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TEST REPORT

Report number : JPD-TR-17133-0
Issue date : June 12, 2017

The device, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of;

FCC Part15 Subpart E

The test results are traceable to the international or national standards.

Applicant	:	KYOCERA Corporation
Equipment under test (EUT)	:	Mobile Phone
Model number	:	EA34
FCC ID	:	JOYEA34

Date of test : April 24, 2017
May 9, 11, 12, 16. 17, 18, 19, 23, 24, 27, 30, 31, 2017
Test place : TÜV SÜD Zacta Ltd. Yonezawa Testing Center
5-4149-7, Hachimanpara, Yonezawa-shi,
Yamagata, 992-1128 Japan
Phone: +81-238-28-2881 Fax: +81-238-28-2888
Test results : Complied

The results in this report are applicable only to the equipment tested.
This report shall not be re-produced except in full without the written approval of TÜV SÜD Zacta Ltd.
This test report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, ILAC-MRA, or any agency of the federal government.

Tested by : Chiaki Kanno Tadahiro Seino
Chiaki Kanno Tadahiro Seino

Tested by : Taiki Watanabe
Taiki Watanabe

Approved by : Hiroaki Suzuki
Hiroaki Suzuki
Lab Manager of RF Lab

NVLAP TESTING
NVLAP LAB CODE 200306-0

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1. Summary of Test

1.1 Purpose of test

It is the original test in order to verify conformance to FCC Part 15 Subpart E.

1.2 Standards

CFR47 FCC Part 15 Subpart E

1.2.1 Test Methods

ANSI C63.10-2013, KDB789033 D02 General U-NII Test Procedures New Rules v01r04

1.2.2 Deviation from standards

None

1.3 List of applied test to the EUT

Test items Section	Test items	Condition	Result
15.407(a)	26dB Bandwidth	Conducted	PASS
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

1.3.1 Test set up

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1.4 Modification to the EUT by laboratory

None

2. Equipment Under Test

2.1 General Description of equipment

EUT is the Mobile Phone.

2.2 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	:	Mobile Phone
Trade name	:	Kyocera
Model number	:	EA34
Serial number	:	N/A
EUT condition	:	Pre-Production
Power ratings	:	Battery: DC 3.8V
Size	:	(W) 73.0 × (D) 8.9 × (H) 146.0 mm
Environment	:	Indoor and Outdoor use
Terminal limitation	:	-20˚C to 60˚C
RF Specification Protocol	:	IEEE802.11a, IEEE802.11n(HT20), IEEE802.11n(HT40) IEEE802.11ac(HT20), IEEE802.11ac(HT40), IEEE802.11ac(HT80)
Frequency range	:	IEEE802.11a/n/ac(HT20): 5180MHz-5320MHz, 5500MHz-5700MHz IEEE802.11n/ac(HT40): 5190MHz-5310MHz, 5510MHz-5670MHz IEEE802.11ac(HT80): 5210MHz, 5290MHz, 5530MHz, 5610MHz
Number of RF Channels	:	IEEE802.11a/n/ac(HT20): 19 Channels IEEE802.11n/ac(HT40): 9 Channels IEEE802.11ac(HT80): 4 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, 65Mbps IEEE802.11n (HT20 SGI): 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2Mbps IEEE802.11ac (HT20 LGI): 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78, 86.5Mbps IEEE802.11ac (HT20 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, 135Mbps IEEE802.11n (HT40 SGI): 15, 30, 45, 60, 90, 120, 135, 150Mbps IEEE802.11ac (HT40 LGI): 13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 180Mbps IEEE802.11ac (HT40 SGI): 15, 30, 45, 60, 90, 120, 135, 150, 180, 200Mbps IEEE802.11ac (HT80 LGI): 29.3, 58.5, 87.8, 117, 175.5, 234, 263.3, 292.6, 351, 390Mbps IEEE802.11ac (HT80 SGI): 32.5, 65, 97.5, 130, 195, 260, 292.5, 325, 390, 433.3Mbps

Channel separation	:	IEEE802.11a/n/ac (HT20): 20MHz IEEE802.11n/ac (HT40): 40MHz IEEE802.11ac (HT80): 80MHz
Output power	:	14.208mW (IEEE802.11a) 14.434mW (IEEE802.11n: HT20) 14.163mW (IEEE802.11n: HT40) 11.322mW (IEEE802.11ac: HT80)
Antenna type	:	Internal antenna
Antenna gain	:	5.15-5.25GHz band: 1.1dBi 5.25-5.35GHz band: 1.1dBi 5.47-5.725GHz band: 0.5dBi

2.3 Variation of the family model(s)

Not applicable

2.4 Operating channels and frequencies

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

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

[IEEE802.11n/ac (HT40)]

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

[IEEE802.11ac (HT80)]

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

2.5 Operating mode

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

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

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
5.2GHz Band	IEEE802.11a: OFDM	6Mbps
	IEEE802.11n (HT20): OFDM	MCS0 (6.5Mbps)
	IEEE802.11n (HT40): OFDM	MCS0 (13.5Mbps)
	IEEE802.11ac (HT80): OFDM	MCS0 (29.3Mbps)
5.3GHz Band	IEEE802.11a: OFDM	6Mbps
	IEEE802.11n (HT20): OFDM	MCS0 (6.5Mbps)
	IEEE802.11n (HT40): OFDM	MCS0 (13.5Mbps)
	IEEE802.11ac (HT80): OFDM	MCS0 (29.3Mbps)
5.6GHz Band	IEEE802.11a: OFDM	6Mbps
	IEEE802.11n (HT20): OFDM	MCS0 (6.5Mbps)
	IEEE802.11n (HT40): OFDM	MCS0 (13.5Mbps)
	IEEE802.11ac (HT80): OFDM	MCS0 (29.3Mbps)

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 Y axis and the worst case recorded.

2.6 Operating mode

[Tx mode]
i) Test program setup to the DM tool
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 DM tool
ii) Select a Test mode
Operating frequency: 5.2GHz Band, 5.3GHz Band, 5.6GHz Band
iii) Start test mode

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3. Configuration of equipment

3.1 Equipment(s) used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	Mobile Phone	KYOCERA	EA34	N/A	JOYEA34	EUT
2	AC Adapter	au	N/A	N/A	N/A	*

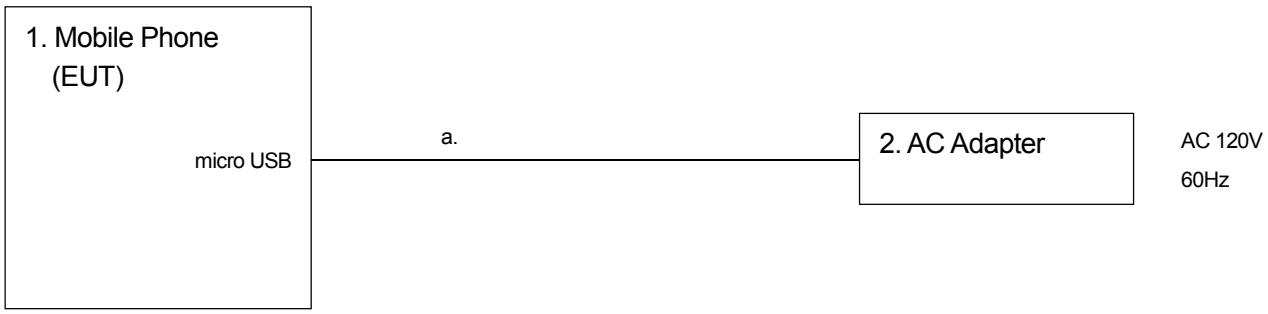
*: AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Cable	Length[m]	Shield	Connector	Comment
a	Micro USB cable(for AC Adapter)	1.0	Yes	Metal	*

*: AC power line Conducted Emission Test.

3.3 System configuration



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “3.1 Equipment(s) used” and “3.2 Cable(s) used”.

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4. 26dB Bandwidth and 99% Occupied Bandwidth

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

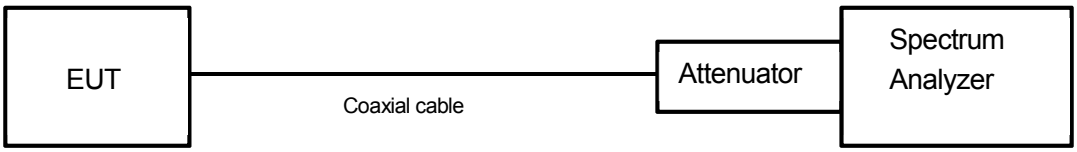
The 26dB bandwidth and 99% occupied bandwidth is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=200kHz/430kHz/820kHz, VBW=620kHz/1.3MHz/2.4MHz, Span=40MHz/80MHz/160MHz
  Sweep=auto, Detector=Peak, Trace mode=Max hold

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 Limit

None

4.3 Measurement result

Date : May 30, 2017
Temperature : 23.6 [˚C]
Humidity : 49.0 [%]
Test place : Shielded room No.4

Test engineer : Tadahiro Seino

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11a	5.2GHz Band	36	5180	21.742	16.8045
		40	5200	21.899	16.8148
		48	5240	21.743	16.7768
	5.3GHz Band	52	5260	22.259	16.8382
		56	5280	21.937	16.8209
		64	5320	22.219	16.8496
	5.6GHz Band	100	5500	22.041	16.8392
		116	5580	22.133	16.8072
		140	5700	22.028	16.8078

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11n (20MHz)	5.2GHz Band	36	5180	22.560	17.8811
		40	5200	22.440	17.8781
		48	5240	22.667	17.8610
	5.3GHz Band	52	5260	22.094	17.8741
		56	5280	22.567	17.8998
		64	5320	22.333	17.8857
	5.6GHz Band	100	5500	22.414	17.8825
		116	5580	22.277	17.8920
		140	5700	22.256	17.8630

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11n (40MHz)	5.2GHz Band	38	5190	43.600	36.1747
		46	5230	43.753	36.1841
	5.3GHz Band	54	5270	43.685	36.2130
		62	5310	44.186	36.1707
	5.6GHz Band	102	5510	43.708	36.1645
		110	5550	42.284	36.1610
		134	5670	44.084	36.2441

Mode	Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied bandwidth (MHz)
802.11ac (80MHz)	5.2GHz Band	42	5210	83.697	74.6391
	5.3GHz Band	58	5290	83.737	74.5898
	5.6GHz Band	106	5530	83.802	74.6661
		122	5610	83.813	74.6399

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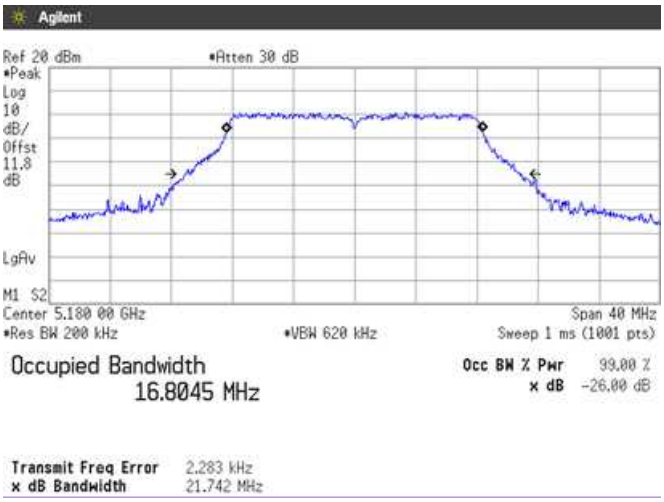
4.4 Trace data

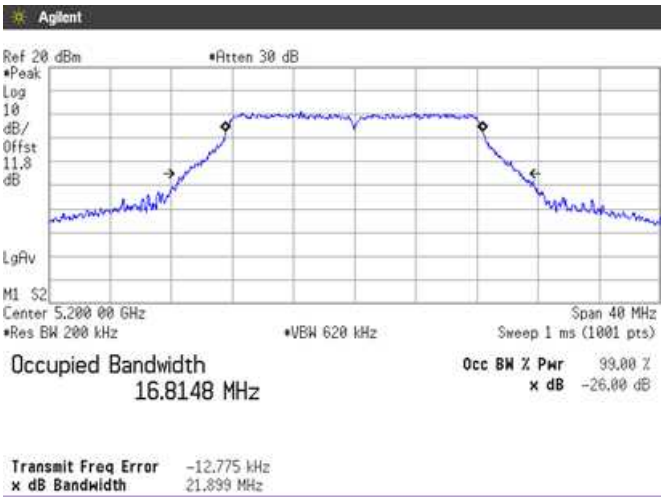
[IEEE802.11a]

(5.2GHz Band)

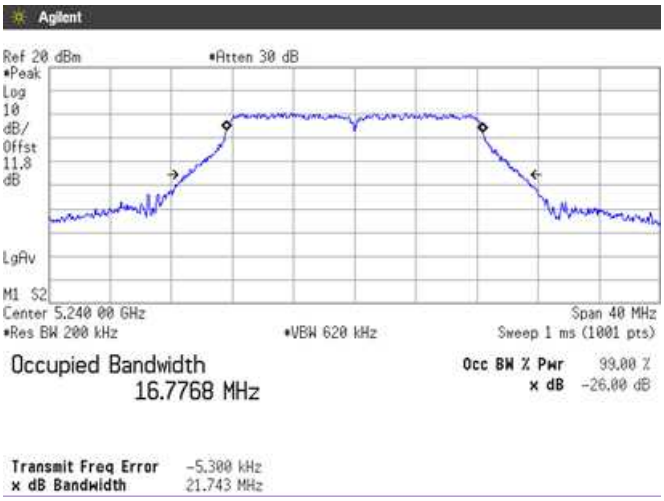
Channel: 36



Channel: 40



Channel: 48



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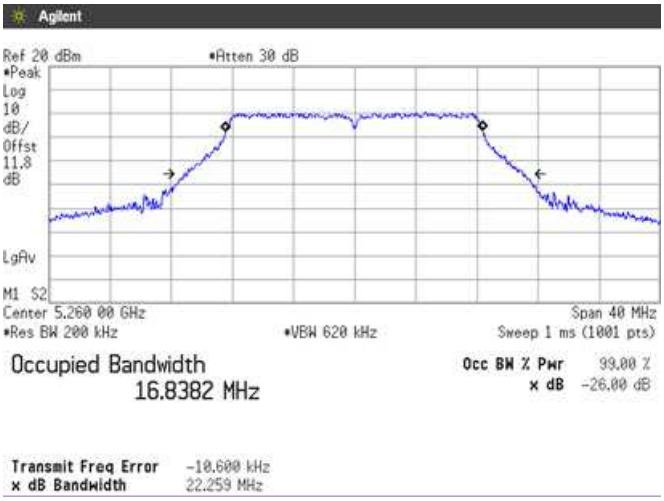
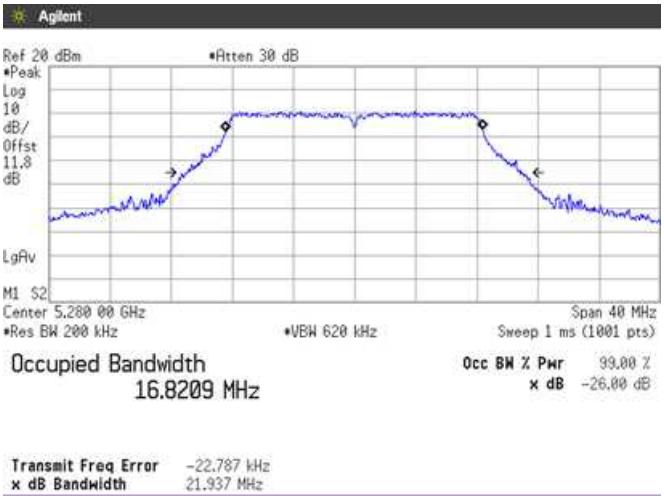
(5.3GHz Band)

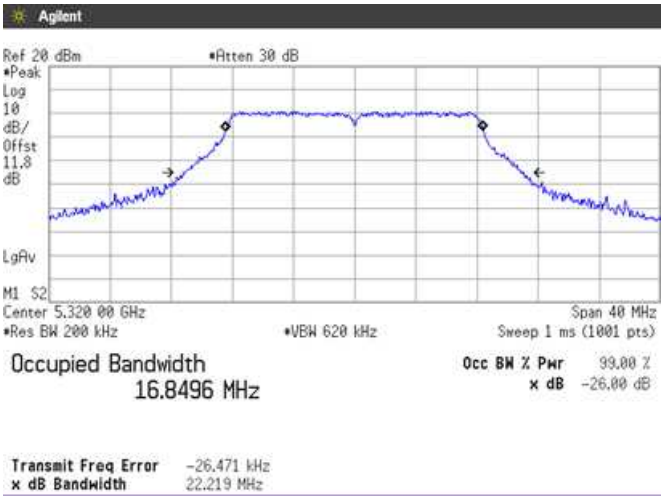
Channel: 52



Channel: 56



Channel: 64



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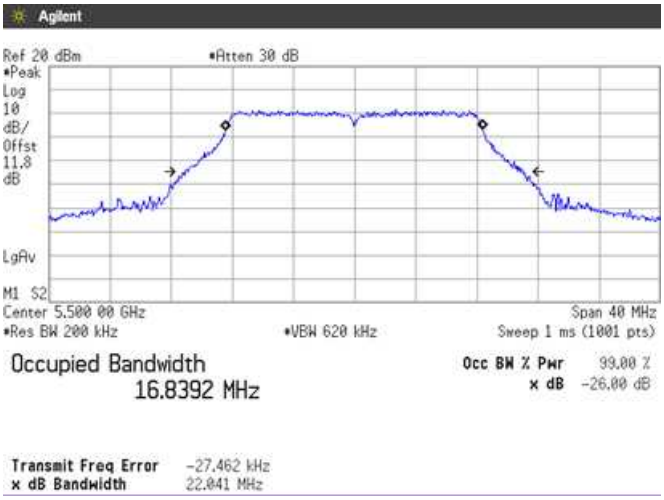
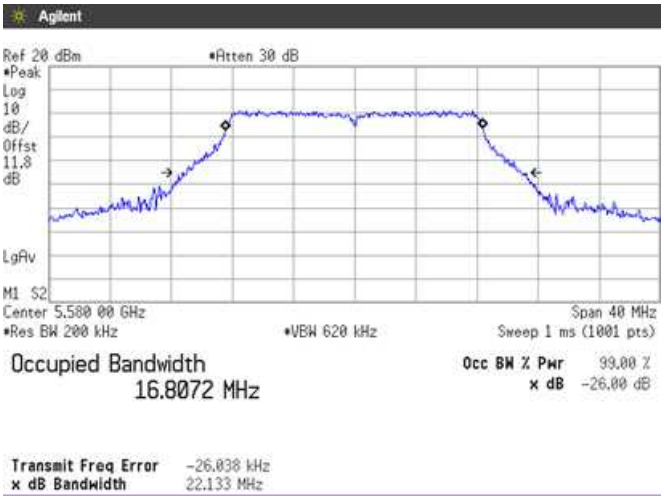
(5.6GHz Band)

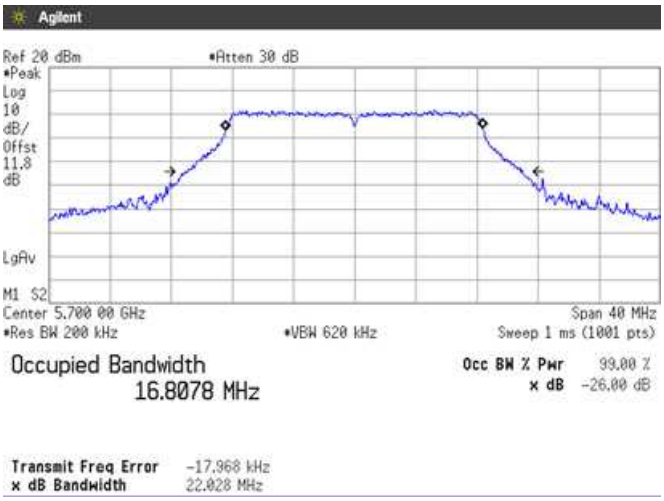
Channel: 100



Channel: 116

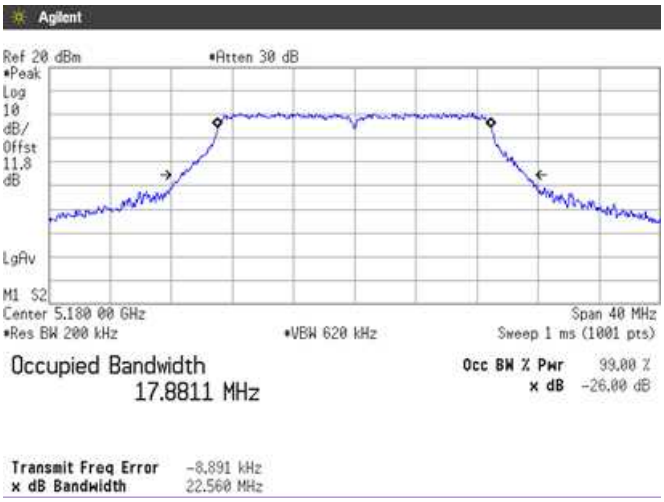


Channel: 140

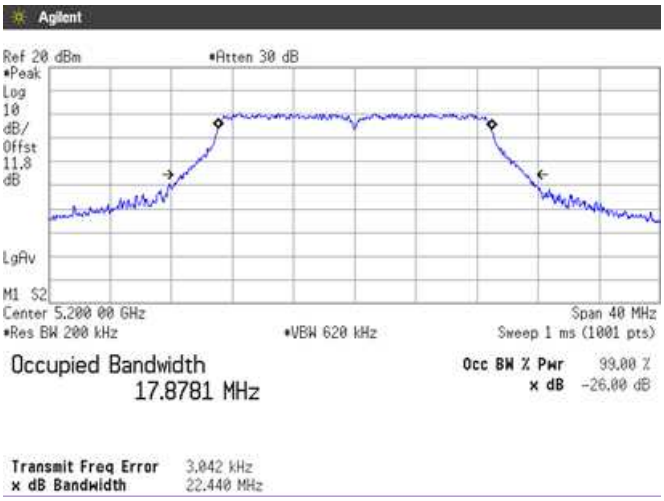


[IEEE802.11n (HT20)]
(5.2GHz Band)

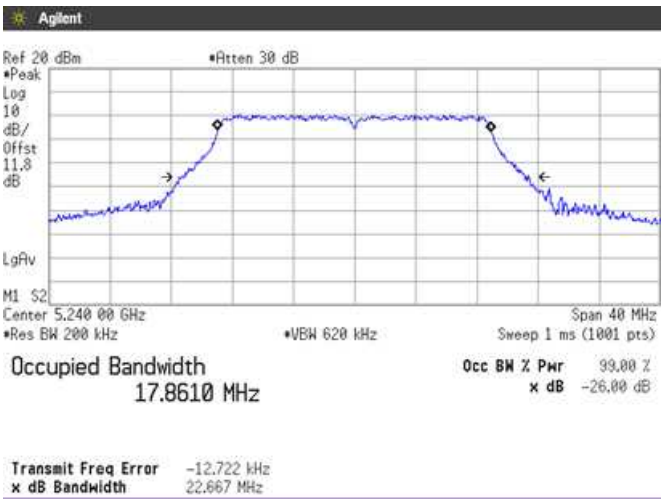
Channel: 36



Channel: 40

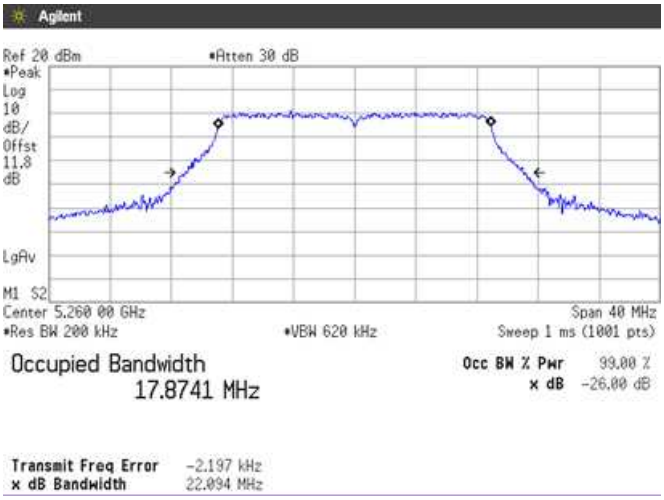


Channel: 48

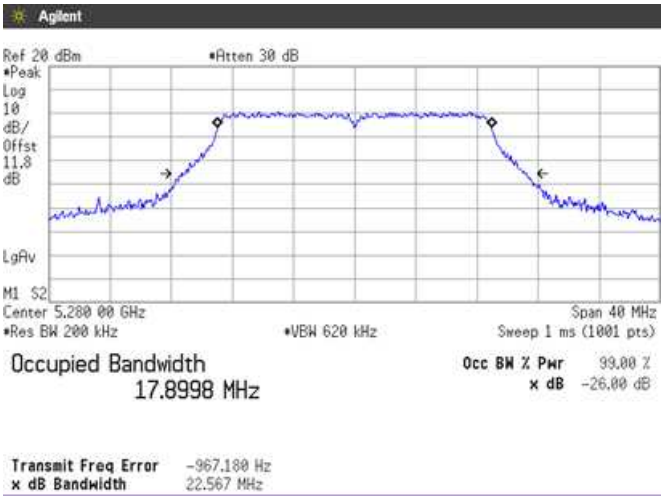


(5.3GHz Band)

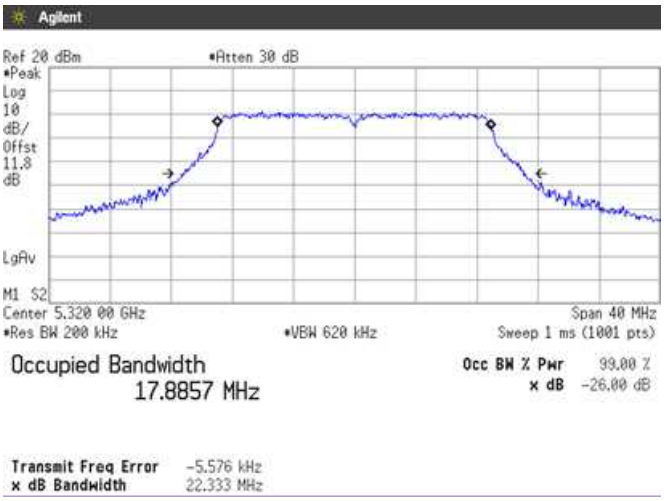
Channel: 52



Channel: 56



Channel: 64



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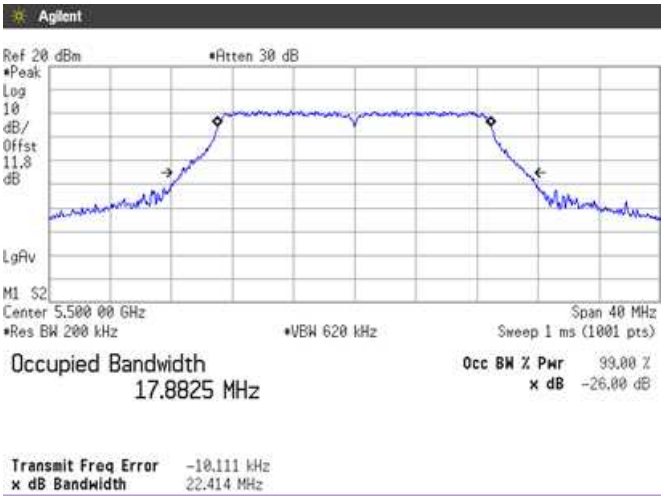
(5.6GHz Band)

Channel: 100



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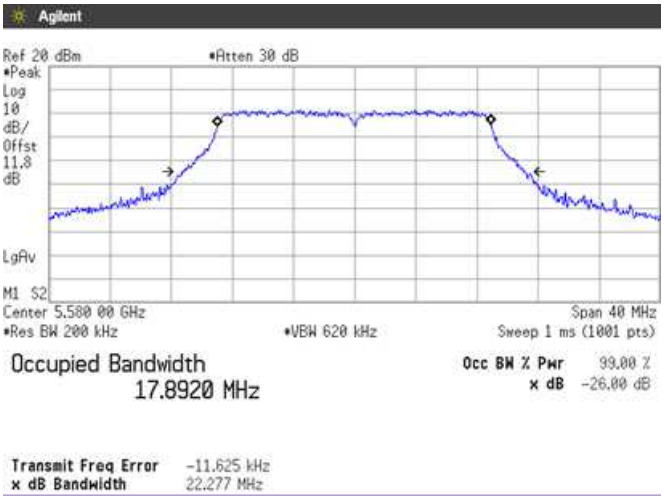

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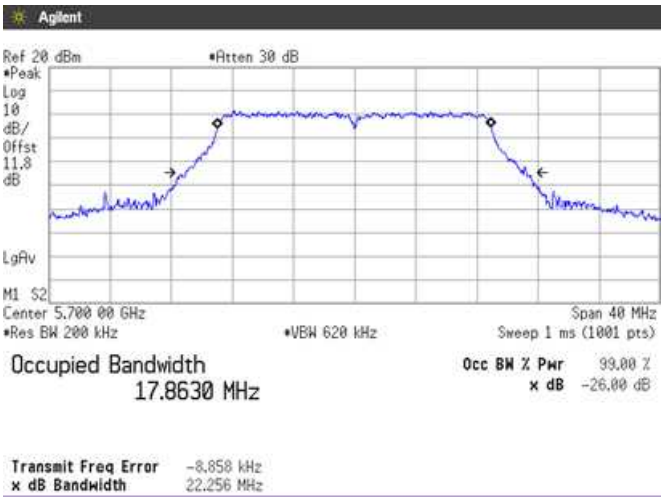
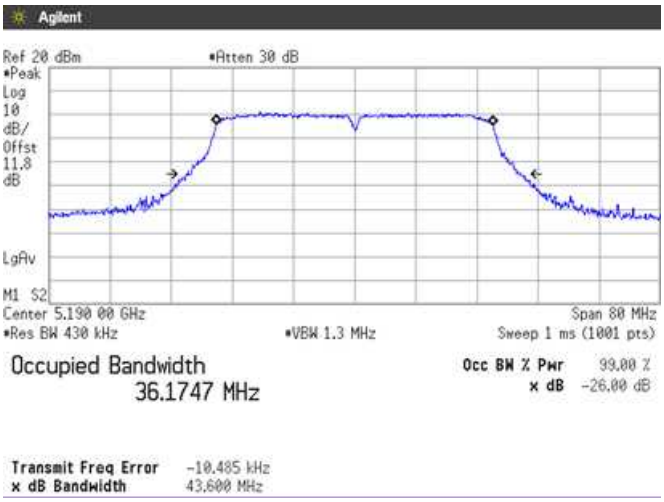
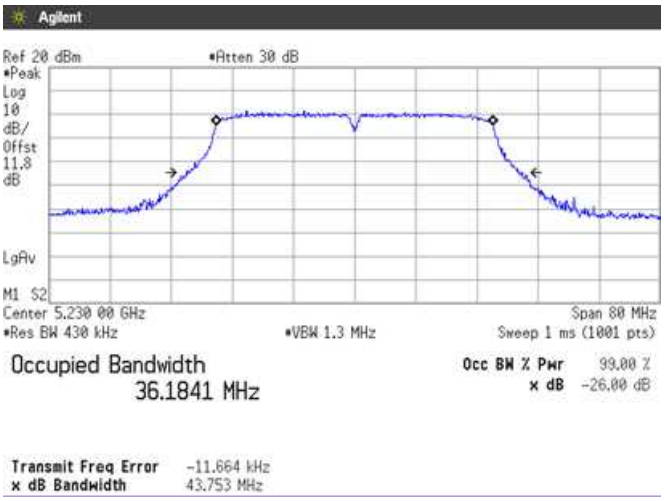


[IEEE802.11n (HT40)]
(5.2GHz Band)

Channel: 38



Channel: 46



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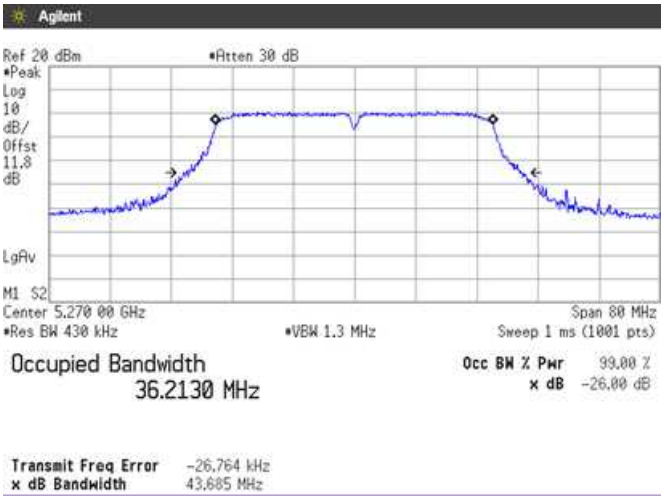
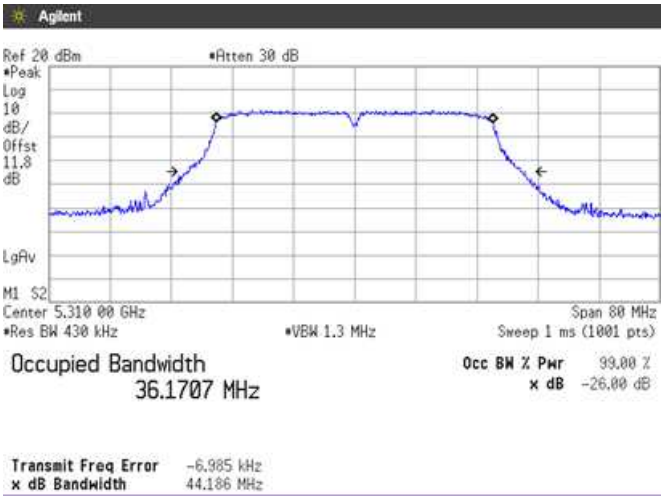
(5.3GHz Band)

Channel: 54

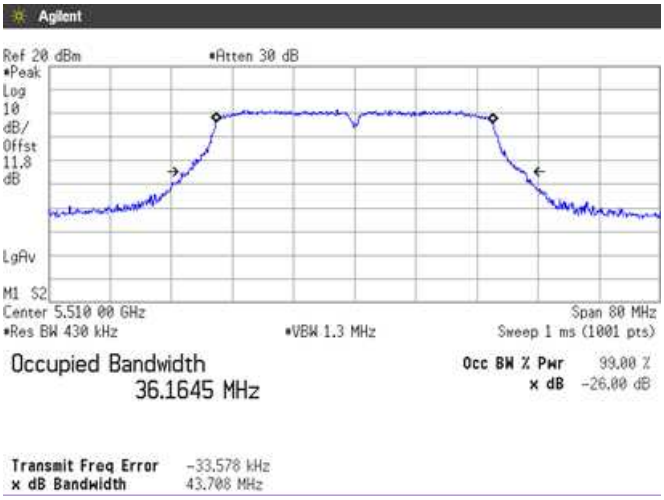


Channel: 62

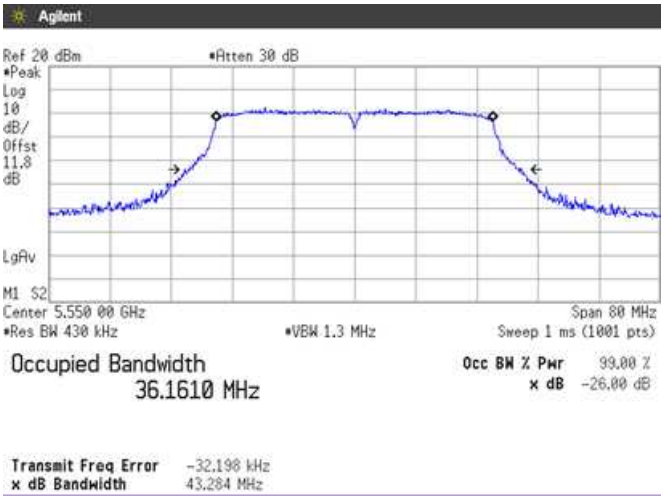


(5.6GHz Band)

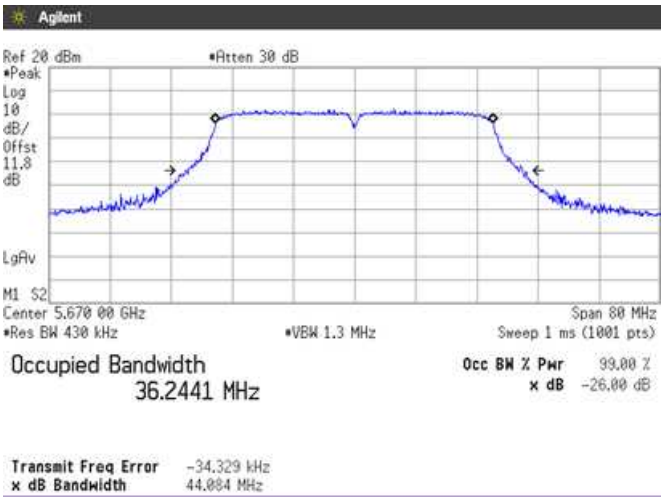
Channel: 102



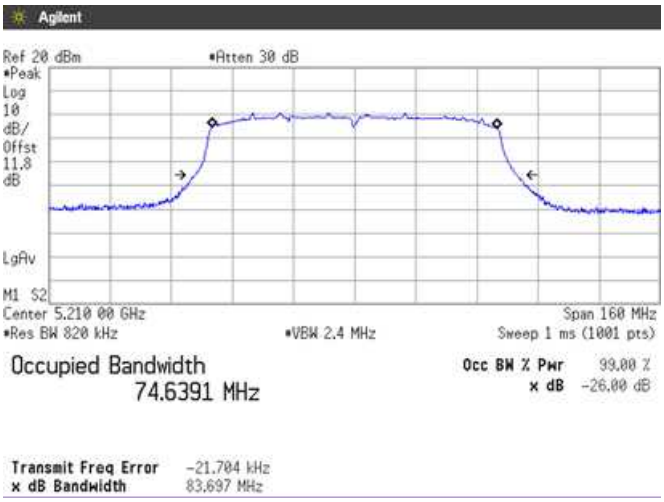
Channel: 110



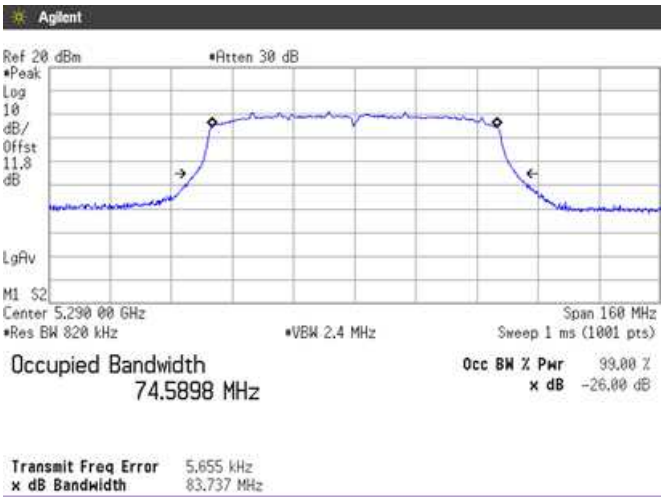
Channel: 134



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



(5.3GHz Band)
Channel: 58



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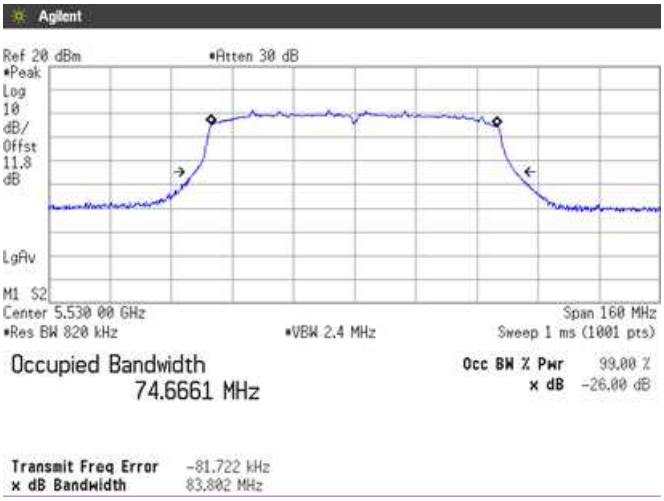
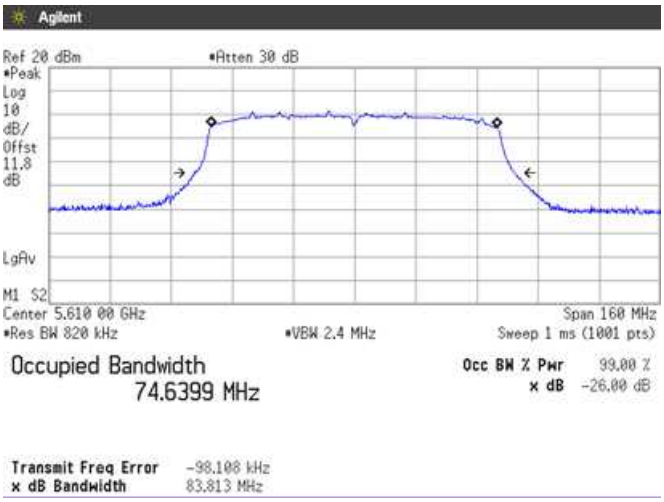
(5.6GHz Band)

Channel: 106



Channel: 122



Zacta

5. Maximum Conducted Output Power

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

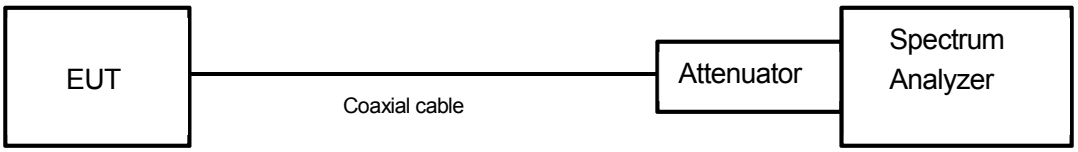
The peak power is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

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



5.2 Limit

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

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

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

<Output Power Limit Calculation>

Band	Mode	Power Limit (mW)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.2GHz Band	802.11a	250	23.97	1.1	23.97
	802.11n HT20				
	802.11n HT40				
	802.11ac HT80				

Band	Mode	Power Limit (mW) / Least 26dBc BW (MHz)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.3GHz Band	802.11a	250	23.97	1.1	23.97
		21.494	24.32		
	802.11n HT20	250	23.97		23.97
		22.217	24.47		
	802.11n HT40	250	23.97		23.97
		42.725	27.31		
	802.11ac HT80	250	23.97		23.97
		83.558	30.22		

Band	Mode	Power Limit (mW) / Least 26dBc BW (MHz)	Calculated Limit (dBm)	Antenna Gain (dBi)	Determined Limit (dBm)
5.6GHz Band	802.11a	250	23.97	0.5	23.97
		21.63	24.35		
	802.11n HT20	250	23.97		23.97
		21.852	24.39		
	802.11n HT40	250	23.97		23.97
		43.014	27.34		
	802.11ac HT80	250	23.97		23.97
		83.168	30.20		

5.3 Measurement result

Date : May 30, 2017
Temperature : 23.6 [˚C]
Humidity : 49.0 [%]
Test place : Shielded room No.4

Test engineer : Tadahiro Seino

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	10.69	1.364	1.372	0.994	0.025	10.715	11.791
	40	5200	10.79					10.815	12.065
	48	5240	10.57					10.595	11.469
	52	5260	10.67	1.364	1.372	0.994	0.025	10.695	11.737
	56	5280	10.68					10.705	11.764
	64	5320	10.94					10.965	12.489
	100	5500	11.15	1.364	1.372	0.994	0.025	11.175	13.108
	116	5580	11.41					11.435	13.917
	140	5700	11.50					11.525	14.208

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

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	10.90	1.274	1.284	0.992	0.034	10.934	12.399
	40	5200	10.82					10.854	12.173
	48	5240	10.75					10.784	11.978
	52	5260	10.70	1.276	1.284	0.994	0.027	10.727	11.823
	56	5280	10.97					10.997	12.581
	64	5320	11.03					11.057	12.756
	100	5500	11.23	1.274	1.284	0.992	0.034	11.264	13.378
	116	5580	11.34					11.374	13.721
	140	5700	11.56					11.594	14.434

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

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	10.69	0.635	0.646	0.983	0.075	10.765	11.925
	46	5230	10.67					10.745	11.870
	54	5270	10.71	0.634	0.645	0.983	0.075	10.785	11.980
	62	5310	11.12					11.195	13.167
	102	5510	11.25	0.634	0.646	0.981	0.081	11.331	13.588
	110	5550	11.40					11.481	14.065
	134	5670	11.43					11.511	14.163

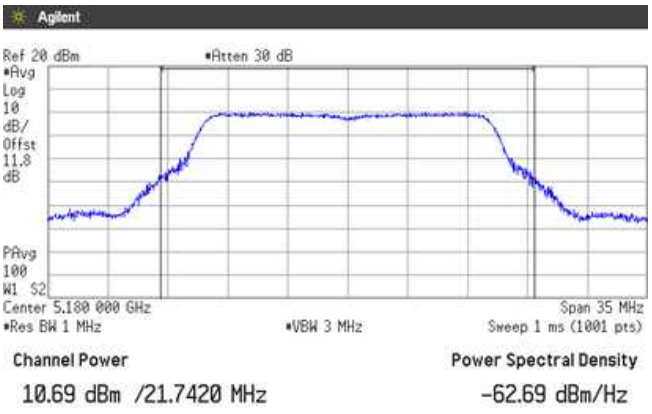
Note: X = On time / (On + Off time), DCF=10log (1/x)

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	10.04	0.248	0.258	0.959	0.180	10.220	10.521
	58	5290	10.19	0.248	0.258	0.961	0.172	10.362	10.868
	106	5530	10.35	0.247	0.258	0.957	0.189	10.539	11.322
	122	5610	10.33	0.248	0.258	0.961	0.172	10.502	11.225

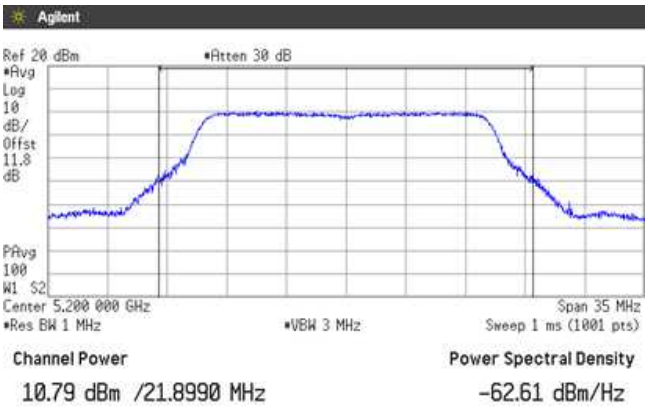
Note: X = On time / (On + Off time), DCF=10log (1/x)

5.4 Trace data
[IEEE802.11a]
(5.2GHz Band)

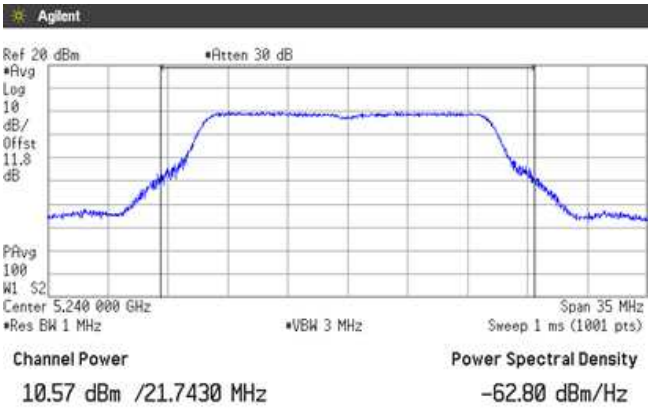
Channel: 36



Channel: 40



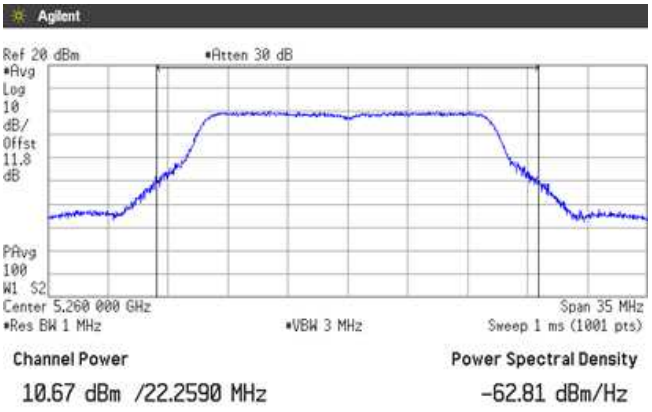
Channel: 48



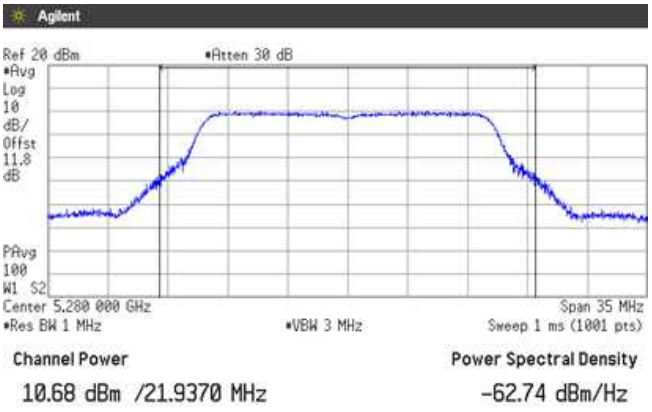
Zacta

(5.3GHz Band)

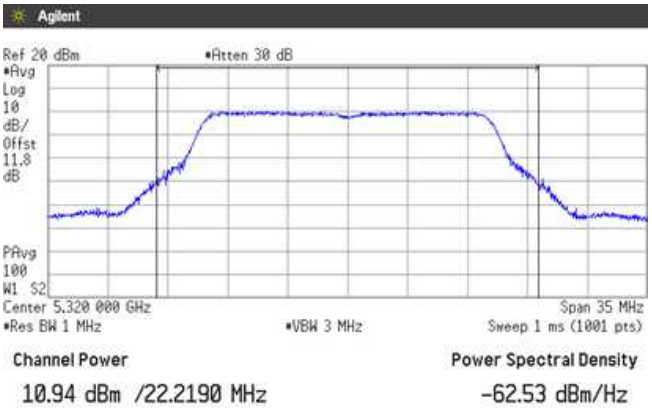
Channel: 52



Channel: 56



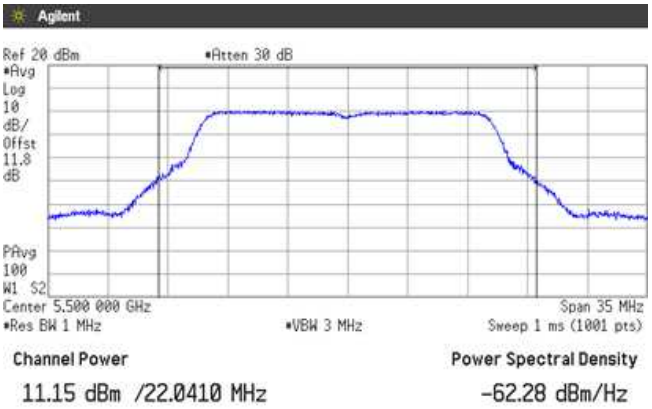
Channel: 64



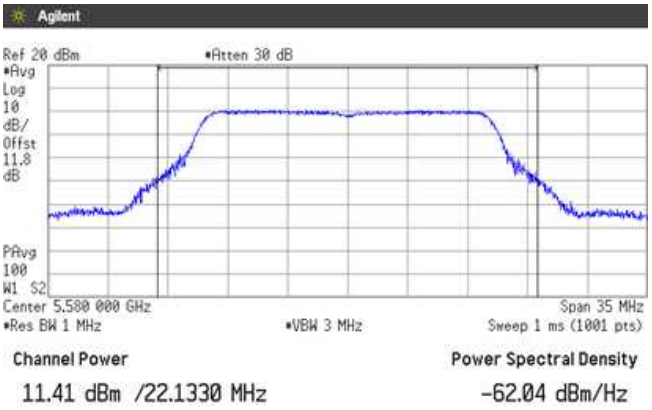
Zacta

(5.6GHz Band)

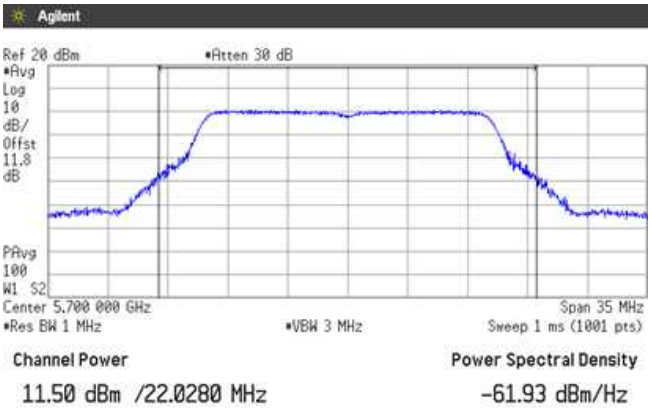
Channel: 100



Channel: 116

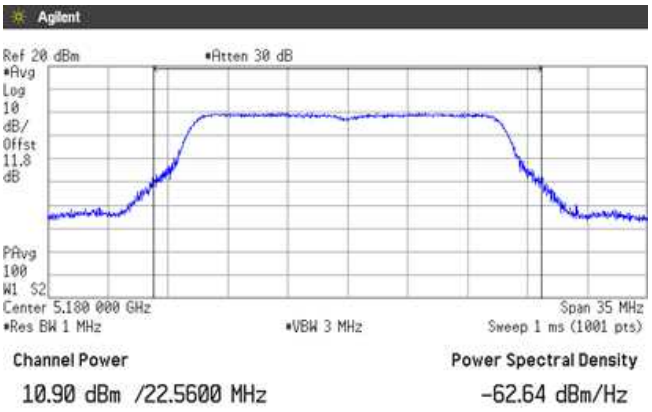


Channel: 140

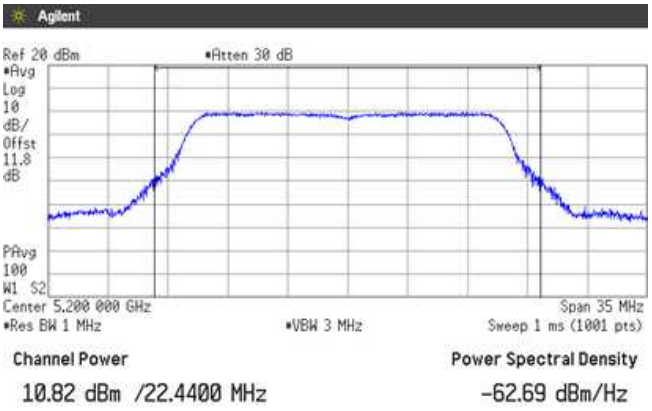


[IEEE802.11n (HT20)]
(5.2GHz Band)

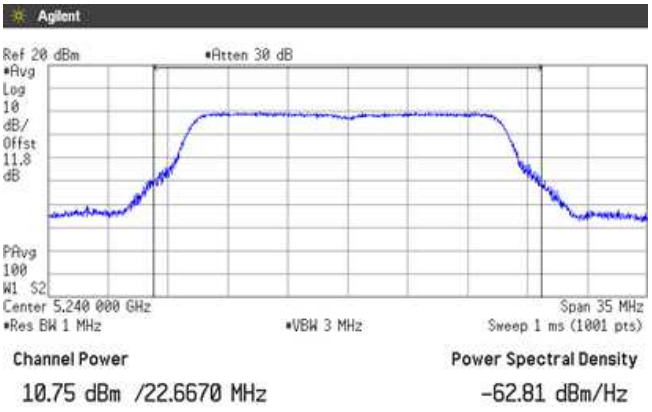
Channel: 36



Channel: 40

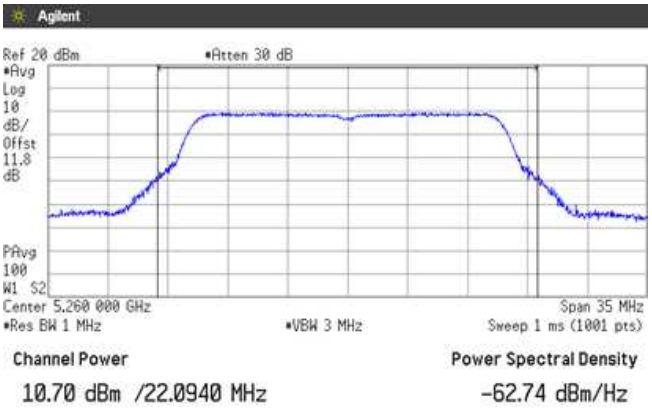


Channel: 48

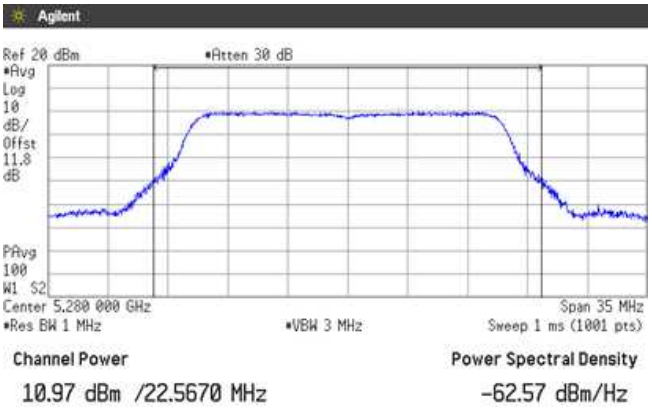


(5.3GHz Band)

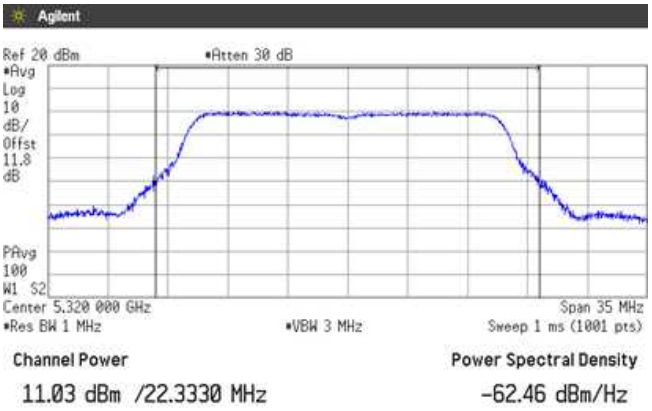
Channel: 52



Channel: 56



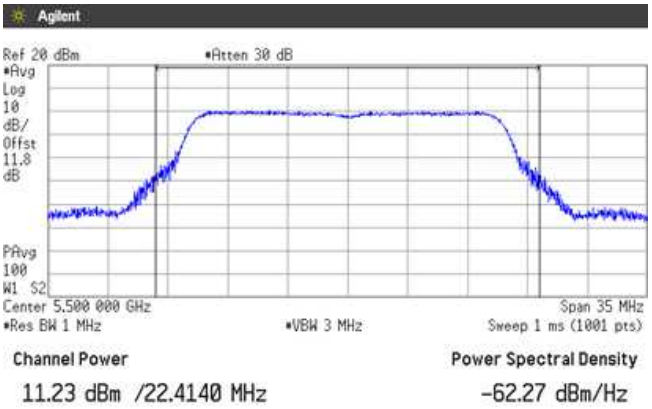
Channel: 64



Zacta

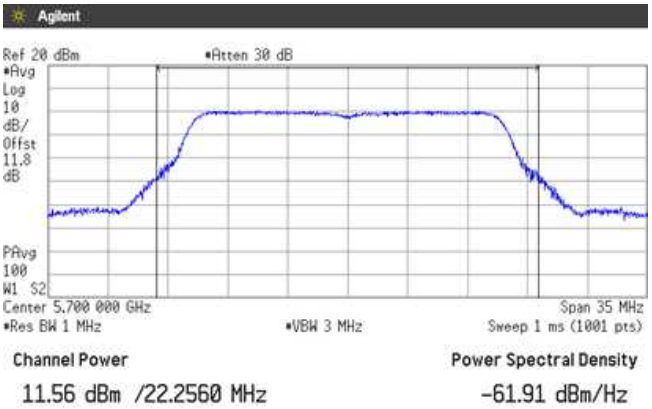
(5.6GHz Band)

Channel: 100



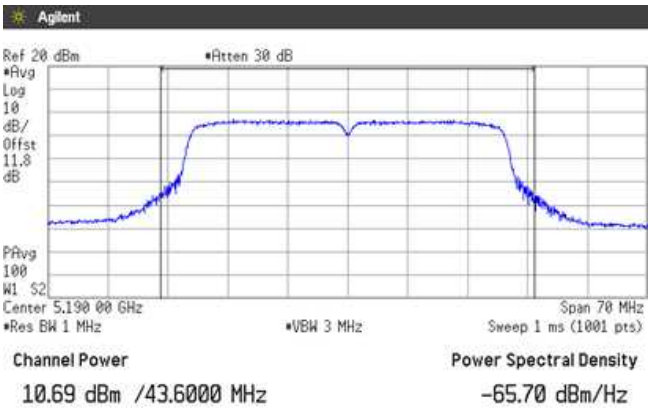
Channel: 116

Channel: 140

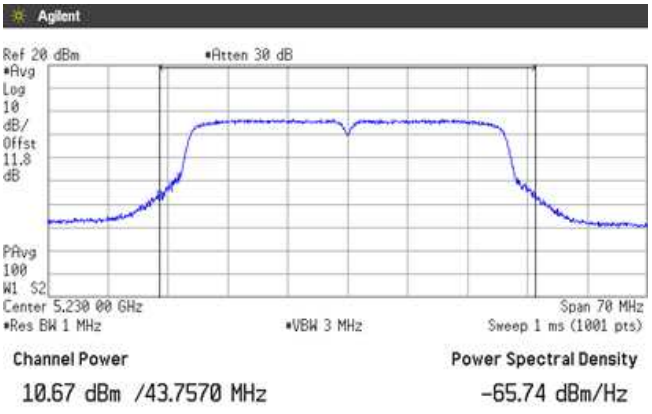


[IEEE802.11n (HT40)]
(5.2GHz Band)

Channel: 38

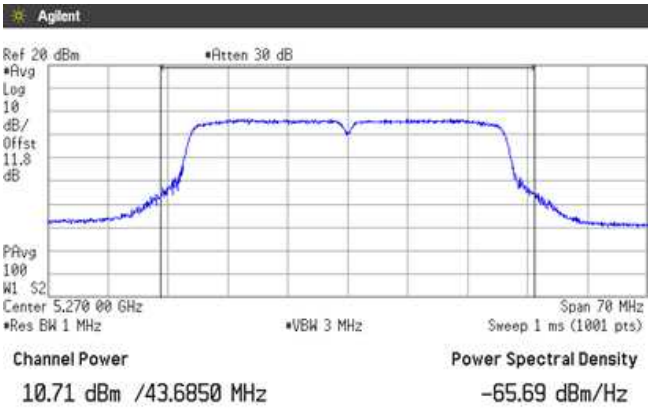


Channel: 46

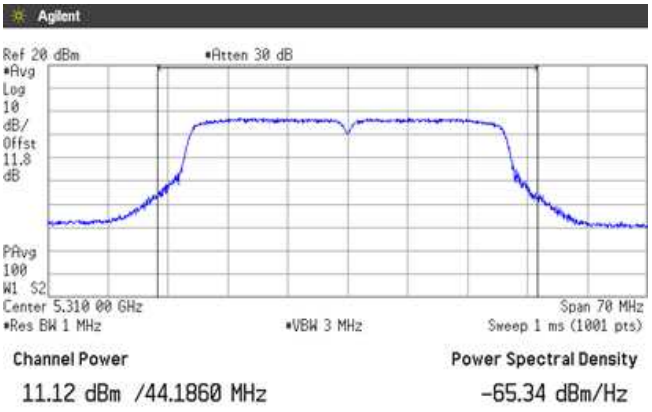


(5.3GHz Band)

Channel: 54



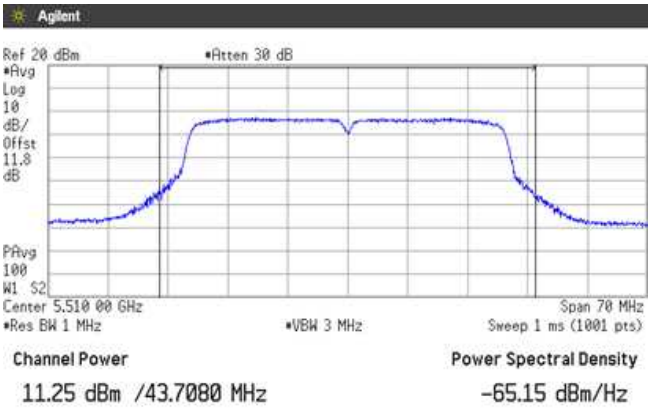
Channel: 62



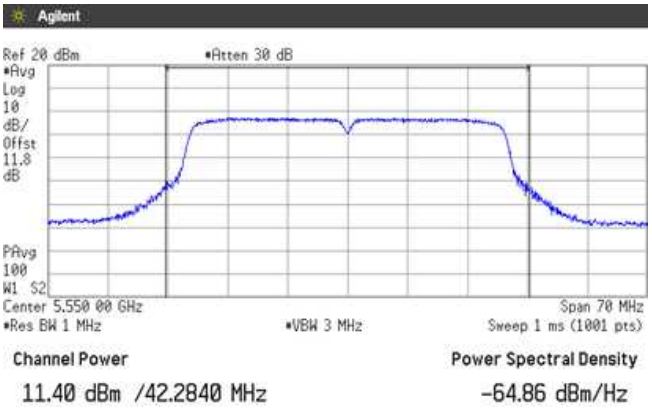
Zacta

(5.6GHz Band)

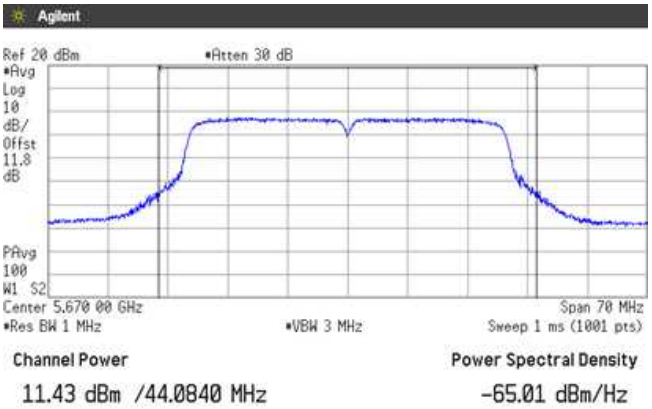
Channel: 102



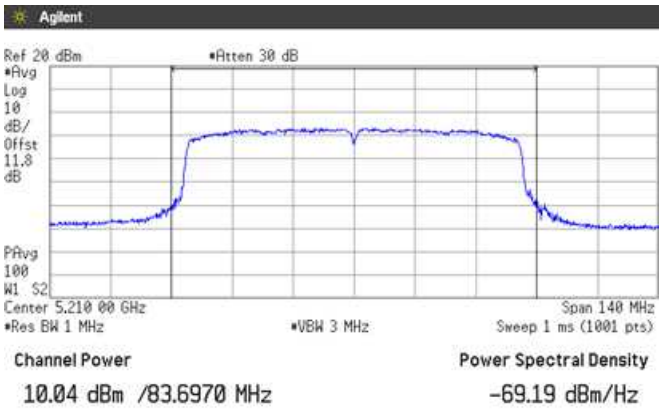
Channel: 110



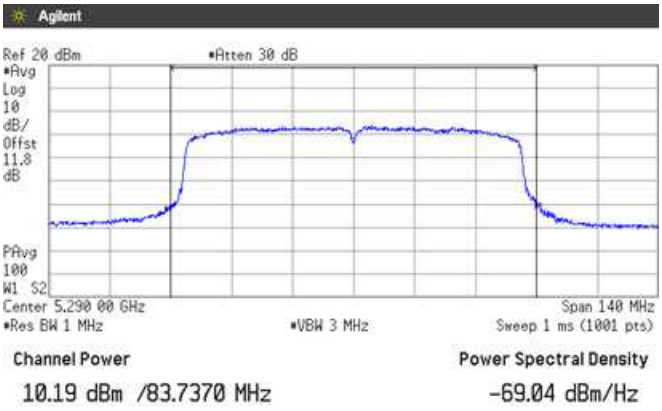
Channel: 134



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

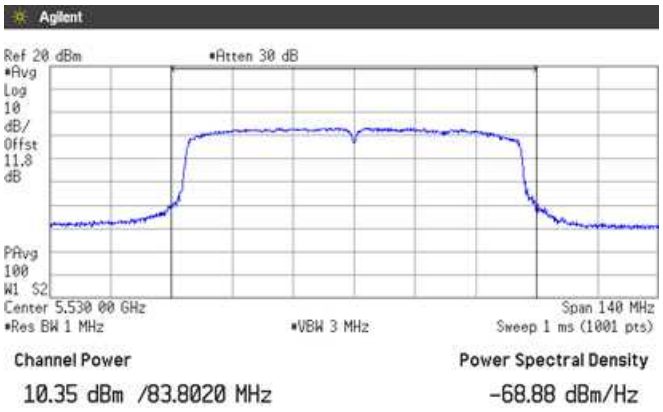


(5.3GHz Band)
Channel: 58

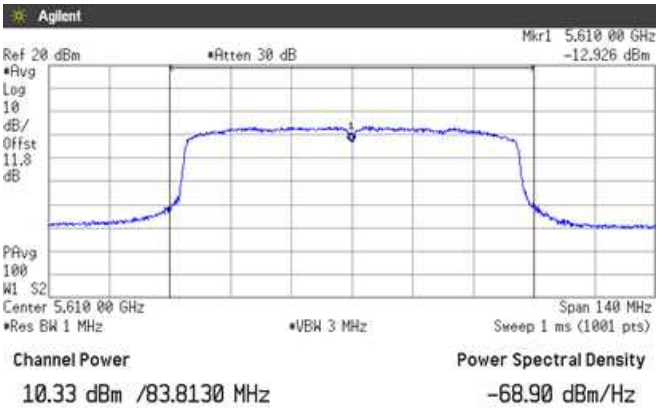


(5.6GHz Band)

Channel: 106



Channel: 122



6. Peak Power Spectral Density

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

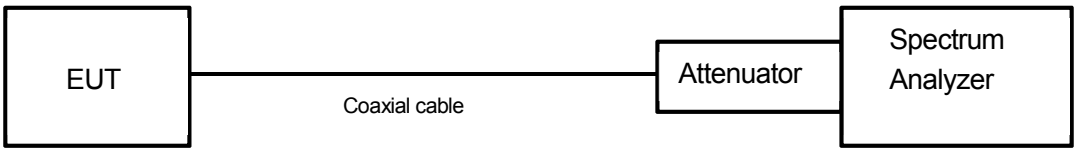
The peak power spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=1MHz, VBW=3MHz, Span=25MHz/50MHz/100MHz, 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



6.2 Limit

(1) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6dBi.

(3) For the 5.725-5.85GHz bands, the maximum power spectral density shall not exceed 30dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. 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.

<Peak Power Spectral Density Limit Calculation>

Band	Antenna Gain (dBi)	Limit
5.2GHz Band	1.1	11dBm/MHz
5.3GHz Band	1.1	11dBm/MHz
5.6GHz Band	0.5	11dBm/MHz

6.3 Measurement result

Date : May 30, 2017
Temperature : 23.6 [˚C]
Humidity : 49.0 [%]
Test place : Shielded room No.4

Test engineer : Chiaki Kanno

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	0.109	1.362	1.372	0.993	0.032	0.141
	40	5200	0.022					0.054
	48	5240	-0.130					-0.098
	52	5260	0.186	1.364	1.372	0.994	0.025	0.211
	56	5280	0.363					0.388
	64	5320	0.300					0.325
	100	5500	0.474	1.364	1.372	0.994	0.025	0.499
	116	5580	0.663					0.688
	140	5700	0.719					0.744

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

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	0.002	1.276	1.284	0.994	0.027	0.029
	40	5200	-0.754					-0.727
	48	5240	-0.126					-0.099
	52	5260	-0.545	1.276	1.284	0.994	0.027	-0.518
	56	5280	-0.128					-0.101
	64	5320	0.074					0.101
	100	5500	0.135	1.276	1.284	0.994	0.027	0.162
	116	5580	0.312					0.339
	140	5700	0.730					0.757

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

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	-3.070	0.636	0.646	0.985	0.068	-3.002
	46	5230	-3.152					-3.084
	54	5270	-3.497	0.636	0.646	0.985	0.068	-3.429
	62	5310	-3.202					-3.134
	102	5510	-2.100	0.636	0.646	0.985	0.068	-2.032
	110	5550	-2.344					-2.276
	134	5670	-2.306					-2.238

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

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	-6.290	0.248	0.258	0.960	0.179	-6.111
	58	5290	-6.327	0.248	0.258	0.960	0.179	-6.148
	106	5530	-6.405	0.248	0.258	0.960	0.179	-6.226
	122	5610	-6.424	0.248	0.257	0.962	0.170	-6.254

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

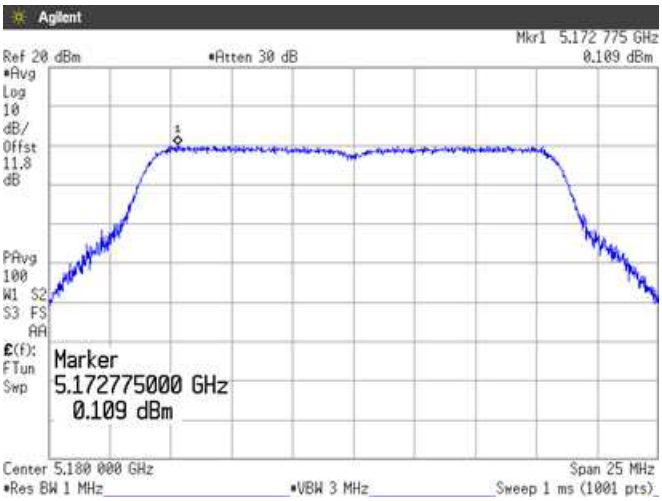
Zacta

6.4 Trace data

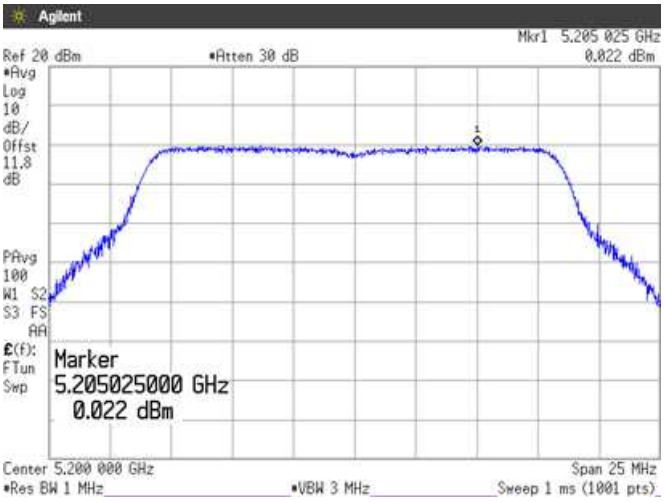
[IEEE802.11a]

(5.2GHz Band)

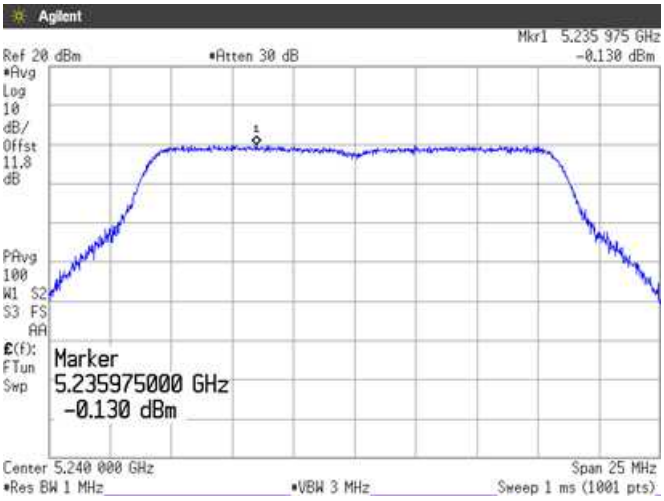
Channel: 36



Channel: 40

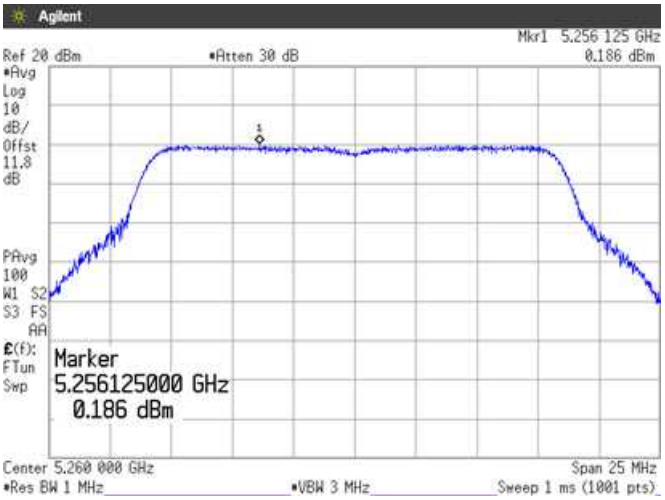


Channel: 48

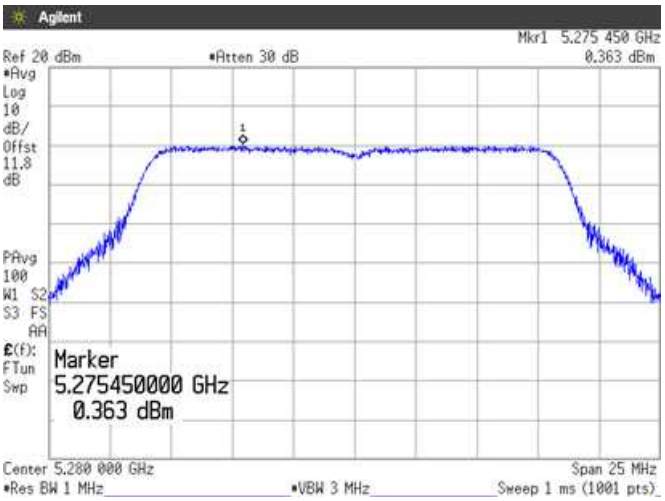


(5.3GHz Band)

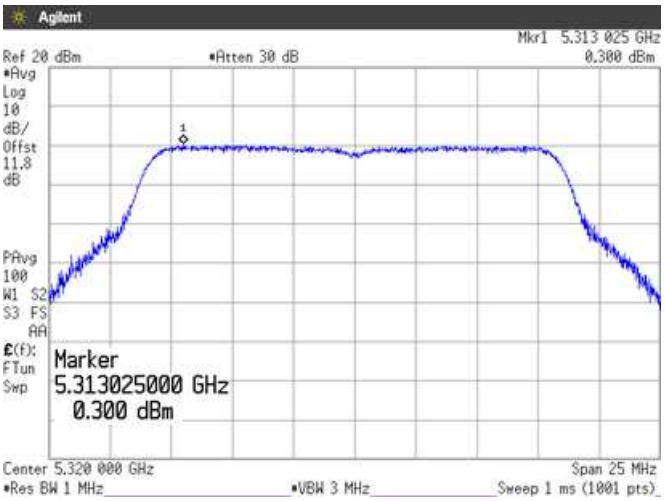
Channel: 52



Channel: 56

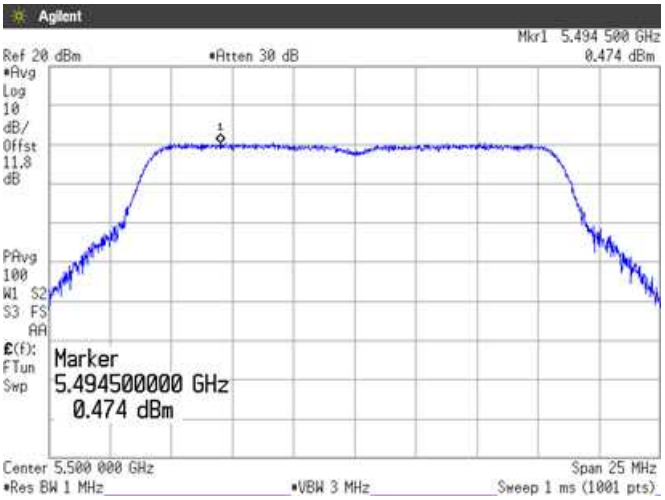


Channel: 64

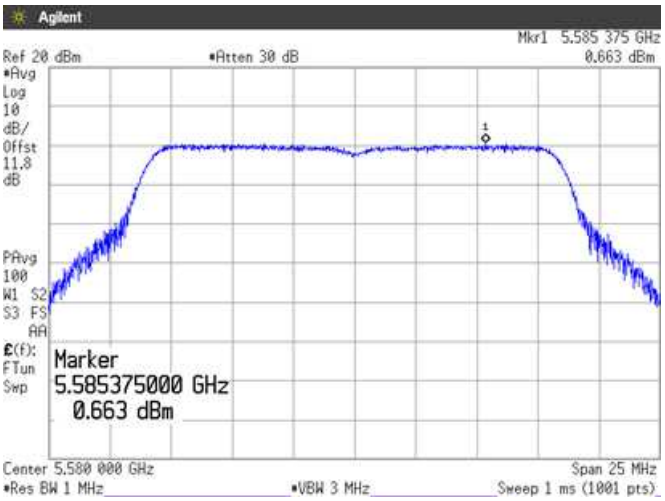


(5.6GHz Band)

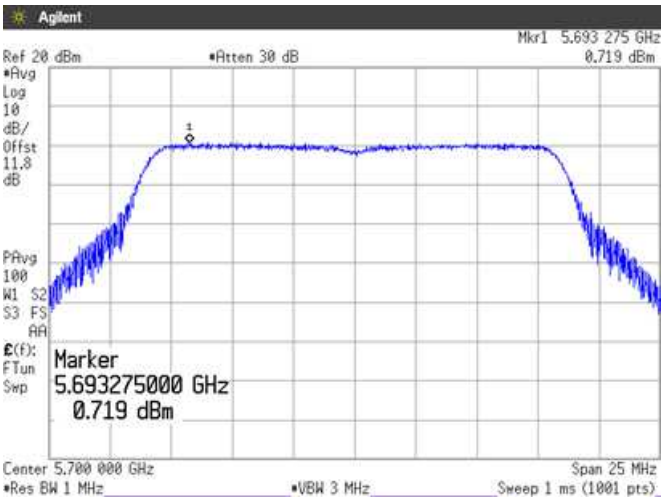
Channel: 100



Channel: 116

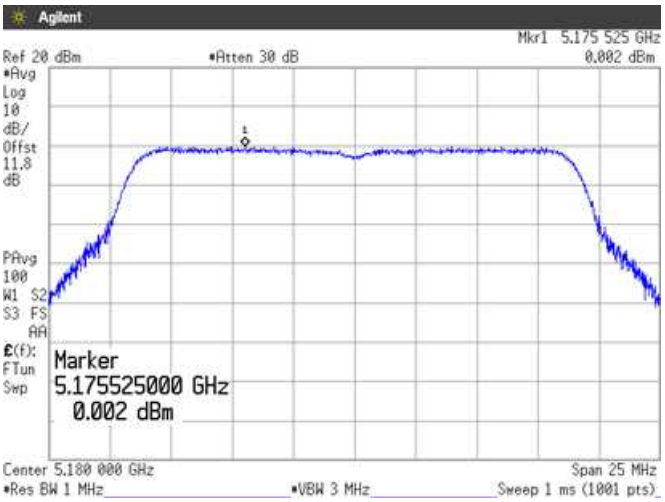


Channel: 140

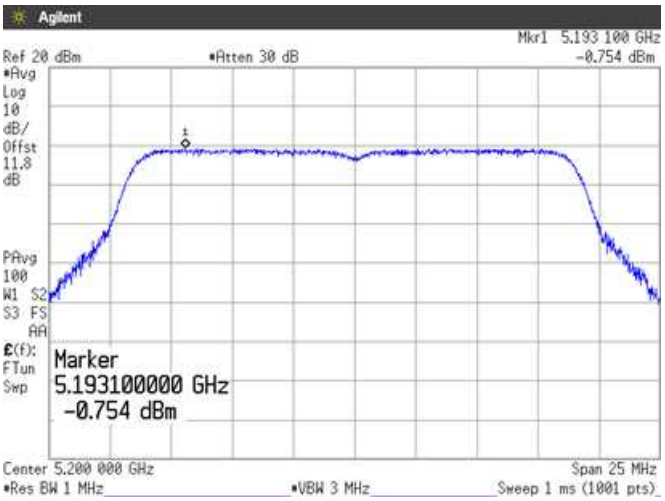


[IEEE802.11n (HT20)]
(5.2GHz Band)

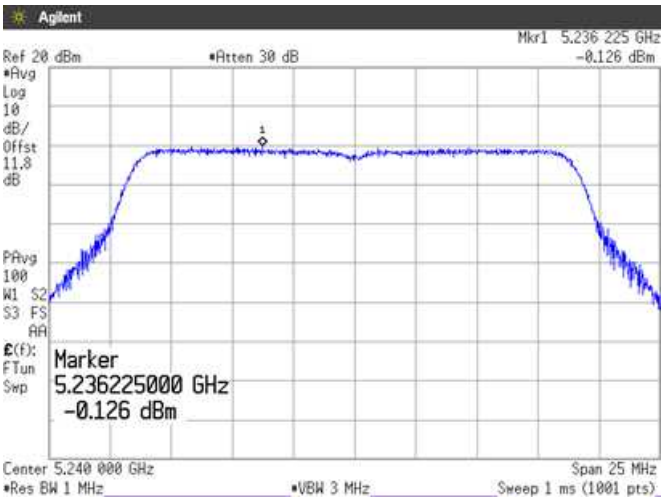
Channel: 36



Channel: 40



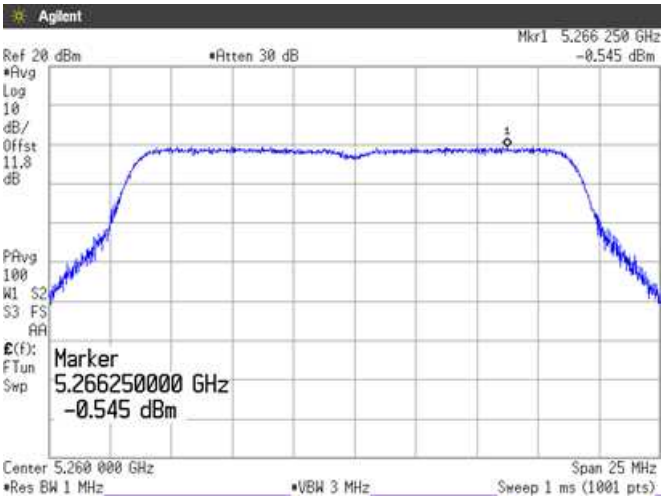
Channel: 48



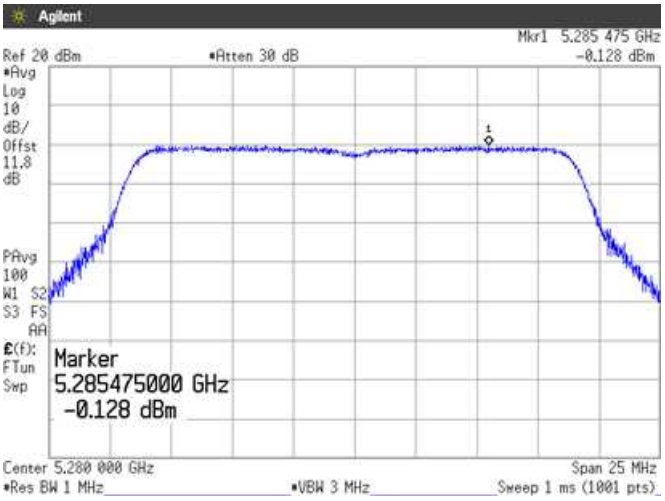
Zacta

(5.3GHz Band)

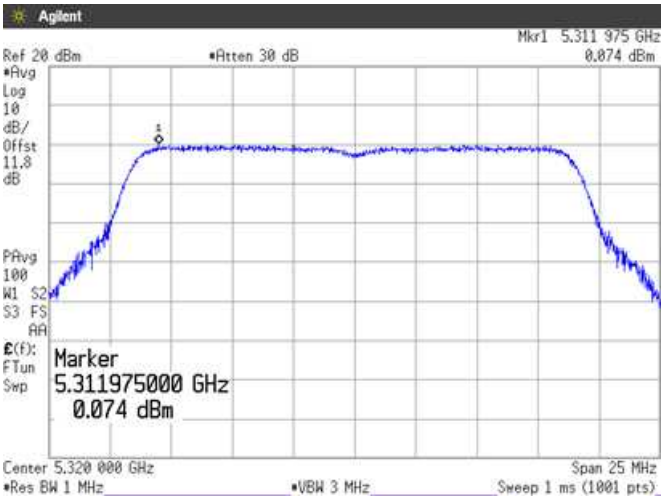
Channel: 52



Channel: 56



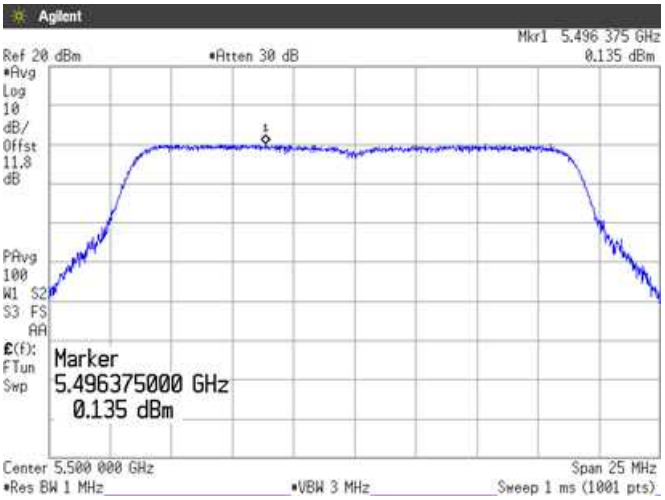
Channel: 64



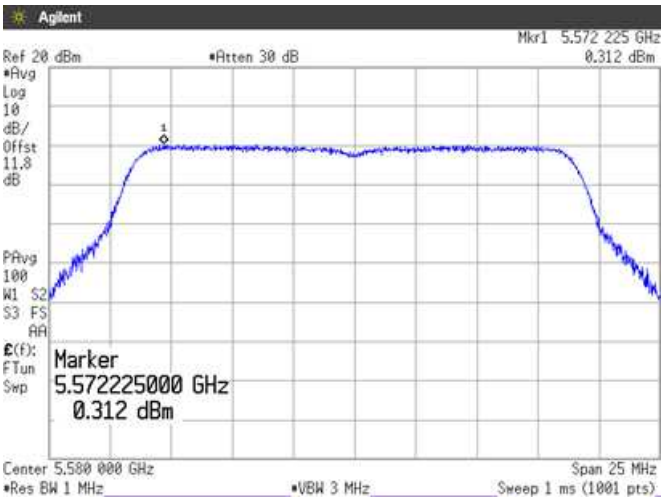
Zacta

(5.6GHz Band)

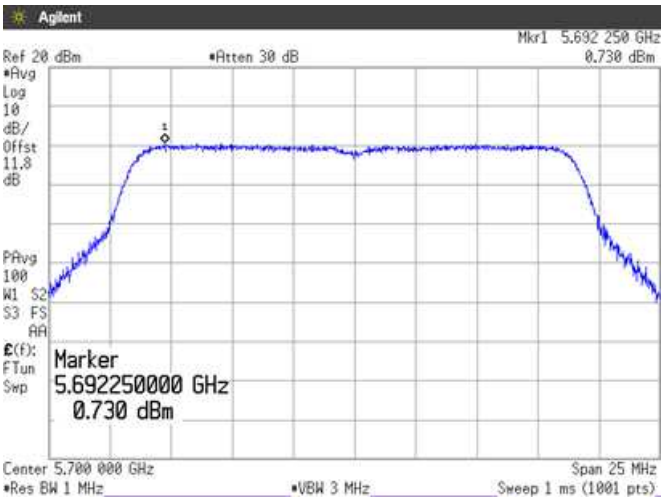
Channel: 100



Channel: 116

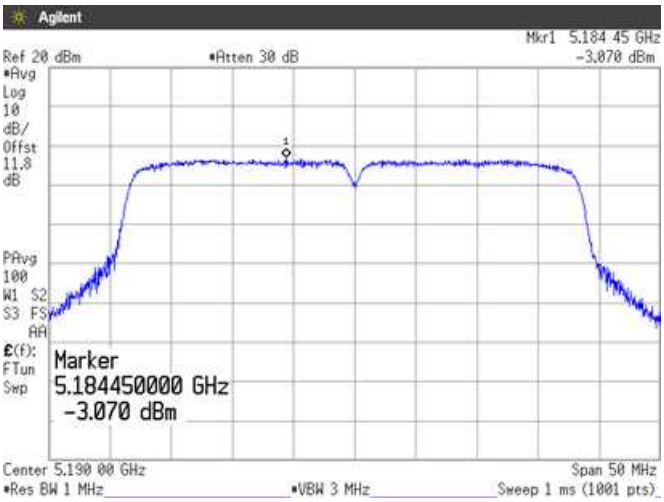


Channel: 140

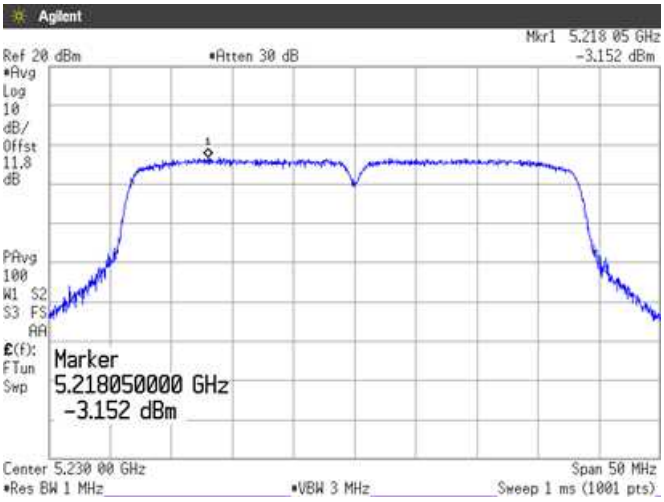


[IEEE802.11n (HT40)]
(5.2GHz Band)

Channel: 38

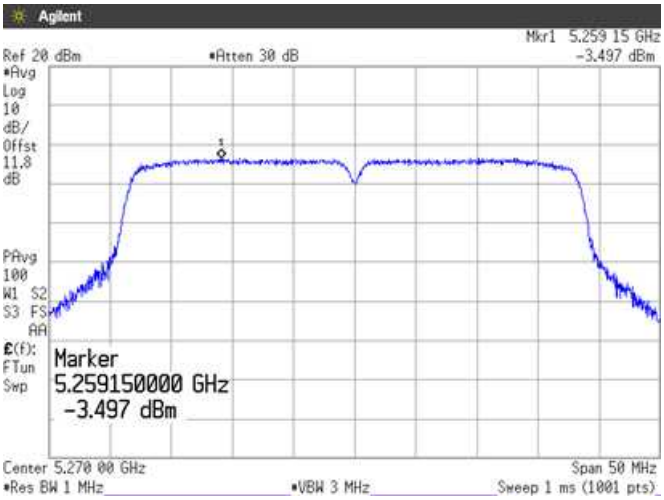


Channel: 46

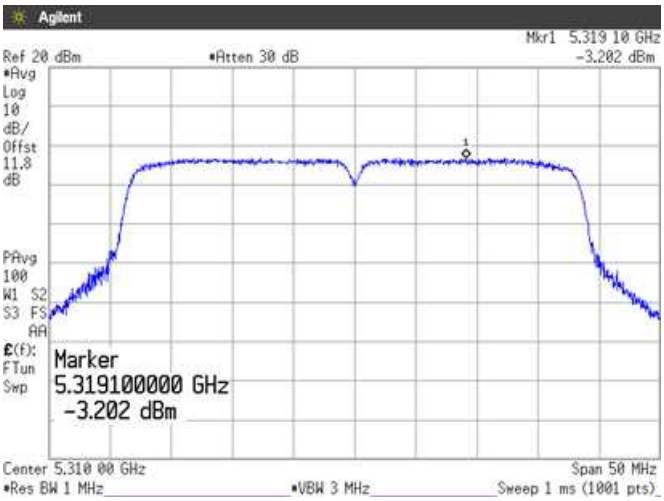


(5.3GHz Band)

Channel: 54

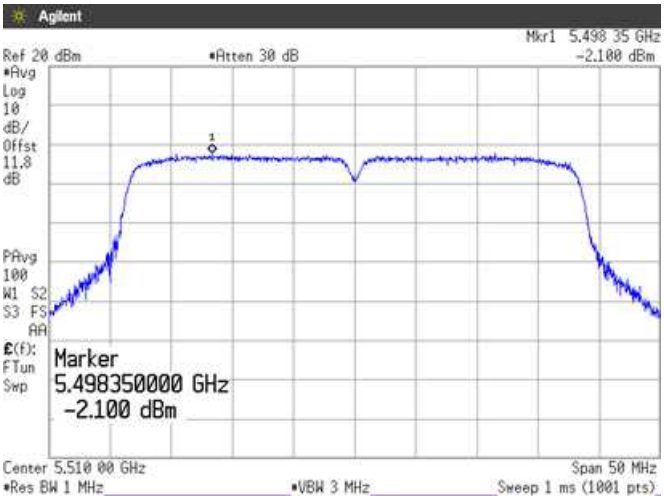


Channel: 62

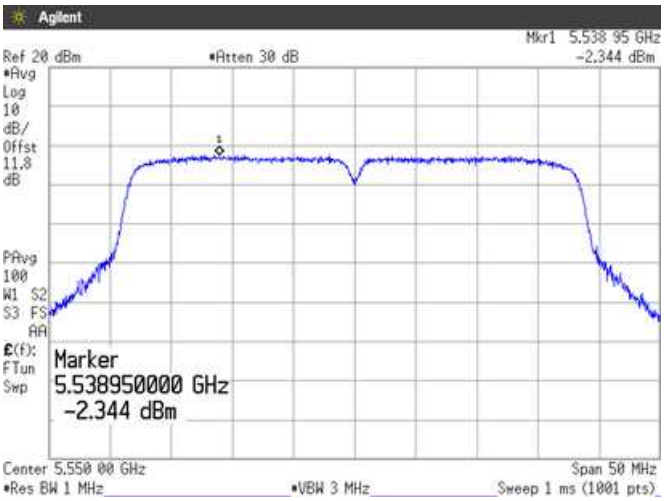


(5.6GHz Band)

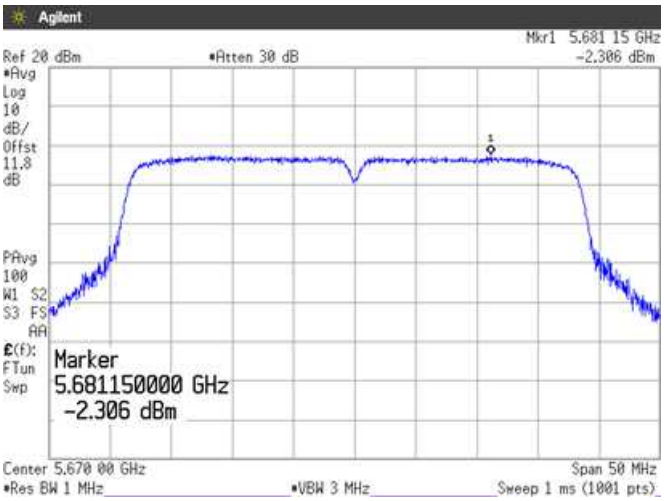
Channel: 102



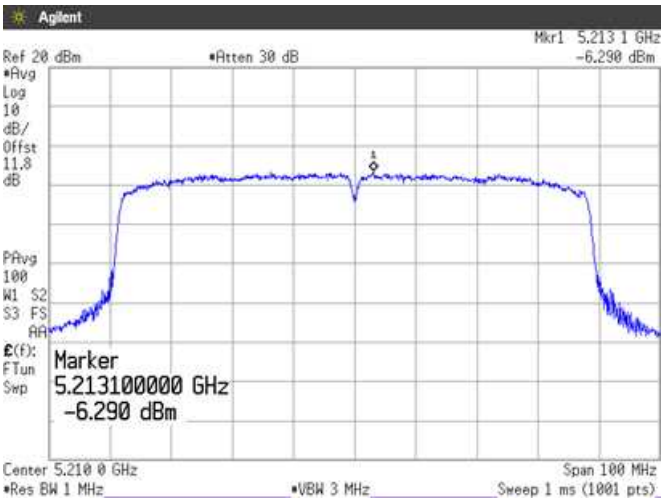
Channel: 110



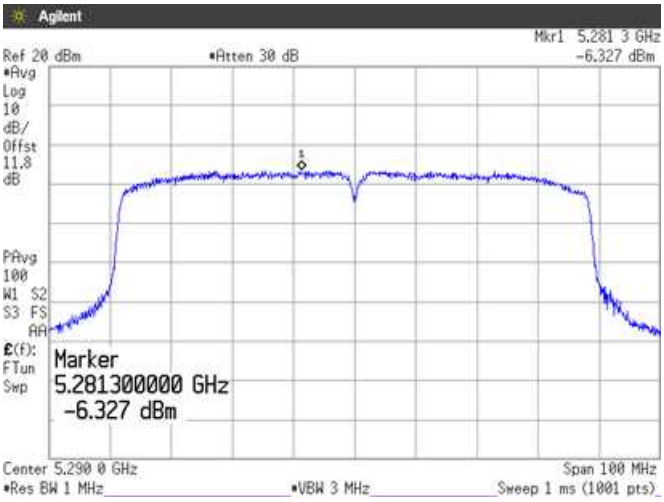
Channel: 134



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

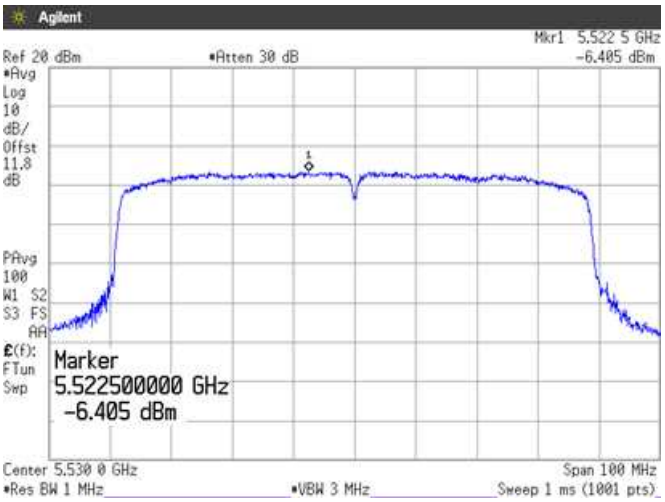


(5.3GHz Band)
Channel: 58

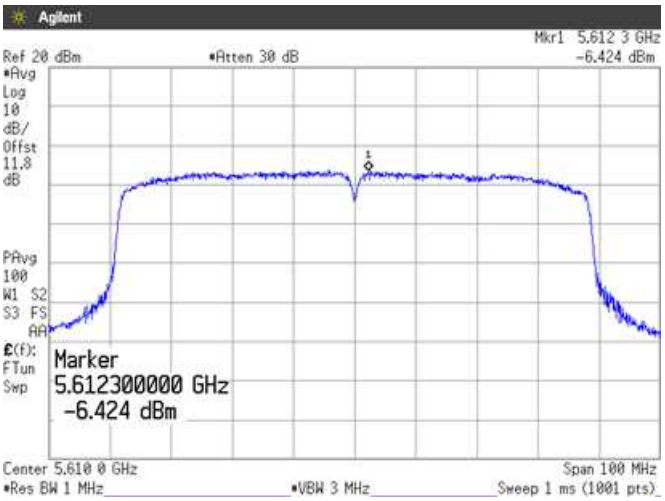


(5.6GHz Band)

Channel: 106



Channel: 122



7. Radiated Emissions (Restricted Bands of Operation)

7.1 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.

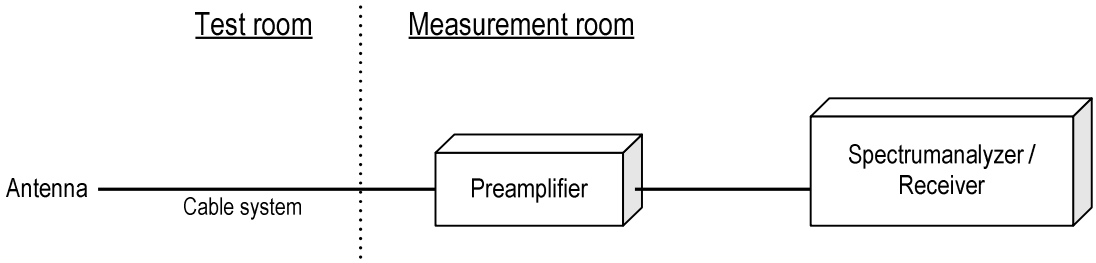
Test method	:	ANSI C63.10
Frequency range	:	30MHz to 40GHz
Test place	:	3m Semi-anechoic chamber No.1
EUT was placed on	:	Styrofoam table / (W)1.0m × (D)1.0m ×(H)0.8m (below 1GHz) Styrofoam table / (W)1.5m × (D)1.0m ×(H)1.5m (above 1GHz)
Antenna distance	:	3m
Test receiver setting		Below 1GHz
- Detector	:	Quasi-peak
- Bandwidth	:	120kHz
Spectrum analyzer setting		Above 1GHz
- Peak	:	RBW=1MHz, VBW=3MHz, Span=0Hz, Sweep=auto, Detector=Peak Trace mode=Max hold
- Average	:	RBW=1MHz, VBW=3MHz, Span=0Hz, 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 Bload-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 1GHz) and 1.5m (above 1GHz) 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.
- 5.2GHz Band, 5.3GHz Band, 5.6GHz 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	1.362	1.372	99.271	-
	W53	1.364	1.372	99.417	-
	W56	1.364	1.372	99.417	-
802.11n (20MHz)	W52	1.276	1.284	99.377	-
	W53	1.276	1.284	99.377	-
	W56	1.276	1.284	99.377	-
802.11n (40MHz)	W52	0.636	0.646	98.452	-
	W53	0.636	0.646	98.452	-
	W56	0.636	0.646	98.452	-
802.11ac (80MHz)	W52	0.248	0.258	95.967	0.179
	W53	0.248	0.258	95.967	0.179
	W56	0.248	0.257	96.154	0.170

7.2 Calculation method

[150kHz to 25GHz]
Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)
Margin = Limit – Emission level

Example:
Detector: Peak
Limit @ 5147.0MHz : 74.0dBuV/m (Peak Limit)
S.A Reading = 40.9dBuV Cable system loss = 16.4dB
Result = 40.9 + 16.4 = 57.3dBuV/m
Margin = 74.0 – 57.3 = 16.7dB