

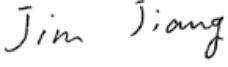


## CTC Laboratories, Inc.

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# TEST REPORT

Report No. ....: CTC20230289E03  
FCC ID.....: 2BAG3MS20A15  
Applicant.....: **EVELAB INSIGHT (SINGAPORE) PTE. LTD.**  
Address.....: 80 Robinson Road #02-00 Singapore 068898  
Manufacturer.....: Xiamen MeituEve Technology Co., Ltd.  
Address.....: Room 568, No.942, Tonglong 2nd Road, Gaoxin District  
(Xiang'an) Industries, Xiamen, China  
Product Name.....: **EveLab Insight-Eve V Skin Imaging Analysis System**  
Trade Mark.....: EveLab Insight  
Model/Type reference.....: MS20A15  
Listed Model(s) .....: /  
Standard.....: **FCC CFR Title 47 Part 15 Subpart C Section 15.247**  
Date of receipt of test sample....: Feb. 13, 2023  
Date of testing.....: Feb. 13, 2023 to Mar. 7, 2023  
Date of issue.....: Mar. 7, 2023  
Result.....: **PASS**

Compiled by:  
(Printed name+signature) Jim Jiang 

Supervised by:  
(Printed name+signature) Eric Zhang 

Approved by:  
(Printed name+signature) Totti Zhao 

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## 1. TEST SUMMARY

### 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

[RSS 247 Issue 2](#): Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSSs) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

### 1.2. Report Version

Revised No.	Date of issue	Description
01	Mar. 7, 2023	Original

### 1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS 247 Issue 2				
Test Item	Standard Section		Result	Test Engineer
	FCC	IC		
Antenna Requirement	15.203	/	Pass	Jim Jiang
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Jim Jiang
Band Edge Emissions	15.247(d)	RSS 247 5.5	Pass	Jim Jiang
6dB Bandwidth	15.247(a)(2)	RSS 247 5.2 (a)	Pass	Jim Jiang
Conducted Max Output Power	15.247(b)(3)	RSS 247 5.4 (d)	Pass	Jim Jiang
Power Spectral Density	15.247(e)	RSS 247 5.2 (b)	Pass	Jim Jiang
Transmitter Radiated Spurious	15.209&15.247(d)	RSS 247 5.5& RSS-Gen 8.9	Pass	Jim Jiang

Note: The measurement uncertainty is not included in the test result.



## 1.4. Test Facility

### CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

### Laboratory accreditation

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

#### A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

#### FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered 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 951311, Aug 26, 2017.

## 1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.



Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 1.6. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C~27°C
Relative Humidity:	40%~60%
Atmospheric Pressure:	101kPa



## 2. GENERAL INFORMATION

### 2.1. Client Information

Applicant:	EVELAB INSIGHT (SINGAPORE) PTE. LTD.
Address:	80 Robinson Road #02-00 Singapore 068898
Manufacturer:	Xiamen MeituEve Technology Co., Ltd.
Address:	Room 568, No.942, Tonglong 2nd Road, Gaoxin District (Xiang'an) Industries, Xiamen, China
Factory:	Kingtronics Corporation Of Elec.& Mech. Technology (Zhangzhou) Co.,Ltd.
Address:	NO.20 Longchi Road, Longchi Industrial Park, Zhangzhou Taiwanese Investment Zone, Fujian, China

### 2.2. General Description of EUT

Product Name:	EveLab Insight-Eve V Skin Imaging Analysis System
Trade Mark:	EveLab Insight
Model/Type reference:	MS20A15
Listed Model(s):	/
Model Difference:	/
Power supply:	DC12V 5.0A from AC/DC Adapter
Hardware version:	/
Software version:	/
<b>Technical index for 2.4G WIFI</b>	
Modulation:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK, QPSK, 16QAM, 64QAM)
Operation frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
Channel number:	802.11b/g/n(HT20): 11 channels 802.11n(HT40): 7 channels
Channel separation:	5MHz
Antenna 1&2 type:	FPC Antenna
Antenna 1&2 gain:	3.21dBi
Antenna 1 + 2 Directional gain:	6.22dBi



## 2.3. Accessory Equipment Information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	ThinkPad X220	/	Lenovo
AC/DC Adapter	FY0681205000	/	Shenzhen Fuyuandian Power Co.,Ltd.
Cable Information			
Name	Shielded Type	Ferrite Core	Length
USB Cable	Unshielded	NO	100cm
Test Software Information			
Name	Version	/	/
QRCT	V3.0.303.0	/	/

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## 2.4. Operation State

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

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

Note: CH 01~CH 11 for 802.11b/g/n(HT20), CH 03~CH 09 for 802.11n(HT40)

Data Rated:

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	Data rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	HT-MCS0
802.11n(HT40)	HT-MCS0

Test mode

For RF test items:
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report.



## 2.5. Measurement Instruments List

Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	MXA Signal Analyzer	Keysight	N9020A	MY46471737	Dec. 16, 2023
2	Spectrum Analyzer	R&S	FSU26	100105	Dec. 16, 2023
3	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 15, 2023
4	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 16, 2023
5	PSG Analog Signal Generator	Agilent	E8257D	MY46521908	Dec. 16, 2023
6	Power Sensor	Keysight	U2021XA	MY55130004	Mar. 15, 2023
7	Power Sensor	Keysight	U2021XA	MY55130006	Mar. 15, 2023
8	Wideband Radio Communication Tester	R&S	CMW500	102414	Dec. 16, 2023
9	High and low temperature box	ESPEC	MT3035	/	Mar. 24, 2023
10	JS1120 RF Test system	TONSCEND	v2.6	/	/

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9163	01026	Dec. 18, 2024
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 01, 2024
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 16, 2023
4	Broadband Premplifier	SCHWARZBECK	BBV9743B	259	Dec. 16, 2023
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 16, 2023
6	3m chamber 3	YIHENG	EE106	/	Sep. 09, 2023



Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 16, 2023
2	LISN	R&S	ENV216	101113	Dec. 16, 2023
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 16, 2023
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 16, 2023
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 16, 2023

**Note:**

1. The Cal. Interval was one year.
2. The Cal. Interval was three years of the antenna.

### 3. TEST ITEM AND RESULTS

#### 3.1. Conducted Emission

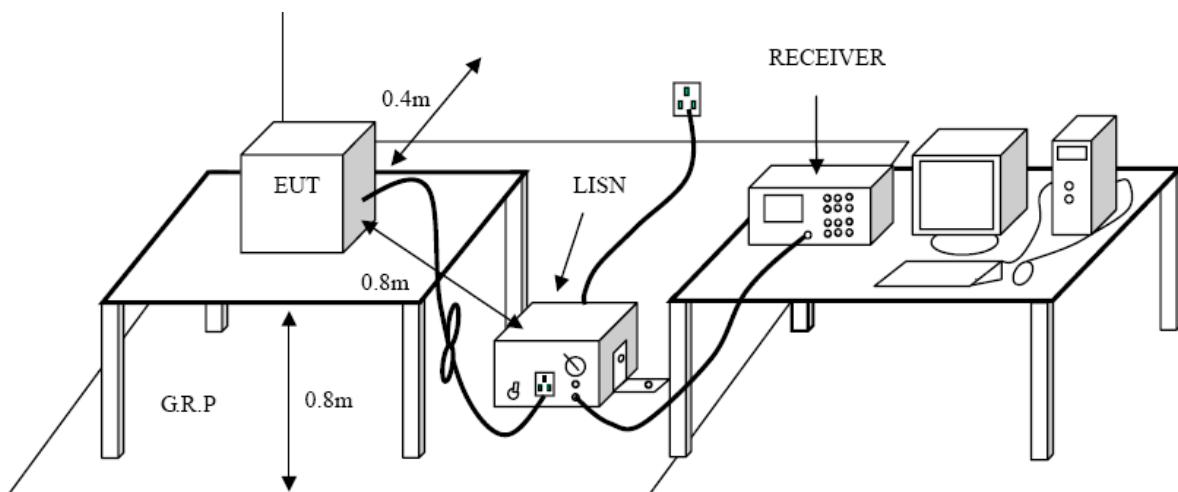
##### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS - Gen 8.8:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

##### Test Configuration

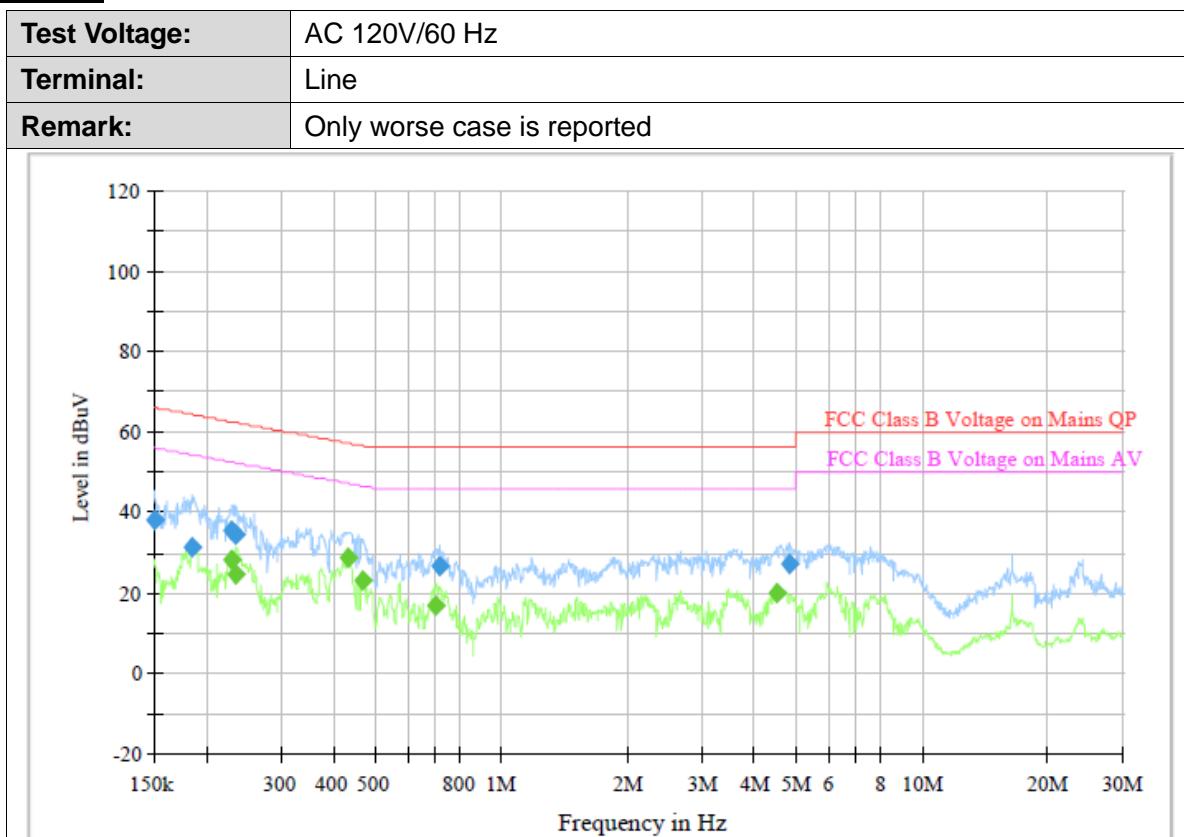


##### Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

**Test Mode:**

Please refer to the clause 2.4.

**Test Results**

**Final Measurement Detector 1**

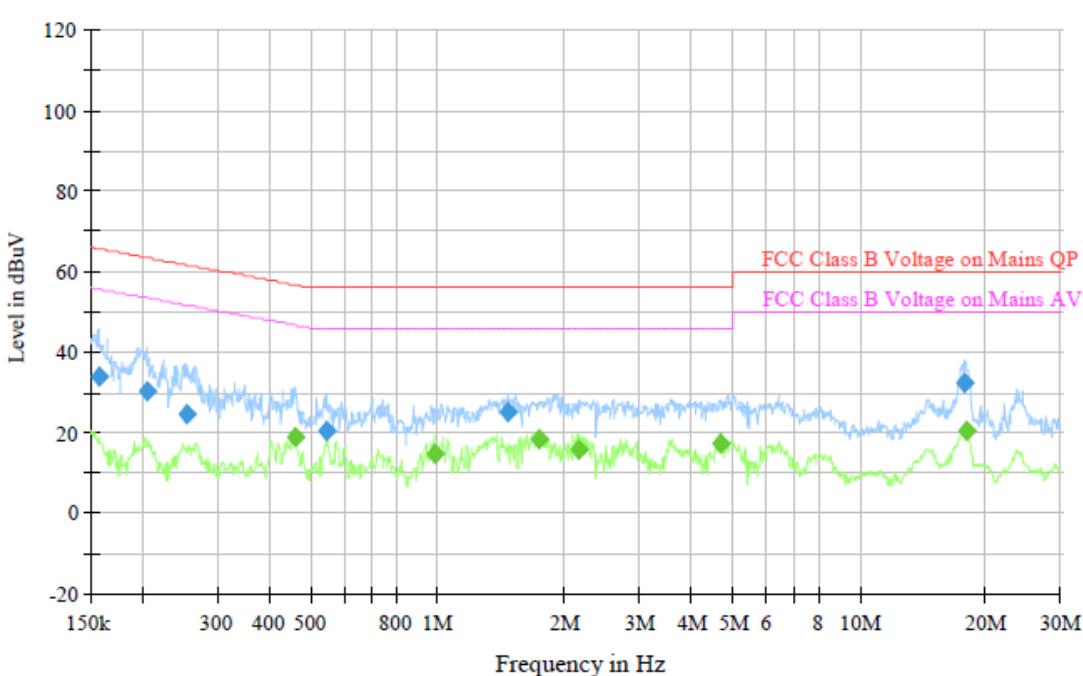
Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.150000	38.3	1000.00	9.000	On	L1	9.7	27.7	66.0	
0.183870	31.3	1000.00	9.000	On	L1	9.7	33.0	64.3	
0.229930	35.4	1000.00	9.000	On	L1	9.7	27.1	62.5	
0.234570	34.2	1000.00	9.000	On	L1	9.7	28.1	62.3	
0.714450	26.6	1000.00	9.000	On	L1	9.7	29.4	56.0	
4.854620	27.3	1000.00	9.000	On	L1	9.7	28.7	56.0	

**Final Measurement Detector 2**

Frequency (MHz)	Average (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.228100	28.0	1000.00	9.000	On	L1	9.7	24.5	52.5	
0.234570	24.8	1000.00	9.000	On	L1	9.7	27.5	52.3	
0.433770	28.5	1000.00	9.000	On	L1	9.7	18.7	47.2	
0.466090	23.3	1000.00	9.000	On	L1	9.7	23.3	46.6	
0.700330	16.8	1000.00	9.000	On	L1	9.7	29.2	46.0	
4.518020	19.9	1000.00	9.000	On	L1	9.7	26.1	46.0	

Emission Level = Read Level + Correct Factor

<b>Test Voltage:</b>	AC 120V/60 Hz
<b>Terminal:</b>	Neutral
<b>Remark:</b>	Only worse case is reported



### Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.156110	34.1	1000.00	9.000	On	N	10.0	31.6	65.7	
0.203170	30.2	1000.00	9.000	On	N	10.0	33.3	63.5	
0.254060	24.8	1000.00	9.000	On	N	10.0	36.8	61.6	
0.542430	20.6	1000.00	9.000	On	N	10.0	35.4	56.0	
1.471550	25.2	1000.00	9.000	On	N	10.0	30.8	56.0	
17.837980	32.3	1000.00	9.000	On	N	10.0	27.7	60.0	

### Final Measurement Detector 2

Frequency (MHz)	Average (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.458700	19.0	1000.00	9.000	On	N	10.0	27.7	46.7	
0.979350	14.7	1000.00	9.000	On	N	10.0	31.3	46.0	
1.740170	18.4	1000.00	9.000	On	N	10.0	27.6	46.0	
2.167430	16.0	1000.00	9.000	On	N	10.0	30.0	46.0	
4.702030	17.3	1000.00	9.000	On	N	10.0	28.7	46.0	
17.909340	20.6	1000.00	9.000	On	N	10.0	29.4	50.0	

Emission Level = Read Level + Correct Factor

## 3.2. Radiated Emission

### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS – Gen 8.9:

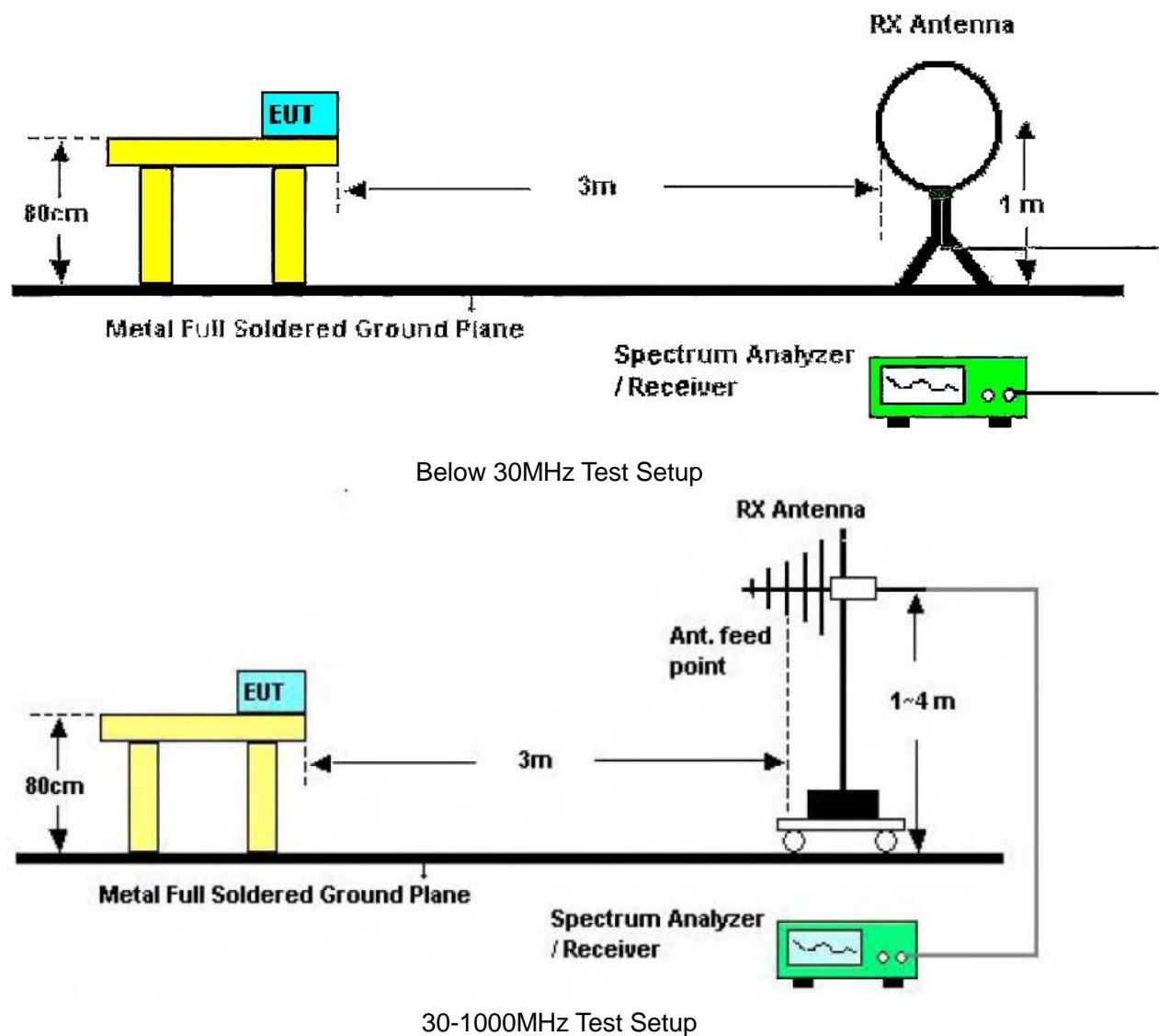
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

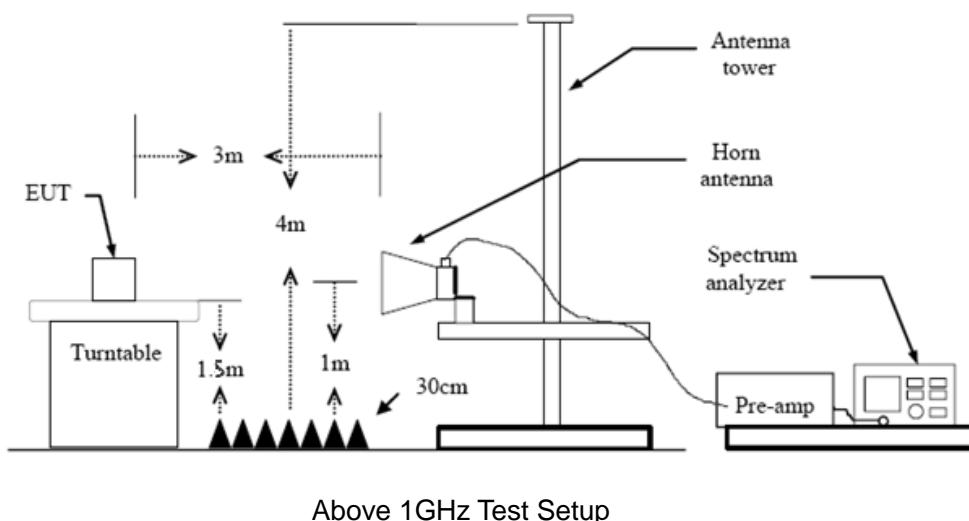
Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

### **Note:**

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dB<sub>u</sub>V/m)=20log Emission Level (uV/m).

### Test Configuration





### Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. 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 turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1 GHz: RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (3) From 1 GHz to 10<sup>th</sup> harmonic: RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
RBW=1MHz, VBW $\geq$ 1/T Peak detector for Average value.

Note 1: For the 1/T& Duty Cycle please refer to clause Duty Cycle.

### Test Mode

Please refer to the clause 2.4.

### Test Result

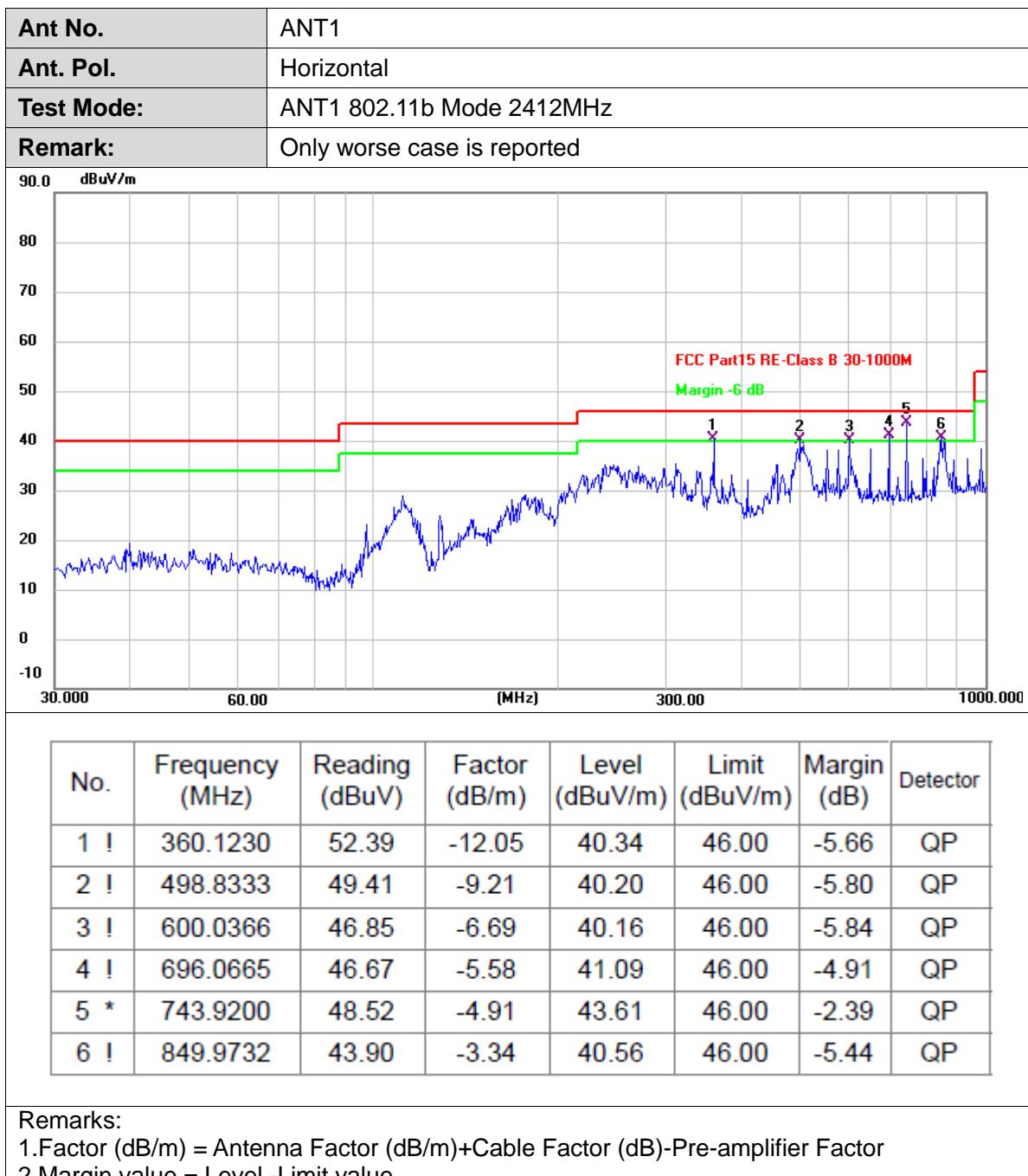
#### 9 KHz~30 MHz

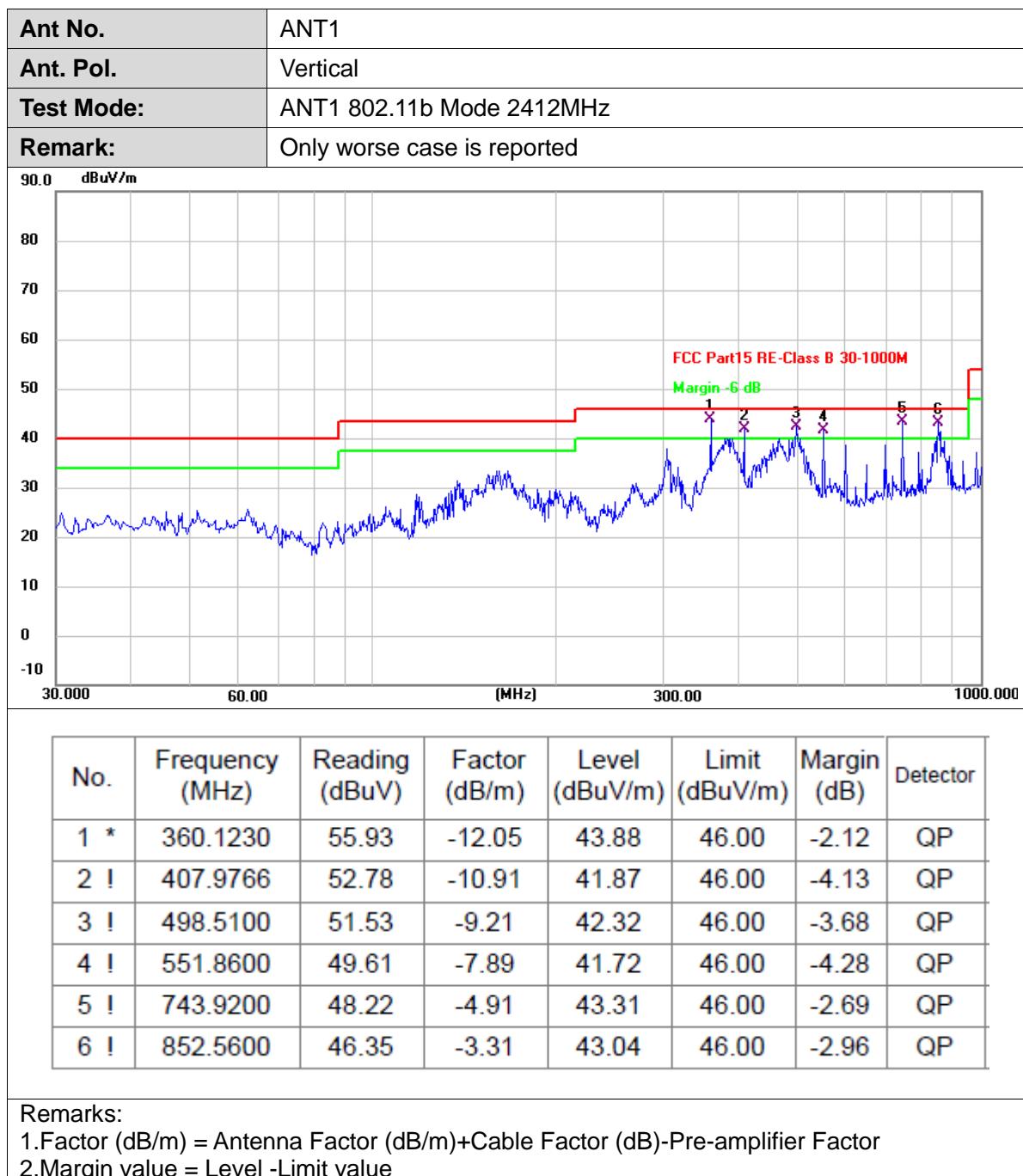
From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

*Pre-scan all antenna, only show the test data for worse case antenna on the test report.*

30MHz-1GHz







Adobe 1GHz

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4823.953	44.83	2.20	47.03	74.00	-26.97	peak
2 *	4823.965	34.00	2.20	36.20	54.00	-17.80	AVG

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor  
 2. Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4823.964	33.39	2.20	35.59	54.00	-18.41	AVG
2	4823.973	44.03	2.20	46.23	74.00	-27.77	peak

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor  
 2. Margin value = Level -Limit value

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Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4873.909	34.56	2.30	36.86	54.00	-17.14	AVG
2	4874.077	44.72	2.30	47.02	74.00	-26.98	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4873.947	43.36	2.30	45.66	74.00	-28.34	peak
2 *	4874.055	32.57	2.30	34.87	54.00	-19.13	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4923.922	45.30	2.41	47.71	74.00	-26.29	peak
2 *	4923.931	33.42	2.41	35.83	54.00	-18.17	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4924.077	44.23	2.41	46.64	74.00	-27.36	peak
2 *	4924.115	32.62	2.41	35.03	54.00	-18.97	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4823.901	33.99	2.20	36.19	54.00	-17.81	AVG
2	4823.941	44.66	2.20	46.86	74.00	-27.14	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4823.975	33.57	2.20	35.77	54.00	-18.23	AVG
2	4823.980	45.15	2.20	47.35	74.00	-26.65	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4873.839	33.39	2.30	35.69	54.00	-18.31	AVG
2	4873.876	44.94	2.30	47.24	74.00	-26.76	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4873.969	44.52	2.30	46.82	74.00	-27.18	peak
2 *	4874.056	32.89	2.30	35.19	54.00	-18.81	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4924.163	44.66	2.41	47.07	74.00	-26.93	peak
2 *	4924.172	33.41	2.41	35.82	54.00	-18.18	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4923.990	44.02	2.41	46.43	74.00	-27.57	peak
2 *	4924.107	32.48	2.41	34.89	54.00	-19.11	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1 + ANT2						
Ant. Pol.	Horizontal						
Test Mode:	TX N20 Mode 2412MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4823.966	44.72	2.20	46.92	74.00	-27.08	peak
2 *	4823.970	32.94	2.20	35.14	54.00	-18.86	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1 + ANT2						
Ant. Pol.	Vertical						
Test Mode:	TX N20 Mode 2412MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4823.893	32.02	2.20	34.22	54.00	-19.78	AVG
2	4824.050	44.50	2.20	46.70	74.00	-27.30	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1 + ANT2						
Ant. Pol.	Horizontal						
Test Mode:	TX N20 Mode 2437MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4873.868	45.29	2.30	47.59	74.00	-26.41	peak
2 *	4873.943	33.27	2.30	35.57	54.00	-18.43	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1 + ANT2						
Ant. Pol.	Vertical						
Test Mode:	TX N20 Mode 2437MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4873.860	43.95	2.30	46.25	74.00	-27.75	peak
2 *	4873.969	32.32	2.30	34.62	54.00	-19.38	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N20 Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4923.895	32.36	2.41	34.77	54.00	-19.23	AVG
2	4924.013	43.71	2.41	46.12	74.00	-27.88	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N20 Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4923.882	43.14	2.41	45.55	74.00	-28.45	peak
2 *	4924.016	31.62	2.41	34.03	54.00	-19.97	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1 + ANT2						
Ant. Pol.	Horizontal						
Test Mode:	TX N40 Mode 2422MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4843.890	33.71	2.24	35.95	54.00	-18.05	AVG
2	4843.931	44.12	2.24	46.36	74.00	-27.64	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1 + ANT2						
Ant. Pol.	Vertical						
Test Mode:	TX N40 Mode 2422MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4843.862	43.68	2.24	45.92	74.00	-28.08	peak
2 *	4844.030	31.49	2.24	33.73	54.00	-20.27	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N40 Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4873.860	32.33	2.30	34.63	54.00	-19.37	AVG
2	4873.913	43.48	2.30	45.78	74.00	-28.22	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N40 Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4874.017	32.66	2.30	34.96	54.00	-19.04	AVG
2	4874.091	43.86	2.30	46.16	74.00	-27.84	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value



Ant No.	ANT1 + ANT2						
Ant. Pol.	Horizontal						
Test Mode:	TX N40 Mode 2452MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4904.174	44.23	2.36	46.59	74.00	-27.41	peak
2 *	4904.189	33.04	2.36	35.40	54.00	-18.60	AVG

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

Ant No.	ANT1 + ANT2						
Ant. Pol.	Vertical						
Test Mode:	TX N40 Mode 2452MHz						
Remark:	No report for the emission which more than 20 dB below the prescribed limit.						

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4903.846	31.78	2.36	34.14	54.00	-19.86	AVG
2	4904.081	42.64	2.36	45.00	74.00	-29.00	peak

Remarks:
1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Margin value = Level -Limit value

### 3.3. Band Edge Emissions (Radiated)

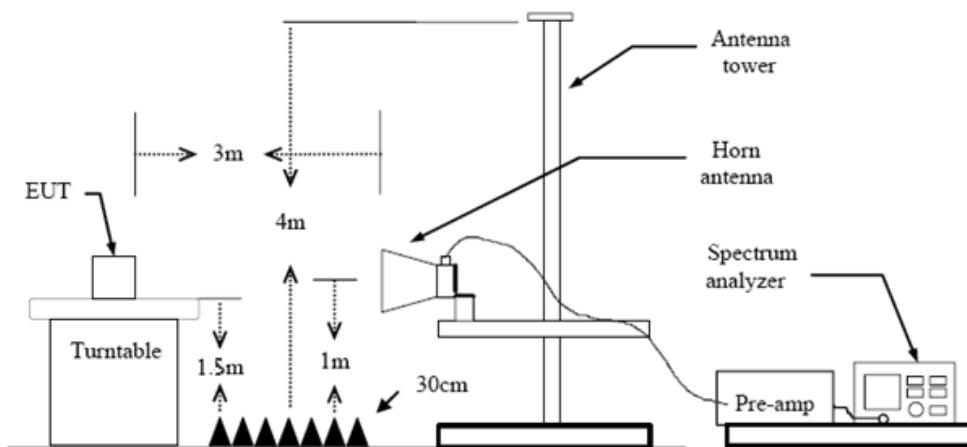
#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS 247 5.5:

Restricted Frequency Band (MHz)	(dBuV/m)(at 3m)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

Conducted band edge limit: The highest point of the operating frequency waveform down 20dB

#### Test Configuration



#### Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:  
RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

2: Duty Cycle > 98%, VBW=10Hz.

#### Test Mode

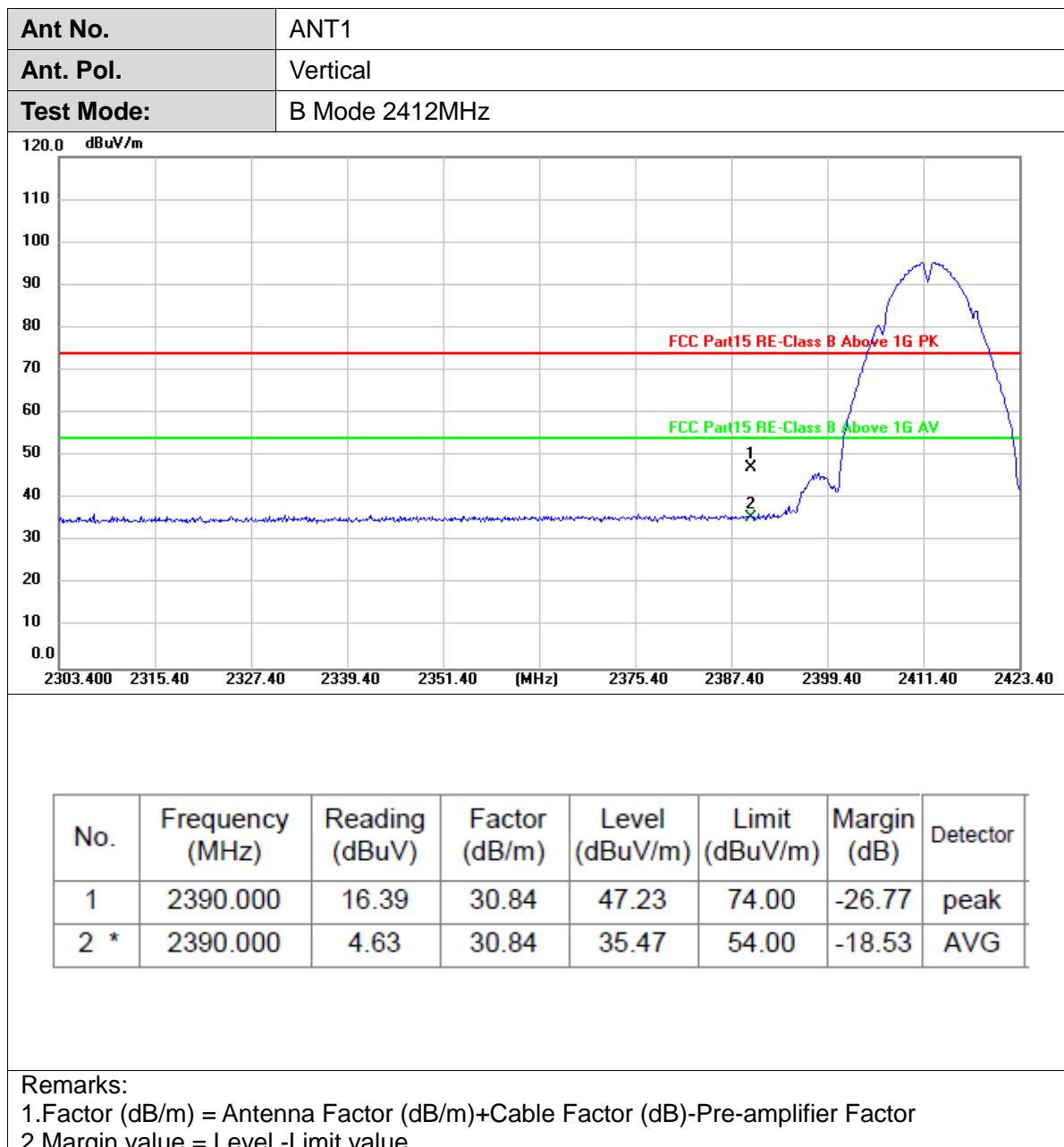
Please refer to the clause 2.4.

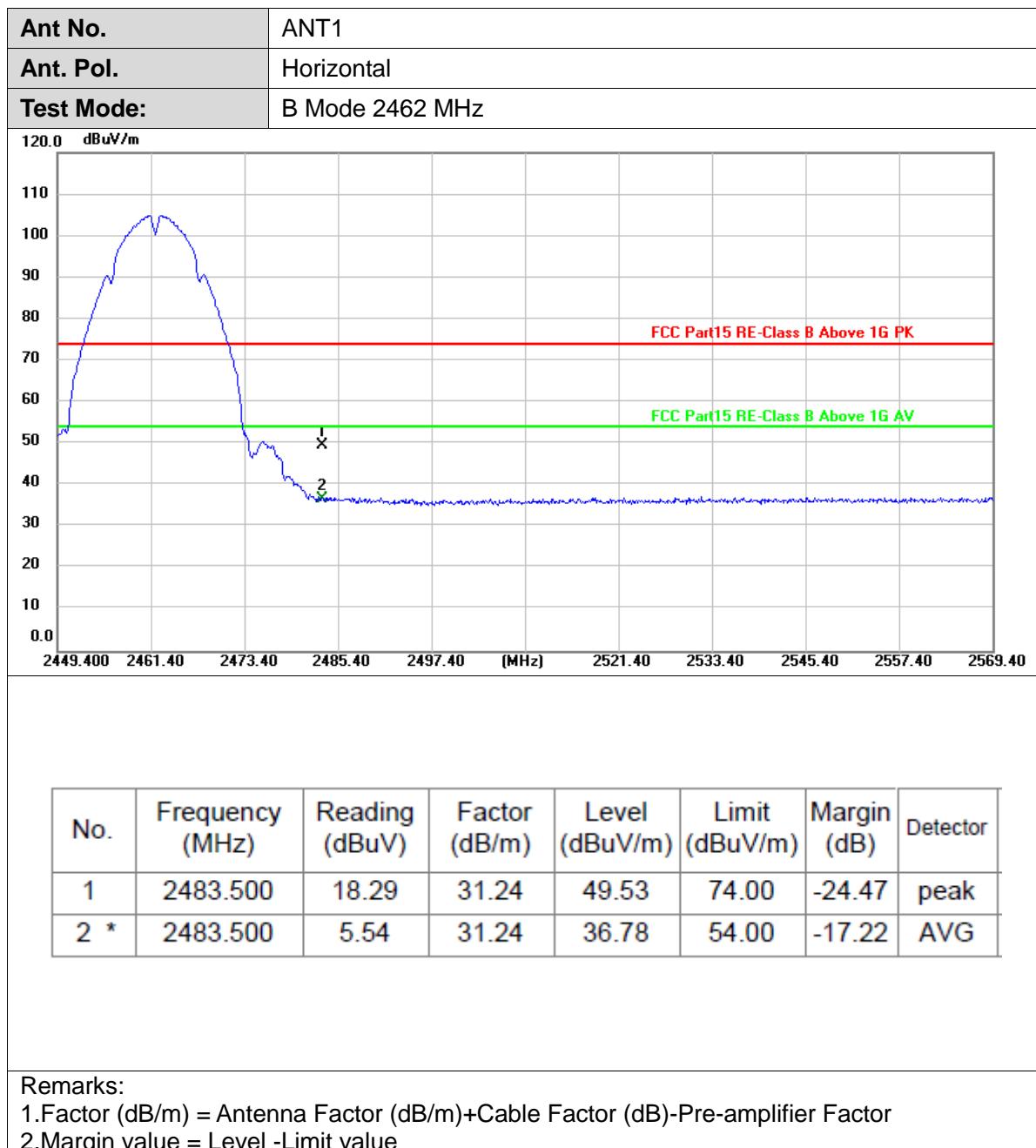
#### Test Results

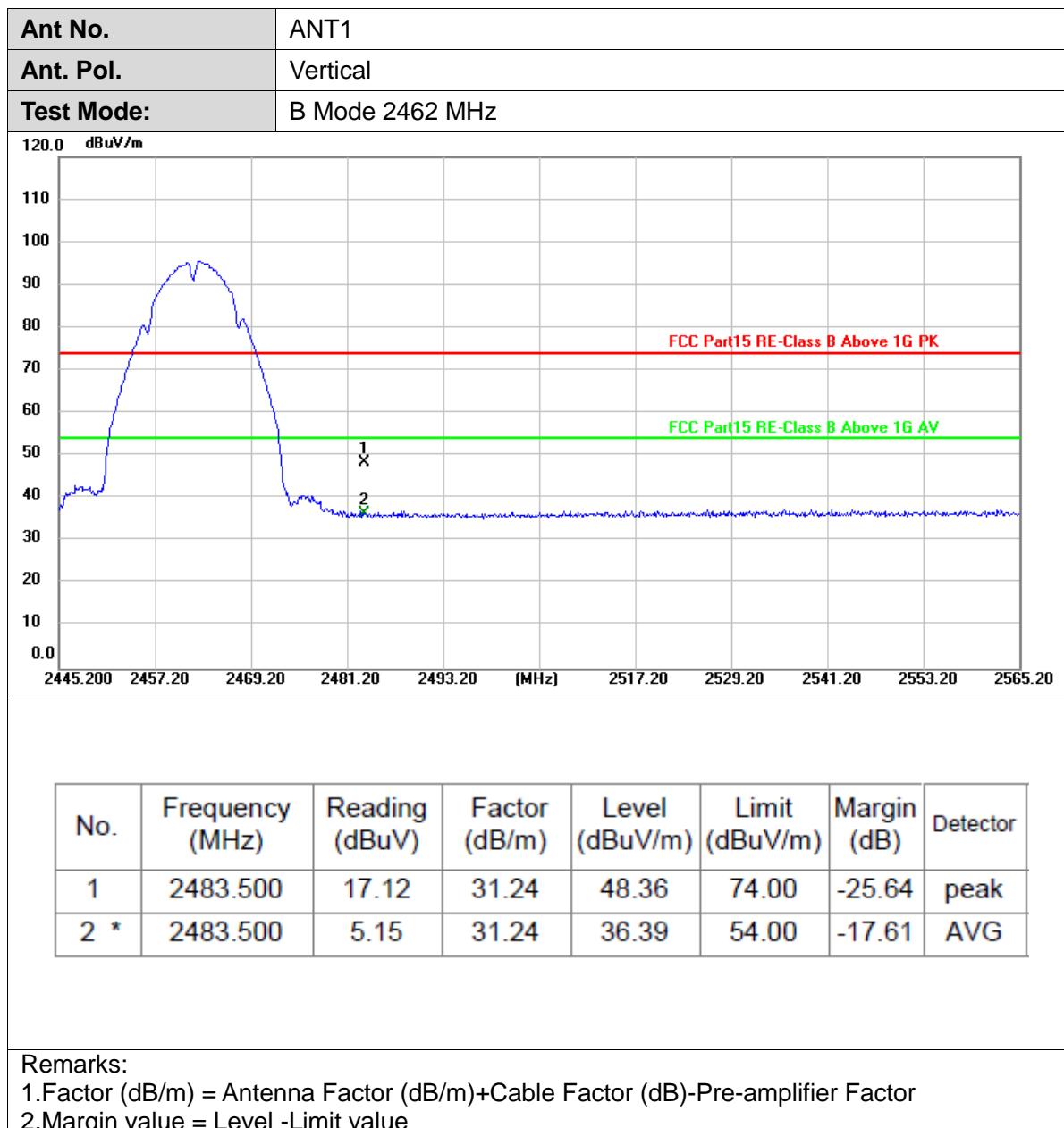
Note: Pre-scan all antenna, only show the test data for worse case antenna on the test report.

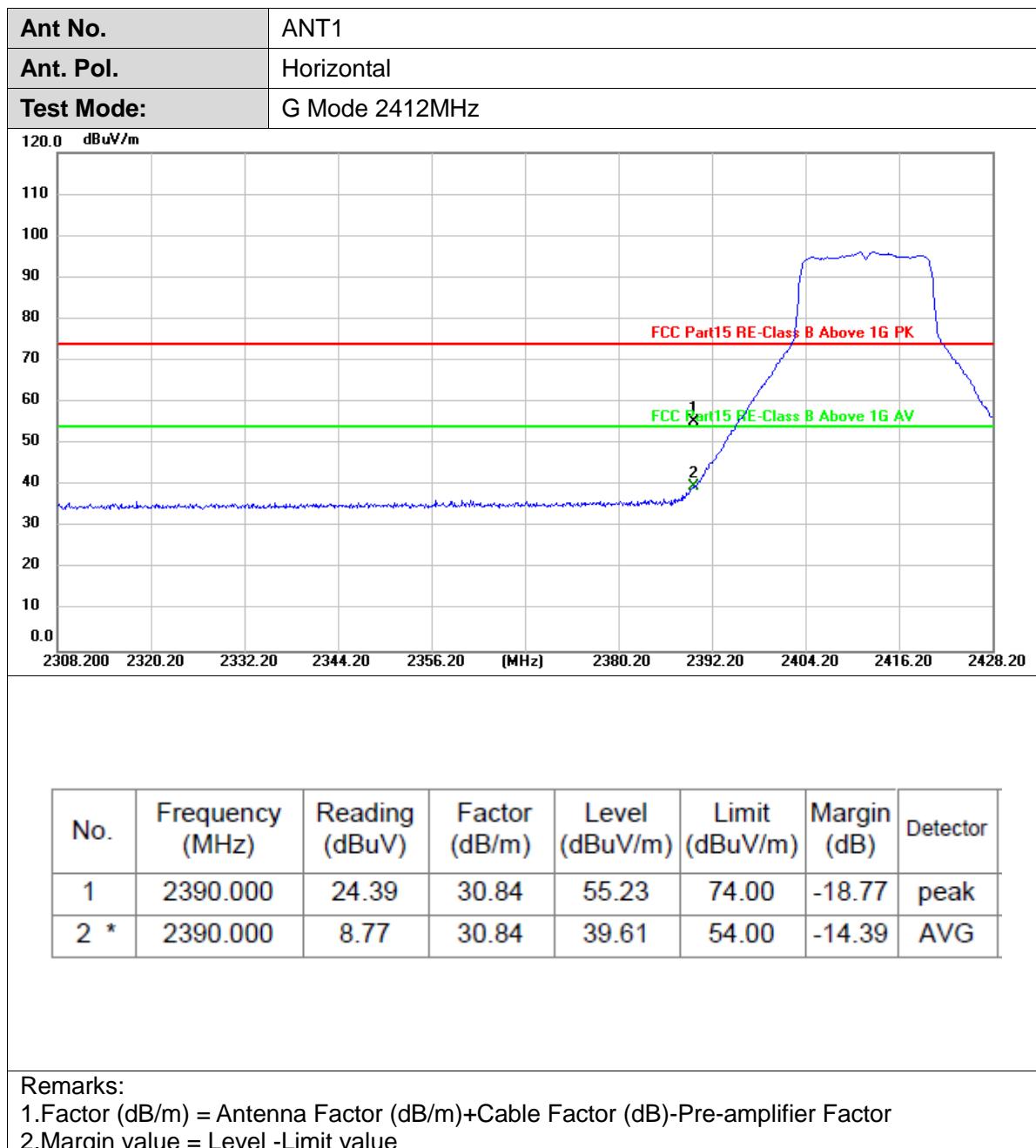
**(1) Radiation Test**

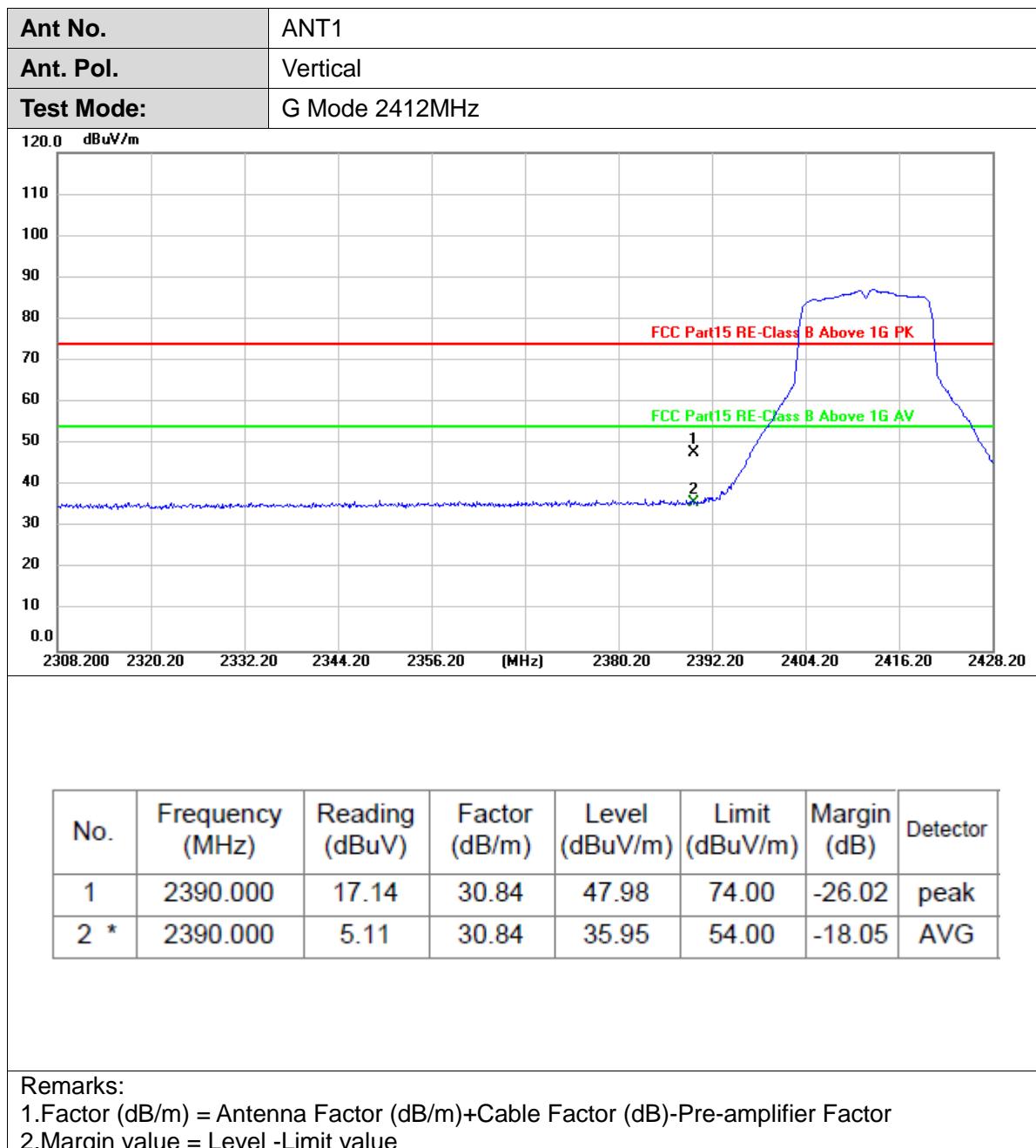
<b>(2) Ant No.</b>	ANT1																														
<b>Ant. Pol.</b>	Horizontal																														
<b>Test Mode:</b>	B Mode 2412MHz																														
<table border="1"><thead><tr><th>No.</th><th>Frequency (MHz)</th><th>Reading (dBuV)</th><th>Factor (dB/m)</th><th>Level (dBuV/m)</th><th>Limit (dBuV/m)</th><th>Margin (dB)</th><th>Detector</th></tr></thead><tbody><tr><td>1</td><td>2390.000</td><td>19.23</td><td>30.84</td><td>50.07</td><td>74.00</td><td>-23.93</td><td>peak</td></tr><tr><td>2 *</td><td>2390.000</td><td>5.71</td><td>30.84</td><td>36.55</td><td>54.00</td><td>-17.45</td><td>AVG</td></tr></tbody></table>								No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	1	2390.000	19.23	30.84	50.07	74.00	-23.93	peak	2 *	2390.000	5.71	30.84	36.55	54.00	-17.45	AVG
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector																								
1	2390.000	19.23	30.84	50.07	74.00	-23.93	peak																								
2 *	2390.000	5.71	30.84	36.55	54.00	-17.45	AVG																								
<p>Remarks:</p> <p>1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor</p> <p>2. Margin value = Level -Limit value</p>																															

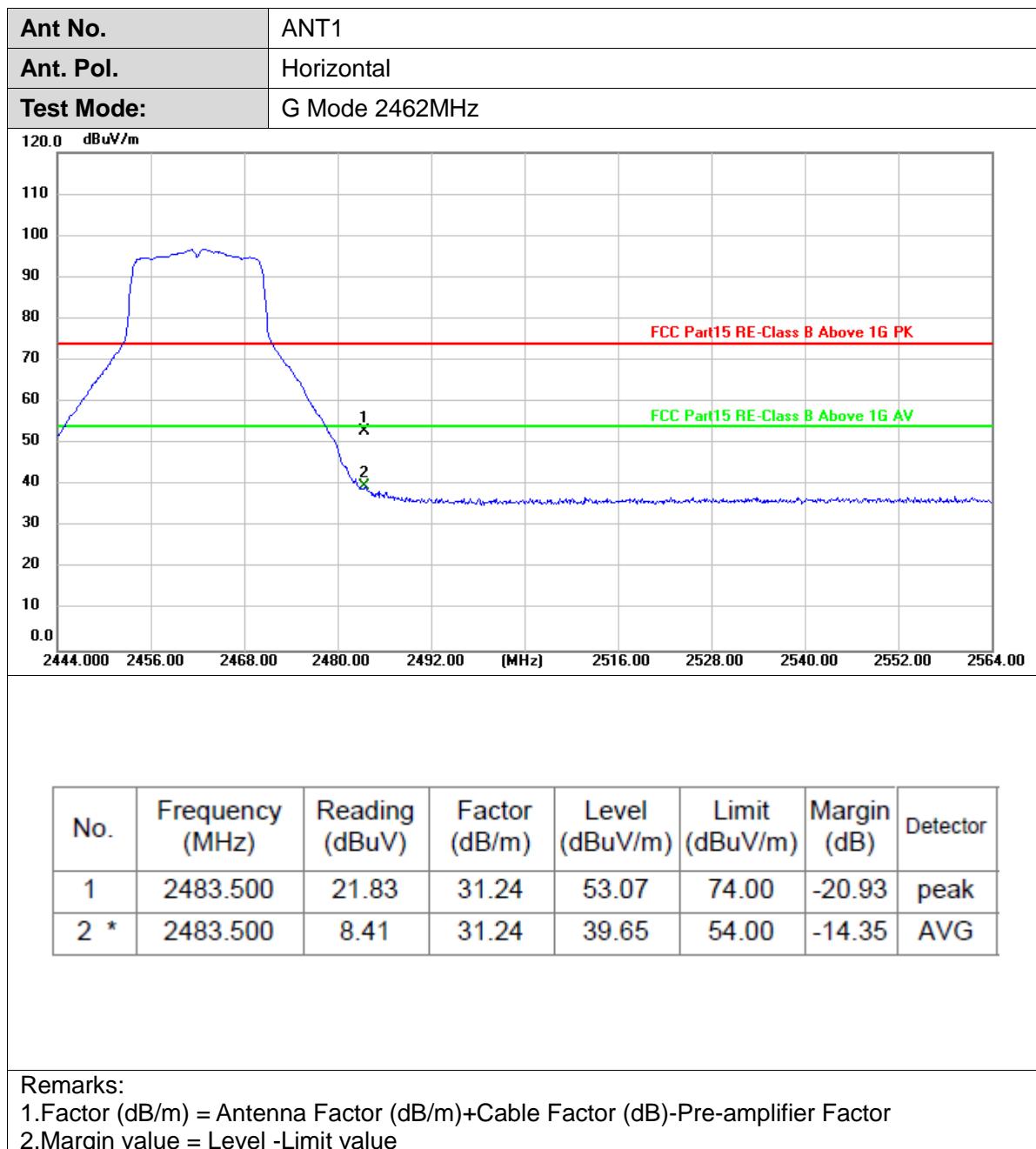


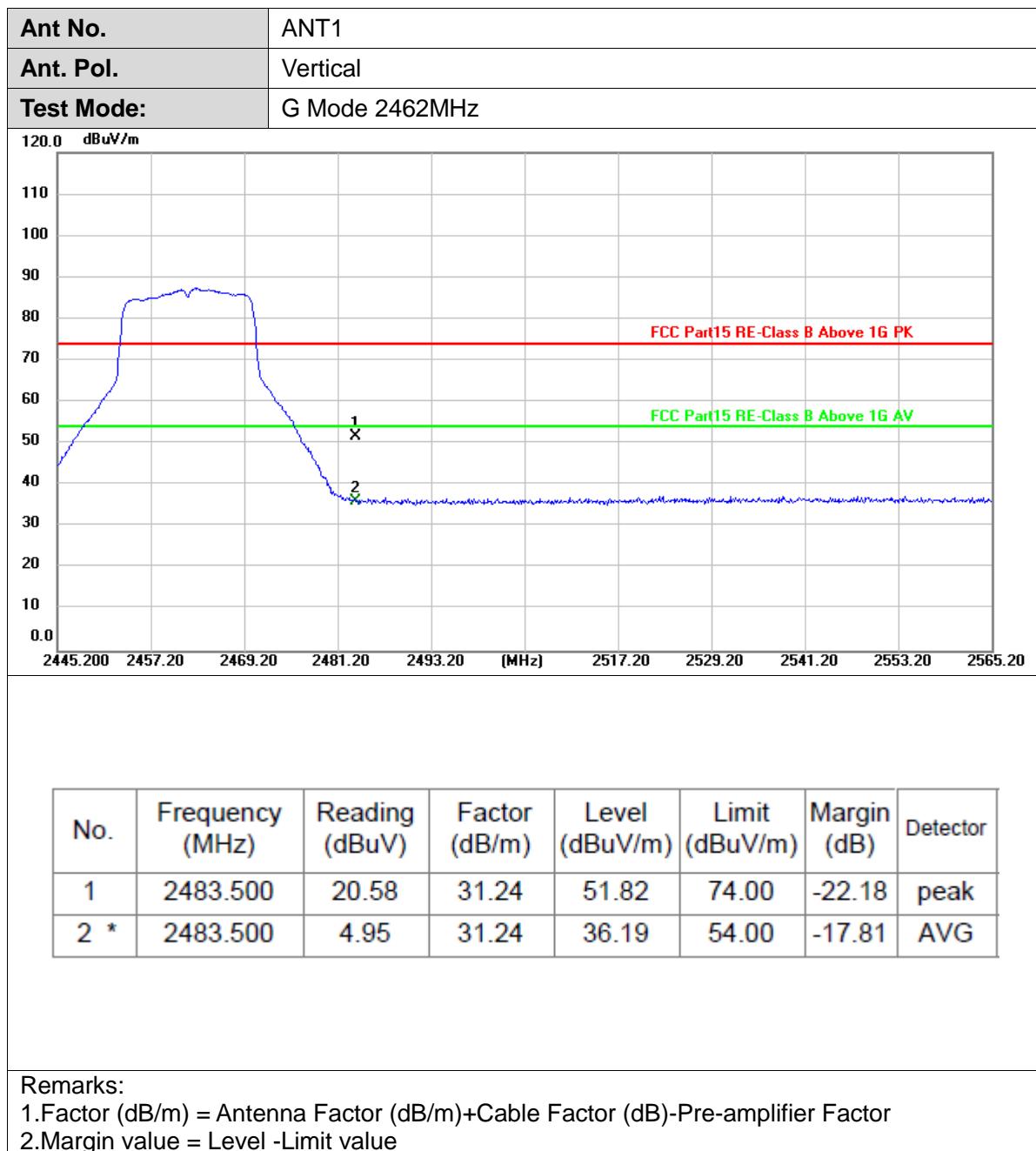


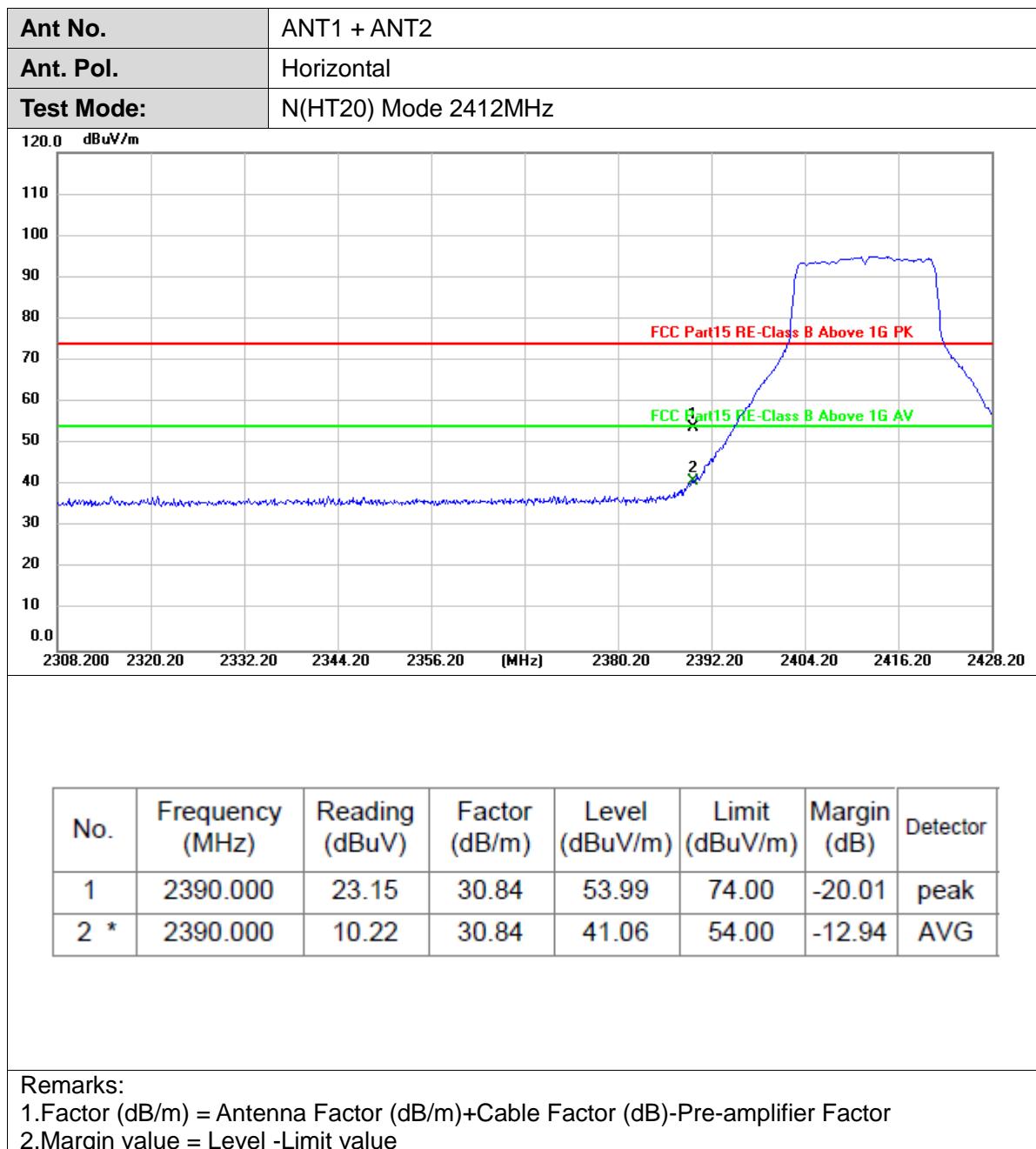


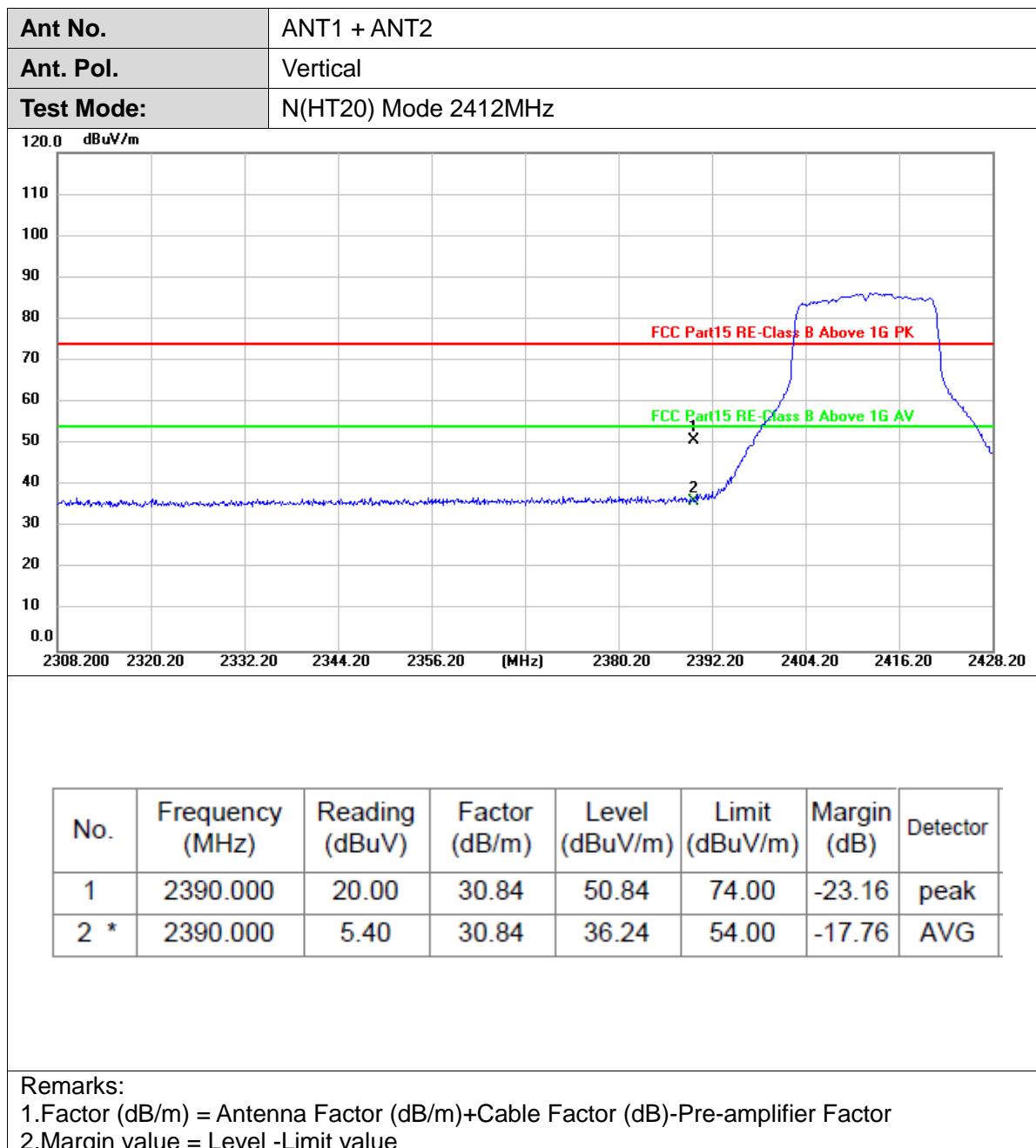


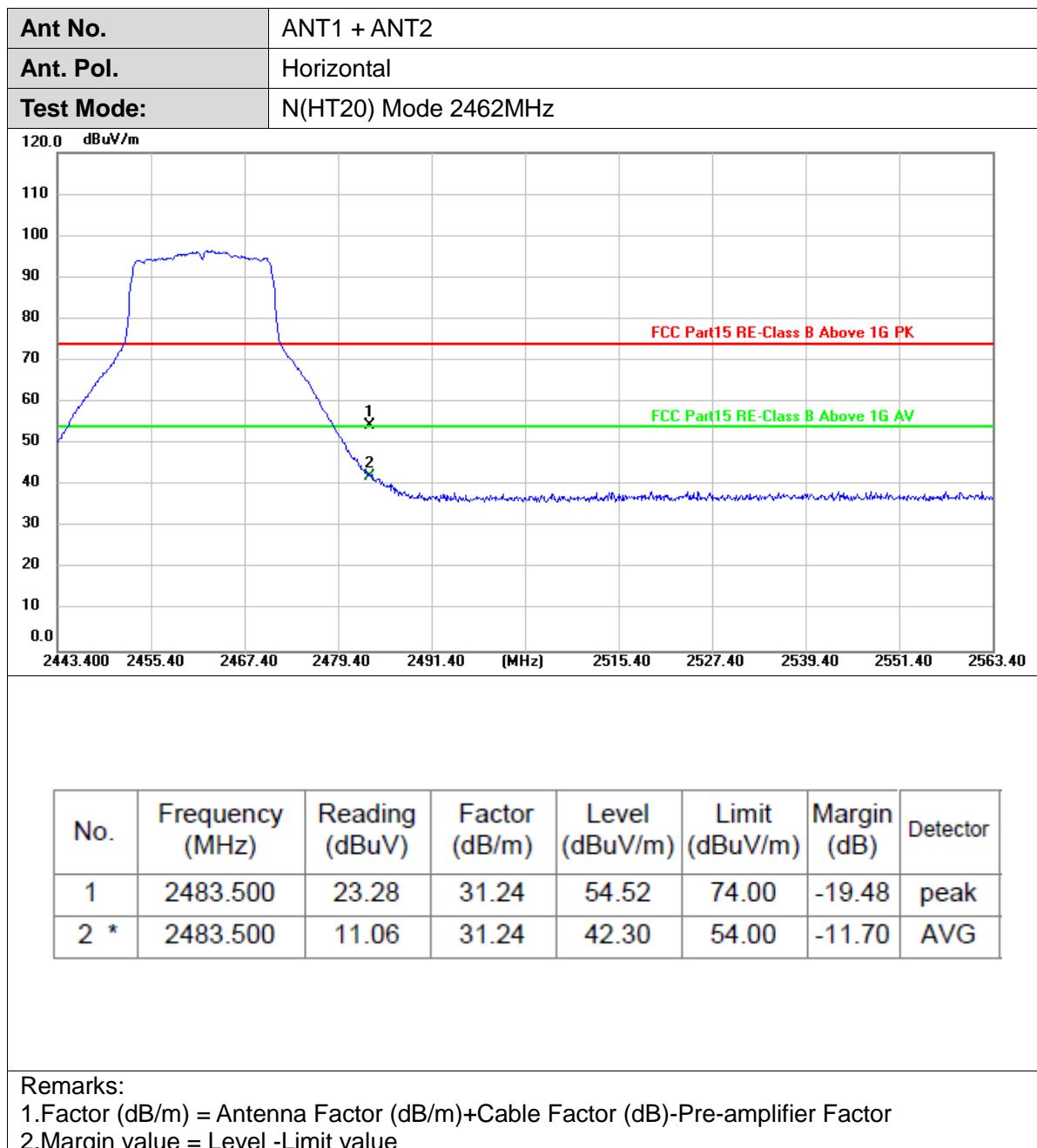


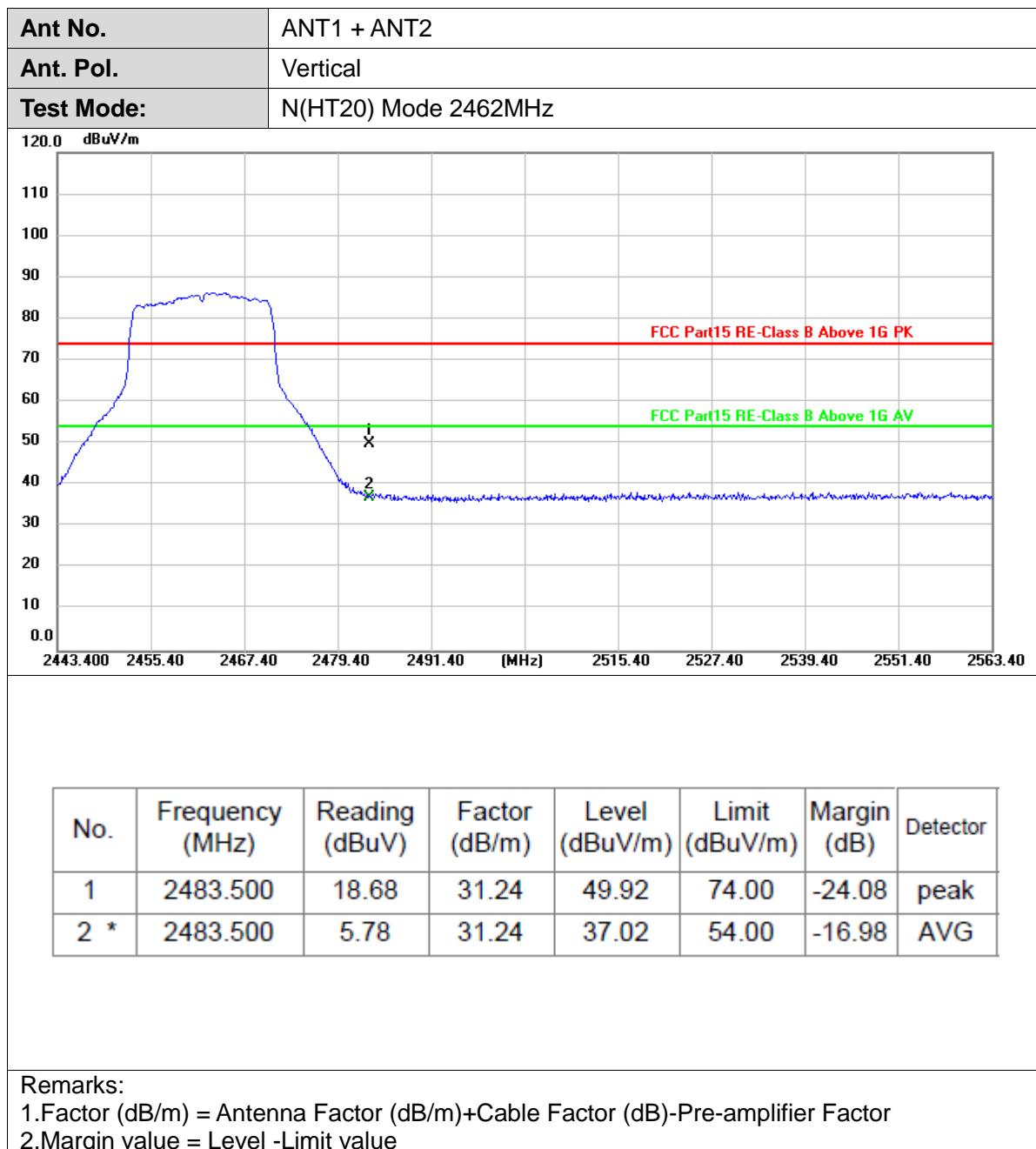


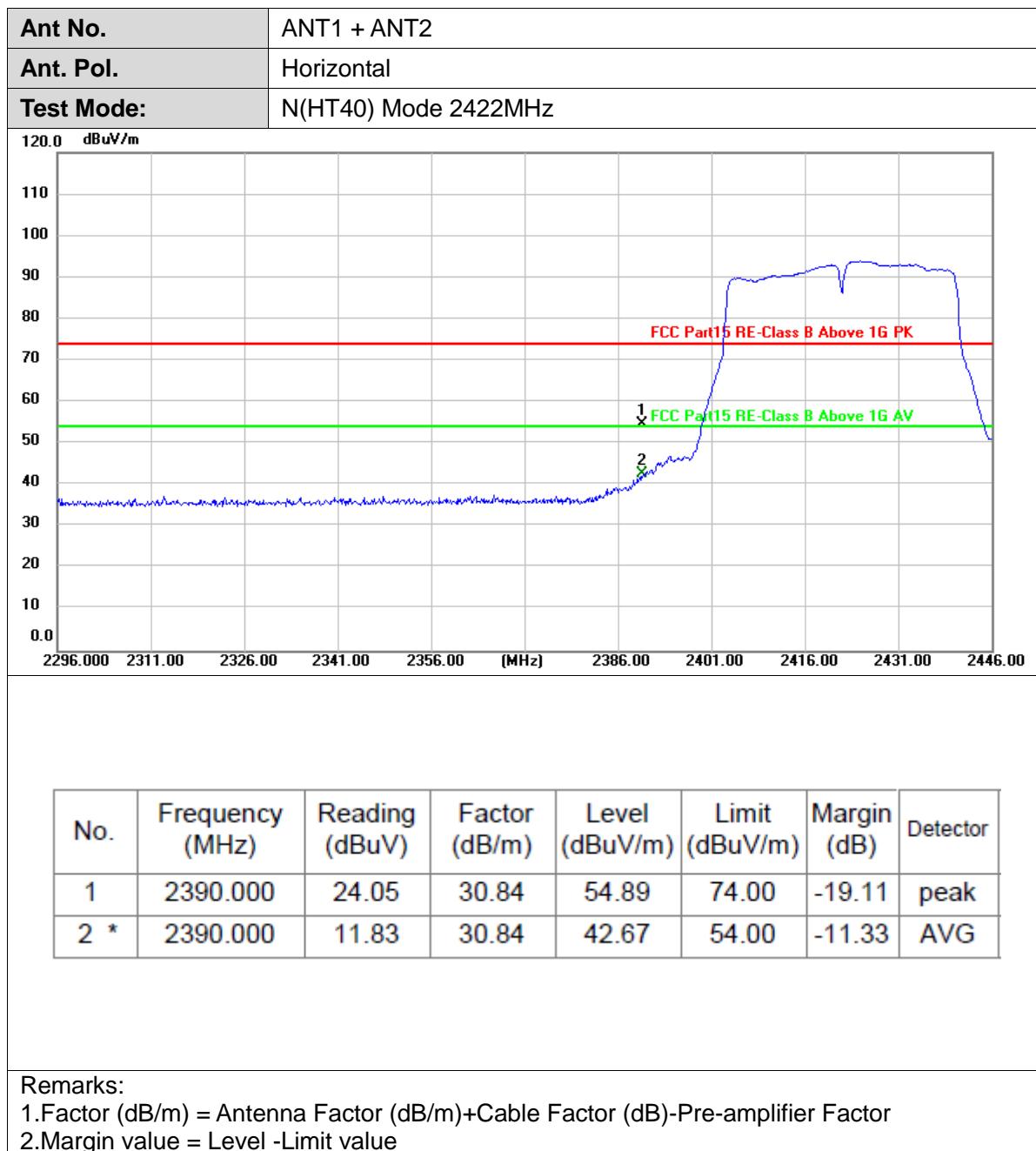


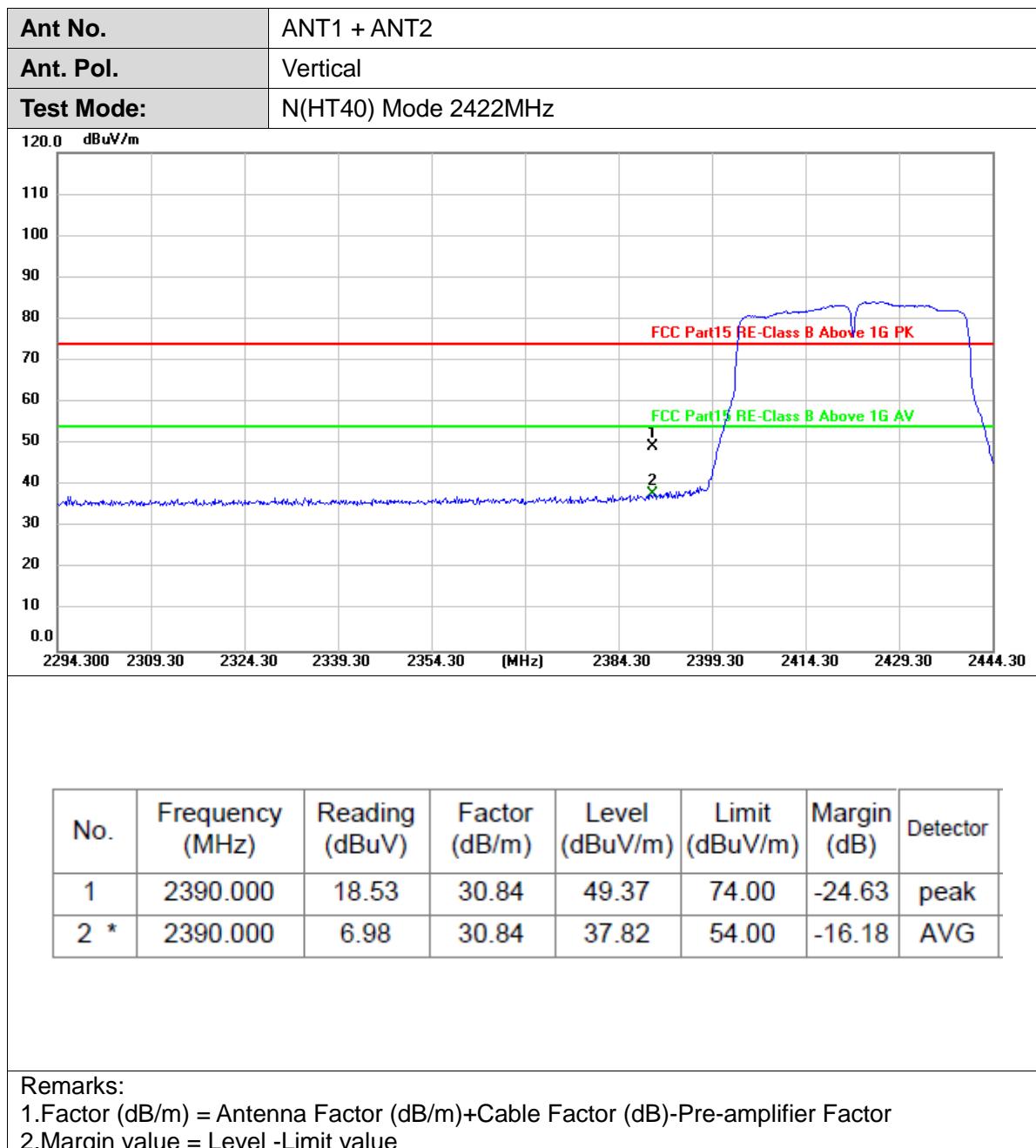


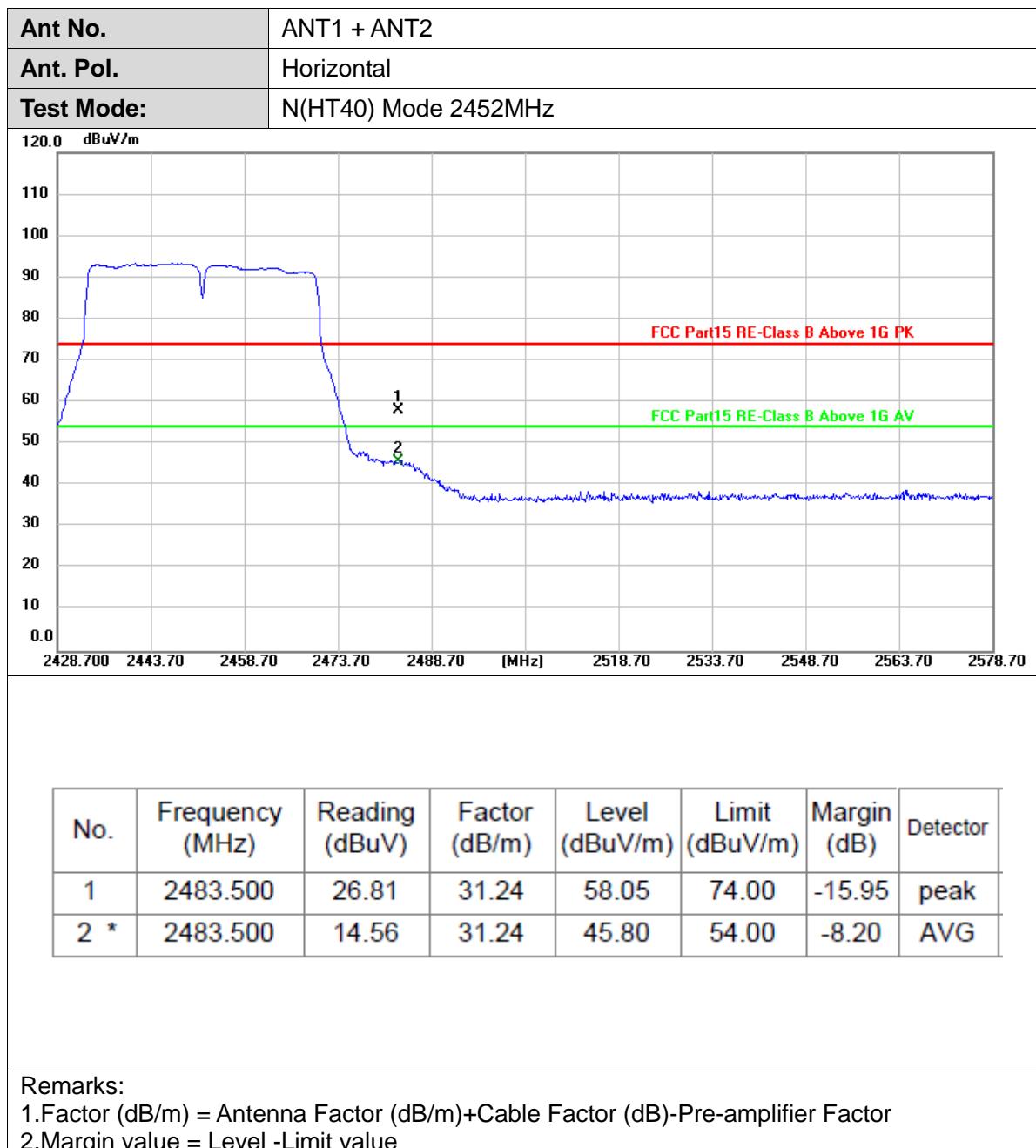


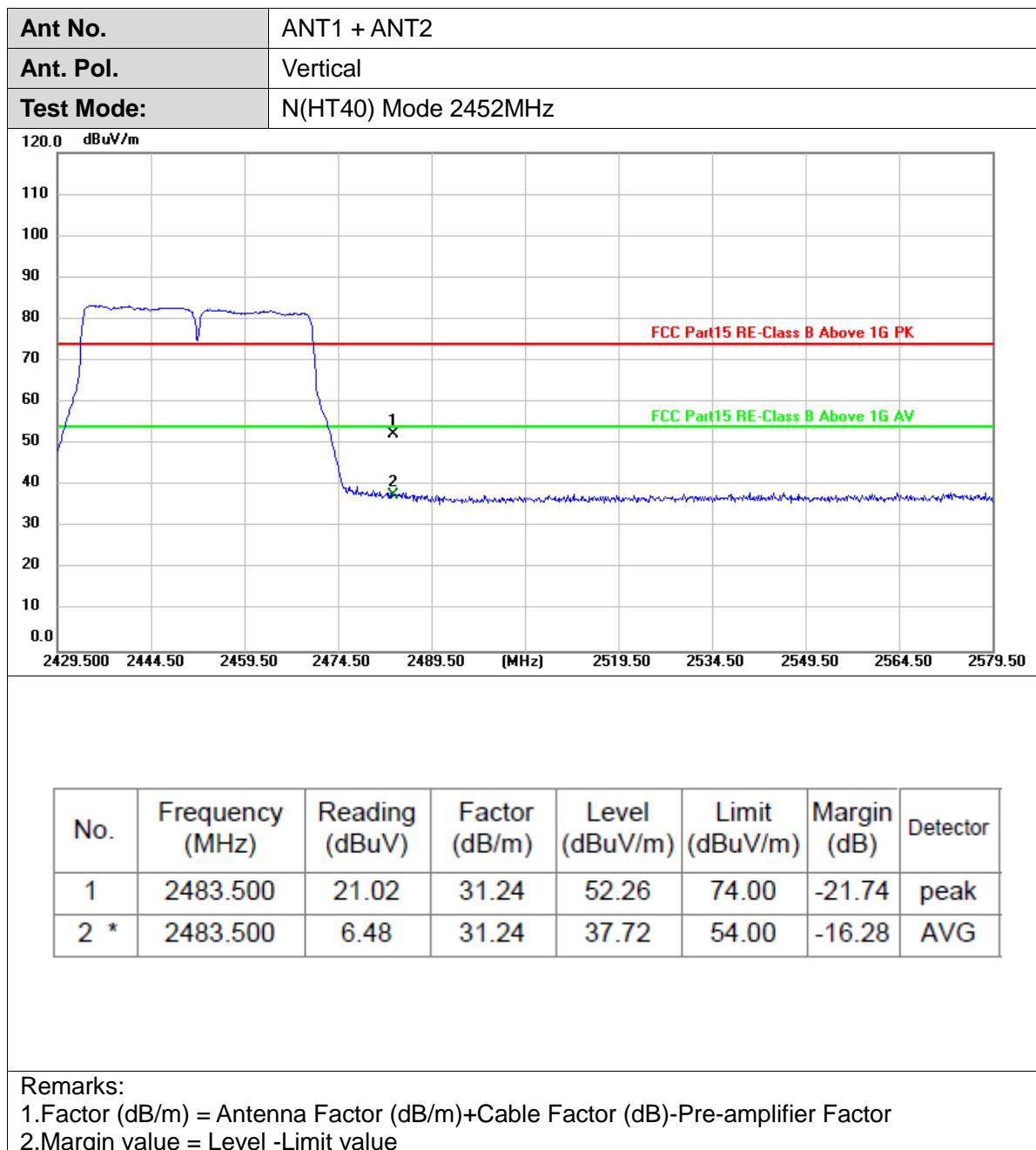










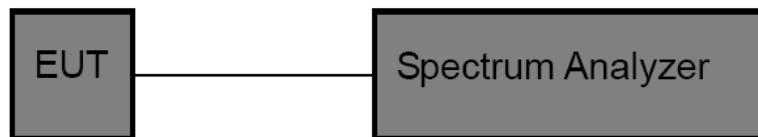


### 3.4. Band edge and Spurious Emissions (Conducted)

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

#### Test Configuration



#### Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:  
RBW = 100 kHz, VBW  $\geq$  RBW, scan up through 10<sup>th</sup> harmonic.  
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

#### Test Mode

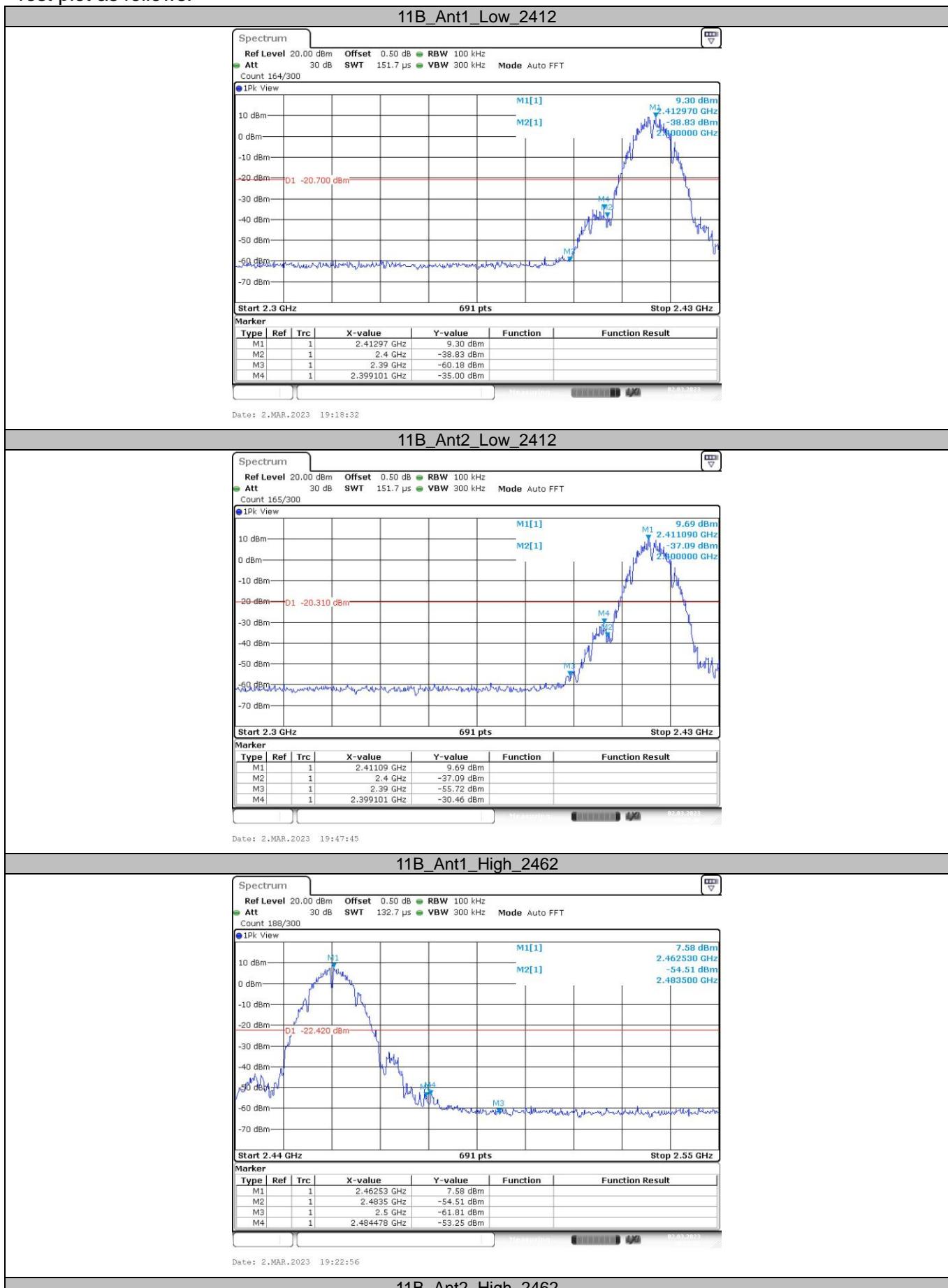
Please refer to the clause 2.4.

#### Test Results

##### (1) Band edge Conducted Test

Test Mode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	9.30	-35.00	$\leq$ -20.70	PASS
	Ant2	Low	2412	9.69	-30.46	$\leq$ -20.31	PASS
	Ant1	High	2462	7.58	-53.25	$\leq$ -22.42	PASS
	Ant2	High	2462	9.01	-53.32	$\leq$ -20.99	PASS
11G	Ant1	Low	2412	2.87	-28.11	$\leq$ -27.13	PASS
	Ant2	Low	2412	1.89	-28.82	$\leq$ -28.11	PASS
	Ant1	High	2462	-0.76	-50.89	$\leq$ -30.76	PASS
	Ant2	High	2462	0.00	-50.48	$\leq$ -30.00	PASS
11N20MIMO	Ant1	Low	2412	-8.08	-39.82	$\leq$ -38.08	PASS
	Ant2	Low	2412	-8.01	-38.77	$\leq$ -38.01	PASS
	Ant1	High	2462	4.49	-43.70	$\leq$ -25.51	PASS
	Ant2	High	2462	3.53	-45.67	$\leq$ -26.47	PASS
11N40MIMO	Ant1	Low	2422	0.86	-34.35	$\leq$ -29.14	PASS
	Ant2	Low	2422	-0.12	-32.10	$\leq$ -30.12	PASS
	Ant1	High	2452	0.01	-39.21	$\leq$ -29.99	PASS
	Ant2	High	2452	0.20	-39.66	$\leq$ -29.80	PASS

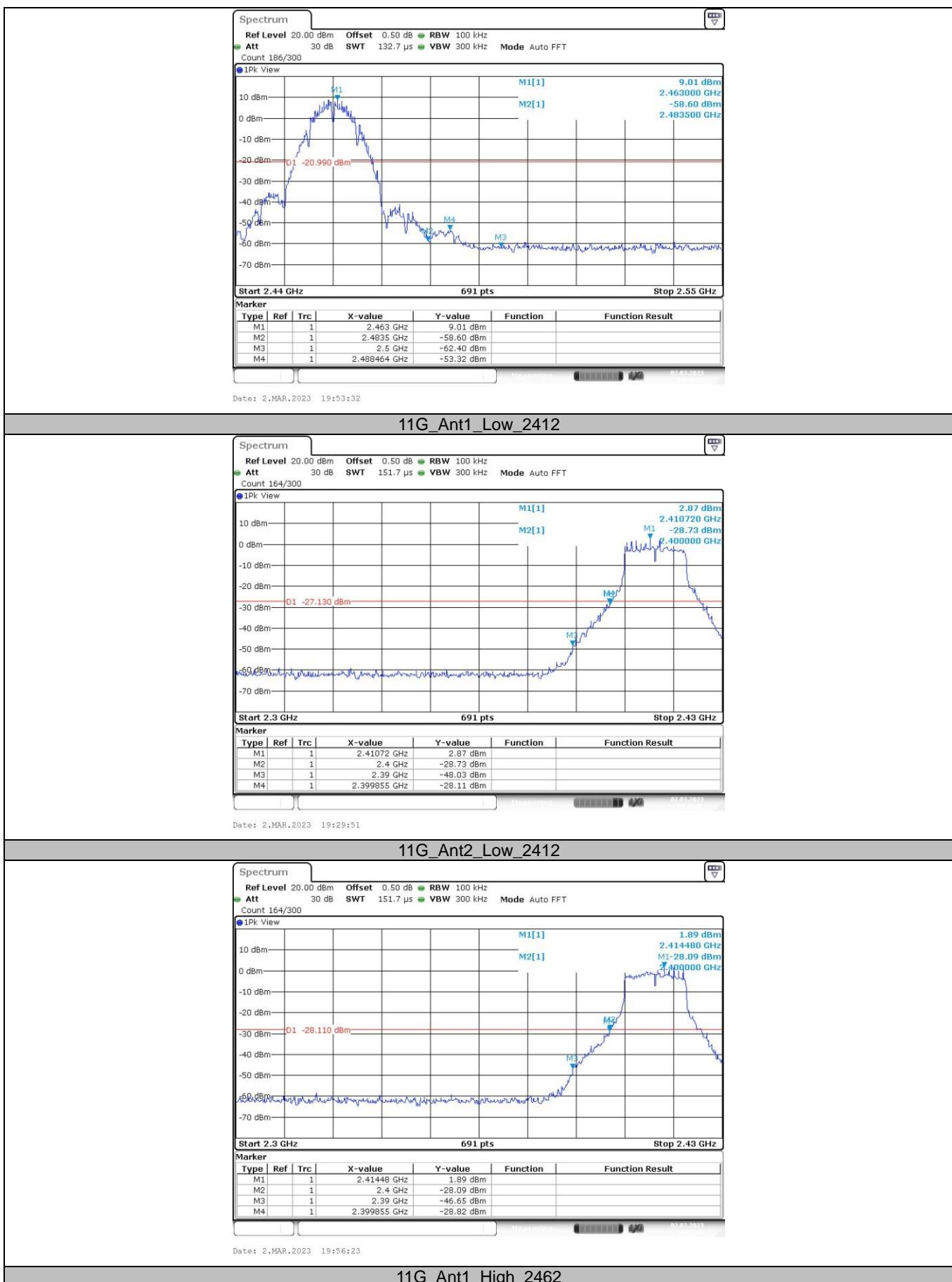
Test plot as follows:



CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China  
Tel.: (86)755-27521059 Fax: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : [yz.cnca.cn](http://yz.cnca.cn)







CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China  
Tel.: (86)755-27521059Fax: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : [yz.cnca.cn](http://yz.cnca.cn)



11N40MIMO Ant2 Low 2422



11N40MIMO Ant1 High 2452



11N40MIMO Ant2 High 2452



CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China  
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**(2) Conducted Spurious Emissions Test**

Test Mode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	9.15	9.15	---	PASS
			30~1000	9.15	-70.62	≤-20.85	PASS
			1000~26500	9.15	-42.13	≤-20.85	PASS
	Ant2	2412	Reference	9.63	9.63	---	PASS
			30~1000	9.63	-69.95	≤-20.37	PASS
			1000~26500	9.63	-42.62	≤-20.37	PASS
	Ant1	2437	Reference	9.56	9.56	---	PASS
			30~1000	9.56	-69.43	≤-20.44	PASS
			1000~26500	9.56	-41.33	≤-20.44	PASS
	Ant2	2437	Reference	9.16	9.16	---	PASS
			30~1000	9.16	-70.56	≤-20.84	PASS
			1000~26500	9.16	-40.44	≤-20.84	PASS
11G	Ant1	2462	Reference	9.39	9.39	---	PASS
			30~1000	9.39	-63.86	≤-20.61	PASS
			1000~26500	9.39	-41.87	≤-20.61	PASS
	Ant2	2462	Reference	8.98	8.98	---	PASS
			30~1000	8.98	-64.78	≤-21.02	PASS
			1000~26500	8.98	-42.17	≤-21.02	PASS
	Ant1	2412	Reference	3.00	3.00	---	PASS
			30~1000	3.00	-70.97	≤-27.00	PASS
			1000~26500	3.00	-40.93	≤-27.00	PASS
	Ant2	2412	Reference	1.79	1.79	---	PASS
			30~1000	1.79	-70.64	≤-28.21	PASS
			1000~26500	1.79	-42.01	≤-28.21	PASS
11N20MIMO	Ant1	2437	Reference	2.60	2.60	---	PASS
			30~1000	2.60	-70.99	≤-27.40	PASS
			1000~26500	2.60	-42.03	≤-27.40	PASS
	Ant2	2437	Reference	1.71	1.71	---	PASS
			30~1000	1.71	-69.90	≤-28.29	PASS
			1000~26500	1.71	-41.71	≤-28.29	PASS
	Ant1	2462	Reference	2.78	2.78	---	PASS
			30~1000	2.78	-70.40	≤-27.22	PASS
			1000~26500	2.78	-41.72	≤-27.22	PASS
	Ant2	2462	Reference	2.01	2.01	---	PASS
			30~1000	2.01	-70.76	≤-27.99	PASS
			1000~26500	2.01	-42.22	≤-27.99	PASS
11N40MIMO	Ant1	2412	Reference	3.64	3.64	---	PASS
			30~1000	3.64	-70.32	≤-26.36	PASS
			1000~26500	3.64	-46.29	≤-26.36	PASS
	Ant2	2412	Reference	3.98	3.98	---	PASS
			30~1000	3.98	-69.81	≤-26.02	PASS
			1000~26500	3.98	-46.70	≤-26.02	PASS
	Ant1	2437	Reference	4.05	4.05	---	PASS
			30~1000	4.05	-69.93	≤-25.96	PASS
			1000~26500	4.05	-46.49	≤-25.96	PASS
	Ant2	2437	Reference	3.61	3.61	---	PASS
			30~1000	3.61	-69.65	≤-26.40	PASS
			1000~26500	3.61	-45.13	≤-26.40	PASS
	Ant1	2462	Reference	4.39	4.39	---	PASS
			30~1000	4.39	-69.98	≤-25.61	PASS
			1000~26500	4.39	-45.77	≤-25.61	PASS
	Ant2	2462	Reference	2.72	2.72	---	PASS
			30~1000	2.72	-69.82	≤-27.28	PASS
			1000~26500	2.72	-46.61	≤-27.28	PASS
11N40MIMO	Ant1	2422	Reference	0.84	0.84	---	PASS
			30~1000	0.84	-69.46	≤-29.16	PASS

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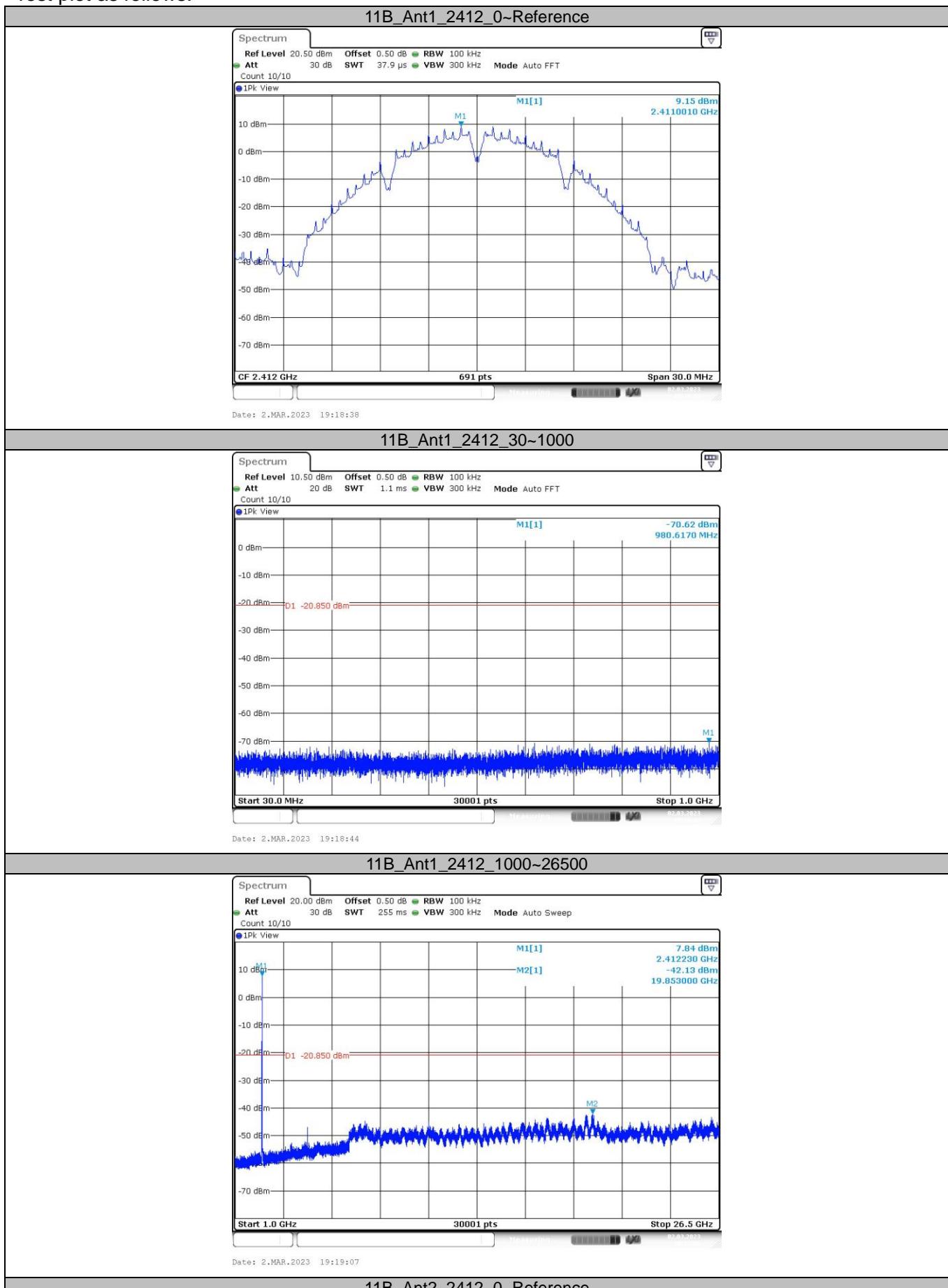
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		1000~26500	0.84	-46.75	≤-29.16	PASS
Ant2	2422	Reference	-0.17	-0.17	---	PASS
		30~1000	-0.17	-69.99	≤-30.17	PASS
		1000~26500	-0.17	-45.94	≤-30.17	PASS
Ant1	2437	Reference	1.16	1.16	---	PASS
		30~1000	1.16	-70.07	≤-28.84	PASS
		1000~26500	1.16	-46.02	≤-28.84	PASS
Ant2	2437	Reference	0.53	0.53	---	PASS
		30~1000	0.53	-69.86	≤-29.47	PASS
		1000~26500	0.53	-46.84	≤-29.47	PASS
Ant1	2452	Reference	0.17	0.17	---	PASS
		30~1000	0.17	-69.52	≤-29.83	PASS
		1000~26500	0.17	-46.22	≤-29.83	PASS
Ant2	2452	Reference	0.34	0.34	---	PASS
		30~1000	0.34	-68.91	≤-29.66	PASS
		1000~26500	0.34	-46.86	≤-29.66	PASS

Test plot as follows:



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