4.5. Peak Power Spectral Density

a. Limit

1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

b. Test Procedure

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5xDTS BW
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

c. Test Equipment

Same as the equipment listed in 4.2.

d. Test Setup

See 4.1

e. Test Results

Pass

f. Test Data

Please refer to the following data.

g. Test Plot See the following pages

ANT 0

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-14.954	-		Pass
Mid	2437	-14.411	-	5.99	Pass
High	2462	-12.423	-		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	∑PPSD (dBm)	Limit (dBm)	Result
Low	2412	-17.928	-		Pass
Mid	2437	-17.996	-	5.99	Pass
High	2462	-17.785	-		Pass

Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-18.270	-		Pass
Mid	2437	-18.834	-	5.99	Pass
High	2462	-16.636	-		Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2422	-21.035	-		Pass
Mid	2437	-18.028	-	5.99	Pass
High	2452	-20.652	-		Pass

ANT 1

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-12.154	-		Pass
Mid	2437	-15.723	-	5.99	Pass
High	2462	-15.127	-		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	∑PPSD (dBm)	Limit (dBm)	Result
Low	2412	-16.784	-		Pass
Mid	2437	-17.761	-	5.99	Pass
High	2462	-17.943	-		Pass

Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-19.015	-		Pass
Mid	2437	-16.158	-	5.99	Pass
High	2462	-18.303	-		Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2422	-20.388	-		Pass
Mid	2437	-20.560	-	5.99	Pass
High	2452	-20.195	-		Pass

Channel	Channel Frequency (MHz)	ANT 0 PSD (dBm)	ANT 1 PSD (dBm)	Data Rate (Mbps)	MIMO PSD (dBm)	Limit (dBm)
802.11n (20M MIMO) mode						
Low	2412	-18.270	-19.015	MCS0	-15.62	5.99
Middle	2437	-18.834	-16.158	MCS0	-14.28	5.99
High	2462	-16.636	-18.303	MCS0	-14.38	5.99
802.11n (40M MIMO) mode						
Low	2422	-21.035	-20.388	MCS0	-17.69	5.99
Middle	2437	-18.028	-20.560	MCS0	-16.10	5.99
High	2452	-20.652	-20.195	MCS0	-17.41	5.99

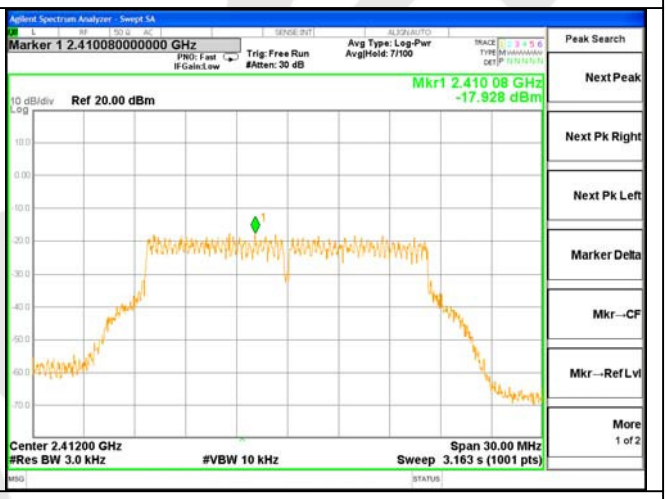
PSD Limit=8 dBm-(8.01-6)=5.99dBm

ANT 0

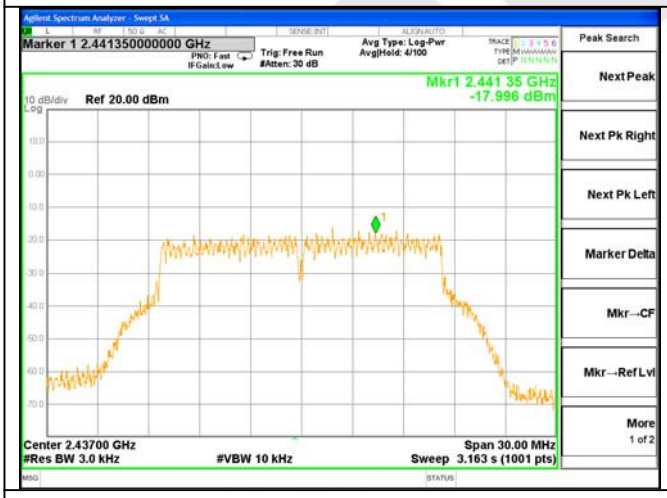
Test Mode: 802.11b---Low

Test Mode: 802.11b---Mid

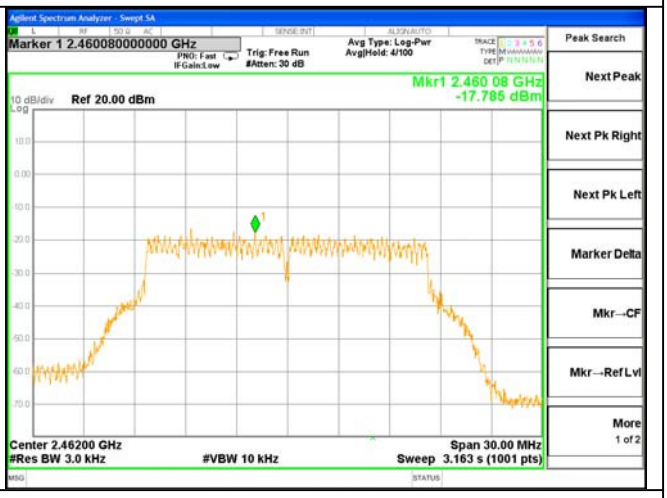
Test Mode: 802.11b---High



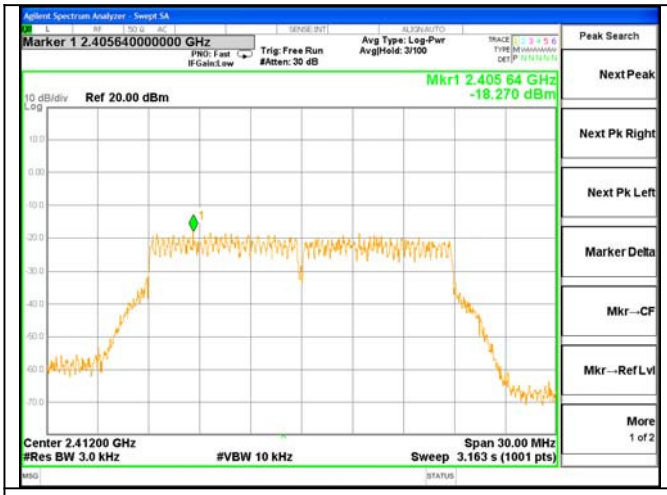
Test Mode: 802.11g---Low



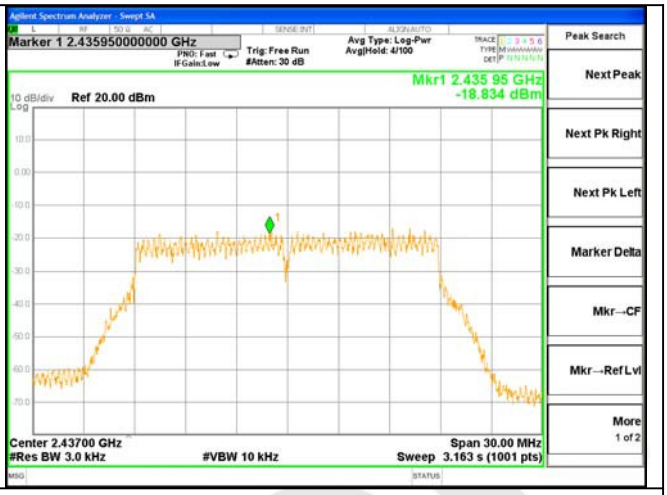
Test Mode: 802.11g---Mid



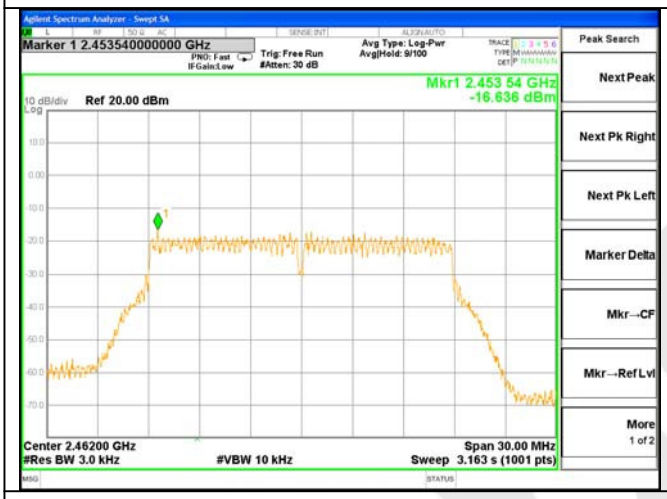
Test Mode: 802.11g---High



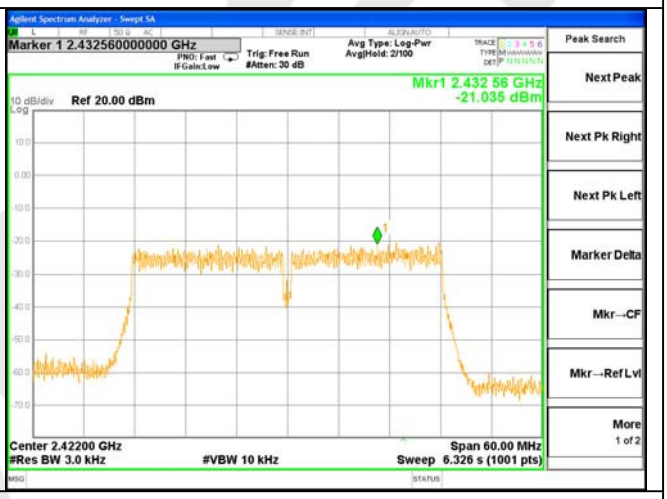
Test Mode: 802.11n20---Low



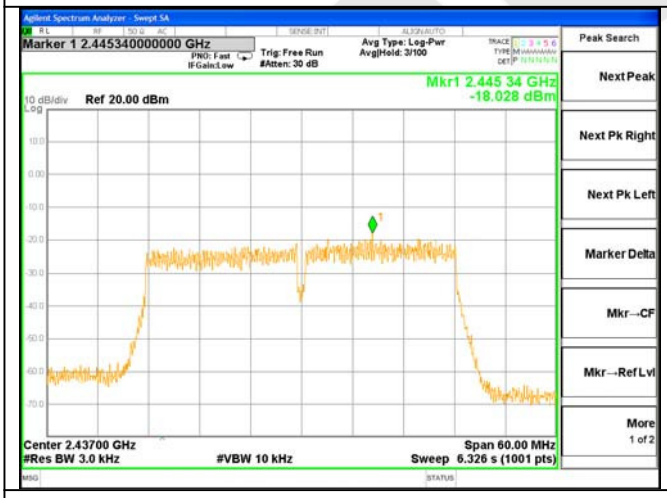
Test Mode: 802.11n20---Mid



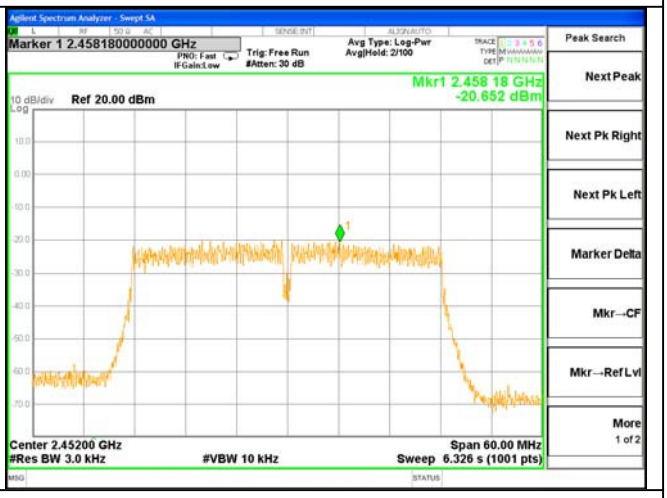
Test Mode: 802.11n20---High



Test Mode: 802.11n40---Low

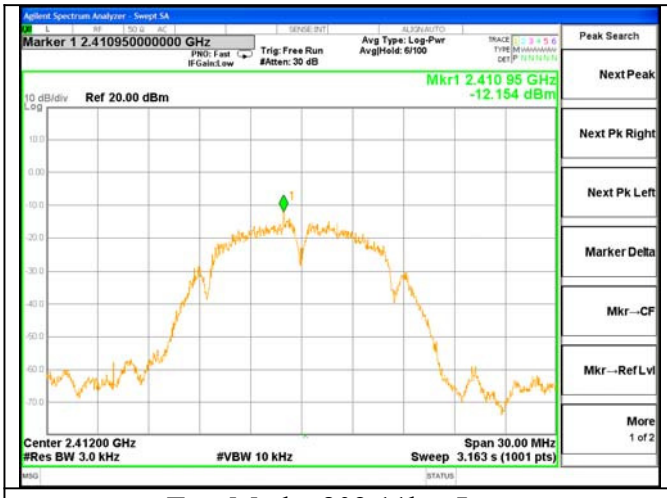


Test Mode: 802.11n40---Mid



Test Mode: 802.11n40---High

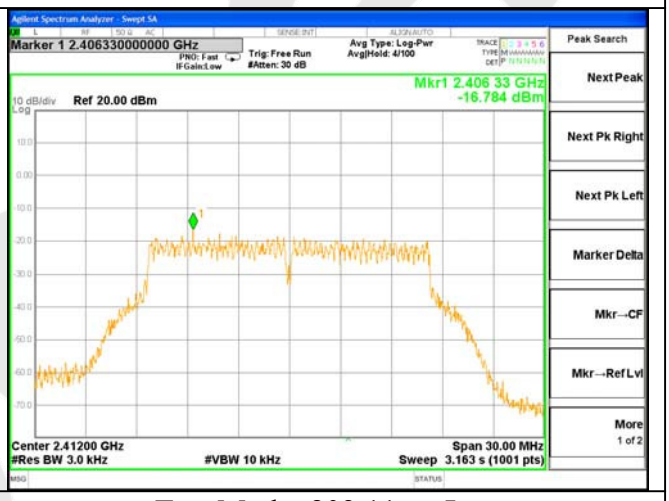
ANT 1



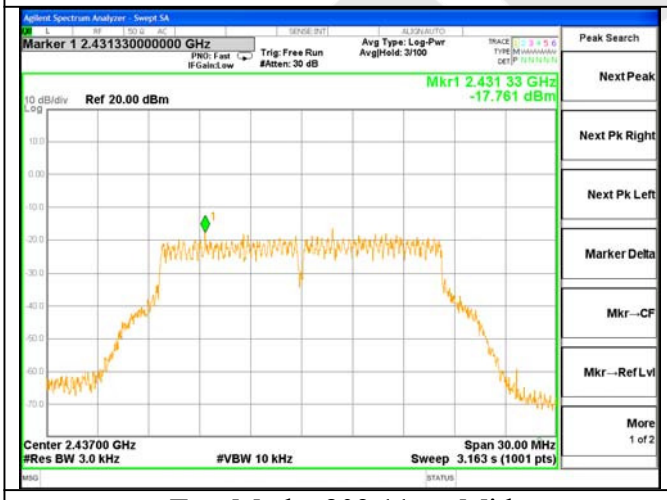
Test Mode: 802.11b---Low

Test Mode: 802.11b---Mid

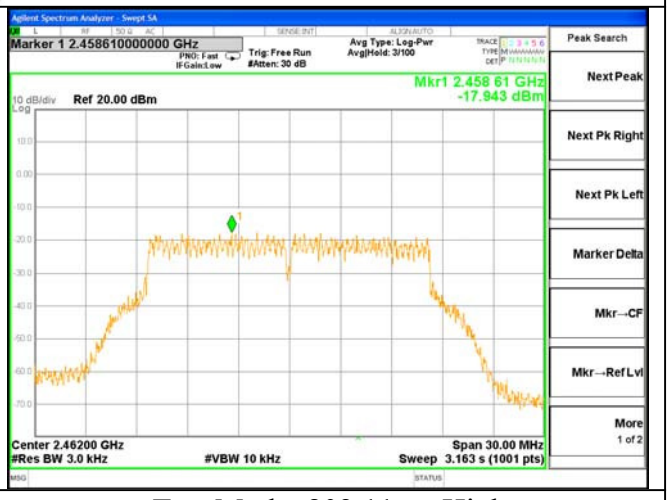
Test Mode: 802.11b---High



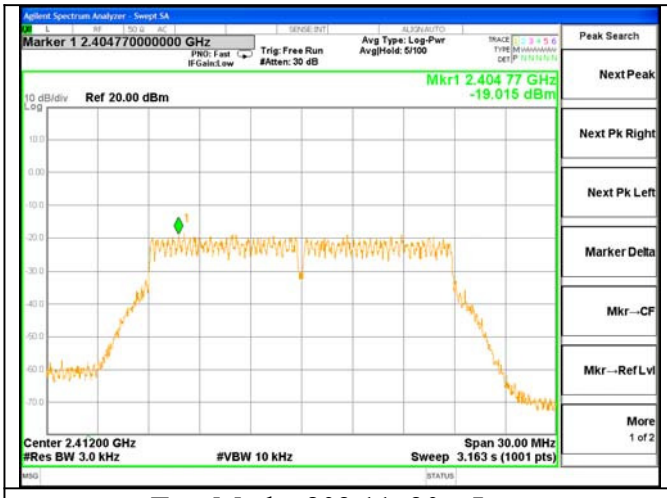
Test Mode: 802.11g---Low



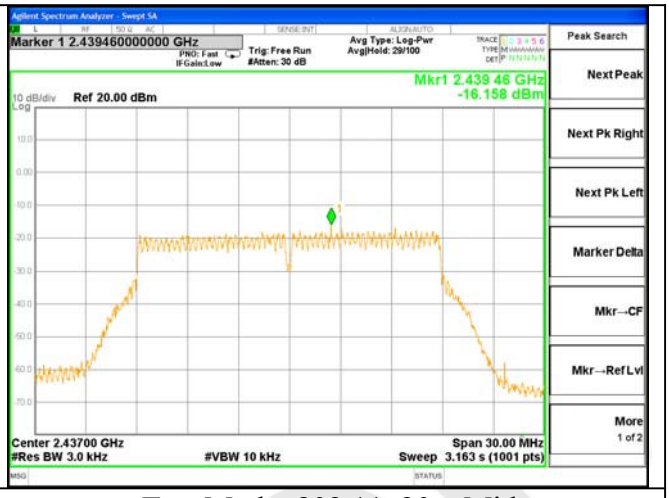
Test Mode: 802.11g---Mid



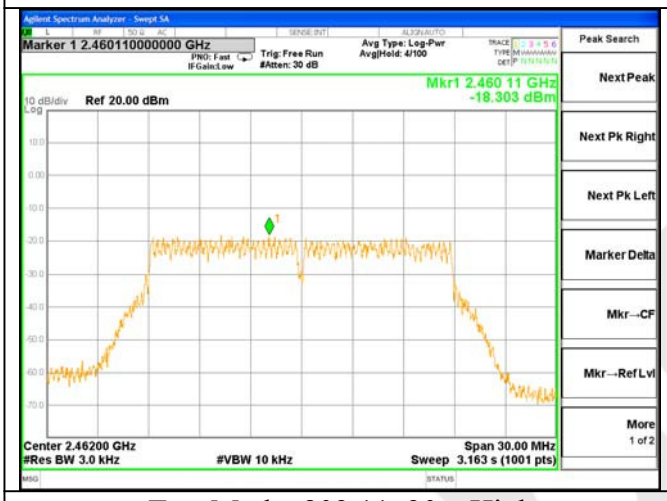
Test Mode: 802.11g---High



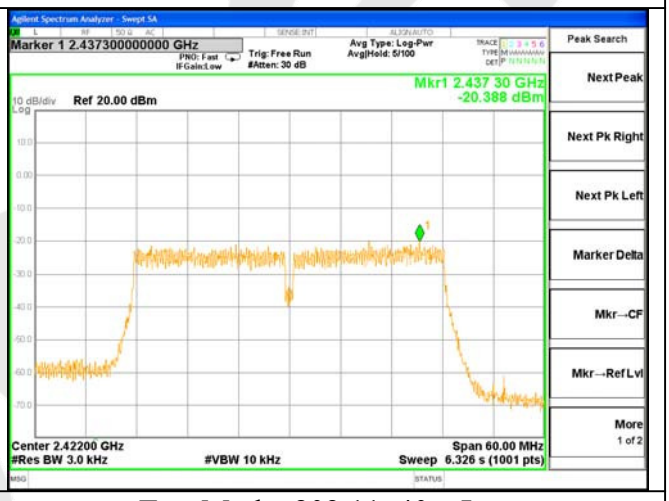
Test Mode: 802.11n20---Low



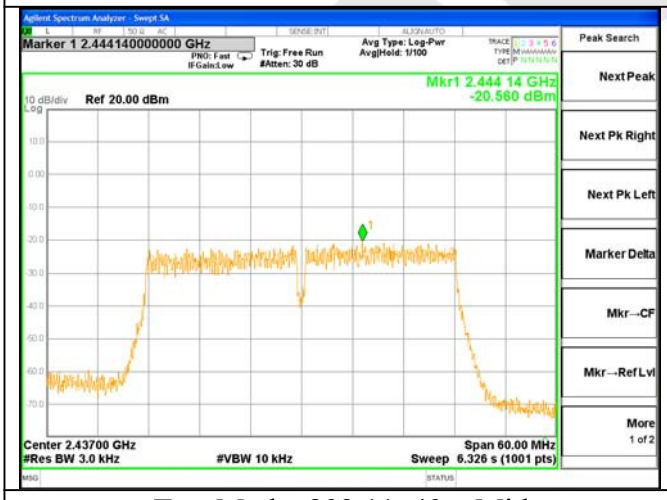
Test Mode: 802.11n20---Mid



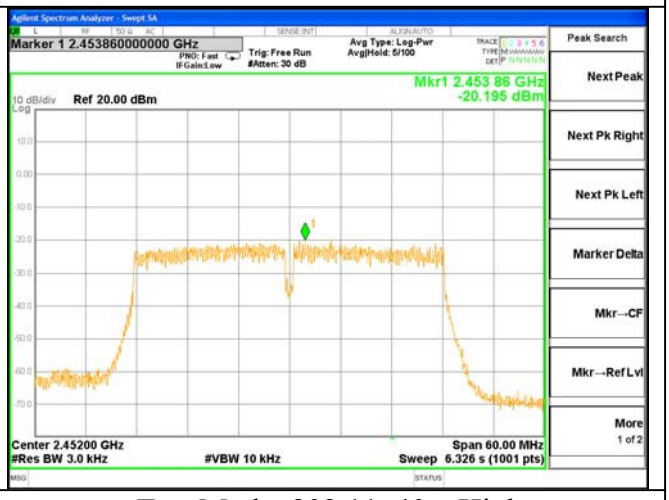
Test Mode: 802.11n20---High



Test Mode: 802.11n40---Low



Test Mode: 802.11n40---Mid



Test Mode: 802.11n40---High

4.6. Radiated Emissions

4.6.1.1. Test Limits (< 30 MHZ)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

4.6.1.2. Test Limits (≥ 30 MHZ)

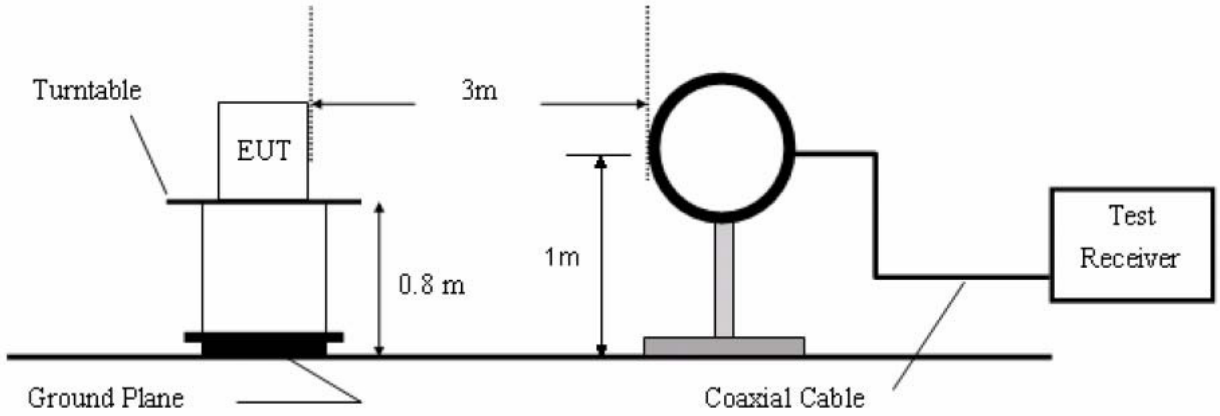
FIELD STRENGTH of Fundamental: @3M	FIELD STRENGTH of Harmonics	S15.209 30 - 88 MHz	40 dBuV/m
902-928 MHZ		88 - 216 MHz	43.5
2.4-2.4835 GHz		216 - 960 MHz	46
94 dBμV/m @3m	54 dBμV/m @3m	ABOVE 960 MHz	54dBuV/m

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

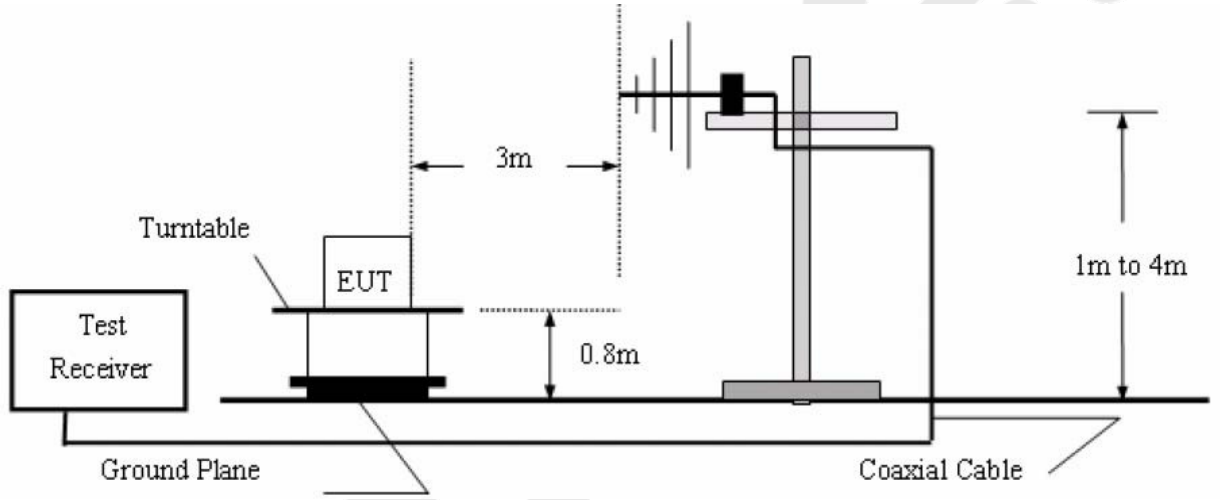
Test Equipment
Same as clause 4.2.

4.6.2. Test Configuration:

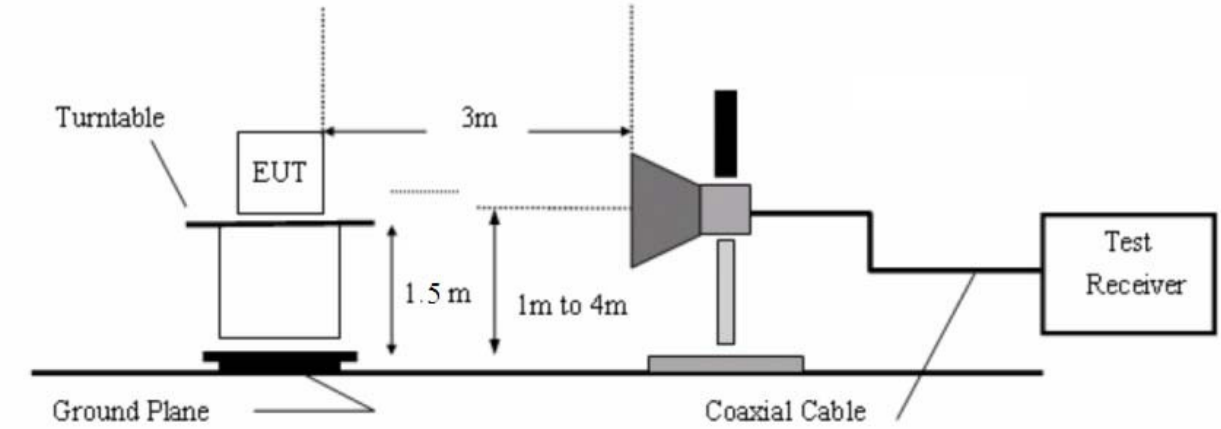
4.6.2.1. 9k to 30MHz emissions:



4.6.2.2. 30M to 1G emissions:



4.6.2.3. 1G to 40G emissions:



4.6.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.
The turn table can rotate 360 degrees to determine the position of the maximum emission level.
The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower.
The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Measurements are made on 9KHz to 30MHz and 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz.
The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

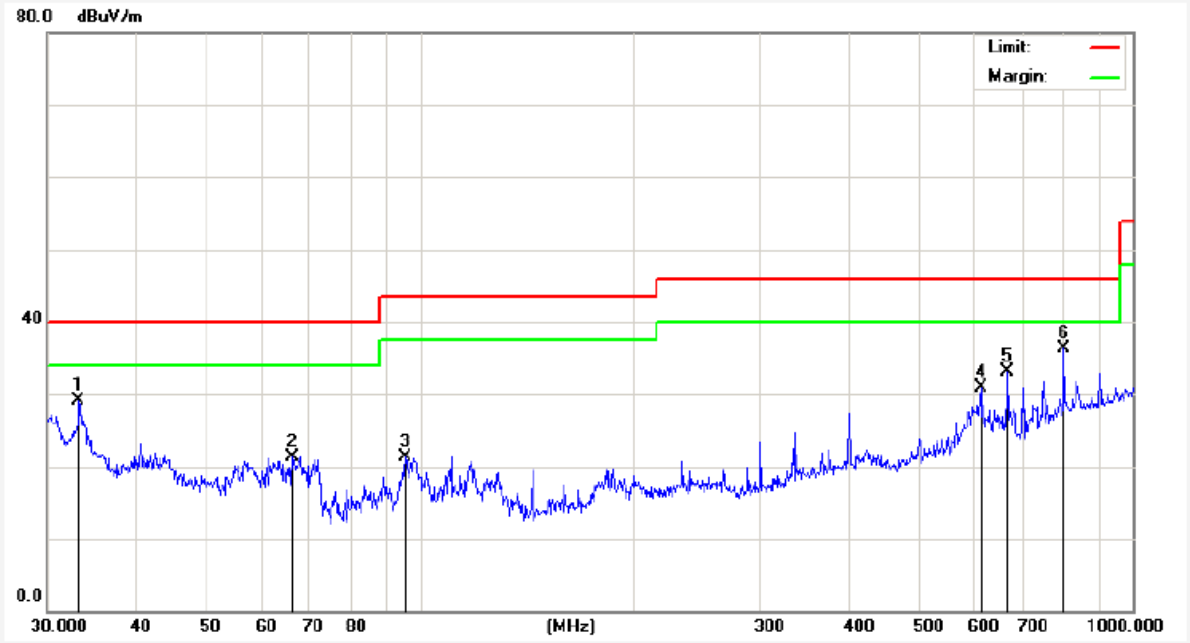
The test results are listed in Section 4.6.4.

3.6.4. Test Results

Please refer the following pages. Only the worst case (x orientation).

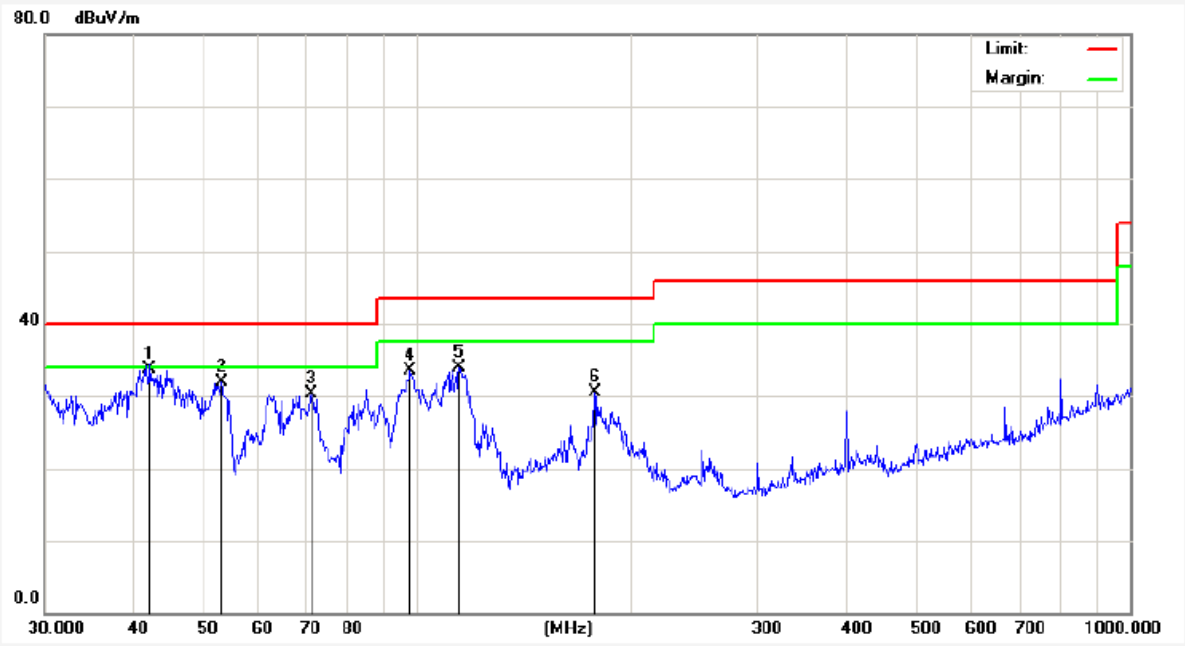
The test results of above 18000MHz are attenuated more than 20dB below the permissible limits, so the results don't record in the report.

Job No.:	**011609746I**	**Plarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Test Mode:	**WiFi Mode**	**Distance:**	**3m**



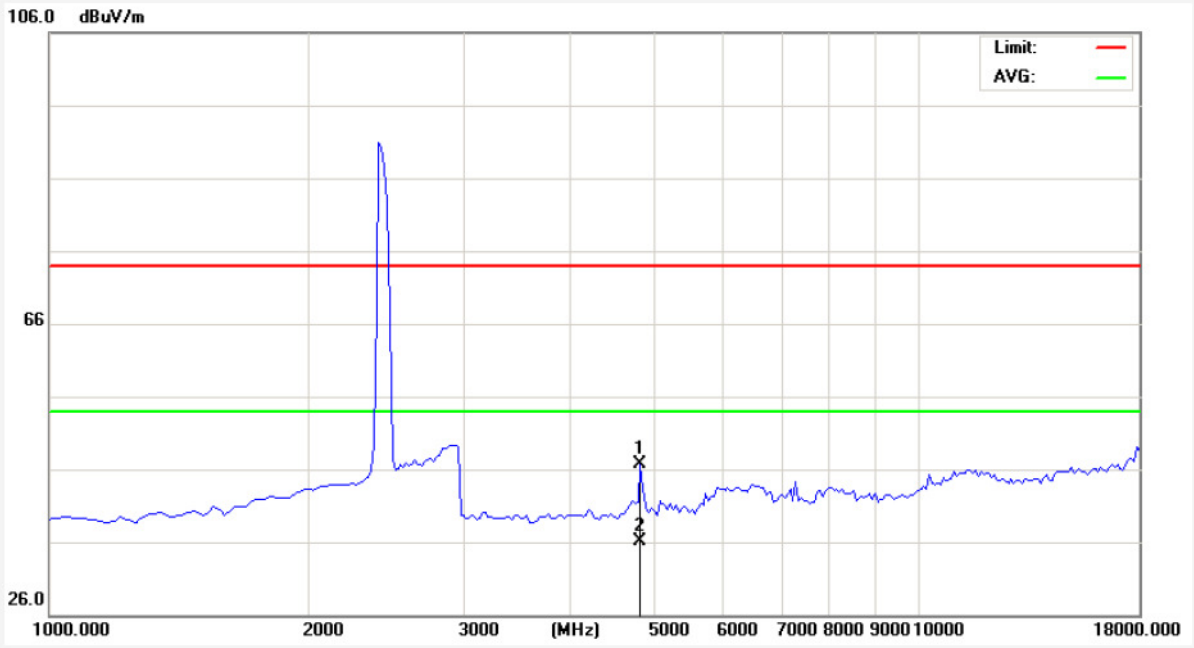
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	33.2112	44.34	-15.24	29.10	40.00	-10.90	peak			
2	66.2662	39.32	-18.01	21.31	40.00	-18.69	peak			
3	95.4270	42.39	-21.00	21.39	43.50	-22.11	peak			
4	612.0642	41.79	-10.91	30.88	46.00	-15.12	peak			
5	668.1423	42.40	-9.35	33.05	46.00	-12.95	peak			
6	801.7863	42.88	-6.54	36.34	46.00	-9.66	peak			

Job No.:	**011609746I**	**Plarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Test Mode:	**WiFi Mode**	**Distance:**	**3m**



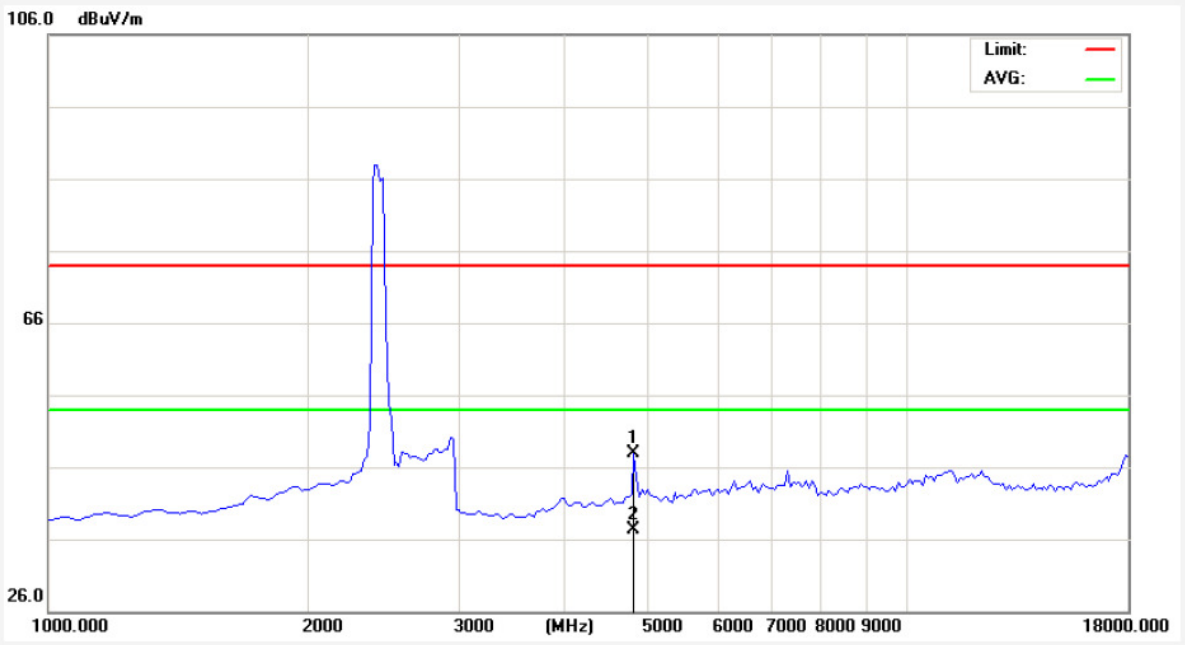
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	42.1542	45.01	-11.21	33.80	40.00	-6.20	QP	100	0	
2	53.1313	46.79	-14.79	32.00	40.00	-8.00	peak			
3	71.0803	50.05	-19.83	30.22	40.00	-9.78	peak			
4	97.7983	49.36	-15.88	33.48	43.50	-10.02	peak			
5	114.5146	49.76	-15.95	33.81	43.50	-9.69	peak			
6	177.5092	47.58	-17.03	30.55	43.50	-12.95	peak			

Job No.:	**011609746I**	**Plarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**802.11b(2412MHz)**	**Distance:**	**3m**



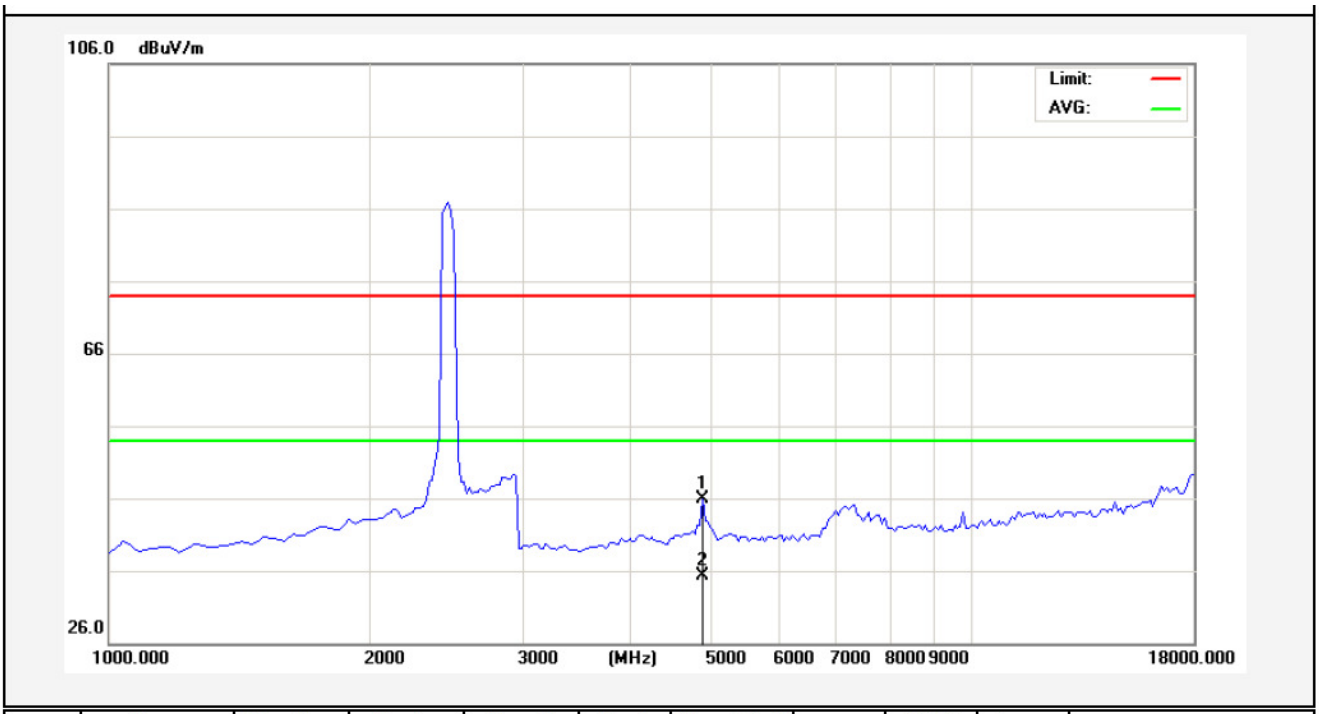
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	43.32	3.34	46.66	74.00	-27.34	peak			
2	4825.000	32.67	3.34	36.01	54.00	-17.99	AVG			

Job No.:	**011609746I**	**Plarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**802.11b(2412MHz)**	**Distance:**	**3m**



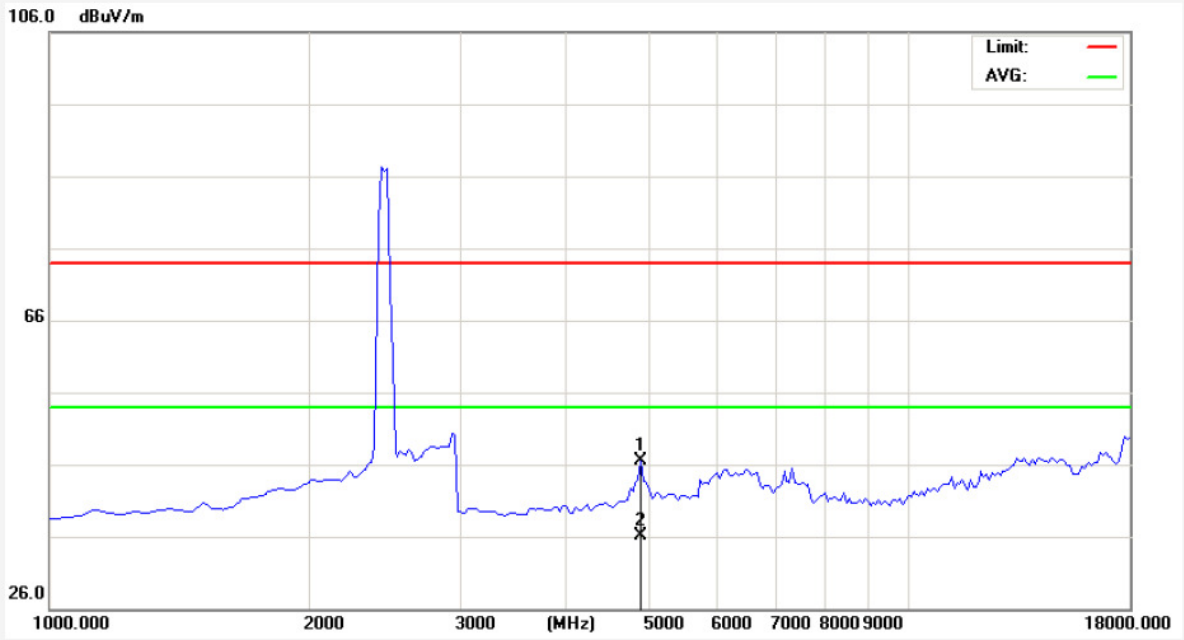
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	44.62	3.34	47.96	74.00	-26.04	peak			
2	4825.000	33.95	3.34	37.29	54.00	-16.71	AVG			

Job No.:	**011609746I**	**Plarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**802.11b(2437MHz)**	**Distance:**	**3m**



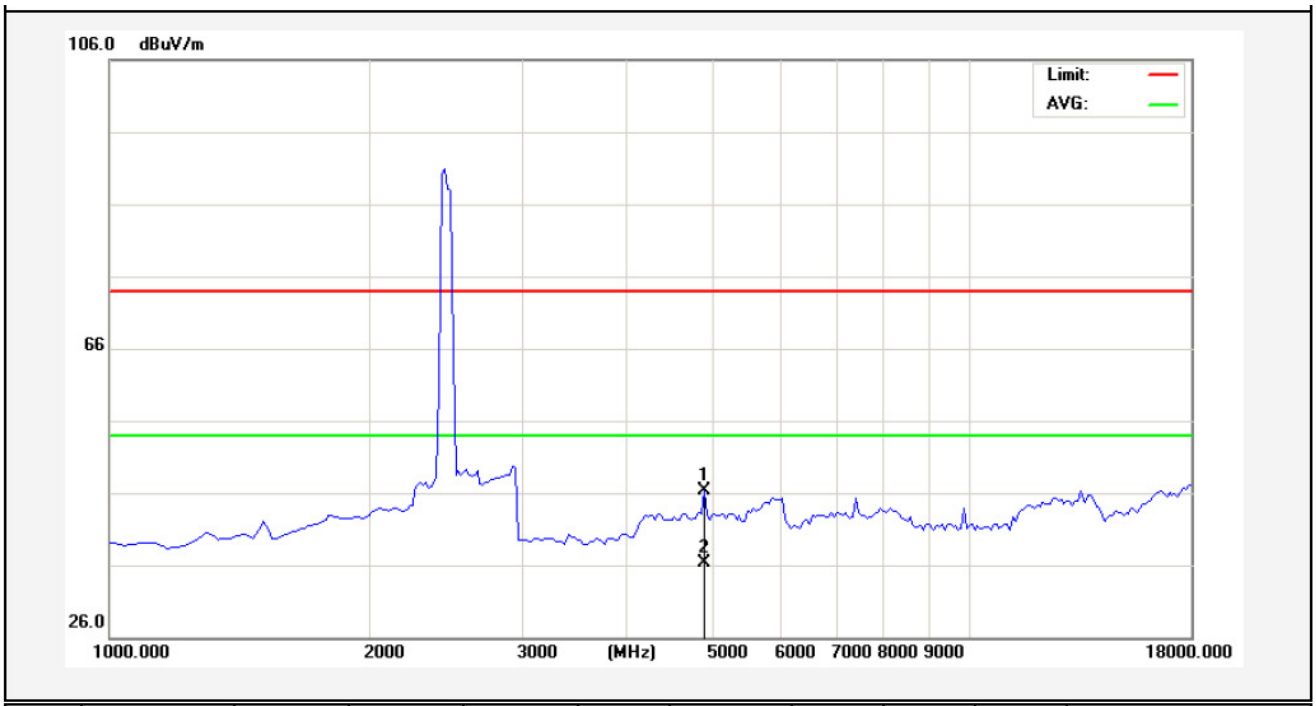
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	42.56	3.41	45.97	74.00	-28.03	peak			
2	4867.500	31.85	3.41	35.26	54.00	-18.74	AVG			

Job No.:	**011609746I**	**Plarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**802.11b(2437MHz)**	**Distance:**	**3m**



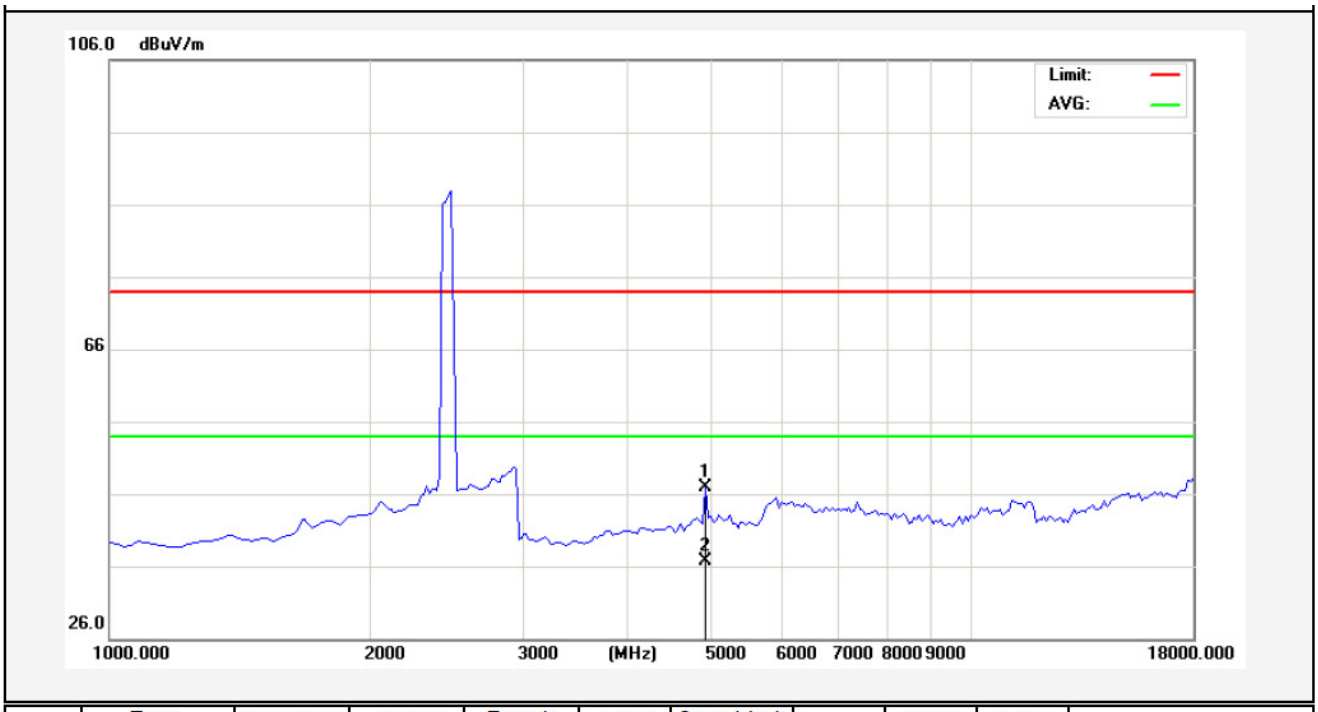
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	43.06	3.41	46.47	74.00	-27.53	peak			
2	4867.500	32.76	3.41	36.17	54.00	-17.83	AVG			

Job No.:	**011609746I**	**Plarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**802.11b(2462MHz)**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4910.000	42.88	3.49	46.37	74.00	-27.63	peak			
2	4910.000	32.84	3.49	36.33	54.00	-17.67	AVG			

Job No.:	**011609746I**	**Plarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for PC**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**802.11b(2462MHz)**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4910.000	43.43	3.49	46.92	74.00	-27.08	peak			
2	4910.000	33.28	3.49	36.77	54.00	-17.23	AVG			

5. ANTENNA APPLICATION

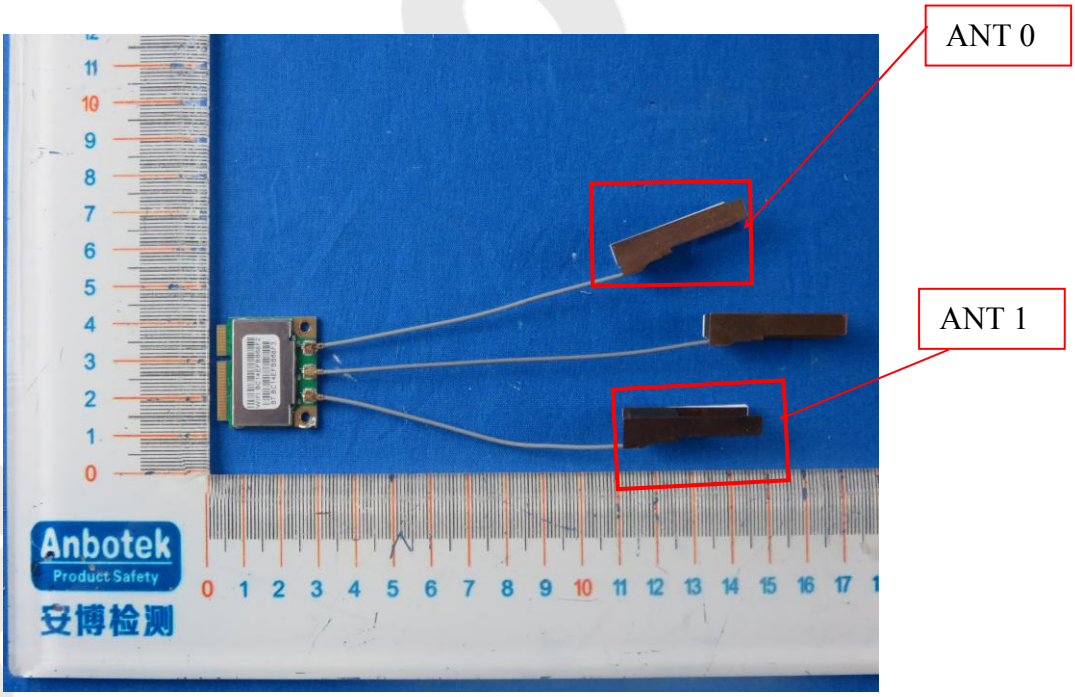
5.1. Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.2. Result

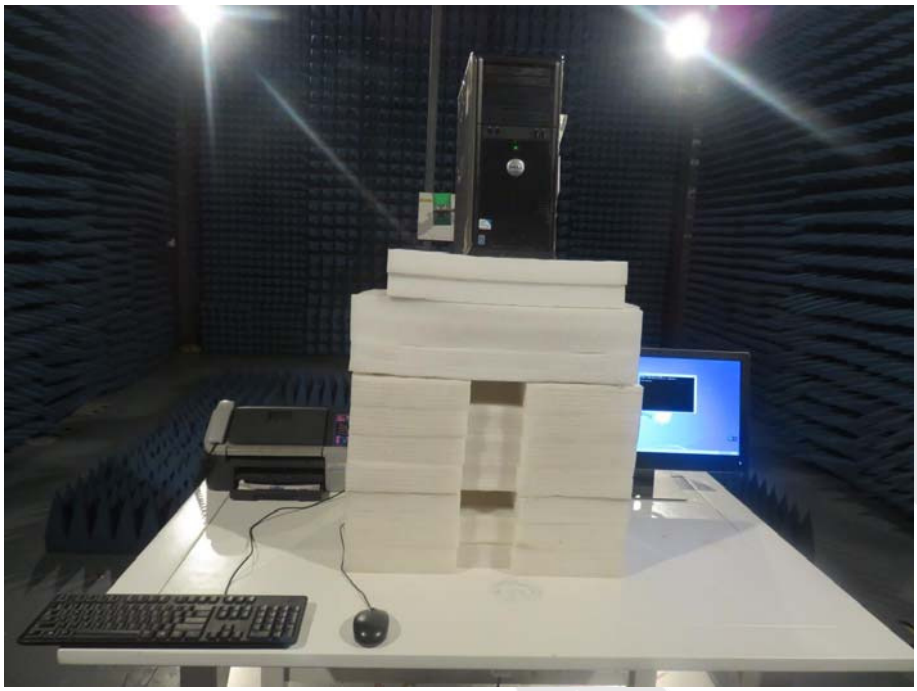
The EUT's antenna used a copper Antenna, which is permanently attached to the PCB with glue, The antenna's gain is 5dBi and meets the requirement.



6. PHOTOGRAPH

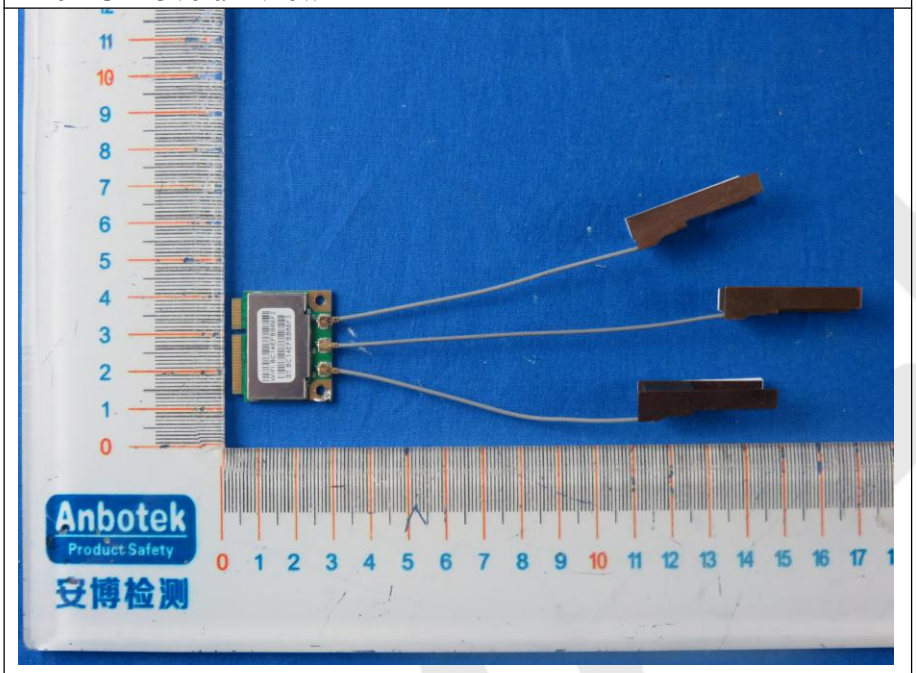
6.1. Photo of Conducted Emission Test

6.2. Photo of Radiation Emission Test

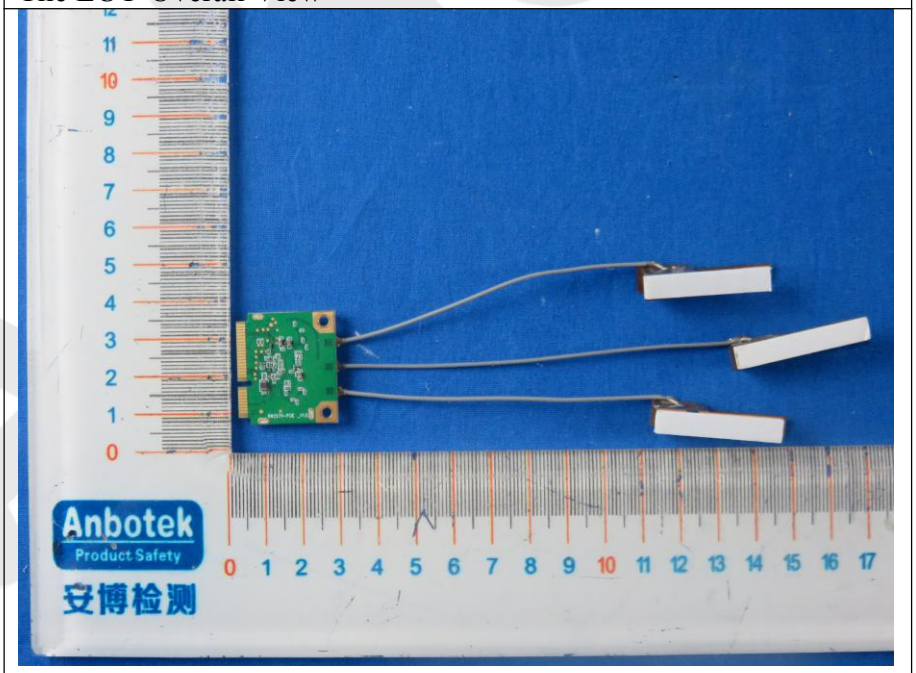


APPENDIX I (EXTERNAL PHOTOS)

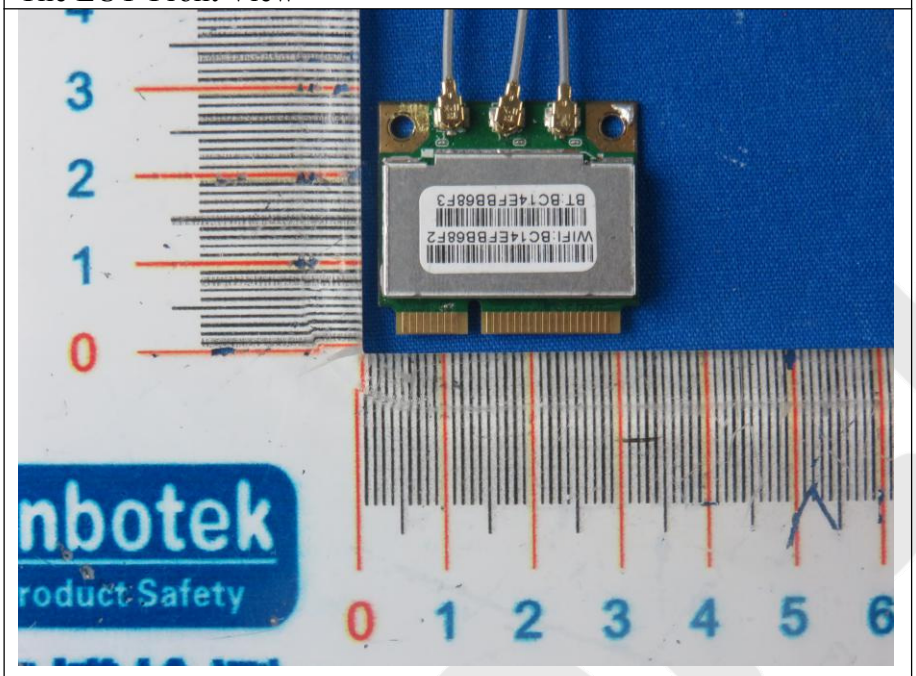
1. Figure
The EUT-Overall View



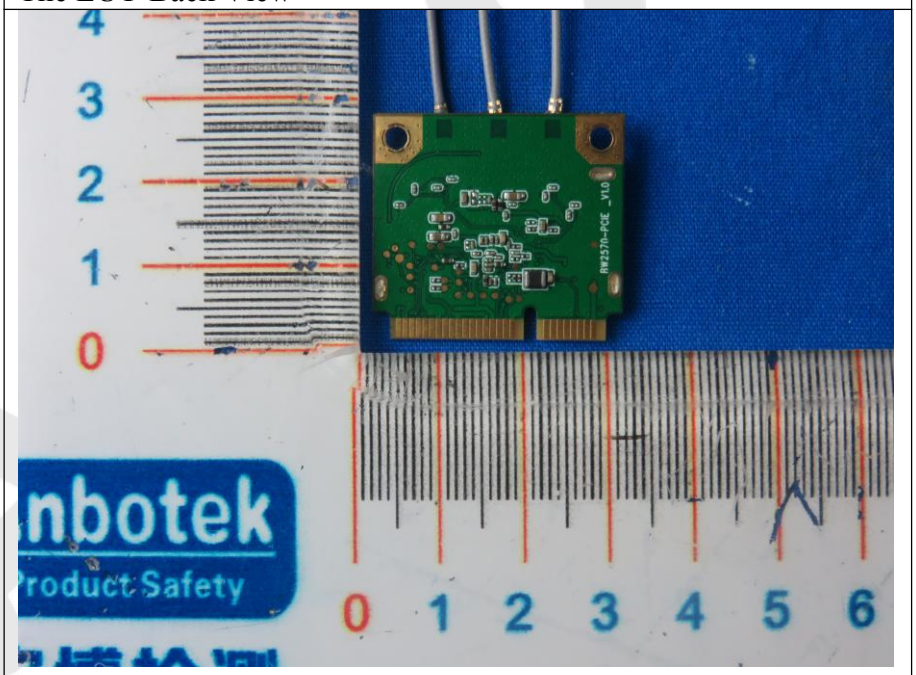
2. Figure
The EUT-Overall View



3. Figure
The EUT-Front View

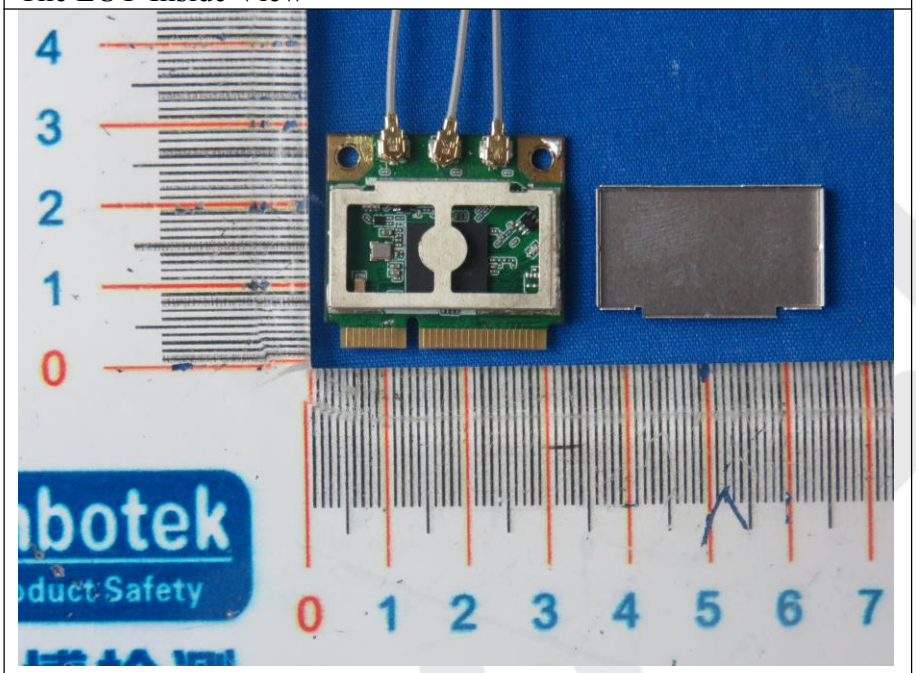


4. Figure
The EUT-Back View

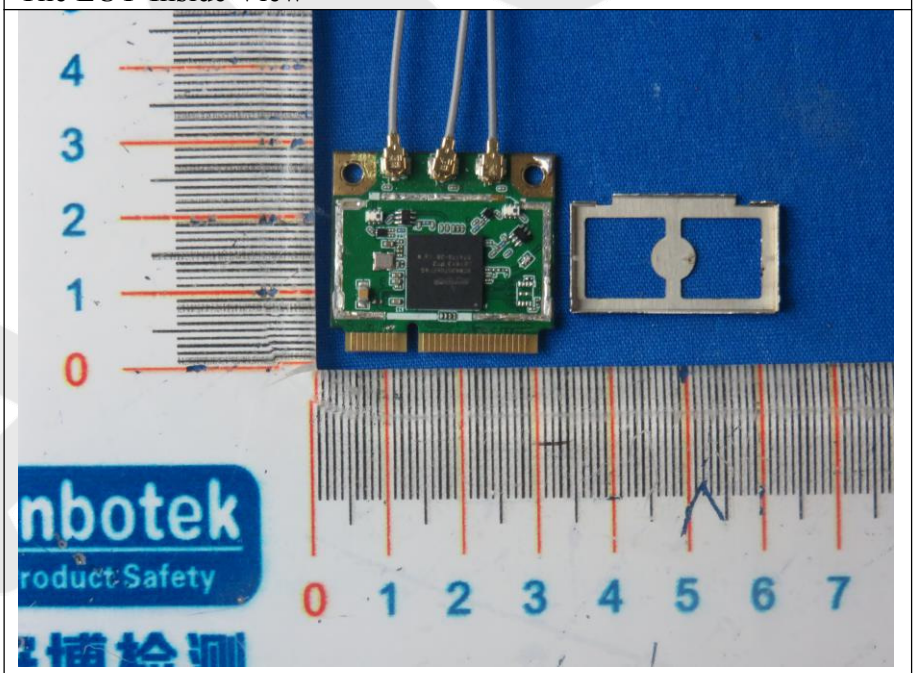


APPENDIX Ⅱ(INTERNAL PHOTOS)

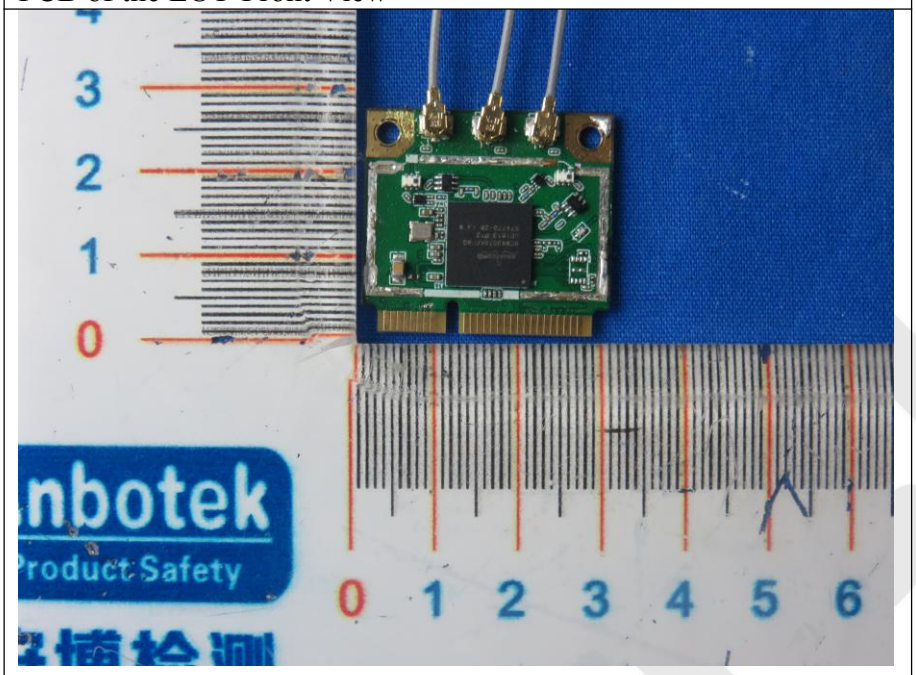
1. Figure
The EUT-Inside View



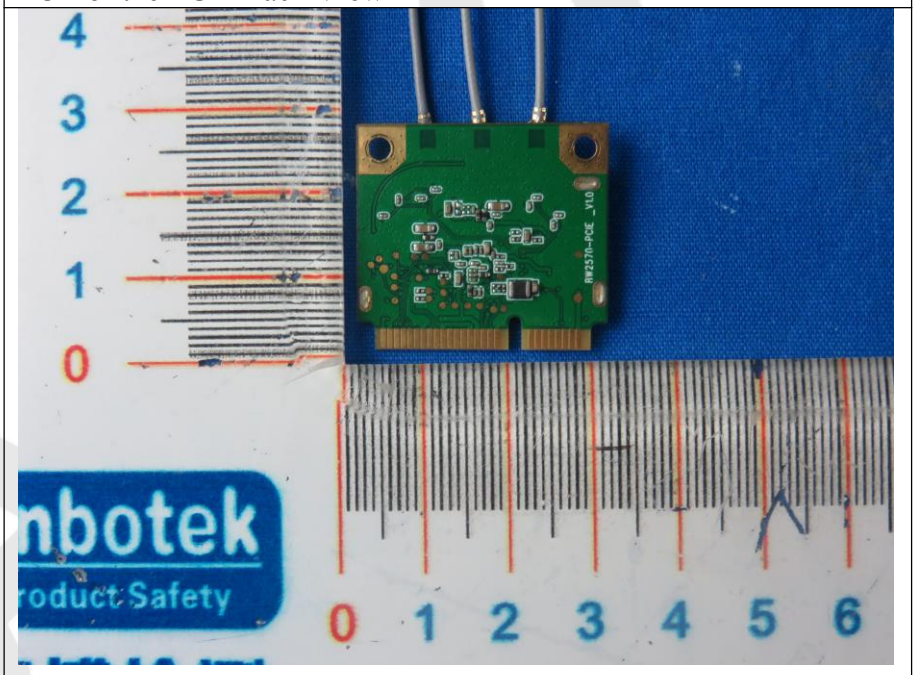
2. Figure
The EUT-Inside View



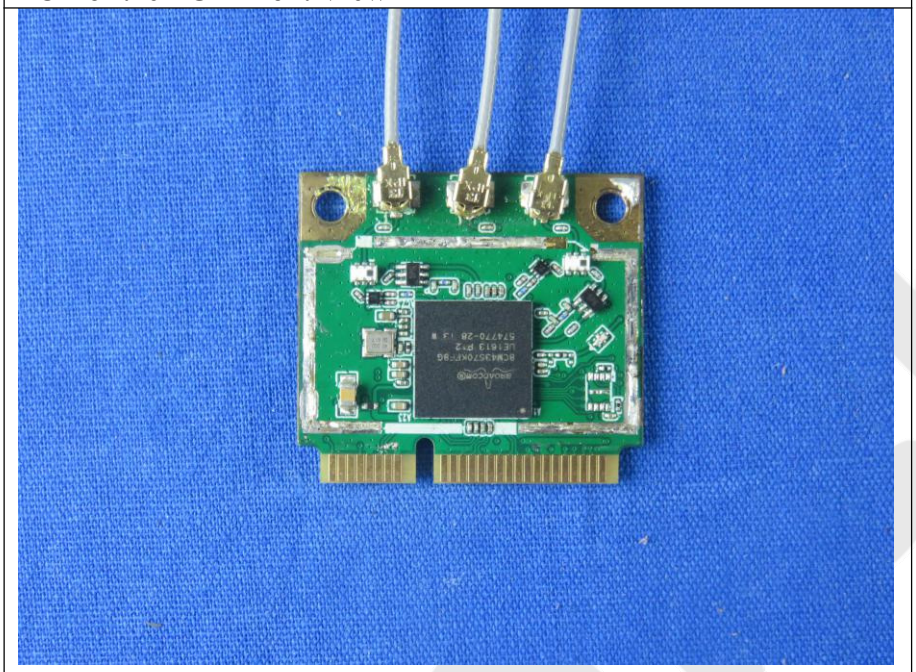
3. Figure
PCB of the EUT-Front View



4. Figure
PCB of the EUT-Back View



5. Figure
PCB of the EUT-Front View



6. Figure
PCB of the EUT-Back View