FCC TEST REPORT

For

Autel Intelligent Technology Corp., Ltd.

AUTOMOTIVE DIAGNOSTIC & ANALYSIS SYSTEM

Model No.: MaxiSys Elite

Prepared For : Autel Intelligent Technology Corp., Ltd.

6th - 10th Floor, Bldg. B1, Zhiyuan, Xueyuan Rd., Xili, Nanshan,

Shenzhen, 518055, China

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited

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Report Number : R0217100099W2

Date of Test : Oct. 11~Nov. 13, 2017

Date of Report : Dec. 02, 2017

Address



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TEST REPORT

Applicant : Autel Intelligent Technology Corp., Ltd.

Manufacturer : Autel Intelligent Technology Corp., Ltd.

Product Name : AUTOMOTIVE DIAGNOSTIC & ANALYSIS SYSTEM

Model No. : MaxiSys Elite

Trade Mark : Autel

Date of Test:

Rating(s) : Input DC 12V, 3A (with DC 3.7V, 15400 mAh Battery inside)

Test Standard(s) : FCC Part15 Subpart C 2017, Section 15.247

Test Method(s) : ANSI C63.10: 2013, KDB558074 D01 DTS Meas Guidance v04

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Oct 11~Nov 13 2017

2 400 01 1000	200 11 100 11 2017
Prepared by :	Winkey Wang
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Reviewer:	
	(Project Manager /Tangcy. T)
: Approved & Authorized Signer :	Ton Chen
	(Manager / Tom Chen)



1. General Information

1.1. Client Information

Applicant	:	Autel Intelligent Technology Corp., Ltd.			
A 11		6th - 10th Floor, Bldg. B1, Zhiyuan, Xueyuan Rd., Xili, Nanshan,			
Address		henzhen, 518055, China			
Manufacturer	:	Autel Intelligent Technology Corp., Ltd.			
A dalueses		6th - 10th Floor, Bldg. B1, Zhiyuan, Xueyuan Rd., Xili, Nanshan,			
Address		Shenzhen, 518055, China			

1.2. Description of Device (EUT)

Product Name	:	AUTOMOTIVE DIAGNOSTIC & ANALYSIS SYSTEM				
Model No.	:	MaxiSys Elite				
Trade Mark	:	Autel				
Test Power	:	AC 120V, 60Hz for adapter/AC 240V, 60Hz for adapter				
Supply		DC 3.7V Battery inside				
		WiFi 2.4G 802.11b/ g/ n(HT20) Operation Frequency: WiFi 2.4G 802.11n(HT40) 2422-2452N				
Product Description	:	Number of Channel: WiFi 2.4G: 11 Channels for 802.11b/ n(HT20) WiFi 2.4G: 7 Channels for 802.11n(HT40)				
		Modulation Type:	WiFi 2.4G: 802.11b CCK; 802.11g/n OFDM			
		Antenna Type:	PIFA Antenna			
		Antenna Gain(Peak):	Antenna Gain(Peak): 0.68 dBi			

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

2)This report is for WiFi 2.4G.

1.3. Auxiliary Equipment Used During Test

Adapter	:	Model: GME36A-120300FDS
		Input: 100-240V~50-60Hz, 1.2A
		Output: 12V, 3A



1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

RADIATED EMISSION TEST (BELOW 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

Mode	Available	Test	Modulation	Modulation	Data Rate
Wiode	Channel	Channel	Tech.	Type	(Mbps)
802.11b	1 to 11	1	CCK	DBPSK	1.0

For the test results, only the worst case was shown in test report.

RADIATED EMISSION TEST (ABOVE 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

Mode	Available	Test	Modulation	Modulation	Data Rate
Mode	Channel	Channel	Tech.	Type	(Mbps)
802.11b	1 to 11	1, 6, 11	CCK	DBPSK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n HT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

POWER LINE CONDUCTED EMISSION TEST:

The EUT was tested with the following mode

EUT configure mode	Test Mode
-	Keeping TX mode

BANDEDGE MEASUREMENT:

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

1	Mode	Available Test Modulation Modulation Data Rat Channel Channel Tech Type (Mbps)	te
---	------	---	----



802.11b	1 to 11	1, 11	CCK	DBPSK	1.0
802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5
802.11n HT40	3 to 9	3, 9	OFDM	BPSK	13.5

ANTENNA PORT CONDUCTED MEASUREMENT:

This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

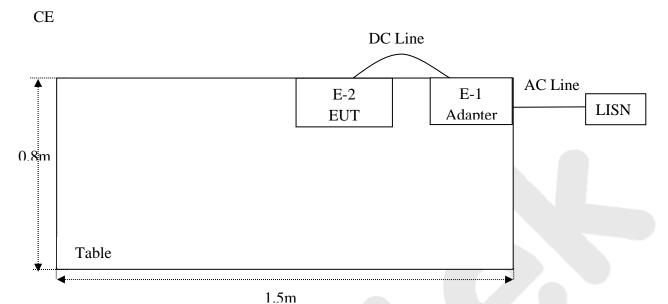
Mode	Available Channel		Modulation Tech.		Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	CCK	DBPSK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n HT40	3 to 9	3,6, 9	OFDM	BPSK	13.5

1.5. List of channels

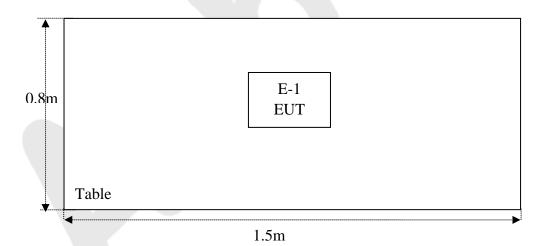
Channel	Freq.	Channel	Freq.	Channel	Freq.	Channel	Freq.
	(MHz)		(MHz)		(MHz)		(MHz)
01	2412	04	2427	07	2442	10	2457
-02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		



1.6. Description Of Test Setup



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1.7. Test Equipment List

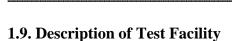
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	May 27, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	May 27, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 27, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	May 27, 2017	1 Year
5.	Spectrum Analysis	Agilent	N9038A	MY53227295	May 27, 2017	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G3 0D	KD17503	May 27, 2017	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	May 27, 2017	1 Year
8.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	May 31, 2017	1 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 31, 2017	1 Year
10.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Apr. 03, 2017	1 Year
11.	Horn Antenna	Schewarzbeck	BBHA9170	9170-375	May 27, 2017	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	May 27, 2017	1 Year
13.	Pre-amplifier	SKET Electronic	BK1G40G5 0A	KD25352	May 27, 2017	1 Year
14.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
15.	Power Sensor	DAER	RPR3006W	15I00041SN045	May 27, 2017	1 Year
16.	Power Sensor	DAER	RPR3006W	15I00041SN046	May 27, 2017	1 Year
17.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	May 27, 2017	1 Year
18.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	May 27, 2017	1 Year
19.	Signal Generator	Agilent	E4421B	MY41000743	May 27, 2017	1 Year
20.	DC Power supply	IVYTECH	IV6003	1601D6030007	May 26, 2017	1 Year
21.	TEMP&HUMI PROGRAMMABL E CHAMBER	Sertep	ZJ-HWHS8 0B	ZJ-17042804	Mar. 03, 2017	1 Year



1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal)
		Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB





The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111, July 31, 2017.

ISED-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A-1, June 13, 2016.

Test Location

All Emissions tests were performed at

Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China



2. Summary of Test Results

Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(3)	Conducted Peak Output Power	PASS
15.247(a)(2)	6dB Occupied Bandwidth	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Band Edge	PASS
Remark: "N/A" is an abbrev	iation for Not Applicable.	



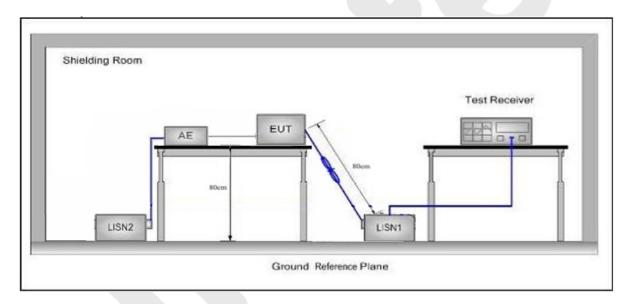
3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207						
	Eraguanav	Maximum RF Line Voltage (dBuV)					
	Frequency	Quasi-peak Level	Average Level				
Test Limit	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *				
	500kHz~5MHz	56	46				
	5MHz~30MHz	60	50				

Remark: (1) *Decreasing linearly with logarithm of the frequency.

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

⁽²⁾ The lower limit shall apply at the transition frequency.

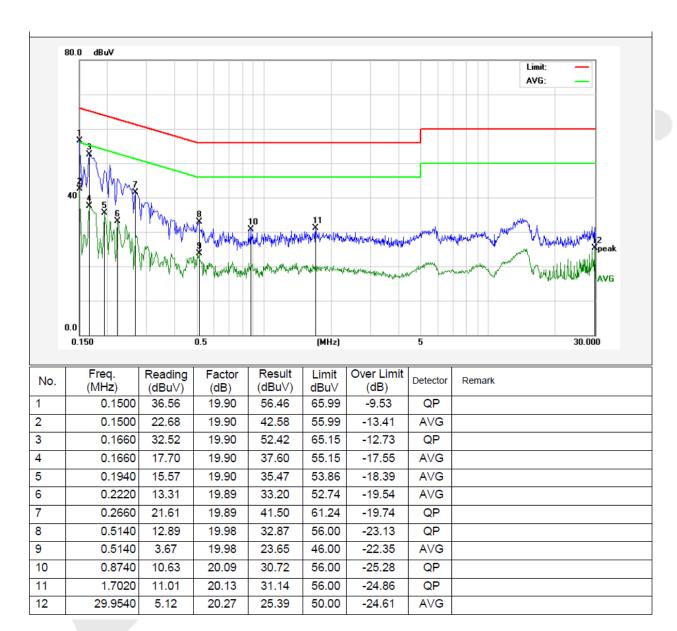


Test Site: 1# Shielded Room Operating Condition: Keeping TX mode

Test Specification: AC 120V, 60Hz via adapter

Comment: Live Line

Tem.:25°C Hum.:50%



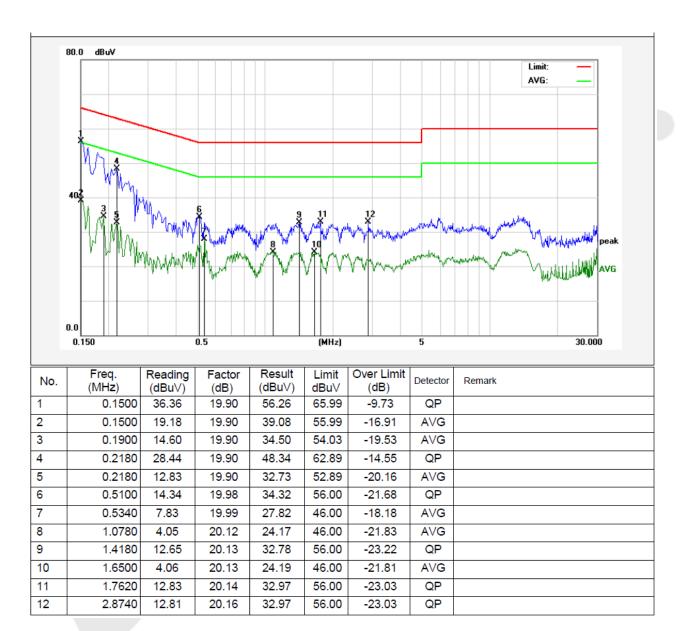


Test Site: 1# Shielded Room Operating Condition: Keeping TX mode

Test Specification: AC 120V, 60Hz via adapter

Comment: Neutral Line

Tem.:25°C Hum.:50%



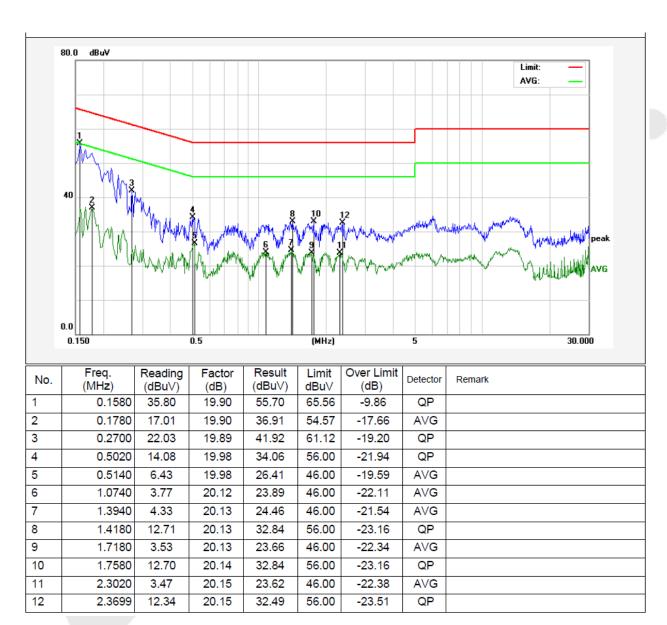


Test Site: 1# Shielded Room Operating Condition: Keeping TX mode

Test Specification: AC 240V, 60Hz via adapter

Comment: Live Line

Tem.:25 ℃ Hum.:50%



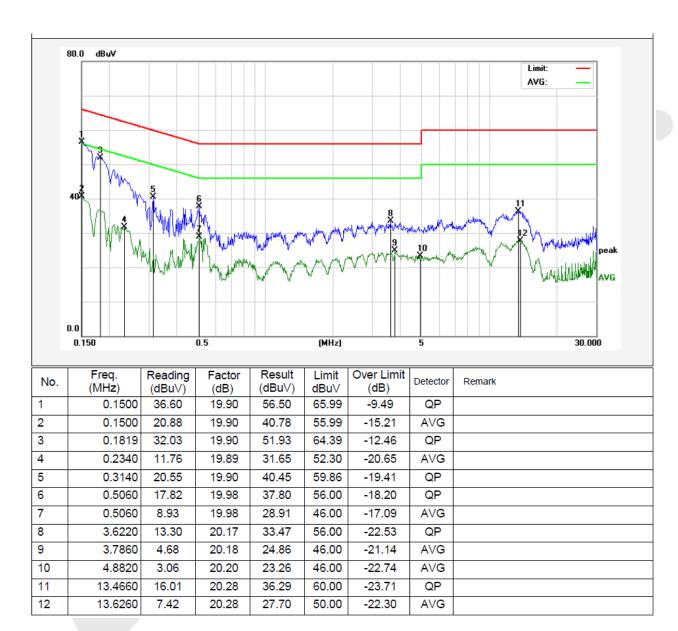


Test Site: 1# Shielded Room Operating Condition: Keeping TX mode

Test Specification: AC 240V, 60Hz via adapter

Comment: Neutral Line

Tem.:25°C Hum.:50%





4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 1	15.209 and 15.205				
	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)	
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300	
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30	
	1.705MHz-30MHz	30	-	1	30	
Test Limit	30MHz~88MHz	100	40.0	Quasi-peak	3	
	88MHz~216MHz	150	43.5	Quasi-peak	3	
	216MHz~960MHz	200	46.0	Quasi-peak	3	
	960MHz~1000MHz	500	54.0	Quasi-peak	3	
	Above 1000MHz	500	54.0	Average	3	
	AUOVE IUUUIVIHZ	-	74.0	Peak	3	

Remark:

- (1) The lower limit shall apply at the transition frequency.
- (2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

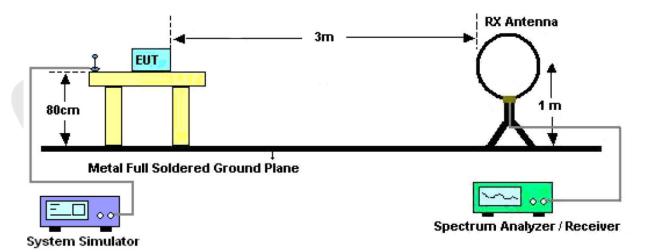


Figure 1. Below 30MHz

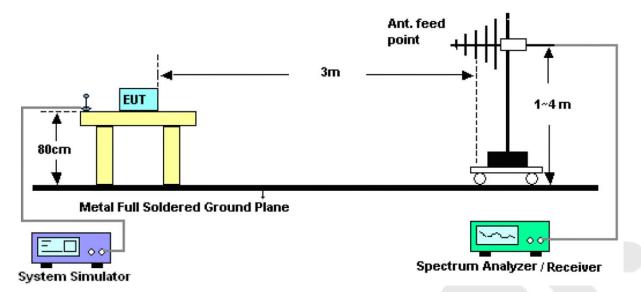


Figure 2. 30MHz to 1GHz

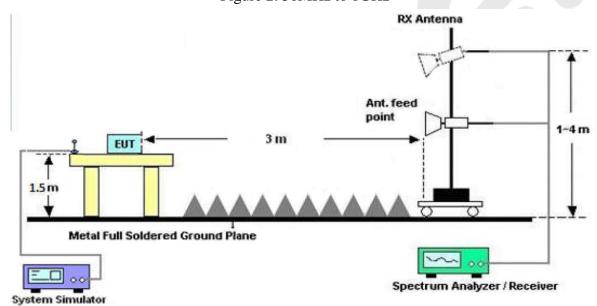


Figure 3. Above 1 GHz

4.3. 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. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for

maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9KHz, VBW = 30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

.

For above 1GHz,Set the spectrum analyzer as:

RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.

RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.



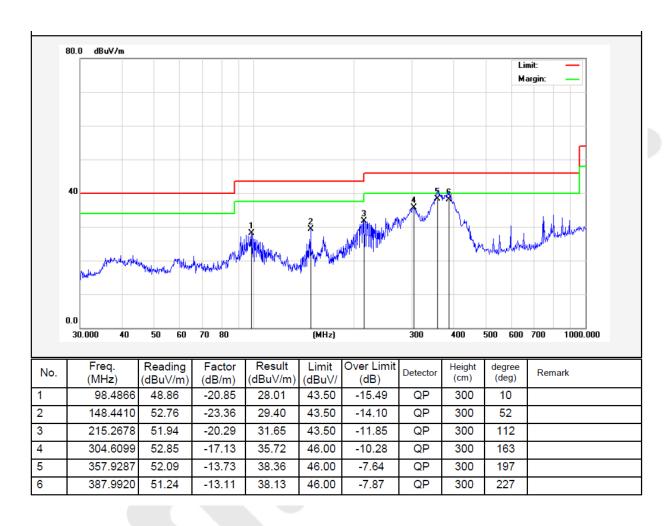
Test Results (30~1000MHz)

Job No.: 0217100099W2 Temp.(°C)/Hum.(%RH) 24.3°C/55%RH

:

Standard: FCC PART 15C Power Source: DC 3.7V

Test Mode: TX Mode Polarization: Horizontal



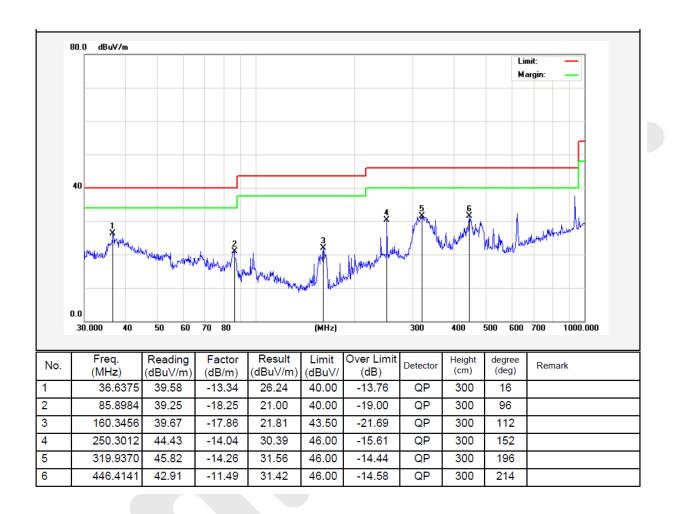


Test Results (30~1000MHz)

Job No.: 0217100099W2 Temp.(℃)/Hum.(%RH 24.3℃/55%RH

):

Standard: FCC PART 15C Power Source: DC 3.7V
Test Mode: TX Mode Polarization: Vertical





Test Results (Above 1000MHz)

Test Mode: 8	802.11b Mo	de		Test	channel: Lowe	est		
				Peak Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4824.00	40.20	34.13	6.61	34.09	46.85	74.00	-27.15	V
7236.00	34.16	37.14	7.74	34.51	44.53	74.00	-29.47	V
9648.00	32.67	39.35	9.26	34.80	46.48	74.00	-27.52	V
12060.00	*					74.00		V
14472.00	*					74.00		V
16884.00	*					74.00		V
4824.00	38.89	34.13	6.61	34.09	45.54	74.00	-28.46	Н
7236.00	33.92	37.14	7.74	34.51	44.29	74.00	-29.71	Н
9648.00	32.26	39.35	9.26	34.80	46.07	74.00	-27.93	Н
12060.00	*					74.00		Н
14472.00	*					74.00		Н
16884.00	*					74.00		Н
			A	verage Valu	e			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4824.00	29.30	34.13	6.61	34.09	35.95	54.00	-18.05	V
7236.00	23.03	37.14	7.74	34.51	33.40	54.00	-20.60	V
9648.00	23.02	39.35	9.26	34.80	36.83	54.00	-17.17	V
12060.00	*					54.00		V
14472.00	*					54.00		V
16884.00	*					54.00		V
4824.00	28.43	34.13	6.61	34.09	35.08	54.00	-18.92	Н
7236.00	22.50	37.14	7.74	34.51	32.87	54.00	-21.13	Н
9648.00	22.00	39.35	9.26	34.80	35.81	54.00	-18.19	Н
12060.00	*					54.00		Н
14472.00	*					54.00		Н
16884.00	*					54.00		Н



Test Results (Above 1000MHz)

Test Mode: 8	302.11b Mo	de		Test	Test channel: Middle				
				Peak Value					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
4874.00	39.28	34.35	6.67	34.09	46.21	74.00	-27.79	V	
7311.00	34.24	37.21	7.77	34.53	44.69	74.00	-29.31	V	
9748.00	33.70	39.45	9.33	34.80	47.68	74.00	-26.32	V	
12185.00	*					74.00		V	
14622.00	*					74.00		V	
17059.00	*					74.00		V	
4874.00	39.77	34.35	6.67	34.09	46.70	74.00	-27.30	Н	
7311.00	32.89	37.21	7.77	34.53	43.34	74.00	-30.66	Н	
9748.00	33.59	39.45	9.33	34.80	47.57	74.00	-26.43	Н	
12185.00	*					74.00		Н	
14622.00	*					74.00		Н	
17059.00	*					74.00		Н	
			A	verage Value	e				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
4874.00	30.14	34.35	6.67	34.09	37.07	54.00	-16.93	V	
7311.00	22.56	37.21	7.77	34.53	33.01	54.00	-20.99	V	
9748.00	22.95	39.45	9.33	34.80	36.93	54.00	-17.07	V	
12185.00	*					54.00		V	
14622.00	*					54.00		V	
17059.00	*					54.00		V	
4874.00	29.88	34.35	6.67	34.09	36.81	54.00	-17.19	Н	
7311.00	21.98	37.21	7.77	34.53	32.43	54.00	-21.57	Н	
9748.00	23.31	39.45	9.33	34.80	37.29	54.00	-16.71	Н	
12185.00	*					54.00		Н	
14622.00	*					54.00		Н	
17059.00	*					54.00		Н	



Test Results (Above 1000MHz)

Test Mode:8	302.11b Mod	le		Test	channel: Highe	est		
				Peak Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4924.00	44.75	34.57	6.74	34.09	51.97	74.00	-22.03	V
7386.00	34.89	37.29	7.80	34.55	45.43	74.00	-28.57	V
9848.00	36.97	39.55	9.41	34.81	51.12	74.00	-22.88	V
12310.00	*					74.00		V
14772.00	*					74.00		V
17234.00	*					74.00	7	V
4924.00	44.08	34.57	6.74	34.09	51.30	74.00	-22.70	Н
7386.00	33.80	37.29	7.80	34.55	44.34	74.00	-29.66	Н
9848.00	33.15	39.55	9.41	34.81	47.30	74.00	-26.70	Н
12310.00	*					74.00		Н
14772.00	*					74.00		Н
17234.00	*					74.00		Н
			A	verage Valu	e			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4924.00	35.68	34.57	6.74	34.09	42.90	54.00	-11.10	V
7386.00	24.80	37.29	7.80	34.55	35.34	54.00	-18.66	V
9848.00	25.48	39.55	9.41	34.81	39.63	54.00	-14.37	V
12310.00	*					54.00		V
14772.00	*					54.00		V
17234.00	*					54.00		V
4924.00	34.45	34.57	6.74	34.09	41.67	54.00	-12.33	Н
7386.00	23.19	37.29	7.80	34.55	33.73	54.00	-20.27	Н
9848.00	22.41	39.55	9.41	34.81	36.56	54.00	-17.44	Н
12310.00	*					54.00		Н
14772.00	*					54.00		Н
17234.00	*					54.00		Н

Remark:

- 1. During the test, pre-scan the 802.11b,g,n(HT20N),n(HT40N) mode, and found the 802.11b mode is worse case, the report only record this mode.
- 2. Level =Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- 3. "*", means this data is the too weak instrument of signal is unable to test.



Test Mode: 8	302.11b Mode			Test	channel: Lowe	est		
				Peak Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2390.00	52.26	29.15	3.41	34.01	50.81	74.00	-23.19	Н
2400.00	61.47	29.16	3.43	34.01	60.05	74.00	-13.95	Н
2390.00	53.98	29.15	3.41	34.01	52.53	74.00	-21.47	V
2400.00	63.43	29.16	3.43	34.01	62.01	74.00	-11.99	V
			A	verage Valu	e			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2390.00	38.84	29.15	3.41	34.01	37.39	54.00	-16.61	Н
2400.00	47.20	29.16	3.43	34.01	45.78	54.00	-8.22	Н
2390.00	40.71	29.15	3.41	34.01	39.26	54.00	-14.74	V
2400.00	48.37	29.16	3.43	34.01	46.95	54.00	-7.05	V

Test Mode: 8	302.11b Mode			Test	Test channel: Highest				
				Peak Value					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
2483.50	53.17	29.28	3.53	34.03	51.95	74.00	-22.05	Н	
2500.00	48.81	29.30	3.56	34.03	47.64	74.00	-26.36	Н	
2483.50	55.56	29.28	3.53	34.03	54.34	74.00	-19.66	V	
2500.00	51.43	29.30	3.56	34.03	50.26	74.00	-23.74	V	
			A	verage Valu	e				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
2483.50	39.30	29.28	3.53	34.03	38.08	54.00	-15.92	Н	
2500.00	35.29	29.30	3.56	34.03	34.12	54.00	-19.88	Н	
2483.50	41.30	29.28	3.53	34.03	40.08	54.00	-13.92	V	
2500.00	37.19	29.30	3.56	34.03	36.02	54.00	-17.98	V	

Remark:



Test Mode: 8	302.11g Mode			Test	Test channel: Lowest				
				Peak Value					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
2390.00	51.14	27.53	5.47	33.92	50.22	74.00	-23.78	Н	
2400.00	59.98	27.55	5.49	29.93	63.09	74.00	-10.91	Н	
2390.00	52.79	27.53	5.47	33.92	51.87	74.00	-22.13	V	
2400.00	61.64	27.55	5.49	29.93	64.75	74.00	-9.25	V	
			A	verage Valu	e				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
2390.00	38.05	27.53	5.47	33.92	37.13	54.00	-16.87	Н	
2400.00	46.29	27.55	5.49	29.93	49.40	54.00	-4.60	Н	
2390.00	39.83	27.53	5.47	33.92	38.91	54.00	-15.09	V	
2400.00	47.37	27.55	5.49	29.93	50.48	54.00	-3.52	V	

Test Mode: 802.11g Mode					Test channel: Highest					
				Peak Value						
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.		
2483.50	51.58	29.28	3.53	34.03	50.36	74.00	-23.64	Н		
2500.00	47.57	29.30	3.56	34.03	46.40	74.00	-27.60	Н		
2483.50	53.73	29.28	3.53	34.03	52.51	74.00	-21.49	V		
2500.00	49.98	29.30	3.56	34.03	48.81	74.00	-25.19	V		
			A	verage Valu	e					
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.		
2483.50	38.34	29.28	3.53	34.03	37.12	54.00	-16.88	Н		
2500.00	34.54	29.30	3.56	34.03	33.37	54.00	-20.63	Н		
2483.50	40.24	29.28	3.53	34.03	39.02	54.00	-14.98	V		
2500.00	36.40	29.30	3.56	34.03	35.23	54.00	-18.77	V		

Remark:



Test Mode: 802.11n20 Mode					channel: Lowe	est		
				Peak Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2390.00	50.70	27.53	5.47	33.92	49.78	74.00	-24.22	Н
2400.00	59.40	27.55	5.49	29.93	62.51	74.00	-11.49	Н
2390.00	52.32	27.53	5.47	33.92	51.40	74.00	-22.60	V
2400.00	60.94	27.55	5.49	29.93	64.05	74.00	-9.95	V
			A	verage Valu	e			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2390.00	37.74	27.53	5.47	33.92	36.82	54.00	-17.18	Н
2400.00	45.93	27.55	5.49	29.93	49.04	54.00	-4.96	Н
2390.00	39.48	27.53	5.47	33.92	38.56	54.00	-15.44	V
2400.00	46.98	27.55	5.49	29.93	50.09	54.00	-3.91	V

Test Mode: 802.11n20 Mode				Tes	Test channel: Highest				
				Peak Value	;				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Hactor			Over Limit (dB)	Pol.	
2483.50	50.95	29.28	3.53	34.03	49.73	74.00	-24.27	Н	
2500.00	47.08	29.30	3.56	34.03	45.91	74.00	-28.09	Н	
2483.50	53.02	29.28	3.53	34.03	51.80	74.00	-22.20	V	
2500.00	49.42	29.30	3.56	34.03	48.25	74.00	-25.75	V	
			A	verage Val	ue				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
2483.50	37.96	29.28	3.53	34.03	36.74	54.00	-17.26	Н	
2500.00	34.24	29.30	3.56	34.03	33.07	54.00	-20.93	Н	
2483.50	39.82	29.28	3.53	34.03	38.60	54.00	-15.40	V	
2500.00	36.08	29.30	3.56	34.03	34.91	54.00	-19.09	V	

Remark:



Test Mode: 8	302.11n40 Mo	de		Test	channel: Lowe	est		
				Peak Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2390.00	50.00	27.53	5.47	33.92	49.08	74.00	-24.92	Н
2400.00	58.46	27.55	5.49	29.93	61.57	74.00	-12.43	Н
2390.00	51.57	27.53	5.47	33.92	50.65	74.00	-23.35	V
2400.00	59.81	27.55	5.49	29.93	62.92	74.00	-11.08	V
			A	verage Valu	e			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2390.00	37.24	27.53	5.47	33.92	36.32	54.00	-17.68	Н
2400.00	45.35	27.55	5.49	29.93	48.46	54.00	-5.54	Н
2390.00	38.92	27.53	5.47	33.92	38.00	54.00	-16.00	V
2400.00	46.35	27.55	5.49	29.93	49.46	54.00	-4.54	V

Test Mode: 802.11n40 Mode				Tes	Test channel: Highest				
				Peak Value	e				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
2483.50	49.95	29.28	3.53	34.03	48.73	74.00	-25.27	Н	
2500.00	46.30	29.30	3.56	34.03	45.13	74.00	-28.87	Н	
2483.50	51.87	29.28	3.53	34.03	50.65	74.00	-23.35	V	
2500.00	48.50	29.30	3.56	34.03	47.33	74.00	-26.67	V	
			A	verage Val	ue				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	
2483.50	37.35	29.28	3.53	34.03	36.13	54.00	-17.87	Н	
2500.00	33.77	29.30	3.56	34.03	32.60	54.00	-21.40	Н	
2483.50	39.15	29.28	3.53	34.03	37.93	54.00	-16.07	V	
2500.00	35.58	29.30	3.56	34.03	34.41	54.00	-19.59	V	

Remark:

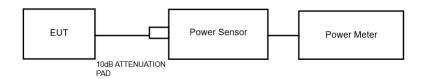


5. Maximum Peak Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (b)(3)
Test Limit	30dBm

5.2. Test Setup



5.3. Test Procedure

- 1. The Transmitter output (antenna port) was connected to the power meter.
- 2. Turn on the EUT and power meter and then record the power value.
- 3. Repeat above procedures on all channels needed to be tested.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

5.4. Test Data

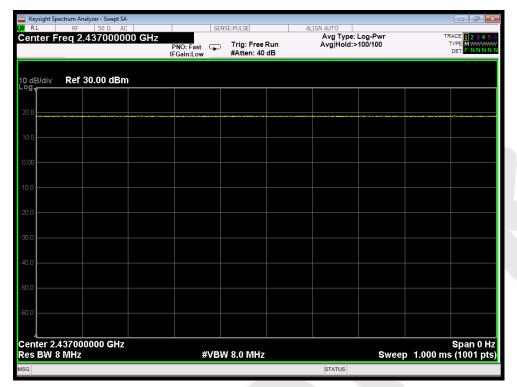
Test Item	:	Max. peak output power	Test Mode	:	CH Low ~ CH High
Test Voltage	:	AC 120V/60Hz	Temperature	:	24℃
Test Result	:	PASS	Humidity	:	55%RH

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power (PK) (dBm)	Limit dBm	Results
		TX 802.11b Mode		.,
CH01	2412	14.32	30	PASS
CH06	2437	15.26	30	PASS
CH11	2462	14.88	30	PASS
		TX 802.11g Mode		
CH01	2412	13.92	30	PASS
CH06	2437	14.02	30	PASS
CH11	2462	13.64	30	PASS
		TX 802.11n(20) Mode		
CH01	2412	13.62	30	PASS
CH06	2437	13.55	30	PASS
CH11	2462	13.04	30	PASS
		TX 802.11n(40) Mode		•
CH03	2422	11.68	30	PASS
CH06	2437	11.96	30	PASS
CH09	2452	11.57	30	PASS

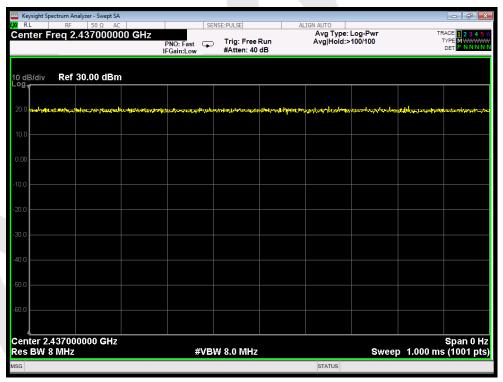
Note: For power test the duty cycle is 100% in continuous transmitting mode. Please see the plot of next page



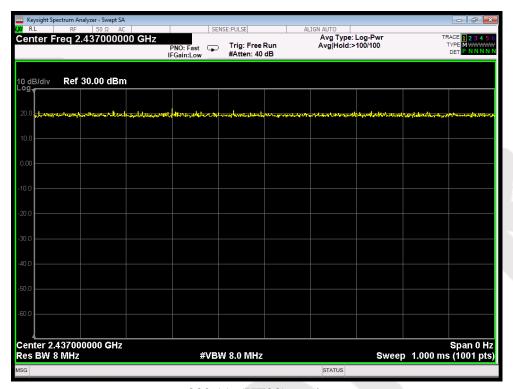
Duty Cycle



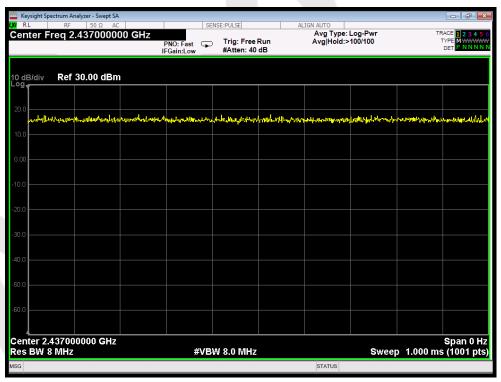
802.11b mode



802.11g mode



802.11n(HT20) mode



802.11n(HT40) mode

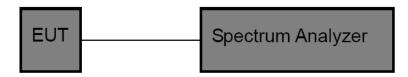


6. 6DB Occupy Bandwidth Test

6.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(2)
Test Limit	>500kHz

6.2. Test Setup



6.3. Test Procedure

- 1. Place the EUT on the table and set it in the transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as:

RBW= 100kHz, VBW≥3*RBW =300kHz

Detector= Peak

Trace mode= Max hold.

Sweep- auto couple.

- 4. Mark the peak frequency and –6dB (upper and lower) frequency.
- 5. Repeat until all the rest channels are investigated.

6.4. Test Data

Test Item	:	6dB Bandwidth	Test Mode	:	CH Low ~ CH High
Test Voltage	:	AC 120V/60Hz	Temperature	:	24℃
Test Result	:	PASS	Humidity	:	55%RH

Mode	Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
	Low	2412	8.081		PASS
802.11b	Middle	2437	8.079	>500	PASS
	High	2462	8.081		PASS
	Low	2412	16.46		PASS
802.11g	Middle	2437	16.43	>500	PASS
	High	2462	16.40		PASS
	Low	2412	17.66		PASS
802.11n20	Middle	2437	17.66	>500	PASS
	High	2462	17.63		PASS
	Low	2422	36.46		PASS
802.11n40	Middle	2437	36.46	>500	PASS
	High	2452	36.44		PASS



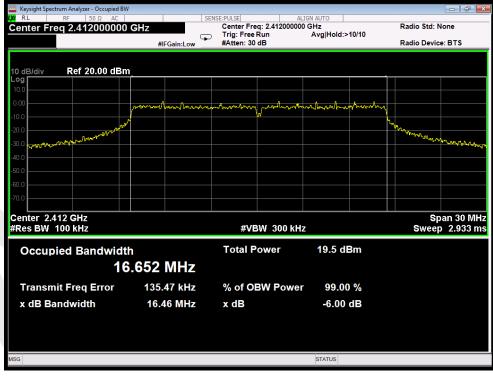
802.11b mode: Lowest



802.11b mode: Middle



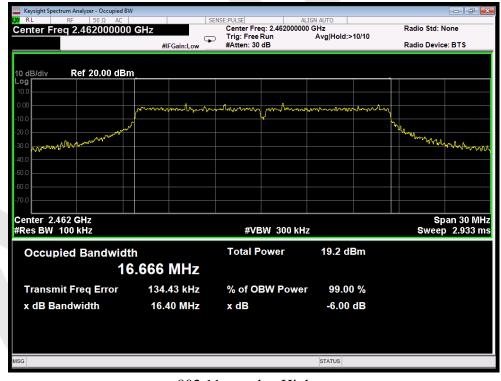
802.11b mode: Highest



802.11g mode: Lowest



802.11g mode: Middle



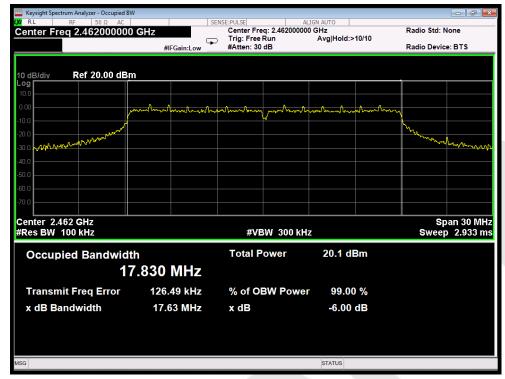
802.11g mode: Highest



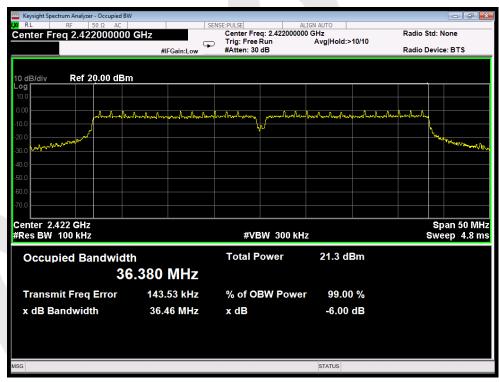
802.11n20 mode: Lowest



802.11n20 mode: Middle



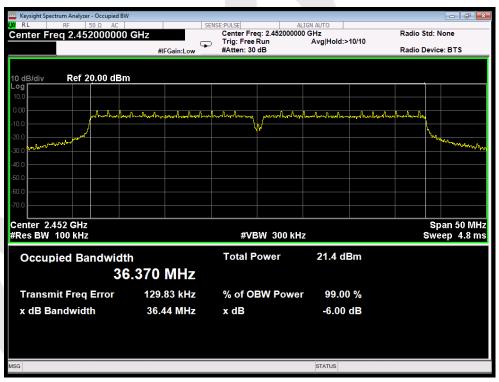
802.11n20 mode: Highest



802.11n40 mode: Lowest



802.11n40 mode: Middle



802.11n40 mode: Highest

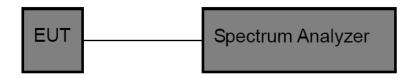


7. Power Spectral Density Test

7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (e)
Test Limit	8dBm/3KHz

7.2. Test Setup



7.3. 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.

7.4. Test Data

Test Item : Power Spectral Density Test Mode : CH Low ~ CH High

Test Voltage : AC 120V/60Hz Temperature : $24^{\circ}C$ Test Result : PASS Humidity : 55%RH

Mode	Channel	Frequency (MHz)	PPSD (dBm/3KHz)	Limit (dBm/3KHz)	Results
	Low	2412	-9.630	8.00	PASS
802.11b	Middle	2437	-8.330	8.00	PASS
	High	2462	-8.359	8.00	PASS
	Low	2412	-13.541	8.00	PASS
802.11g	Middle	2437	-11.430	8.00	PASS
	High	2462	-13.275	8.00	PASS
802.11n2 0	Low	2412	-12.942	8.00	PASS
	Middle	2437	-12.233	8.00	PASS
	High	2462	-12.478	8.00	PASS
802.11n4 0	Low	2422	-15.094	8.00	PASS
	Middle	2437	-14.676	8.00	PASS
	High	2452	-14.328	8.00	PASS



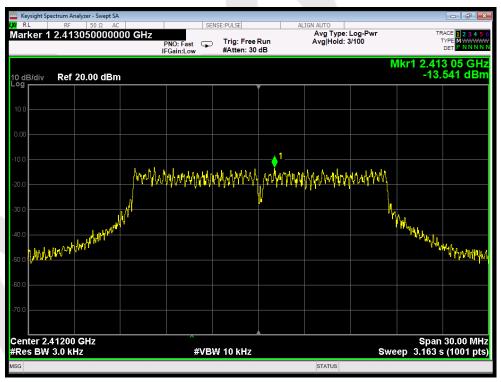
802.11b mode: Lowest



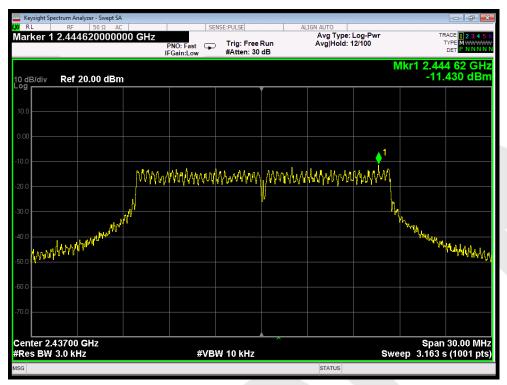
802.11b mode: Middle



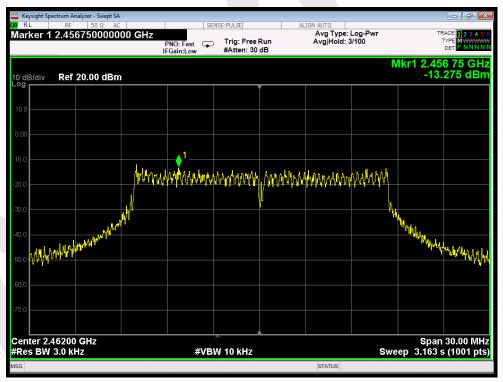
802.11b mode: Highest



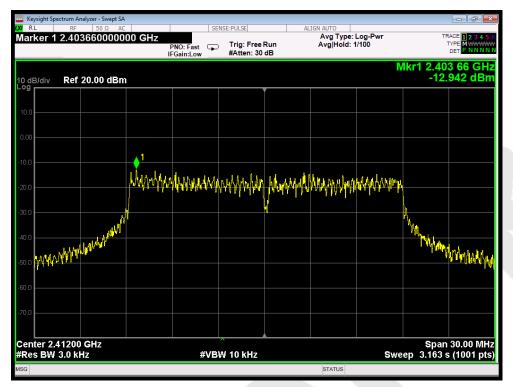
802.11g mode: Lowest



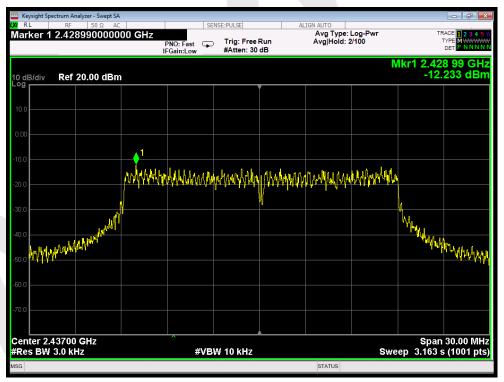
802.11g mode: Middle



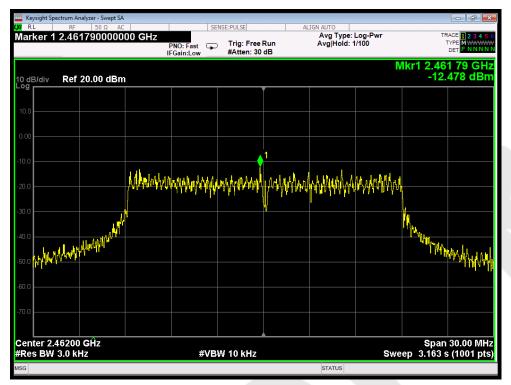
802.11g mode: Highest



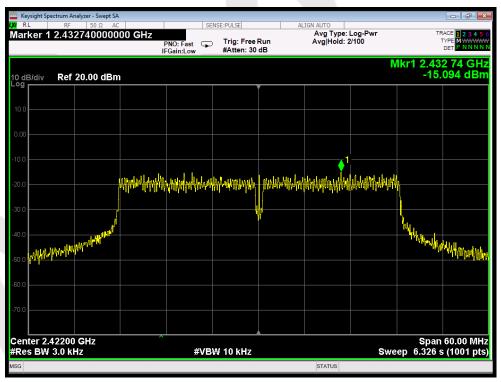
802.11n20 mode: Lowest



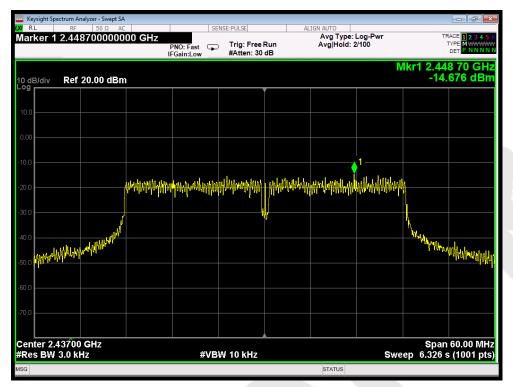
802.11n20 mode: Middle



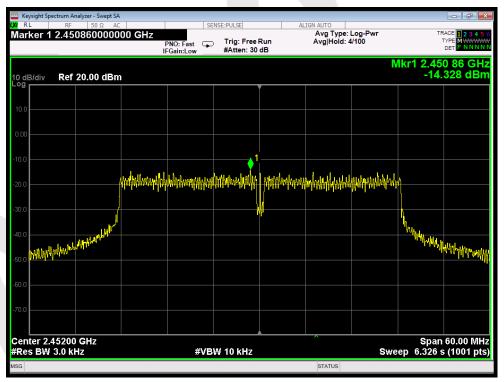
802.11n20 mode: Highest



802.11n40 mode: Lowest



802.11n40 mode: Middle



802.11n40 mode: Highest

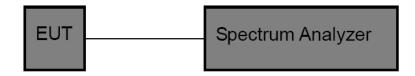


8. 100kHz Bandwidth of Frequency Band Edge Requirement

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)	
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).	

8.2. Test Setup



8.3. Test Procedure

Using the following spectrum analyzer setting:

- 1. Set the RBW = 100KHz.
- 2. Set the VBW = 300KHz.
- 3. Sweep time = auto couple.
- 4. Detector function = peak.
- 5. Trace mode = max hold.
- 6. Allow trace to fully stabilize.

8.4. Test Data

Test Item : Band edge : CH Low ~ CH High Test Voltage : AC 120V/60Hz Temperature : 24°C

Test Result : PASS Humidity : 55%RH

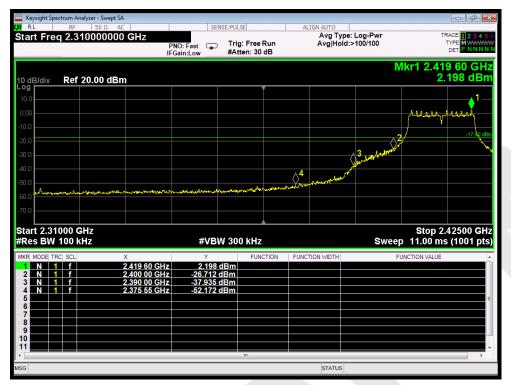
Mode	Frequency Band (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Results
802.11b	2412	49.929	>20	PASS
	2462	58.557	>20	PASS
802.11g	2412	28.910	>20	PASS
	2462	40.978	>20	PASS
802.11n20	2412	27.195	>20	PASS
	2462	36.022	>20	PASS
802.11n40	2422	25.407	>20	PASS
	2452	30.120	>20	PASS



802.11b mode: Lowest



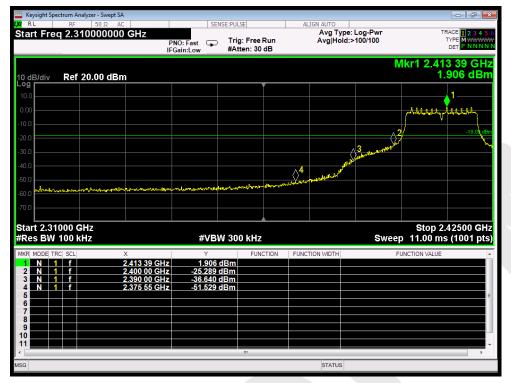
802.11b mode: Highest



802.11g mode: Lowest



802.11g mode: Highest



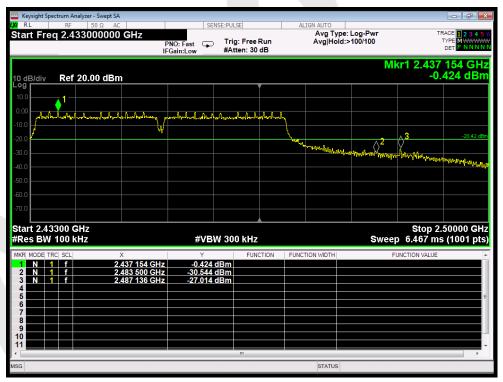
802.11n20 mode: Lowest



802.11n20 mode: Highest



802.11n40 mode: Lowest



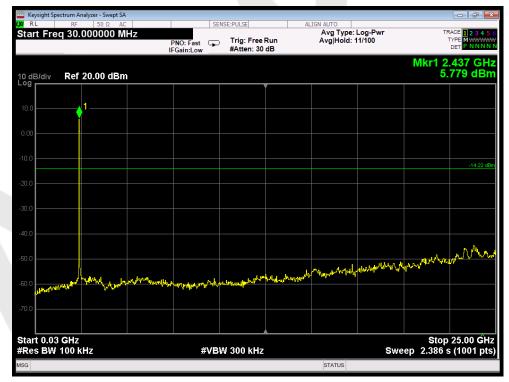
802.11n40 mode: Highest



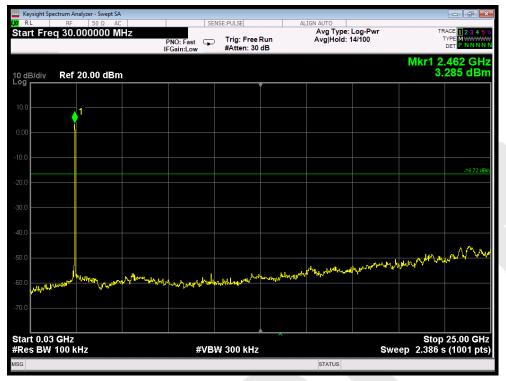
Conducted Emission Method



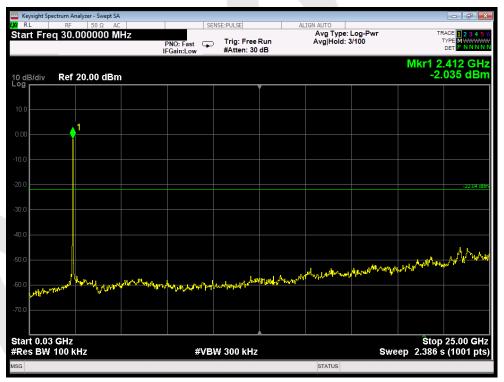
802.11b mode: Lowest



802.11b mode: Middle



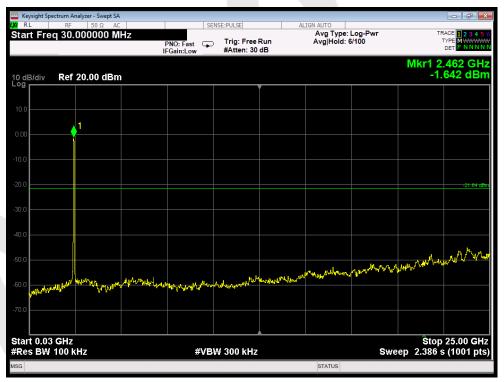
802.11b mode: Highest



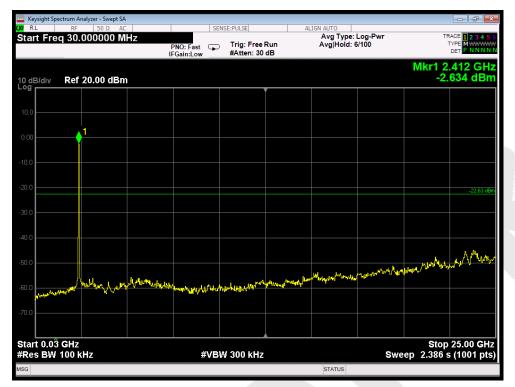
802.11g mode: Lowest



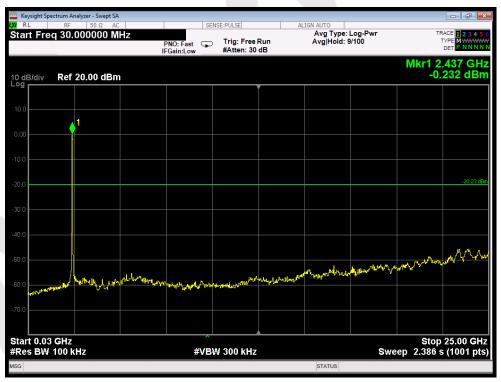
802.11g mode: Middle



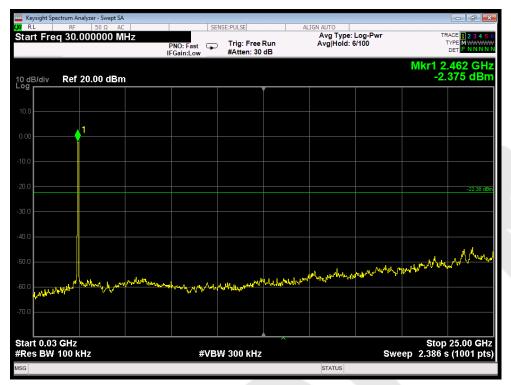
802.11g mode: Highest



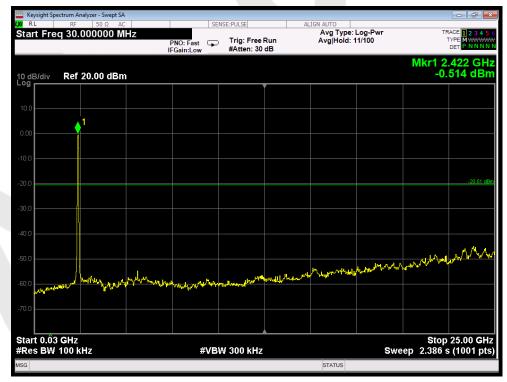
802.11n20 mode: Lowest



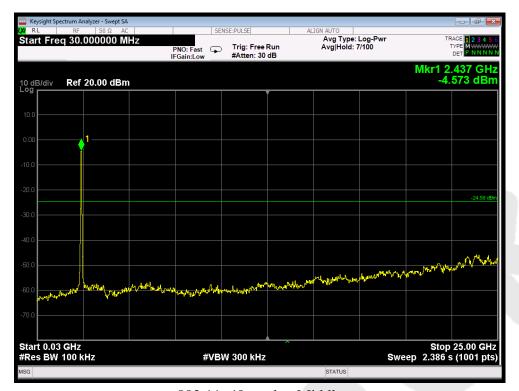
802.11n20 mode: Middle



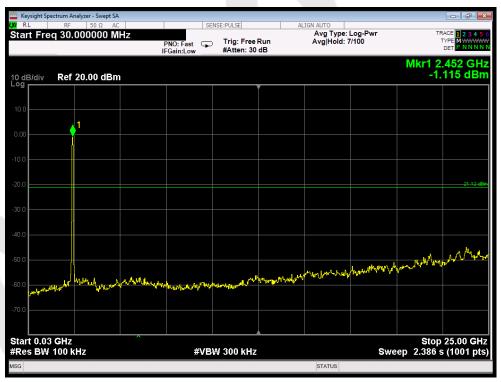
802.11n20 mode: Highest



802.11n40 mode: Lowest



802.11n40 mode: Middle



802.11n40 mode: Highest



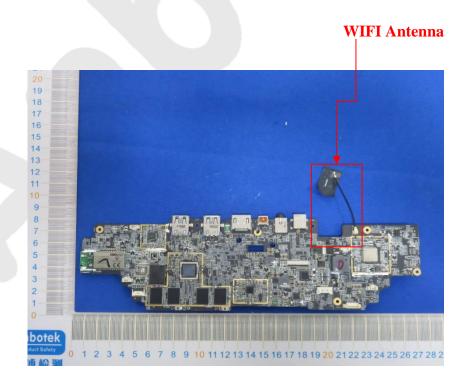
9. Antenna Requirement

9.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: 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, 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. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

9.2. Antenna Connected Construction

The WIFI antenna is a PIFA Antenna which permanently attached, and the best case gain of the antenna is 0.68 dBi It complies with the standard requirement.





APPENDIX I -- TEST SETUP PHOTOGRAPH

Please see the test report of R0217100099W1



APPENDIX II -- EXTERNAL PHOTOGRAPH

Please see the test report of R0217100099W1





APPENDIX III -- INTERNAL PHOTOGRAPH

Please see the test report of R0217100099W1



End of Report