6. 26DB AND 6DB BANDWIDTH TEST

6.1. Applicable Standard

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

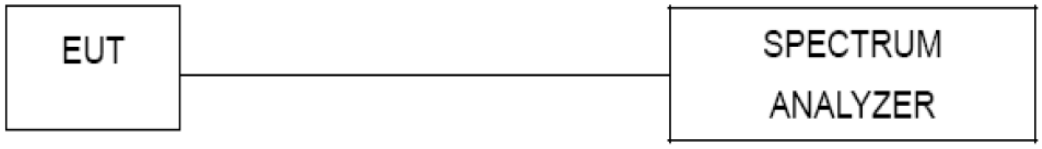
The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

6.2. Test Procedure

1. Emission Bandwidth (EBW)

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6.3. Test Setup



5.2G

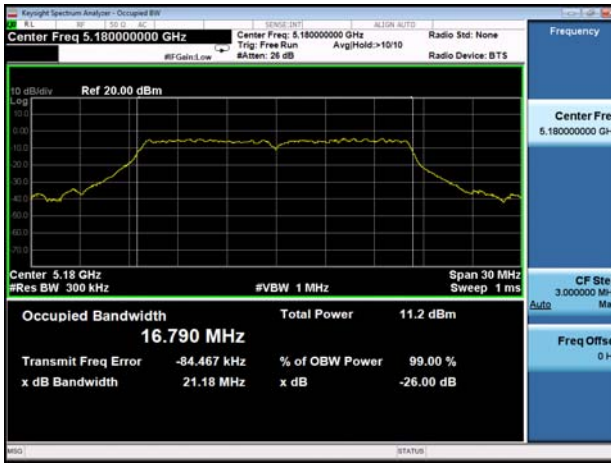
Mode	Channel number	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11a	36	5180	21.18	16.790
	40	5200	21.18	16.803
	48	5240	21.41	16.784
802.11n (HT20)	36	5180	21.81	17.875
	40	5200	21.99	17.858
	48	5240	21.96	17.851
802.11n (HT40)	38	5190	42.34	36.222
	46	5230	41.98	36.209

5.8G

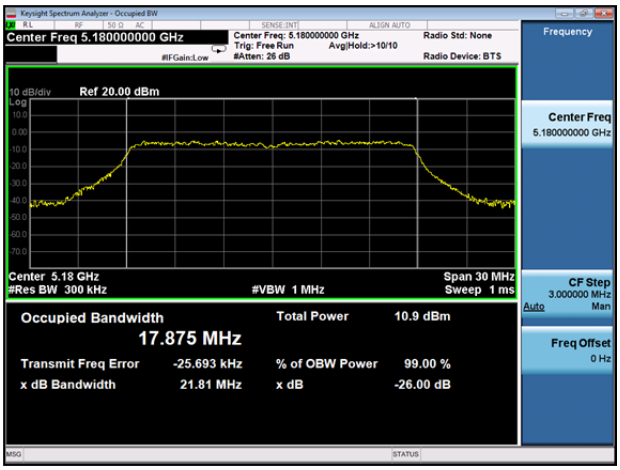
	Channel number	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11a	149	5745	16.56	16.525	0.5
	157	5785	16.56	16.536	0.5
	165	5825	16.55	16.518	0.5
802.11n (HT20)	149	5745	17.81	17.684	0.5
	157	5785	17.79	17.694	0.5
	165	5825	17.71	17.682	0.5
802.11n (HT40)	151	5755	36.52	36.191	0.5
	159	5795	36.53	36.200	0.5

5.2G

802.11a mode-ch36

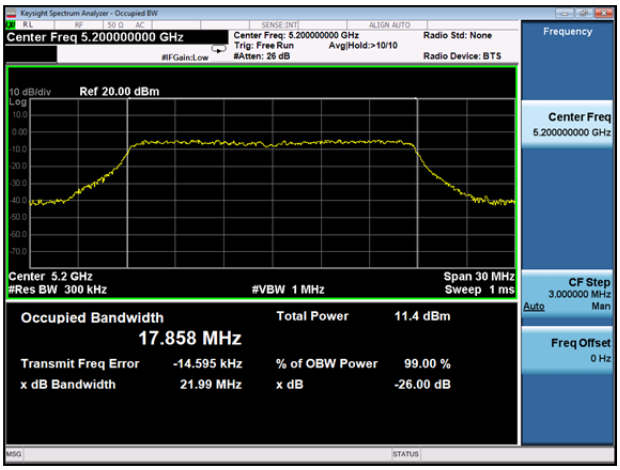


802.11n(HT20) mode-ch36

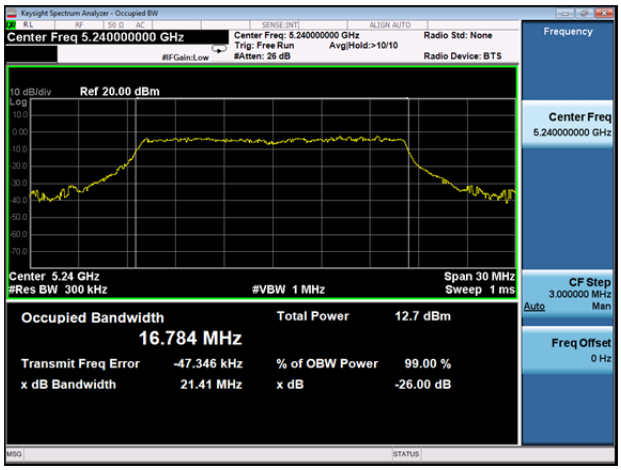


802.11a mode-ch40

802.11 n(HT20) mode-ch40

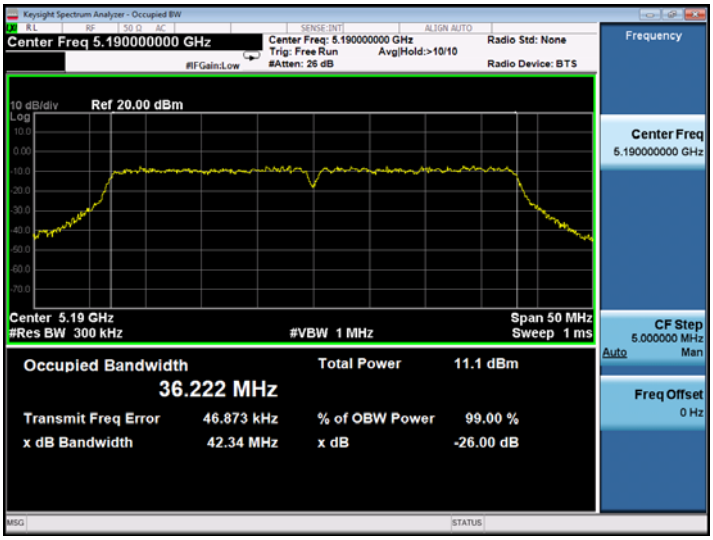


802.11a mode-ch48

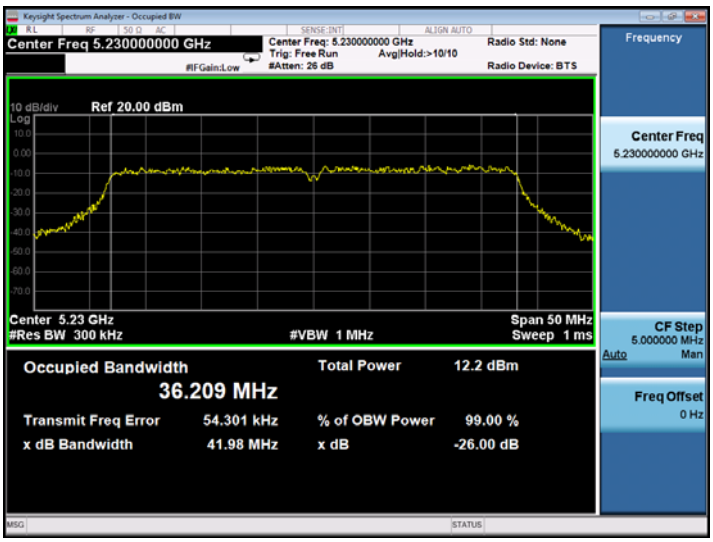


802.11 n(HT20) mode-ch48

802.11n(HT40) mode-ch38

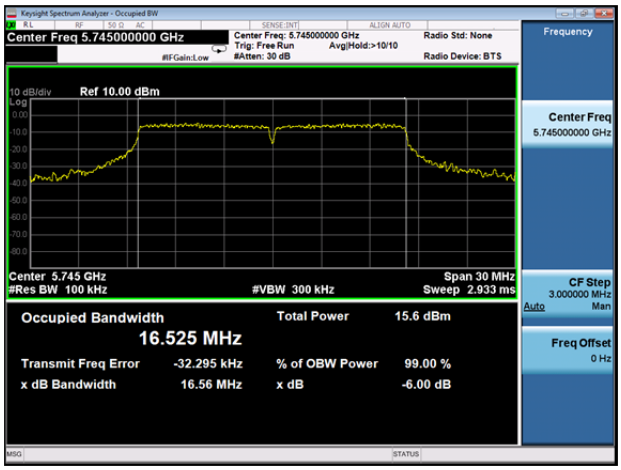


802.11 n(HT40) mode-ch46

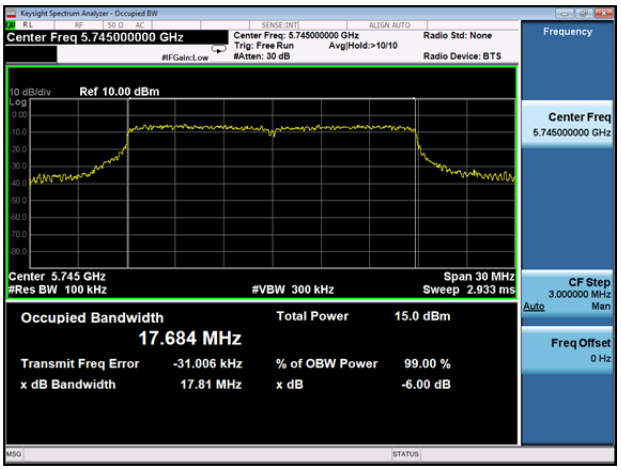


5.8G

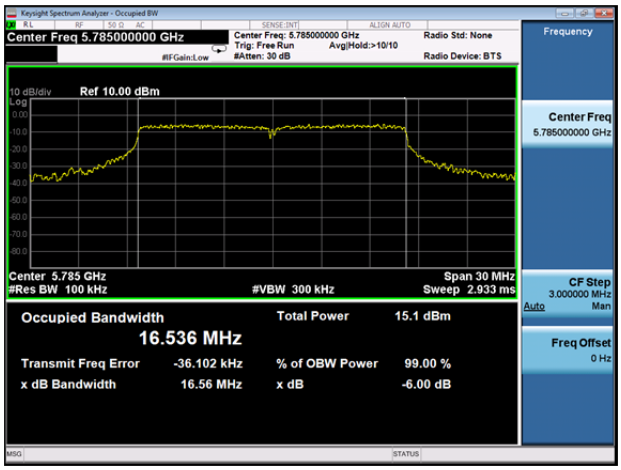
802.11a mode-ch149



802.11n(HT20) mode-ch149

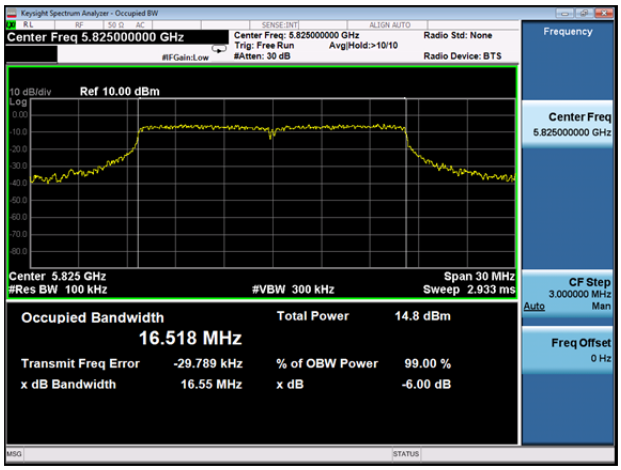


802.11a mode-ch157



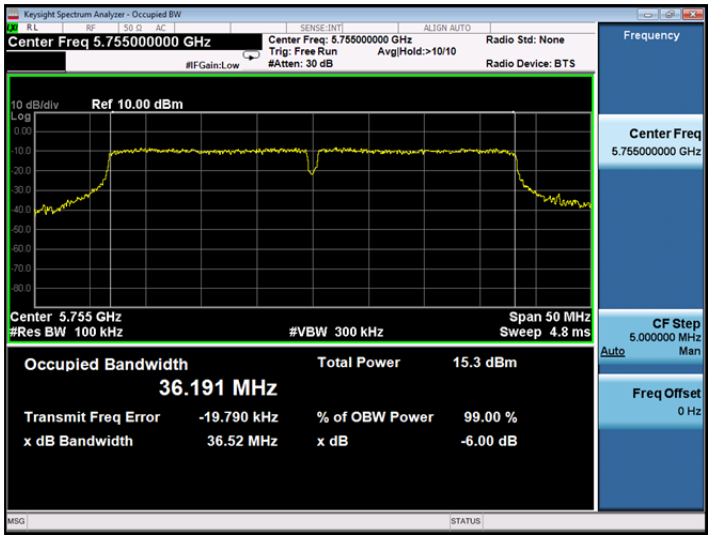
802.11 n(HT20) mode-ch157

802.11a mode-ch165



802.11 n(HT20) mode-ch165

802.11n(HT40) mode-ch151



802.11n(HT40) mode-ch159

7. OUTPUT POWER TEST

7.1. Limits

Band 5.15-5.25GHz:

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

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

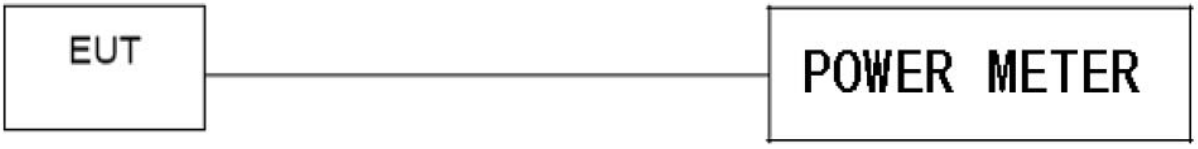
7.2. Test Setup

1. The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

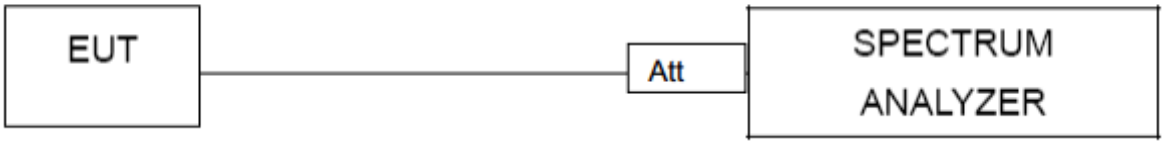
a. The Transmitter output (antenna port) was connected to the power meter.

b. Turn on the EUT and power meter and then record the power value.

c. Repeat above procedures on all channels needed to be tested.



Duty cycle



7.3. Test Result

	Frequency (MHz)	Average Output Power (dBm)	FCC Limit (dBm)	Result
802.11a	5180	15.09	24	Pass
	5200	15.43	24	Pass
	5240	15.34	24	Pass
	5745	14.54	30	Pass
	5785	14.35	30	Pass
	5825	14.12	30	Pass
802.11n (HT20)	5180	12.62	24	Pass
	5200	12.11	24	Pass
	5240	12.13	24	Pass
	5745	11.87	30	Pass
	5785	11.56	30	Pass
	5825	11.45	30	Pass
802.11n (HT40)	5190	10.41	24	Pass
	5230	10.32	24	Pass
	5755	10.53	30	Pass
	5795	10.62	30	Pass

Note: For power test the duty cycle is 100% in continous transmitting mode.

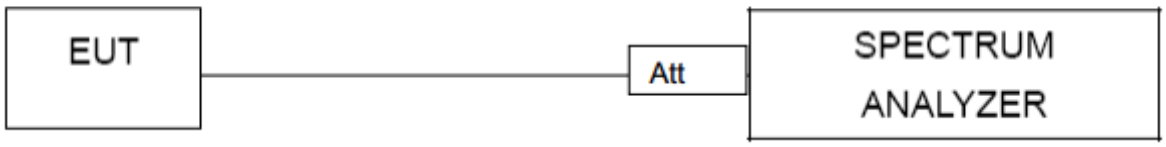
8. DUTY CYCLE

8.1. Test Procedure

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

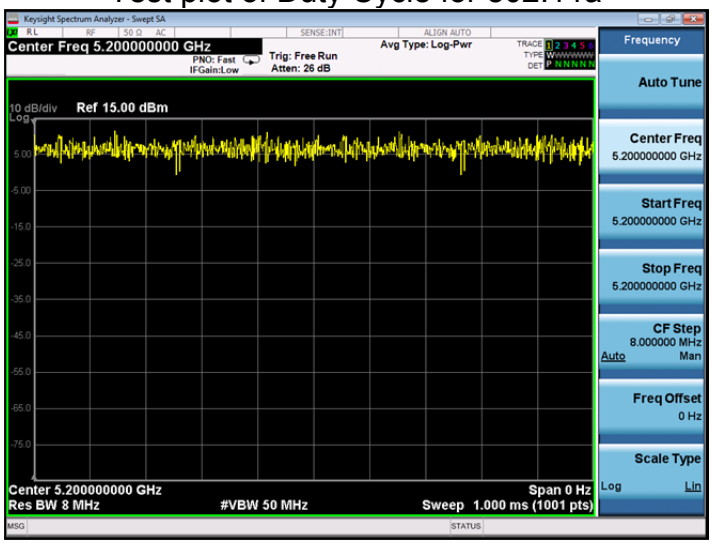
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously.
The EUT was operating in controlled its channel.
Use the following spectrum analyzer settings:
Span = Zero Span
RBW = 8MHz
VBW = 50MHz
Number of points in Sweep >100
Detector function = peak
Trace = Clear write Measure Ttotal and Ton
Calculate Duty Cycle = Ton / Ttotal and Duty Cycle Factor=10*log(1/Duty Cycle)

8.2. Test Setup

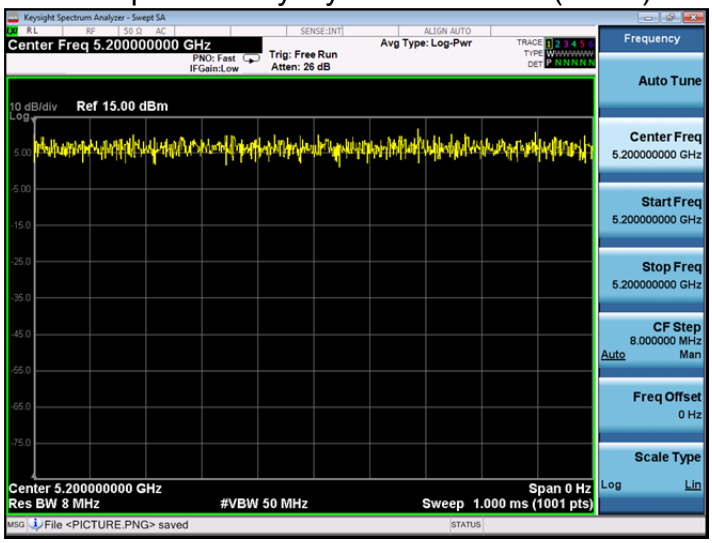


5.2G

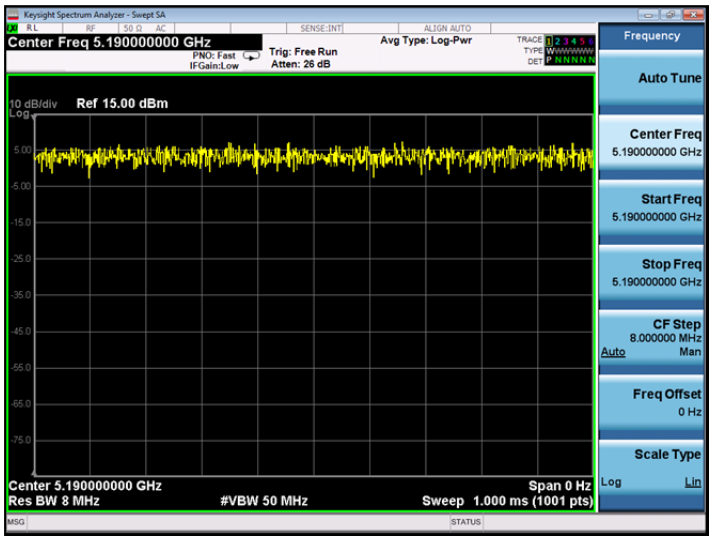
Test plot of Duty Cycle for 802.11a



Test plot of Duty Cycle for 802.11n(HT20)

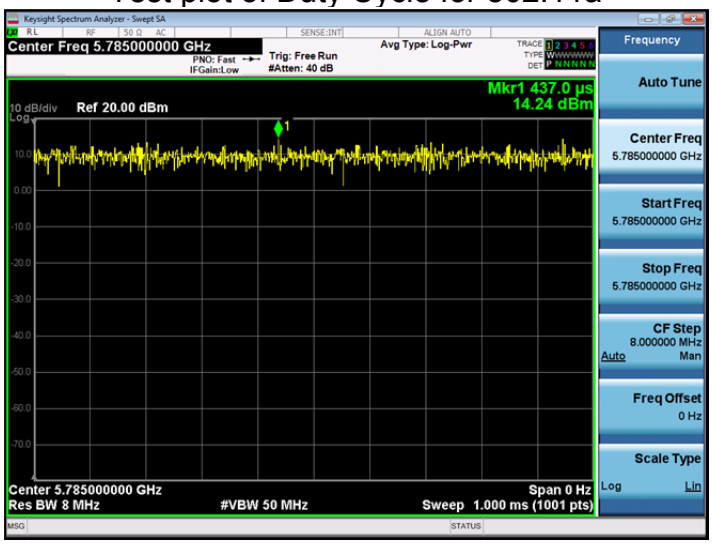


Test plot of Duty Cycle for 802.11n(HT40)

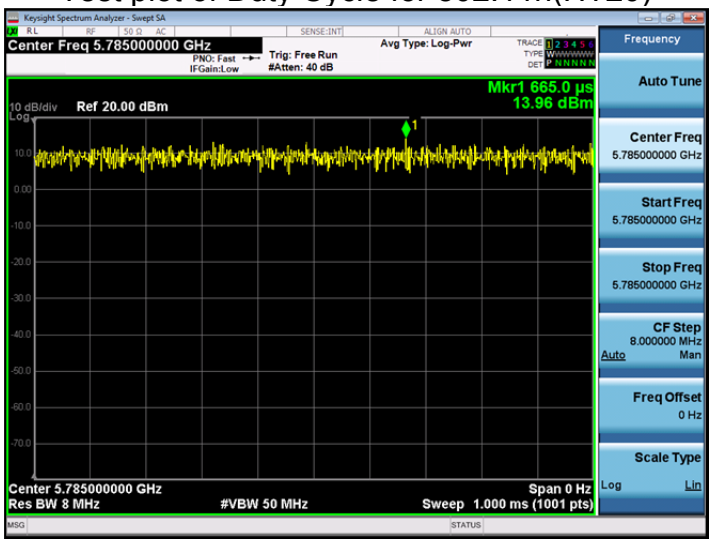


5.8G

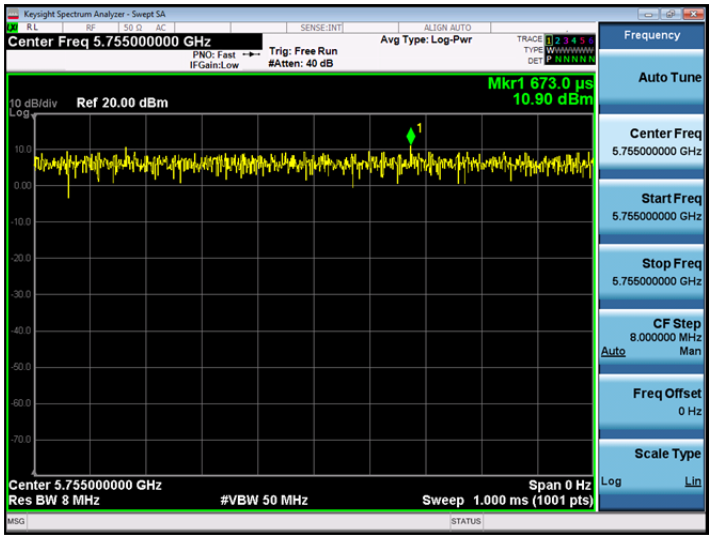
Test plot of Duty Cycle for 802.11a



Test plot of Duty Cycle for 802.11n(HT20)



Test plot of Duty Cycle for 802.11n(HT40)



9. PEAK POWER SPECTRAL DENSITY TEST

9.1. Limits

Band 5.15-5.25GHz:

FCC: In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Band 5.725-5.85GHz:

FCC: In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

9.2. Test Setup

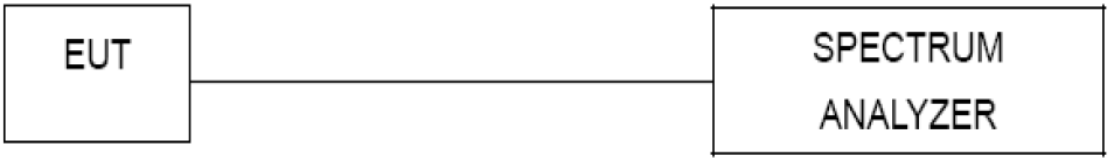
Methods refer to FCC KDB 789033

1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”.

2) Use the peak search function on the instrument to find the peak of the spectrum.

3) The result is the PPSD.

4) The above procedures make use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified in the 15.407(a)(5). That rule section also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated to show the total power over the measurement bandwidth” (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth



9.3. Test Data

Model	Channel Frequency (MHz)	Power Density. Antenna (dBm/MHz)	Limit (dBm/1MHz)	Result
802.11a	5180	1.187	11.0	Pass
	5200	1.663	11.0	Pass
	5240	2.998	11.0	Pass
	5745	5.297	30.0	Pass
	5785	4.792	30.0	Pass
	5825	4.642	30.0	Pass
802.11n (HT20)	5180	1.014	11.0	Pass
	5200	1.519	11.0	Pass
	5240	2.981	11.0	Pass
	5745	4.992	30.0	Pass
	5785	4.641	30.0	Pass
	5825	4.534	30.0	Pass
802.11n (HT40)	5190	-1.936	11.0	Pass
	5230	-0.373	11.0	Pass
	5755	1.018	30.0	Pass
	5795	1.106	30.0	Pass

5.2G

802.11a 5180MHz

802.11n(HT20) 5180MHz

802.11a 5200MHz

802.11n(HT20) 5200MHz

802.11a 5240MHz

802.11n(HT20) 5240MHz

802.11n (HT40) 5190MHz

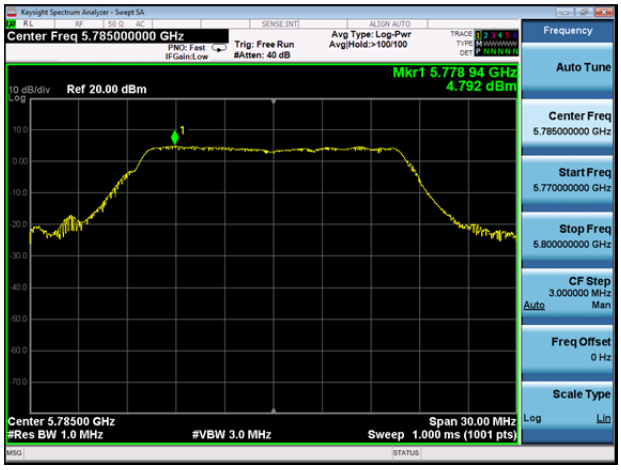
802.11n (HT40) 5230MHz

5.8G

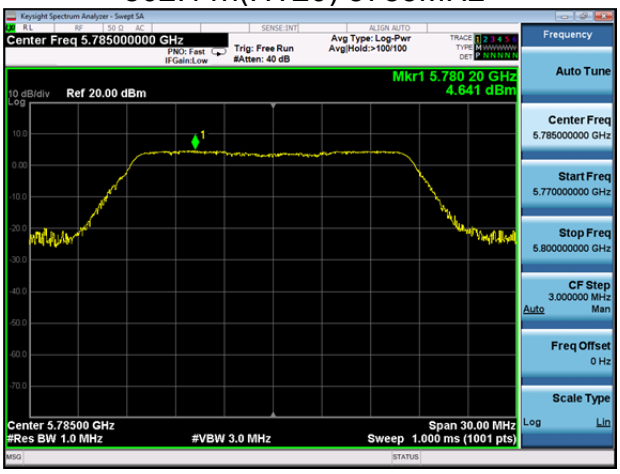
802.11a 5745MHz

802.11n(HT20) 5745MHz

802.11a 5785MHz



802.11n(HT20) 5785MHz



802.11a 5825MHz

802.11n(HT20) 5825MHz

802.11n (HT40) 5755MHz

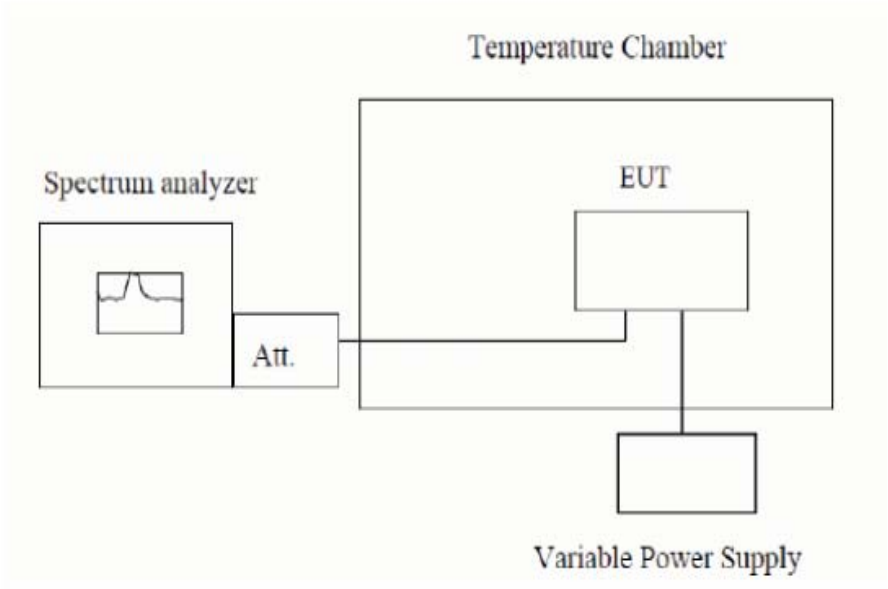
802.11n (HT40) 5795MHz

10. FREQUENCY STABILITY TEST

10.1. Limit

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

10.2. Test Configuration



10.3. Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and max hold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is -30°C~50°C..

10.4. Test Result

Measurement Data : (the worst model was 802.11a)

Frequency Stability under Temperature

Operating Frequency: 5180 MHz				
Environment Temperature(oC)	Voltage(V)	Measured Frequency(MHz)	Test Result (MHz)	Max. Deviation (ppm)
50	120	5180	5180.0548	10.579
40	120	5180	5180.0652	12.587
30	120	5180	5180.0519	10.019
20	120	5180	5180.0542	10.463
10	120	5180	5180.0516	9.961
0	120	5180	5180.0653	12.606
-10	120	5180	5180.0545	10.521
-20	120	5180	5180.0672	12.973
-30	120	5180	5180.0548	10.579

Frequency Stability under Voltage

Operating Frequency: 5180 MHz			
DC Voltage(V)	Measured Frequency(MHz)	Test Result(MHz)	Max. Deviation(ppm)
108	5180	5180.0547	10.560
120	5180	5180.0519	10.019
132	5180	5180.0526	10.154

Frequency Stability under Temperature

Operating Frequency: 5200 MHz				
Environment Temperature(oC)	Voltage(V)	Measured Frequency(MHz)	Test Result (MHz)	Max. Deviation (ppm)
50	120	5200	5200.0612	11.769
40	120	5200	5200.0598	11.500
30	120	5200	5200.0586	11.269
20	120	5200	5200.0576	11.077
10	120	5200	5200.0563	10.827
0	120	5200	5200.0543	10.442
-10	120	5200	5200.0601	11.558
-20	120	5200	5200.0594	11.423
-30	120	5200	5200.0585	11.250

Frequency Stability under Voltage

Operating Frequency: 5200 MHz			
DC Voltage(V)	Measured Frequency(MHz)	Test Result(MHz)	Max. Deviation(ppm)
108	5200	5200.0488	9.385
120	5200	5200.0501	9.635
132	5200	5200.0531	10.212

Frequency Stability under Temperature

Operating Frequency: 5240 MHz				
Environment Temperature(oC)	Voltage(V)	Measured Frequency(MHz)	Test Result (MHz)	Max. Deviation (ppm)
50	120	5240	5240.0618	11.794
40	120	5240	5240.0598	11.412
30	120	5240	5240.0576	10.992
20	120	5240	5240.0582	11.107
10	120	5240	5240.0585	11.164
0	120	5240	5240.0607	11.584
-10	120	5240	5240.0623	11.889
-20	120	5240	5240.0605	11.546
-30	120	5240	5240.0597	11.393

Frequency Stability under Voltage

Operating Frequency: 5240 MHz			
DC Voltage(V)	Measured Frequency(MHz)	Test Result(MHz)	Max. Deviation(ppm)
108	5240	5240.0523	9.981
120	5240	5240.0497	9.485
132	5240	5240.0513	9.790

11. ANTENNA REQUIREMENTS

11.1. Limits

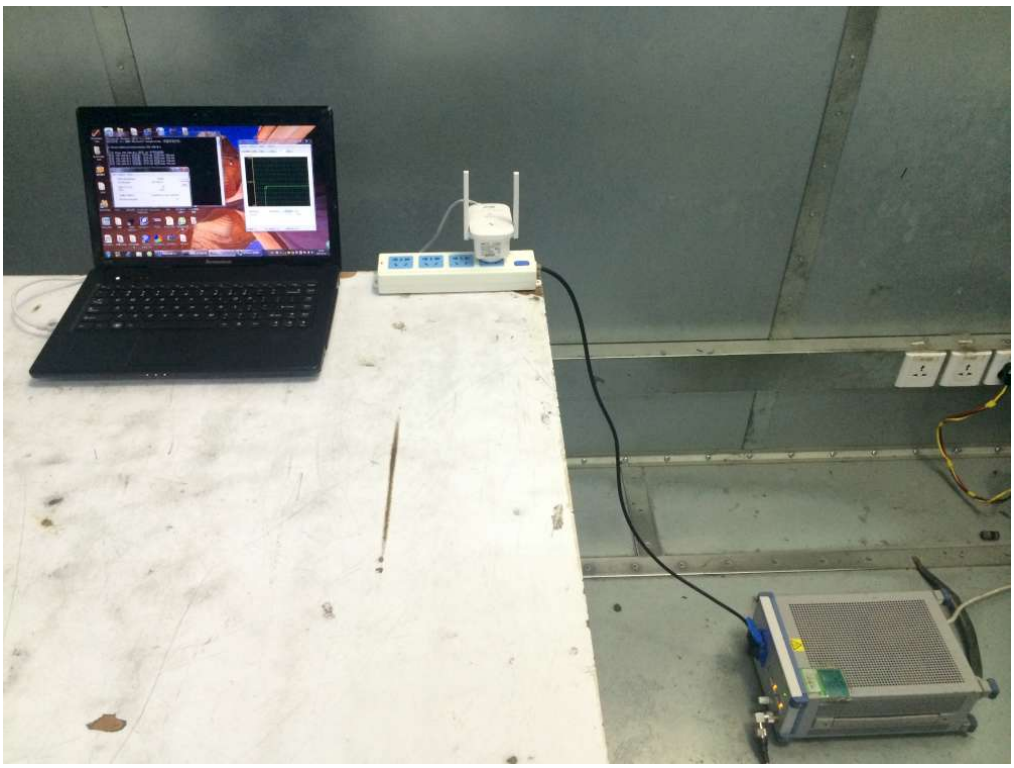
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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.

11.2. Test Result

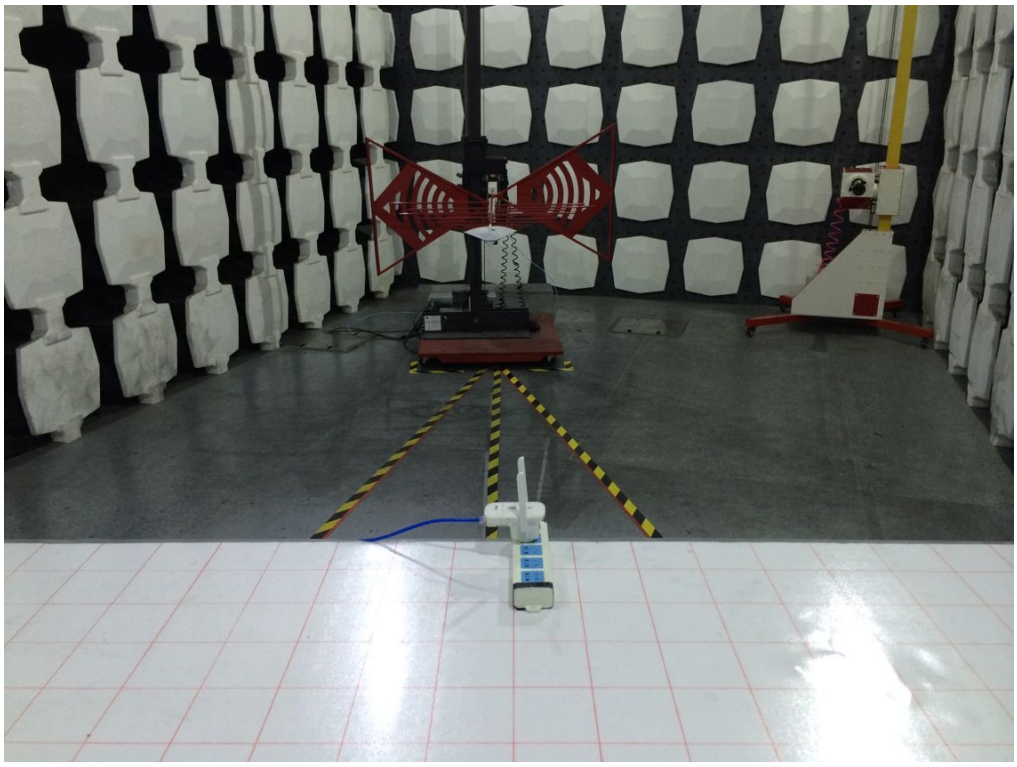
The antenna used for this product is PCB Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 3.08dBi.

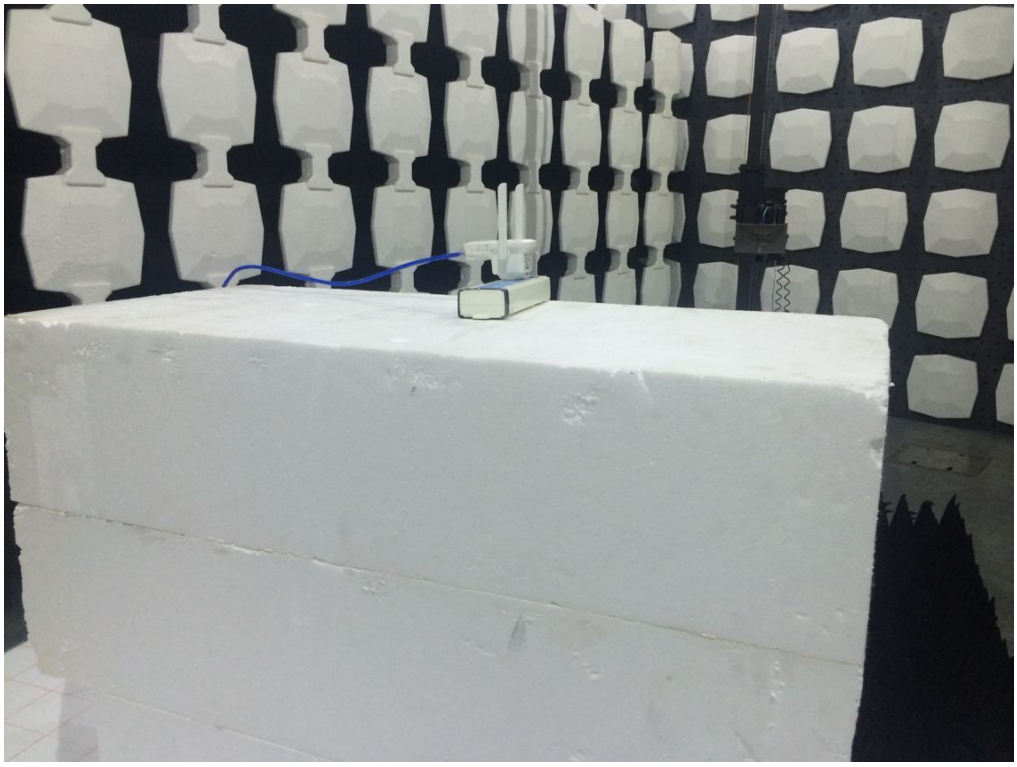
12. PHOTOGRAPHS OF TEST SET-UP

Conducted Emission Test

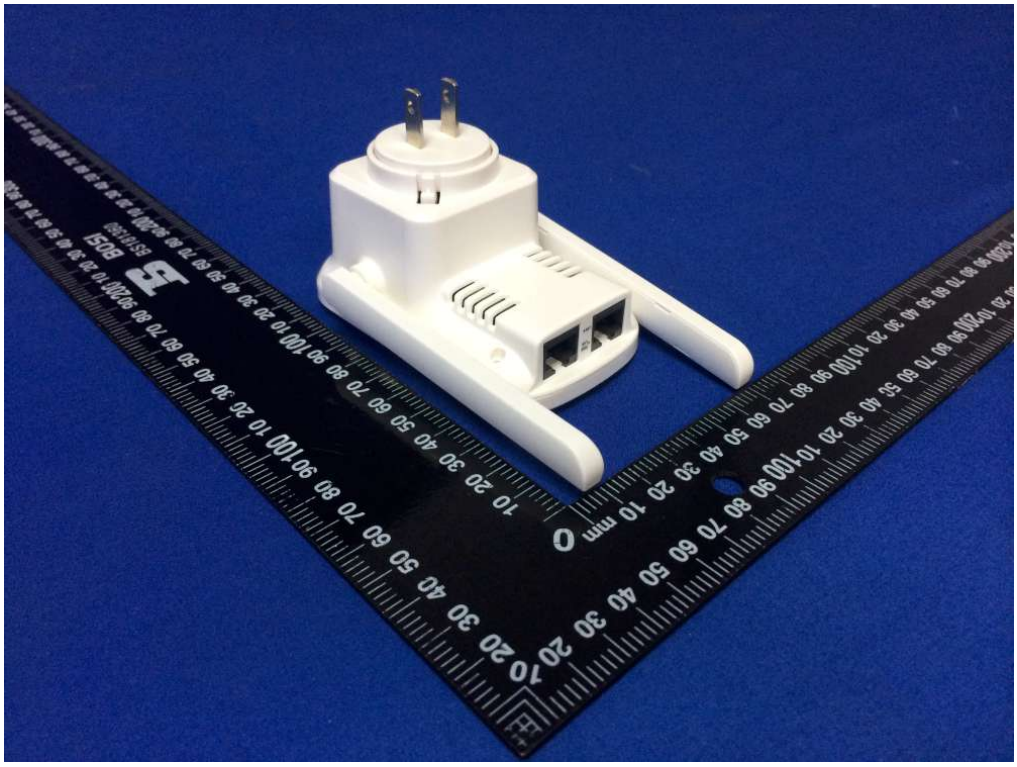


Radiated Emission Test

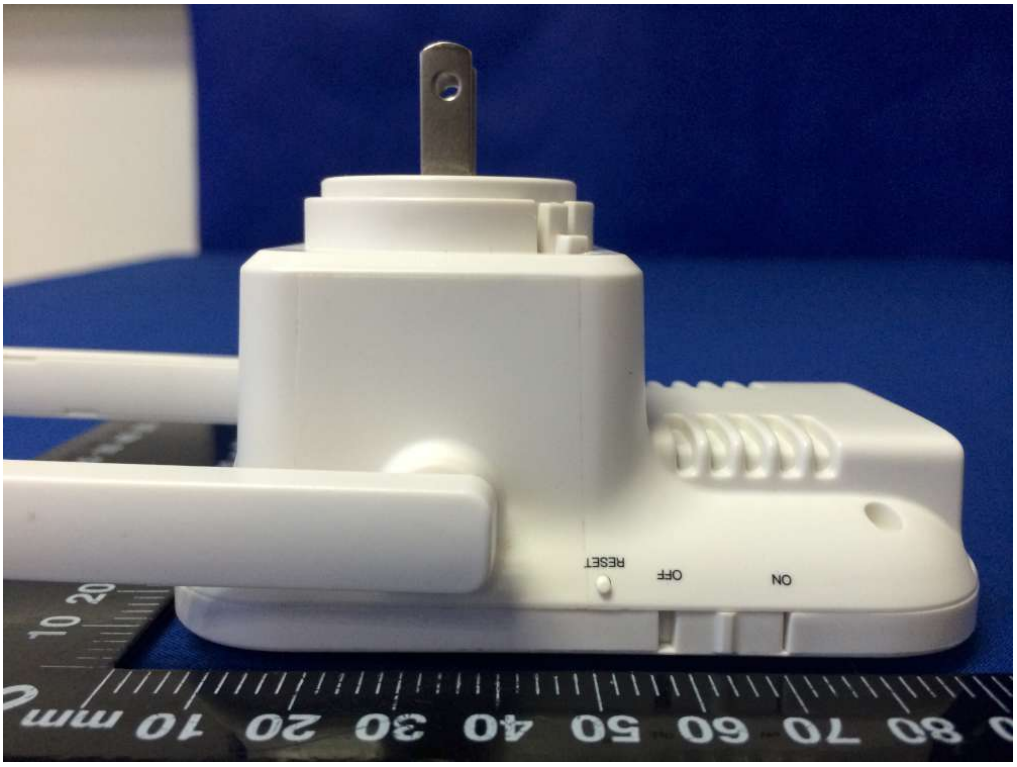


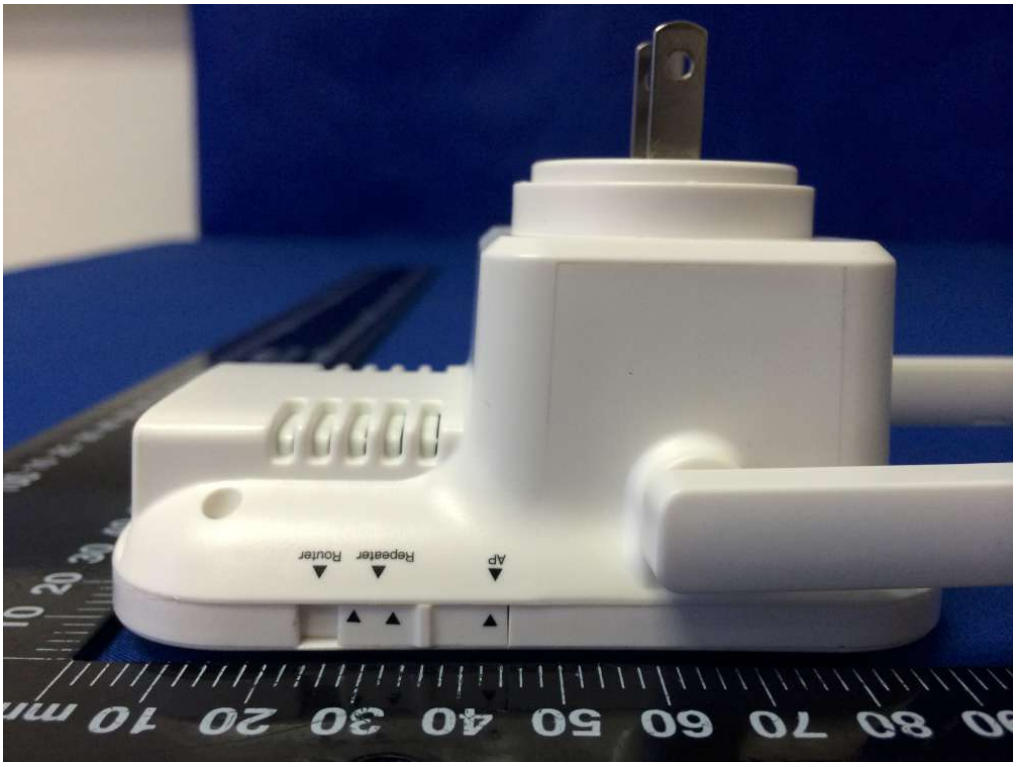


13. PHOTOGRAPHS OF THE EUT




POWER
WAN/LAN
LAN
2.4G
5G
NEXXT
SOLUTIONS

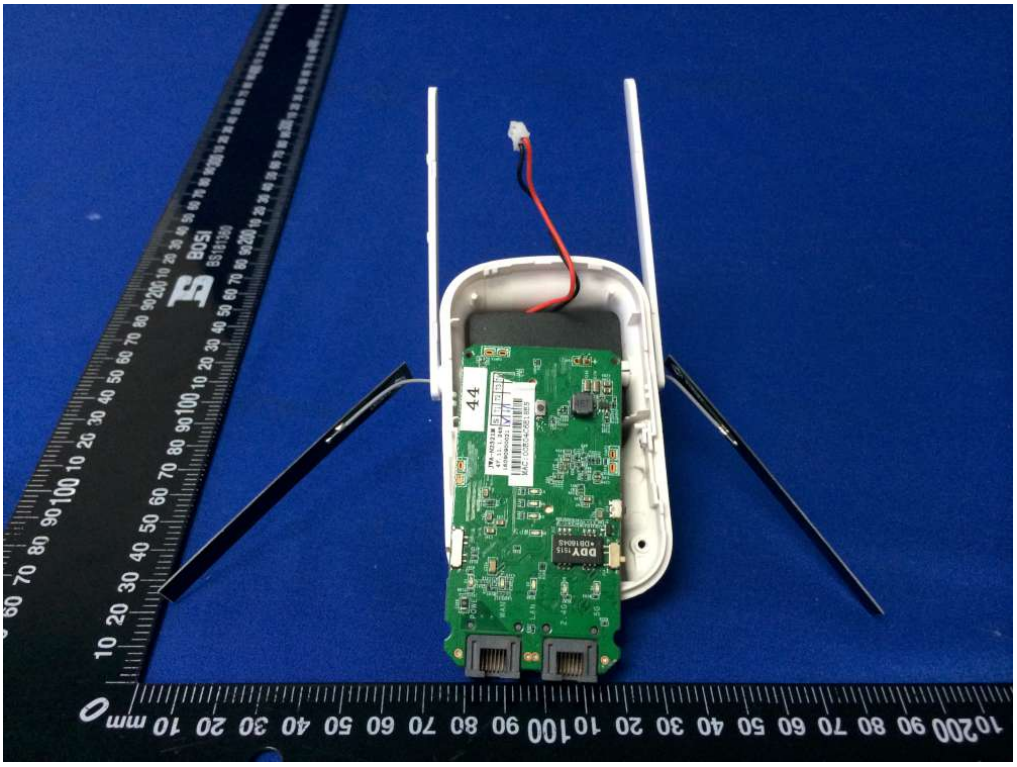

RESET
OFF
ON


Router
Repeater
AP


NEXXT
Kronos 750-AC
Universal
Range Extender
Model No.: AEIEL755U1
Input: 100-240VAC, 50/60Hz 0.3A
Username: admin
Password: admin
Access: 192.168.0.1
or nexxt.setup
FCC ID: X4YKRNS750
Network key: 12345678
MAC:
00E04C23FAE4
Made in China

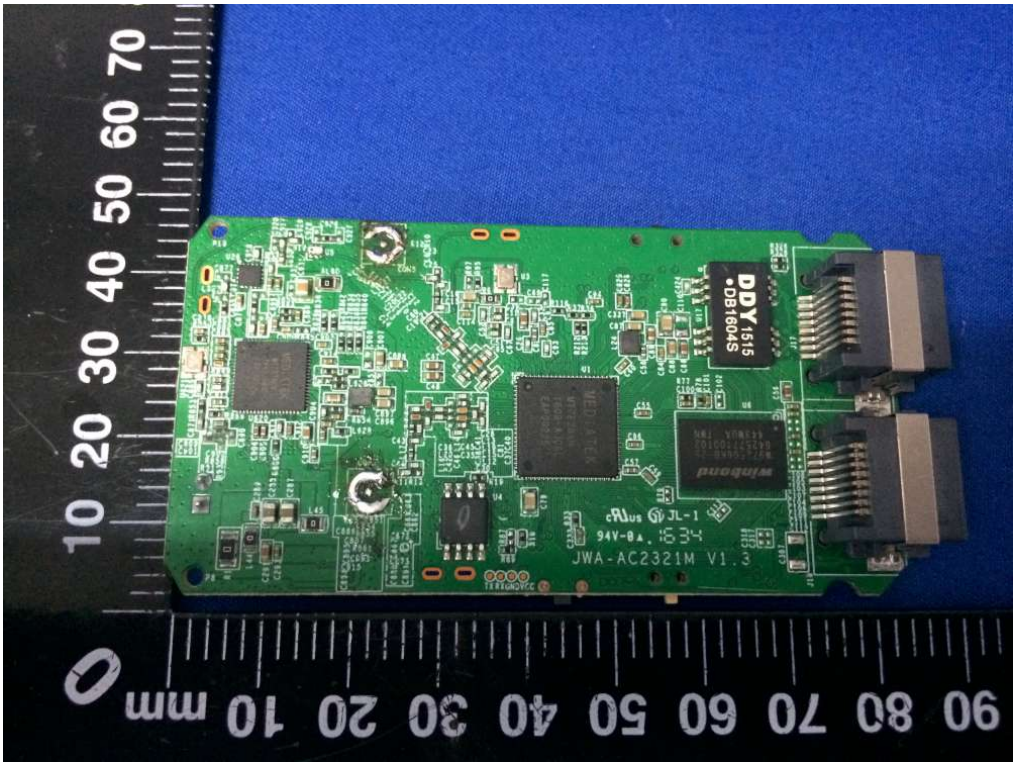

LAN
WAN
LAN

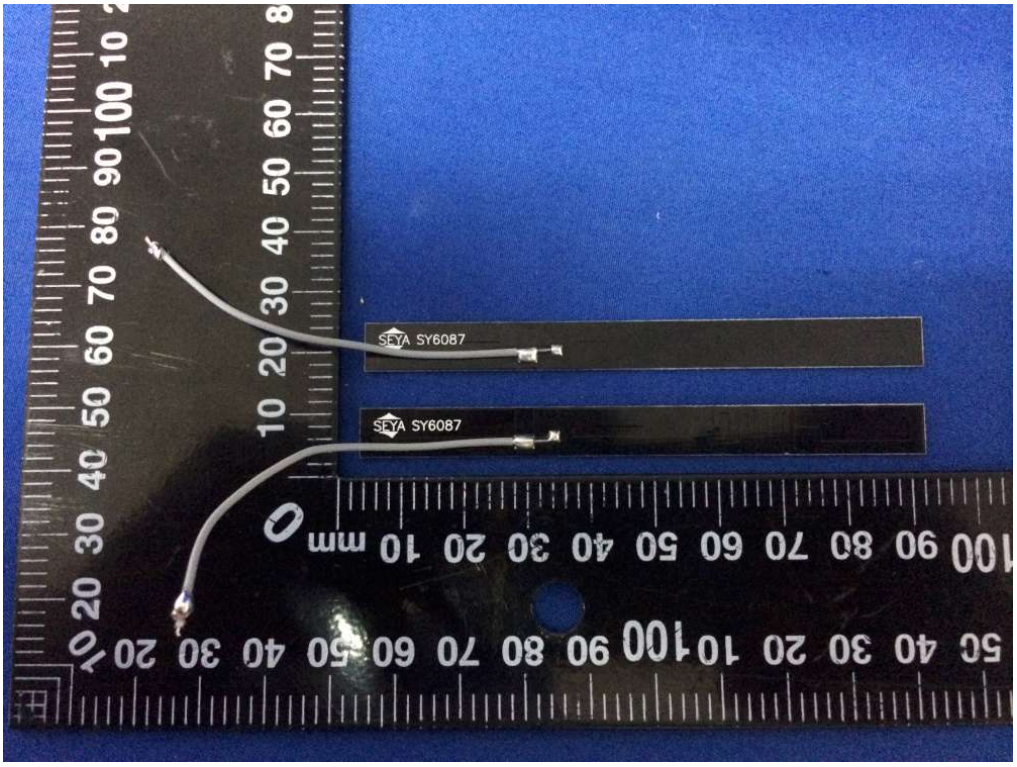

44
JWA-N2321M
MAC:00E04C6E1E5
WAN
LAN
2.4G
5G
DDY 1615
DB160AS

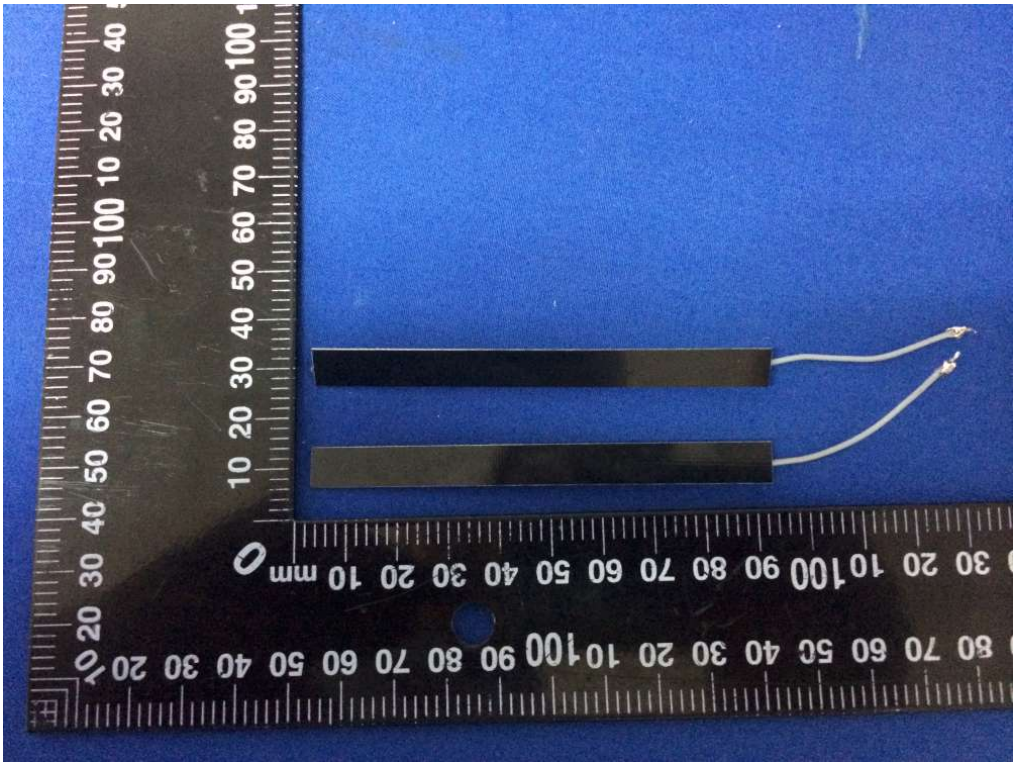

44

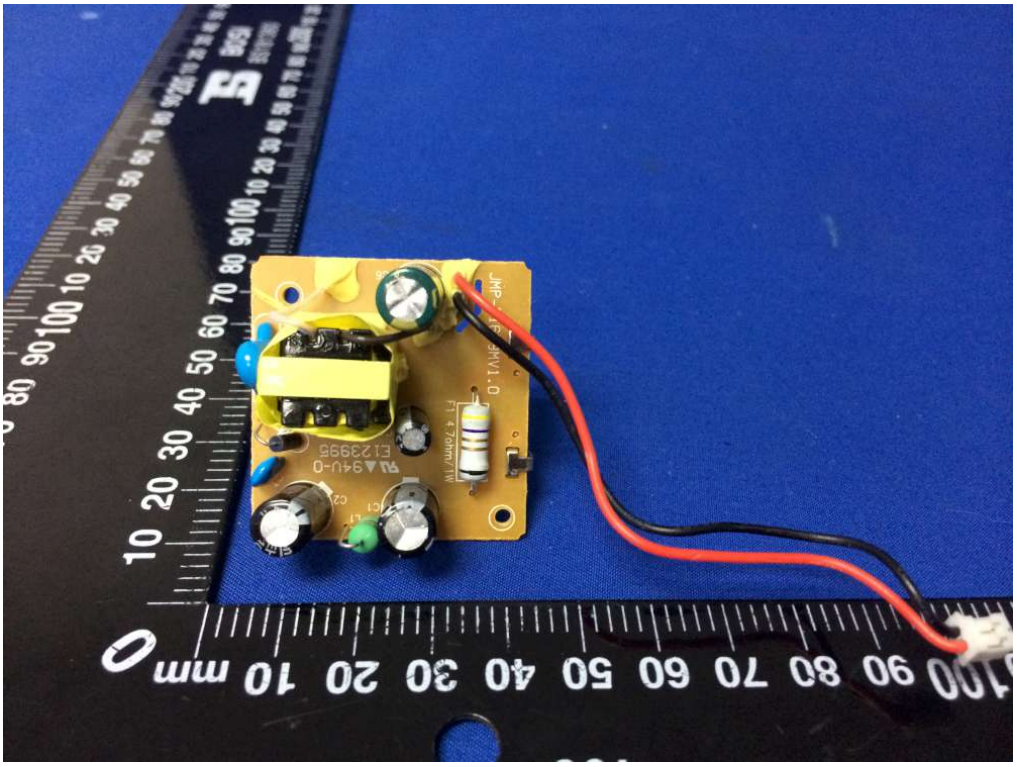

44
JWA-N2321M
47. 11. 1. 246
16090900021
MAC:00E04C6E18E5
POWER
WAN
LAN
2.4G
5G
DDY 1515
DB1604S

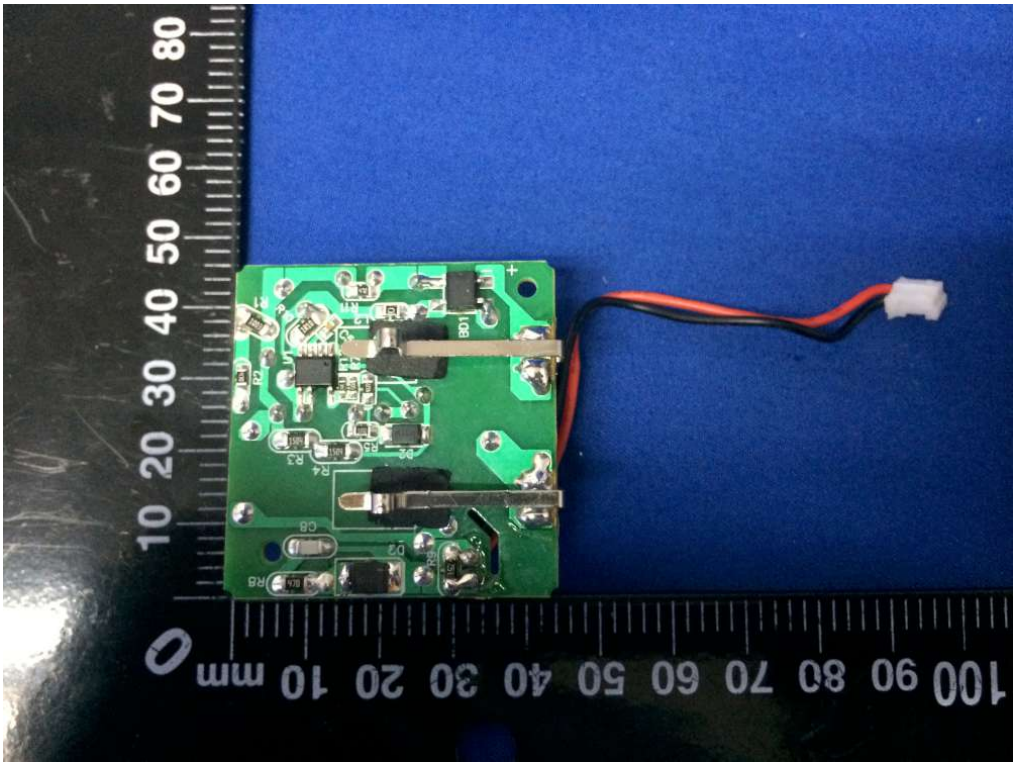

POWER
WAN
LAN
2.4G
5G
WPS
DDY 1515
DB1604S
44
JWA-N2321M
47.11.1.246
16090900021
MAC:00E04C6B18E5


DDY 1515
DB1604S
JWA-AC2321M V1.3


SEYA SY6087
SEYA SY6087







*** the end of report ***