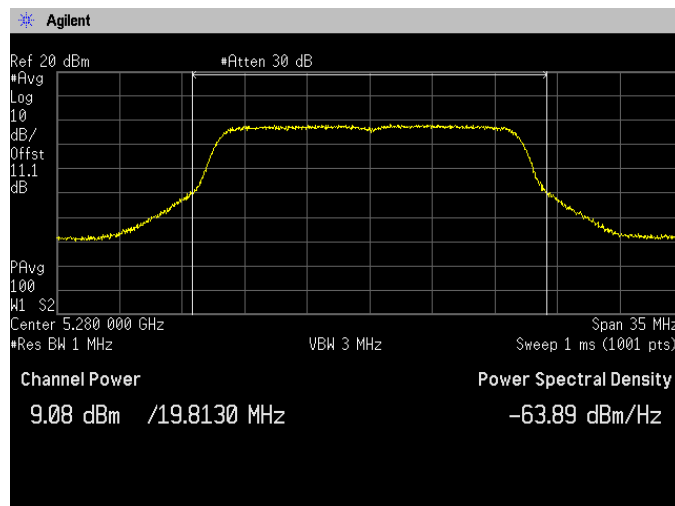
Channel: 48[Chain 0]



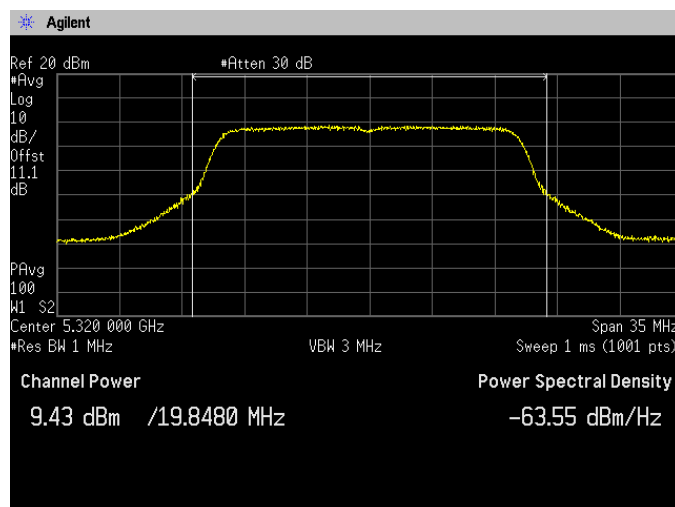
**(5.3 GHz Band)
Channel: 52[Chain 0]**



Channel: 56[Chain 0]

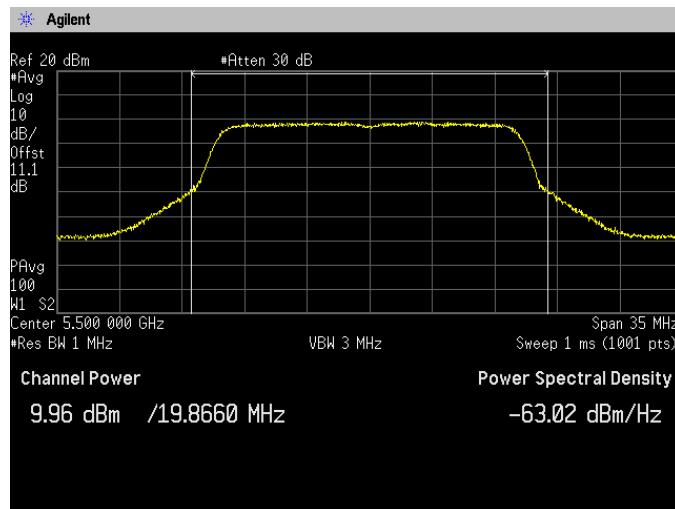


Channel: 64[Chain 0]

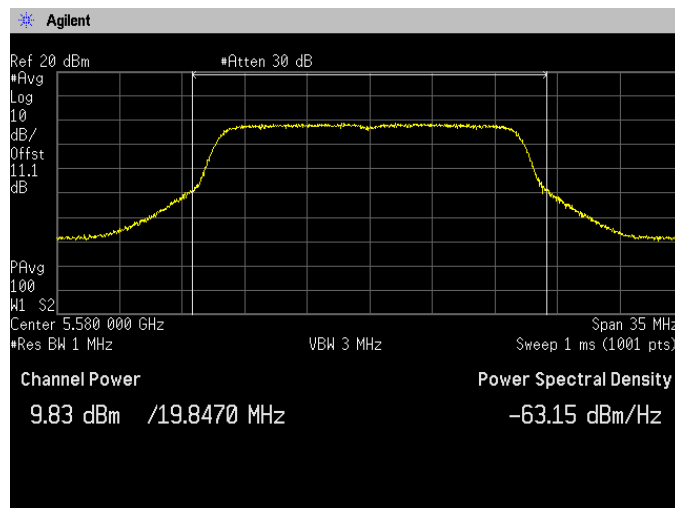




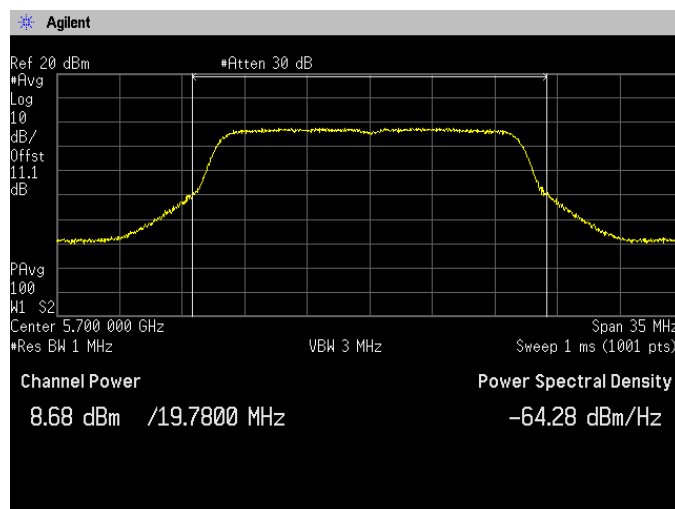
**(5.6 GHz Band)
Channel: 100[Chain 0]**



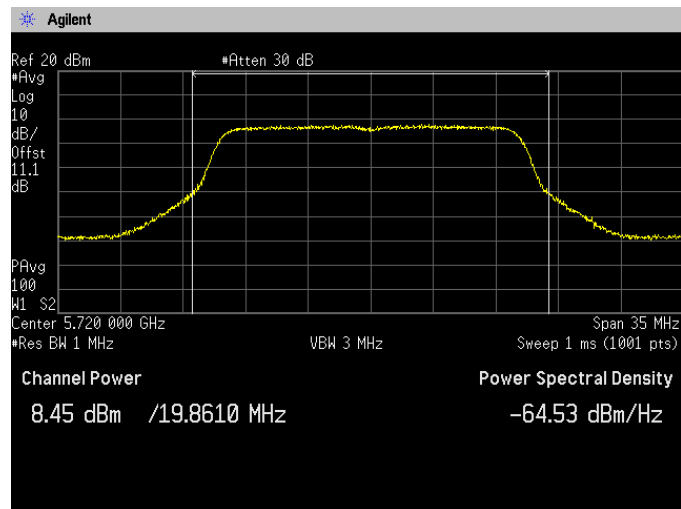
Channel: 116[Chain 0]



Channel: 140[Chain 0]

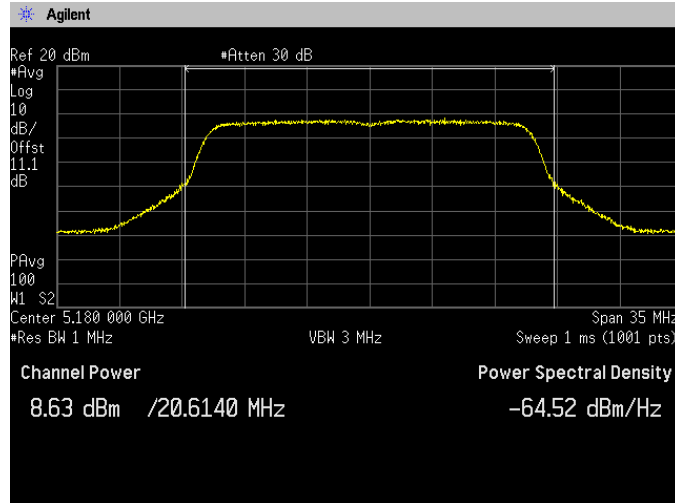


**(5.6 GHz Band)
Channel: 144[Chain 0]**

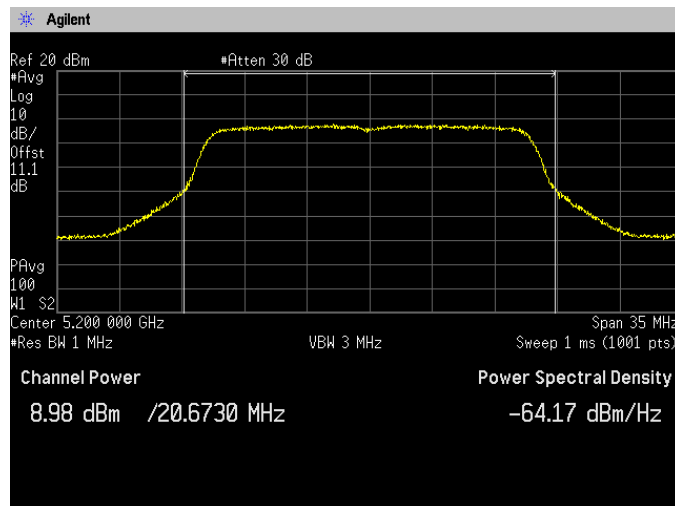




**[IEEE802.11n (HT20)]
(5.2 GHz Band)
Channel: 36[Chain 0]**

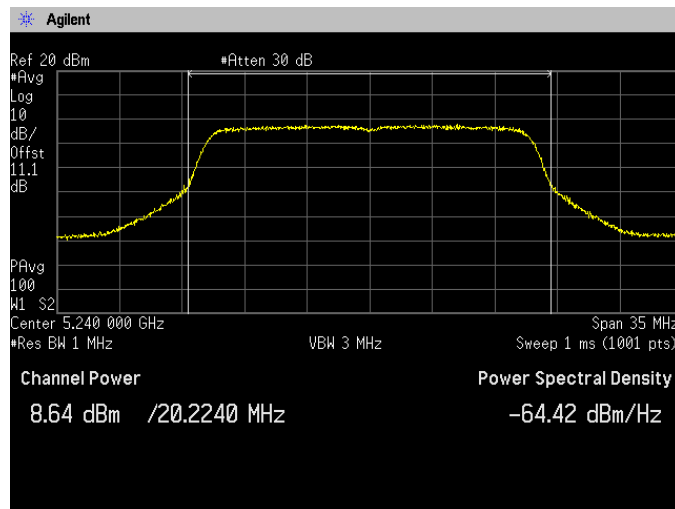


Channel: 40[Chain 0]

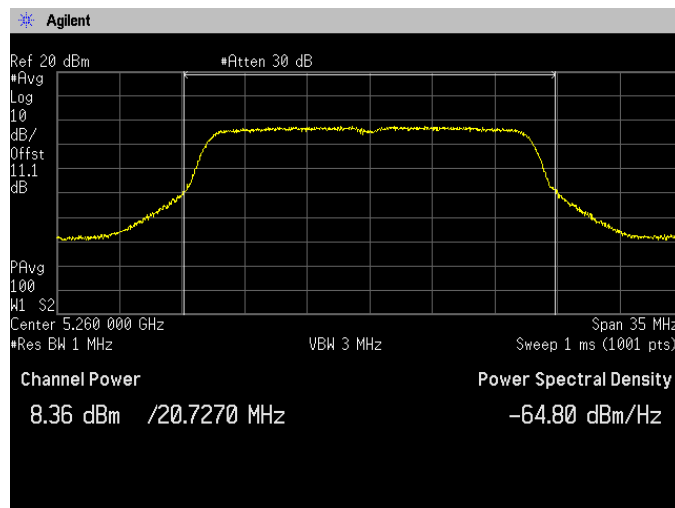




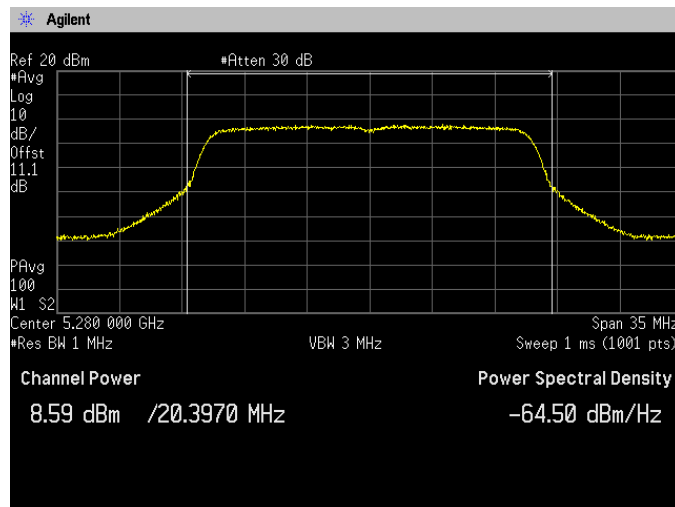
**(5.2 GHz Band)
Channel: 48[Chain 0]**



**(5.3 GHz Band)
Channel: 52[Chain 0]**

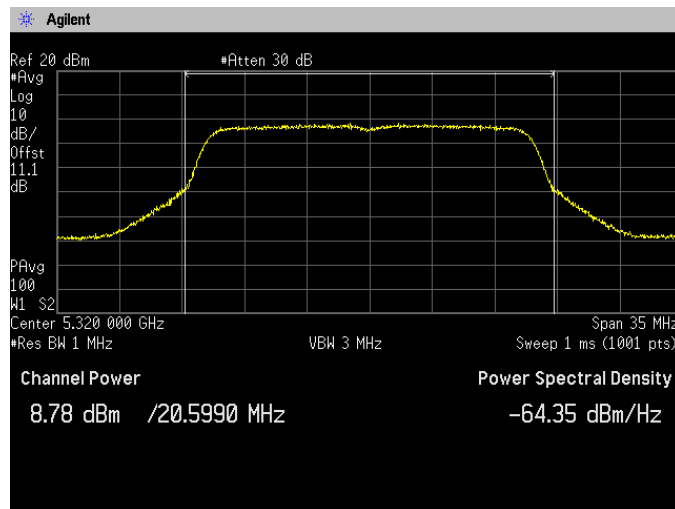


Channel: 56[Chain 0]

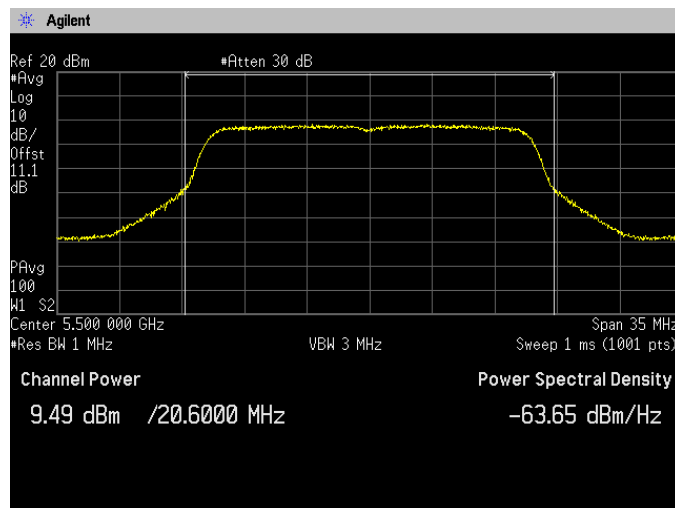




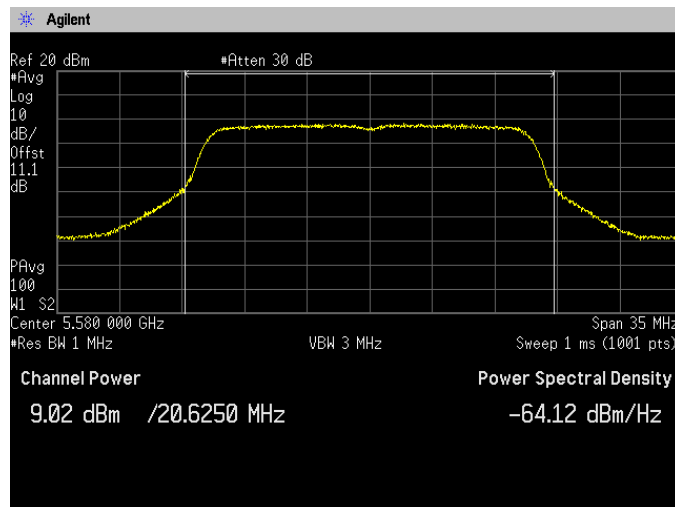
**(5.3 GHz Band)
Channel: 64[Chain 0]**



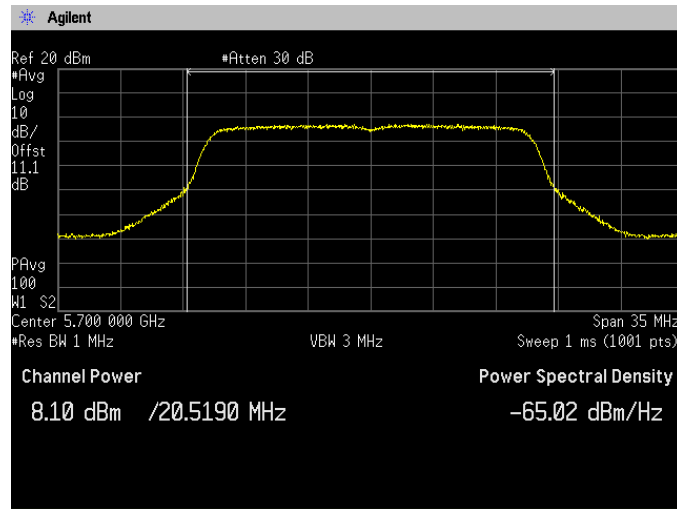
**(5.6 GHz Band)
Channel: 100[Chain 0]**



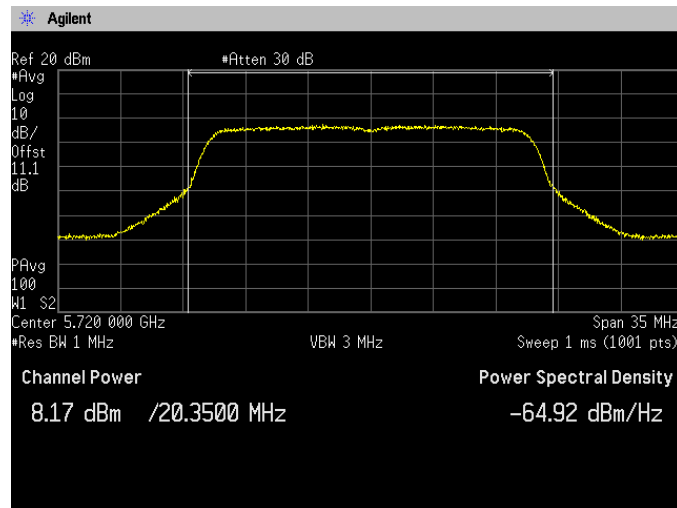
Channel: 116[Chain 0]



**(5.6 GHz Band)
Channel: 140[Chain 0]**

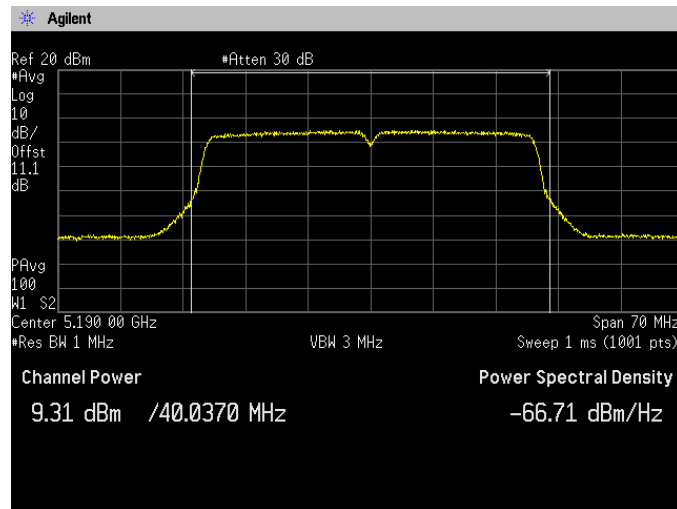


Channel: 144[Chain 0]

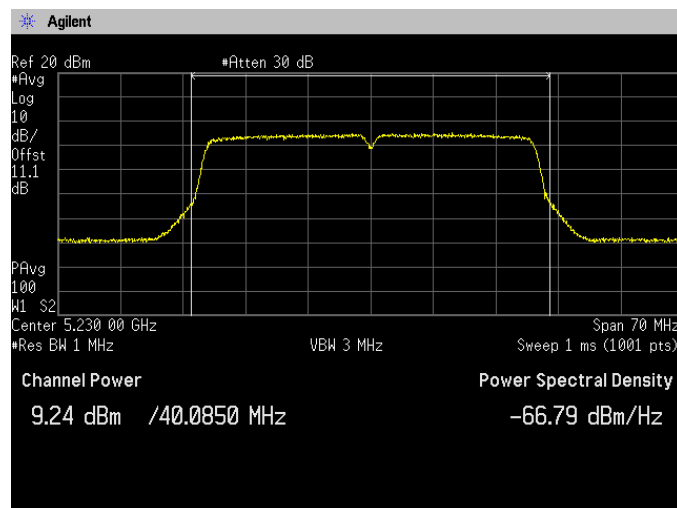




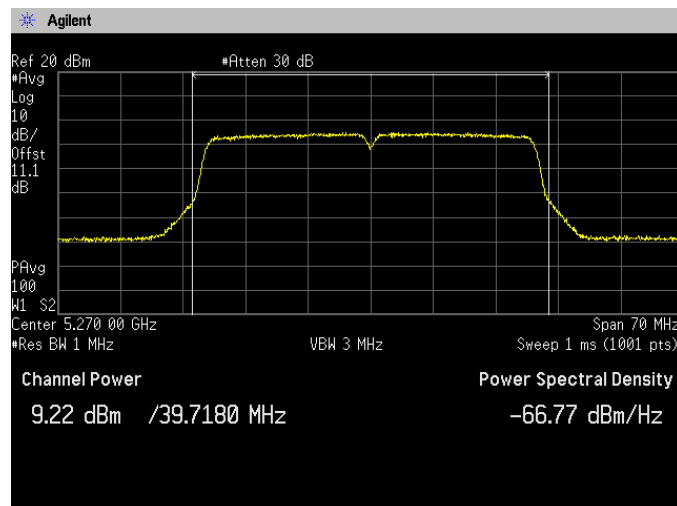
**[IEEE802.11n (HT40)]
(5.2 GHz Band)
Channel: 38[Chain 0]**



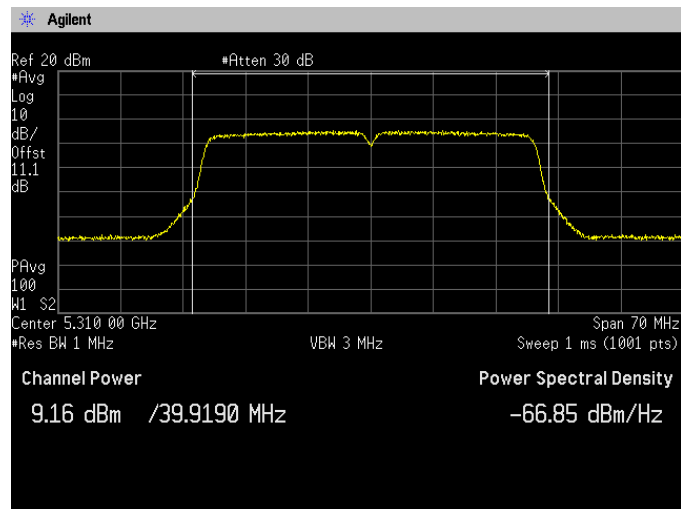
**(5.2 GHz Band)
Channel: 46[Chain 0]**



**(5.3 GHz Band)
Channel: 54[Chain 0]**

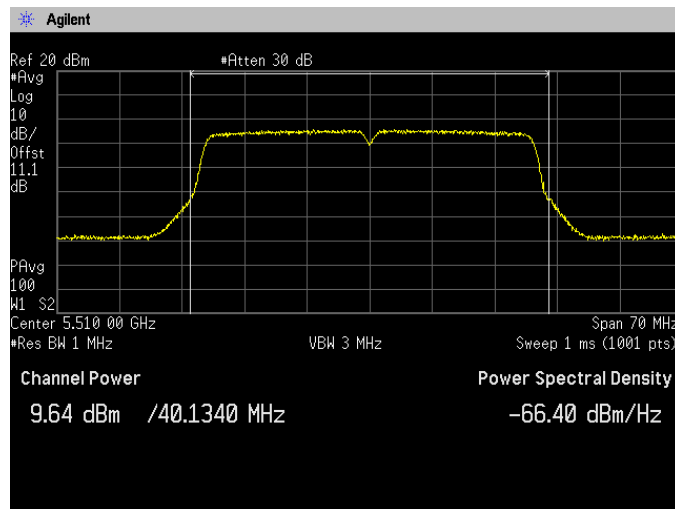


**(5.3 GHz Band)
Channel: 62[Chain 0]**

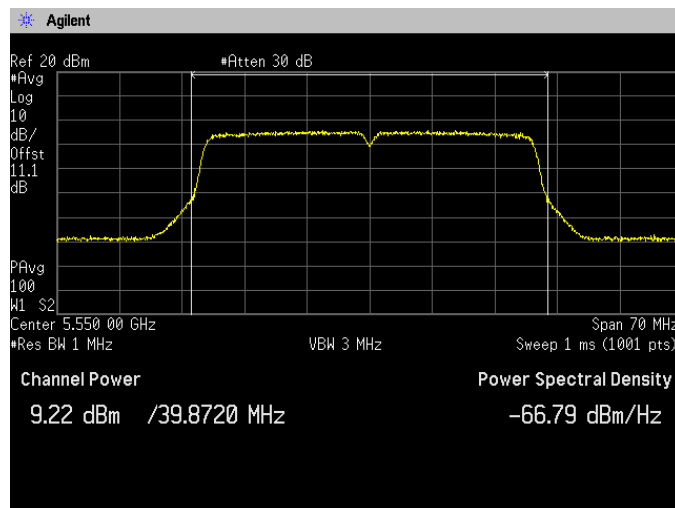




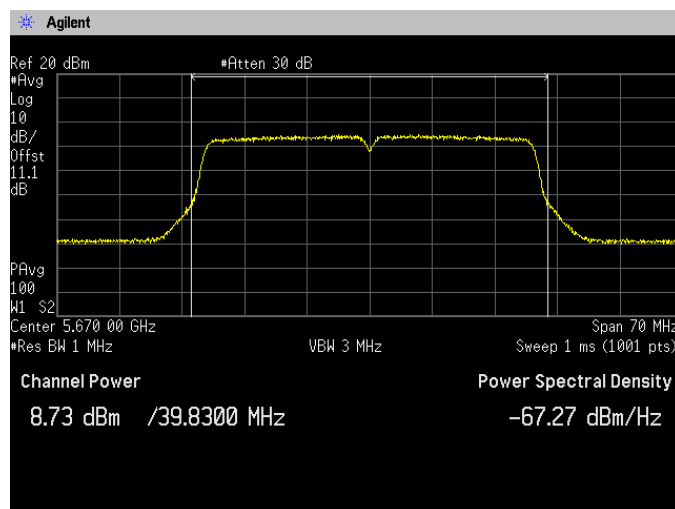
**(5.6 GHz Band)
Channel: 102[Chain 0]**



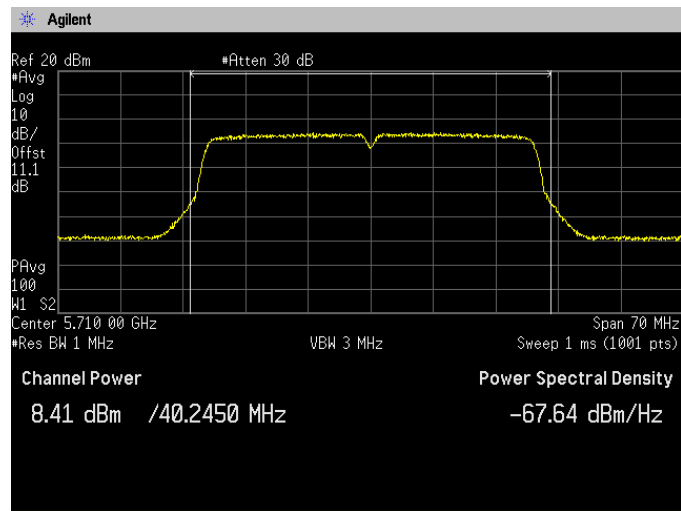
Channel: 110[Chain 0]



Channel: 134[Chain 0]

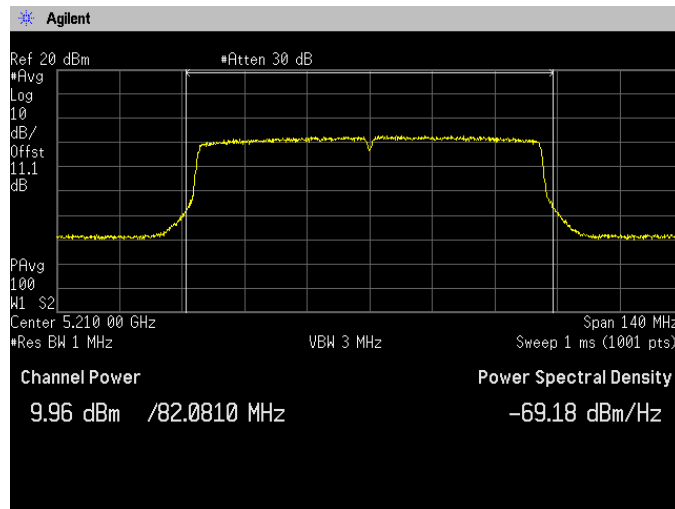


**(5.6 GHz Band)
Channel: 142[Chain 0]**

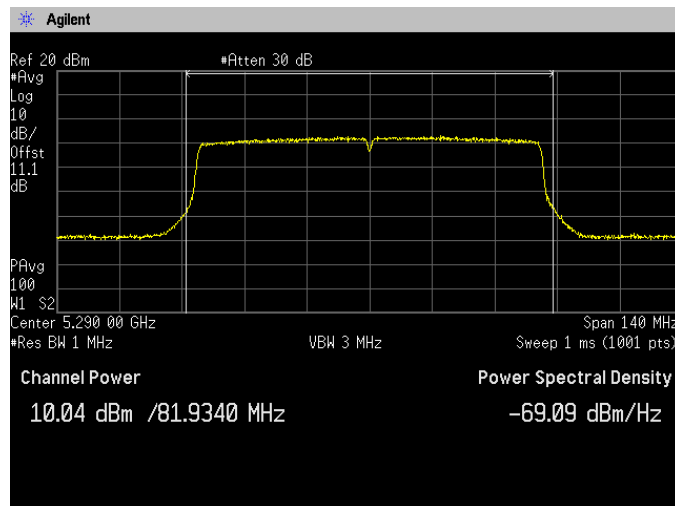




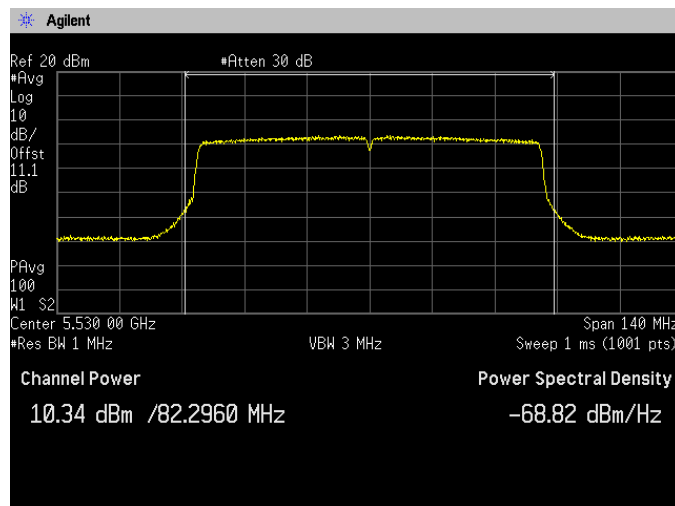
**[IEEE802.11ac (HT80)]
(5.2 GHz Band)
Channel: 42[Chain 0]**



**(5.3GHz Band)
Channel: 58[Chain 0]**

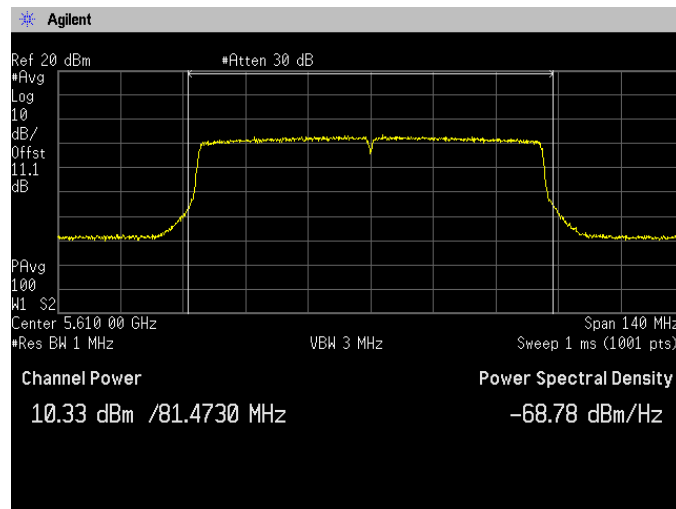


**(5.6 GHz Band)
Channel: 106[Chain 0]**

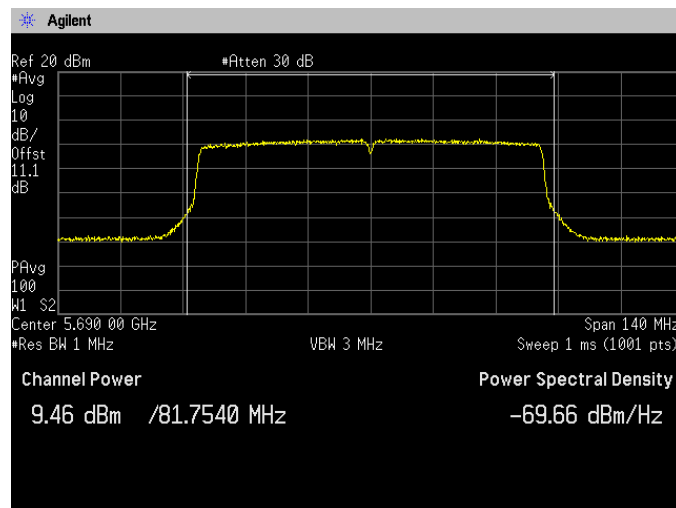




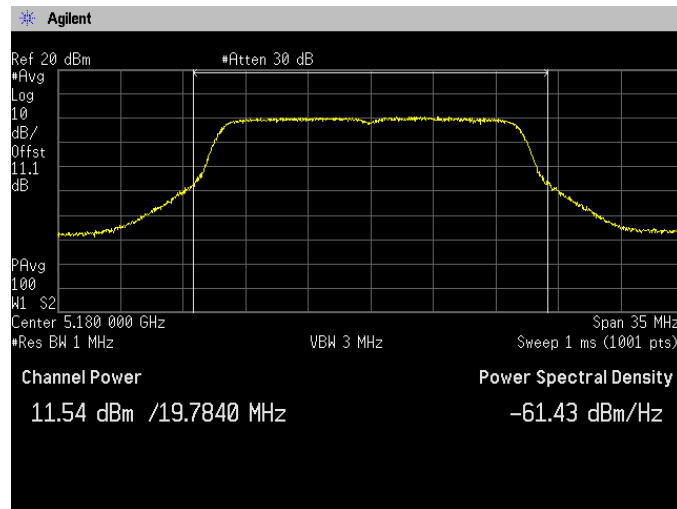
**(5.6 GHz Band)
Channel: 122[Chain 0]**



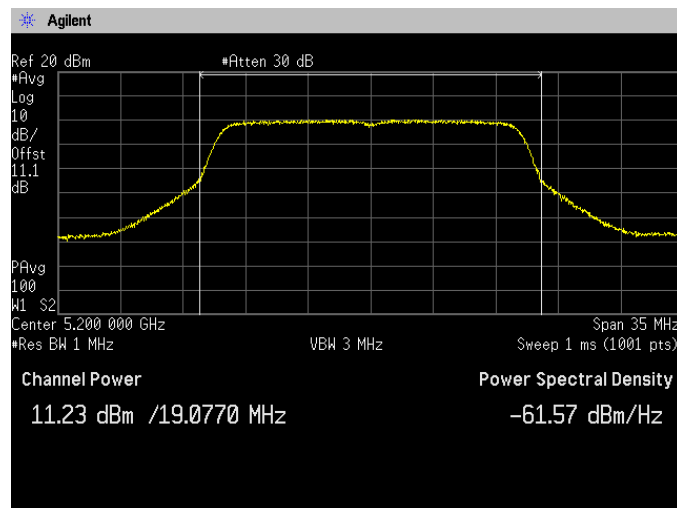
Channel: 138[Chain 0]



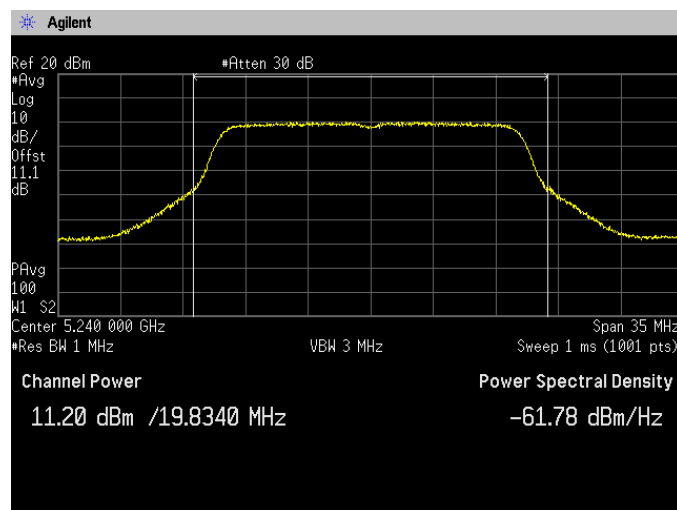
**[IEEE802.11a]
(5.2 GHz Band)
Channel: 36[Chain 1]**



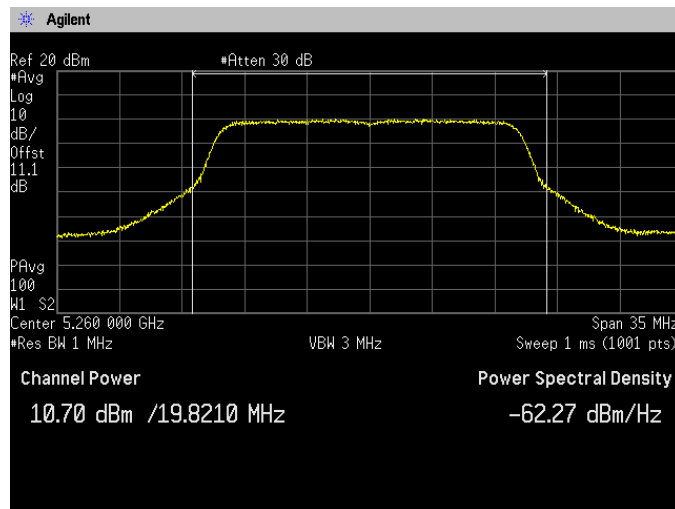
Channel: 40[Chain 1]



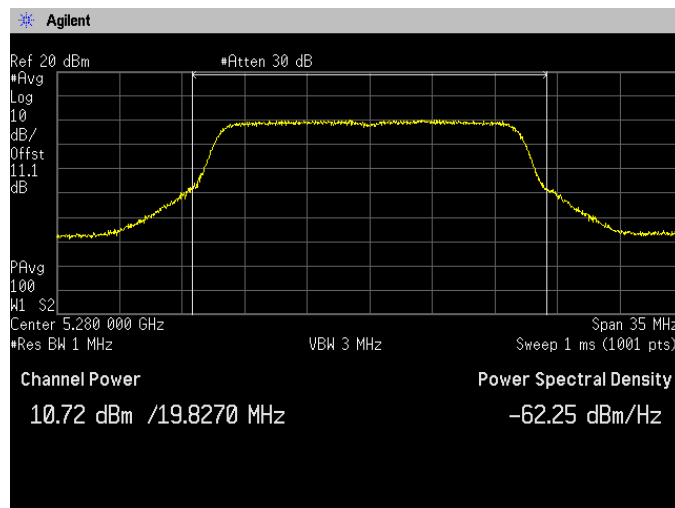
Channel: 48[Chain 1]



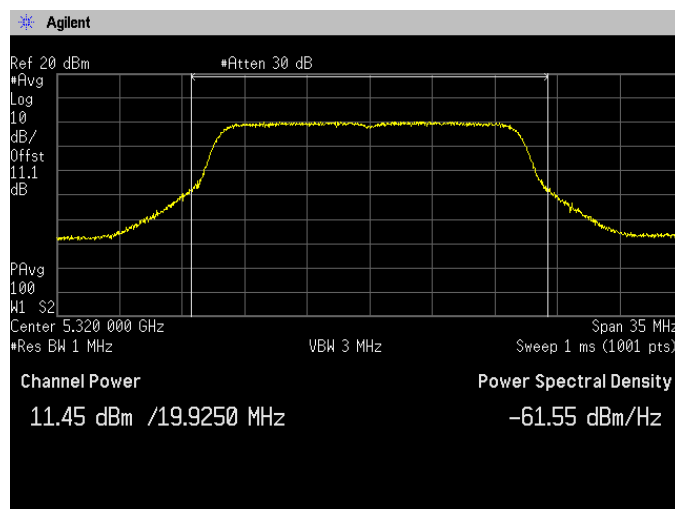
**(5.3 GHz Band)
Channel: 52[Chain 1]**



Channel: 56[Chain 1]

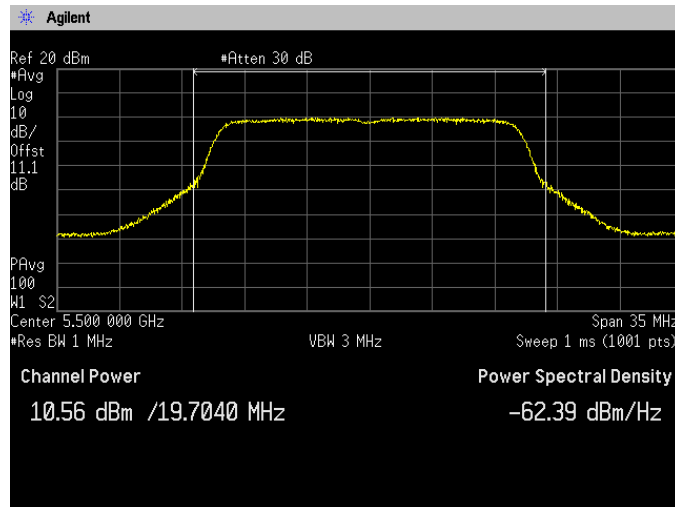


Channel: 64[Chain 1]

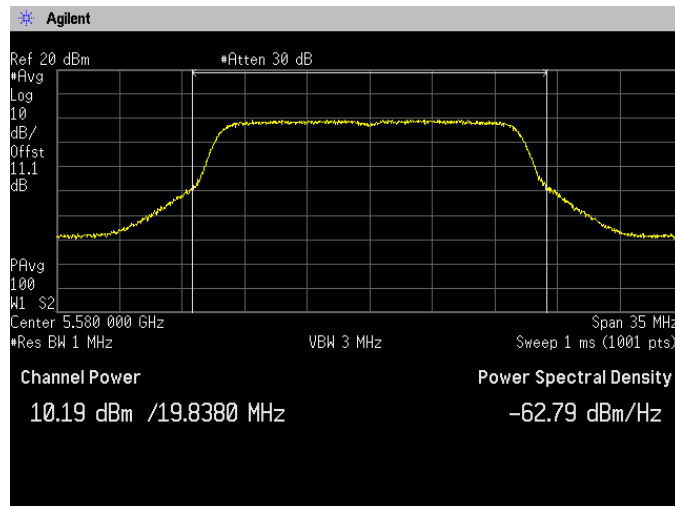




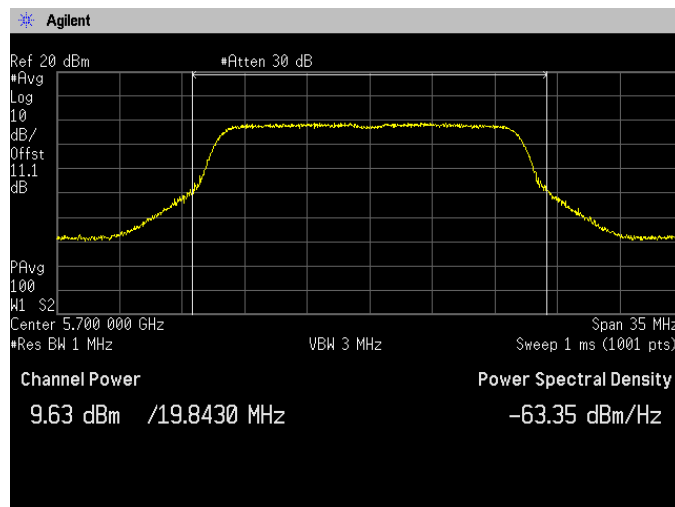
**(5.6 GHz Band)
Channel: 100[Chain 1]**



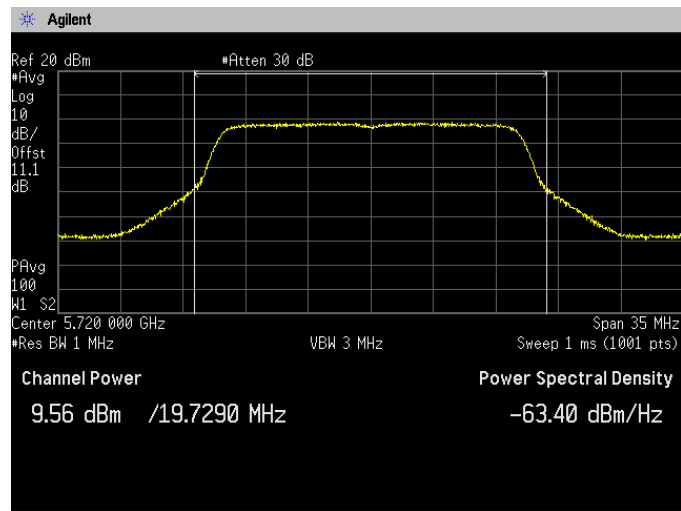
Channel: 116[Chain 1]



Channel: 140[Chain 1]

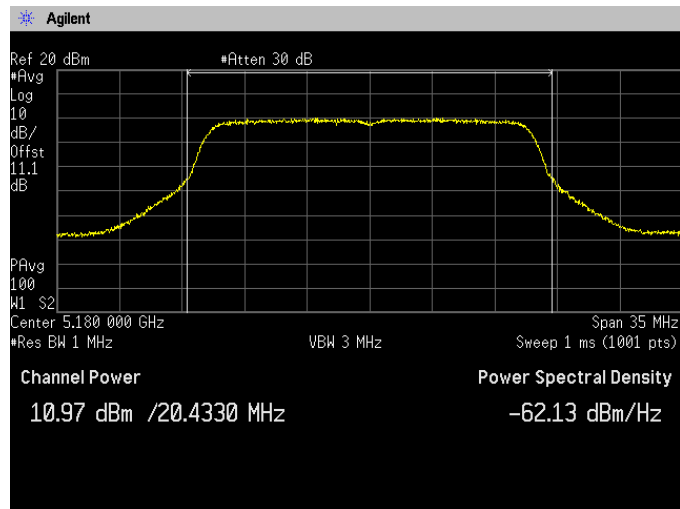


**(5.6 GHz Band)
Channel: 144[Chain 1]**

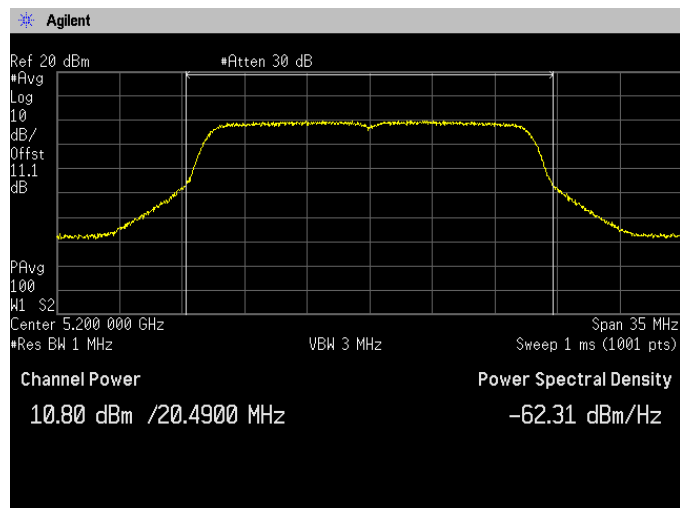




**[IEEE802.11n (HT20)]
(5.2 GHz Band)
Channel: 36[Chain 1]**

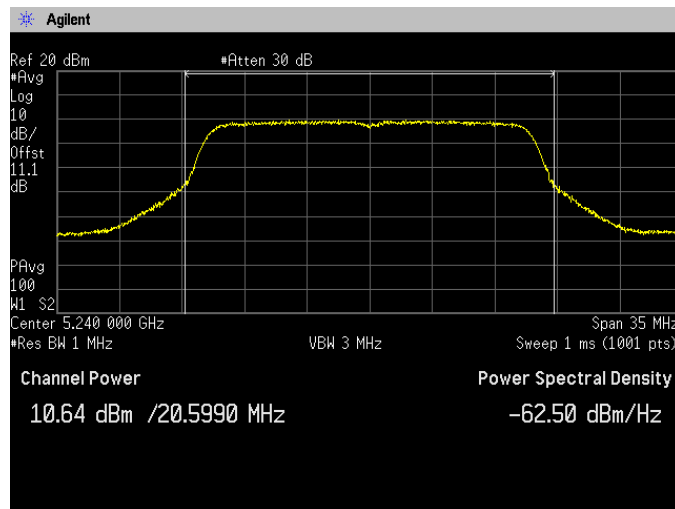


Channel: 40[Chain 1]

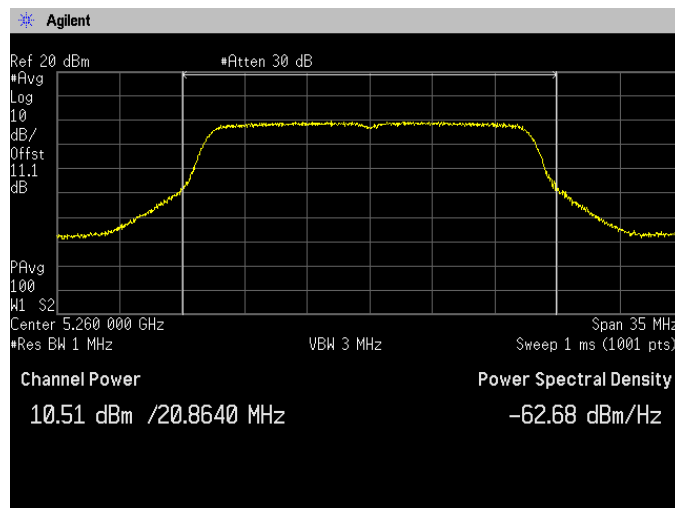




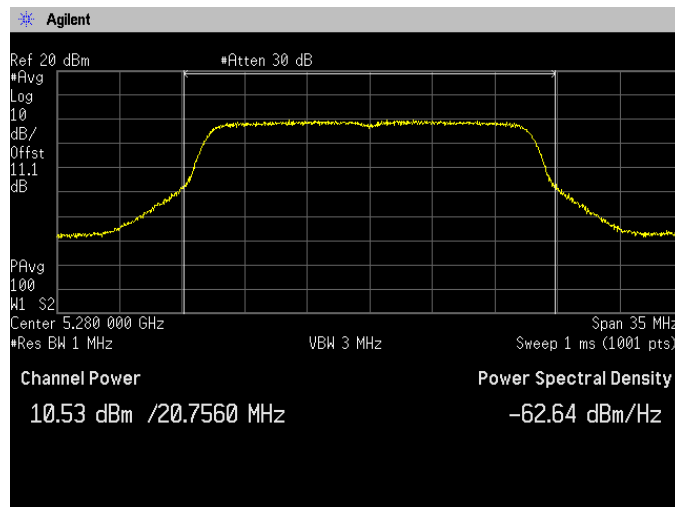
**(5.2 GHz Band)
Channel: 48[Chain 1]**



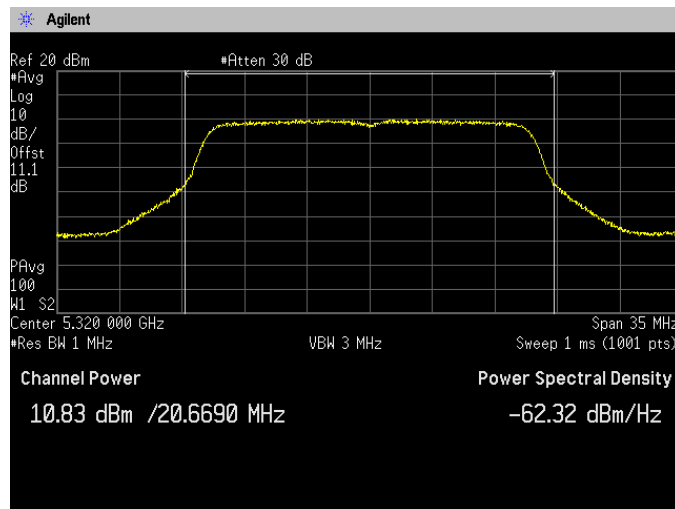
**(5.3 GHz Band)
Channel: 52[Chain 1]**



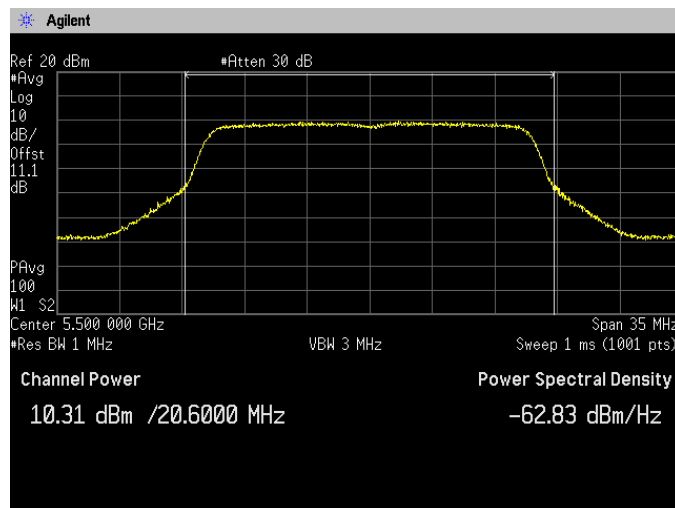
Channel: 56[Chain 1]



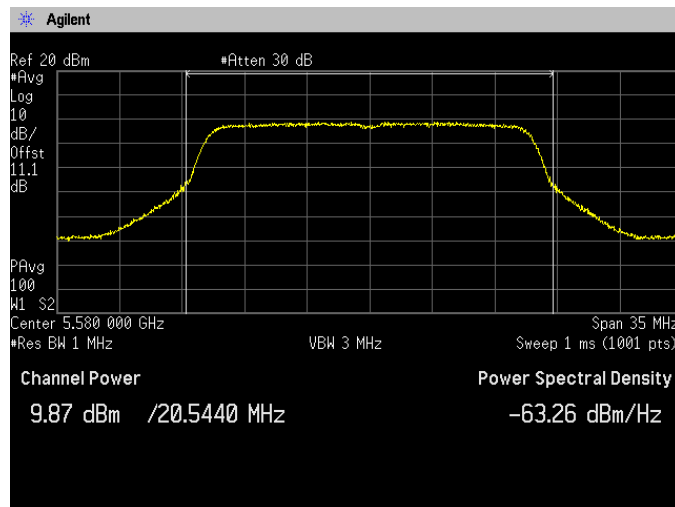
**(5.3 GHz Band)
Channel: 64[Chain 1]**



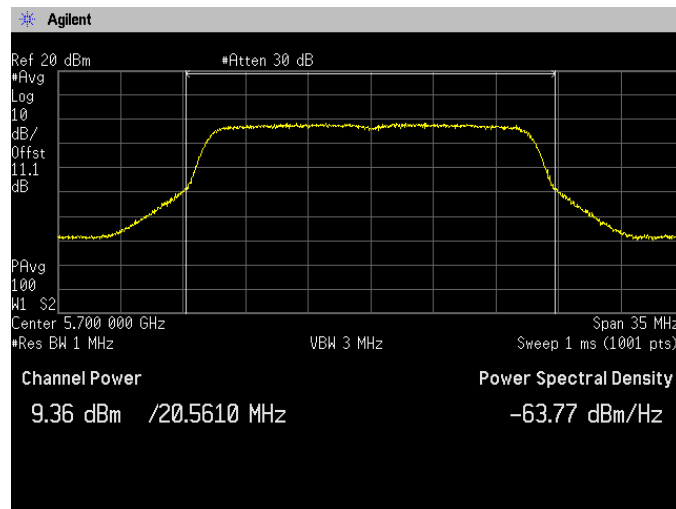
**(5.6 GHz Band)
Channel: 100[Chain 1]**



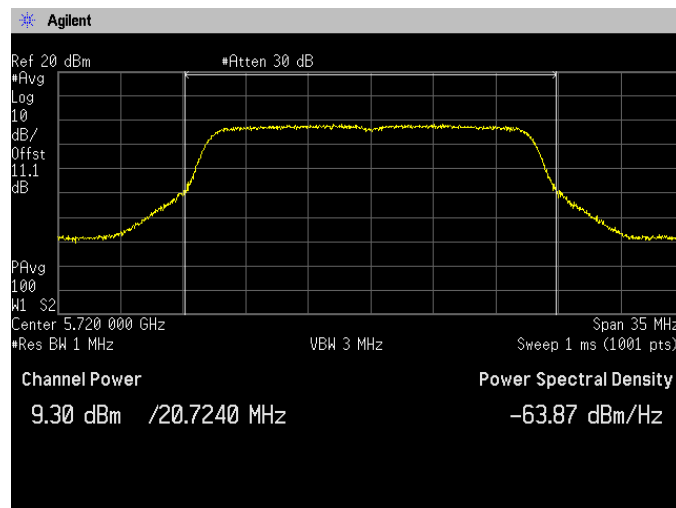
Channel: 116[Chain 1]



**(5.6 GHz Band)
Channel: 140[Chain 1]**

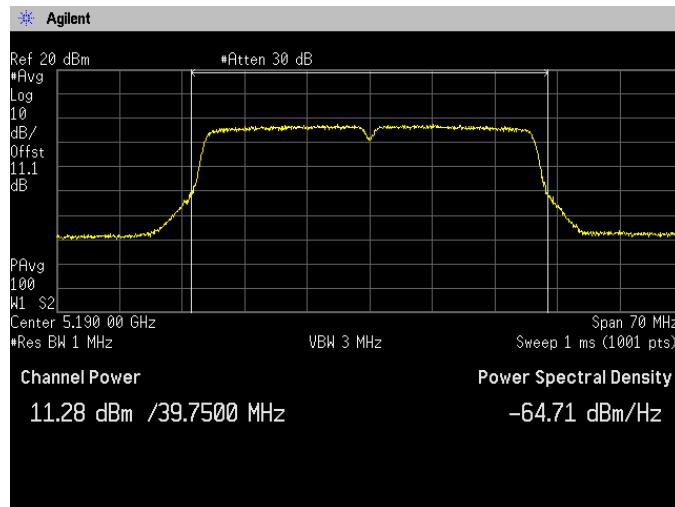


Channel: 144[Chain 1]

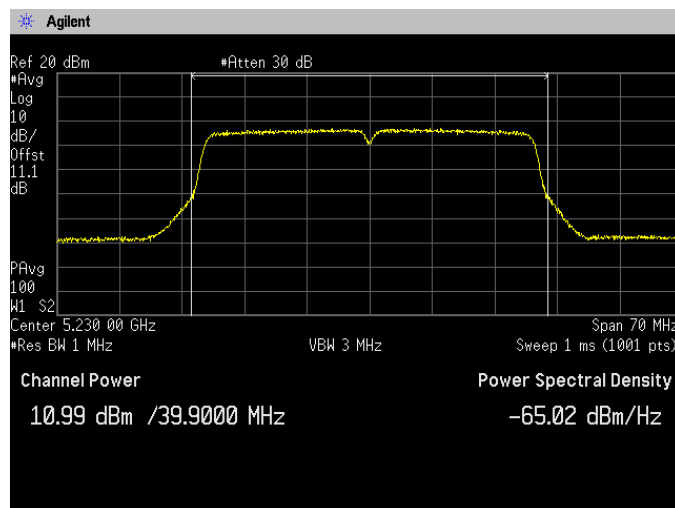




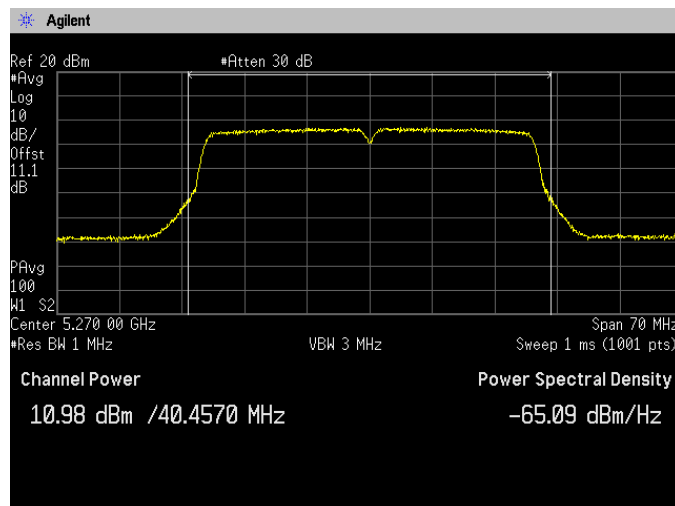
**[IEEE802.11n (HT40)]
(5.2 GHz Band)
Channel: 38[Chain 1]**



**(5.2 GHz Band)
Channel: 46[Chain 1]**

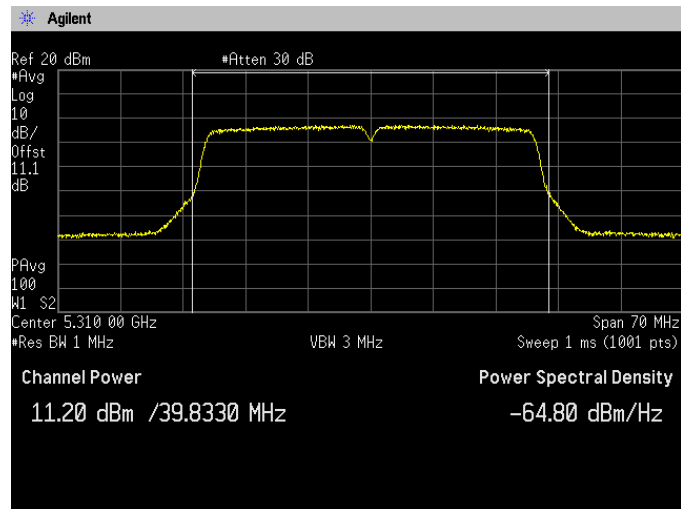


**(5.3 GHz Band)
Channel: 54[Chain 1]**

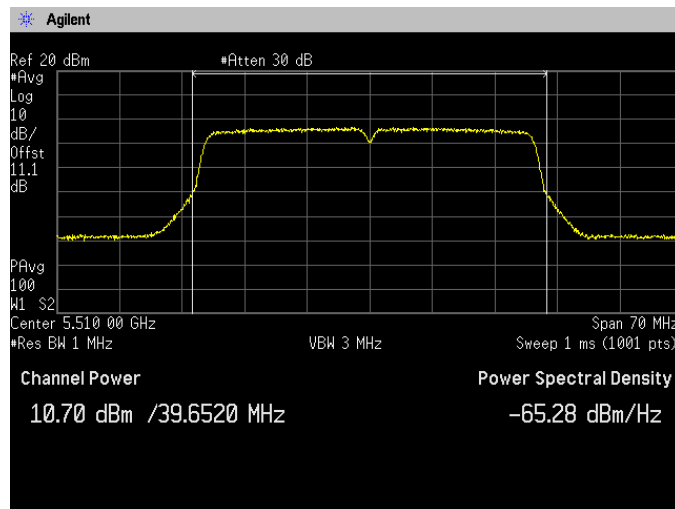


(5.3 GHz Band)

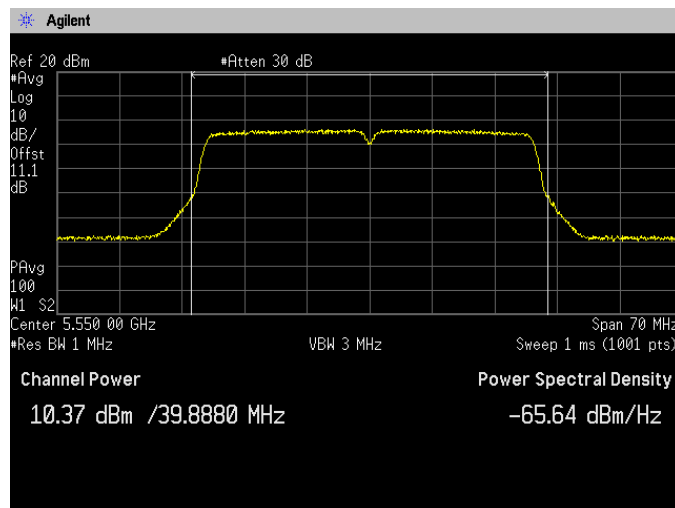
Channel: 62[Chain 1]



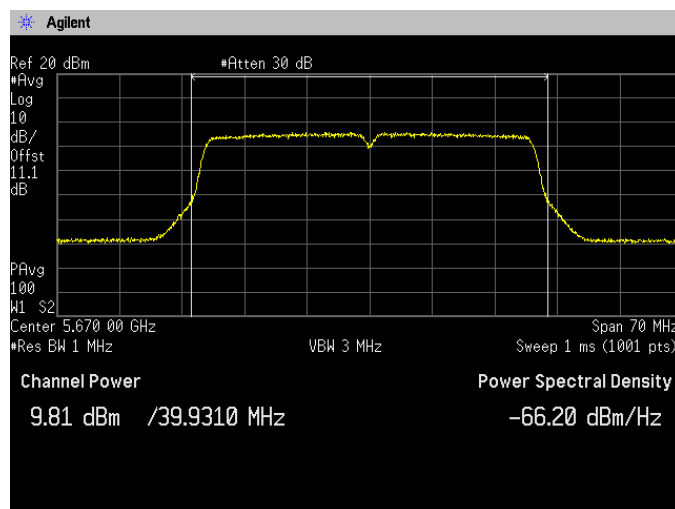
**(5.6 GHz Band)
Channel: 102[Chain 1]**



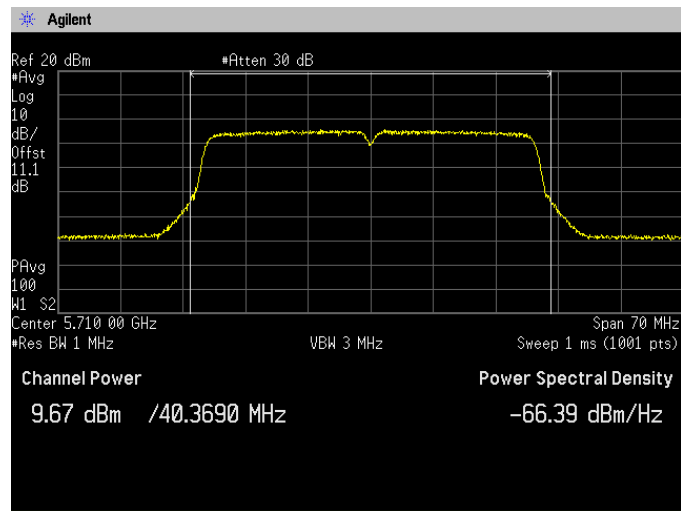
Channel: 110[Chain 1]



Channel: 134[Chain 1]

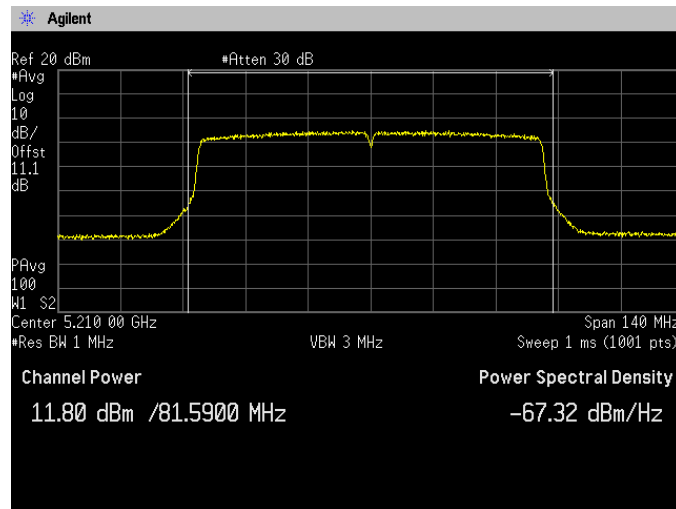


**(5.6 GHz Band)
Channel: 142[Chain 1]**

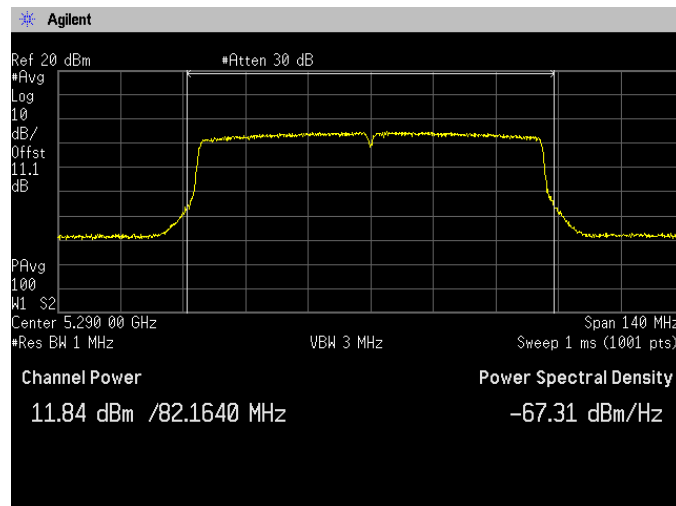




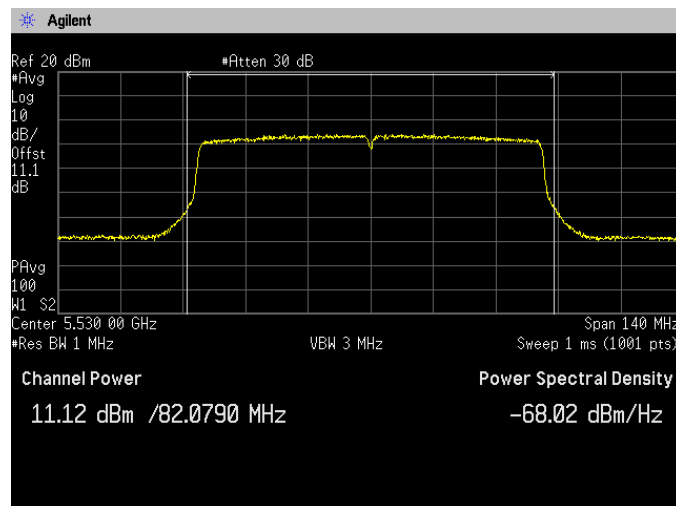
**[IEEE802.11ac (HT80)]
(5.2 GHz Band)
Channel: 42[Chain 1]**



**(5.3GHz Band)
Channel: 58[Chain 1]**

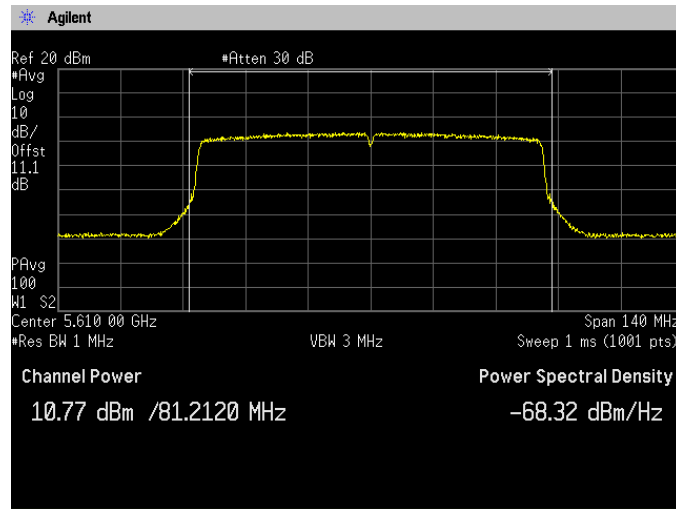


**(5.6 GHz Band)
Channel: 106[Chain 1]**

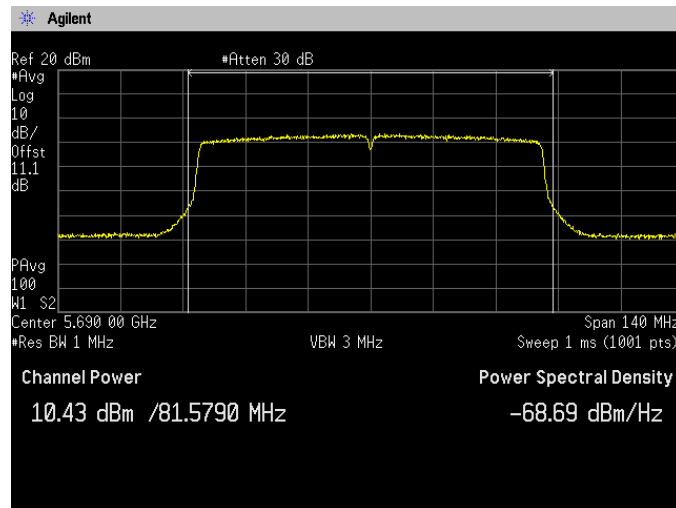




**(5.6 GHz Band)
Channel: 122[Chain 1]**



Channel: 138[Chain 1]



4.3 Peak Power Spectral Density

4.3.1 Measurement procedure

[FCC 15.407(a), KDB 789033 D02, Section F]

The peak power spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- RBW=1 MHz, VBW=3 MHz, Span=25 MHz/50 MHz/100 MHz, Sweep=Auto, Detector=RMS, Trace mode=Averaging

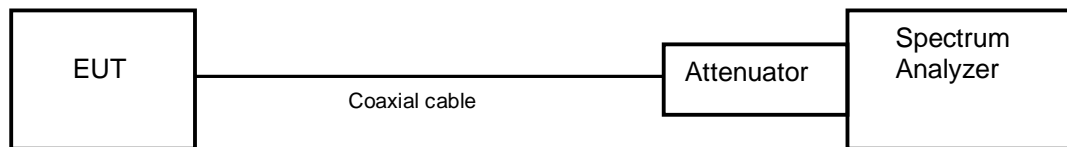
The EUT was set to operate with following conditions.

- 5.2 GHz Band, 5.3 GHz Band, 5.6 GHz Band, 5.8 GHz Band

The test mode of EUT is as follows.

- Tx mode

- Test configuration



4.3.2 Limit

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

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

(3) For the 5.725-5.85 GHz bands, 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 directional gain of the antenna exceeds 6 dBi.

However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirection applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

4.3.3 DIRECTIONAL ANTENNA GAIN

Tx chains are uncorrelated for power and correlated for PSD due to the device supporting OFDMA in all MIMO modes. The directional gains are as follows:

Band	Chain 0 Gain (dBi)	Chain 1 Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.2 GHz Band	2.2	0.6	1.47	4.45
5.3 GHz Band	2.2	0.6	1.47	4.45
5.6 GHz Band	3.2	1.9	2.60	5.58

Note: 802.11a does not support MIMO.

<Peak Power Spectral Density Limit Calculation[Chain 0]>

Band	Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.2 GHz Band	11	2.2	13.2 dBm/MHz
5.3 GHz Band	11	2.2	13.2 dBm/MHz
5.6 GHz Band	11	3.2	14.2 dBm/MHz

<Peak Power Spectral Density Limit Calculation[Chain 1]>

Band	Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.2 GHz Band	11	0.6	11.6 dBm/MHz
5.3 GHz Band	11	0.6	11.6 dBm/MHz
5.6 GHz Band	11	1.9	12.9 dBm/MHz

<Peak Power Spectral Density Limit Calculation[Chain 0+1]>

Band	Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.2 GHz Band	11	4.45	15.4 dBm/MHz
5.3 GHz Band	11	4.45	15.4 dBm/MHz
5.6 GHz Band	11	5.58	16.6 dBm/MHz

4.3.4 Measurement result

Date : 14-July-2023

Temperature : 23.7 [°C]

Humidity : 55.7 [%]

Test place : Shielded room No.4

Test engineer :

Kazunori Saito

[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11a	36	5180	-1.204	2.095	2.113	0.991	0	-1.204
	40	5200	-1.724					-1.724
	48	5240	-1.804					-1.804
	52	5260	-1.564	2.095	2.113	0.991	0	-1.564
	56	5280	-1.545					-1.545
	64	5320	-0.999					-0.999
	100	5500	-1.057	2.095	2.113	0.991	0	-1.057
	116	5580	-1.050					-1.050
	140	5700	-2.094					-2.094
	144	5720	-1.750					-1.750

[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11n (20MHz)	36	5180	-2.281	5.429	5.449	0.996	0	-2.281
	40	5200	-2.199					-2.199
	48	5240	-2.263					-2.263
	52	5260	-2.356	5.429	5.449	0.996	0	-2.356
	56	5280	-2.219					-2.219
	64	5320	-1.789					-1.789
	100	5500	-1.558	5.429	5.449	0.996	0	-1.558
	116	5580	-1.502					-1.502
	140	5700	-2.696					-2.696
	144	5720	-2.575					-2.575

Note 1: X = On time / (On + Off time), DCF=10log (1/x)

Note 2: Test Result = Reading + DCF



[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11n (40MHz)	38	5190	-4.760	5.429	5.442	0.998	0	-4.760
	46	5230	-4.920					-4.920
	54	5270	-4.894	5.429	5.442	0.998	0	-4.894
	62	5310	-4.612					-4.612
	102	5510	-4.209	5.429	5.442	0.998	0	-4.209
	110	5550	-4.237					-4.237
	134	5670	-5.113					-5.113
	142	5710	-5.490					-5.490

[Chain 0]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11ac (80MHz)	42	5210	-7.274	5.429	5.442	0.998	0	-7.274
	58	5290	-7.272	5.429	5.442	0.998	0	-7.272
	106	5530	-6.548	5.429	5.442	0.998	0	-6.548
	122	5610	-6.737	5.429	5.442	0.998	0	-6.737
	138	5690	-7.758	5.429	5.442	0.998	0	-7.758

Note 1: $X = \text{On time} / (\text{On} + \text{Off time})$, $\text{DCF} = 10 \log (1/x)$

Note 2: $\text{Test Result} = \text{Reading} + \text{DCF}$



[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11a	36	5180	0.718	2.095	2.113	0.991	0	0.718
	40	5200	0.466					0.466
	48	5240	0.390					0.390
	52	5260	0.070	2.095	2.113	0.991	0	0.070
	56	5280	0.275					0.275
	64	5320	0.617					0.617
	100	5500	0.121	2.095	2.113	0.991	0	0.121
	116	5580	-0.336					-0.336
	140	5700	-1.036					-1.036
	144	5720	-1.084					-1.084

[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11n (20MHz)	36	5180	0.240	5.429	5.449	0.996	0	0.240
	40	5200	0.419					0.419
	48	5240	-0.022					-0.022
	52	5260	-0.463	5.429	5.449	0.996	0	-0.463
	56	5280	-0.404					-0.404
	64	5320	0.385					0.385
	100	5500	-0.692	5.429	5.449	0.996	0	-0.692
	116	5580	-0.862					-0.862
	140	5700	-1.373					-1.373
	144	5720	-1.685					-1.685

Note 1: X = On time / (On + Off time), DCF=10log (1/x)

Note 2: Test Result = Reading + DCF



[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11n (40MHz)	38	5190	-2.798	5.429	5.442	0.998	0	-2.798
	46	5230	-3.052					-3.052
	54	5270	-2.842	5.429	5.442	0.998	0	-2.842
	62	5310	-2.773					-2.773
	102	5510	-3.071	5.429	5.442	0.998	0	-3.071
	110	5550	-3.290					-3.290
	134	5670	-4.026					-4.026
	142	5710	-4.166					-4.166

[Chain 1]

Mode	Channel	Frequency (MHz)	Reading (dBm)	Duty Cycle			DCF (dB)	Test Result (dBm)
				On Time(ms)	On+Off Time(ms)	X		
802.11ac (80MHz)	42	5210	-5.140	5.429	5.442	0.998	0	-5.140
	58	5290	-5.215	5.429	5.442	0.998	0	-5.215
	106	5530	-5.844	5.429	5.442	0.998	0	-5.844
	122	5610	-6.296	5.429	5.442	0.998	0	-6.296
	138	5690	-6.370	5.429	5.442	0.998	0	-6.370

Note 1: X = On time / (On + Off time), DCF=10log (1/x)

Note 2: Test Result = Reading + DCF

[Chain 0+1]

Mode	Channel	Frequency (MHz)	Test Result (dBm)		Total Test Result (dBm)
			Chain 0	Chain 1	
802.11n (20MHz)	36	5180	-2.281	0.240	2.170
	40	5200	-2.199	0.419	2.315
	58	5240	-2.263	-0.022	2.011
	52	5260	-2.356	-0.463	1.703
	56	5280	-2.219	-0.404	1.793
	64	5320	-1.789	0.385	2.443
	100	5500	-1.558	-0.692	1.907
	116	5580	-1.502	-0.862	1.840
	140	5700	-2.696	-1.373	1.026
	144	5720	-2.575	-1.685	0.903



[Chain 0+1]

Mode	Channel	Frequency (MHz)	Test Result (dBm)		Total Test Result (dBm)
			Chain 0	Chain 1	
802.11n (40MHz)	38	5190	-4.760	-2.798	-0.659
	46	5230	-4.920	-3.052	-0.876
	54	5270	-4.894	-2.842	-0.738
	62	5310	-4.612	-2.773	-0.586
	102	5510	-4.209	-3.071	-0.593
	110	5550	-4.237	-3.290	-0.727
	134	5670	-5.113	-4.026	-1.525
	142	5710	-5.490	-4.166	-1.767

Note 1: X = On time / (On + Off time), DCF=10log (1/x)

Note 2: Test Result = Reading + DCF

[Chain 0+1]

Mode	Channel	Frequency (MHz)	Test Result (dBm)		Total Test Result (dBm)
			Chain 0	Chain 1	
802.11ac (80MHz)	42	5210	-7.274	-5.140	-3.067
	58	5290	-7.272	-5.215	-3.113
	106	5530	-6.548	-5.844	-3.171
	122	5610	-6.737	-6.296	-3.501
	138	5690	-7.758	-6.370	-3.998

Note 1: X = On time / (On + Off time), DCF=10log (1/x)

Note 2: Test Result = Reading + DCF

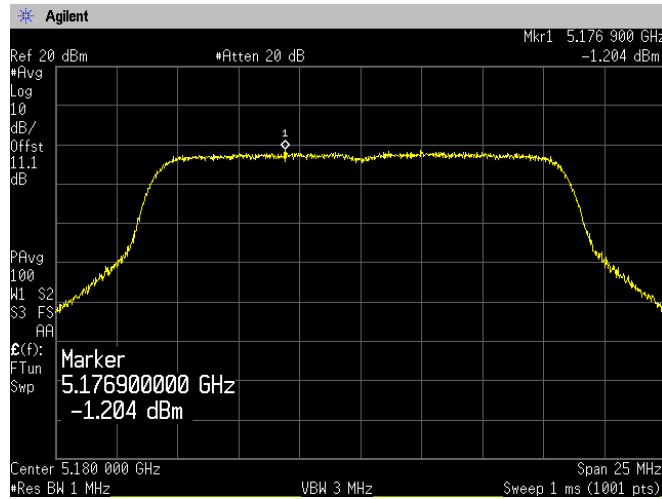
Note: 802.11a does not support MIMO.



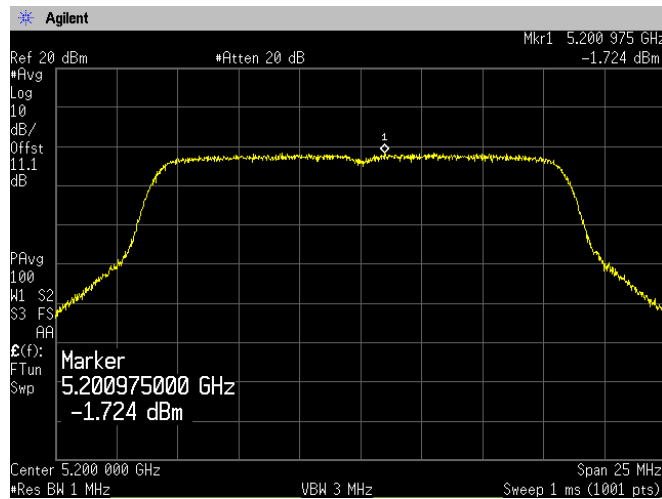
Japan

4.3.5 Trace data

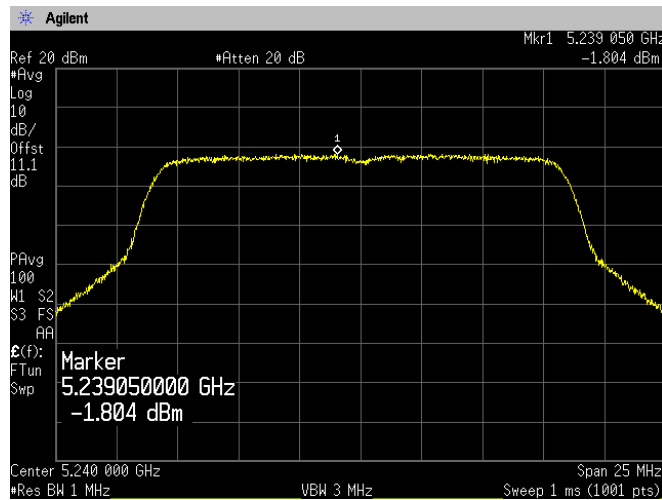
[IEEE802.11a]
(5.2 GHz Band)
Channel: 36[Chain 0]



Channel: 40[Chain 0]

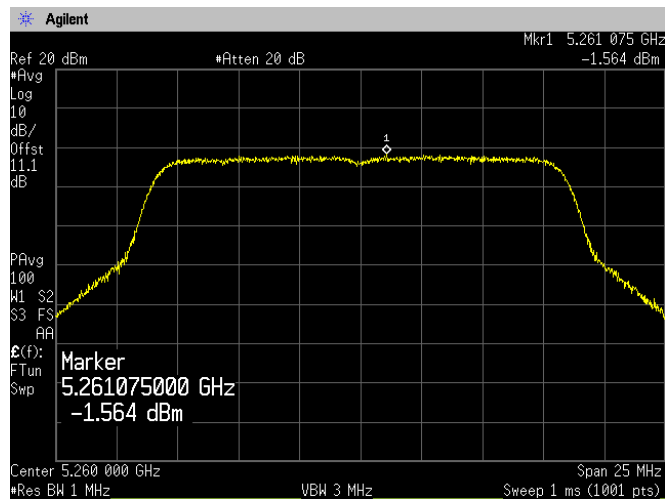


Channel: 48[Chain 0]

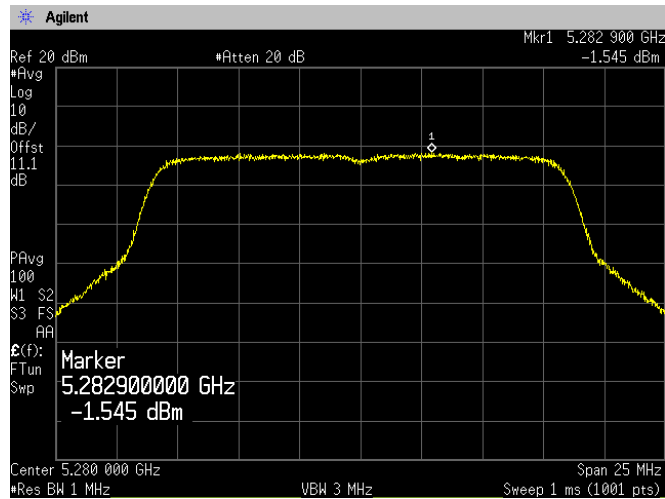




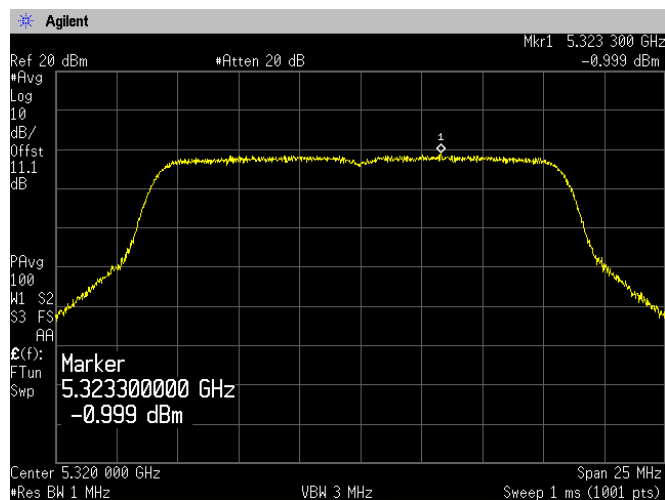
**(5.3 GHz Band)
Channel: 52[Chain 0]**



Channel: 56[Chain 0]

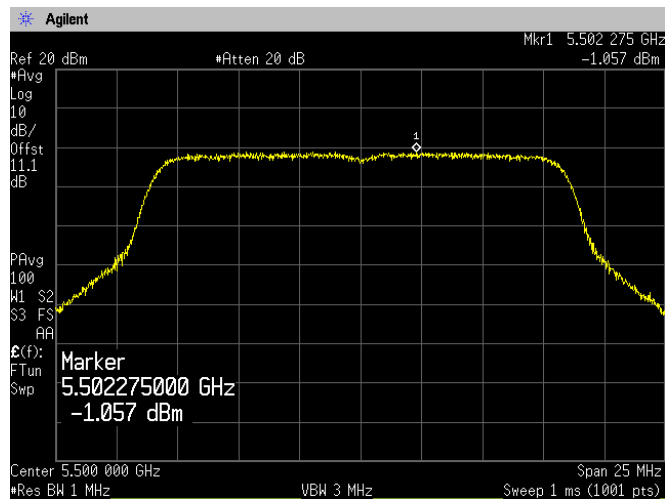


Channel: 64[Chain 0]

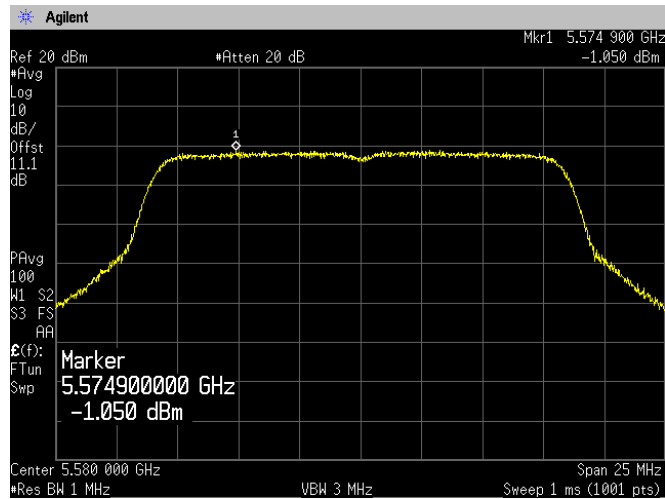




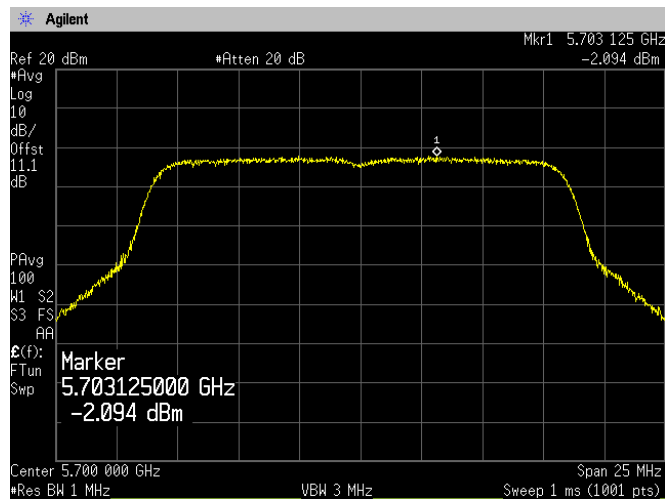
**(5.6 GHz Band)
Channel: 100[Chain 0]**



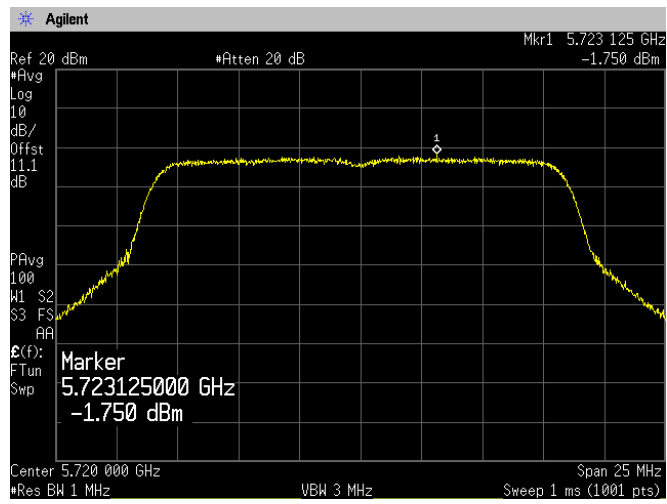
Channel: 116[Chain 0]



Channel: 140[Chain 0]

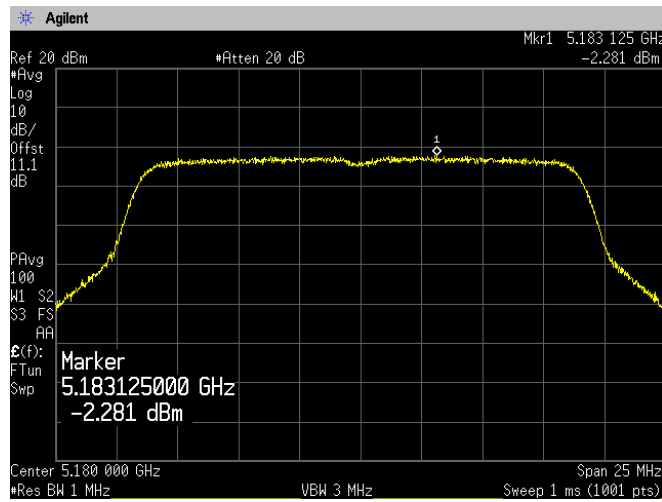


**(5.6 GHz Band)
Channel: 144[Chain 0]**

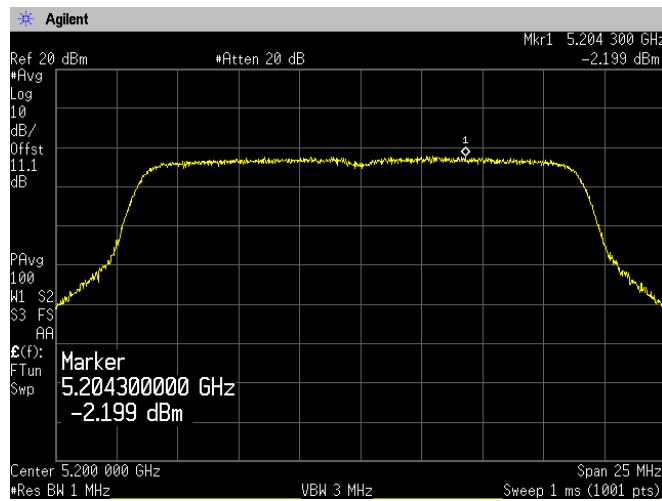




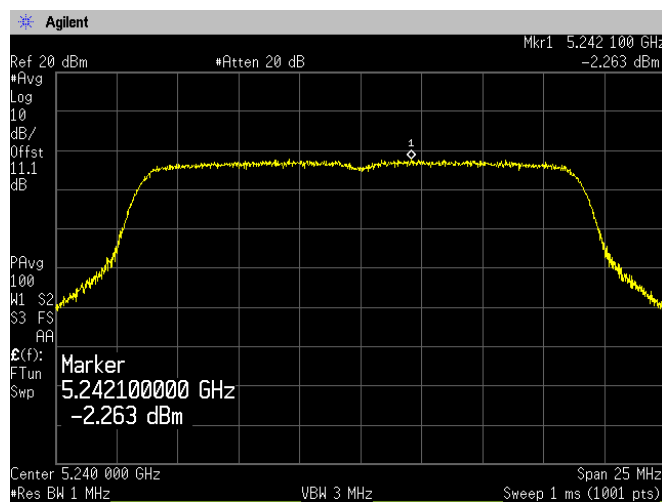
**[IEEE802.11n (HT20)]
(5.2 GHz Band)
Channel: 36[Chain 0]**



Channel: 40[Chain 0]

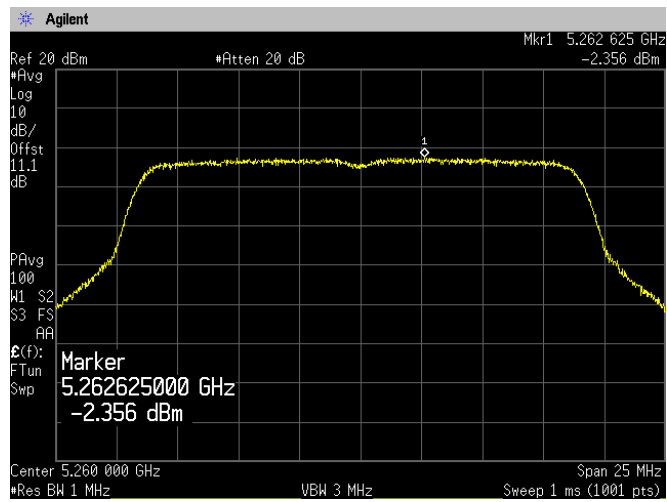


Channel: 48[Chain 0]

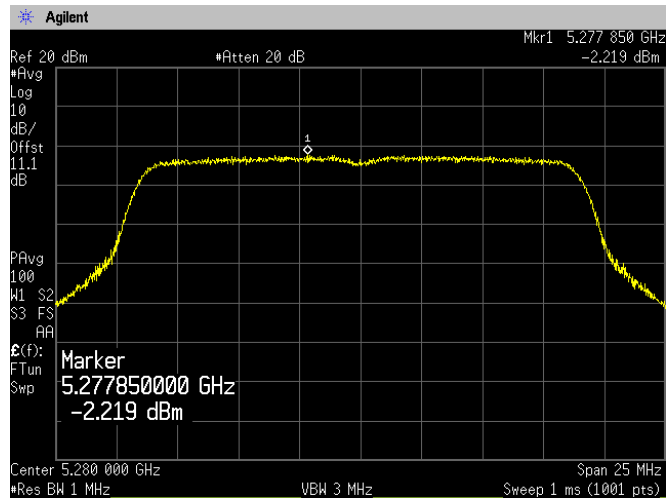




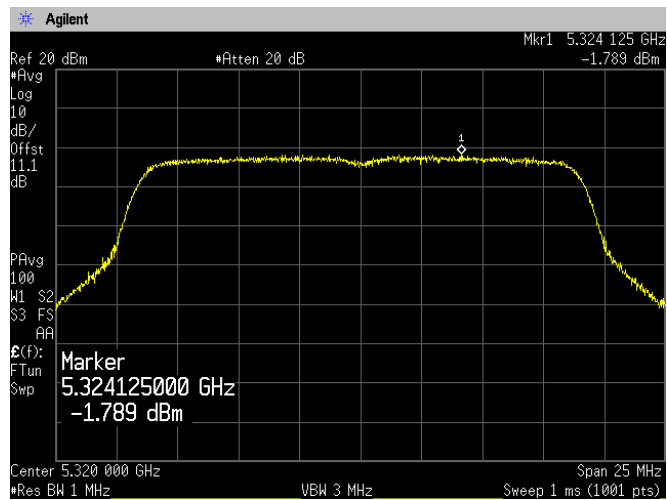
**(5.3 GHz Band)
Channel: 52[Chain 0]**



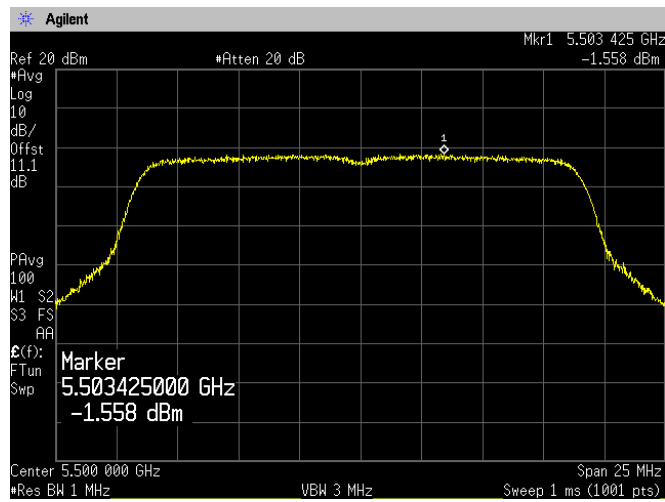
Channel: 56[Chain 0]



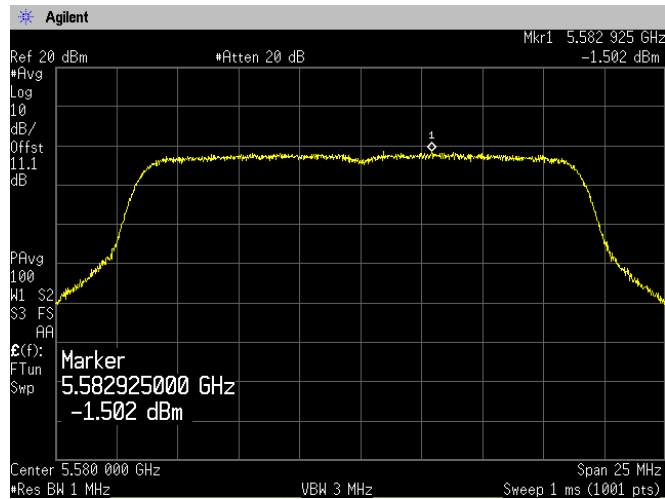
Channel: 64[Chain 0]



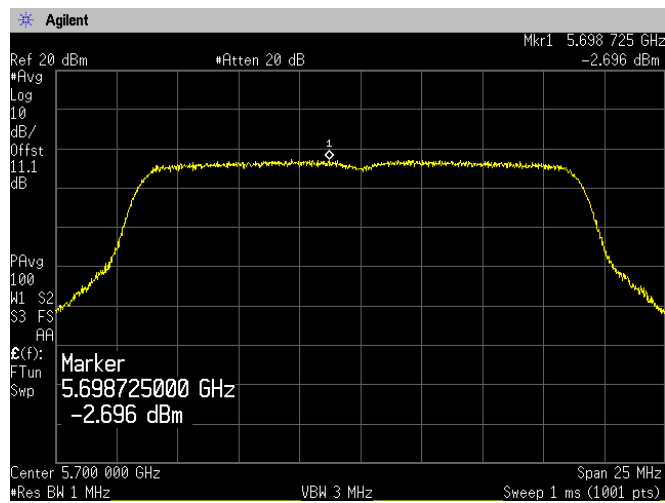
**(5.6 GHz Band)
Channel: 100[Chain 0]**



Channel: 116[Chain 0]

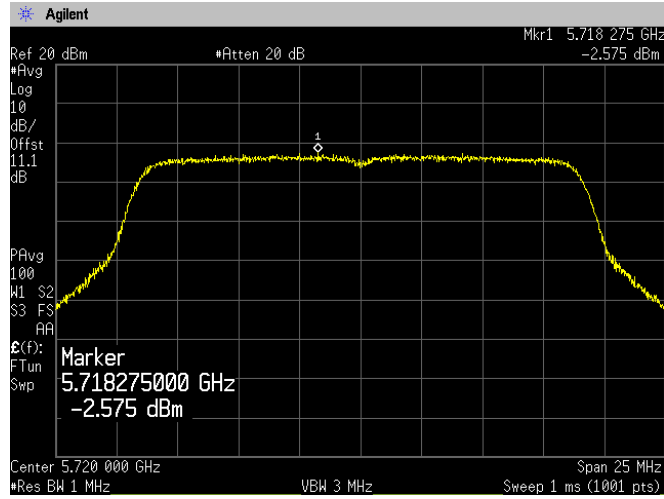


Channel: 140[Chain 0]



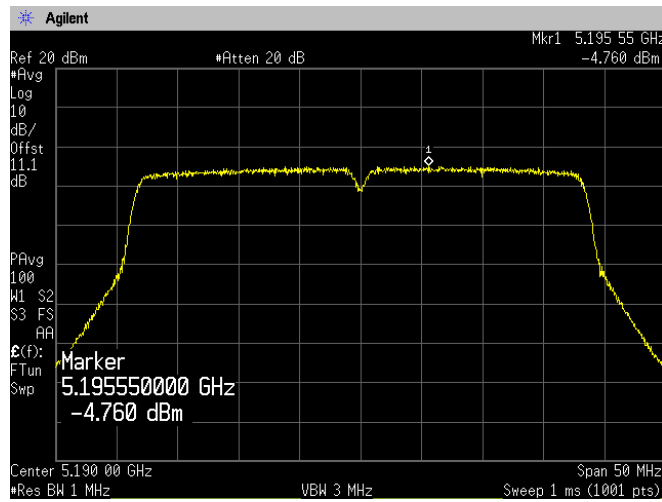


**(5.6 GHz Band)
Channel: 144[Chain 0]**

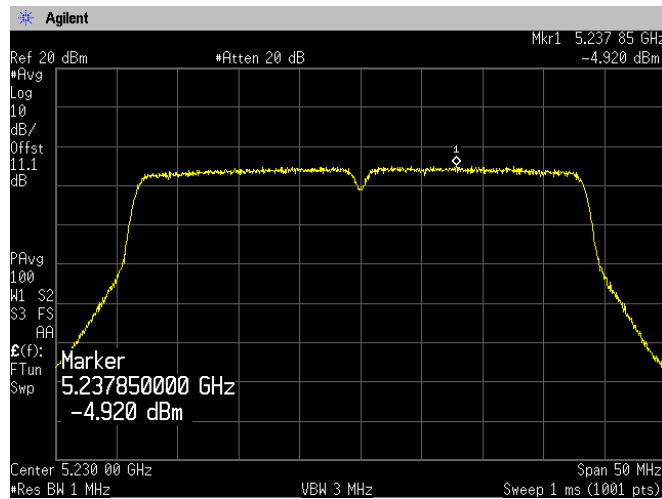




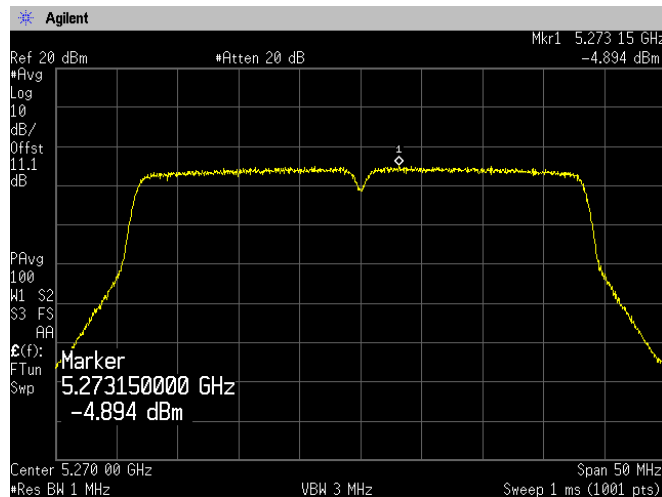
**[IEEE802.11n (HT40)]
(5.2 GHz Band)
Channel: 38[Chain 0]**



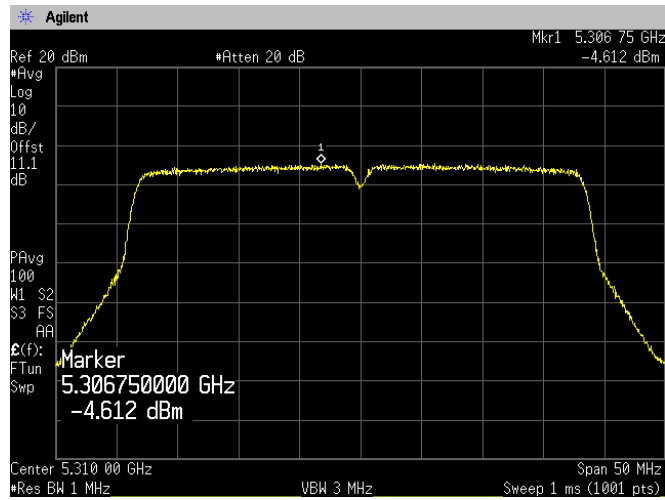
**(5.2 GHz Band)
Channel: 46[Chain 0]**



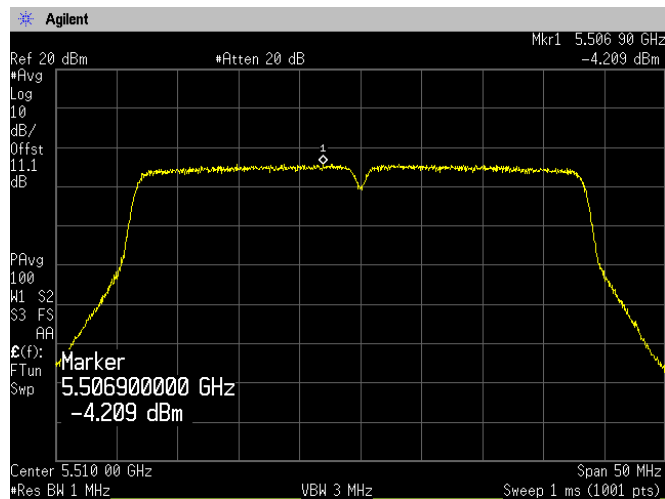
**(5.3 GHz Band)
Channel: 54[Chain 0]**



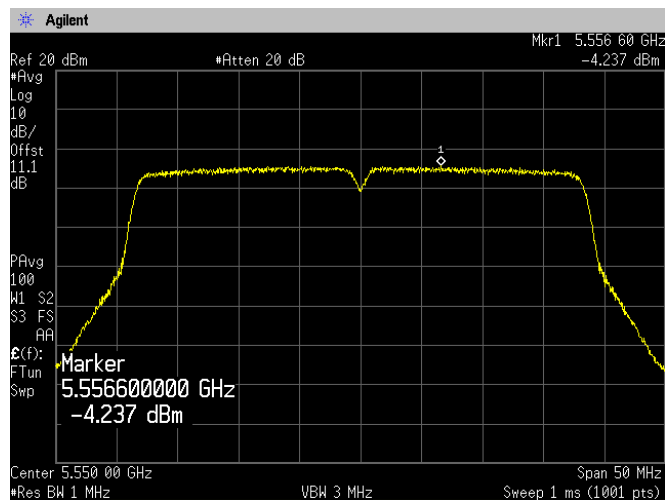
**(5.3 GHz Band)
Channel: 62[Chain 0]**



**(5.6 GHz Band)
Channel: 102[Chain 0]**



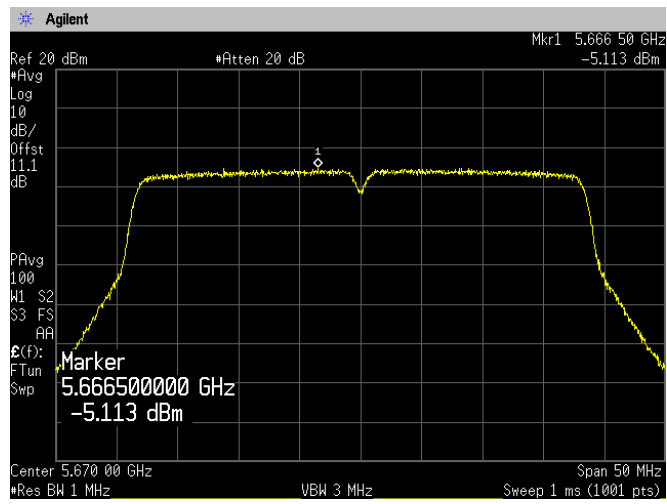
Channel: 110[Chain 0]



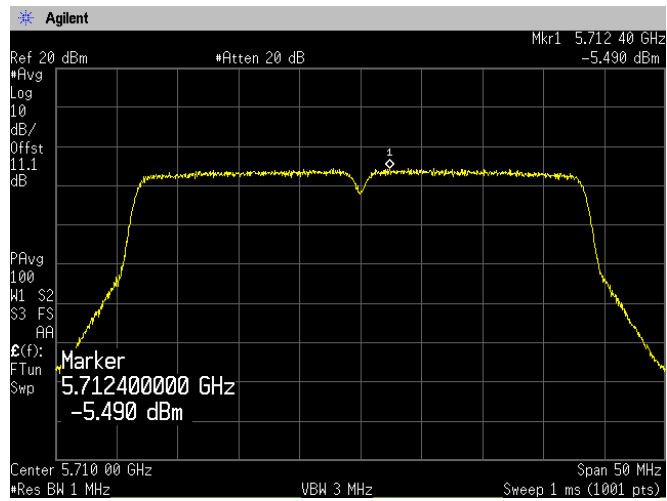


Japan

**(5.6 GHz Band)
Channel: 134[Chain 0]**

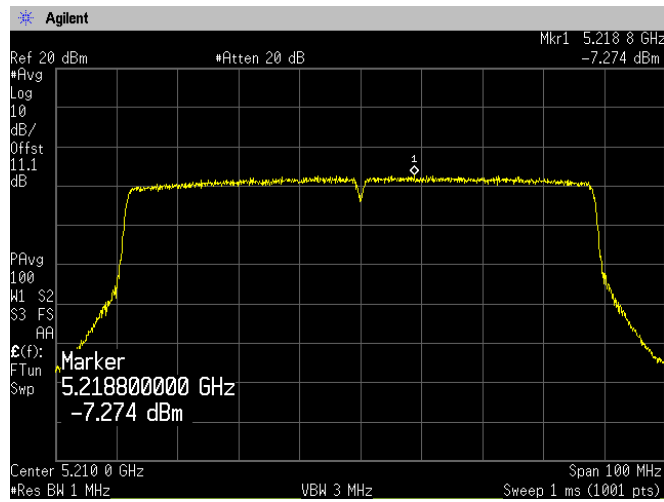


**(5.6 GHz Band)
Channel: 142[Chain 0]**

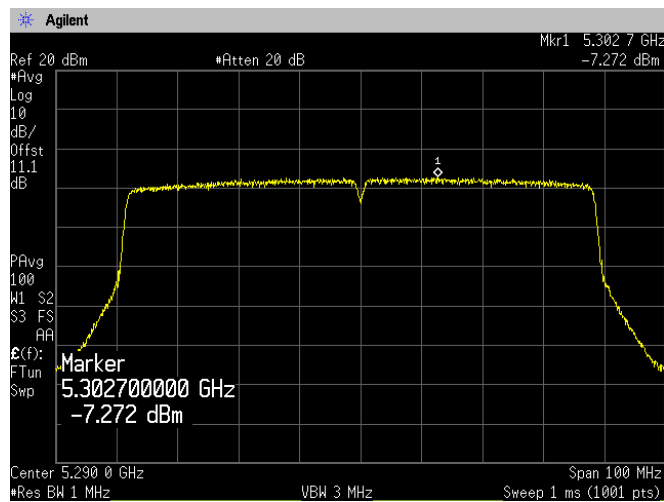




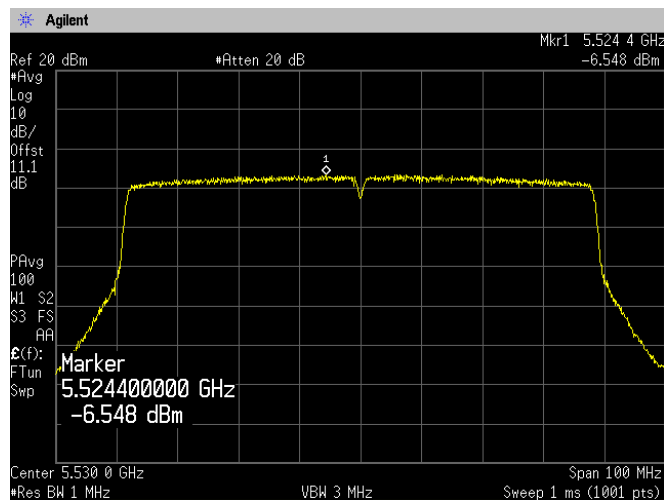
[IEEE802.11ac (HT80)]
(5.2 GHz Band)
Channel: 42[Chain 0]



(5.3GHz Band)
Channel: 58[Chain 0]

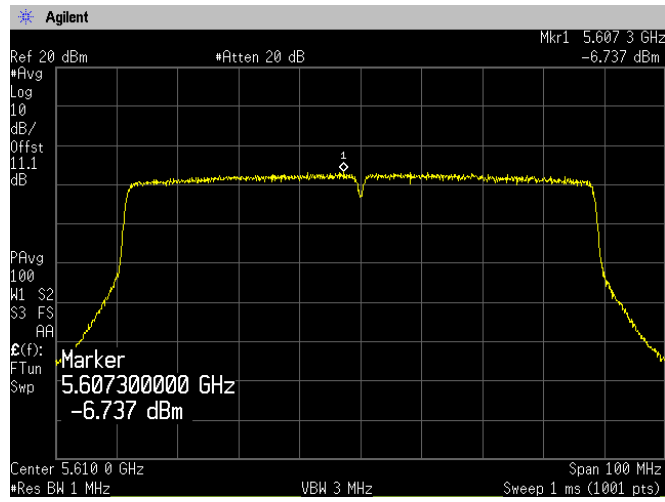


(5.6GHz Band)
Channel: 106[Chain 0]

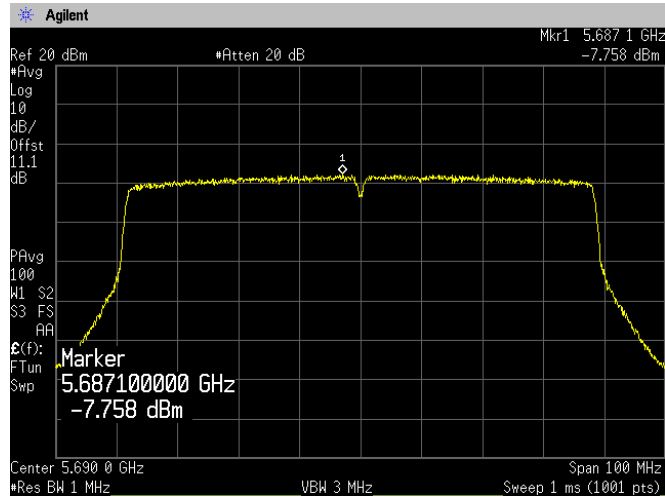




**(5.6GHz Band)
Channel: 122[Chain 0]**

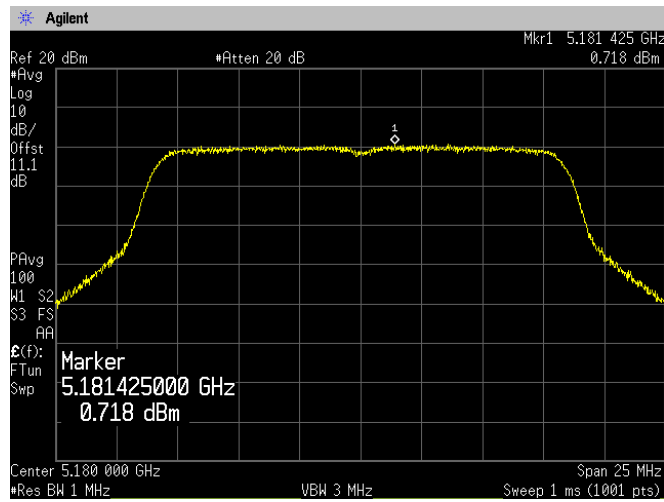


Channel: 138[Chain 0]

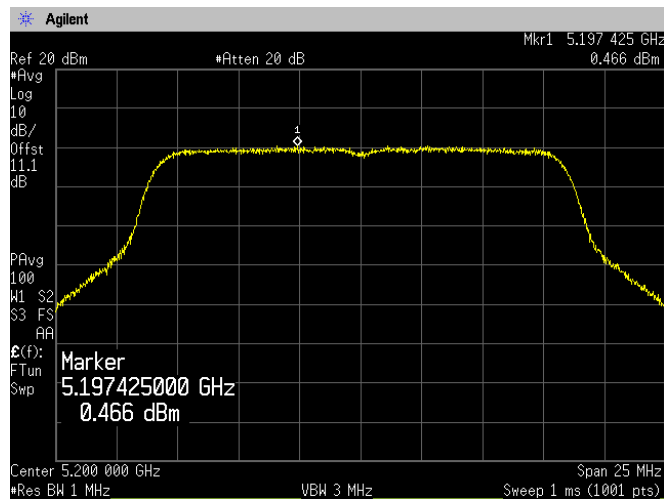




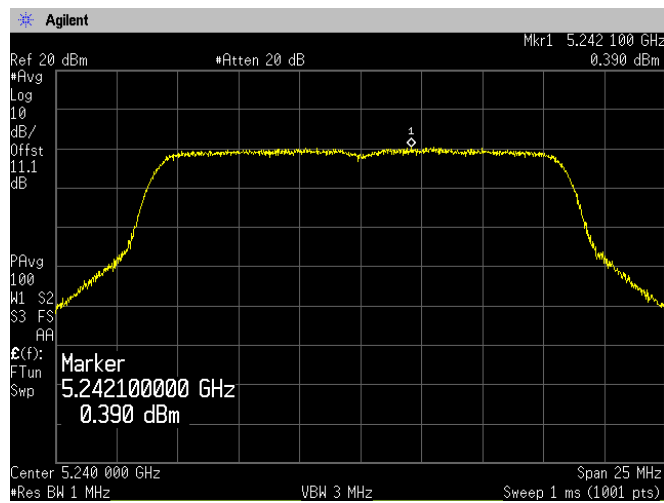
**[IEEE802.11a]
(5.2 GHz Band)
Channel: 36[Chain 1]**



Channel: 40[Chain 1]

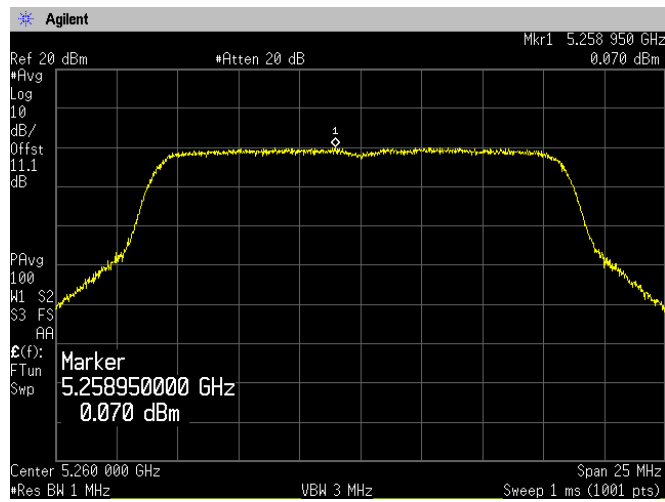


Channel: 48[Chain 1]

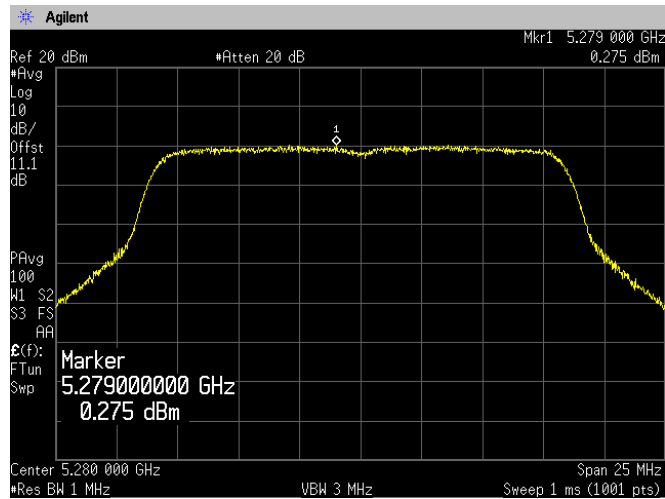




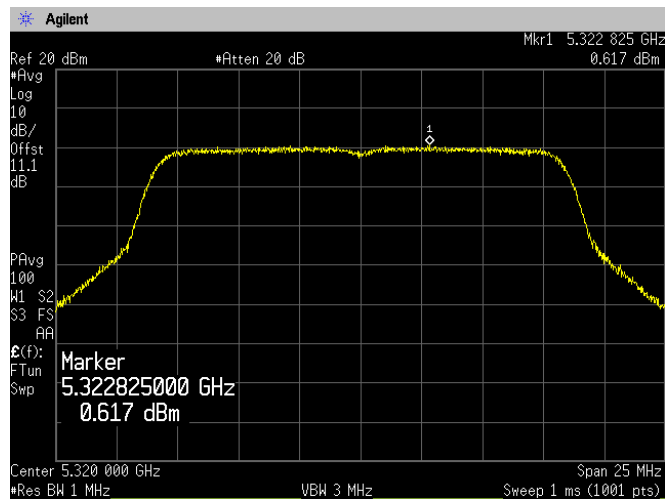
**(5.3 GHz Band)
Channel: 52[Chain 1]**



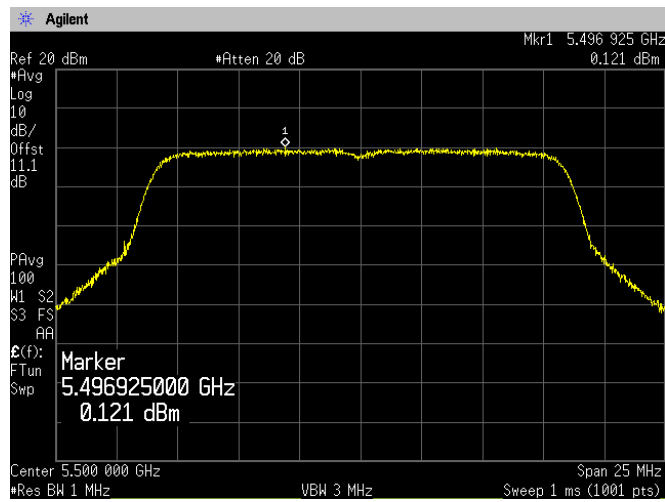
Channel: 56[Chain 1]



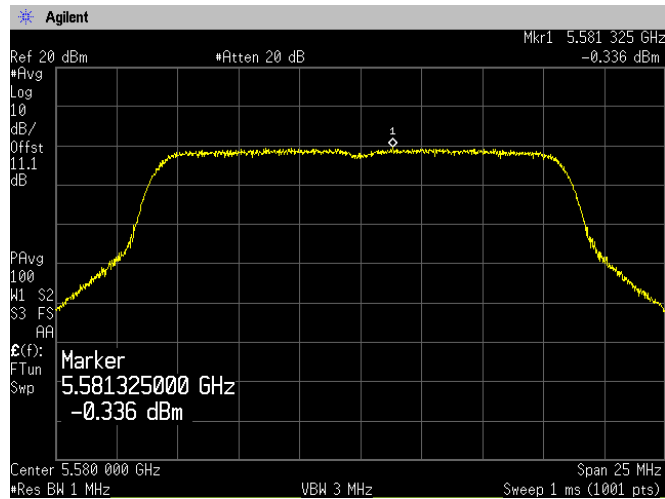
Channel: 64[Chain 1]



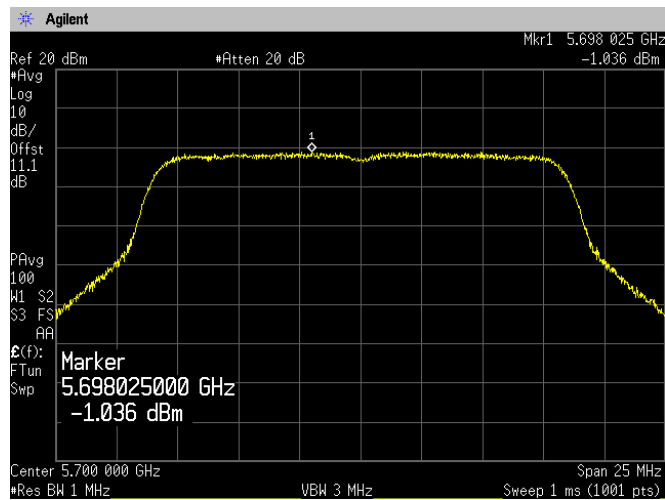
**(5.6 GHz Band)
Channel: 100[Chain 1]**



Channel: 116[Chain 1]



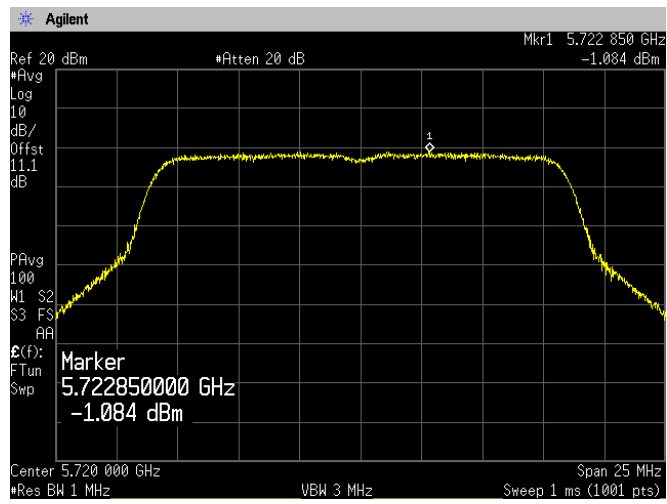
Channel: 140[Chain 1]





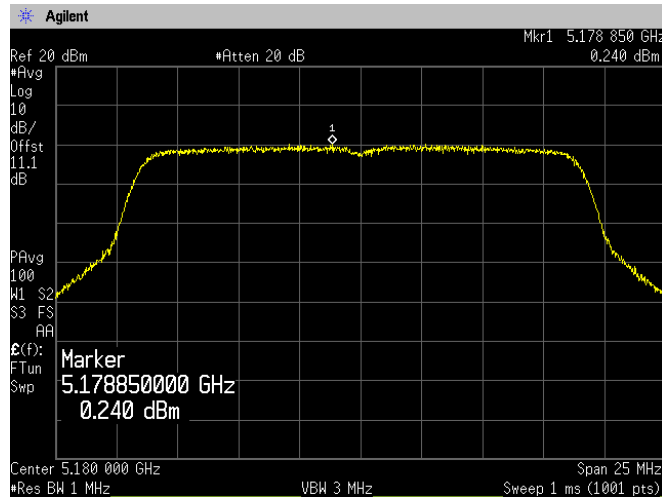
Japan

**(5.6 GHz Band)
Channel: 144[Chain 1]**

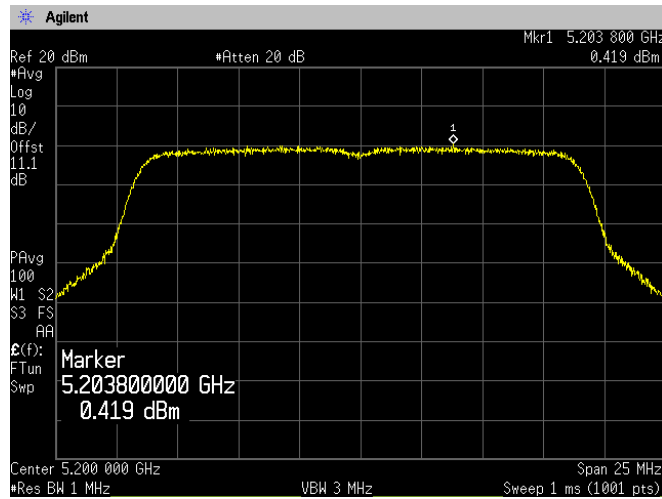




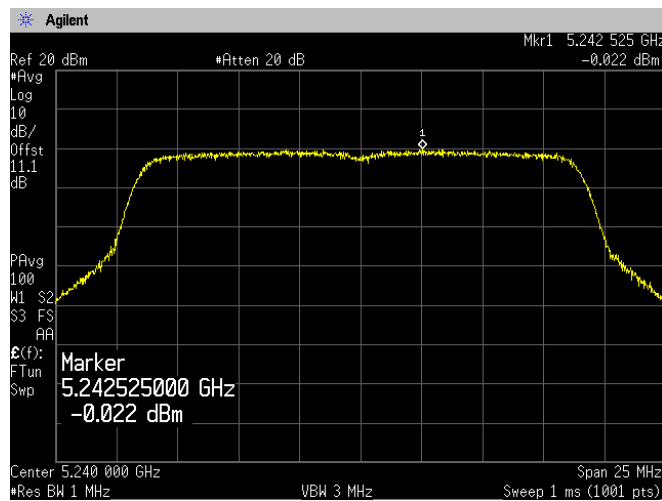
**[IEEE802.11n (HT20)]
(5.2 GHz Band)
Channel: 36[Chain 1]**



Channel: 40[Chain 1]

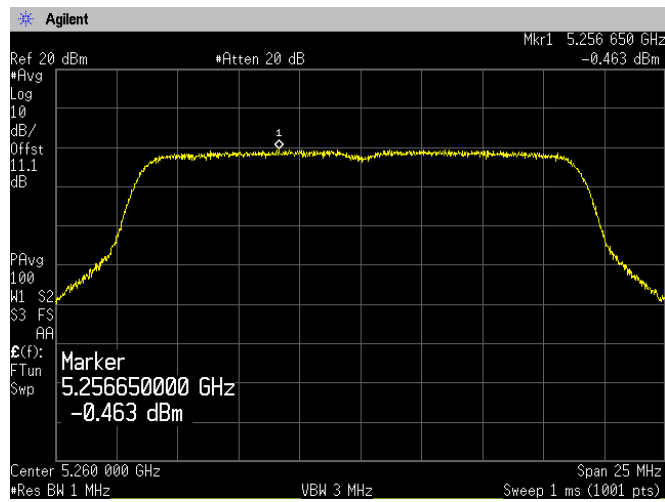


Channel: 48[Chain 1]

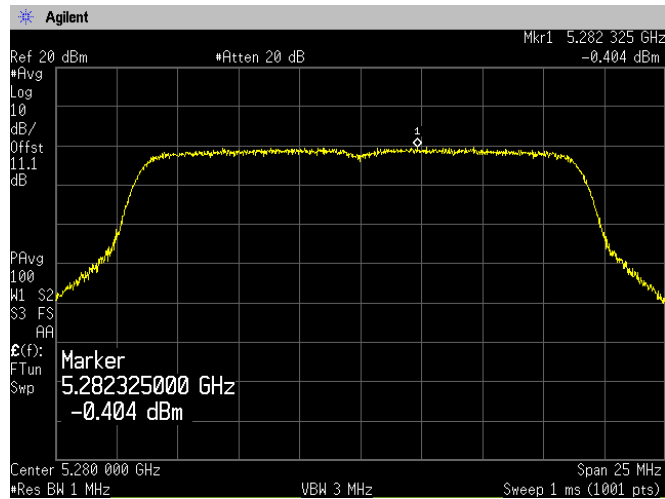




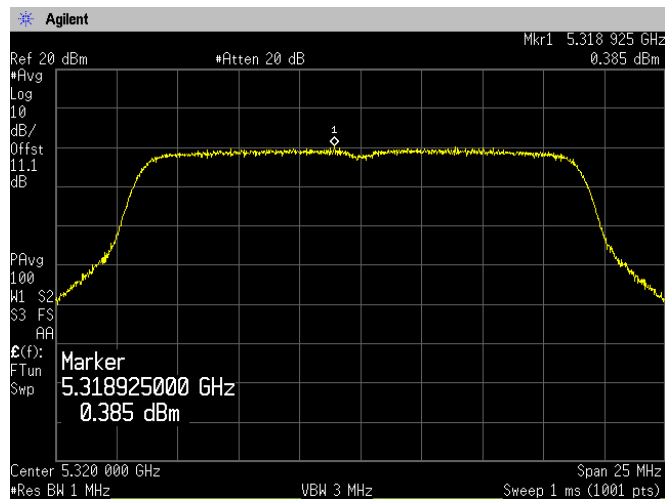
**(5.3 GHz Band)
Channel: 52[Chain 1]**



Channel: 56[Chain 1]

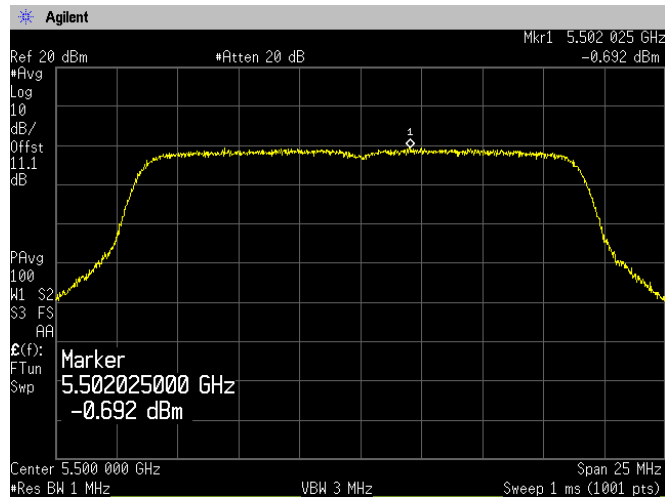


Channel: 64[Chain 1]

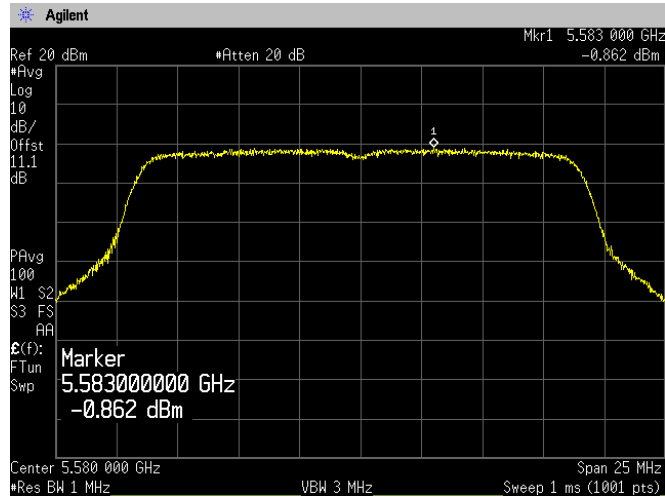




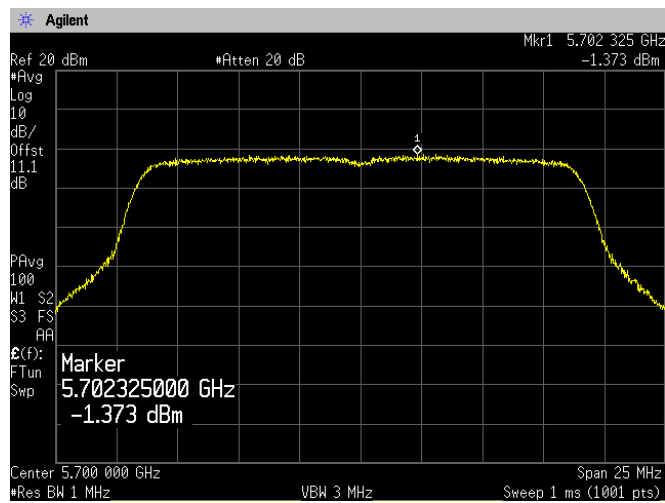
**(5.6 GHz Band)
Channel: 100[Chain 1]**



Channel: 116[Chain 1]

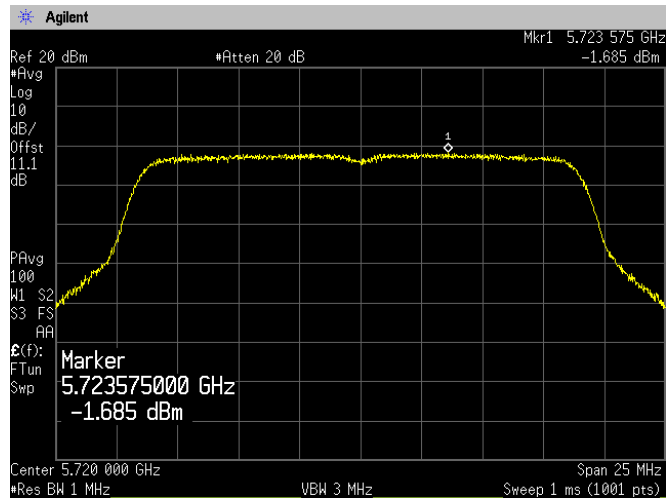


Channel: 140[Chain 1]



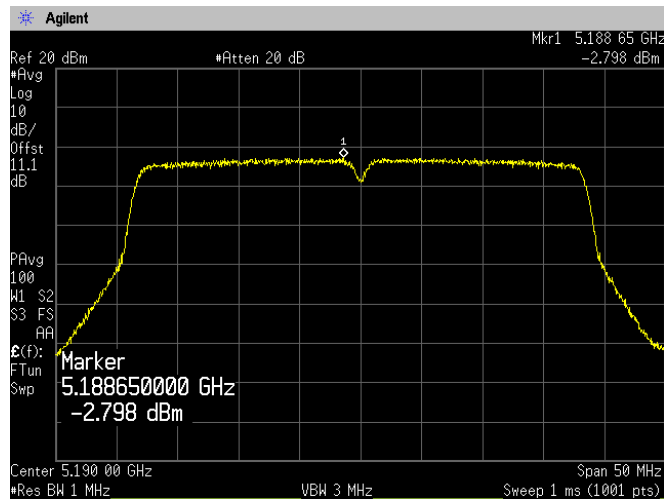


**(5.6GHz Band)
Channel: 144[Chain 1]**

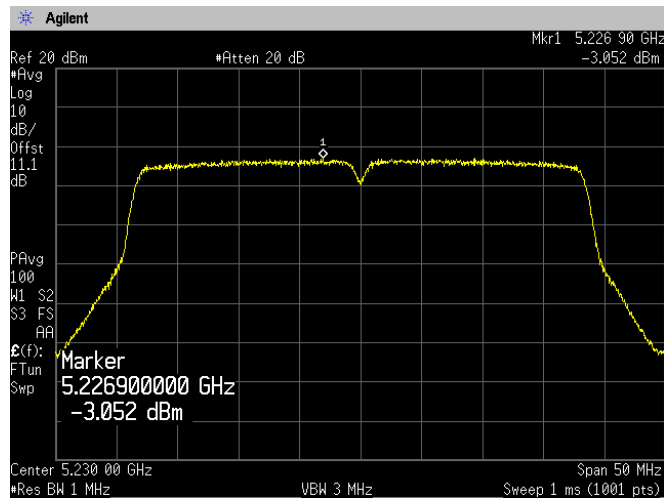




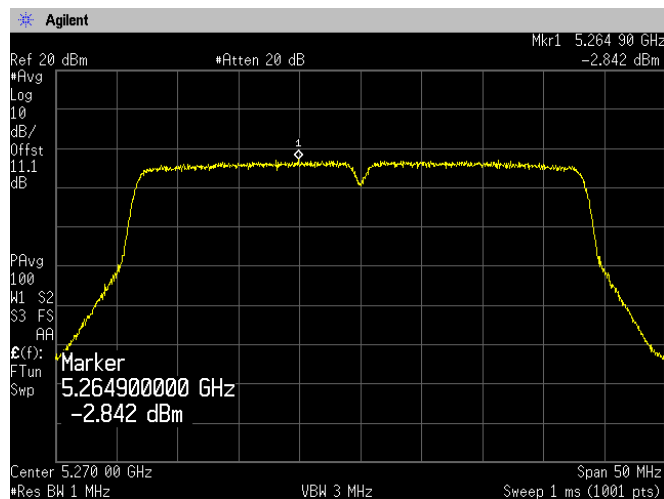
**[IEEE802.11n (HT40)]
(5.2 GHz Band)
Channel: 38[Chain 1]**



**(5.2 GHz Band)
Channel: 46[Chain 1]**

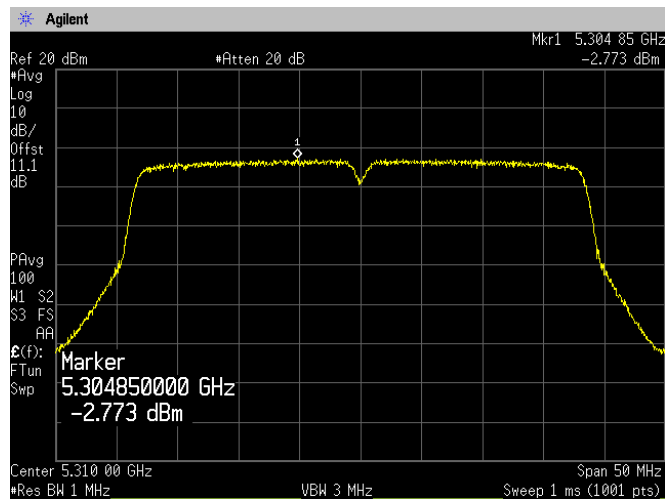


**(5.3 GHz Band)
Channel: 54[Chain 1]**

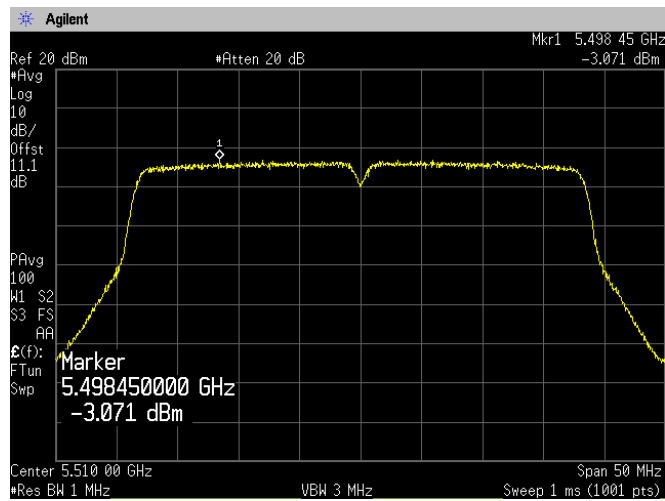




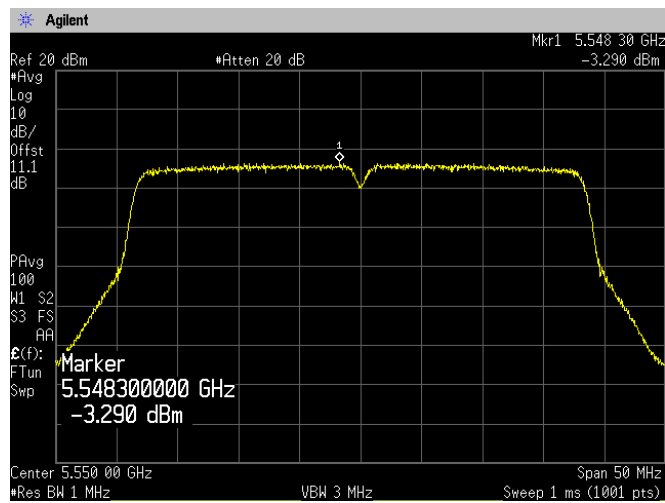
**(5.3 GHz Band)
Channel: 62[Chain 1]**



**(5.6 GHz Band)
Channel: 102[Chain 1]**



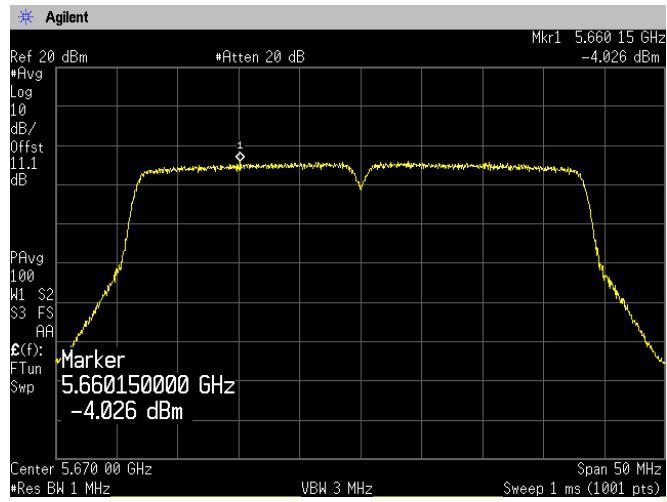
Channel: 110[Chain 1]



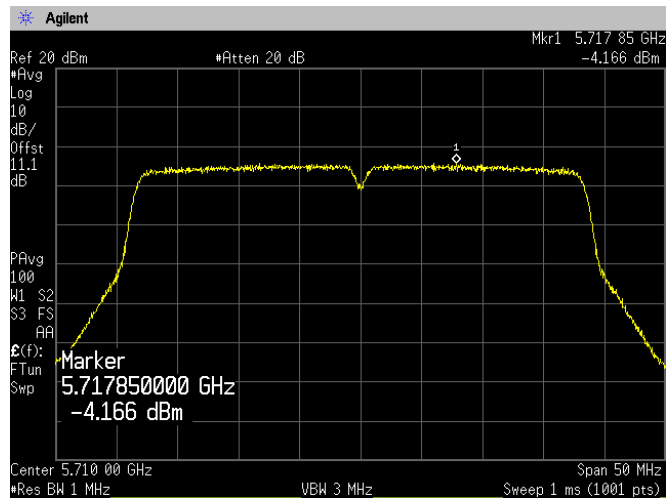


Japan

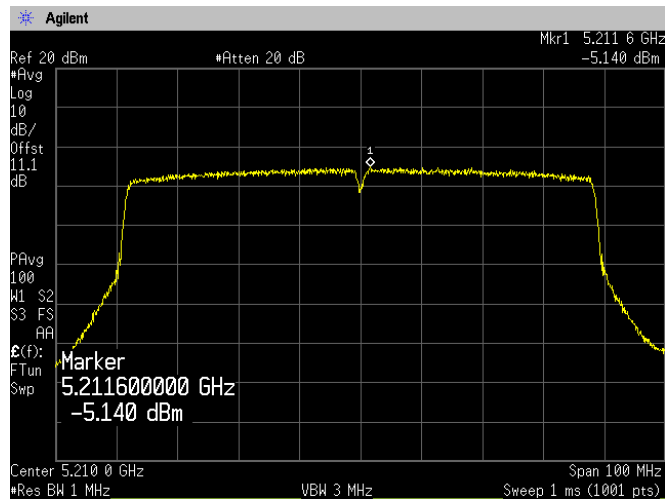
**(5.6 GHz Band)
Channel: 134[Chain 1]**



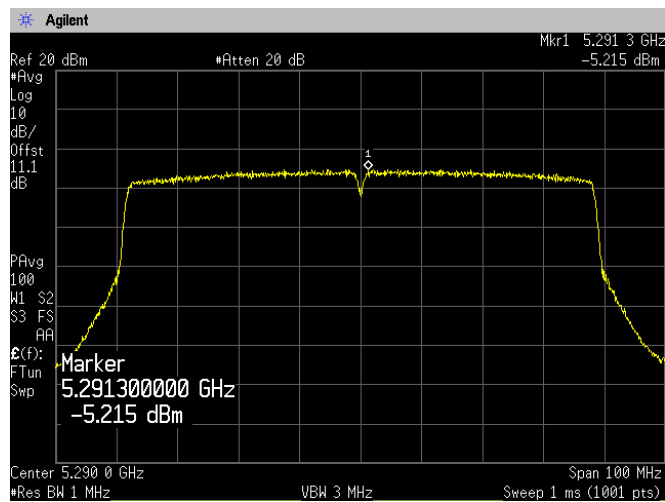
**(5.6 GHz Band)
Channel: 142[Chain 1]**



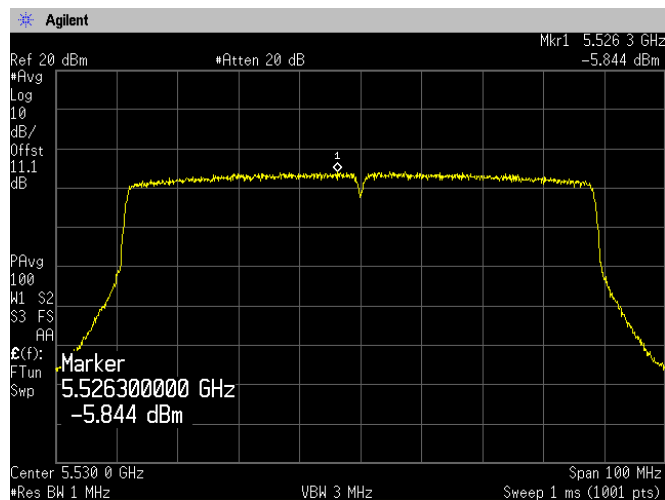
**[IEEE802.11ac (HT80)]
(5.2 GHz Band)
Channel: 42[Chain 1]**



**(5.3GHz Band)
Channel: 58[Chain 1]**



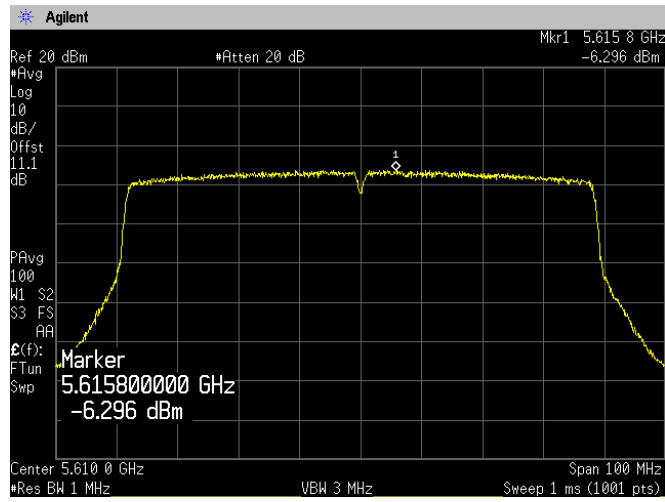
**(5.6GHz Band)
Channel: 106[Chain 1]**



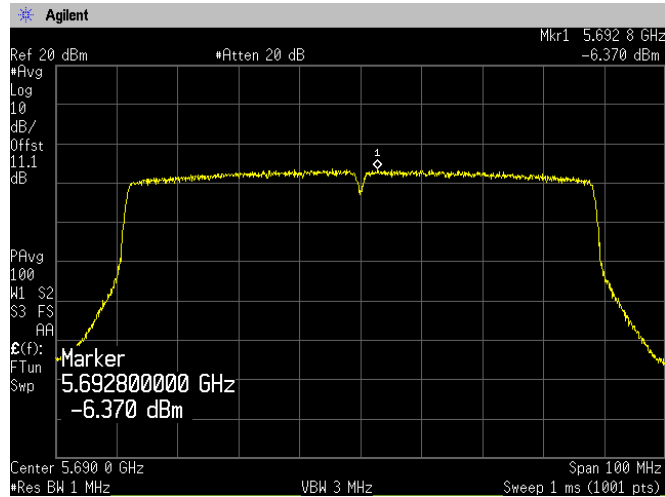


Japan

**(5.6GHz Band)
Channel: 122[Chain 1]**



Channel: 138[Chain 1]



4.4 Radiated Emissions (Restricted Bands of Operation)

4.4.1 Measurement procedure

[FCC 15.407(b), 15.205, 15.209, KDB 789033 D02, Section G.4, 5, 6.c) Method AD]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	9 kHz to 40 GHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W) 1.0 x (D) 1.0 x(H) 0.8 m (below 1 GHz) Styrofoam table / (W) 0.6 x (D) 0.6 x(H) 1.5 m (above 1 GHz)
Antenna distance	:	3m
Test receiver setting	:	Below 1 GHz
- Detector	:	Quasi-peak
- Bandwidth	:	120 kHz
Spectrum analyzer setting	:	Above 1 GHz
- Peak	:	RBW=1 MHz, VBW=3 MHz, Span=0 Hz, Sweep=auto, Detector=Peak Trace mode=Max hold
- Average	:	RBW=1 MHz, VBW=3 MHz, Span=0 Hz, Sweep=auto, Detector=RMS Trace mode=Averaging (300 counts)

Radiated emission measurements are performed at 3m distance with the broadband antenna (Loop antenna, Biconical antenna, Log periodic antenna, Double ridged guide antenna and Broad-band horn Antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission. As for the Loop antenna, it is positioned with its plane vertical, and the center of the Loop antenna is 1m above the ground plane.

The EUT is Placed on a turntable, which is 0.8m (below 1 GHz) and 1.5m (above 1 GHz) above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

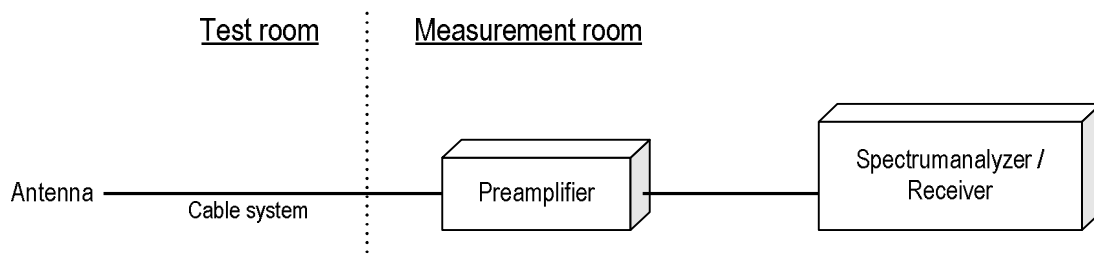
The EUT was set to operate with following conditions.

- 5.2 GHz Band, 5.3 GHz Band, 5.6 GHz Band

The test mode of EUT is as follows.

- Tx mode, Rx mode

- Test configuration



Duty cycle result

Mode	Band	On Time(ms)	On+Off Time(ms)	Duty Cycle (%)	DCF (dB)
802.11a	W52	2.095	2.113	99.15	0
	W53	2.095	2.113	99.15	0
	W56	2.095	2.113	99.15	0
802.11n (20MHz)	W52	5.429	5.449	99.63	0
	W53	5.429	5.449	99.63	0
	W56	5.429	5.449	99.63	0
802.11n (40MHz)	W52	5.429	5.442	99.76	0
	W53	5.429	5.442	99.76	0
	W56	5.429	5.442	99.76	0
802.11ac (80MHz)	W52	5.429	5.442	99.76	0
	W53	5.429	5.442	99.76	0
	W56	5.429	5.442	99.76	0

Note: $DCF = 10\log(1/x)$

4.4.2 Calculation method

[150 kHz to 25 GHz]

Emission level = Reading + (Ant. factor + Cable system loss - Amp. Gain)

Margin = Limit - Emission level

Example:

Detector: Peak

Limit @ 5147.0 MHz: 74.0 dBuV/m (Peak Limit)

S.A Reading = 40.9 dBuV Cable system loss = 16.4 dB

Result = 40.9 + 16.4 = 57.3 dBuV/m

Margin = 74.0 - 57.3 = 16.7 dB

4.4.3 Limit

- (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.
- (3) For transmitters operating in the 5.47-5.725GHz band: all emissions outside of the 5.47 5-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	2400 / F [kHz]	20logE [uV/m]	300
0.490-1.705	24000 / F [kHz]	20logE [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition modulation.



Japan

4.4.4 Test data

Date : 6-July-2023
Temperature : 23.8 [°C]
Humidity : 69.5 [%]
Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

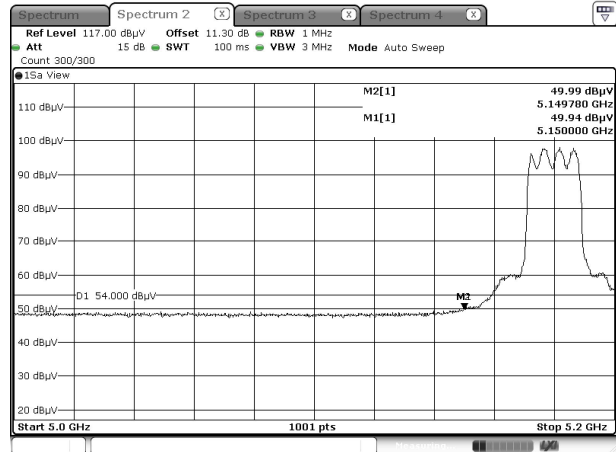
4.4.4.1 Restricted Bandedge

[IEEE802.11a]

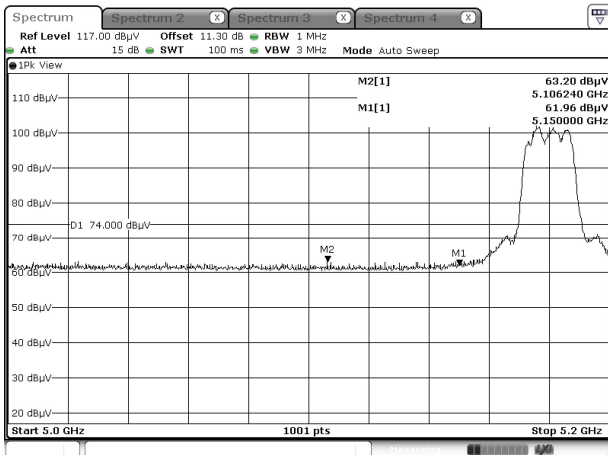
5.2 GHz Band, Channel Low Horizontal Peak



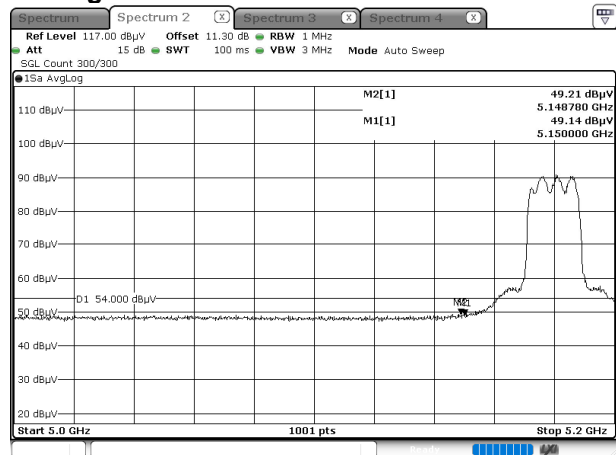
Average



Vertical Peak



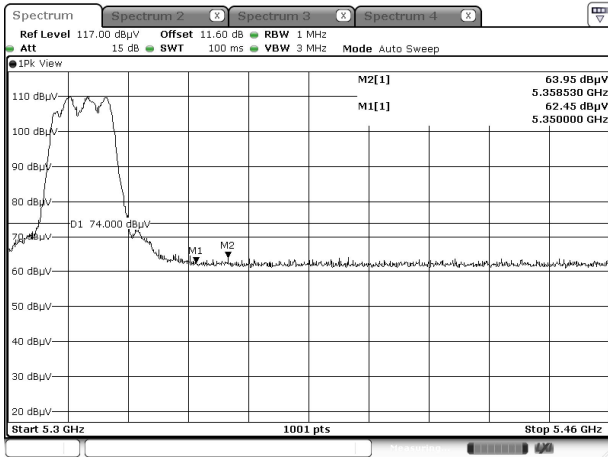
Average



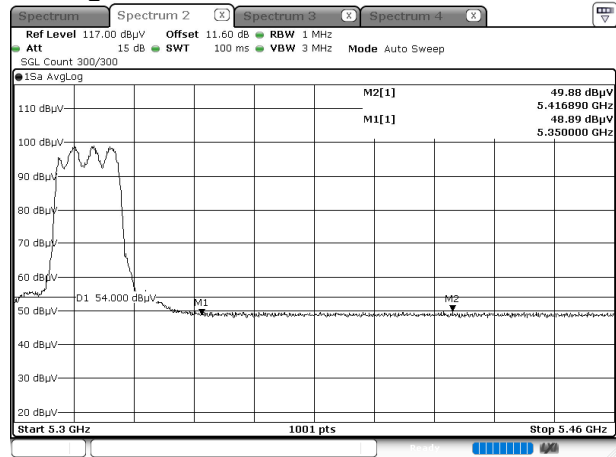


[IEEE802.11a]

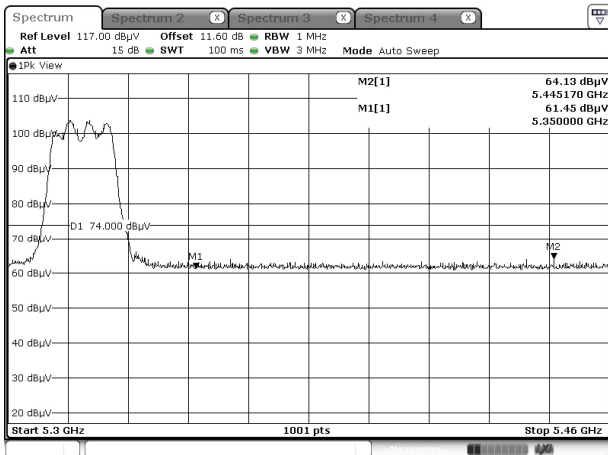
**5.3 GHz Band, Channel High
Horizontal
Peak**



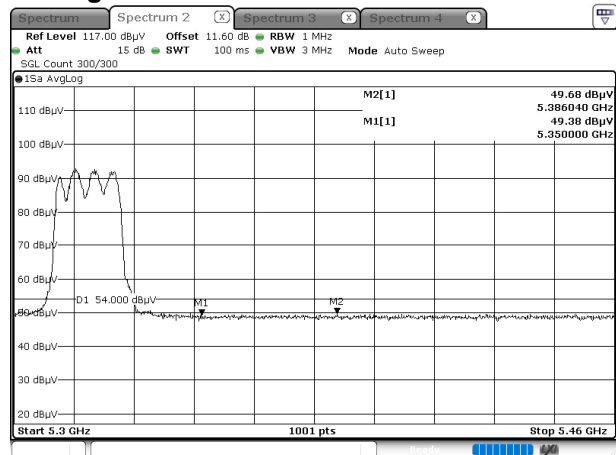
Average



**Vertical
Peak**



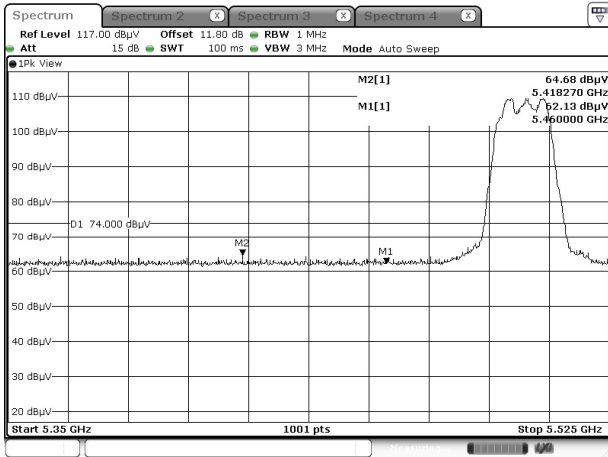
Average



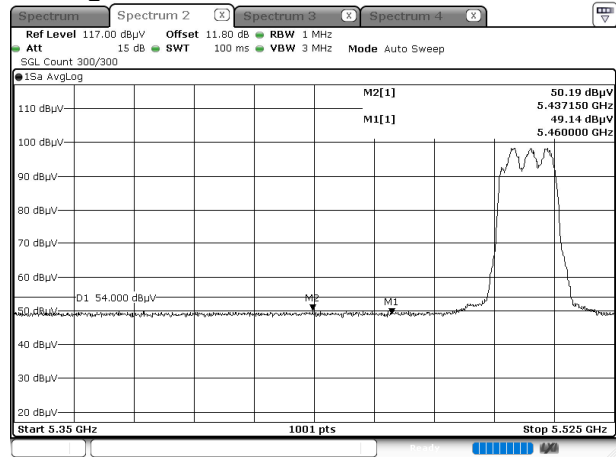


[IEEE802.11a]

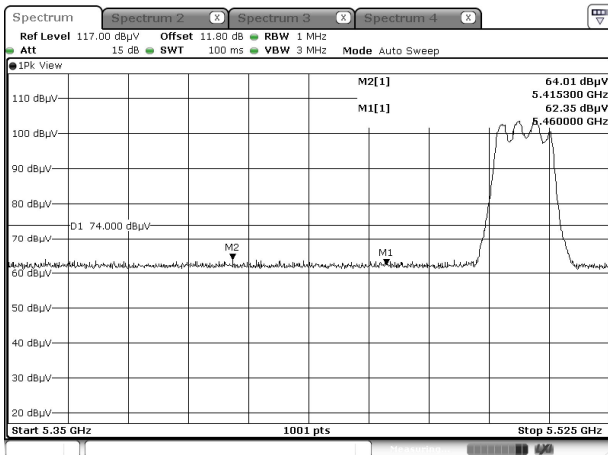
5.6 GHz Band, Channel Low
Horizontal
Peak



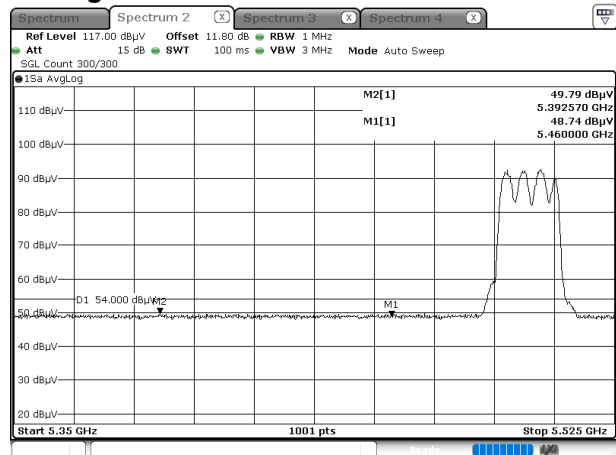
Average



Vertical
Peak

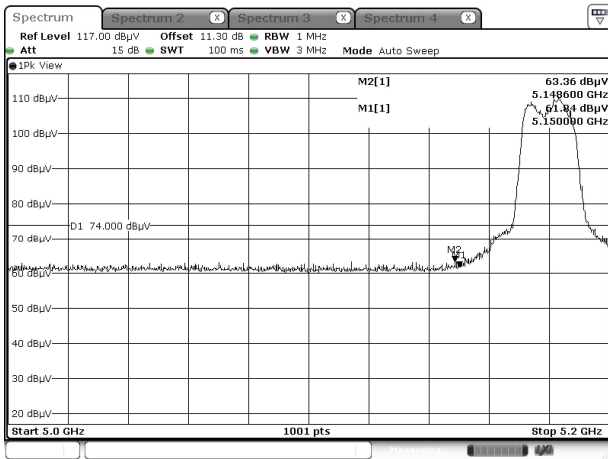


Average

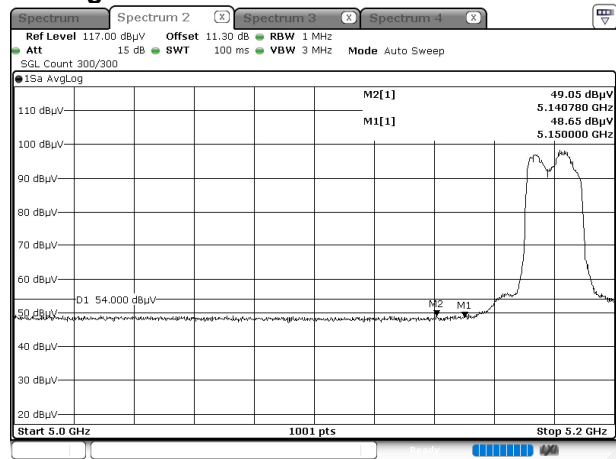


[IEEE802.11n (HT20)]

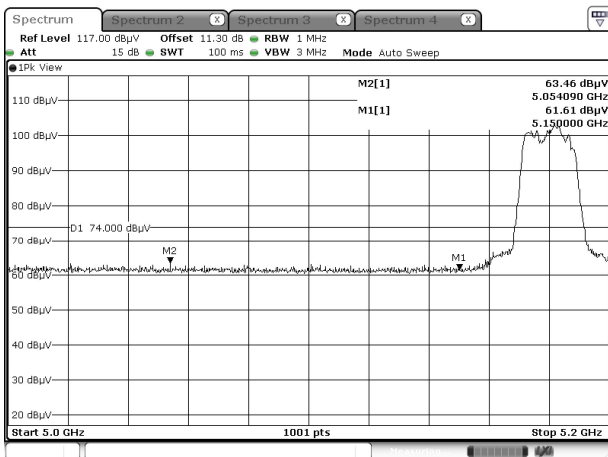
5.2 GHz Band, Channel Low
Horizontal
Peak



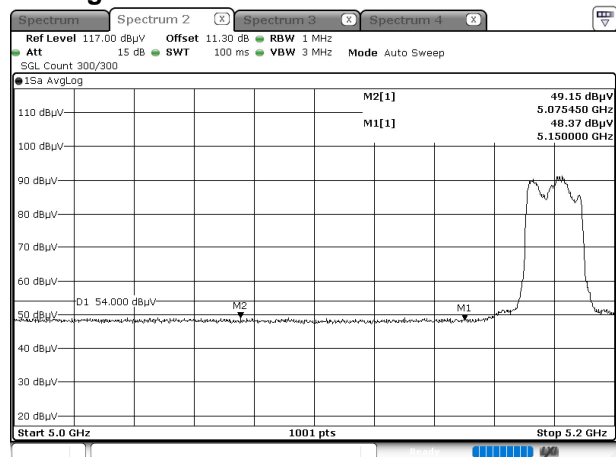
Average



Vertical
Peak



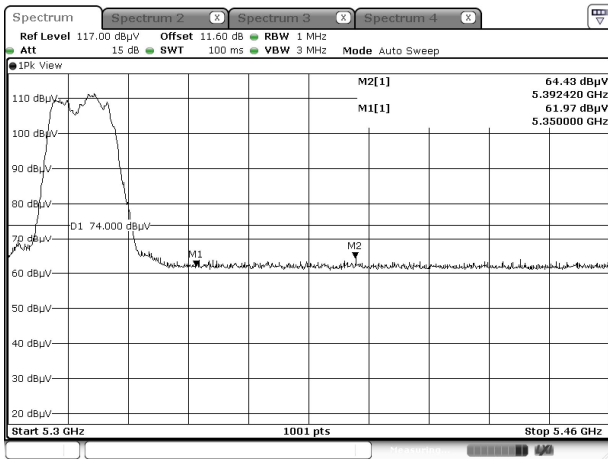
Average



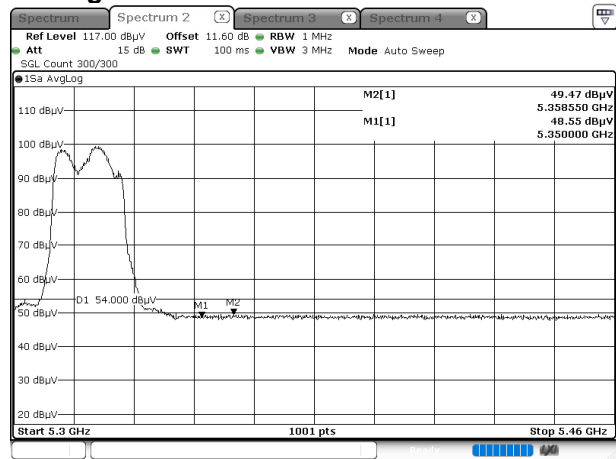


[IEEE802.11n (HT20)]

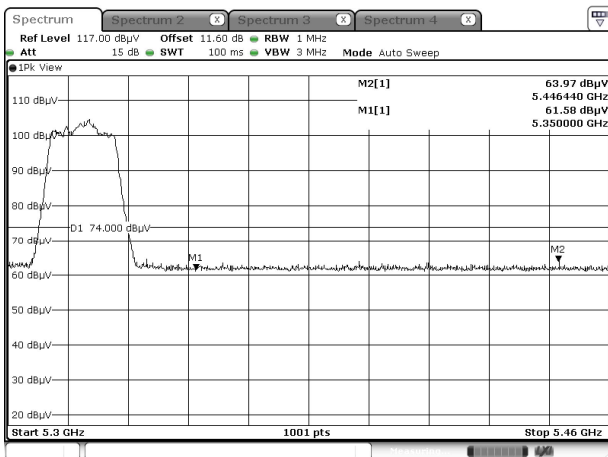
5.3 GHz Band, Channel High
Horizontal
Peak



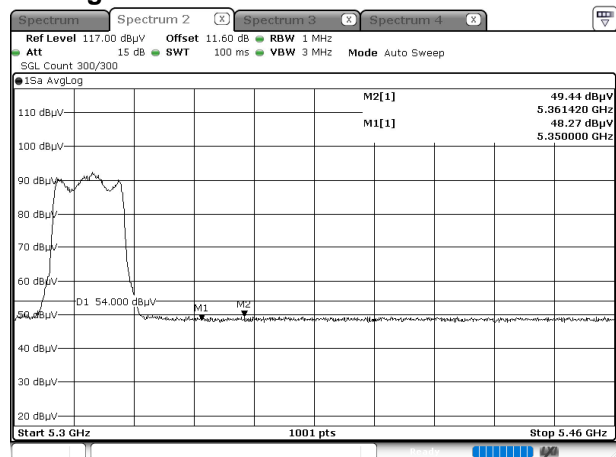
Average



Vertical
Peak



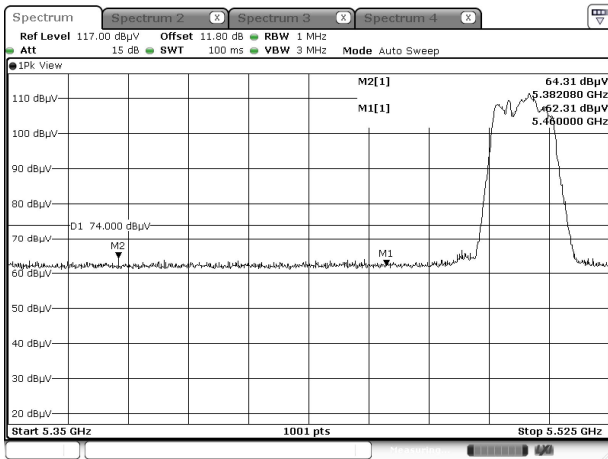
Average



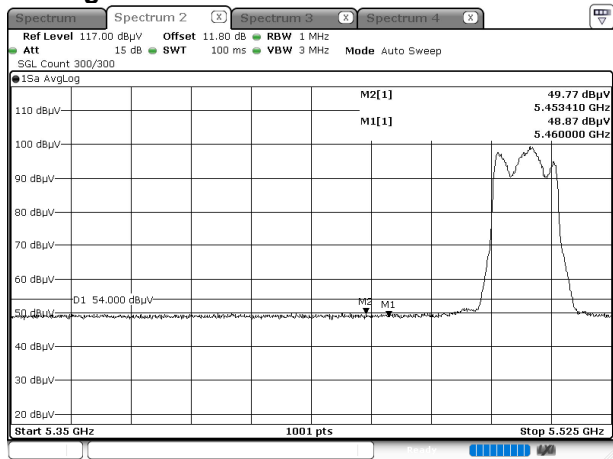


[IEEE802.11n (HT20)]

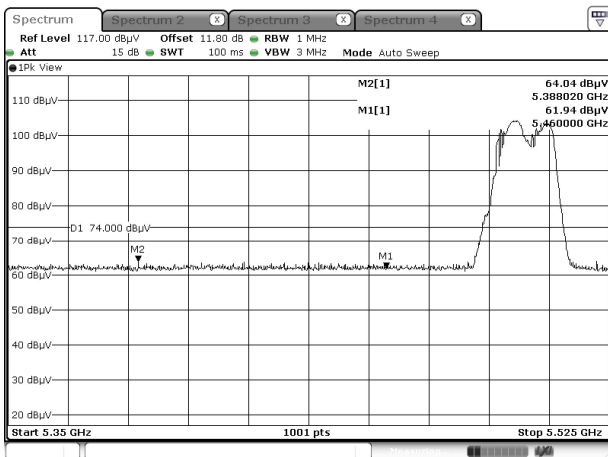
5.6 GHz Band, Channel Low
Horizontal
Peak



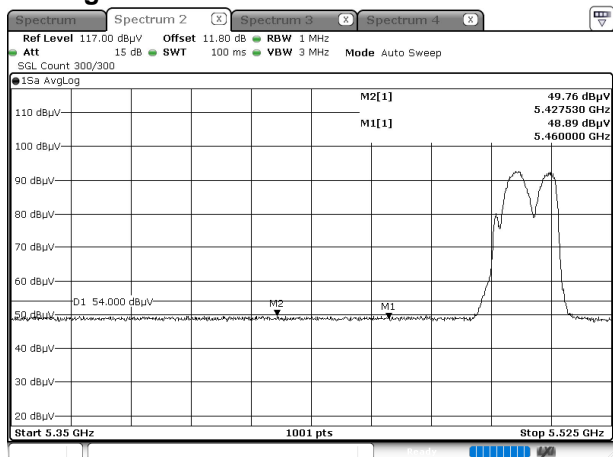
Average



Vertical
Peak



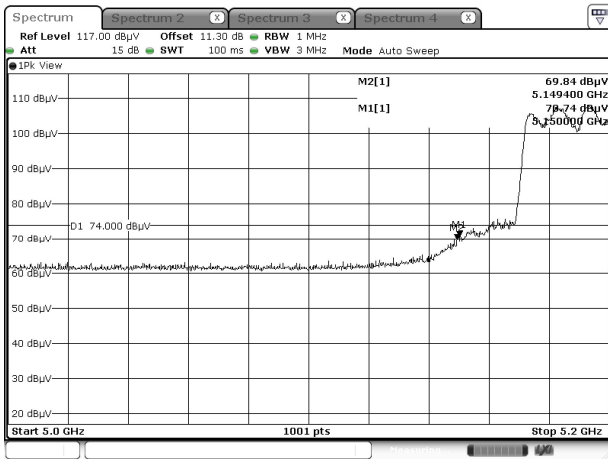
Average



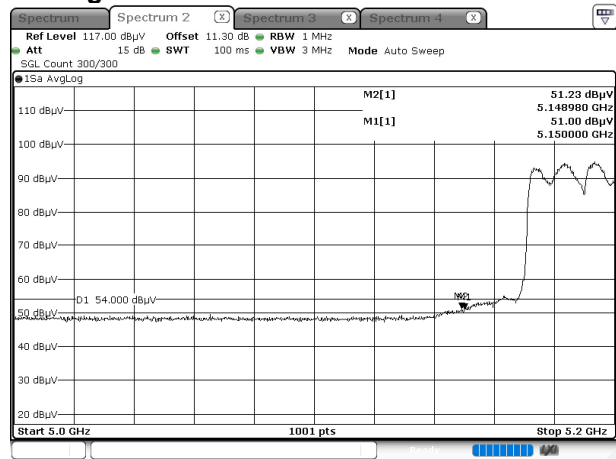


[IEEE802.11n (HT40)]

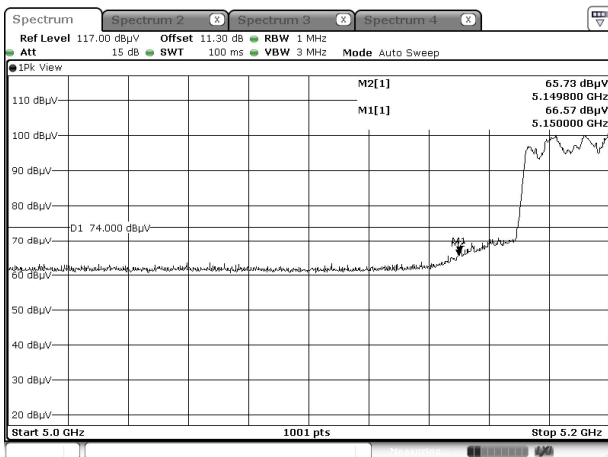
5.2 GHz Band, Channel Low Horizontal Peak



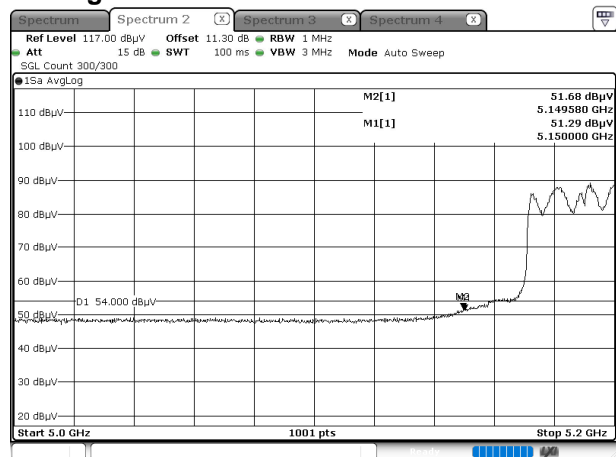
Average



Vertical Peak



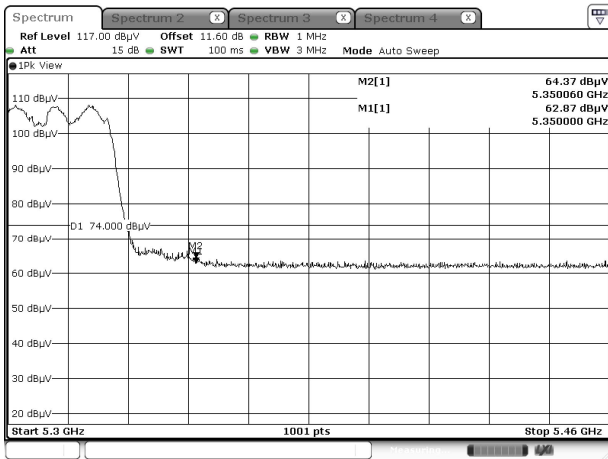
Average



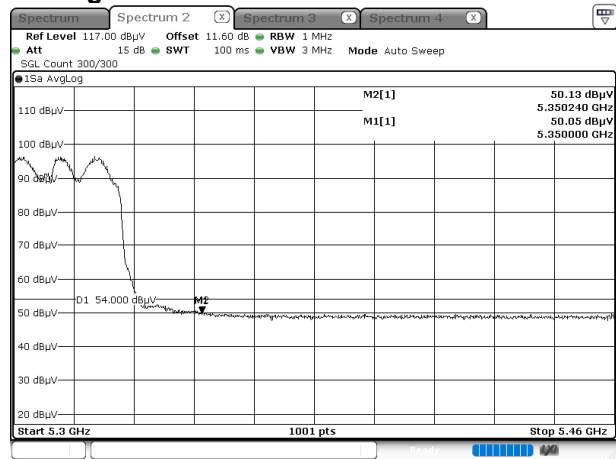


[IEEE802.11n (HT40)]

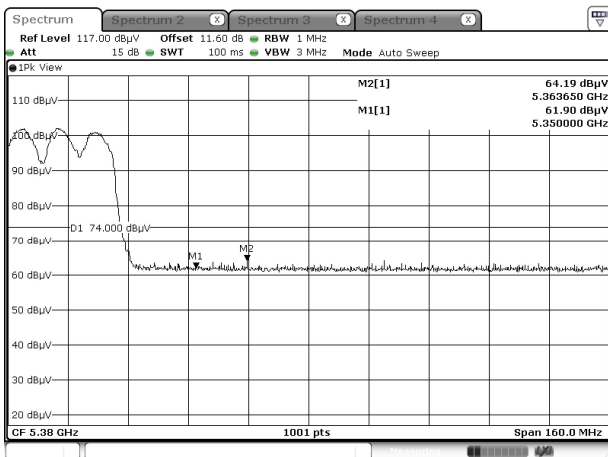
5.3 GHz Band, Channel High
Horizontal
Peak



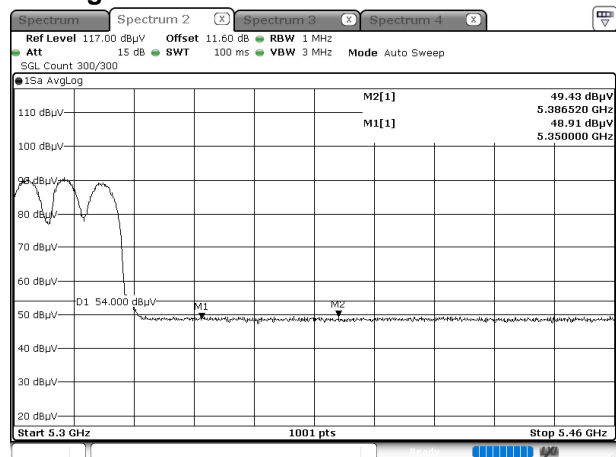
Average



Vertical
Peak



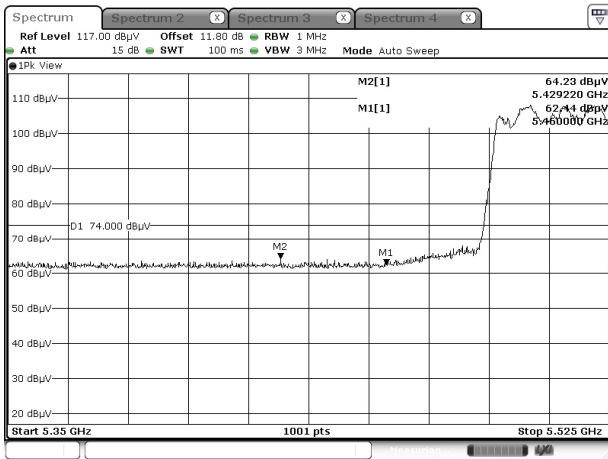
Average



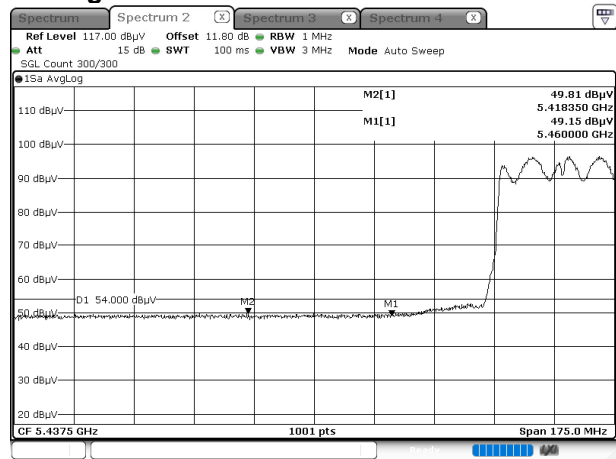


[IEEE802.11n (HT40)]

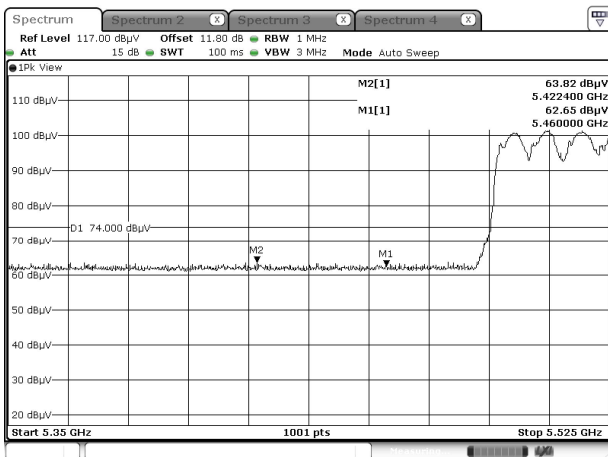
5.6 GHz Band, Channel Low
Horizontal
Peak



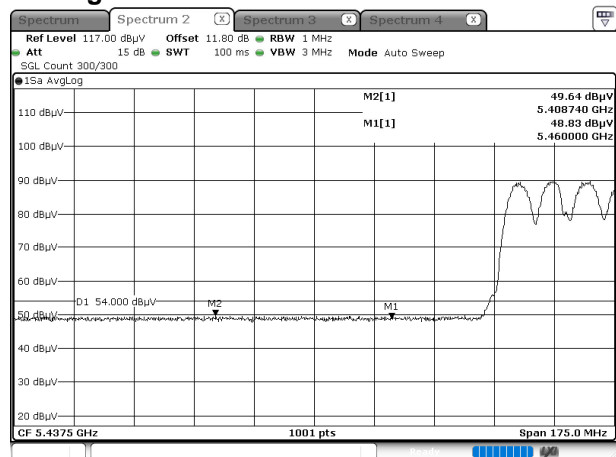
Average



Vertical
Peak



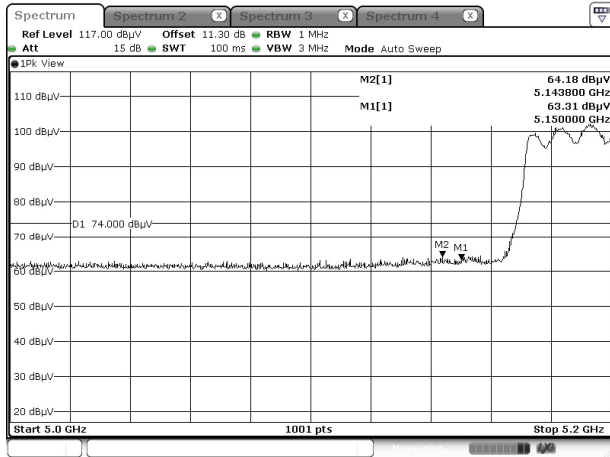
Average



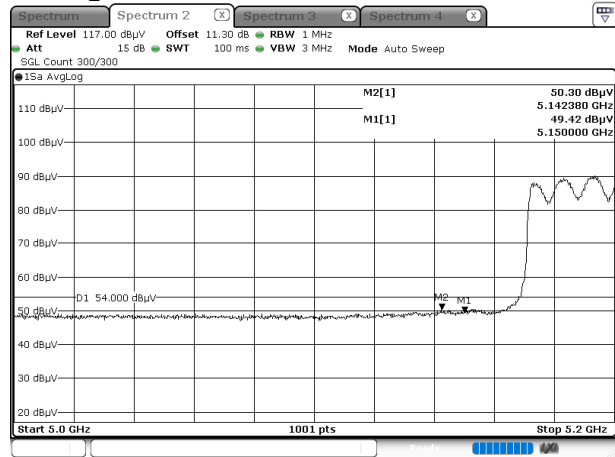


[IEEE802.11ac (VHT80)]

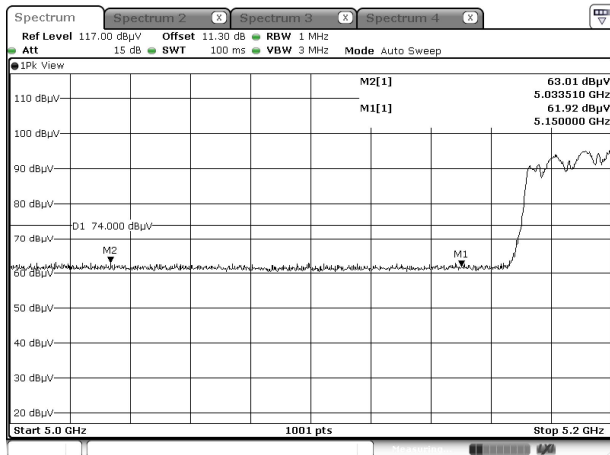
5.2 GHz Band, Channel Low Horizontal Peak



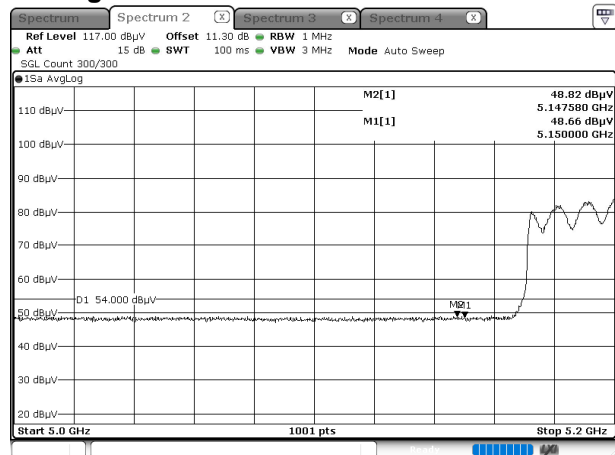
Average



Vertical Peak



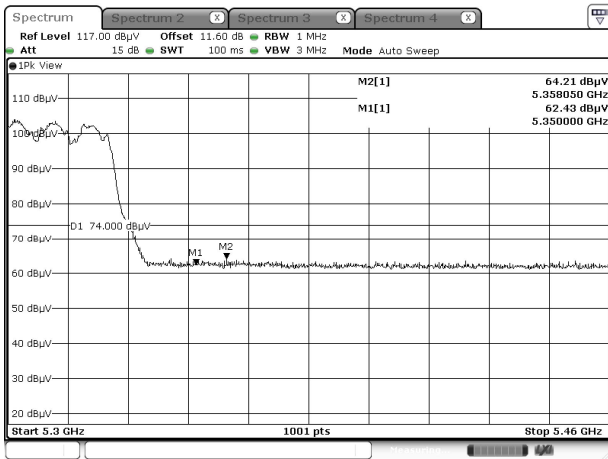
Average



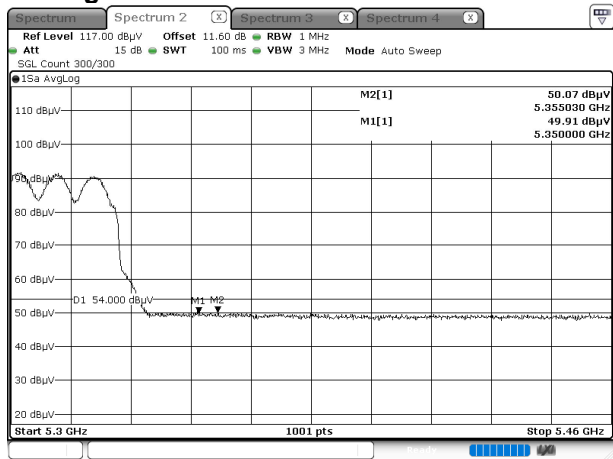


[IEEE802.11ac (VHT80)]

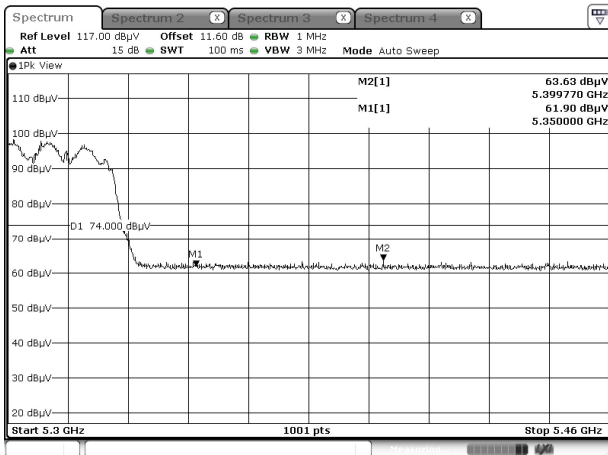
5.3 GHz Band, Channel High
Horizontal
Peak



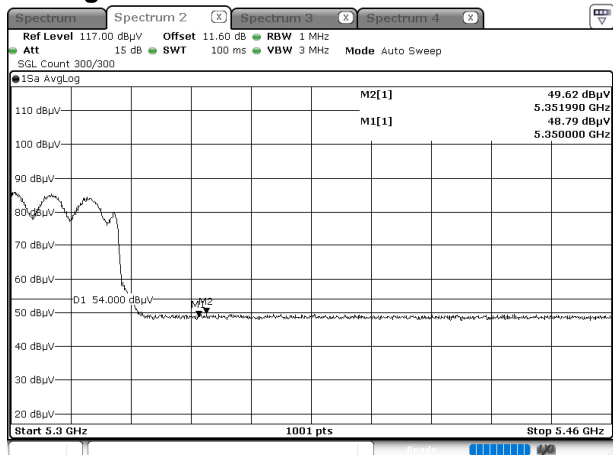
Average



Vertical
Peak



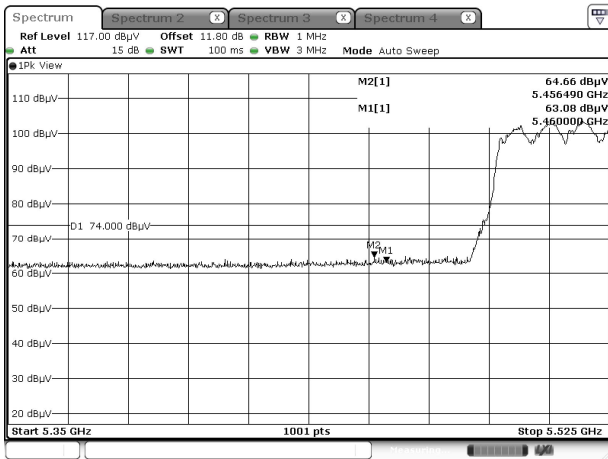
Average



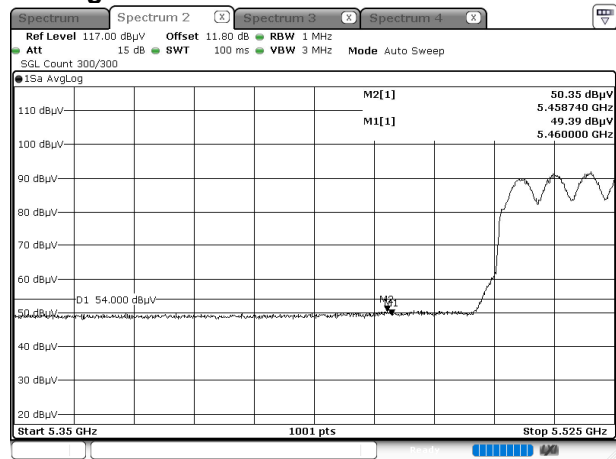


[IEEE802.11ac (VHT80)]

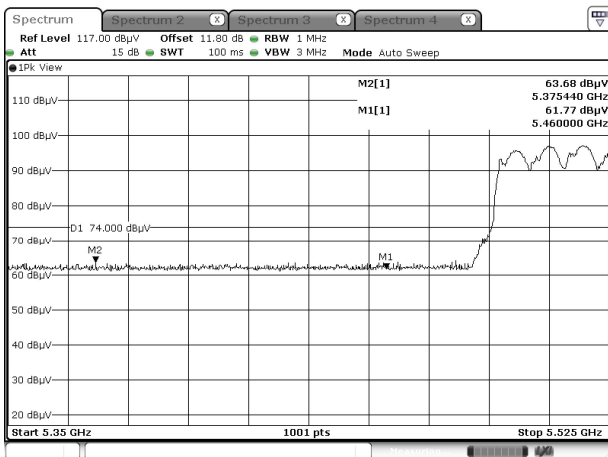
5.6 GHz Band, Channel Low
Horizontal
Peak



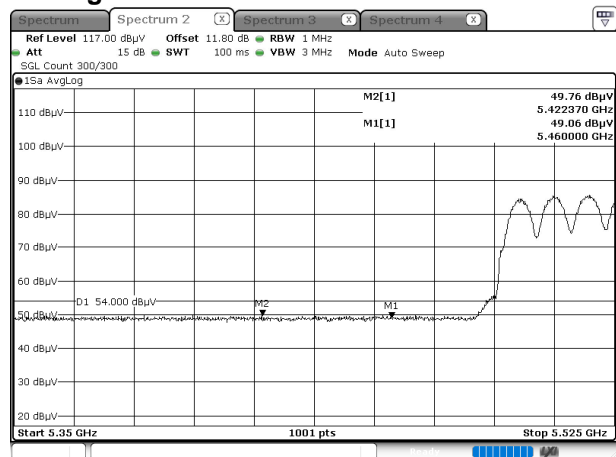
Average



Vertical
Peak



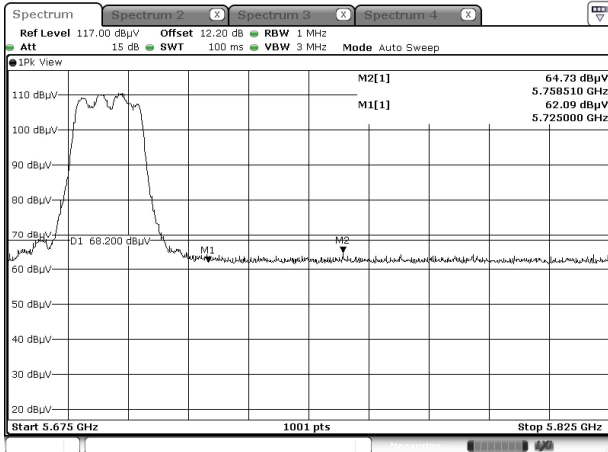
Average



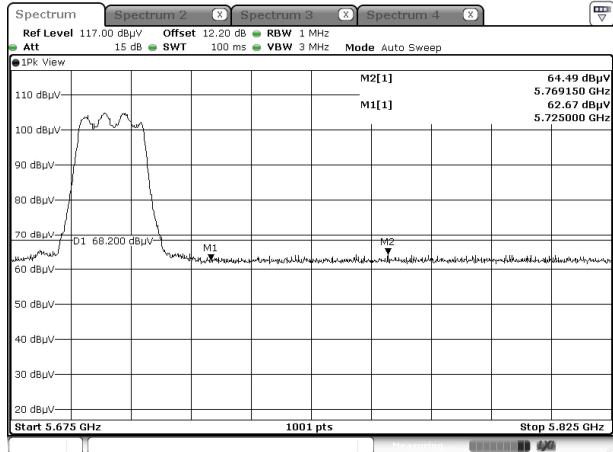
4.4.4.2 Non-Restricted Bandedge

[IEEE802.11a]

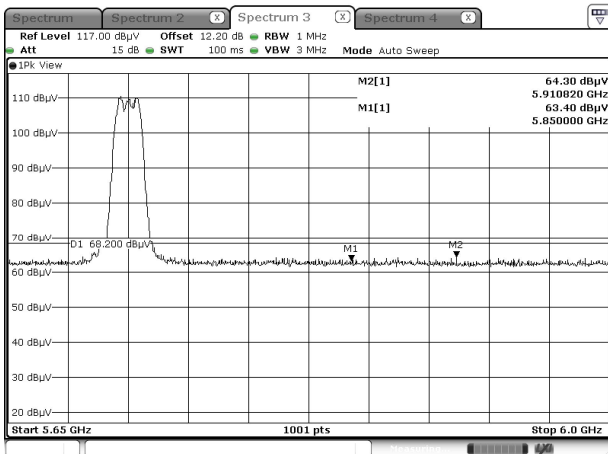
5.6 GHz Band, Channel High (140) Peak Horizontal



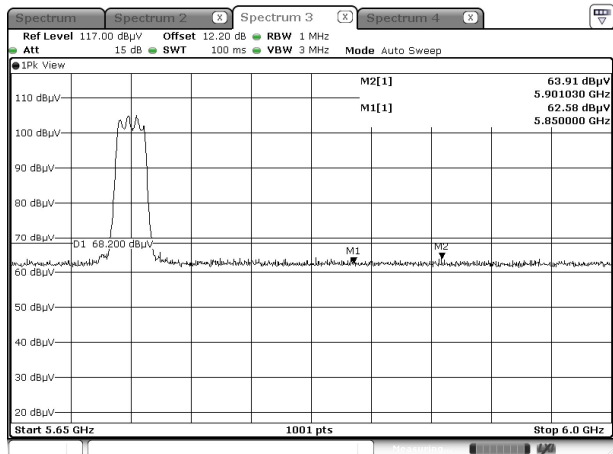
Vertical



5.6 GHz Band, Channel High (144) Peak Horizontal



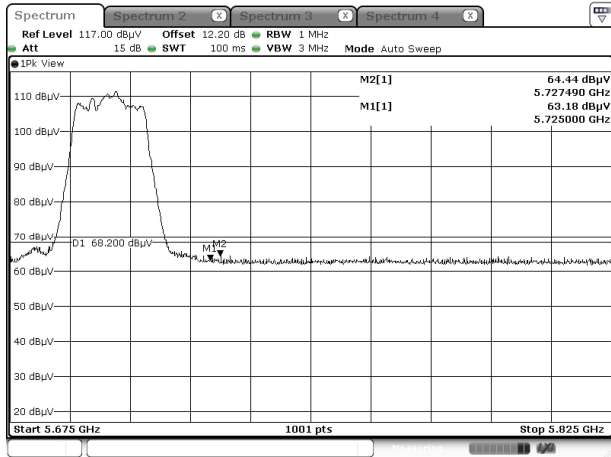
Vertical



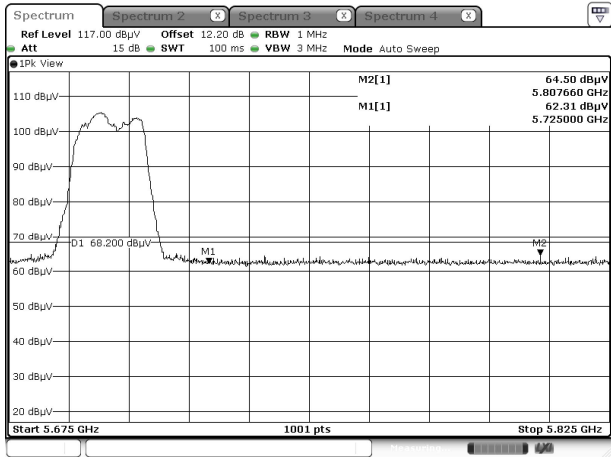


[IEEE802.11n (HT20)]

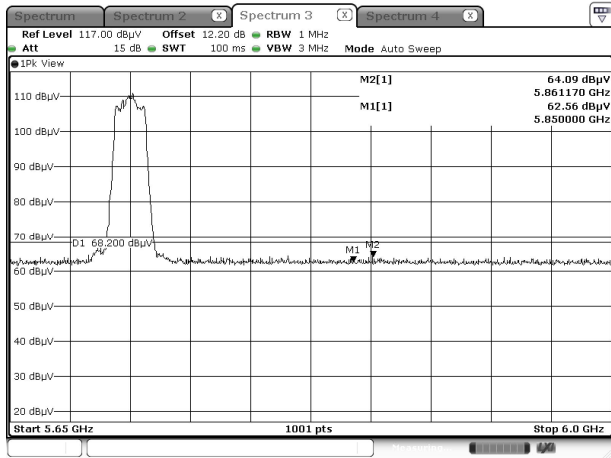
5.6 GHz Band, Channel High (140)
Peak
Horizontal



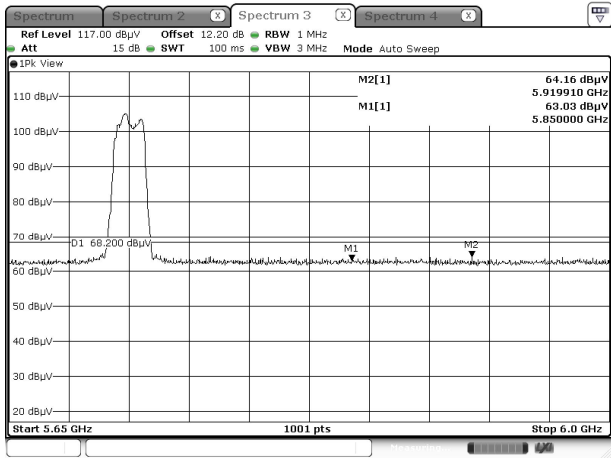
Vertical



5.6 GHz Band, Channel High (144)
Peak
Horizontal



Vertical



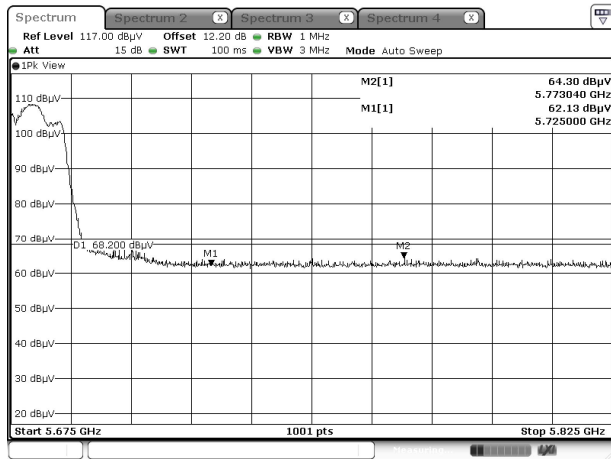


[IEEE802.11n (HT40)]

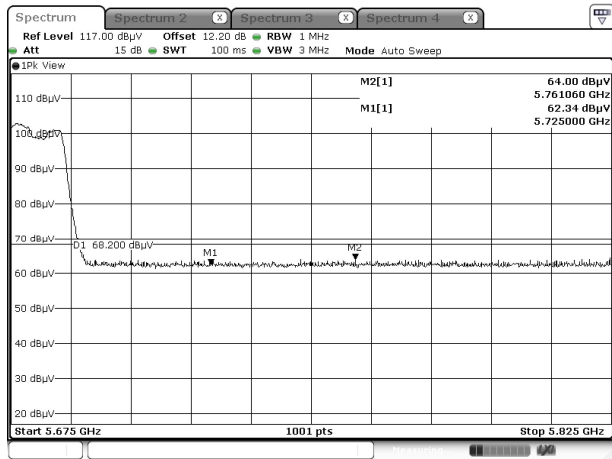
5.6GHz Band, Channel High (134)

Peak

Horizontal



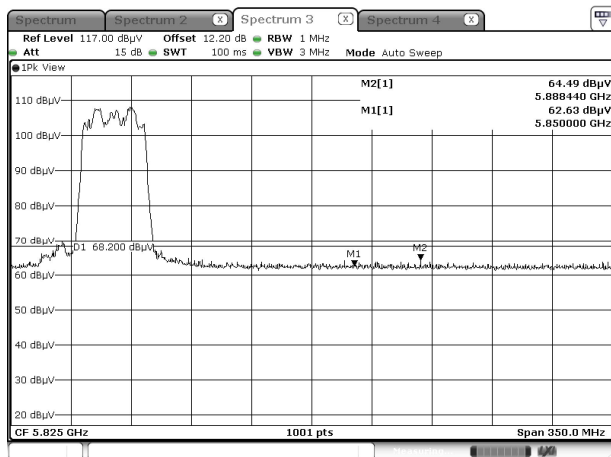
Vertical



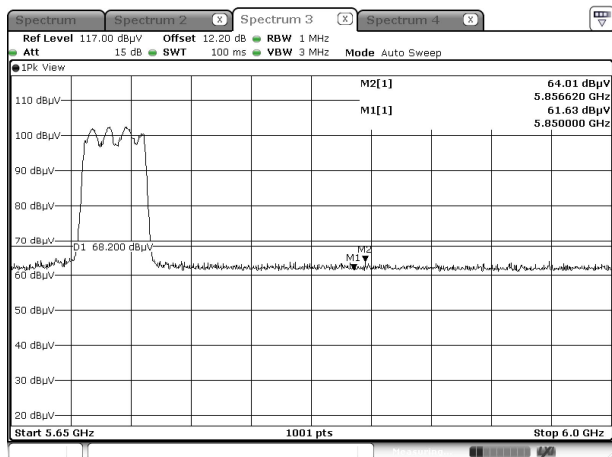
5.6GHz Band, Channel High (142)

Peak

Horizontal



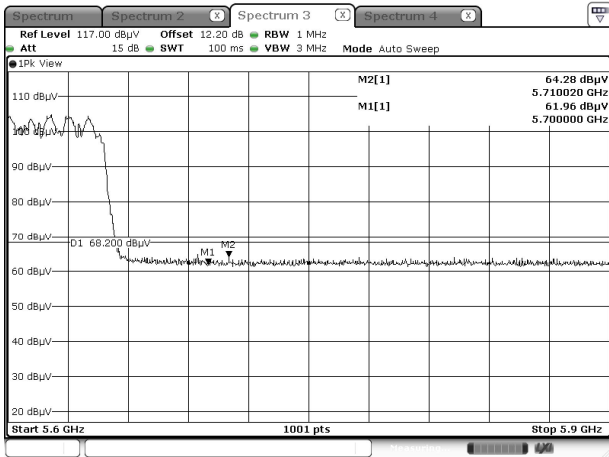
Vertical



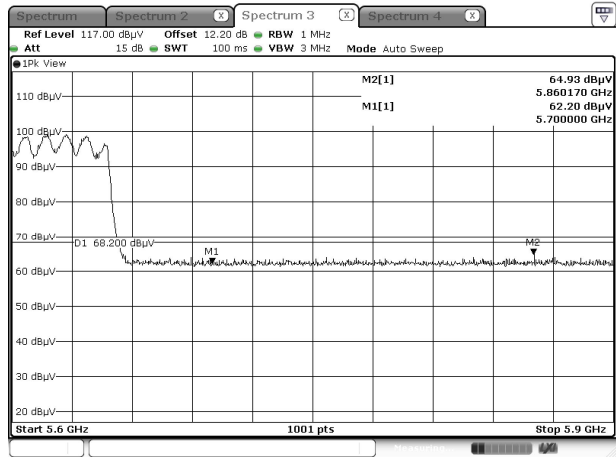


[IEEE802.11ac (VHT80)]

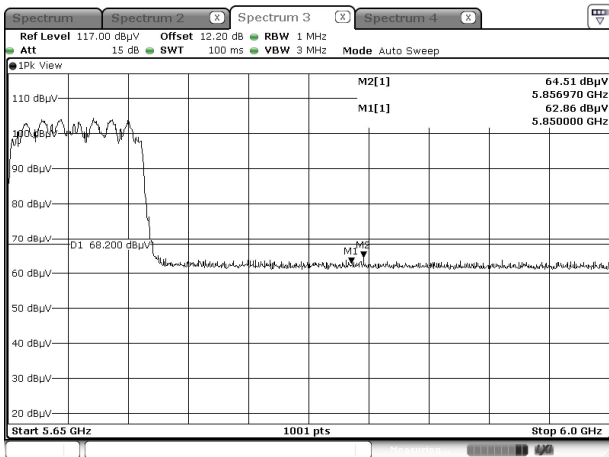
5.6 GHz Band, Channel High (122)
Peak
Horizontal



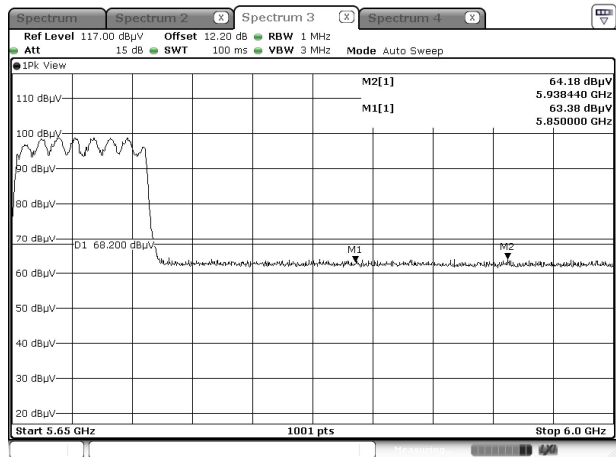
Vertical



5.6 GHz Band, Channel High (138)
Peak
Horizontal



Vertical





Japan

4.4.4.3 Radiated Emissions

Date	: 6-July-2023		
Temperature	: 23.8 [°C]		
Humidity	: 69.5 [%]	Test engineer	:
Test place	: 3m Semi-anechoic chamber		<u>Chiaki Kanno</u>

Date	: 7-July-2023		
Temperature	: 22.9 [°C]		
Humidity	: 69.8 [%]	Test engineer	:
Test place	: 3m Semi-anechoic chamber		<u>Taiki Watanabe</u>

Date	: 12-July-2023		
Temperature	: 23.8 [°C]		
Humidity	: 71.2 [%]	Test engineer	:
Test place	: 3m Semi-anechoic chamber		<u>Chiaki Kanno</u>



**[IEEE802.11a]
(5.2 GHz Band)**

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11a	36	5180	10360.00	H	PK	46.6	12.0		58.6	68.2	9.6
			10360.00	V	PK	46.6	12.0		58.6	68.2	9.6
	40	5200	10400.00	H	PK	44.9	12.0		56.9	68.2	11.3
			10400.00	V	PK	44.9	12.0		56.9	68.2	11.3
	48	5240	10480.00	H	PK	43.8	12.2		56.0	68.2	12.2
			10480.00	V	PK	44.5	12.2		56.7	68.2	11.5

(5.3 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11a	52	5260	10520.00	H	PK	44.4	12.3		56.7	68.2	11.5
			10520.00	V	PK	43.9	12.3		56.2	68.2	12.0
	56	5280	10560.00	H	PK	44.3	12.4		56.7	68.2	11.5
			10560.00	V	PK	44.3	12.4		56.7	68.2	11.5
	64	5320	10640.00	H	PK	44.6	12.5		57.1	74.0	16.9
			10640.00	H	AV	36.8	12.5	0.000	49.3	54.0	4.7
			10640.00	V	PK	45.4	12.5		57.9	74.0	16.1
			10640.00	V	AV	36.5	12.5	0.000	49.0	54.0	5.0

(5.6 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11a	100	5500	5467.70	H	PK	46.4	11.7		58.1	68.2	10.1
			5465.00	V	PK	39.4	11.7		51.1	68.2	17.1
			11000.00	H	PK	45.5	12.9		58.4	74.0	15.6
			11000.00	H	AV	33.6	12.9	0.000	46.5	54.0	7.5
			11000.00	V	PK	46.0	12.9		58.9	74.0	15.1
			11000.00	V	AV	33.6	12.9	0.000	46.5	54.0	7.5
	116	5580	11160.00	H	PK	45.2	13.1		58.3	74.0	15.7
			11160.00	H	AV	32.9	13.1	0.000	46.0	54.0	8.0
			11160.00	V	PK	45.2	13.1		58.3	74.0	15.7
			11160.00	V	AV	32.9	13.1	0.000	46.0	54.0	8.0
	140	5700	11400.00	H	PK	45.8	13.3		59.1	74.0	14.9
			11400.00	H	AV	32.7	13.3	0.000	46.0	54.0	8.0
			11400.00	V	PK	45.3	13.3		58.6	74.0	15.4
			11400.00	V	AV	32.7	13.3	0.000	46.0	54.0	8.0
	144	5720	11440.00	H	PK	45.2	13.3		58.5	74.0	15.5
			11440.00	H	AV	32.8	13.3	0.000	46.1	54.0	7.9
			11440.00	V	PK	45.4	13.3		58.7	74.0	15.3
			11440.00	V	AV	32.7	13.3	0.000	46.0	54.0	8.0

Note:

1. Emission Level (Margin) = Limit - [Reading + C.F (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 30 MHz to 1000 MHz at the 3 meters distance.
3. No emission was detected in the receive mode.



**[IEEE802.11n (HT20)]
(5.2 GHz Band)**

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11n (20MHz)	36	5180	10360.00	H	PK	46.1	12.0		58.1	68.2	10.1
			10360.00	V	PK	45.4	12.0		57.4	68.2	10.8
	40	5200	10400.00	H	PK	45.3	12.0		57.3	68.2	10.9
			10400.00	V	PK	45.2	12.0		57.2	68.2	11.0
	48	5240	10480.00	H	PK	45.5	12.2		57.7	68.2	10.5
			10480.00	V	PK	45.6	12.2		57.8	68.2	10.4

(5.3 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11n (20MHz)	52	5260	10520.00	H	PK	44.5	12.3		56.8	68.2	11.4
			10520.00	V	PK	44.8	12.3		57.1	68.2	11.1
	56	5280	10560.00	H	PK	45.1	12.4		57.5	68.2	10.7
			10560.00	V	PK	44.9	12.4		57.3	68.2	10.9
	64	5320	10640.00	H	PK	45.2	12.5		57.7	74.0	16.3
			10640.00	H	AV	35.3	12.5	0.000	47.8	54.0	6.2
			10640.00	V	PK	45.6	12.5		58.1	74.0	15.9
			10640.00	V	AV	35.7	12.5	0.000	48.2	54.0	5.8

(5.6 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11n (20MHz)	100	5500	5468.81	H	PK	49.6	11.7		61.3	68.2	6.9
			5469.19	V	PK	49.5	11.7		61.2	68.2	7.0
			11000.00	H	PK	44.6	12.9		57.5	74.0	16.5
			11000.00	H	AV	35.1	12.9	0.000	48.0	54.0	6.0
			11000.00	V	PK	44.5	12.9		57.4	74.0	16.6
			11000.00	V	AV	34.9	12.9	0.000	47.8	54.0	6.2
	116	5580	11160.00	H	PK	45.6	13.1		58.7	74.0	15.3
			11160.00	H	AV	35.7	13.1	0.000	48.8	54.0	5.2
			11160.00	V	PK	45.2	13.1		58.3	74.0	15.7
	140	5700	11160.00	V	AV	35.4	13.1	0.000	48.5	54.0	5.5
			11400.00	H	PK	45.4	13.3		58.7	74.0	15.3
			11400.00	H	AV	35.3	13.3	0.000	48.6	54.0	5.4
	144	5720	11400.00	V	PK	45.3	13.3		58.6	74.0	15.4
			11400.00	V	AV	35.4	13.3	0.000	48.7	54.0	5.3
			11440.00	H	PK	44.9	13.3		58.2	74.0	15.8
			11440.00	H	AV	35.5	13.3	0.000	48.8	54.0	5.2
			11440.00	V	PK	44.6	13.3		57.9	74.0	16.1
			11440.00	V	AV	35.2	13.3	0.000	48.5	54.0	5.5

Note:

1. Emission Level (Margin) = Limit - [Reading + C.F (Antenna + Cable - Amp)]
2. No emission were detected in frequency range 30 MHz to 1000 MHz at the 3 meters distance.
3. No emission was detected in the receive mode.



**[IEEE802.11n (HT40)]
(5.2 GHz Band)**

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11n (40MHz)	38	5190	10380.00	H	PK	46.2	12.0		58.2	68.2	10.0
			10380.00	V	PK	46.1	12.0		58.1	68.2	10.1
	46	5230	10460.00	H	PK	44.7	12.2		56.9	68.2	11.3
			10460.00	V	PK	45.2	12.2		57.4	68.2	10.8

(5.3 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11n (40MHz)	54	5270	10540.00	H	PK	45.0	12.3		57.3	68.2	10.9
			10540.00	V	PK	44.4	12.3		56.7	68.2	11.5
	62	5310	10620.00	H	PK	44.8	12.5		57.3	74.0	16.7
			10620.00	H	AV	35.4	12.5	0.000	47.9	54.0	6.1
			10620.00	V	PK	45.6	12.5		58.1	74.0	15.9
			10620.00	V	AV	35.4	12.5	0.000	47.9	54.0	6.1

(5.6 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11n (40MHz)	102	5510	5464.40	H	PK	50.0	11.7		61.7	68.2	6.5
			5467.70	V	PK	49.8	11.7		61.5	68.2	6.7
			11020.00	H	PK	45.5	12.9		58.4	74.0	15.6
			11020.00	H	AV	35.2	12.9	0.000	48.1	54.0	5.9
	110	5550	11100.00	H	PK	45.2	13.1		58.3	74.0	15.7
			11100.00	H	AV	32.7	13.1	0.000	45.8	54.0	8.2
			11100.00	V	PK	45.1	13.1		58.2	74.0	15.8
			11100.00	V	AV	32.8	13.1	0.000	45.9	54.0	8.1
	134	5670	11340.00	H	PK	45.6	13.3		58.9	74.0	15.1
			11340.00	H	AV	32.9	13.3	0.000	46.2	54.0	7.8
			11340.00	V	PK	45.3	13.3		58.6	74.0	15.4
			11340.00	V	AV	32.6	13.3	0.000	45.9	54.0	8.1
	142	5710	11420.00	H	PK	45.4	13.3		58.7	74.0	15.3
			11420.00	H	AV	32.6	13.3	0.000	45.9	54.0	8.1
			11420.00	V	PK	45.3	13.3		58.6	74.0	15.4
			11420.00	V	AV	32.6	13.3	0.000	45.9	54.0	8.1

Note:

1. Emission Level (Margin) = Limit - [Reading + C.F (Antenna + Cable - Amp)]
2. No emission were detected in frequency range 30 MHz to 1000 MHz at the 3 meters distance.
3. No emission was detected in the receive mode.



**[IEEE802.11ac (VHT80)]
(5.2 GHz Band)**

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11ac (80MHz)	42	5210	10420.00	H	PK	45.2	12.1		57.3	68.2	10.9
			10420.00	V	PK	45.7	12.1		57.8	68.2	10.4

(5.3 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11ac (80MHz)	58	5290	10580.00	H	PK	45.5	12.4		57.9	68.2	10.3
			10580.00	V	PK	45.2	12.4		57.6	68.2	10.6

(5.6 GHz Band)

Mode	Channel	Frequency (MHz)	Frequency (MHz)	ANT H/V	Detector PK/AV	Reading (dBμV)	C.F (dB)	DCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11ac (80MHz)	106	5530	5462.50	H	PK	50.1	11.7		61.8	68.2	6.4
			5469.50	V	PK	50.3	11.7		62.0	68.2	6.2
			11060.00	H	PK	45.8	13.0		58.8	74.0	15.2
			11060.00	H	AV	32.8	13.0	0.000	45.8	54.0	8.2
			11060.00	V	PK	45.4	13.0		58.4	74.0	15.6
			11060.00	V	AV	32.7	13.0	0.000	45.7	54.0	8.3
	122	5610	11220.00	H	PK	46.0	13.1		59.1	74.0	14.9
			11220.00	H	AV	33.0	13.1	0.000	46.1	54.0	7.9
			11220.00	V	PK	45.7	13.1		58.8	74.0	15.2
			11220.00	V	AV	33.1	13.1	0.000	46.2	54.0	7.8
			11380.00	H	PK	45.7	13.3		59.0	74.0	15.0
	138	5690	11380.00	H	AV	32.8	13.3	0.000	46.1	54.0	7.9
			11380.00	V	PK	45.3	13.3		58.6	74.0	15.4
			11380.00	V	AV	32.8	13.3	0.000	46.1	54.0	7.9
			11380.00	V	AV	32.8	13.3	0.000	46.1	54.0	7.9

Note:

1. Emission Level (Margin) = Limit - [Reading + C.F (Antenna + Cable - Amp)]
2. No emission were detected in frequency range 30 MHz to 1000 MHz at the 3 meters distance.
3. No emission was detected in the receive mode.