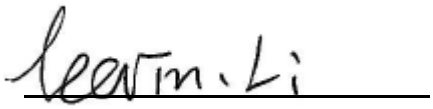
FCC RADIO TEST REPORT

Applicant	:	Benq Corporation
Address	:	16 Jihu Road, Neihu, Taipei 114, Taiwan
Equipment	:	BenQ Wireless Dongle
Model No.	:	WDR02U
Trade Name	:	BenQ
FCC ID.	:	JVPWDR02U
Standard	:	FCC part 15 Subpart E §15.407

I HEREBY CERTIFY THAT :

The sample was received on Jul. 01, 2021 and the testing was completed on Jul. 19, 2021 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:



Leevin Li /Supervisor

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History of this test report

Report No.	Issue Date	Description
DEDG2105094	Jul. 19, 2021	Original

Note: This is a Class II permissive change report(C2PC).

This report is issued as a supplementary report to original Cerpass report No.: TEDL1806202.

The modification is only concerned with adding 5250~5350MHz and 5470~5725MHz band by software setting.

1. Summary of Test Procedure and Test Results

1.1. Applicable Standards

ANSI C63.10:2013
FCC Rules and Regulations Part 15 Subpart E §15.407
KDB 789033

FCC Rule	Description of Test	Result
15.203	Antenna Requirement	PASS
15.207(a)	AC Power Line Conducted Emission	PASS
15.407(b) 15.209	Radiated Spurious Emission	PASS
15.407(a)	26 dB & Occupied Bandwidth	PASS
15.407 (a) & (a)(3)	Average Power	PASS
15.407(a)	Power Spectral Density	PASS
Note: Deviations Yes ☐ No ■ *The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement.		

2. Test Configuration of Equipment under Test

2.1. Feature of Equipment and Model Description

Equipment	BenQ Wireless Dongle
Model Name	WDR02U
Model Discrepancy	N/A
Frequency Range	802.11a/n/ac: 5150MHz-5250MHz,5250-5350MHz, 5470-5725MHz, 5725MHz -5850MHz
Modulation Type	OFDM
Data Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 400.0Mbps 802.11ac : up to 867Mbps
Power Rating	DC 5V

Note:

1.For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.2. Carrier Frequency of Channels

Band: 5250MHz -5350MHz

802.11a, 802.11n HT20, 802.11ac VHT20

Channel	Frequency(MHz)	Channel	Frequency(MHz)
***52**	**5260**	***60**	**5300**
56	5280	***64**	**5320**

802.11n HT 40, 802.11ac VHT40

Channel	Frequency(MHz)	Channel	Frequency(MHz)
***54**	**5270**	***62**	**5310**

802.11ac VHT80

Channel	Frequency(MHz)
***58**	**5290**

Band : 5470MHz -5725MHz

802.11a, 802.11n HT20, 802.11ac VHT20

Channel	Frequency(MHz)	Channel	Frequency(MHz)
***100**	**5500**	***116**	**5580**
104	5520	132	5660
108	5540	136	5680
112	5560	***140**	**5700**

802.11n HT40, 802.11ac VHT40

Channel	Frequency(MHz)	Channel	Frequency(MHz)
***102**	**5510**	***134**	**5670**
***110**	**5550**		

802.11ac VHT80

Channel	Frequency(MHz)
***106**	**5530**

Note: Channels remarked * are selected to perform test.

2.3. Test Mode and Test Software

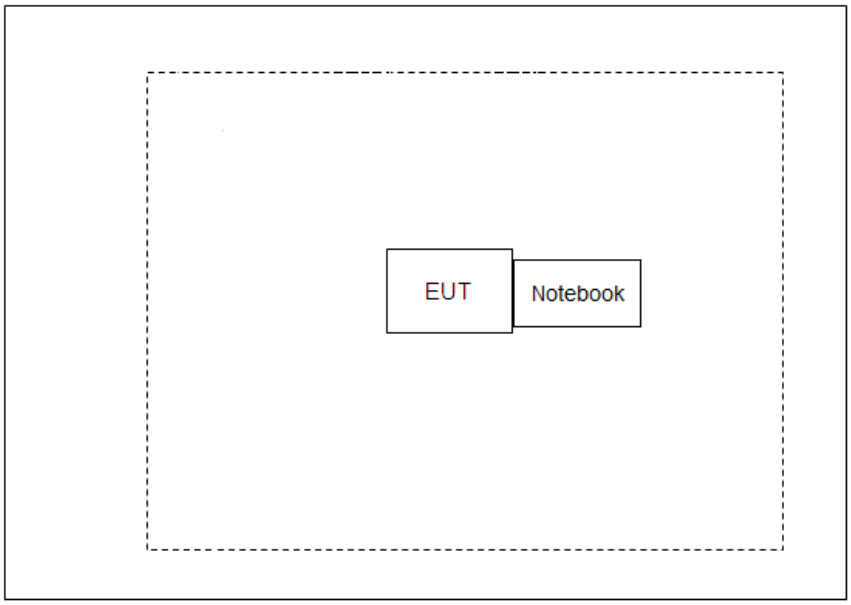
a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10.
b. The complete test system included Notebook and EUT for RF test.
c. An executive program, ” MT7662UQA.exe” under Windows 7 system was executed to transmit and receive data via WLAN.
d. The following test modes were performed for the test:

Conducted Emissions from the AC mains power ports	
Test Mode	Operating Description
1	802.11a (6Mbps) for 120V
2	802.11ac VHT20 (6.5Mbps) for 120V
3	802.11ac VHT40 (13.5Mbps) for 120V
4	802.11ac VHT80 (29.3Mbps) for 120V
5	802.11a (6Mbps) for 240V
caused “Test Mode 1 at CH100:5500” generated the worst case, it was reported as the final data.	
Radiation Emissions (30MHz ~ 1GHz)	
Test Mode	Operating Description
1	802.11a (6Mbps)
2	802.11ac VHT20 (6.5Mbps)
3	802.11ac VHT40 (13.5Mbps)
4	802.11ac VHT80 (29.3Mbps)
caused “Test Mode 1 at CH100:5500” generated the worst case, it was reported as the final data.	
Radiation Emissions (1GHz ~ 40GHz)	
Test Mode	Operating Description
1	802.11a (6Mbps)
2	802.11ac VHT20 (6.5Mbps)
3	802.11ac VHT40 (13.5Mbps)
4	802.11ac VHT80 (29.3Mbps)
caused “Test Mode 1~4” generated the worst case, they were reported as the final data.	

2.4. Description of Test System

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	SONY	PCG-71811P	N/A	Non-Shielded, 1.8m

Connection Diagram



Signal Cable Type		Quantity	Signal cable Description
N/A	N/A	N/A	N/A

2.5. General Information of Test

Test Site	**Cerpass Technology Corporation(Cerpass Laboratory)** Address: Room 102, No. 5, Xing'an Road, Chang'an Town, Dongguan City, Guangdong Province Tel: +86-769-8547-1212 Fax: +86-769-8547-1912
FCC Designation No.:	CN1288
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 40,000MHz
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.

Test Item	Test Site	Test period	Environmental Conditions	Tested By
RF Conducted	RFCON01-DG	2021/07/02~2021/07/19	22~25℃ / 50~60%	Amos Zhang
Radiated Emissions	3M02-DG	2021/07/02~2021/07/19	22~25℃ / 50~60%	Amos Zhang
AC Power Line Conducted Emission	CON01-DG	2021/07/02~2021/07/19	22~25℃ / 50~60%	Amos Zhang

2.6. Measurement Uncertainty

Measurement Item	Uncertainty
AC Power Line Conduction(150K~30MHz)	±2.88dB
Radiated Spurious Emission(9KHz~30MHz)	±2.15dB
Radiated Spurious Emission(30MHz~1GHz)	±4.95dB
Radiated Spurious Emission(1GHz~18GHz)	±3.24dB
Radiated Spurious Emission(18GHz~40GHz)	±5.43dB
6dB Bandwidth&26dB Bandwidth	±4.422%
Occupied Bandwidth	±4.244%
Peak Output Power(Conducted Power Meter)	±1.4 dB
Power Spectral Density	±1.387 dB
Frequency Stability	±0.6338Hz

3. Test Equipment and Ancillaries Used for Tests

Test Item	AC Power Line Conducted Emission				
Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
Test Receiver	R&S	ESCI	100564	2021.01.07	2022.01.06
LISN	SCHWARZBECK	NSLK 8127	8127748	2021.01.07	2022.01.06
LISN	SCHWARZBECK	NSLK 8127	8127749	2021.01.07	2022.01.06
ISN	TESEQ	ISN T800	42809	2021.05.10	2022.05.09
Pulse Limiter with 10dB Attenuation	SCHWARZBECK	VTSD 9561-F	9561-F106	2021.01.07	2022.01.06
Temperature/ Humidity Meter	GEMLEAD	STH200A	N/A	2020.08.20	2021.08.19

Test Item	Radiated Emissions				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Test Receiver	R&S	ESCI	100563	2021.05.14	2022.05.13
H64 Preamplifier	HP	8447F	3113A05582	2021.01.07	2022.01.06
Loop Antenna	R&S	HFH2-Z2	100150	2020.06.08	2022.06.07
Bilog Antenna	Sunol Science	JB1	A072414-1	2020.06.08	2022.06.07
Preamplifier	EMEC	EM01G18G	060739	2021.05.14	2022.05.13
Preamplifier	COM-POWER	PA-840	711885	2021.05.14	2022.05.13
Horn Antenna	Sunol	DRH-118	A072913	2019.09.07	2021.09.06
Standard Gain Horn Antenna	TRC	HA-2640	18050	2020.06.08	2022.06.07
Standard Gain Horn Antenna	TRC	HA-1726	18051	2020.06.08	2022.06.07
FSQ Signal Analyzer	R&S	FSQ40	200012	2021.05.14	2022.05.13
Temperature/ Humidity Meter	GEMLEAD	STH200A	N/A	2020.08.20	2021.08.19

Test Item	RF Conducted				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
MXA Signal Analyzer	KEYSIGHT	N9020A	US46220290	2021.05.14	2022.05.13
ESG VECTOR SIGNAL GENERATOR	Agilent	E4438C	MY45092582	2021.05.14	2022.05.13
MXG VECTOR SIGNAL GENERATOR	Agilent	N5182B	MY53050127	2021.05.14	2022.05.13
USB Wideband Power Sensor	Boonton	55006	9778	2021.01.07	2022.01.06
Temperature/ Humidity Meter	mingle	ETH529	N/A	2021.01.07	2022.01.06

4. Antenna Requirements

4.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2. Antenna Construction and Directional Gain

Antenna Type	PCB Antenna
Antenna Gain	5250MHz-5350MHz: ANT A: 2.0 dBi ; ANT B: 2.0 dBi 5475MHz-5725MHz: ANT A: 2.0 dBi ; ANT B: 2.0 dBi

5250MHz ~ 5350MHz
For Power directional gain= G_{ant}= 2.0 dBi For PSD directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}$] = 5.01 (dBi)
5470MHz ~ 5725MHz
For Power directional gain= G_{ant}= 2.0 dBi For PSD directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}$] = 5.01 (dBi)

5. Test of AC Power Line Conducted Emission

5.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

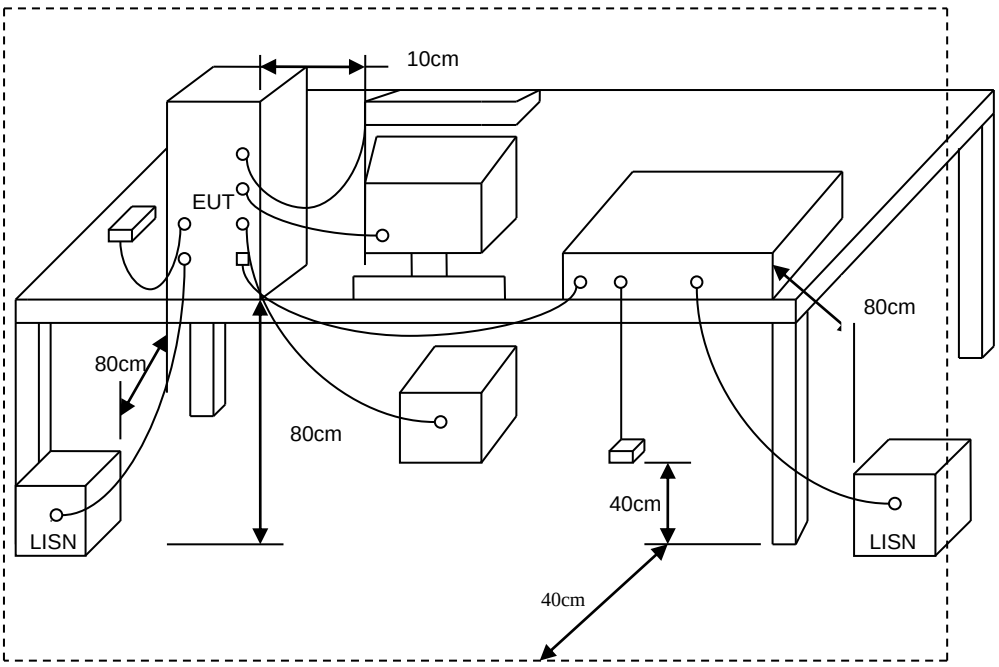
Frequency (MHz)	Quasi Peak (dBμV)	Average (dBμV)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

5.2. Test Procedures

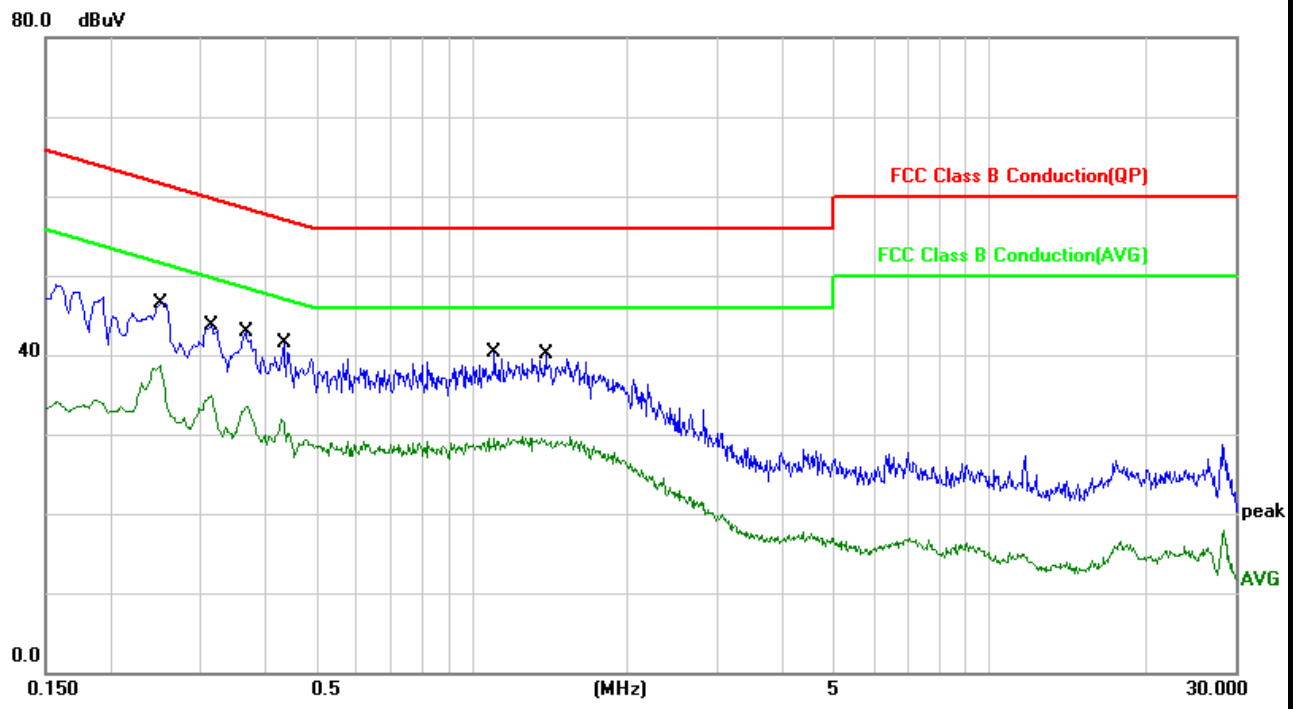
a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3. Typical Test Setup



5.4. Test Result and Data

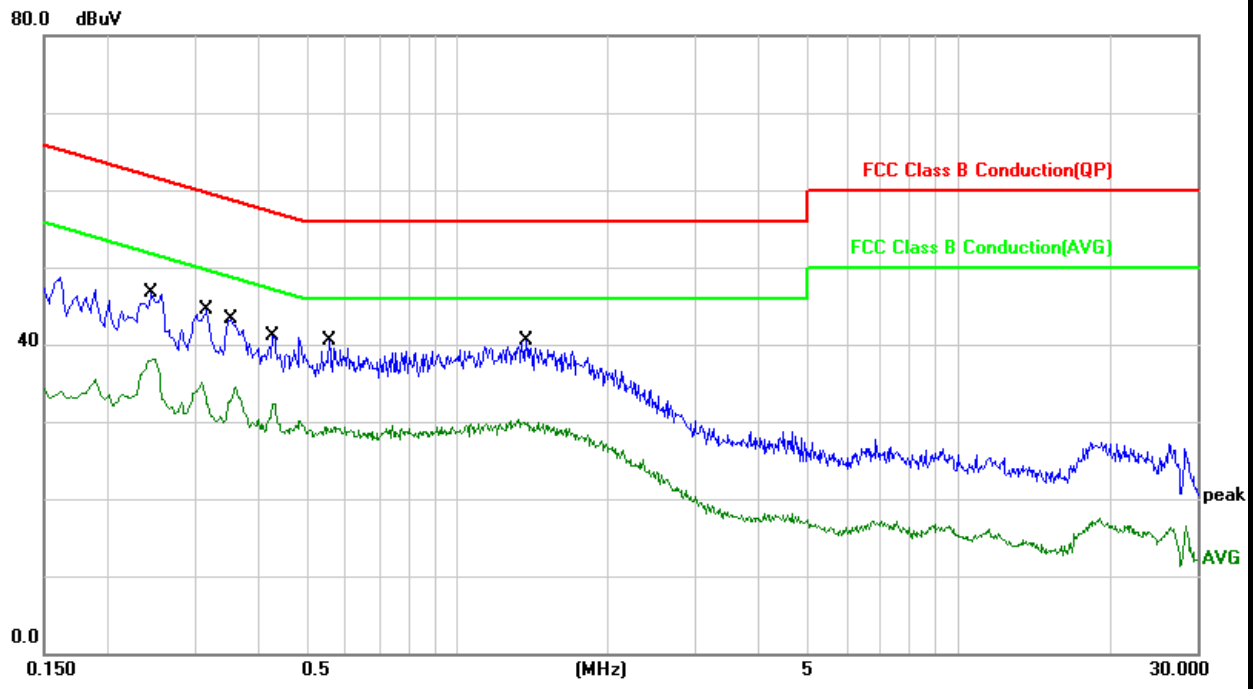
Test Mode :	Mode 1		
AC Power :	AC 120V/60Hz	Phase:	LINE



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2500	10.09	33.02	43.11	61.75	-18.64	QP
2	0.2500	10.09	27.67	37.76	51.75	-13.99	AVG
3	0.3140	10.11	30.14	40.25	59.86	-19.61	QP
4	0.3140	10.11	23.94	34.05	49.86	-15.81	AVG
5	0.3660	10.10	28.81	38.91	58.59	-19.68	QP
6	0.3660	10.10	23.19	33.29	48.59	-15.30	AVG
7	0.4340	10.09	26.52	36.61	57.18	-20.57	QP
8	0.4340	10.09	20.87	30.96	47.18	-16.22	AVG
9	1.1100	10.04	23.82	33.86	56.00	-22.14	QP
10	1.1100	10.04	18.67	28.71	46.00	-17.29	AVG
11	1.3940	10.01	24.13	34.14	56.00	-21.86	QP
12	1.3940	10.01	18.99	29.00	46.00	-17.00	AVG

Note: Measurement Level = Reading Level + Correct Factor

Test Mode :	Mode 1		
AC Power :	AC 120V/60Hz	Phase:	NEUTRAL



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2460	10.09	33.13	43.22	61.89	-18.67	QP
2	0.2460	10.09	27.81	37.90	51.89	-13.99	AVG
3	0.3180	10.08	29.75	39.83	59.76	-19.93	QP
4	0.3180	10.08	23.35	33.43	49.76	-16.33	AVG
5	0.3540	10.10	27.73	37.83	58.87	-21.04	QP
6	0.3540	10.10	21.41	31.51	48.87	-17.36	AVG
7	0.4300	10.12	27.43	37.55	57.25	-19.70	QP
8	0.4300	10.12	22.11	32.23	47.25	-15.02	AVG
9	0.5580	10.14	24.09	34.23	56.00	-21.77	QP
10	0.5580	10.14	18.80	28.94	46.00	-17.06	AVG
11	1.3779	10.07	24.41	34.48	56.00	-21.52	QP
12	1.3779	10.07	19.26	29.33	46.00	-16.67	AVG

Note: Measurement Level = Reading Level + Correct Factor

6. Test of Spurious Emission (Radiated)

6.1. Test Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. 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 e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

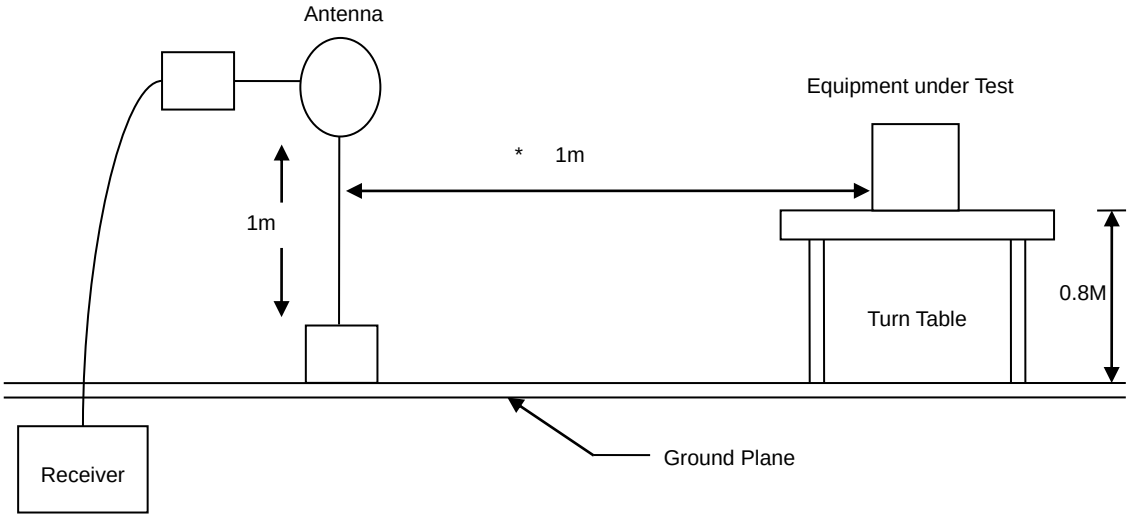
(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

6.2. Test Procedures

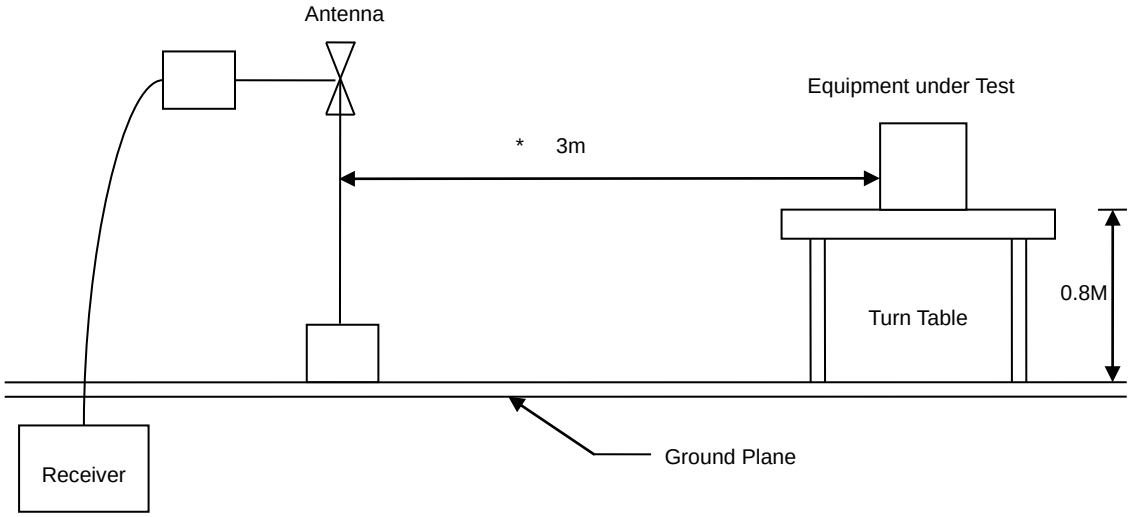
a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
i. “Cone of radiation” has been considered to be 3dB bandwidth of the measurement antenna.

6.3. Typical Test Setup

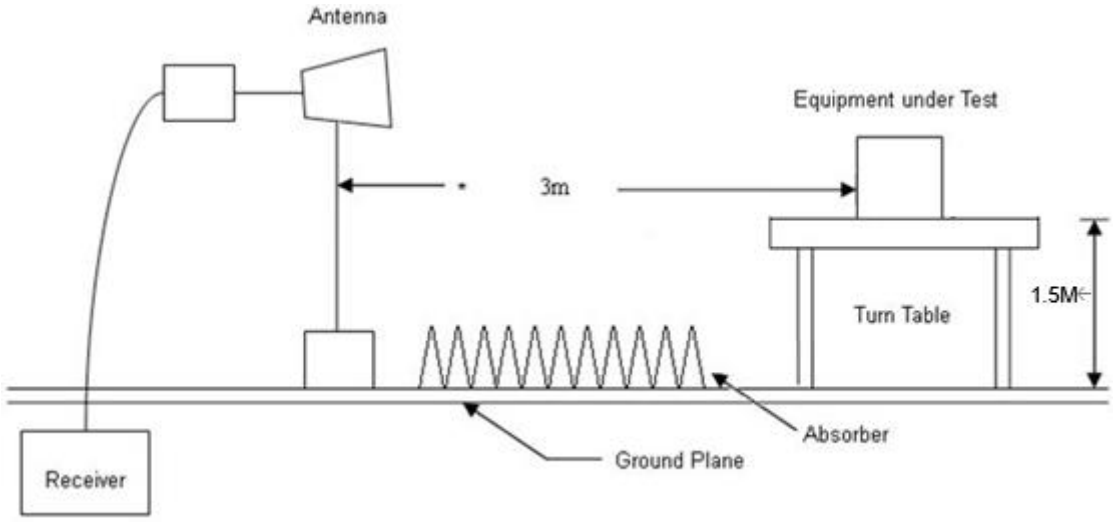
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



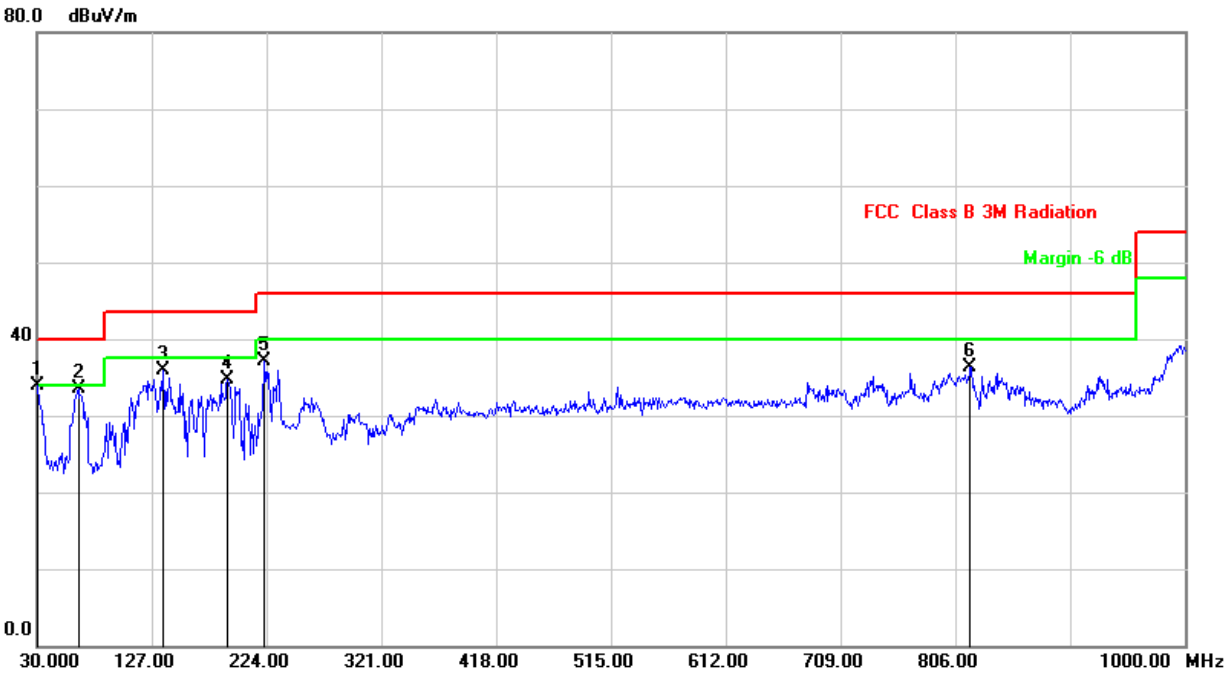
6.4. Test Result and Data (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

6.5. Test Result and Data (30MHz ~ 1GHz)

Power	AC120V/60Hz	Pol/Phase	VERTICAL
Test Mode	Mode 1		

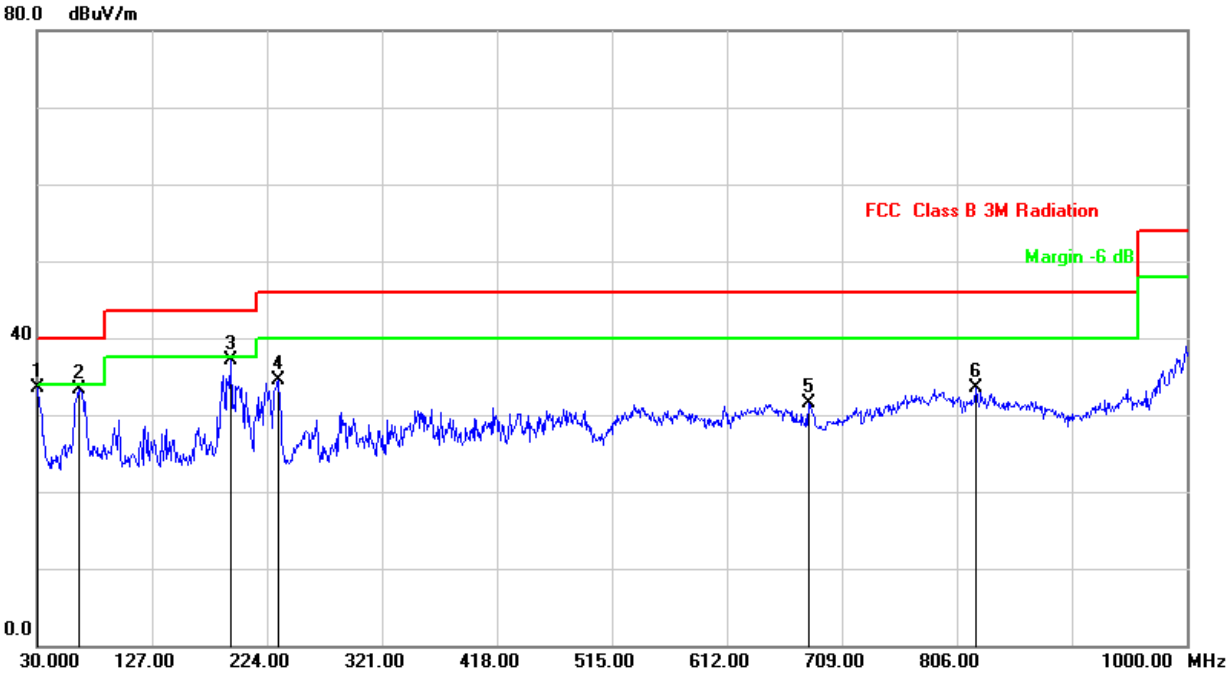
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.9699	-4.66	38.51	33.85	40.00	-6.15	peak	100	113
2	64.9200	-16.67	50.10	33.43	40.00	-6.57	peak	100	327
3	136.6999	-10.41	46.27	35.86	43.50	-7.64	peak	100	196
4	191.0200	-11.48	46.18	34.70	43.50	-8.80	peak	200	251
5	222.0600	-12.54	49.57	37.03	46.00	-8.97	peak	100	304
6	818.6100	-0.15	36.54	36.39	46.00	-9.61	peak	200	291

Power	AC120V/60Hz	Pol/Phase	HORIZONTAL
Test Mode	Mode 1		

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.9698	-4.66	38.17	33.51	40.00	-6.49	peak	100	87
2	64.9200	-16.67	50.04	33.37	40.00	-6.63	peak	200	251
3	193.9299	-11.57	48.76	37.19	43.50	-6.31	peak	200	143
4	233.6999	-12.31	46.72	34.41	46.00	-11.59	peak	200	239
5	680.8700	-1.92	33.46	31.54	46.00	-14.46	peak	200	337
6	822.4900	0.15	33.39	33.54	46.00	-12.46	peak	100	306

6.6. Test Result and Data (1GHz ~ 40GHz)

Power	AC120V/60Hz
Test Mode	Mode 1, 802.11a CH52 UNII-2A
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5350.000	1.89	45.92	47.81	74.00	-26.19	peak	H
2	5350.000	1.89	31.37	33.26	54.00	-20.74	AVG	H
3	10520.000	13.22	31.96	45.18	68.20	-23.02	peak	H
4	15780.000	25.36	25.71	51.07	74.00	-22.93	peak	H
5	15780.000	25.36	13.17	38.53	54.00	-15.47	AVG	H
1	5350.000	1.89	43.12	45.01	74.00	-28.99	peak	V
2	5350.000	1.89	28.27	30.16	54.00	-23.84	AVG	V
3	10520.000	13.22	35.40	48.62	68.20	-19.58	peak	V
4	15780.000	25.36	26.80	52.16	74.00	-21.84	peak	V
5	15780.000	25.36	15.72	41.08	54.00	-12.92	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 1, 802.11a CH60 UNII-2A
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5350.000	1.89	45.46	47.35	74.00	-26.65	peak	H
2	5350.000	1.89	29.17	31.06	54.00	-22.94	AVG	H
3	10600.000	13.46	35.16	48.62	74.00	-25.38	peak	H
4	10600.000	13.46	23.67	37.13	54.00	-16.87	AVG	H
5	15900.000	25.41	24.53	49.94	74.00	-24.06	peak	H
6	15900.000	25.41	12.86	38.27	54.00	-15.73	AVG	H
1	5350.000	1.89	43.75	45.64	74.00	-28.36	peak	V
2	5350.000	1.89	29.18	31.07	54.00	-22.93	AVG	V
3	10600.000	13.46	35.30	48.76	74.00	-25.24	peak	V
4	10600.000	13.46	26.67	40.13	54.00	-13.87	AVG	V
5	15900.000	25.41	27.24	52.65	74.00	-21.35	peak	V
6	15900.000	25.41	15.51	40.92	54.00	-13.08	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 1, 802.11a CH64 UNII-2A

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5350.000	1.89	54.70	56.59	74.00	-17.41	peak	H
2	5350.000	1.89	39.18	41.07	54.00	-12.93	AVG	H
3	10640.000	13.58	35.59	49.17	74.00	-24.83	peak	H
4	10640.000	13.58	23.10	36.68	54.00	-17.32	AVG	H
5	15960.000	25.44	21.31	46.75	74.00	-27.25	peak	H
6	15960.000	25.44	9.48	34.92	54.00	-19.08	AVG	H
1	5350.000	1.89	50.68	52.57	74.00	-21.43	peak	V
2	5350.000	1.89	36.02	37.91	54.00	-16.09	AVG	V
3	10640.000	13.58	35.70	49.28	74.00	-24.72	peak	V
4	10640.000	13.58	24.56	38.14	54.00	-15.86	AVG	V
5	15960.000	25.44	26.48	51.92	74.00	-22.08	peak	V
6	15960.000	25.44	14.40	39.84	54.00	-14.16	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 2, 802.11ac VHT20 CH52 UNII-2A

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5150.000	1.73	43.36	45.09	74.00	-28.91	peak	H
2	5150.000	1.73	29.42	31.15	54.00	-22.85	AVG	H
3	10520.000	13.22	32.16	45.38	68.20	-22.82	peak	H
4	15780.000	25.36	25.69	51.05	74.00	-22.95	peak	H
5	15780.000	25.36	13.72	39.08	54.00	-14.92	AVG	H
1	5150.000	1.73	40.87	42.60	74.00	-31.40	peak	V
2	5150.000	1.73	33.44	35.17	54.00	-18.83	AVG	V
3	10520.000	13.22	31.03	44.25	68.20	-23.95	peak	V
4	15780.000	25.36	27.83	53.19	74.00	-20.81	peak	V
5	15780.000	25.36	16.67	42.03	54.00	-11.97	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 2, 802.11ac VHT20 CH60 UNII-2A
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5350.000	1.89	45.59	47.48	74.00	-26.52	peak	H
2	5350.000	1.89	33.40	35.29	54.00	-18.71	AVG	H
3	10600.000	13.46	30.69	44.15	74.00	-29.85	peak	H
4	10600.000	13.46	18.61	32.07	54.00	-21.93	AVG	H
5	15900.000	25.41	26.22	51.63	74.00	-22.37	peak	H
6	15900.000	25.41	14.35	39.76	54.00	-14.24	AVG	H
1	5350.000	1.89	42.33	44.22	74.00	-29.78	peak	V
2	5350.000	1.89	30.28	32.17	54.00	-21.83	AVG	V
3	10600.000	13.46	31.92	45.38	74.00	-28.62	peak	V
4	10600.000	13.46	19.18	32.64	54.00	-21.36	AVG	V
5	15900.000	25.41	26.55	51.96	74.00	-22.04	peak	V
6	15900.000	25.41	16.39	41.80	54.00	-12.20	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 2, 802.11ac VHT20 CH64 UNII-2A

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5350.000	1.89	49.57	51.46	74.00	-22.54	peak	H
2	5350.000	1.89	38.18	40.07	54.00	-13.93	AVG	H
3	10640.000	13.58	31.35	44.93	74.00	-29.07	peak	H
4	10640.000	13.58	18.70	32.28	54.00	-21.72	AVG	H
5	15960.000	25.44	25.90	51.34	74.00	-22.66	peak	H
6	15960.000	25.44	14.31	39.75	54.00	-14.25	AVG	H
1	5350.000	1.89	45.32	47.21	74.00	-26.79	peak	V
2	5350.000	1.89	33.24	35.13	54.00	-18.87	AVG	V
3	10640.000	13.58	35.04	48.62	74.00	-25.38	peak	V
4	10640.000	13.58	23.57	37.15	54.00	-16.85	AVG	V
5	15960.000	25.44	28.93	54.37	74.00	-19.63	peak	V
6	15960.000	25.44	14.84	40.28	54.00	-13.72	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 3, 802.11ac VHT40 CH54 UNII-2A

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5150.000	1.73	41.76	43.49	74.00	-30.51	peak	H
2	5150.000	1.73	28.94	30.67	54.00	-23.33	AVG	H
3	5350.000	1.89	43.32	45.21	74.00	-28.79	peak	H
4	5350.000	1.89	31.30	33.19	54.00	-20.81	AVG	H
5	10540.000	13.28	35.35	48.63	68.20	-19.57	peak	H
6	15810.000	25.37	27.34	52.71	74.00	-21.29	peak	H
7	15810.000	25.37	14.57	39.94	54.00	-14.06	AVG	H
1	5150.000	1.73	41.16	42.89	74.00	-31.11	peak	V
2	5150.000	1.73	28.44	30.17	54.00	-23.83	AVG	V
3	5350.000	1.89	42.10	43.99	74.00	-30.01	peak	V
4	5350.000	1.89	29.84	31.73	54.00	-22.27	AVG	V
5	10540.000	13.28	34.97	48.25	68.20	-19.95	peak	V
6	15810.000	25.37	26.39	51.76	74.00	-22.24	peak	V
7	15810.000	25.37	14.06	39.43	54.00	-14.57	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 3, 802.11ac VHT40 CH62 UNII-2A
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5350.000	1.89	68.78	70.67	74.00	-3.33	peak	H
2	5350.000	1.89	50.24	52.13	54.00	-1.87	AVG	H
3	10620.000	13.52	35.42	48.94	74.00	-25.06	peak	H
4	10620.000	13.52	24.30	37.82	54.00	-16.18	AVG	H
5	15930.000	25.43	26.50	51.93	74.00	-22.07	peak	H
6	15930.000	25.43	16.24	41.67	54.00	-12.33	AVG	H
1	5350.000	1.89	61.34	63.23	74.00	-10.77	peak	V
2	5350.000	1.89	48.47	50.36	54.00	-3.64	AVG	V
3	10620.000	13.52	36.44	49.96	74.00	-24.04	peak	V
4	10620.000	13.52	24.55	38.07	54.00	-15.93	AVG	V
5	15930.000	25.43	28.19	53.62	74.00	-20.38	peak	V
6	15930.000	25.43	14.77	40.20	54.00	-13.80	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 4, 802.11ac VHT80 CH58 UNII-2A

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5150.000	1.73	42.02	43.75	74.00	-30.25	peak	H
2	5150.000	1.73	28.22	29.95	54.00	-24.05	AVG	H
3	5350.000	1.89	68.78	70.67	74.00	-3.33	peak	H
4	5350.000	1.89	50.05	51.94	54.00	-2.06	AVG	H
5	10580.000	13.40	35.36	48.76	68.20	-19.44	peak	H
6	15870.000	25.40	29.13	54.53	74.00	-19.47	peak	H
7	15870.000	25.40	16.77	42.17	54.00	-11.83	AVG	H
1	5150.000	1.73	41.79	43.52	74.00	-30.48	peak	V
2	5150.000	1.73	30.19	31.92	54.00	-22.08	AVG	V
3	5350.000	1.89	64.72	66.61	74.00	-7.39	peak	V
4	5350.000	1.89	49.78	51.67	54.00	-2.33	AVG	V
5	10580.000	13.40	34.86	48.26	68.20	-19.94	peak	V
6	15870.000	25.40	26.30	51.70	74.00	-22.30	peak	V
7	15870.000	25.40	14.95	40.35	54.00	-13.65	AVG	V

Power	AC120V/60Hz
Test Mode	Mode 1, 802.11a CH100 UNII-2C

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5460.000	1.99	45.98	47.97	74.00	-26.03	peak	H
2	5460.000	1.99	37.96	39.95	54.00	-14.05	AVG	H
3	5470.000	1.99	49.08	51.07	68.20	-17.13	peak	H
4	11000.000	14.67	33.59	48.26	74.00	-25.74	peak	H
5	11000.000	14.67	20.21	34.88	54.00	-19.12	AVG	H
6	16500.000	29.95	22.28	52.23	68.20	-15.97	peak	H
1	5460.000	1.99	44.28	46.27	74.00	-27.73	peak	V
2	5460.000	1.99	39.05	41.04	54.00	-12.96	AVG	V
3	5470.000	1.99	48.37	50.36	68.20	-17.84	peak	V
4	11000.000	14.67	35.06	49.73	74.00	-24.27	peak	V
5	11000.000	14.67	24.98	39.65	54.00	-14.35	AVG	V
6	16500.000	29.95	23.22	53.17	68.20	-15.03	peak	V

Power	AC120V/60Hz
Test Mode	Mode 1, 802.11a CH116 UNII-2C
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5460.000	1.99	44.62	46.61	74.00	-27.39	peak	H
2	5460.000	1.99	32.87	34.86	54.00	-19.14	AVG	H
3	5470.000	1.99	44.14	46.13	68.20	-22.07	peak	H
4	5725.000	2.58	43.34	45.92	68.20	-22.28	peak	H
5	11160.000	15.05	33.00	48.05	74.00	-25.95	peak	H
6	11160.000	15.05	22.57	37.62	54.00	-16.38	AVG	H
7	16740.000	29.65	10.60	40.25	68.20	-27.95	peak	H
1	5460.000	1.99	43.79	45.78	74.00	-28.22	peak	V
2	5460.000	1.99	30.18	32.17	54.00	-21.83	AVG	V
3	5470.000	1.99	43.62	45.61	68.20	-22.59	peak	V
4	5725.000	2.58	42.48	45.06	68.20	-23.14	peak	V
5	11160.000	15.05	35.71	50.76	74.00	-23.24	peak	V
6	11160.000	15.05	24.78	39.83	54.00	-14.17	AVG	V
7	16740.000	29.65	23.62	53.27	68.20	-14.93	peak	V

Power	AC120V/60Hz
Test Mode	Mode 1, 802.11a CH140 UNII-2C

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5725.000	2.58	47.23	49.81	68.20	-18.39	peak	H
2	11400.000	15.62	22.00	37.62	74.00	-36.38	peak	H
3	11400.000	15.62	25.76	41.38	54.00	-12.62	AVG	H
4	17100.000	29.73	23.21	52.94	68.20	-15.26	peak	H
1	5725.000	2.58	50.02	52.60	68.20	-15.60	peak	V
2	11400.000	15.62	37.33	52.95	74.00	-21.05	peak	V
3	11400.000	15.62	24.76	40.38	54.00	-13.62	AVG	V
4	17100.000	29.73	24.42	54.15	68.20	-14.05	peak	V

Power	AC120V/60Hz
Test Mode	Mode 2, 802.11ac VHT20 CH100 UNII-2C

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5460.000	1.99	45.89	47.88	74.00	-26.12	peak	H
2	5460.000	1.99	32.76	34.75	54.00	-19.25	AVG	H
3	5470.000	1.99	48.55	50.54	68.20	-17.66	peak	H
4	11000.000	14.67	35.19	49.86	74.00	-24.14	peak	H
5	11000.000	14.67	24.53	39.20	54.00	-14.80	AVG	H
6	16500.000	29.95	21.22	51.17	68.20	-17.03	peak	H
1	5460.000	1.99	44.85	46.84	74.00	-27.16	peak	V
2	5460.000	1.99	32.28	34.27	54.00	-19.73	AVG	V
3	5470.000	1.99	46.05	48.04	68.20	-20.16	peak	V
4	11000.000	14.67	38.58	53.25	74.00	-20.75	peak	V
5	11000.000	14.67	26.05	40.72	54.00	-13.28	AVG	V
6	16500.000	29.95	22.43	52.38	68.20	-15.82	peak	V

Power	AC120V/60Hz
Test Mode	Mode 2, 802.11ac VHT20 CH116 UNII-2C
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5460.000	1.99	44.14	46.13	74.00	-27.87	peak	H
2	5460.000	1.99	30.39	32.38	54.00	-21.62	AVG	H
3	5470.000	1.99	43.60	45.59	68.20	-22.61	peak	H
4	5725.000	2.58	42.62	45.20	68.20	-23.00	peak	H
5	11160.000	15.05	35.11	50.16	74.00	-23.84	peak	H
6	11160.000	15.05	22.13	37.18	54.00	-16.82	AVG	H
7	16740.000	29.65	21.52	51.17	68.20	-17.03	peak	H
1	5460.000	1.99	42.77	44.76	74.00	-29.24	peak	V
2	5460.000	1.99	30.26	32.25	54.00	-21.75	AVG	V
3	5470.000	1.99	43.38	45.37	68.20	-22.83	peak	V
4	5725.000	2.58	42.58	45.16	68.20	-23.04	peak	V
5	11160.000	15.05	35.44	50.49	74.00	-23.51	peak	V
6	11160.000	15.05	25.37	40.42	54.00	-13.58	AVG	V
7	16740.000	29.65	23.11	52.76	68.20	-15.44	peak	V

Power	AC120V/60Hz
Test Mode	Mode 2, 802.11ac VHT20 CH140 UNII-2C

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5725.000	2.58	48.41	50.99	68.20	-17.21	peak	H
2	11400.000	15.62	34.56	50.18	74.00	-23.82	peak	H
3	11400.000	15.62	23.65	39.27	54.00	-14.73	AVG	H
4	17100.000	29.73	22.33	52.06	68.20	-16.14	peak	H
1	5725.000	2.58	44.71	47.29	68.20	-20.91	peak	V
2	11400.000	15.62	34.00	49.62	74.00	-24.38	peak	V
3	11400.000	15.62	22.21	37.83	54.00	-16.17	AVG	V
4	17100.000	29.73	21.40	51.13	68.20	-17.07	peak	V

Power	AC120V/60Hz
Test Mode	Mode 3, 802.11ac VHT40 CH102 UNII-2C

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5460.000	1.99	52.43	54.42	74.00	-19.58	peak	H
2	5460.000	1.99	40.08	42.07	54.00	-11.93	AVG	H
3	5470.000	1.99	62.97	64.96	68.20	-3.24	peak	H
4	11020.000	14.72	35.46	50.18	74.00	-23.82	peak	H
5	11020.000	14.72	25.00	39.72	54.00	-14.28	AVG	H
6	16530.000	29.91	24.16	54.07	68.20	-14.13	peak	H
1	5460.000	1.99	52.47	54.46	74.00	-19.54	peak	V
2	5460.000	1.99	40.30	42.29	54.00	-11.71	AVG	V
3	5470.000	1.99	56.94	58.93	68.20	-9.27	peak	V
4	11020.000	14.72	36.36	51.08	74.00	-22.92	peak	V
5	11020.000	14.72	23.65	38.37	54.00	-15.63	AVG	V
6	16530.000	29.91	21.01	50.92	68.20	-17.28	peak	V

Power	AC120V/60Hz
Test Mode	Mode 3, 802.11ac VHT40 CH110 UNII-2C
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5460.000	1.99	45.37	47.36	74.00	-26.64	peak	H
2	5460.000	1.99	33.86	35.85	54.00	-18.15	AVG	H
3	5470.000	1.99	44.90	46.89	68.20	-21.31	peak	H
4	5725.000	2.58	42.34	44.92	68.20	-23.28	peak	H
5	11100.000	14.91	39.47	54.38	74.00	-19.62	peak	H
6	11100.000	14.91	27.00	41.91	54.00	-12.09	AVG	H
7	16650.000	29.76	22.97	52.73	68.20	-15.47	peak	H
1	5460.000	1.99	43.45	45.44	74.00	-28.56	peak	V
2	5460.000	1.99	31.37	33.36	54.00	-20.64	AVG	V
3	5470.000	1.99	42.57	44.56	68.20	-23.64	peak	V
4	5725.000	2.58	43.14	45.72	68.20	-22.48	peak	V
5	11100.000	14.91	36.72	51.63	74.00	-22.37	peak	V
6	11100.000	14.91	25.16	40.07	54.00	-13.93	AVG	V
7	16650.000	29.76	20.62	50.38	68.20	-17.82	peak	V

Power	AC120V/60Hz
Test Mode	Mode 3, 802.11ac VHT40 CH134 UNII-2C
Note : Level = Reading + Factor Margin = Level – Limit Factor = Antenna Factor + Cable Loss – Amplifier Factor	

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5725.000	2.58	44.15	46.73	68.20	-21.47	peak	H
2	11340.000	15.48	35.89	51.37	74.00	-22.63	peak	H
3	11340.000	15.48	25.04	40.52	54.00	-13.48	AVG	H
4	17010.000	29.37	22.39	51.76	68.20	-16.44	peak	H
1	5725.000	2.58	44.11	46.69	68.20	-21.51	peak	V
2	11340.000	15.48	37.66	53.14	74.00	-20.86	peak	V
3	11340.000	15.48	24.94	40.42	54.00	-13.58	peak	V
4	17010.000	29.37	21.66	51.03	68.20	-17.17	peak	V

Power	AC120V/60Hz
Test Mode	Mode 4, 802.11ac VHT80 CH106 UNII-2C

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector mode (PK/AVG)	AntPol. H/V
1	5460.000	1.99	57.12	59.11	74.00	-14.89	peak	H
2	5460.000	1.99	42.63	44.62	54.00	-9.38	AVG	H
3	5470.000	1.99	59.06	61.05	68.20	-7.15	peak	H
4	5725.000	2.58	42.78	45.36	68.20	-22.84	peak	H
5	11060.000	14.81	38.16	52.97	74.00	-21.03	peak	H
6	11060.000	14.81	27.57	42.38	54.00	-11.62	AVG	H
7	16590.000	29.84	21.22	51.06	68.20	-17.14	peak	H
1	5460.000	1.99	57.12	59.11	74.00	-14.89	peak	V
2	5460.000	1.99	42.36	44.35	54.00	-9.65	AVG	V
3	5470.000	1.99	59.06	61.05	68.20	-7.15	peak	V
4	5725.000	2.58	42.78	45.36	68.20	-22.84	peak	V
5	11060.000	14.81	30.37	45.18	74.00	-28.82	peak	V
6	11060.000	14.81	22.55	37.36	54.00	-16.64	AVG	V
7	16590.000	29.84	21.23	51.07	68.20	-17.13	peak	V

6.7. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

7. On Time, Duty Cycle and Measurement methods

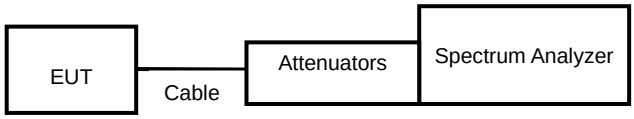
7.1. Test Limit

None; for reporting purposes only.

7.2. Test Procedure

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.3. Test Setup Layout



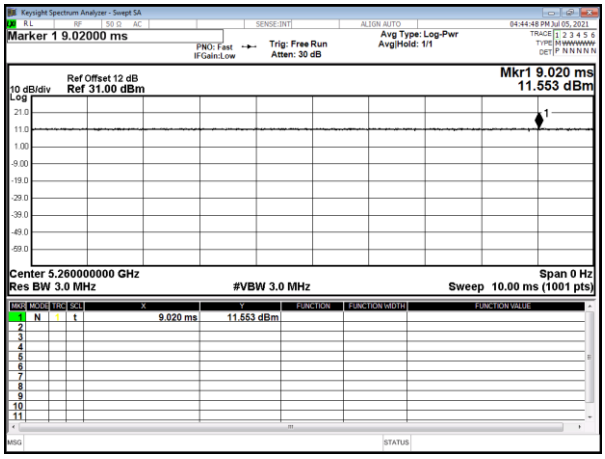
7.4. Test Result and Data

Modulation Mode	On Time (msec)	Period Time (msec)	Duty Cycle (%)
802.11a	100.00	100.00	100.00%
802.11ac VHT20	100.00	100.00	100.00%
802.11ac VHT40	100.00	100.00	100.00%
802.11ac VHT80	100.00	100.00	100.00%

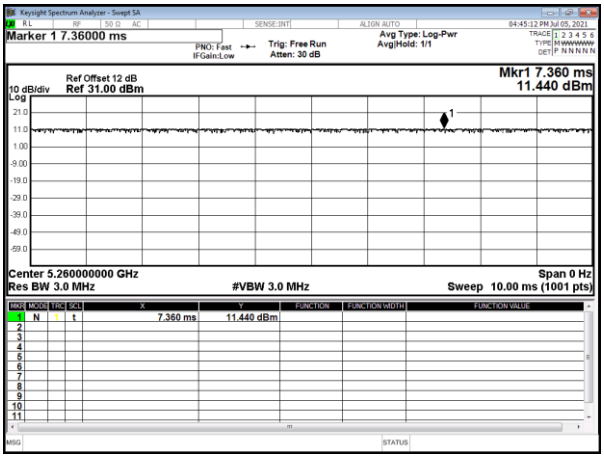
7.5. Measurement Methods

26 dB and 6dB Emission BW	KDB 789033 D02 v01, Section C
99% Occupied BW	KDB 789033 D02 v01, Section D
Conducted Output Power	KDB 789033 D02 v01, Section E.2.d and E.3.b (Method PM-G)
Power Spectral Density	KDB 789033 D02 v01, Section F
Unwanted emissions in restricted bands	KDB 789033 D02 v01, Sections G and H
Unwanted emissions in non-restricted bands	KDB 789033 D02 v01, Sections G and H

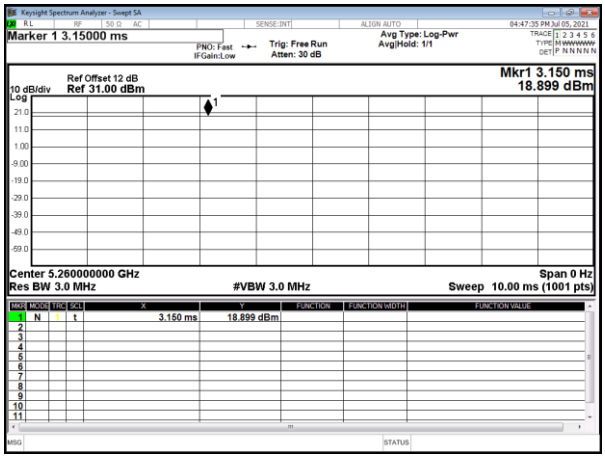
Modulation Type: 802.11a (6Mbps)



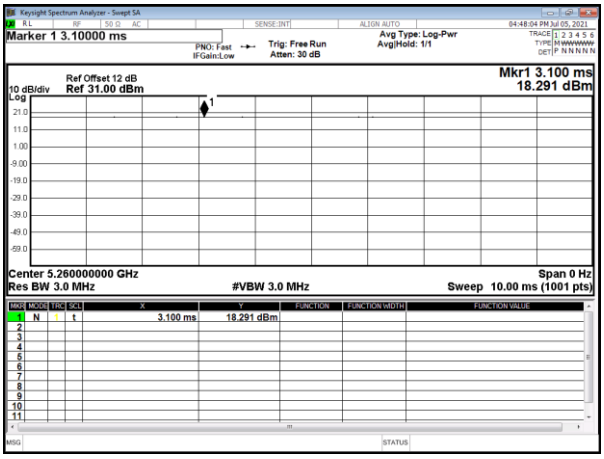
Modulation Type: 802.11ac VHT20 (6.5Mbps)



Modulation Type: 802.11ac VHT40 (13.5Mbps)



Modulation Type: 802.11ac VHT80 (29.3Mbps)



8. 26dB Bandwidth & 99% Occupied Bandwidth

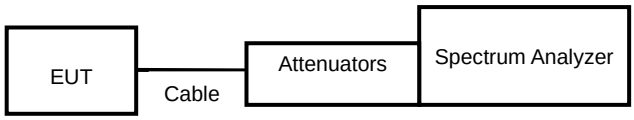
8.1. Test Limit

None; for reporting purposes only.

8.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW = approximately 1% of the emission bandwidth, the VBW >= 3 x RBW, peak detector and max hold.

8.3. Test Setup Layout



8.4. Test Result and Data (26dB Bandwidth)

In the 5.3G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	52	5260	32.38	26.40
	60	5300	31.29	24.77
	64	5320	27.36	25.13
802.11ac VHT20	52	5260	22.57	20.44
	60	5300	20.38	19.89
	64	5320	20.38	20.24
802.11ac VHT40	54	5270	53.47	40.74
	62	5310	42.38	40.73
802.11ac VHT80	58	5290	88.85	86.77

In the 5.5G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	100	5500	20.95	19.76
	116	5580	20.16	20.43
	140	5700	24.16	23.16
802.11ac VHT20	100	5500	19.99	20.11
	116	5580	19.95	20.06
	140	5700	20.09	20.62
802.11ac VHT40	102	5510	40.34	40.53
	110	5550	40.35	41.95
	134	5670	40.42	40.14
802.11ac VHT80	106	5530	81.11	83.48

8.5. Test Result and Data (99% Occupied Bandwidth)

In the 5.3G Band

Mode	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT B
802.11a	52	5260	17.95	16.89
	60	5300	17.40	16.97
	64	5320	17.31	16.89
802.11ac VHT20	52	5260	17.94	17.71
	60	5300	17.86	17.69
	64	5320	17.89	17.69
802.11ac VHT40	54	5270	36.22	36.11
	62	5310	36.08	36.10
802.11ac VHT80	58	5290	75.15	75.04

In the 5.5G Band

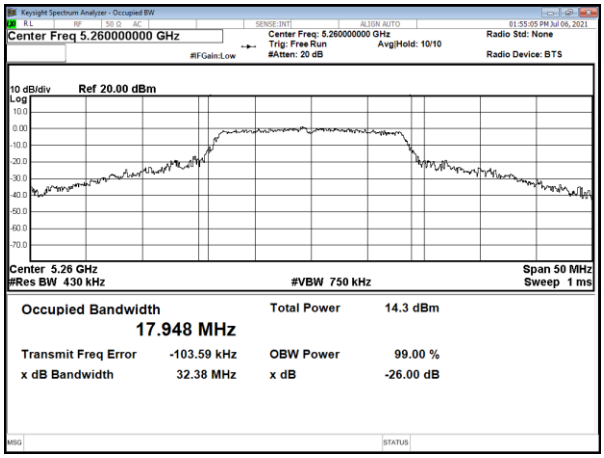
Mode	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT B
802.11a	100	5500	16.65	16.71
	116	5580	16.76	16.75
	140	5700	16.68	16.79
802.11ac VHT20	100	5500	17.66	17.66
	116	5580	17.67	17.68
	140	5700	17.69	17.69
802.11ac VHT40	102	5510	35.99	36.09
	110	5550	36.05	36.09
	134	5670	36.09	36.11
802.11ac VHT80	106	5530	74.92	74.92

ANT A

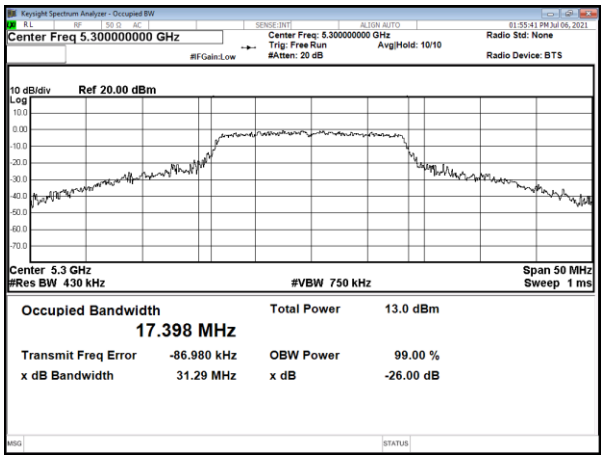
26dB Bandwidth &99% Occupied Bandwidth, UNII-2A

Modulation Standard: 802.11a (6Mbps)

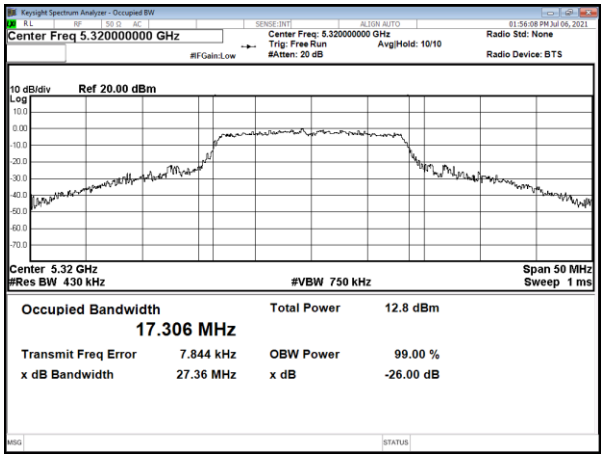
CH52



CH60

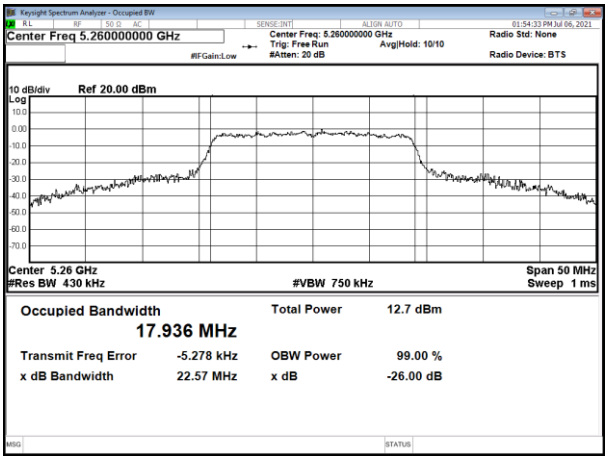


CH64

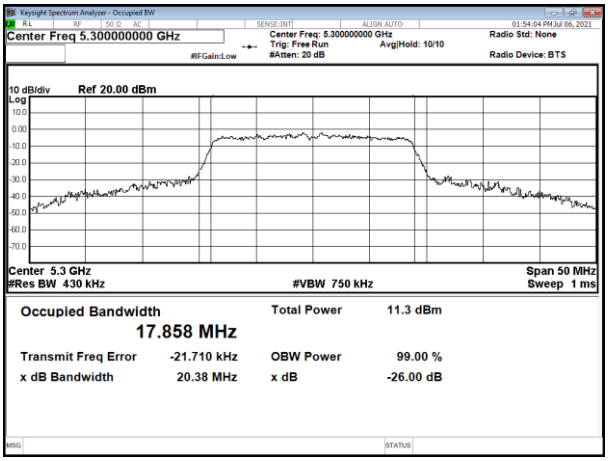


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

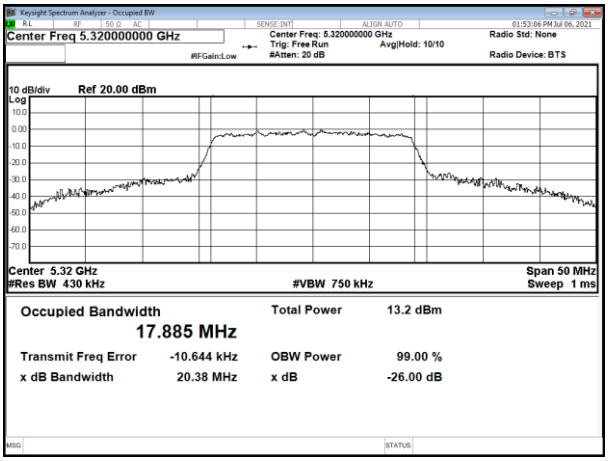
CH52



CH60



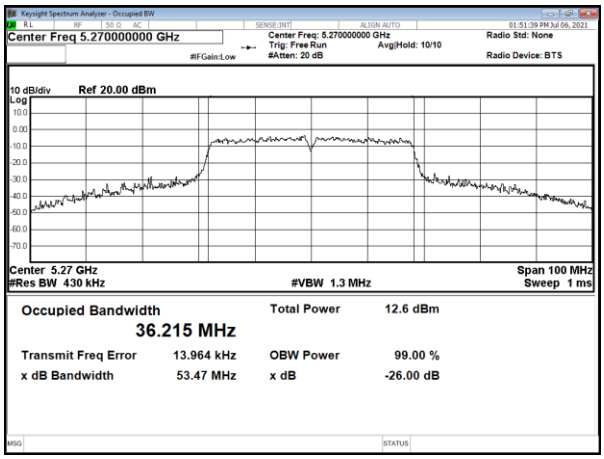
CH64



26dB Bandwidth &99% Occupied Bandwidth, UNII-2A

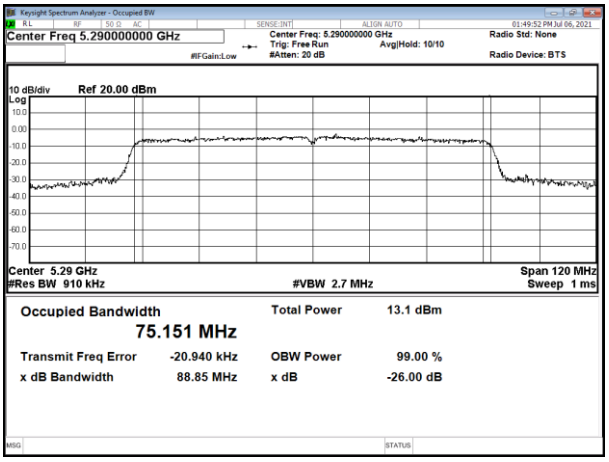
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH54

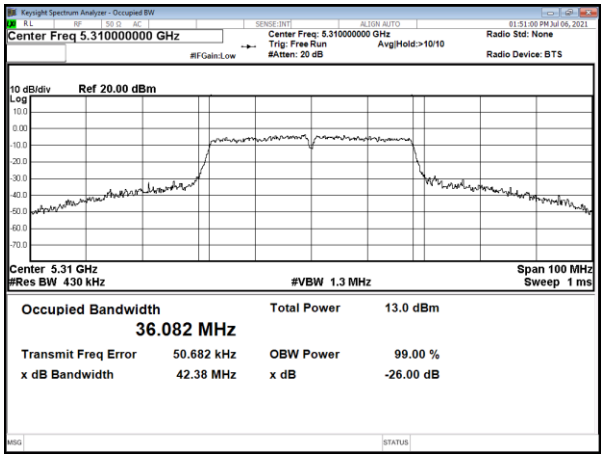


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH58



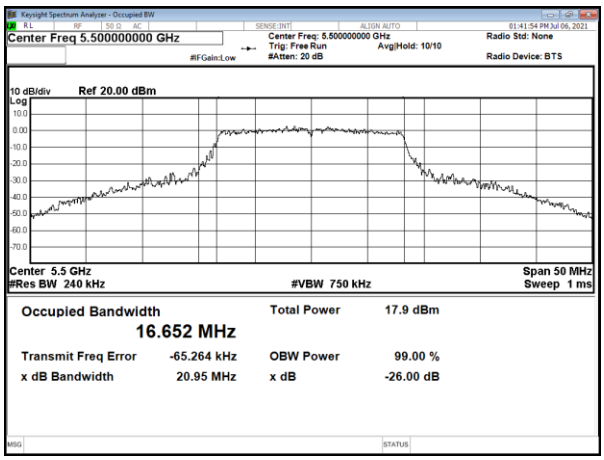
CH62



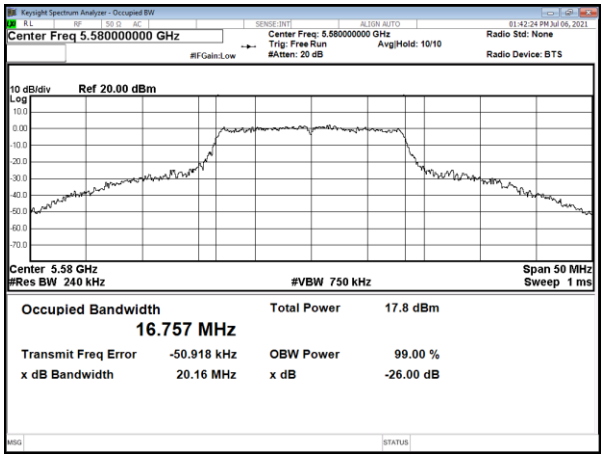
26dB Bandwidth &99% Occupied Bandwidth, UNII-2C

Modulation Standard: 802.11a (6Mbps)

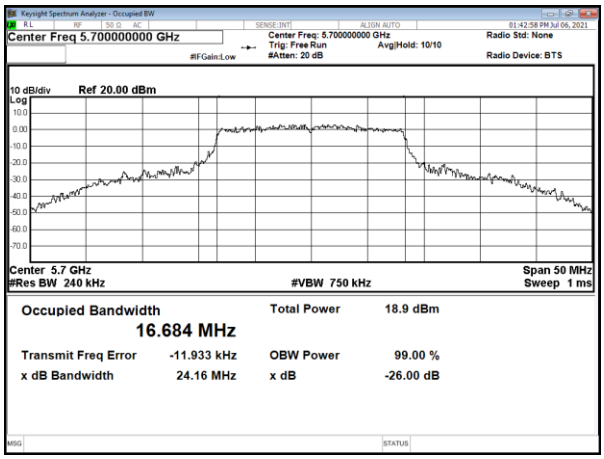
CH100



CH116

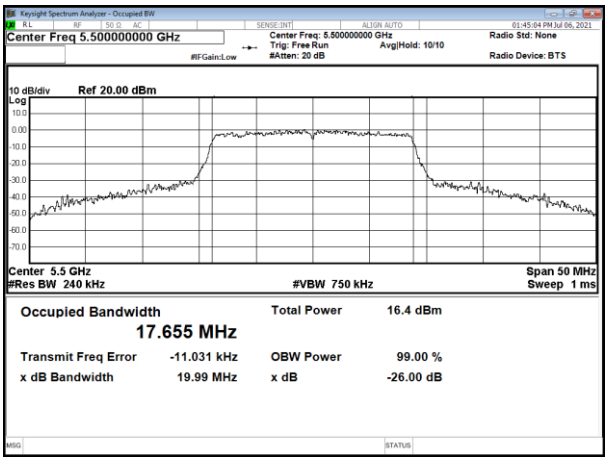


CH140

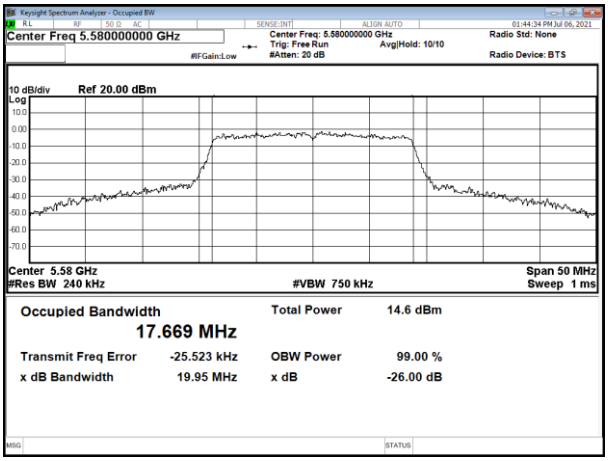


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

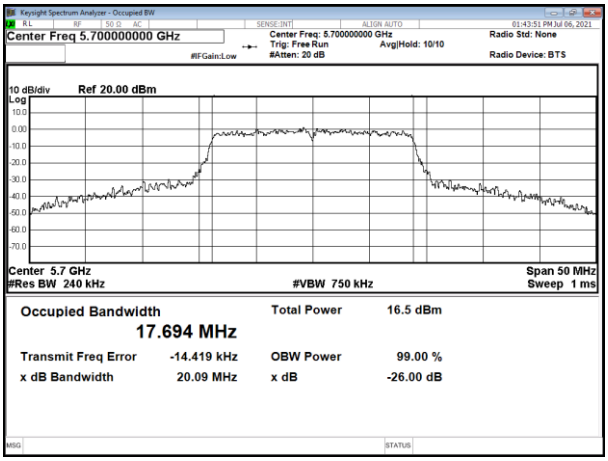
CH100



CH116



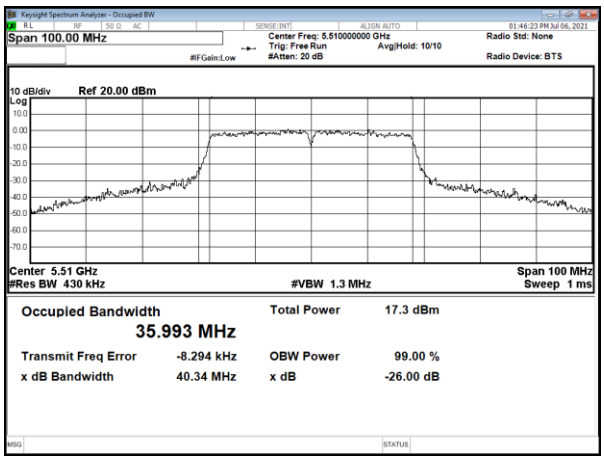
CH140



26dB Bandwidth &99% Occupied Bandwidth, UNII-2C

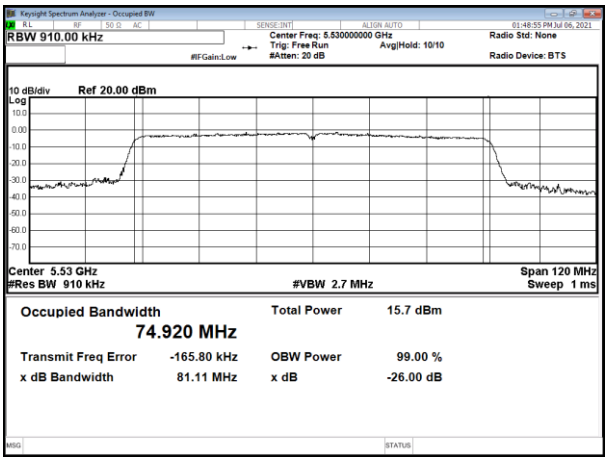
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH102

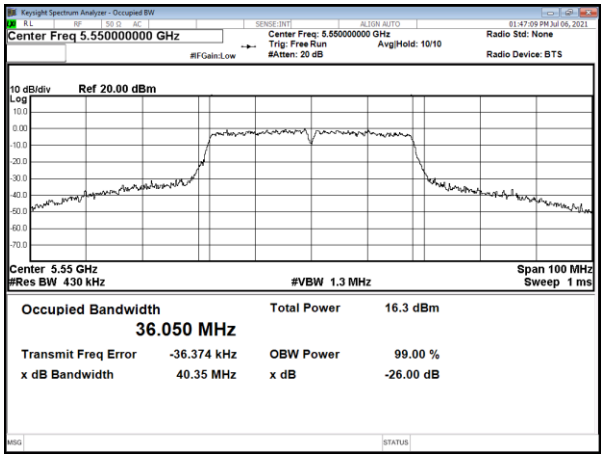


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

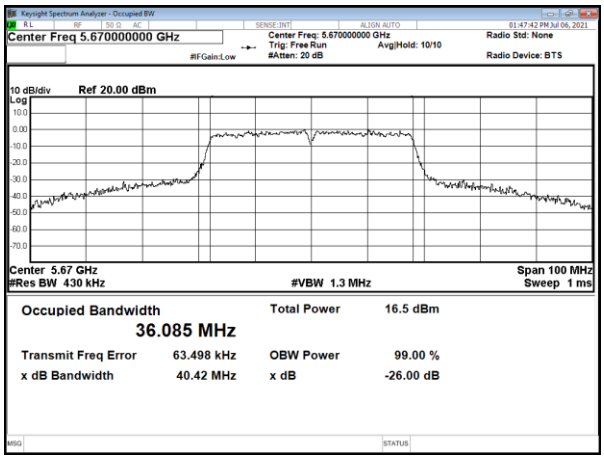
CH106



CH1110



CH134

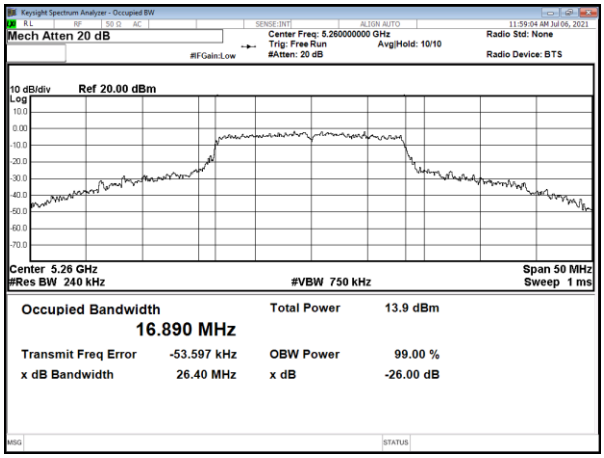


ANT B

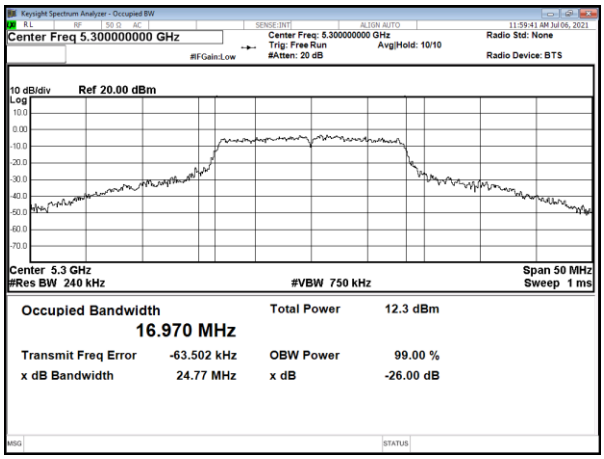
26dB Bandwidth &99% Occupied Bandwidth, UNII-2A

Modulation Standard: 802.11a (6Mbps)

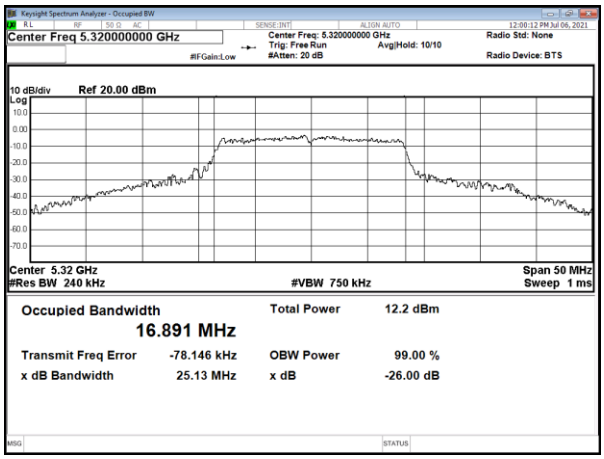
CH52



CH60

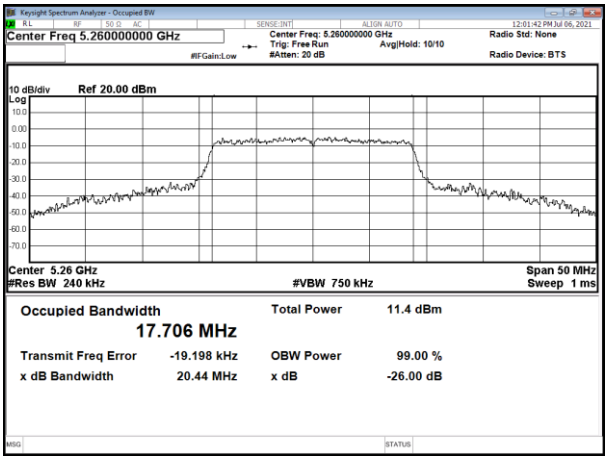


CH64

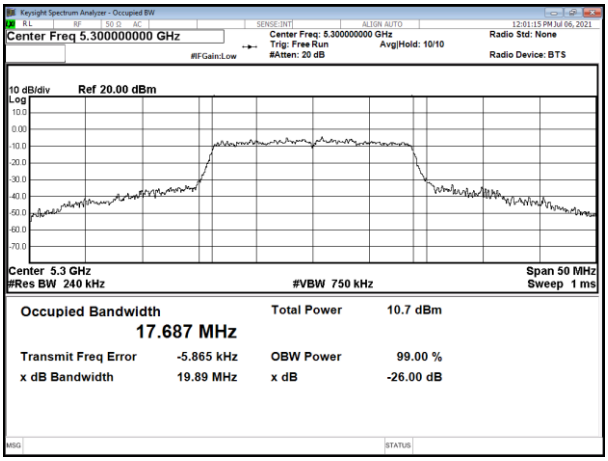


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

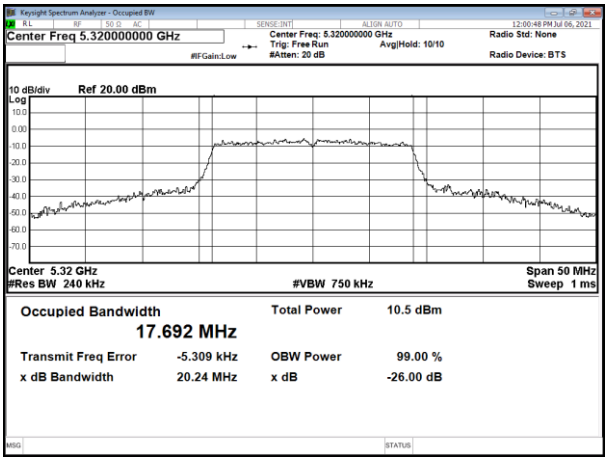
CH52



CH60



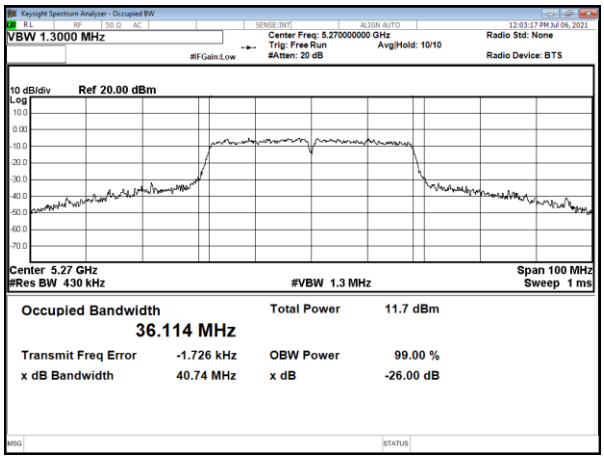
CH64



26dB Bandwidth &99% Occupied Bandwidth, UNII-2A

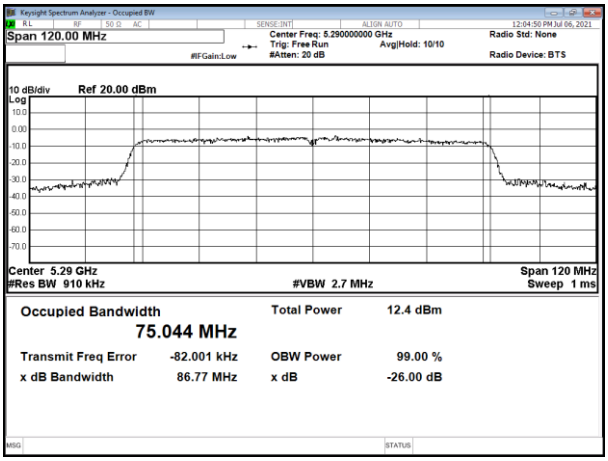
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH54

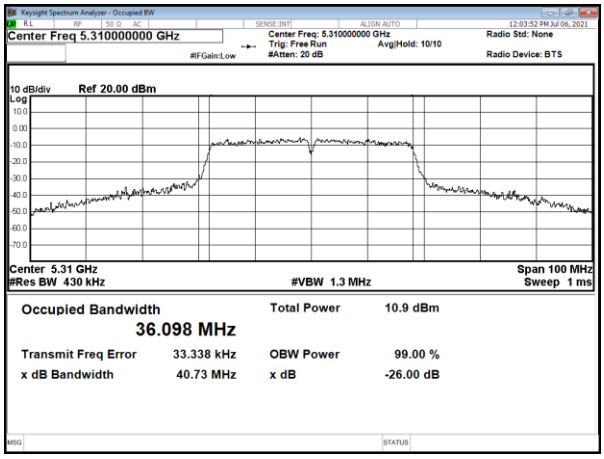


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH58



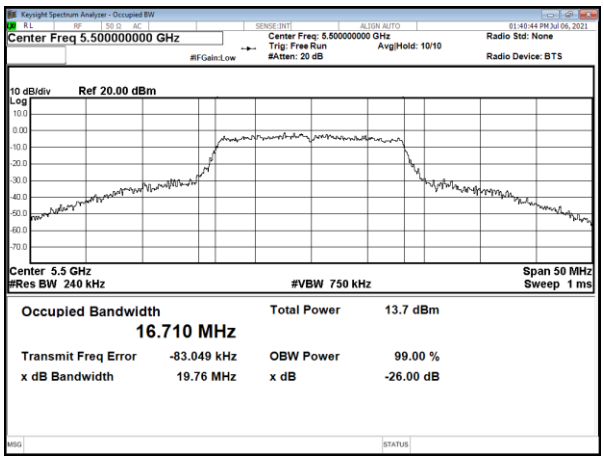
CH62



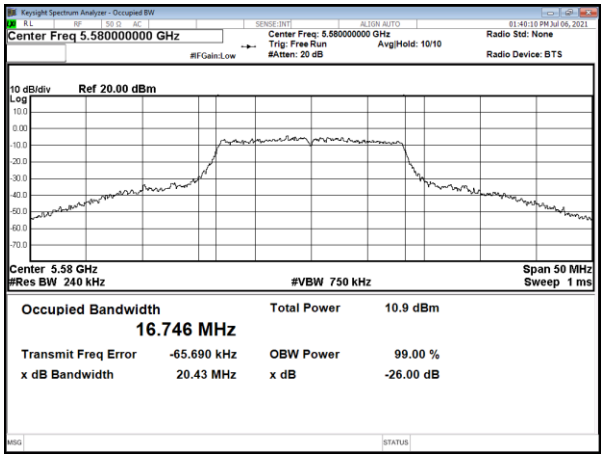
26dB Bandwidth &99% Occupied Bandwidth, UNII-2C

Modulation Standard: 802.11a (6Mbps)

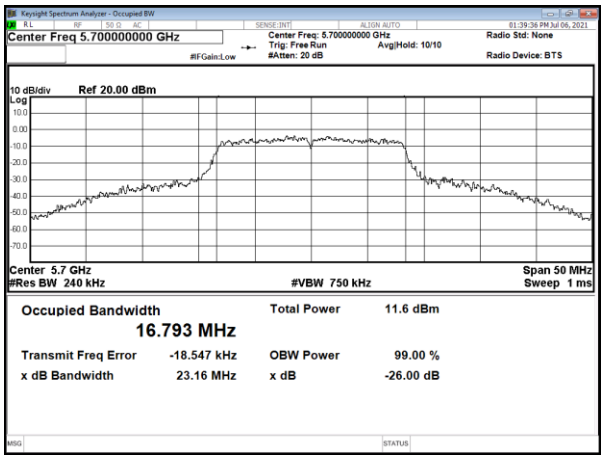
CH100



CH116

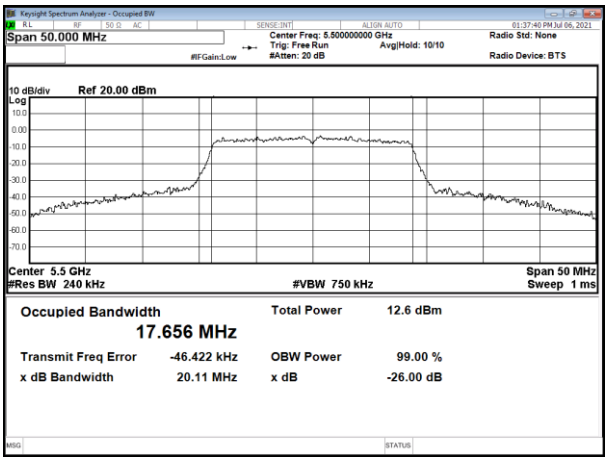


CH140

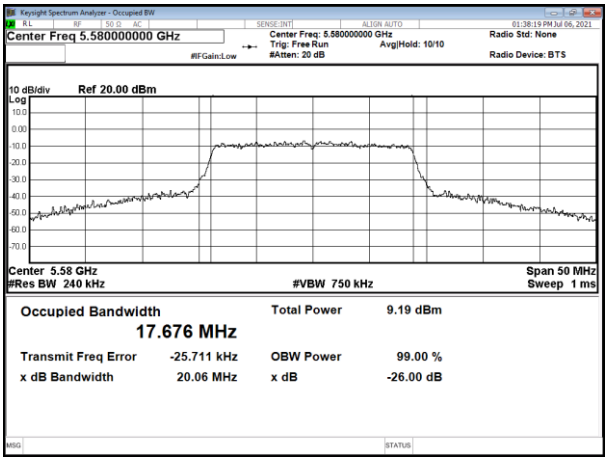


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

CH100



CH116



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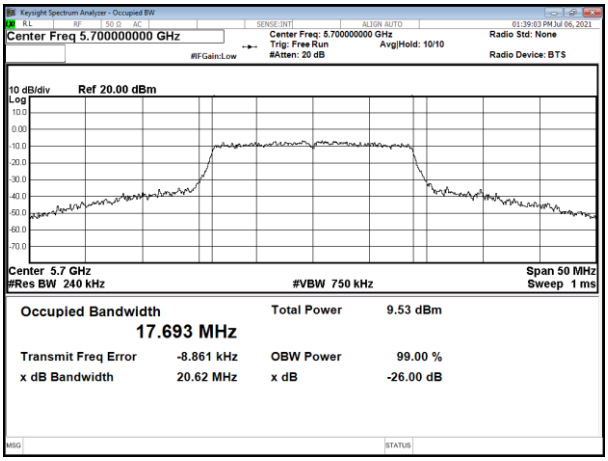
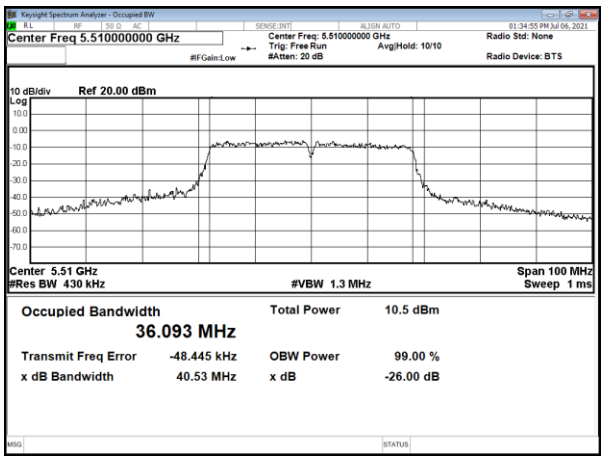


26dB Bandwidth &99% Occupied Bandwidth, UNII-2C

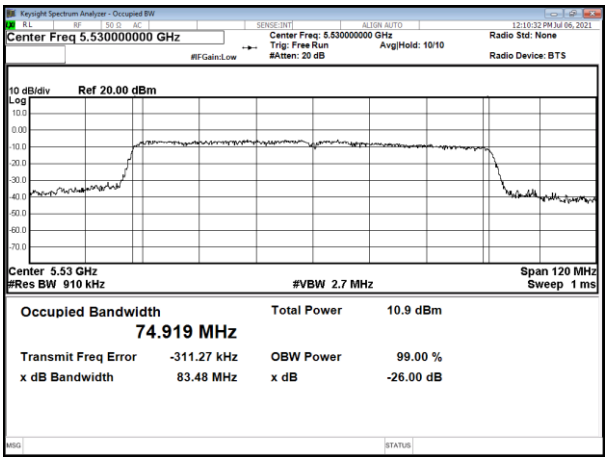
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH102

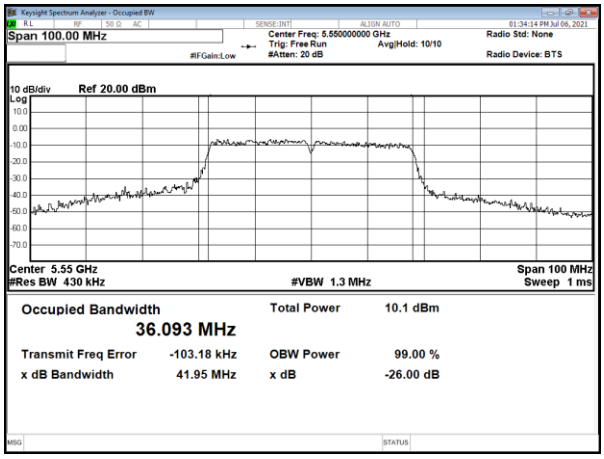


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

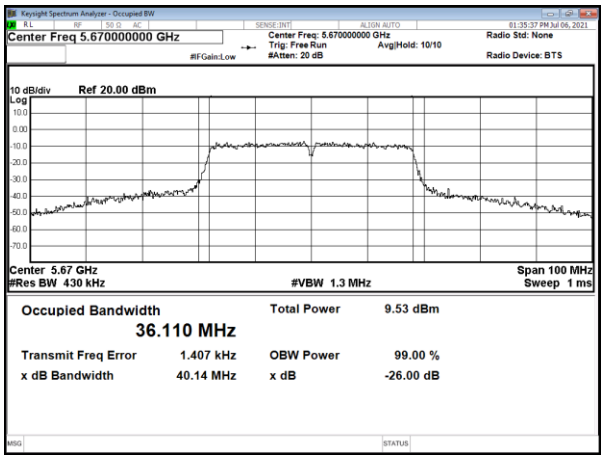
CH106



CH1110



CH134



9. Average Power

9.1. Test Limit

Output Power:

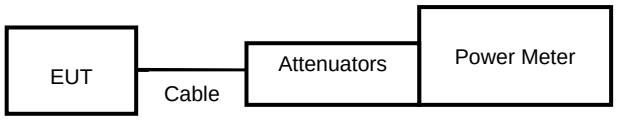
Frequency Band			Limit
☒	5.15~5.25GHz		
	Operating Mode		
	☐	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30degrees as measured from the horizon must not exceed125 mW (21 dBm).
	☐	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
	☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
	☒	client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Frequency Band		Limit
☒	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☒	5.470-5.725 GHz	
☐	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

9.2. Test Procedure

The transmitter output is connected to a power meter.
The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

9.3. Test Setup Layout



9.4. Test Result and Data

In the 5.3G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B	A+B	
11a	52	5260	7.32	7.22	10.28	10.667	24.00
11a	60	5300	7.41	7.03	10.23	10.555	24.00
11a	64	5320	7.25	7.13	10.20	10.473	24.00
11n HT20	52	5260	7.35	7.52	10.45	11.082	24.00
11n HT20	60	5300	7.44	7.12	10.29	10.699	24.00
11n HT20	64	5320	7.24	7.16	10.21	10.497	24.00
11n HT40	54	5270	6.32	4.02	8.33	6.809	24.00
11n HT40	62	5310	6.12	3.40	7.98	6.280	24.00
11ac VHT20	52	5260	7.56	7.58	10.58	11.430	24.00
11ac VHT20	60	5300	7.53	7.24	10.40	10.959	23.99
11ac VHT20	64	5320	7.35	7.35	10.36	10.865	24.00
11ac VHT40	54	5270	6.54	4.04	8.48	7.043	24.00
11ac VHT40	62	5310	6.24	3.43	8.07	6.410	24.00
11ac VHT80	58	5290	4.02	1.02	5.78	3.788	24.00

In the 5.5G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B	A+B	
11a	100	5500	7.65	7.35	10.51	11.254	23.96
11a	116	5580	7.86	7.54	10.71	11.785	24.00
11a	140	5700	7.27	7.31	10.30	10.716	24.00
11n HT20	100	5500	7.30	6.94	10.13	10.313	24.00
11n HT20	116	5580	7.44	7.72	10.59	11.462	24.00
11n HT20	140	5700	7.28	7.15	10.23	10.534	24.00
11n HT40	102	5510	6.00	6.28	9.15	8.227	24.00
11n HT40	110	5550	6.12	6.50	9.32	8.559	24.00
11n HT40	134	5670	6.32	6.36	9.35	8.611	24.00
11ac VHT20	100	5500	7.31	6.98	10.16	10.372	24.00
11ac VHT20	116	5580	7.46	7.78	10.63	11.570	24.00
11ac VHT20	140	5700	7.32	7.16	10.25	10.595	24.00
11ac VHT40	102	5510	6.02	6.33	9.19	8.295	24.00
11ac VHT40	110	5550	6.19	6.53	9.37	8.657	24.00
11ac VHT40	134	5670	6.33	6.41	9.38	8.671	24.00
11ac VHT80	106	5530	3.92	4.25	7.10	5.127	24.00

10. Maximum Power Spectral Density

10.1. Test Limit

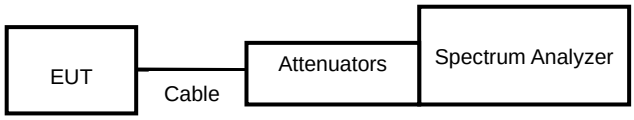
PSD:

Frequency Band			Limit
☐	5.15~5.25GHz		
	Operating Mode		
	☐	Outdoor access point	17 dBm/MHz
	☐	Indoor access point	17 dBm/MHz
	☐	Fixed point-to-point access points	17 dBm/MHz
	☐	client devices	11 dBm/MHz
☒	5.250~5.350 GHz		11 dBm/MHz
☒	5.470~5.725 GHz		11 dBm/MHz
☐	5.725~5.85 GHz		30 dBm/500kHz

10.2. Test Procedure

Reference to KDB789033 D02 General UNII Test Procedures New Rules v02r01

10.3. Test Setup Layout



10.4. Test Result and Data

In the 5.3G Band

Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PPSD (dBm/MHz)	PPSD Limit (dBm/MHz)
			ANT A	ANT B				
11a	52	5260	0.00	-1.11	2.49	0.00	2.49	11.00
11a	60	5300	-1.21	-2.32	1.28	0.00	1.28	11.00
11a	64	5320	-0.94	-2.82	1.23	0.00	1.23	11.00
11ac VHT20	52	5260	-2.23	-3.15	0.35	0.00	0.35	11.00
11ac VHT20	60	5300	-2.48	-4.01	-0.17	0.00	-0.17	11.00
11ac VHT20	64	5320	-3.02	-4.19	-0.56	0.00	-0.56	11.00
11ac VHT40	54	5270	-5.33	-6.27	-2.77	0.00	-2.77	11.00
11ac VHT40	62	5310	-6.31	-7.14	-3.70	0.00	-3.70	11.00
11ac VHT80	58	5290	-8.48	-9.92	-6.13	0.00	-6.13	11.00

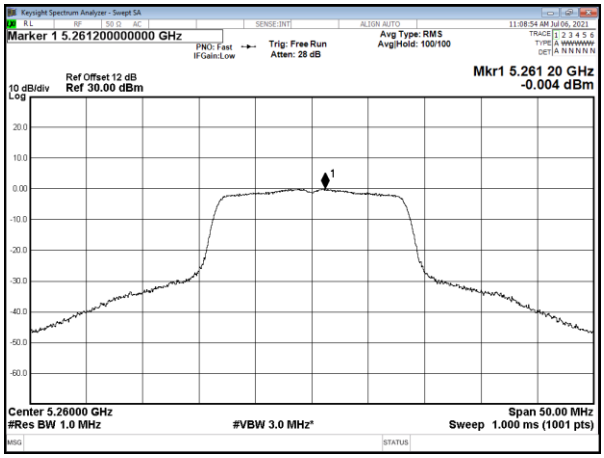
In the 5.5G Band

Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PPSD (dBm/MHz)	PPSD Limit (dBm/MHz)
			ANT A	ANT B				
11a	100	5500	-1.46	-2.61	1.01	0.00	1.01	11.00
11a	116	5580	-0.16	-6.34	0.78	0.00	0.78	11.00
11a	140	5700	0.60	-5.19	1.62	0.00	1.62	11.00
11ac VHT20	100	5500	0.10	-7.12	0.86	0.00	0.86	11.00
11ac VHT20	116	5580	-1.84	-7.71	-0.84	0.00	-0.84	11.00
11ac VHT20	140	5700	-1.07	-7.57	-0.19	0.00	-0.19	11.00
11ac VHT40	102	5510	-3.77	-9.31	-2.70	0.00	-2.70	11.00
11ac VHT40	110	5550	-5.36	-10.46	-4.19	0.00	-4.19	11.00
11ac VHT40	134	5670	-4.22	-10.57	-3.31	0.00	-3.31	11.00
11ac VHT80	106	5530	-8.36	-11.96	-6.79	0.00	-6.79	11.00

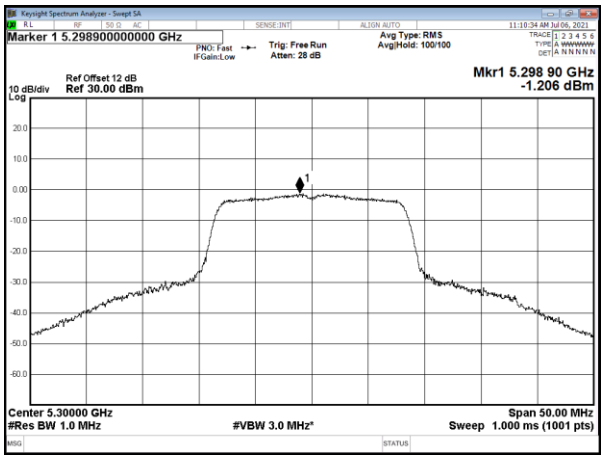
ANT A
5.3G, UNII-2A

Modulation Standard: 802.11a (6Mbps)

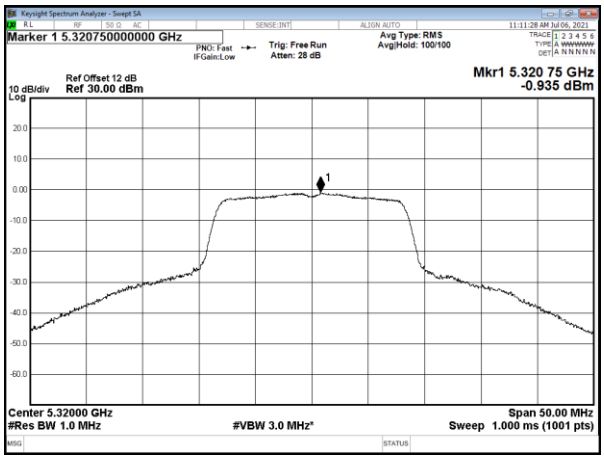
CH52



CH60

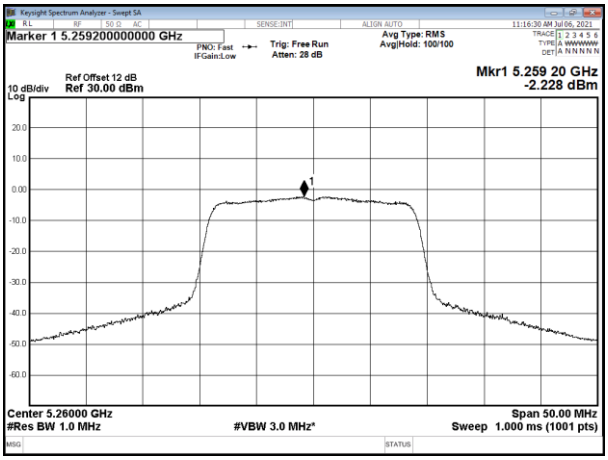


CH64

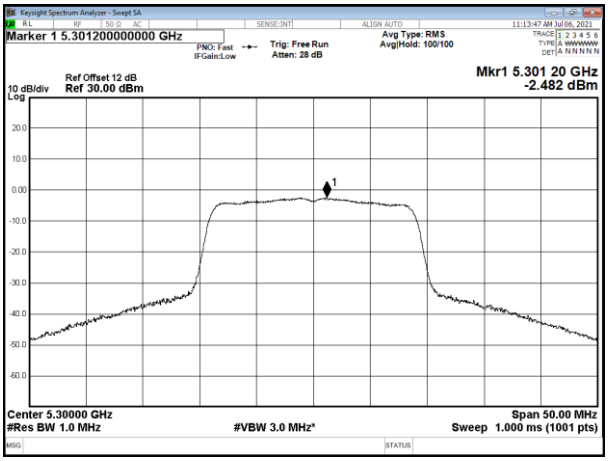


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

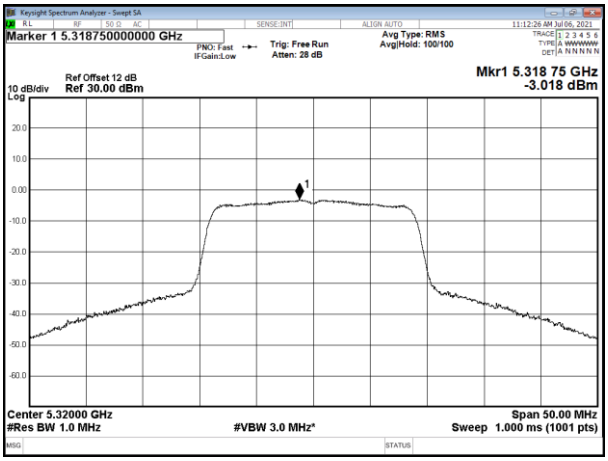
CH52



CH60



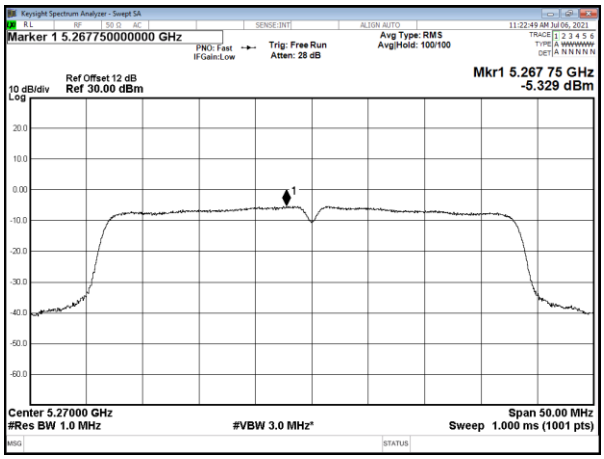
CH64



5.3G, UNII-2A

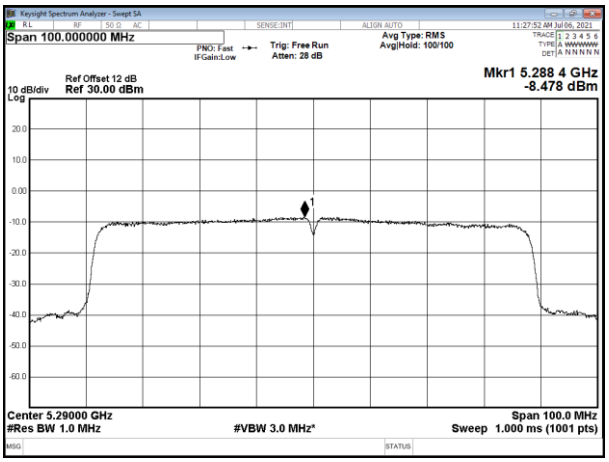
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH54

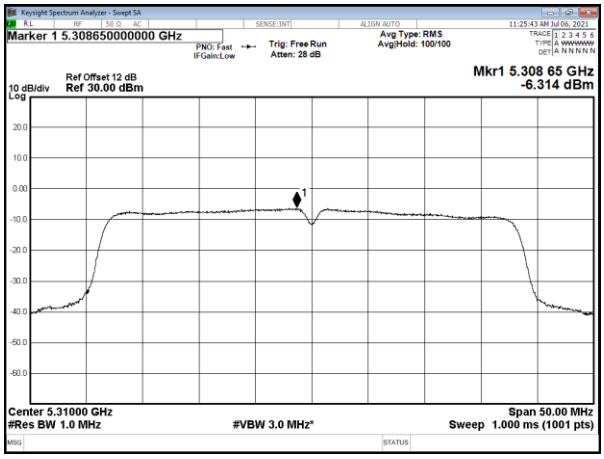


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH58



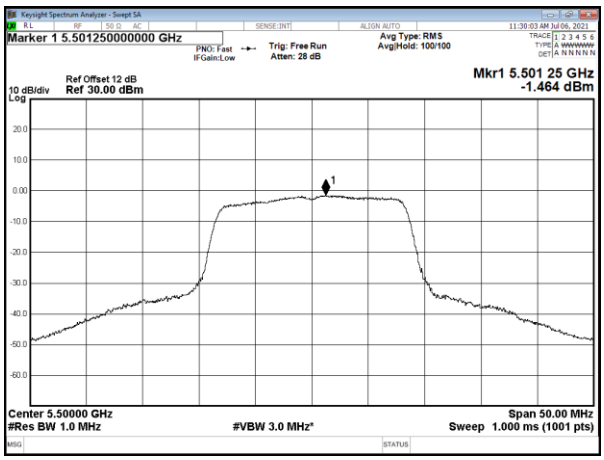
CH62



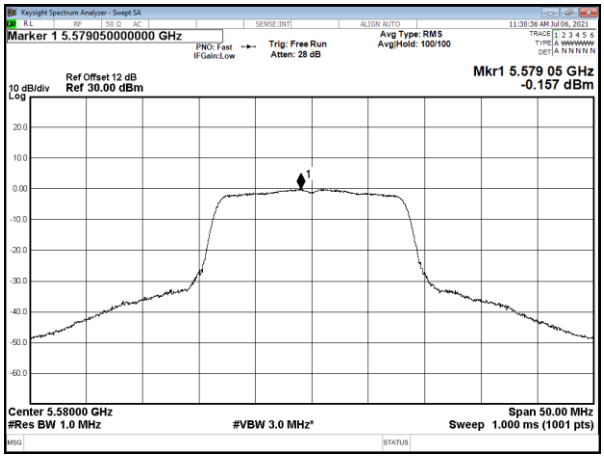
5.5G, UNII-2C

Modulation Standard: 802.11a (6Mbps)

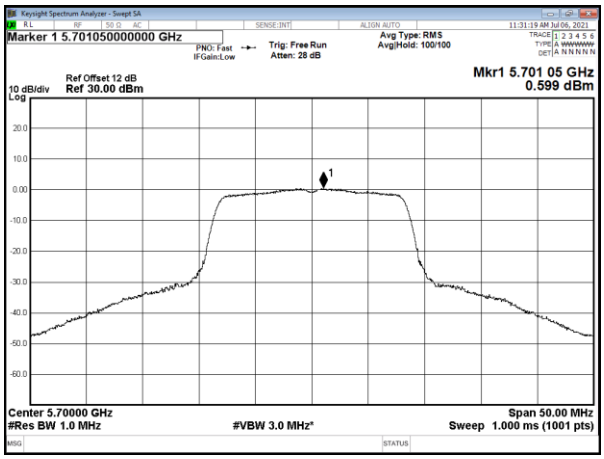
CH100



CH116

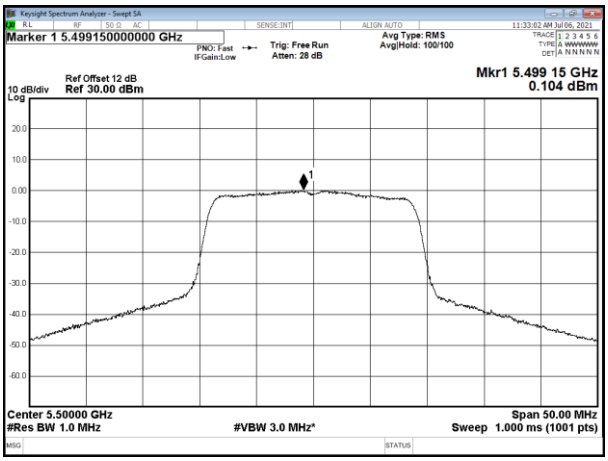


CH140

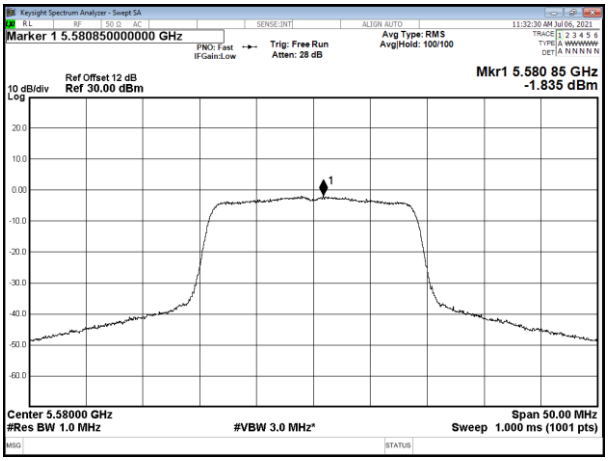


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

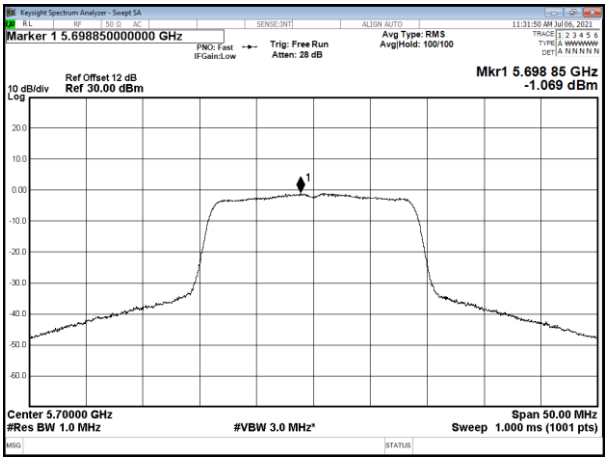
CH100



CH116



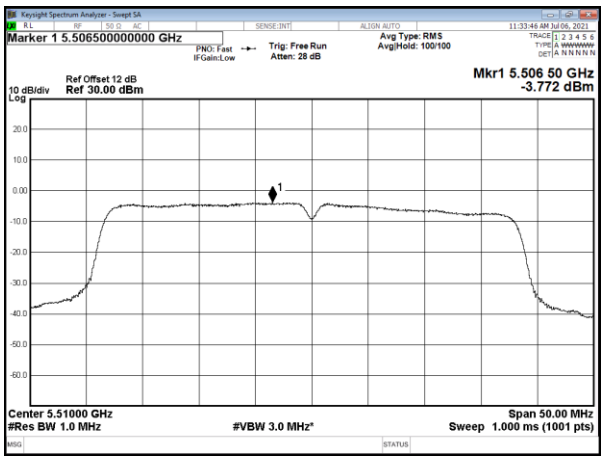
CH140



5.5G, UNII-2C

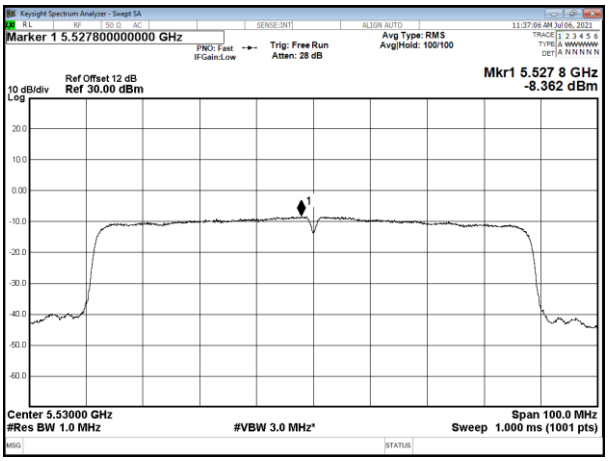
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH102

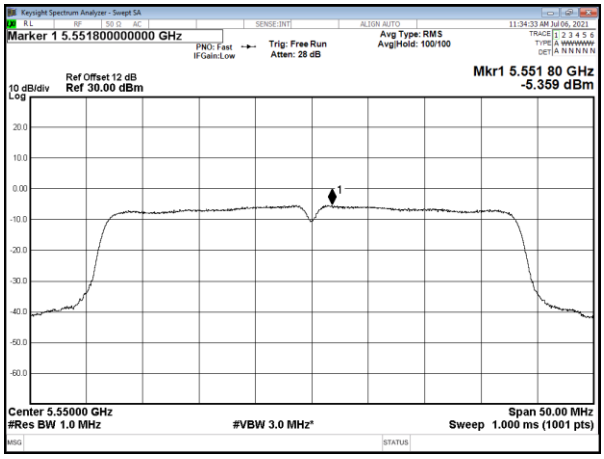


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

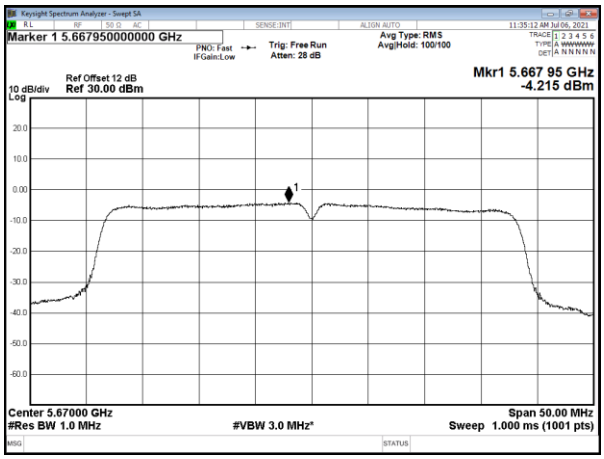
CH106



CH1110



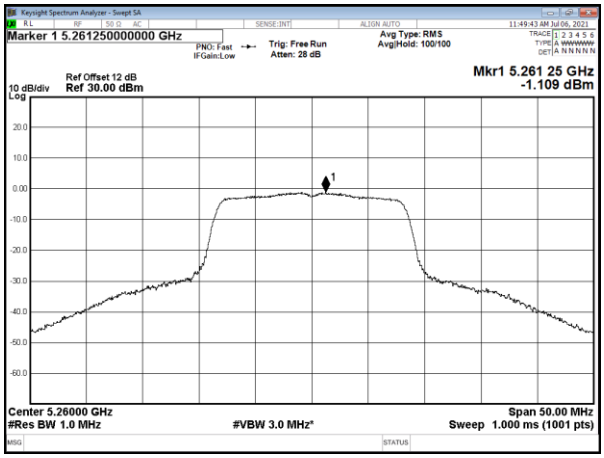
CH134



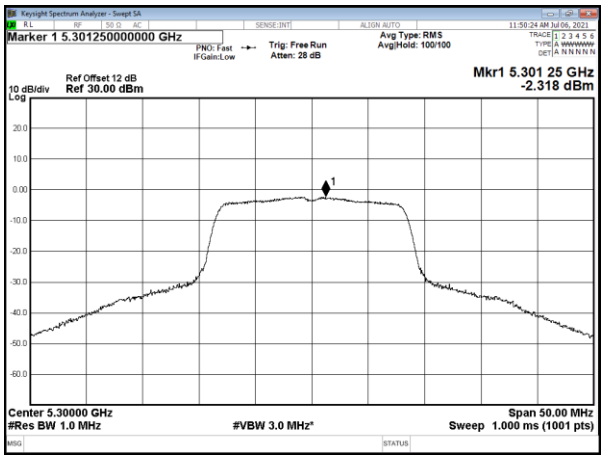
ANT B
5.3G, UNII-2A

Modulation Standard: 802.11a (6Mbps)

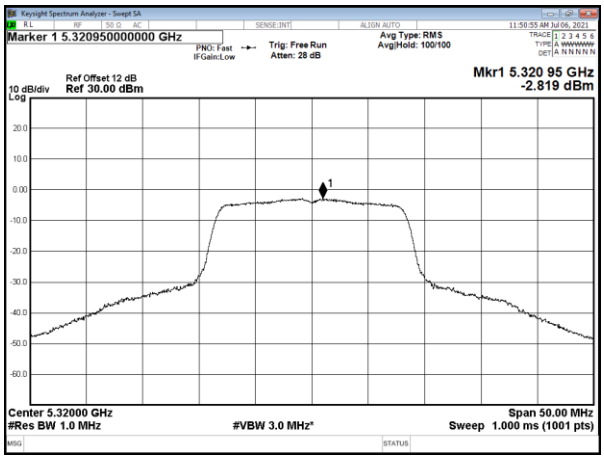
CH52



CH60

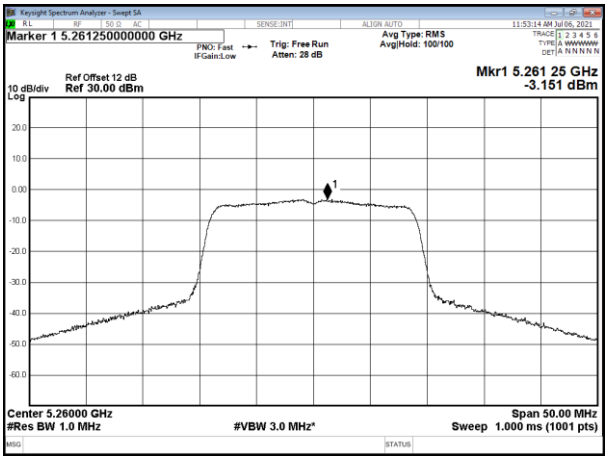


CH64

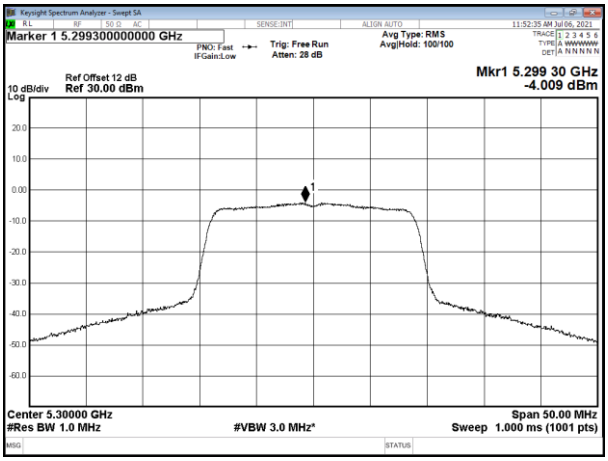


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

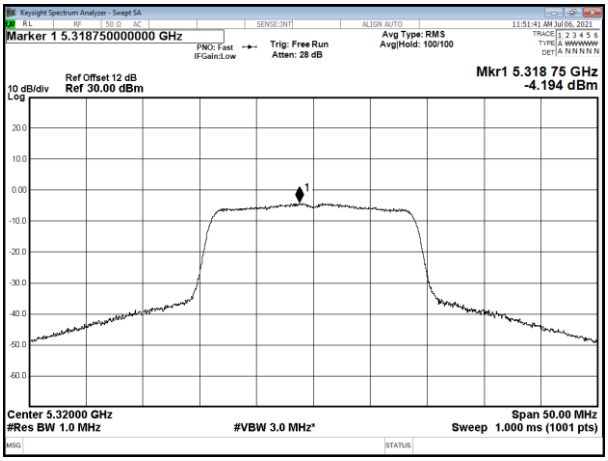
CH52



CH60



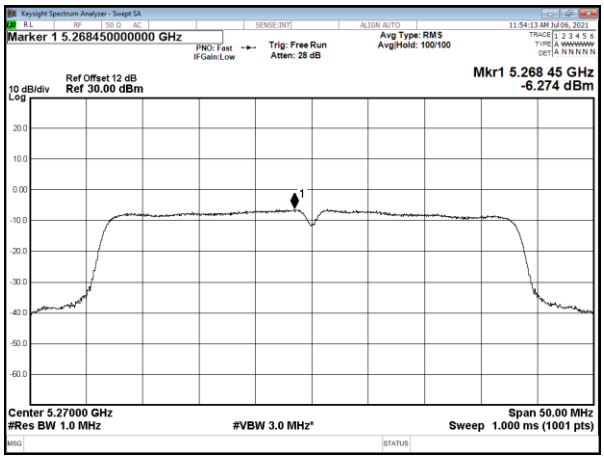
CH64



5.3G, UNII-2A

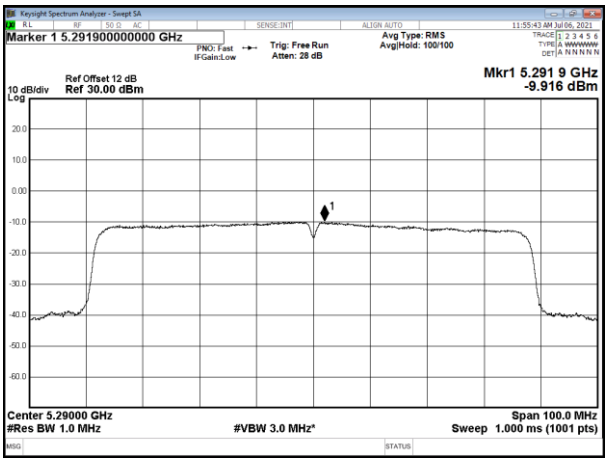
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH54

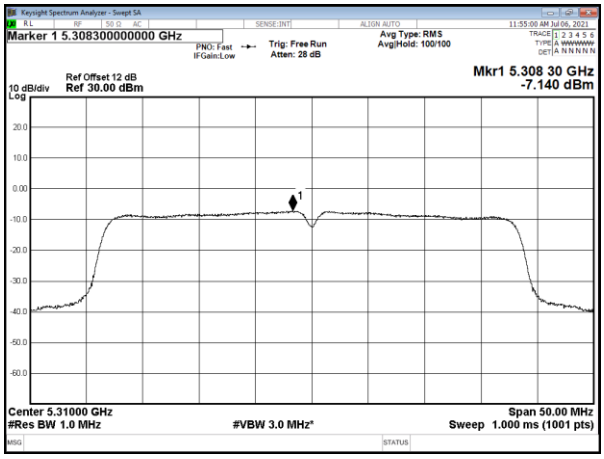


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH58



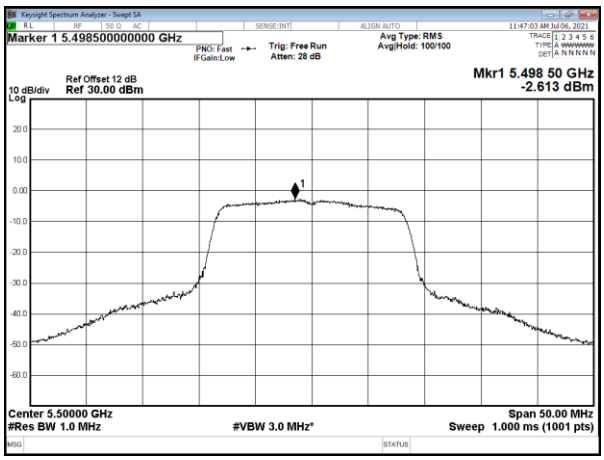
CH62



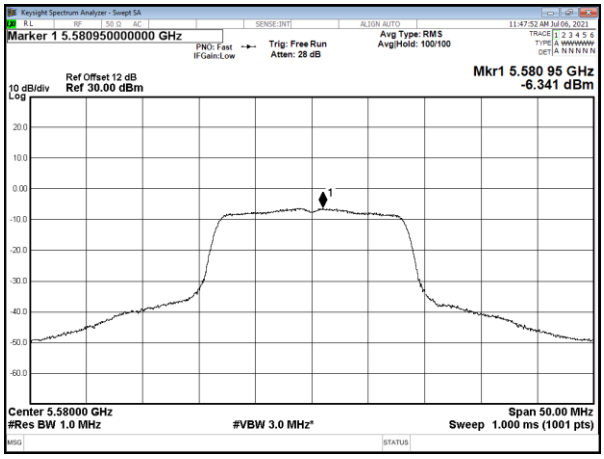
5.5G, UNII-2C

Modulation Standard: 802.11a (6Mbps)

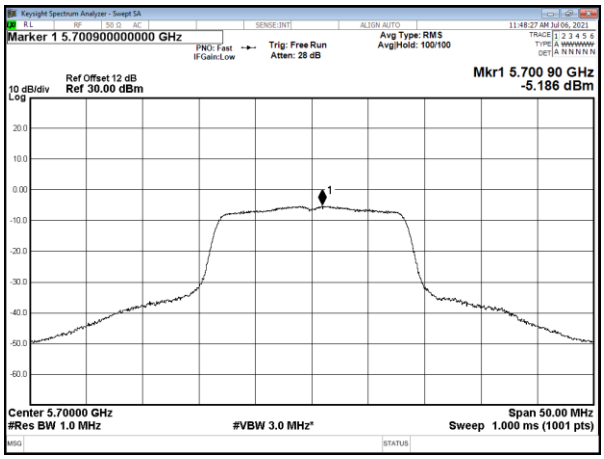
CH100



CH116

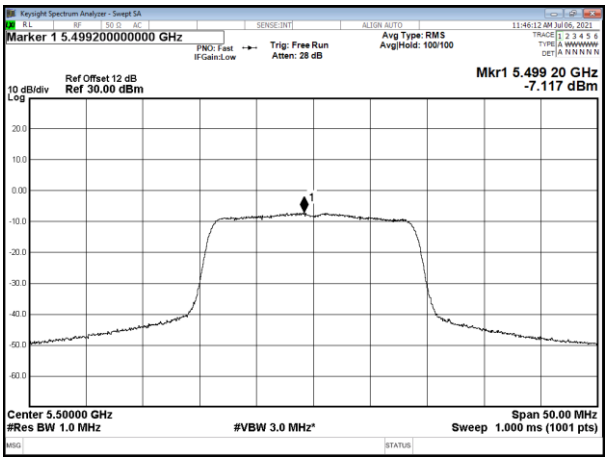


CH140

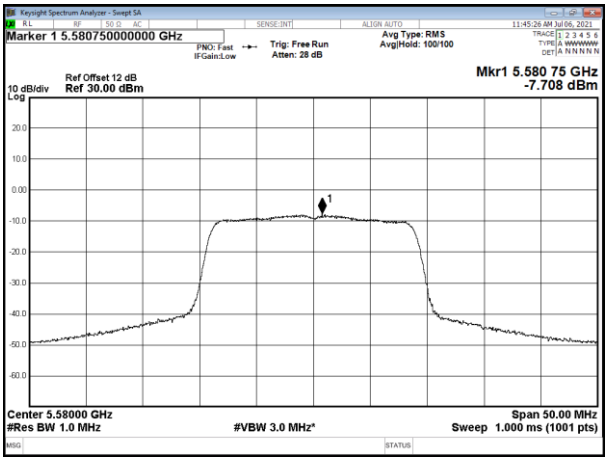


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

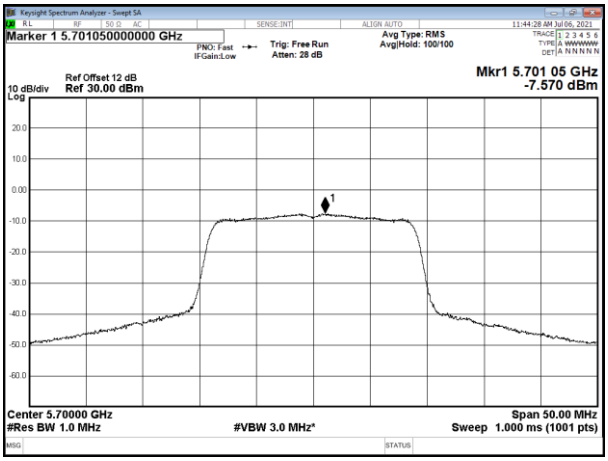
CH100



CH116



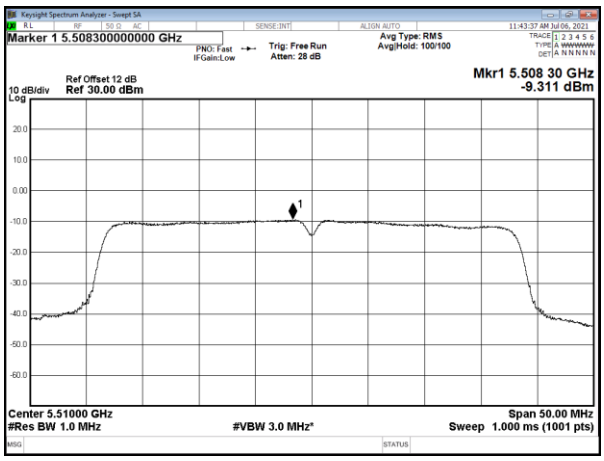
CH140



5.5G, UNII-2C

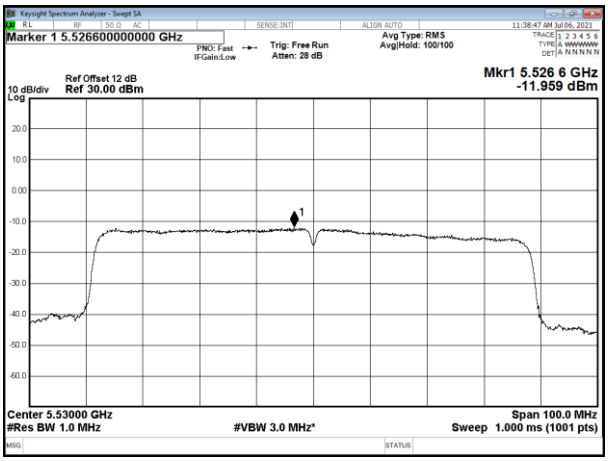
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH102

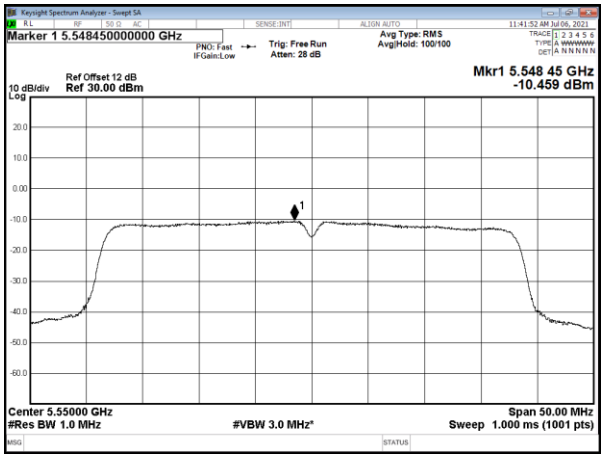


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

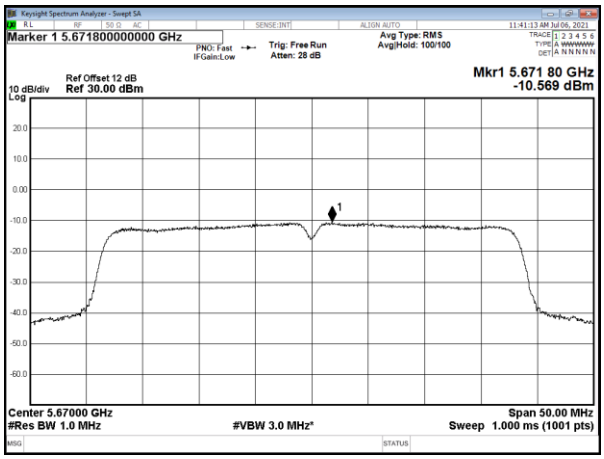
CH106



CH1110



CH134



----------End of the report ----------