

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

TEST REPORT

Report No.: CTC20210133E17

FCC ID······ XUJPADVII

Applicant-----: LAUNCH TECH CO., LTD

Launch Industrial Park, North of Wuhe Avenue, Banxuegang, Address.....

Longgang, Shenzhen, Guangdong, P.R. China

Manufacturer·····: LAUNCH TECH CO., LTD

Launch Industrial Park, North of Wuhe Avenue, Banxuegang, Address

Longgang, Shenzhen, Guangdong, P.R. China

Automotive Diagnosis Tool, Automotive intelligent Product Name·····:

diagnostic tools

Trade Mark·····: LAUNCH

Model/Type reference······: X-431 PAD VII

Listed Model(s) ····· X-431 Throttle III

Standard FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of receipt of test sample...: Feb. 03, 2021

Date of testing...... Feb. 04, 2021 ~ Mar. 28, 2021

Date of issue....: Mar. 29, 2021

Result....: **PASS**

Compiled by:

(Printed name+signature) Terry Su Terry Su Niller Ma water chn

Supervised by:

(Printed name+signature) Miller Ma

Approved by:

(Printed name+signature) Walter Chen

Testing Laboratory Name.....: CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Address.....

Shenzhen, Guangdong, China

This test report may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CTC. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CTC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.

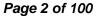




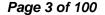
Table of Contents

Р	а	a	1

Report No.: CTC20210133E17

1. Ti	TEST SUMMARY	3
1.1.	. Test Standards	3
1.2.		
1.3.	. Test Description	4
1.4.	. Test Facility	5
1.5.	. Measurement Uncertainty	5
1.6.	. Environmental conditions	6
2. G	GENERAL INFORMATION	7
2.1.	. CLIENT INFORMATION	7
2.2.		
2.3.		
2.4.	. OPERATION STATE	10
2.5.	. Measurement Instruments List	11
3. TI	TEST ITEM AND RESULTS	13
3.1.	. CONDUCTED EMISSION	13
3.2.		
3.3.	. BAND EDGE EMISSIONS (RADIATED)	46
3.4.	BAND EDGE AND SPURIOUS EMISSIONS (CONDUCTED)	63
3.5.		
3.6.	PEAK OUTPUT POWER	86
3.7.	Power Spectral Density	88
3.8.	. Duty Cycle	94
3.9.	. Antenna requirement	100







1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

<u>FCC Rules Part 15.247:</u> Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

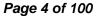
RSS 247 Issue 2: Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSs) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version

Revised No. Date of issue		Description
01	Mar. 29, 2021	Original

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



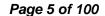


1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS 247 Issue 2					
Test Item	Standard	Section	Result	Test Engineer	
rest item	FCC	IC	Resuit		
Antenna Requirement	15.203	/	Pass	Rod Luo	
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Eva Feng	
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	RSS 247 5.5	Pass	Rod Luo	
Conducted Band Edge and Spurious Emissions	15.247(d)	RSS 247 5.5	Pass	Rod Luo	
6dB Bandwidth	15.247(a)(2)	RSS 247 5.2 (a)	Pass	Rod Luo	
Conducted Max Output Power	15.247(b)(3)	RSS 247 5.4 (d)	Pass	Rod Luo	
Power Spectral Density	15.247(e)	RSS 247 5.2 (b)	Pass	Rod Luo	
Transmitter Radiated Spurious	15.209&15.247(d)	RSS 247 5.5& RSS-Gen 8.9	Pass	Rod Luo	

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

Accreditation Administration of the People's Republic of China: yz.cnca.cn





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:

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

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)

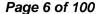
CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

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.

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





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 3.08 dB (1) Radiated Emissions 30~1000MHz 4.51 dB (1) Radiated Emissions 1~18GHz 5.84 dB (1) Radiated Emissions 18~40GHz 6.12 dB (1) Occupied Bandwidth (1)

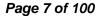
Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

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

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

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





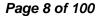
2. GENERAL INFORMATION

2.1. Client Information

Applicant:	LAUNCH TECH CO., LTD
Address:	Launch Industrial Park, North of Wuhe Avenue, Banxuegang, Longgang, Shenzhen, Guangdong, P.R. China
Manufacturer:	LAUNCH TECH CO., LTD
Address:	Launch Industrial Park, North of Wuhe Avenue, Banxuegang, Longgang, Shenzhen, Guangdong, P.R. China

Report No.: CTC20210133E17

Accreditation Administration of the People's Republic of China: yz.cnca.cn

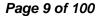




2.2. General Description of EUT

Product Name:	Automotive Diagnosis Tool, Automotive intelligent diagnostic tools		
Trade Mark:	LAUNCH		
Model/Type reference:	X-431 PAD VII		
Listed Model(s):	X-431 Throttle III		
Mode different:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name.		
Power supply:	12Vdc/4A from AC/DC Adapter 7.6Vdc from 9400mAh Li-ion Battery		
Adapter 1 Model: FJ-SW20171204000D Input:100-240V~ 50/60Hz 1.5A Max Output: 12Vdc/4A			
Adapter 2 Model:	PSY1204000 Input:100-240V~ 50/60Hz 1.3A Output: 12Vdc/4A		
Hardware version:	PL280_V2.0		
Software version:	V1.0.5.20210323		
WIFI 802.11b/ g/ n(HT20	0)/ n(HT40)		
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):11channels 802.11n(HT40):7channels		
Channel separation:	5MHz		
Antenna type:	FPC Antenna		
Antenna gain:	5.25dBi Max		

Accreditation Administration of the People's Republic of China: yz.cnca.cn

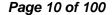




2.3. Accessory Equipment information

Equipment Information					
Name	Model	S/N	Manufacturer		
1	1	1	1		
1	1	1	1		
Cable Information					
Name	Shielded Type	Ferrite Core	Length		
1	1	1	1		
Test Software Information					
Name	1	1	1		
cmd.exe	1	1	/		

CTC Laboratories, Inc.





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:

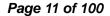
The engineering test program was provided and enabled to make EUT continuous transmit.

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	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 25, 2021
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2021
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 25, 2021
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 25, 2021
5	Power Sensor	Agilent	U2021XA	MY5365004	Dec. 25, 2021
6	Power Sensor	Agilent	U2021XA	MY5365006	Dec. 25, 2021
7	Simultaneous Sampling DAQ	Agilent	U2531A	TW54493510	Dec. 25, 2021
8	Climate Chamber	TABAI	PR-4G	A8708055	Dec. 25, 2021
9	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 25, 2021
10	Climate Chamber	ESPEC	MT3065	1	Dec. 25, 2021
11	300328 v2.2.2 test system	TONSCEND	v2.6	1	1

Radiate	ed Emission and Transmi	tter spurious emissior	าร		
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	Rohde & Schwarz	ESCI	100658	Dec. 25, 2021
2	High pass filter	micro-tranics	HPM50111	142	Dec. 25, 2021
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 25, 2021
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec. 25, 2021
5	Loop Antenna	LAPLAC	RF300	9138	Dec. 25, 2021
6	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 25, 2021
7	Horn Antenna	Schwarzbeck	BBHA 9120D	647	Dec. 25, 2021
8	Pre-Amplifier	HP	8447D	1937A03050	Dec. 25, 2021
9	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 25, 2021
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A
12	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Dec. 25, 2021
13	Cable Above 1GHz	Hubersuhner	SUCOFLEX 102	DA1580	Dec. 25, 2021
14	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 25, 2021
15	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	Dec. 25, 2021
16	RF Connection Cable	Chengdu E-Microwave			Dec. 25, 2021
17	High pass filter	Compliance	BSU-6	34202	Dec. 25, 2021



Page 12 of 100

Report No.: CTC20210133E17

		Direction systems			
18	Attenuator	Chengdu E-Microwave	EMCAXX-10 RNZ-3		Dec. 25, 2021
19	High and low temperature box	ESPEC	MT3065	12114019	Dec. 25, 2021

Conduc	Conducted Emission										
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until						
1	LISN	R&S	ENV216	101112	Dec. 25, 2021						
2	LISN R&S		ENV216	101113	Dec. 25, 2021						
3	EMI Test Receiver	R&S	ESCI	100658	Dec. 25, 2021						

Note:1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.



3. TEST ITEM AND RESULTS

3.1. Conducted Emission

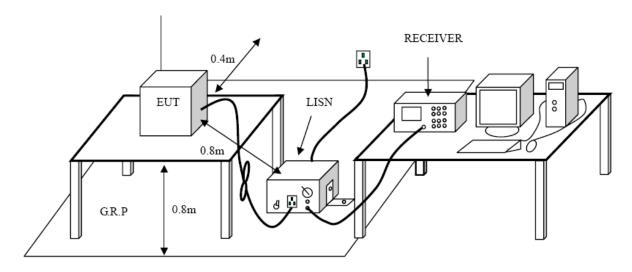
Limit

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

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

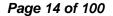
^{*} Decreases with the logarithm of the frequency.

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.





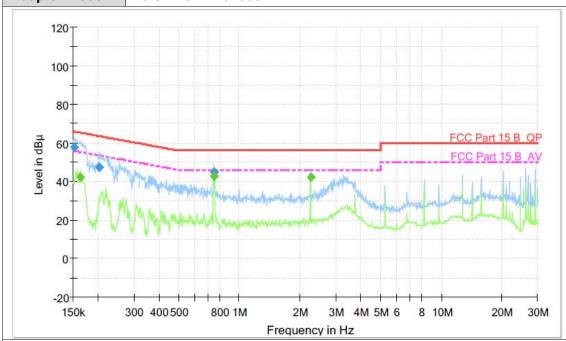
Test Mode:

Please refer to the clause 2.4.

Test Results

Test Voltage:	AC 120V/60 Hz
Terminal:	Line
Adapter Model:	FJ-SW20171204000D

Report No.: CTC20210133E17



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.151200	57.9	1000.00	9.000	On	L1	10.1	8.0	65.9	
0.200750	47.2	1000.00	9.000	On	L1	10.1	16.4	63.6	
0.749510	44.8	1000.00	9.000	On	L1	10.1	11.2	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.161820	42.1	1000.00	9.000	On	L1	10.1	13.3	55.4	
0.749510	42.8	1000.00	9.000	On	L1	10.1	3.2	46.0	
2.246720	42.1	1000.00	9.000	On	L1	10.2	3.9	46.0	

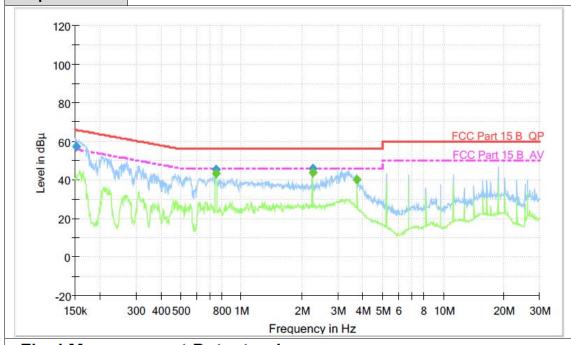
Emission Level= Read Level+ Correct Factor

Accreditation Administration of the People's Republic of China: yz.cnca.cn



Test Voltage: AC 120V/60 Hz
Terminal: Neutral
Adapter Model: FJ-SW20171204000D

Report No.: CTC20210133E17



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.152410	57.3	1000.00	9.000	On	N	10.1	8.6	65.9	
0.749510	45.3	1000.00	9.000	On	N	10.1	10.7	56.0	
2.246720	45.7	1000.00	9.000	On	N	10.2	10.3	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.749510	43.3	1000.00	9.000	On	N	10.1	2.7	46.0	
2.246720	43.6	1000.00	9.000	On	N	10.2	2.4	46.0	
3.745110	40.2	1000.00	9.000	On	N	10.2	5.8	46.0	

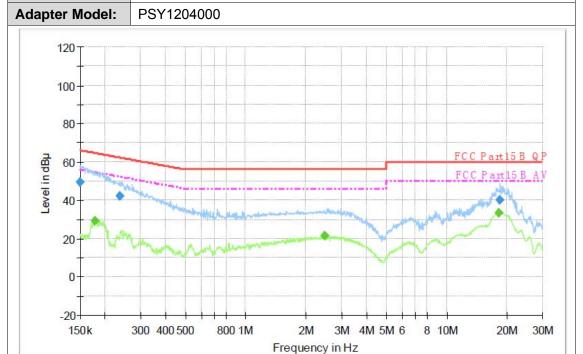
Emission Level= Read Level+ Correct Factor





Test Voltage: AC 120V/60 Hz
Terminal: Line

Report No.: CTC20210133E17



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.150600	49.7	1000.00	9.000	On	L1	10.1	16.3	66.0	
0.235510	42.0	1000.00	9.000	On	L1	10.1	20.3	62.3	
18.416860	40.1	1000.00	9.000	On	L1	10.6	19.9	60.0	

Final Measurement Detector 2

	Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
Γ	0.178800	29.3	1000.00	9.000	On	L1	10.1	25.2	54.5	
	2.462770	21.4	1000.00	9.000	On	L1	10.2	24.6	46.0	
	18.197610	33.4	1000.00	9.000	On	L1	10.6	16.6	50.0	

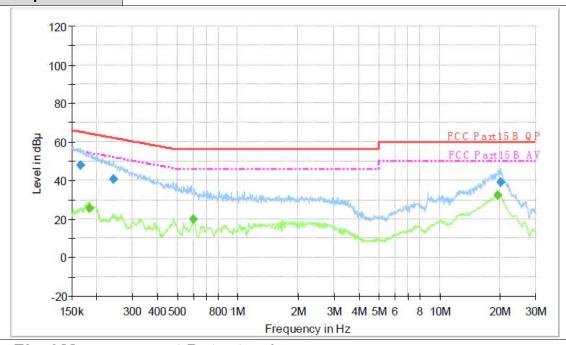
Emission Level= Read Level+ Correct Factor





Test Voltage: AC 120V/60 Hz
Terminal: Neutral
Adapter Model: PSY1204000

Report No.: CTC20210133E17



Final Measurement Detector 1

	Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
Γ	0.166410	47.9	1000.00	9.000	On	N	10.1	17.2	65.1	
Γ	0.241210	40.6	1000.00	9.000	On	N	10.1	21.5	62.1	
Γ	20.027350	38.9	1000.00	9.000	On	N	10.6	21.1	60.0	

Final Measurement Detector 2

	Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
Г	0.183140	25.8	1000.00	9.000	On	N	10.1	28.5	54.3	
Γ	0.599360	20.0	1000.00	9.000	On	N	10.1	26.0	46.0	
	19.553350	32.4	1000.00	9.000	On	N	10.6	17.6	50.0	

Emission Level= Read Level+ Correct Factor



3.2. Radiated Emission

Limit

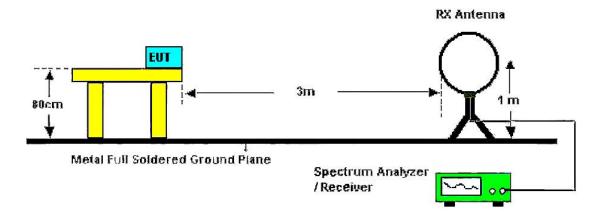
FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS - Gen 8.9:

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 GHz	54.00	Average
Above 1 GHz	74.00	Peak

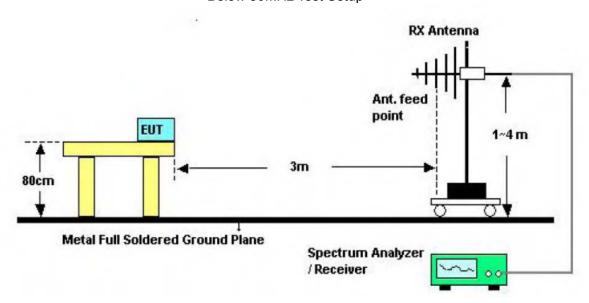
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

Test Configuration



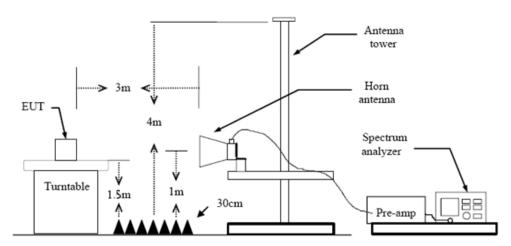
Below 30MHz Test Setup



Below 1000MHz Test Setup

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





Above 1GHz Test Setup

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 10th harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW≥1/T Peak detector for Average value.

Note 1: For the 1/T& Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

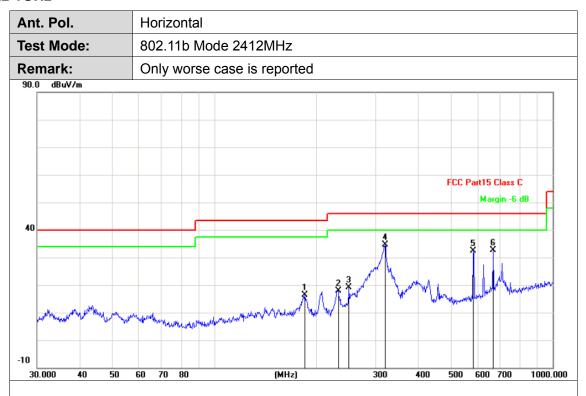
9 KHz~30 MHz

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.

EN 中国国家认证认可监督管理委员会

30MHz-1GHz



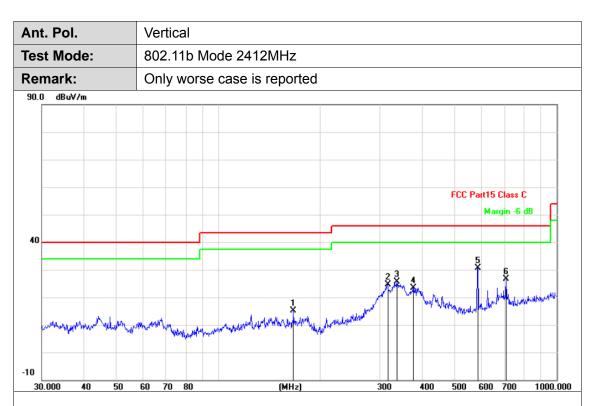
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	185.1379	-19.69	36.09	16.40	43.50	-27.10	QP
2	231.7179	-19.80	37.59	17.79	46.00	-28.21	QP
3	250.3012	-19.11	38.18	19.07	46.00	-26.93	QP
4	319.9370	-17.42	52.15	34.73	46.00	-11.27	QP
5	582.7425	-12.53	44.95	32.42	46.00	-13.58	QP
6	668.1423	-11.24	43.96	32.72	46.00	-13.28	QP

Remarks:

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

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





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	166.6513	-18.17	33.35	15.18	43.50	-28.32	QP
2	316.5889	-17.49	42.20	24.71	46.00	-21.29	QP
3	337.2155	-17.01	42.63	25.62	46.00	-20.38	QP
4	377.2590	-16.22	39.72	23.50	46.00	-22.50	QP
5	584.7894	-12.50	43.25	30.75	46.00	-15.25	QP
6	709.1821	-10.63	37.32	26.69	46.00	-19.31	QP

Remarks:

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

中国国家认证认可监督管理委员会



Adobe 1GHz

Ant.	Pol.		Horiz	zontal							
Test	Mode:		TX E	B Mode 2412MHz report for the emission which more than 10 dB b							
Rem	nark:			eport for cribed li		ssion wh	ich m	ore tha	an 10 dE	B below	the
100.0	dBuV/m		•								
							F	CC Part15	Class C 3M .	Above-1G Po	eak
								FCC Part	15 Class C 3	M Above-16	AV
50											
		×									
		2									
		*									
0.0											
100	0.000 3500	.00 60	00.00	8500.00	11000.00	13500.00	16000.0	00 1850	00.00 210	00.00	26000.00 MH

No.	Frequency (MHz)			Level (dBuV/m)			Detector
1	4824.340	-2.76	48.56	45.80	74.00	-28.20	peak
2	4824.968	-2.76	35.12	32.36	54.00	-21.64	AVG

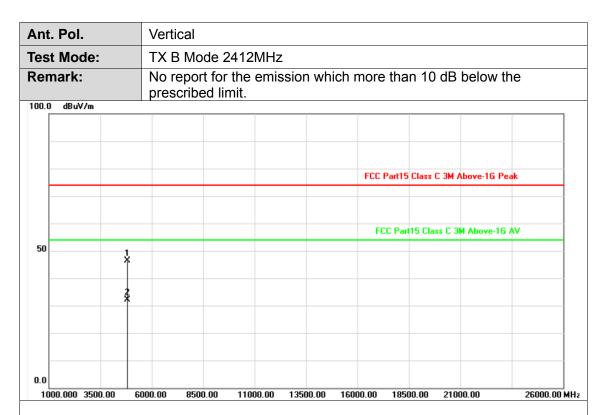
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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





No.	Frequency (MHz)			Level (dBuV/m)		Margin (dB)	Detector
1	4823.074	-2.76	49.20	46.44	74.00	-27.56	peak
2	4824.003	-2.76	34.88	32.12	54.00	-21.88	AVG

Remarks:

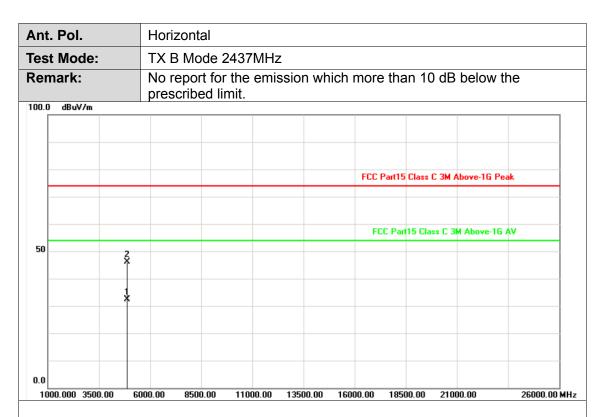
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

中国国家认证认可监督管理委员会

Tel.: (86)755-27521059

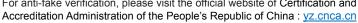




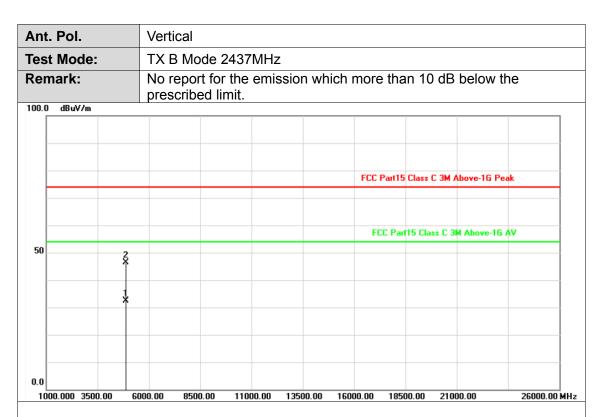
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4874.218	-2.61	34.97	32.36	54.00	-21.64	AVG
2	4874.984	-2.61	48.82	46.21	74.00	-27.79	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





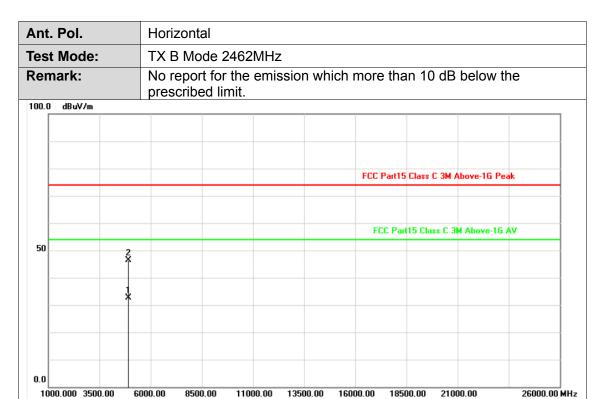


No.	Frequency (MHz)	1	_	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4873.301	-2.61	34.96	32.35	54.00	-21.65	AVG
2	4874.135	-2.61	49.09	46.48	74.00	-27.52	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor



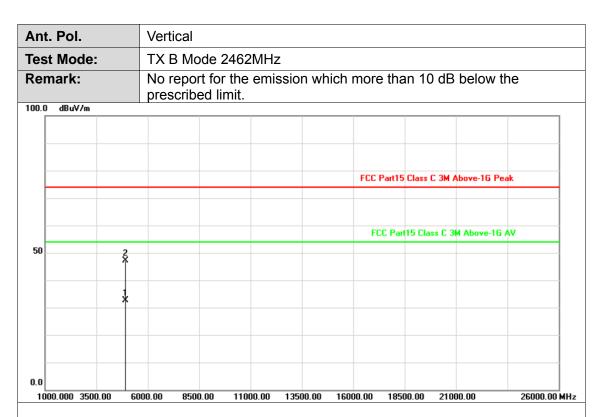


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4923.724	-2.47	34.99	32.52	54.00	-21.48	AVG
2	4924.000	-2.47	48.80	46.33	74.00	-27.67	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4923.567	-2.47	35.01	32.54	54.00	-21.46	AVG
2	4924.997	-2.47	49.68	47.21	74.00	-26.79	peak

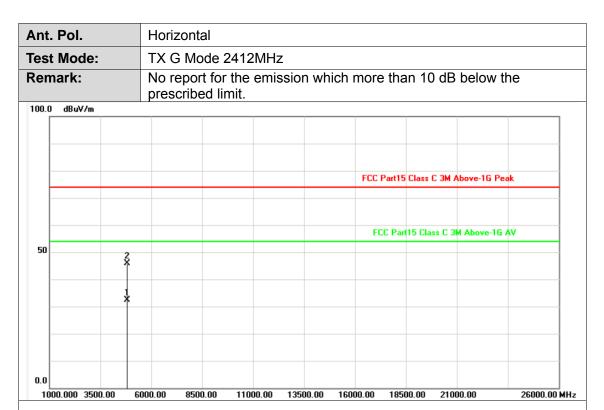
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

中国国家认证认可监督管理委员会



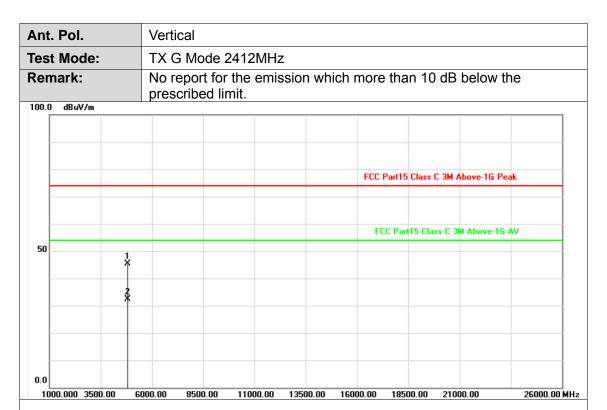


No.	Frequency (MHz)			Level (dBuV/m)		Margin (dB)	Detector
1	4823.756	-2.76	35.11	32.35	54.00	-21.65	AVG
2	4823.994	-2.76	48.70	45.94	74.00	-28.06	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	4824.035	-2.76	48.13	45.37	74.00	-28.63	peak
2	4824.369	-2.76	35.08	32.32	54.00	-21.68	AVG

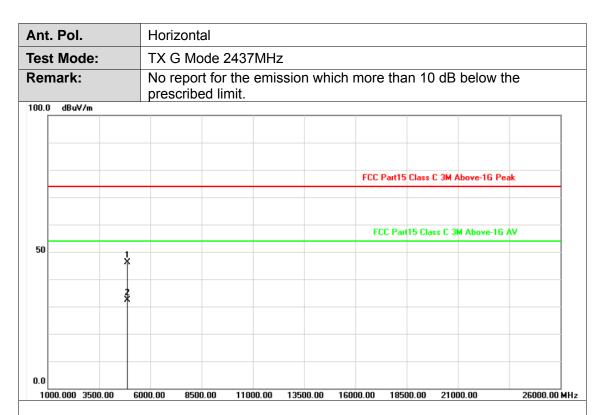
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

中国国家认证认可监督管理委员会



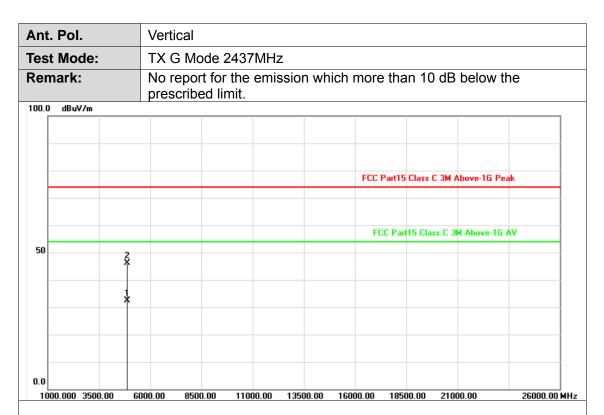


No.	Frequency (MHz)			Level (dBuV/m)			Detector
1	4873.926	-2.61	48.79	46.18	74.00	-27.82	peak
2	4874.458	-2.61	35.11	32.50	54.00	-21.50	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

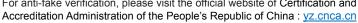




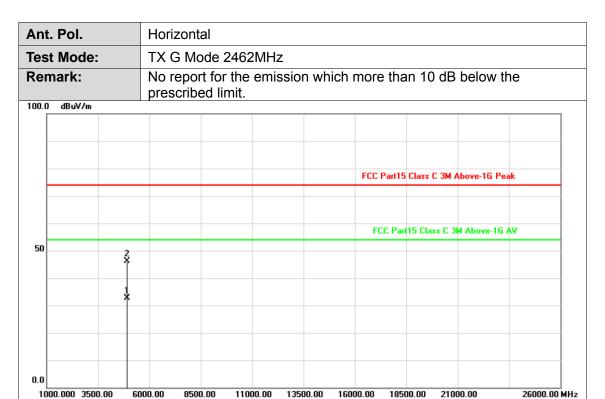
No.	Frequency (MHz)	Factor (dB/m)	_	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4874.503	-2.61	35.00	32.39	54.00	-21.61	AVG
2	4874.756	-2.61	48.64	46.03	74.00	-27.97	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





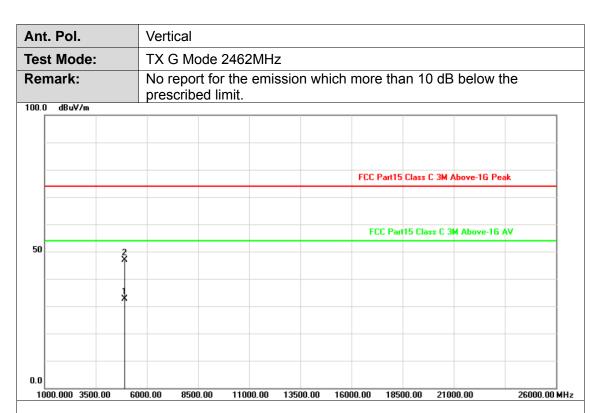


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	4924.686	-2.47	35.17	32.70	54.00	-21.30	AVG
2	4924.753	-2.47	48.70	46.23	74.00	-27.77	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	4923.154	-2.47	35.13	32.66	54.00	-21.34	AVG
2	4924.465	-2.47	49.26	46.79	74.00	-27.21	peak

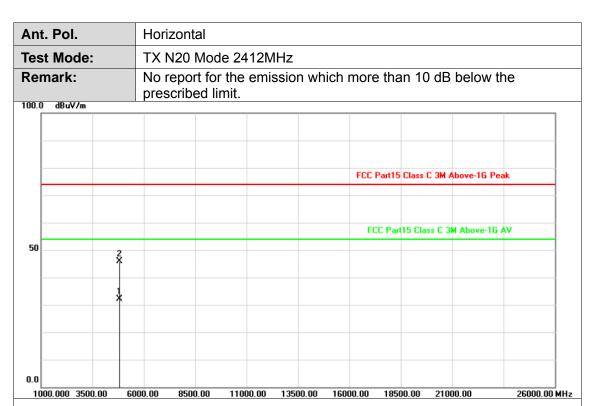
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

中国国家认证认可监督管理委员会



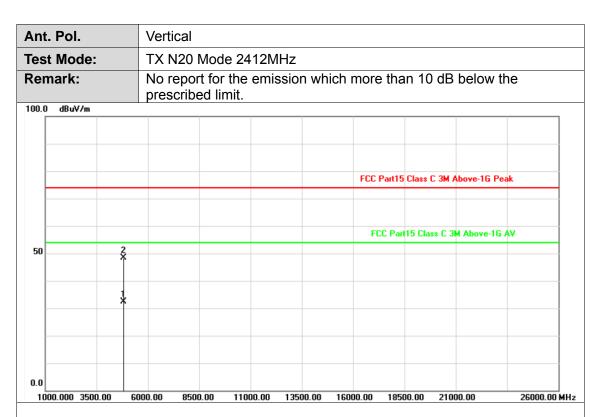


No.	Frequency (MHz)	l .	Reading (dBuV)	l .	l	Margin (dB)	Detector
1	4823.218	-2.76	34.97	32.21	54.00	-21.79	AVG
2	4824.946	-2.76	48.67	45.91	74.00	-28.09	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





No.	Frequency (MHz)		_	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4824.333	-2.76	35.07	32.31	54.00	-21.69	AVG
2	4824.628	-2.76	51.23	48.47	74.00	-25.53	peak

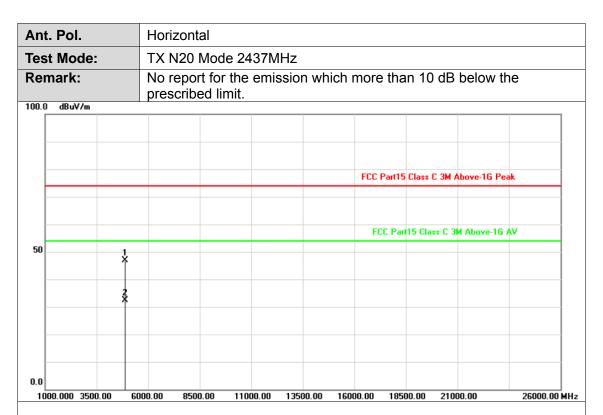
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Tel.: (86)755-27521059 中国国家认证认可监督管理委员会





No.	Frequency (MHz)		_	Level (dBuV/m)		Margin (dB)	Detector
1	4874.311	-2.61	49.54	46.93	74.00	-27.07	peak
2	4874.535	-2.61	34.96	32.35	54.00	-21.65	AVG

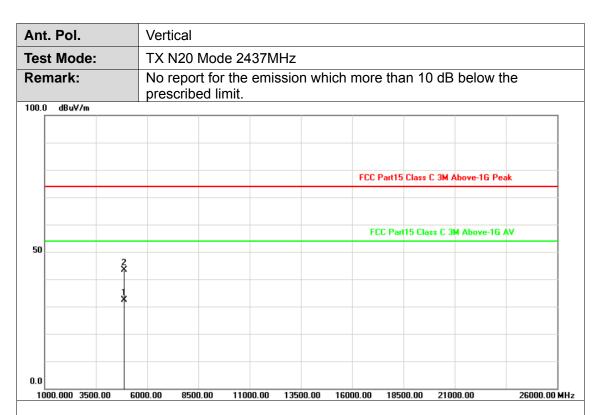
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

中国国家认证认可监督管理委员会

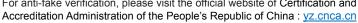




No.	Frequency (MHz)	l	_	Level (dBuV/m)		Margin (dB)	Detector
1	4873.061	-2.61	35.02	32.41	54.00	-21.59	AVG
2	4873.622	-2.61	46.08	43.47	74.00	-30.53	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor







Ant. Pol.

Test Mode: TX N20 Mode 2462MHz

Remark: No report for the emission which more than 10 dB below the prescribed limit.

100.0 dBuv/m

FCC Part15 Class C 3M Above-16 Peak

FCC Part15 Class C 3M Above-16 AV

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	4924.644	-2.47	35.08	32.61	54.00	-21.39	AVG
2	4924.837	-2.47	48.94	46.47	74.00	-27.53	peak

13500.00

16000.00 18500.00

21000.00

26000.00 MHz

Remarks:

0.0

1000.000 3500.00

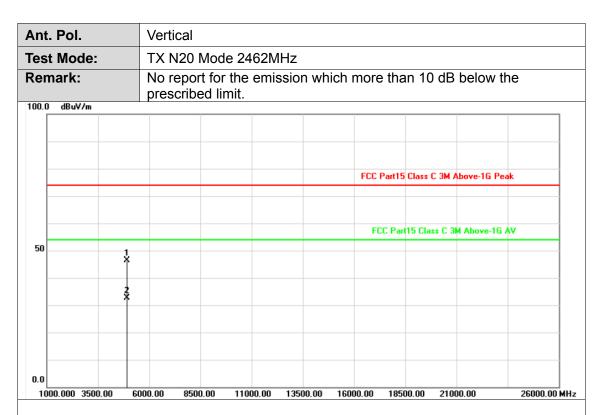
- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value

6000.00

8500.00

11000.00



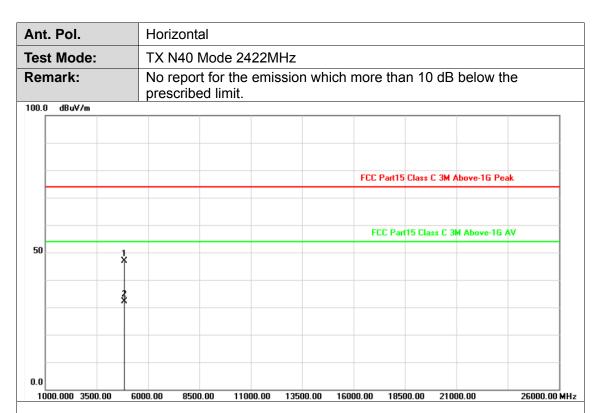


No.	Frequency (MHz)	Factor (dB/m)		Level (dBuV/m)		Margin (dB)	Detector
1	4923.869	-2.47	48.83	46.36	74.00	-27.64	peak
2	4924.830	-2.47	35.07	32.60	54.00	-21.40	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

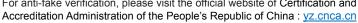




No.	Frequency (MHz)		Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4843.503	-2.70	49.47	46.77	74.00	-27.23	peak
2	4843.657	-2.70	34.93	32.23	54.00	-21.77	AVG

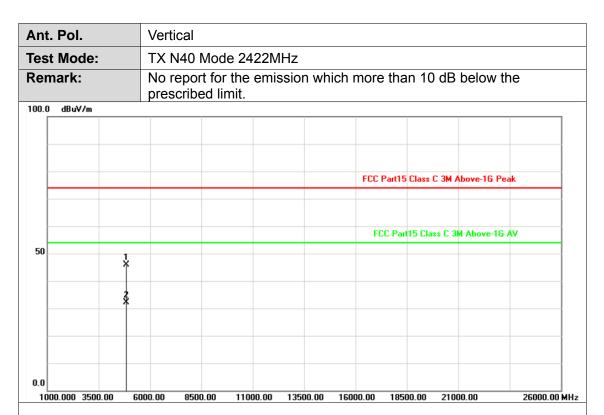
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor







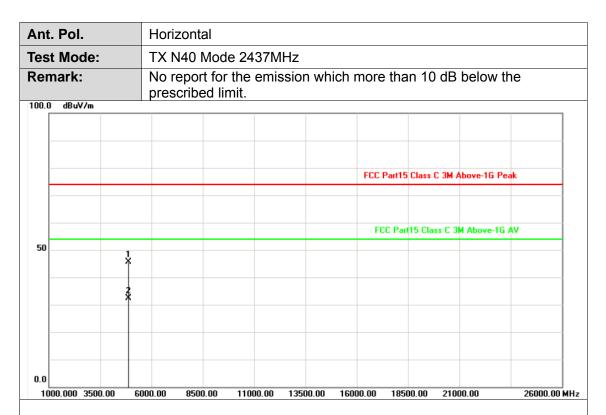


No.	Frequency (MHz)			Level (dBuV/m)			Detector
1	4844.692	-2.70	48.47	45.77	74.00	-28.23	peak
2	4844.875	-2.70	34.92	32.22	54.00	-21.78	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





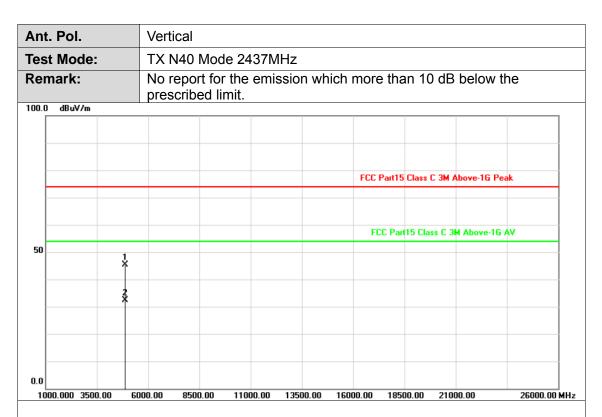
No.	Frequency (MHz)	l	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	4874.054	-2.61	48.33	45.72	74.00	-28.28	peak
2	4874.545	-2.61	35.06	32.45	54.00	-21.55	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value





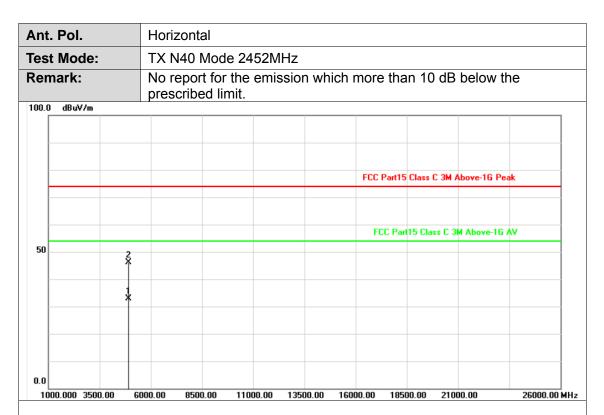
No.	Frequency (MHz)		Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4873.869	-2.61	48.06	45.45	74.00	-28.55	peak
2	4874.500	-2.61	35.03	32.42	54.00	-21.58	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	4904.715	-2.53	35.33	32.80	54.00	-21.20	AVG
2	4904.801	-2.53	48.66	46.13	74.00	-27.87	peak

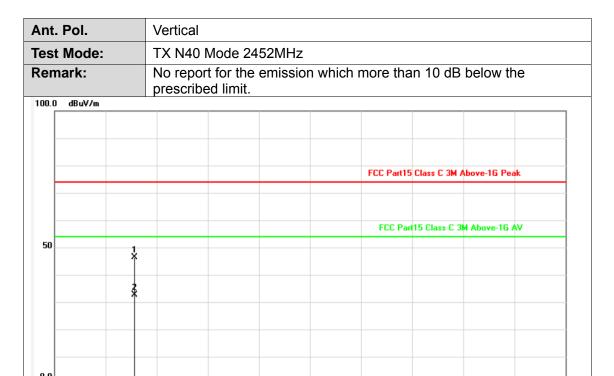
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

26000.00 MHz

21000.00





No.	Frequency (MHz)	l	_	Level (dBuV/m)	l .	Margin (dB)	Detector
1	4903.676	-2.53	48.97	46.44	74.00	-27.56	peak
2	4903.872	-2.53	35.15	32.62	54.00	-21.38	AVG

11000.00 13500.00 16000.00 18500.00

Remarks:

1000.000 3500.00

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

6000.00

8500.00



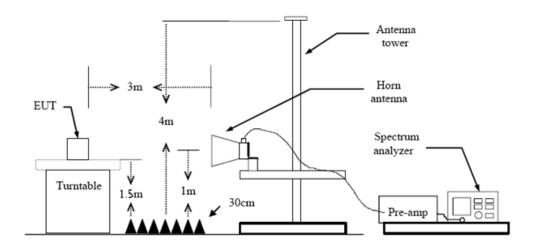
3.3. Band Edge Emissions (Radiated)

Limit

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

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

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 3.7 Duty Cycle.

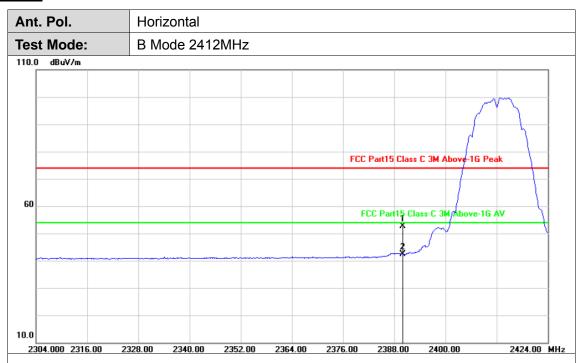
Test Mode

Please refer to the clause 2.4.

CTC Laboratories, Inc.



Test Results



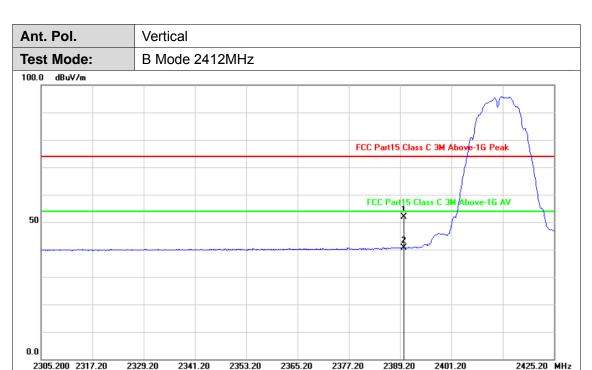
No.	Frequency (MHz)		_	Level (dBuV/m)		Margin (dB)	Detector
1	2390.000	31.10	21.62	52.72	74.00	-21.28	peak
2	2390.000	31.10	11.28	42.38	54.00	-11.62	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



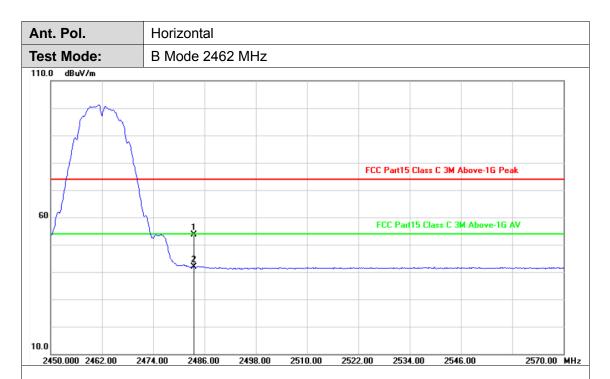


No.	Frequency (MHz)		Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2390.000	31.10	20.80	51.90	74.00	-22.10	peak
2	2390.000	31.10	9.53	40.63	54.00	-13.37	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor



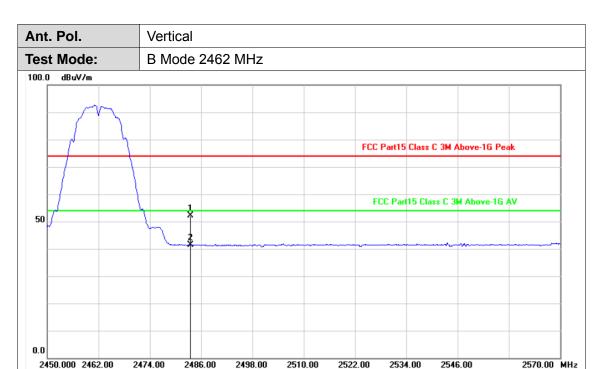


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	22.10	53.60	74.00	-20.40	peak
2	2483.500	31.50	10.33	41.83	54.00	-12.17	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	20.61	52.11	74.00	-21.89	peak
2	2483.500	31.50	9.82	41.32	54.00	-12.68	AVG

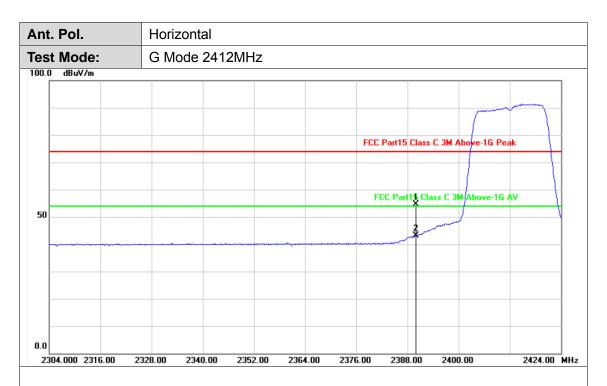
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Accreditation Administration of the People's Republic of China: yz.cnca.cn





No.	Frequency (MHz)	Factor (dB/m)		Level (dBuV/m)		Margin (dB)	Detector
1	2390.000	31.10	23.50	54.60	74.00	-19.40	peak
2	2390.000	31.10	12.09	43.19	54.00	-10.81	AVG

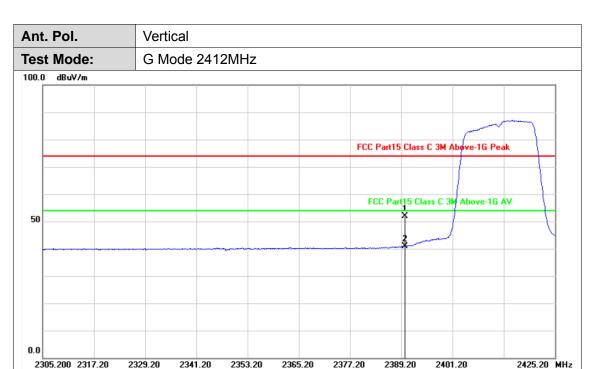
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Fax: (86)755-27521011 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





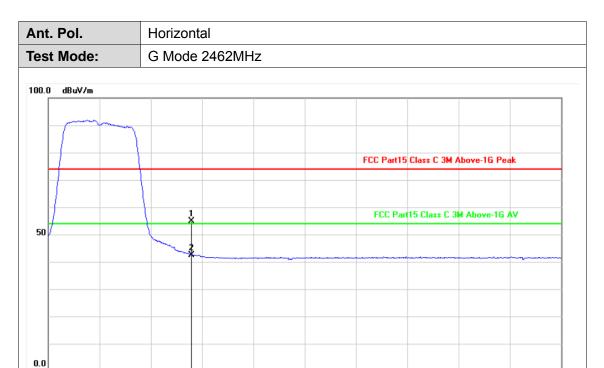
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2390.000	31.10	20.89	51.99	74.00	-22.01	peak
2	2390.000	31.10	9.82	40.92	54.00	-13.08	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	23.40	54.90	74.00	-19.10	peak
2	2483.500	31.50	11.00	42.50	54.00	-11.50	AVG

2510.00

2522.00

2534.00

2546.00

2570.00 MHz

Remarks:

2450.000 2462.00

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

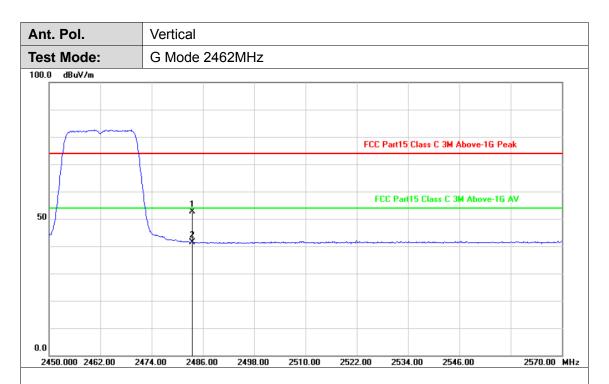
2.Margin value = Level -Limit value

2474.00

2486.00

2498.00



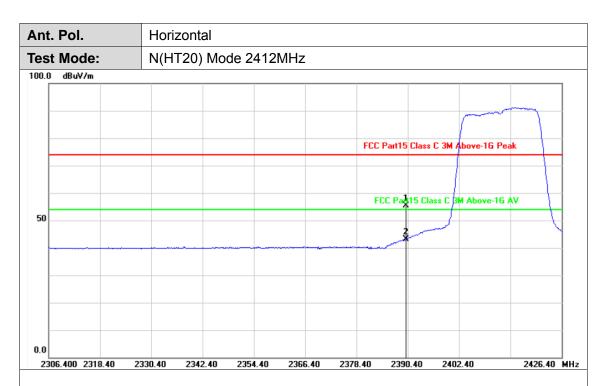


No.	Frequency (MHz)	Factor (dB/m)	_	Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	21.16	52.66	74.00	-21.34	peak
2	2483.500	31.50	9.82	41.32	74.00	-32.68	peak

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





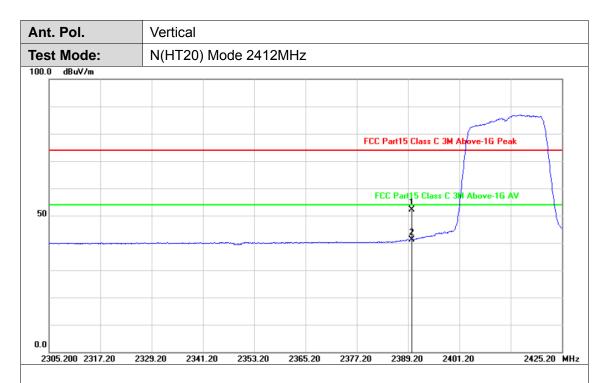
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2390.000	31.10	24.20	55.30	74.00	-18.70	peak
2	2390.000	31.10	12.00	43.10	54.00	-10.90	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value





No.	Frequency (MHz)			Level (dBuV/m)		Margin (dB)	Detector
1	2390.000	31.10	21.00	52.10	74.00	-21.90	peak
2	2390.000	31.10	10.06	41.16	54.00	-12.84	AVG

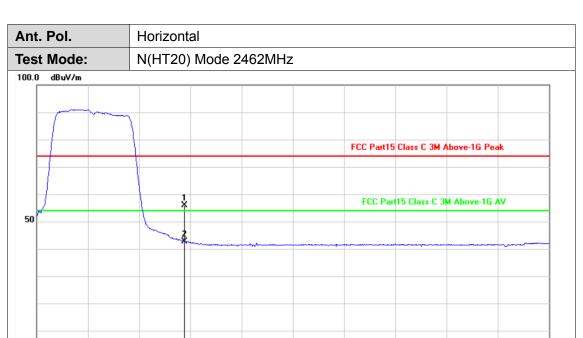
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2544.80

2568.80 MHz





No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	24.30	55.80	74.00	-18.20	peak
2	2483.500	31.50	11.09	42.59	54.00	-11.41	AVG

Remarks:

0.0

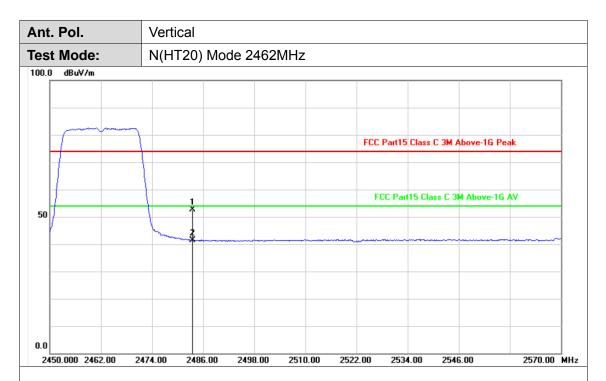
2448.800 2460.80

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2496.80

2.Margin value = Level -Limit value





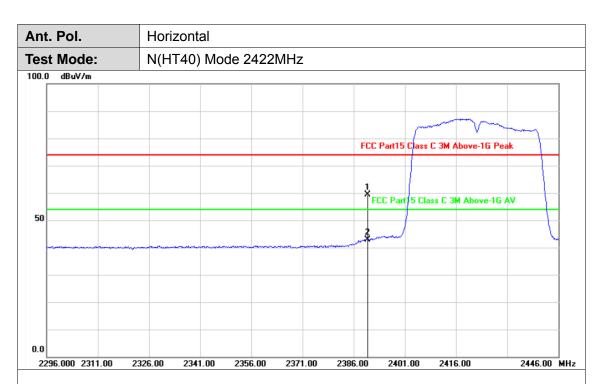
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	21.16	52.66	74.00	-21.34	peak
2	2483.500	31.50	9.95	41.45	54.00	-12.55	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



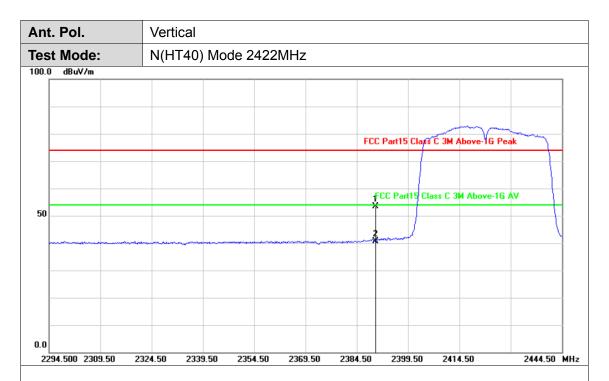


No.	Frequency (MHz)			Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	31.10	28.20	59.30	74.00	-14.70	peak
2	2390.000	31.10	11.77	42.87	54.00	-11.13	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





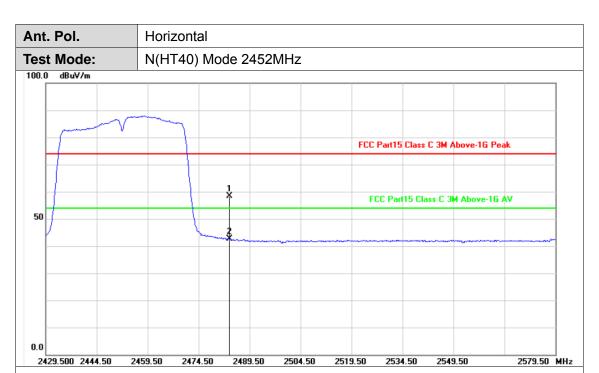
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2390.000	31.10	22.30	53.40	74.00	-20.60	peak
2	2390.000	31.10	9.56	40.66	54.00	-13.34	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



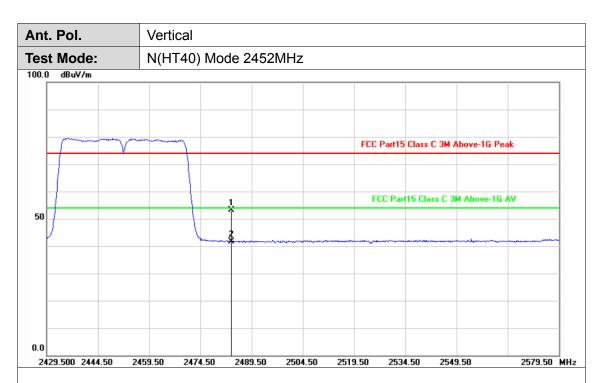


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	26.80	58.30	74.00	-15.70	peak
2	2483.500	31.50	11.18	42.68	54.00	-11.32	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor





No.	Frequency (MHz)	Factor (dB/m)		Level (dBuV/m)		Margin (dB)	Detector
1	2483.500	31.50	21.51	53.01	74.00	-20.99	peak
2	2483.500	31.50	10.05	41.55	54.00	-12.45	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Page 63 of 100

Report No.: CTC20210133E17

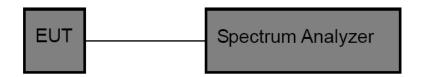


3.4. Band edge and Spurious Emissions (Conducted)

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.
- Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: RBW = 100 kHz, VBW ≥ RBW, scan up through 10th 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

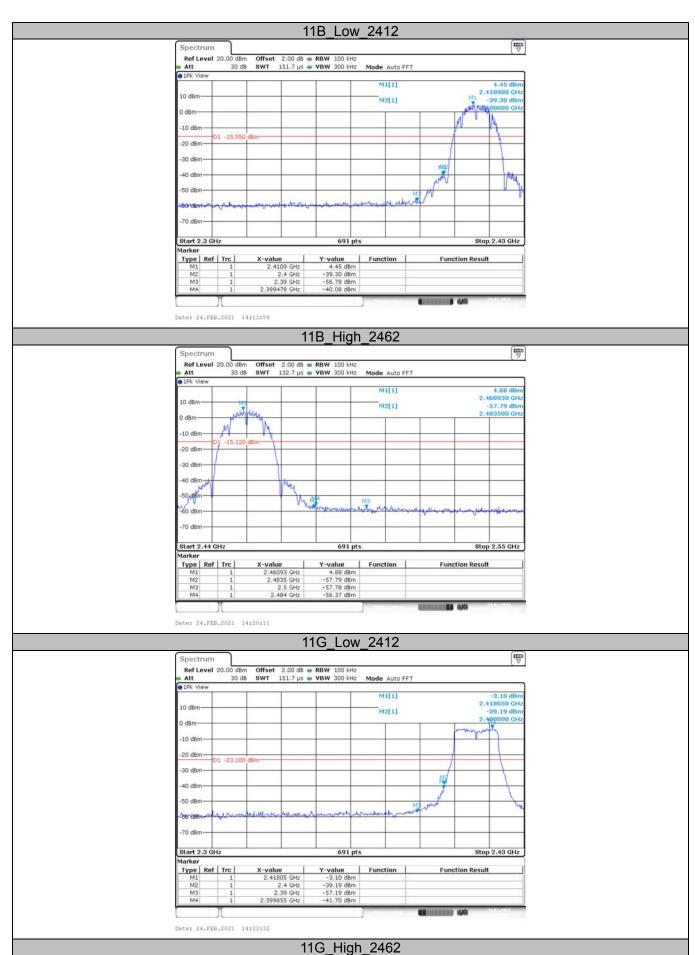
(1) Band edge Conducted Test

Test Mode	Frequency[MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
802.11b	2412	4.45	-40.08	<=-15.55	PASS
002.110	2462	4.88	-56.37	<=-15.12	PASS
902 11a	2412	-3.10	-41.70	<=-23.10	PASS
802.11g	2462	-1.32	-55.13	<=-21.32	PASS
902 11 _p /UT20\	2412	-0.97	-41.31	<=-20.97	PASS
802.11n(HT20)	2462	-1.18	-56.78	<=-21.18	PASS
902 11n/UT40)	2422	-5.01	-43.99	<=-25.01	PASS
802.11n(HT40)	2452	-6.07	-56.34	<=-26.07	PASS

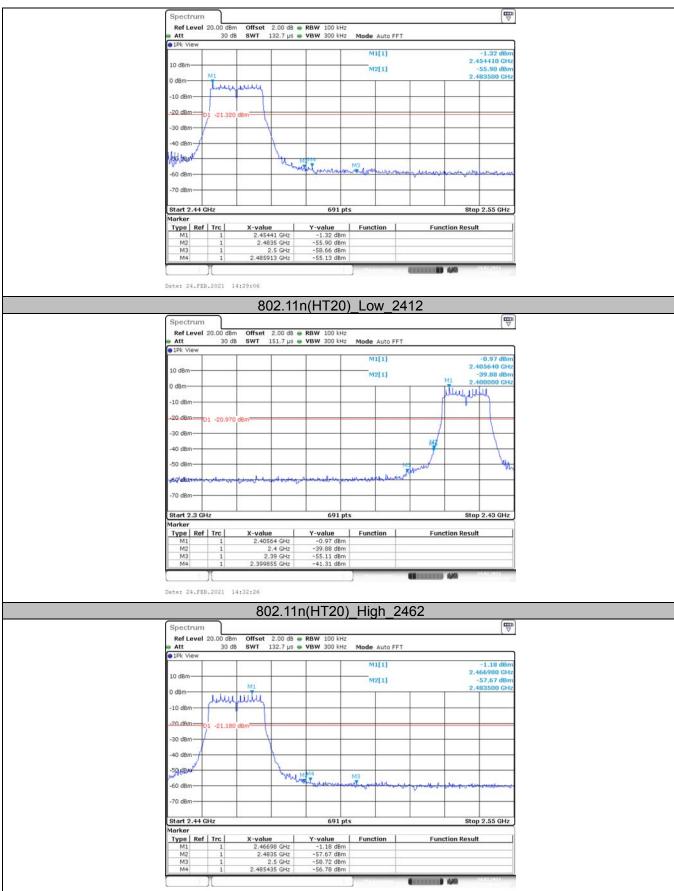
CTC Laboratories, Inc.

Accreditation Administration of the People's Republic of China: yz.cnca.cn





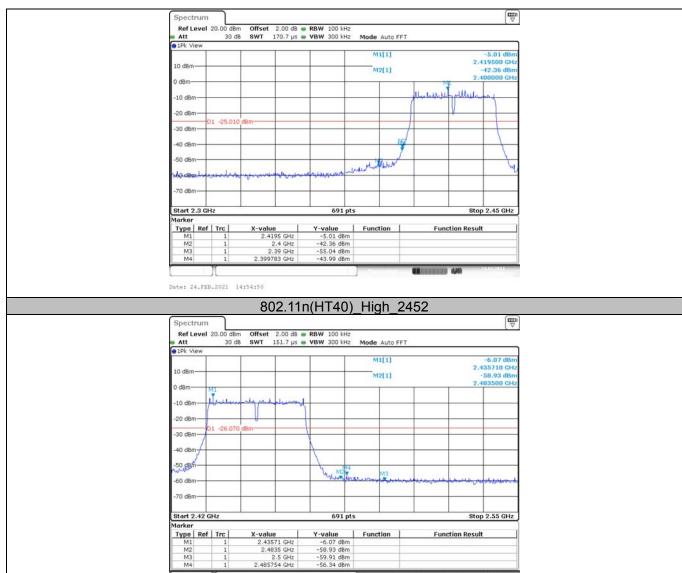




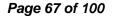
802.11n(HT40) Low 2422

FI 中国国家认证认可监督管理委员会 For a Accre





Date: 24.FEB.2021 15:00:26



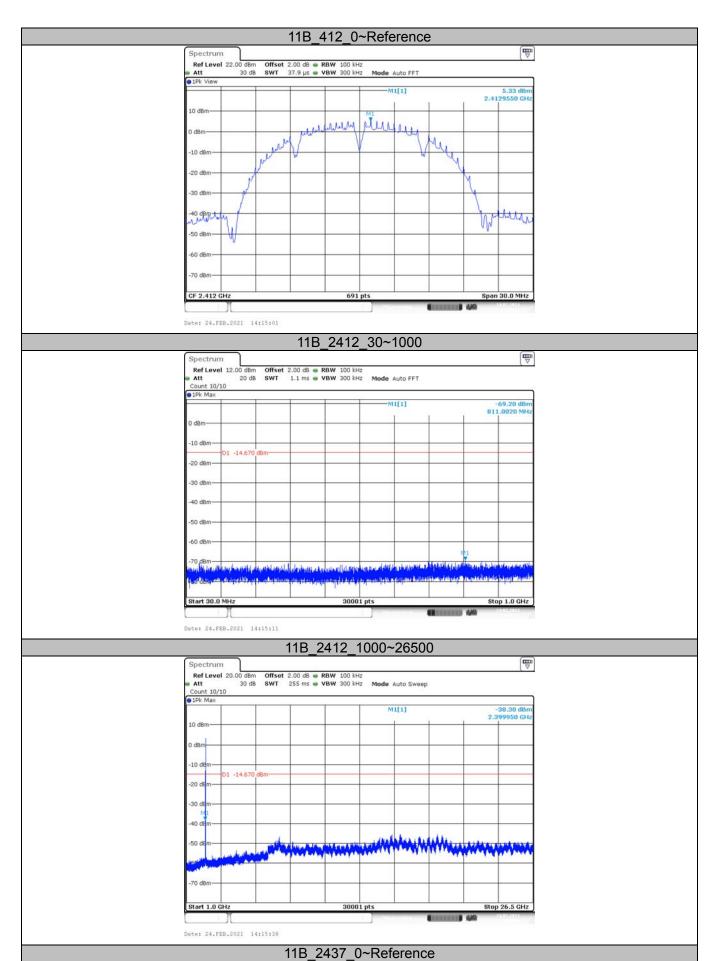


(2) Conducted Spurious Emissions Test

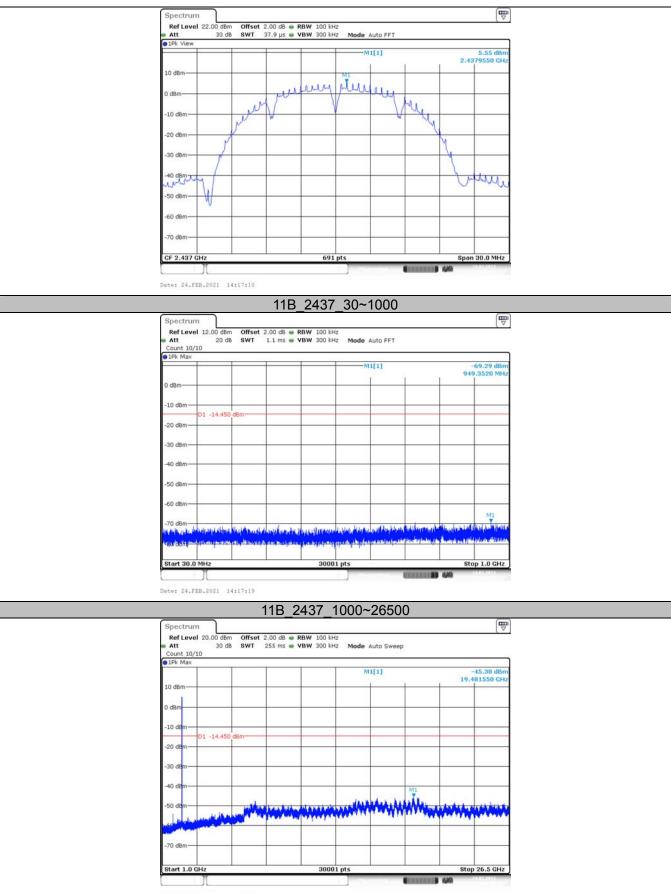
Test Mode	Frequency[MHz]	Freq Range [Mhz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
	2412	Reference	5.33	5.33		PASS
		30~1000	30~1000	-69.2	<=-14.67	PASS
		1000~26500	1000~26500	-38.3	<=-14.67	PASS
		Reference	5.55	5.55		PASS
802.11b	2437	30~1000	30~1000	-69.29	<=-14.45	PASS
		1000~26500	1000~26500	-45.38	<=-14.45	PASS
		Reference	5.24	5.24		PASS
	2462	30~1000	30~1000	-69.79	<=-14.76	PASS
		1000~26500	1000~26500	-45.87	<=-14.76	PASS
		Reference	-0.23	-0.23		PASS
	2412	30~1000	30~1000	-70.05	<=-20.23	PASS
		1000~26500	1000~26500	-37.77	<=-20.23	PASS
	2437	Reference	-0.18	-0.18		PASS
802.11g		30~1000	30~1000	-69.69	<=-20.18	PASS
		1000~26500	1000~26500	-46.27	<=-20.18	PASS
	2462	Reference	-0.43	-0.43		PASS
		30~1000	30~1000	-69.65	<=-20.43	PASS
		1000~26500	1000~26500	-45.63	<=-20.43	PASS
	2412	Reference	-2.00	-2.00		PASS
		30~1000	30~1000	-69.62	<=-22	PASS
		1000~26500	1000~26500	-37.34	<=-22	PASS
	2437	Reference	-0.87	-0.87		PASS
802.11n(HT20)		30~1000	30~1000	-69.63	<=-20.87	PASS
		1000~26500	1000~26500	-45.46	<=-20.87	PASS
	2462	Reference	-1.45	-1.45		PASS
		30~1000	30~1000	-69.86	<=-21.45	PASS
		1000~26500	1000~26500	-44.89	<=-21.45	PASS
	2422	Reference	-4.64	-4.64		PASS
		30~1000	30~1000	-70.48	<=-24.64	PASS
		1000~26500	1000~26500	-42.87	<=-24.64	PASS
802.11n(HT40)	2437	Reference	-5.17	-5.17		PASS
		30~1000	30~1000	-69.63	<=-25.17	PASS
		1000~26500	1000~26500	-44.99	<=-25.17	PASS
		Reference	-4.98	-4.98		PASS
	2452	30~1000	30~1000	-69.24	<=-24.98	PASS
	<u> </u>	1000~26500	1000~26500	-46.13	<=-24.98	PASS

Accreditation Administration of the People's Republic of China: <u>yz.cnca.cn</u>



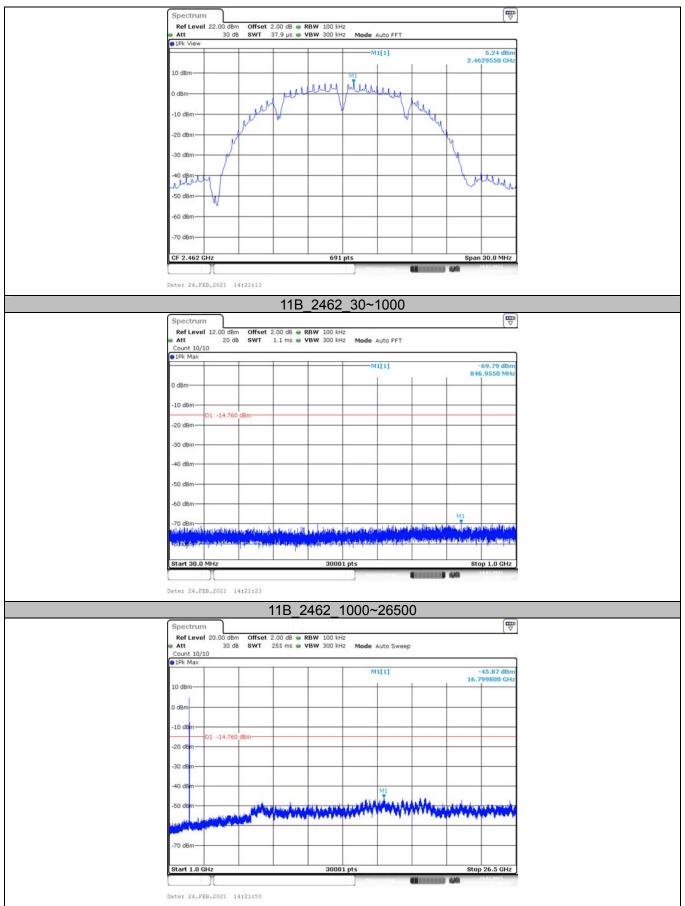






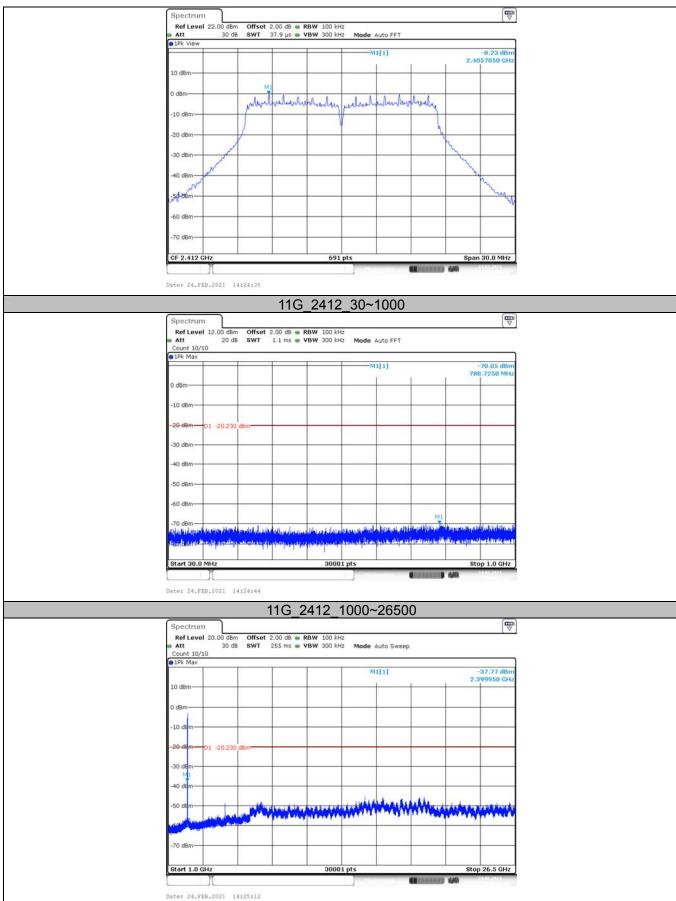
11B 2462 0~Reference





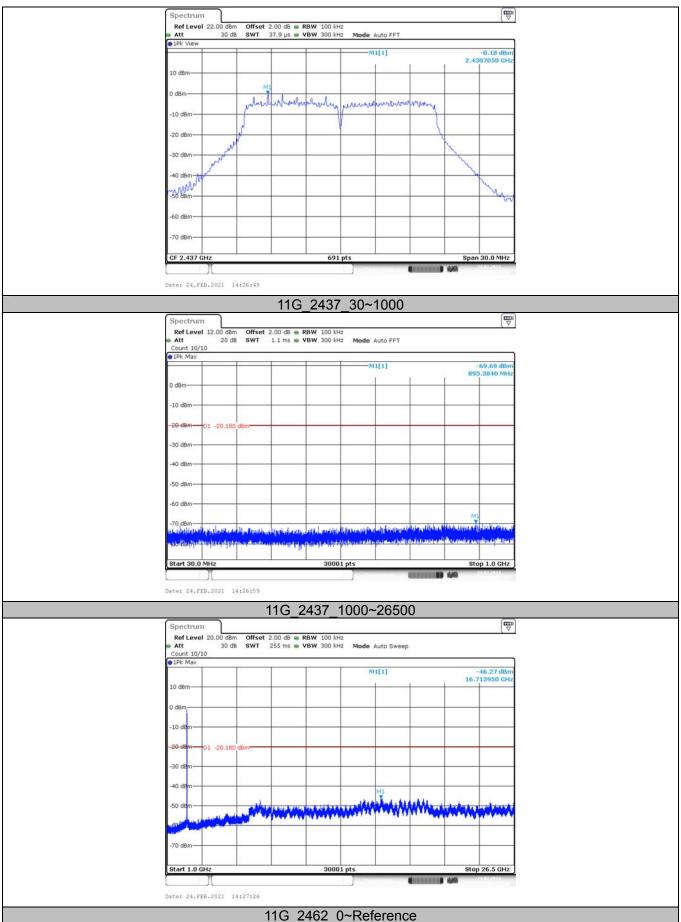
11G 2412 0~Reference





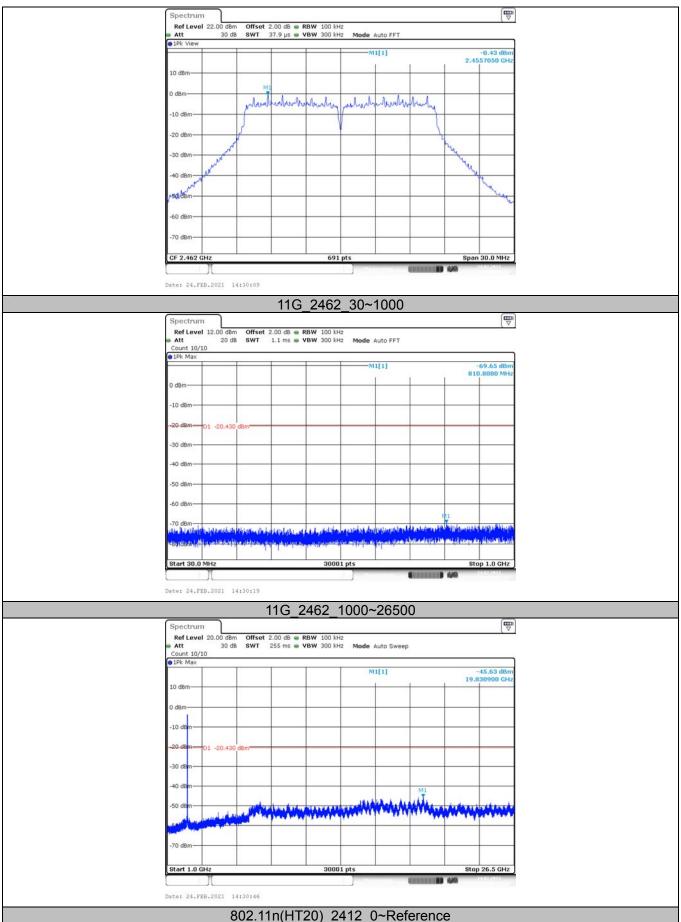
11G 2437 0~Reference



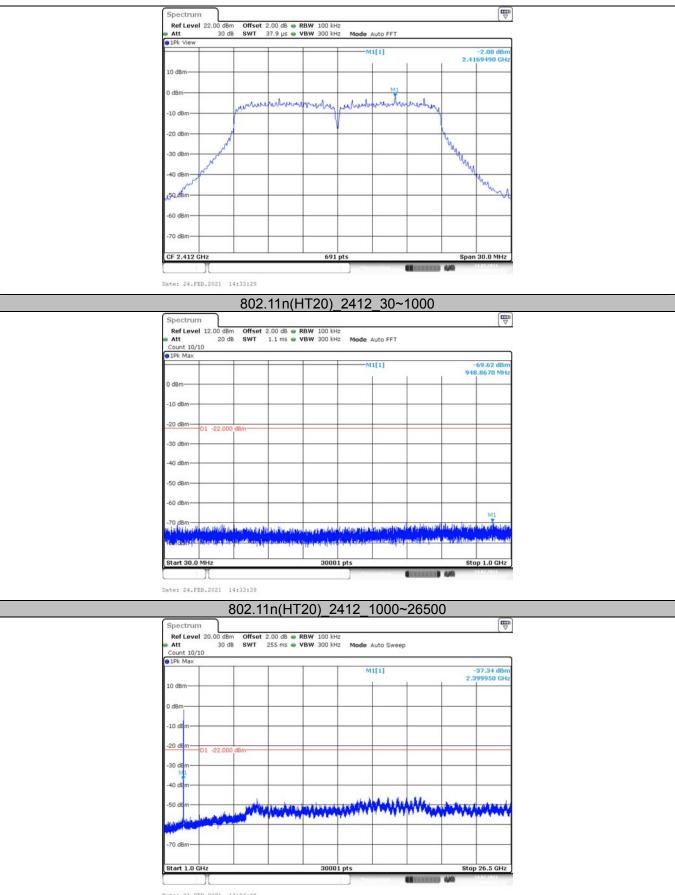


EN 中国国家认证认可监督管理委员会



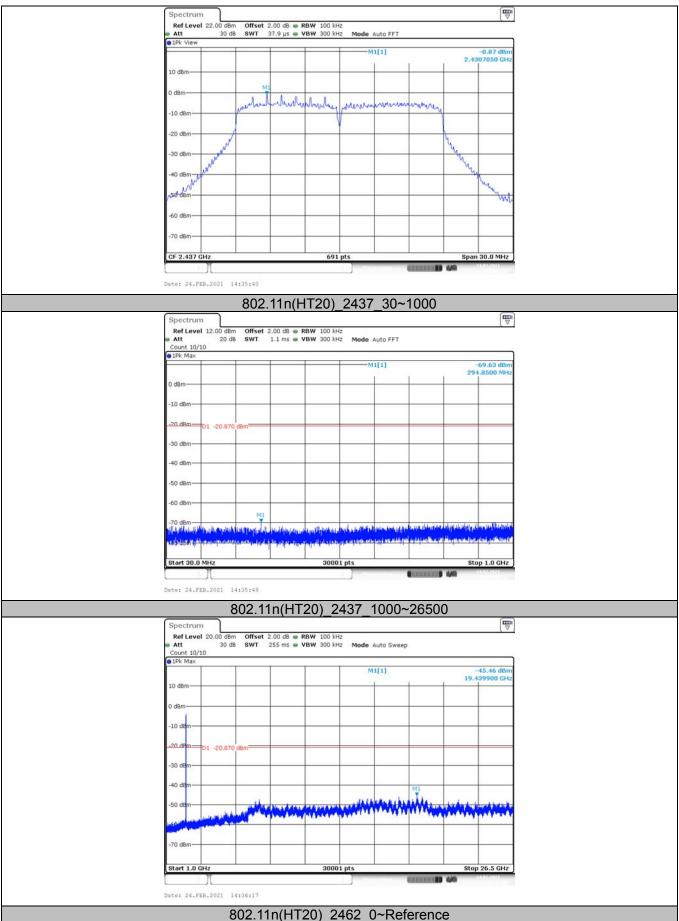






802.11n(HT20) 2437 0~Reference

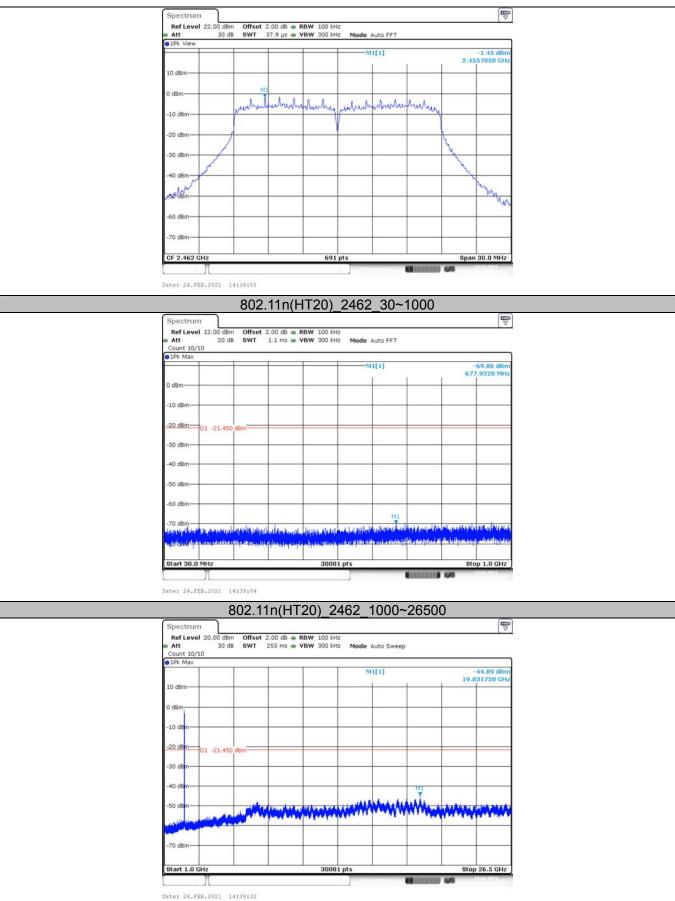




Accreditation Administration of the People's Republic of China: yz.cnca.cn

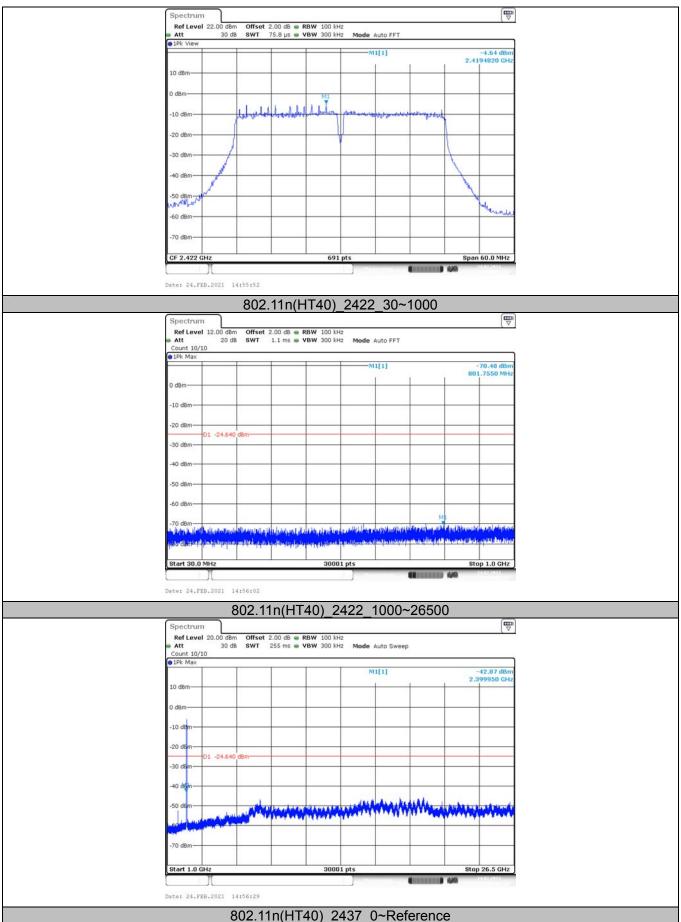




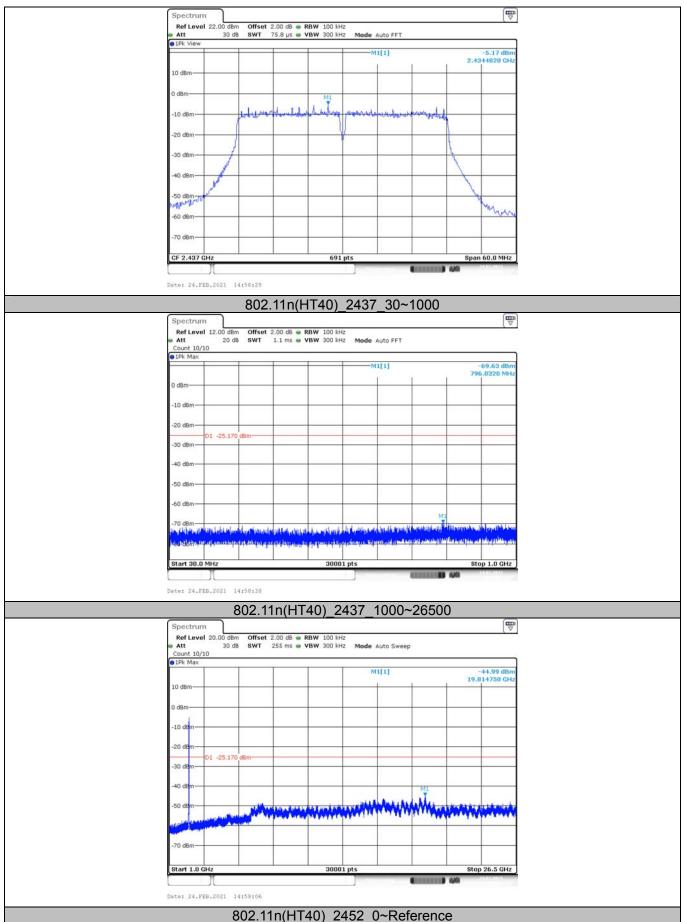


802.11n(HT40) 2422 0~Reference

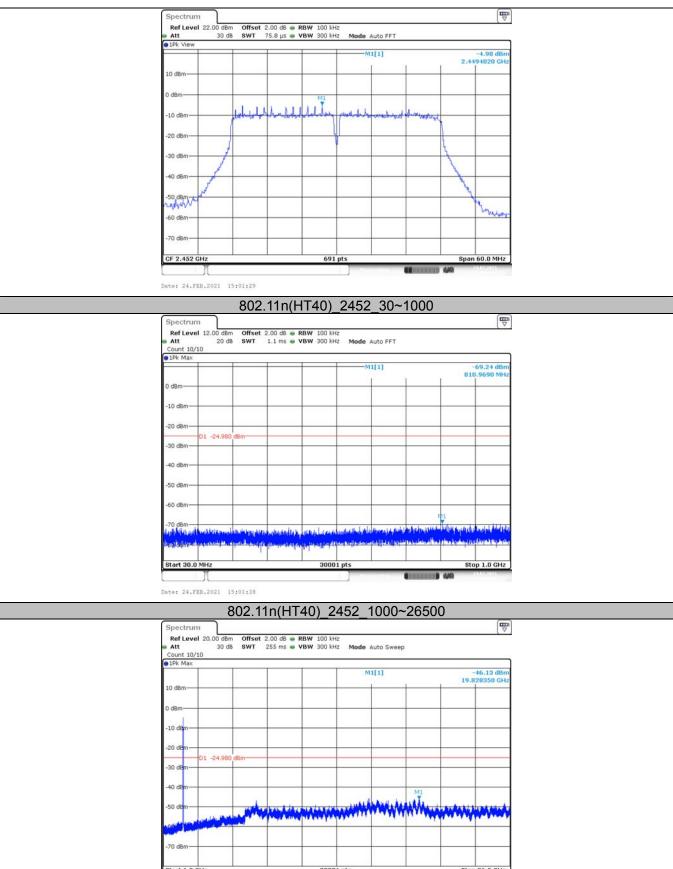














3.5. DTS Bandwidth

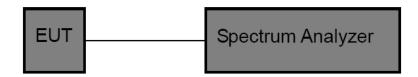
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

Report No.: CTC20210133E17

Test Configuration



Test Procedure

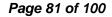
- 5. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 6. DTS Spectrum Setting:
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.
 - OCB Spectrum Setting:
 - (1) Set RBW = $1\% \sim 5\%$ occupied bandwidth.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

Please refer to the clause 2.4.



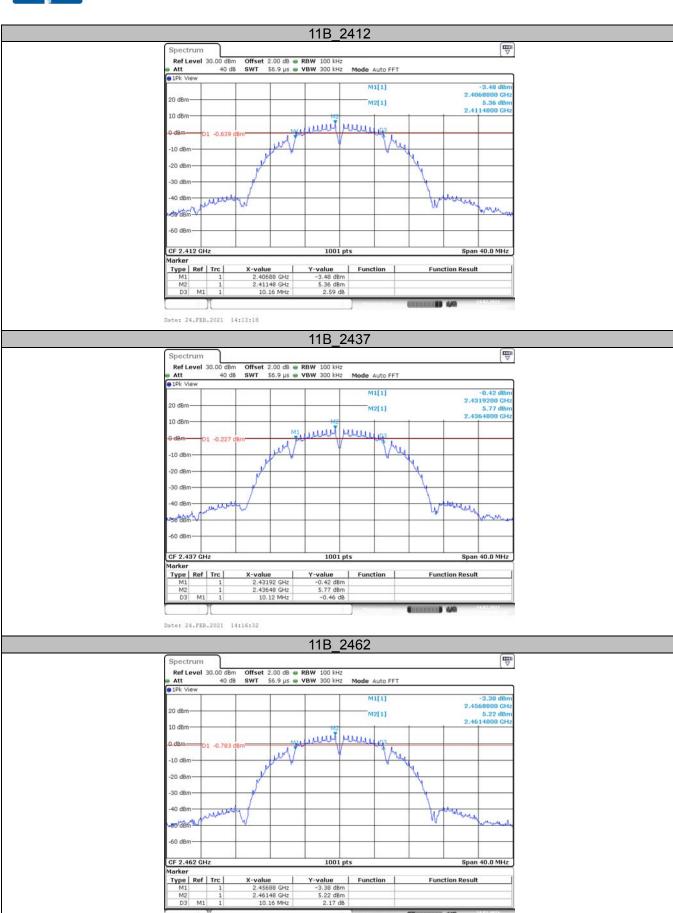




Test Results

Test Mode	Frequency[MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
802.11b	2412	10.160	>=0.5	PASS
	2437	10.120	>=0.5	PASS
	2462	10.160	>=0.5	PASS
	2412	16.400	>=0.5	PASS
802.11g	2437	16.440	>=0.5	PASS
	2462	16.440	>=0.5	PASS
802.11n(HT20)	2412	17.040	>=0.5	PASS
	2437	16.960	>=0.5	PASS
	2462	17.400	>=0.5	PASS
802.11n(HT40)	2422	35.520	>=0.5	PASS
	2437	35.280	>=0.5	PASS
	2452	35.360	>=0.5	PASS

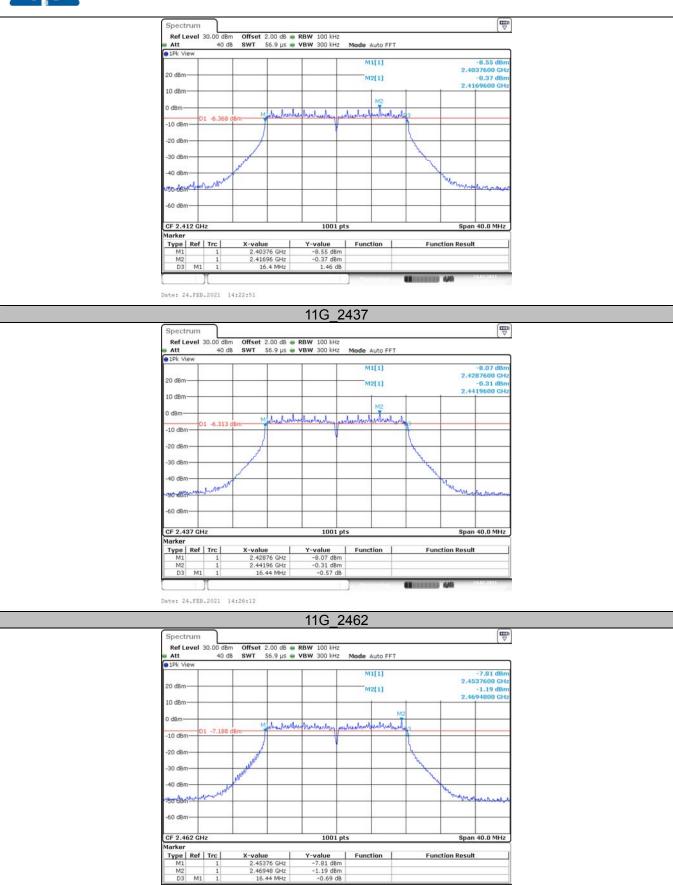




11G_2412

Date: 24.FEB.2021 14:19:30

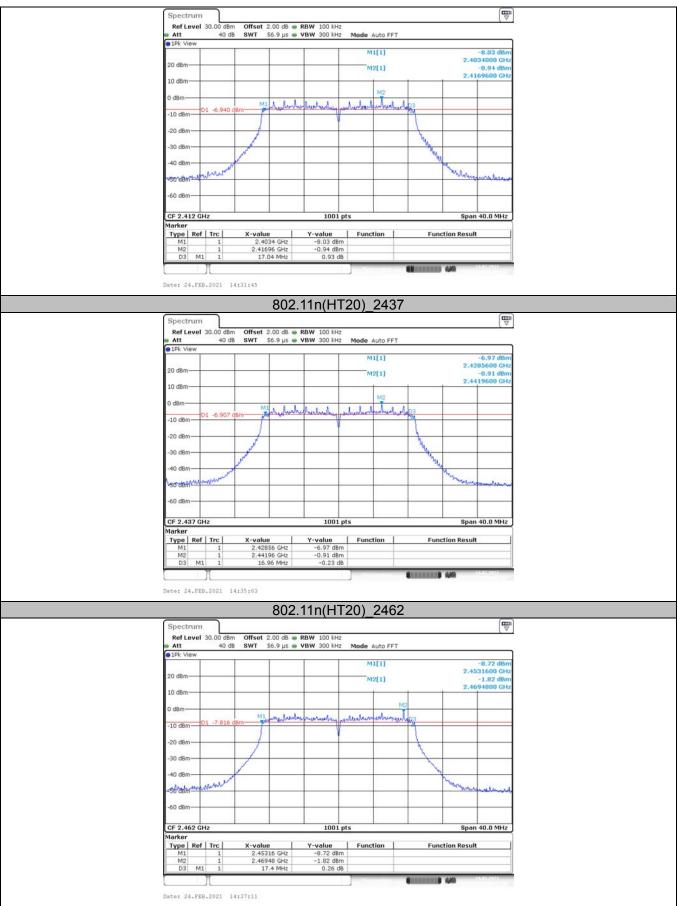




CTC Laboratories, Inc.

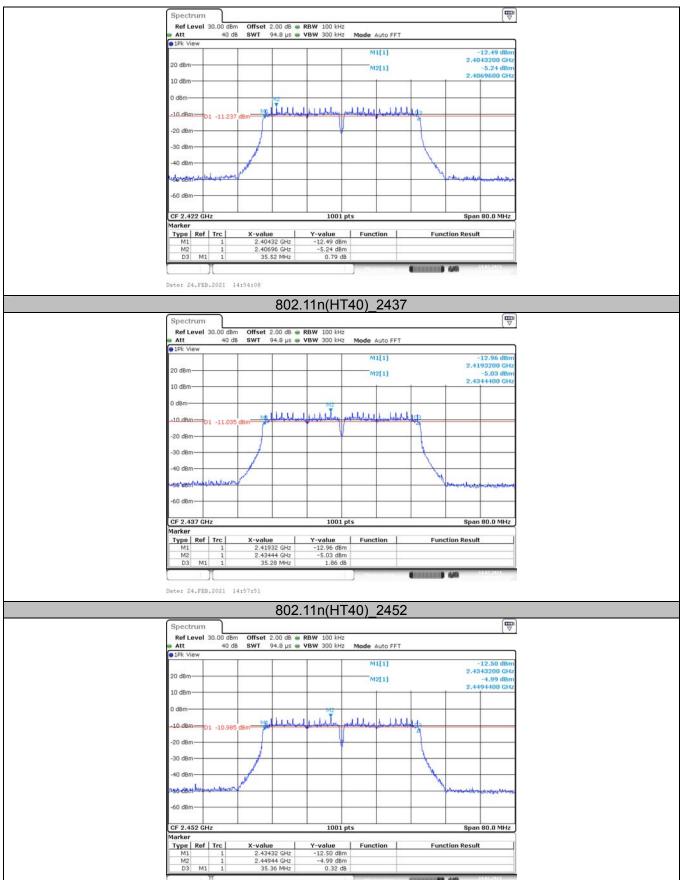
802.11n(HT20)_2412

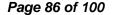




802.11n(HT40) 2422









3.6. Peak Output Power

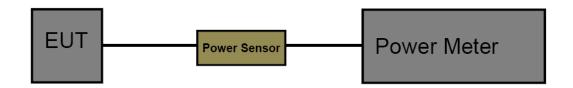
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4:

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

Report No.: CTC20210133E17

Test Configuration



Test Procedure

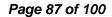
- 1. The maximum conducted output power may be measured using a broadband Peak RF power meter.
- 2. Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
- 3. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
- 4. Record the measurement data.

Test Mode

Please refer to the clause 2.4.

Test Result

Accreditation Administration of the People's Republic of China: yz.cnca.cn



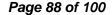


Test Mode Frequency[MHz] Result[dBm] Limit[dBm] Verdict 17.37 **PASS** 2412 <=30 2437 17.48 <=30 **PASS** 802.11b 2462 17.38 **PASS** <=30 2412 17.81 <=30 **PASS** 17.90 **PASS** 802.11g 2437 <=30 **PASS** 2462 17.80 <=30 2412 17.08 <=30 **PASS** 2437 17.06 **PASS** 802.11n(HT20) <=30 **PASS** 2462 17.00 <=30 **PASS** 2422 16.23 <=30 **PASS** 2437 16.28 <=30 802.11n(HT40) 2452 **PASS** 16.20 <=30

Note: Test results increased RF cable loss by 2dB.

CTC Laboratories, Inc.

For anti-take verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China: yz.cnca.cn





3.7. Power Spectral Density

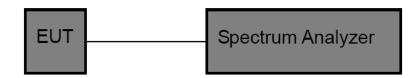
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

Test Item	Limit	Frequency Range(MHz)	
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5	

Report No.: CTC20210133E17

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
- Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

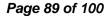
Set the RBW to: 3 kHz Set the VBW to: 10 kHz

Detector: PK Sweep time: Auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

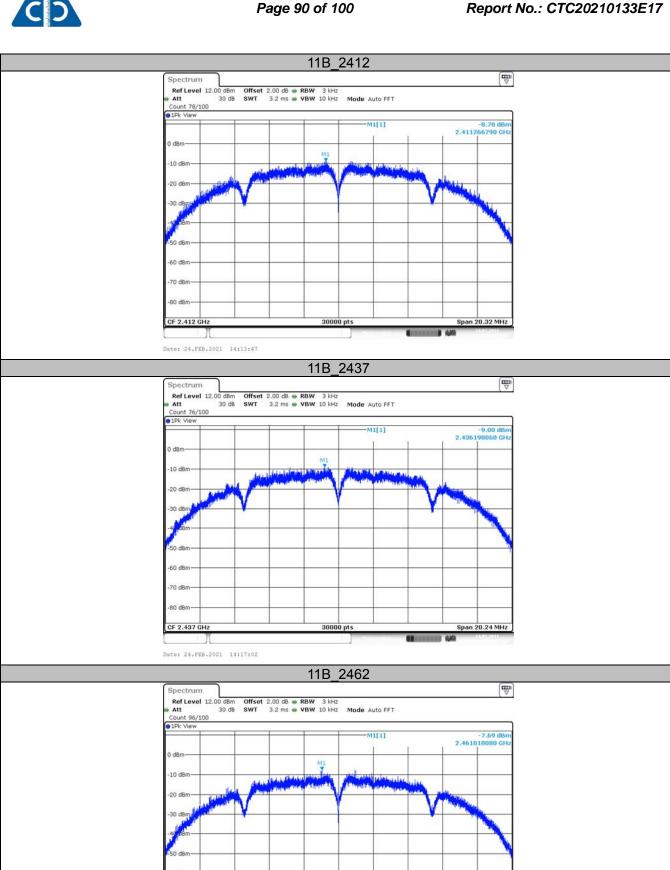
Please refer to the clause 2.4.





Test Result

Test Mode	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
802.11b	2412	-8.70	<=8	PASS
	2437	-9.00	<=8	PASS
	2462	-7.69	<=8	PASS
802.11g	2412	-14.57	<=8	PASS
	2437	-14.32	<=8	PASS
	2462	-14.5	<=8	PASS
802.11n(HT20)	2412	-15.82	<=8	PASS
	2437	-15.56	<=8	PASS
	2462	-15.07	<=8	PASS
802.11n(HT40)	2422	-19.46	<=8	PASS
	2437	-18.77	<=8	PASS
	2452	-19.33	<=8	PASS



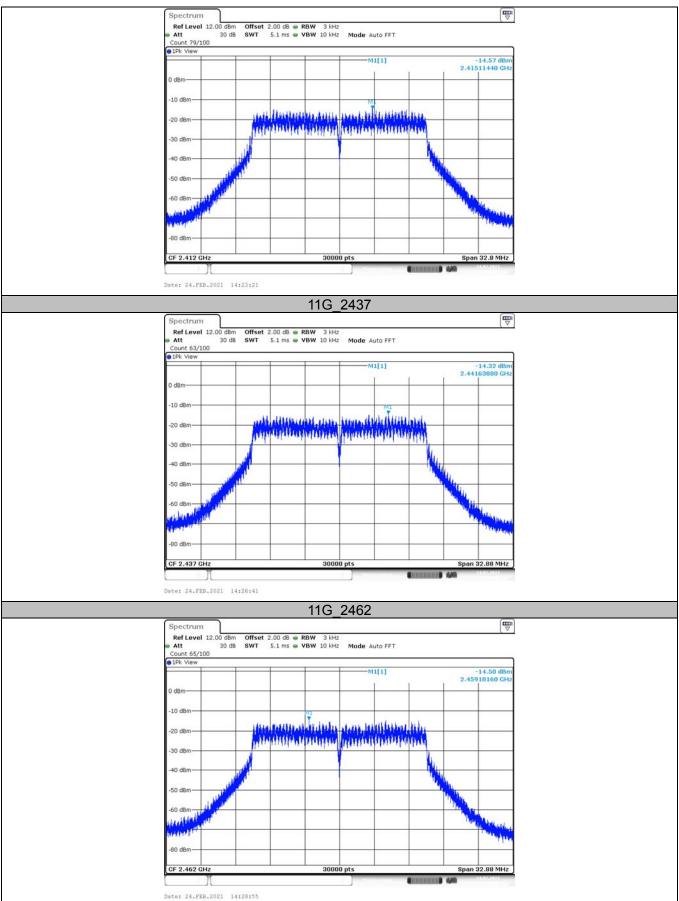
CTC Laboratories, Inc.

Accreditation Administration of the People's Republic of China: yz.cnca.cn

11G_2412

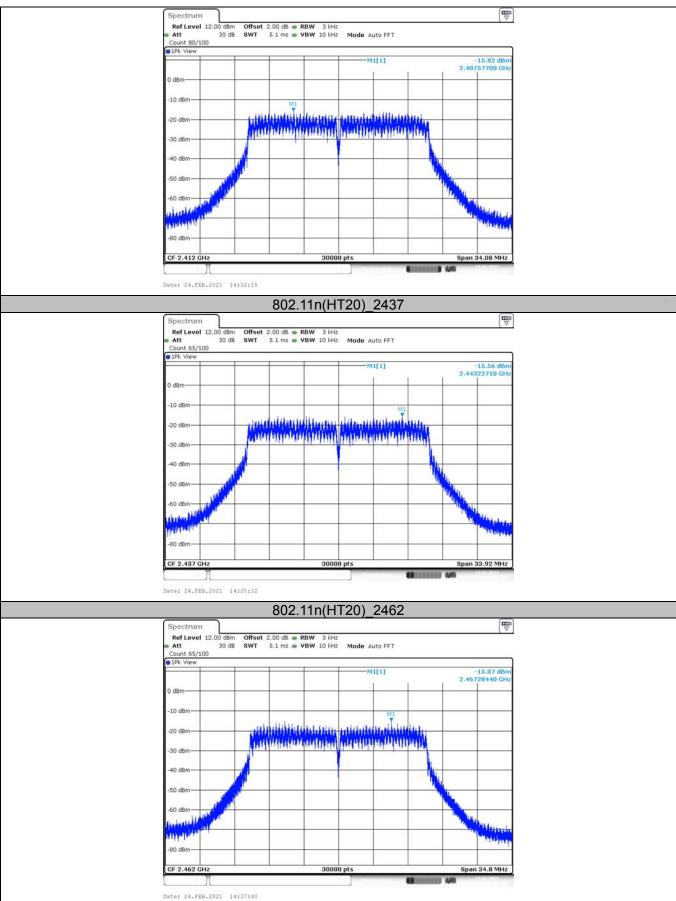
Date: 24.FEB.2021 14:19:59





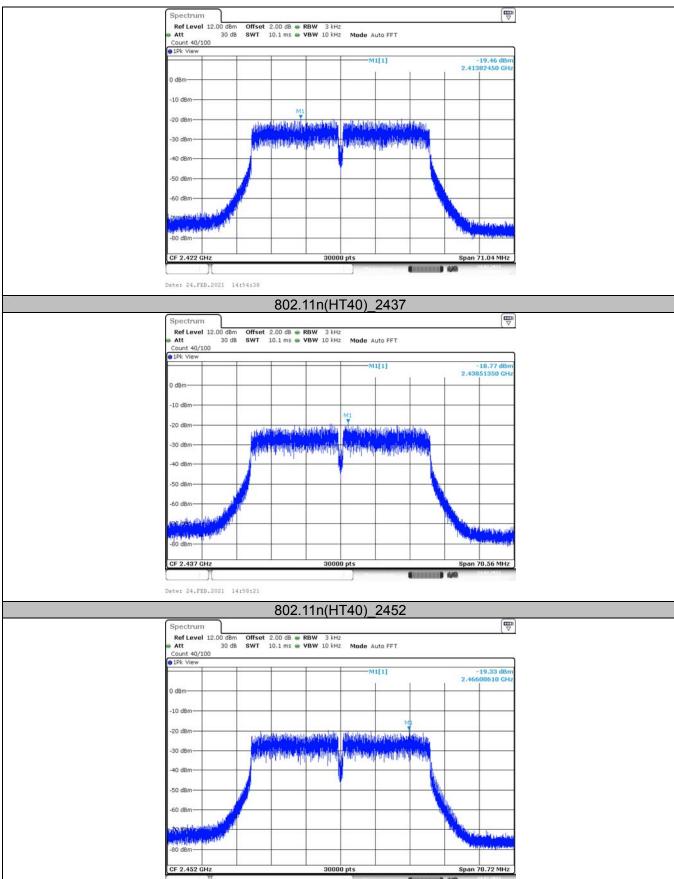
802.11n(HT20) 2412

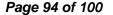




802.11n(HT40) 2422







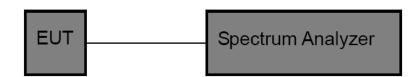


3.8. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
- Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency.

Set the span to 0Hz Set the RBW to 10MHz Set the VBW to 10MHz

Detector: peak Sweep time: auto

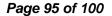
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.4.

Test Result

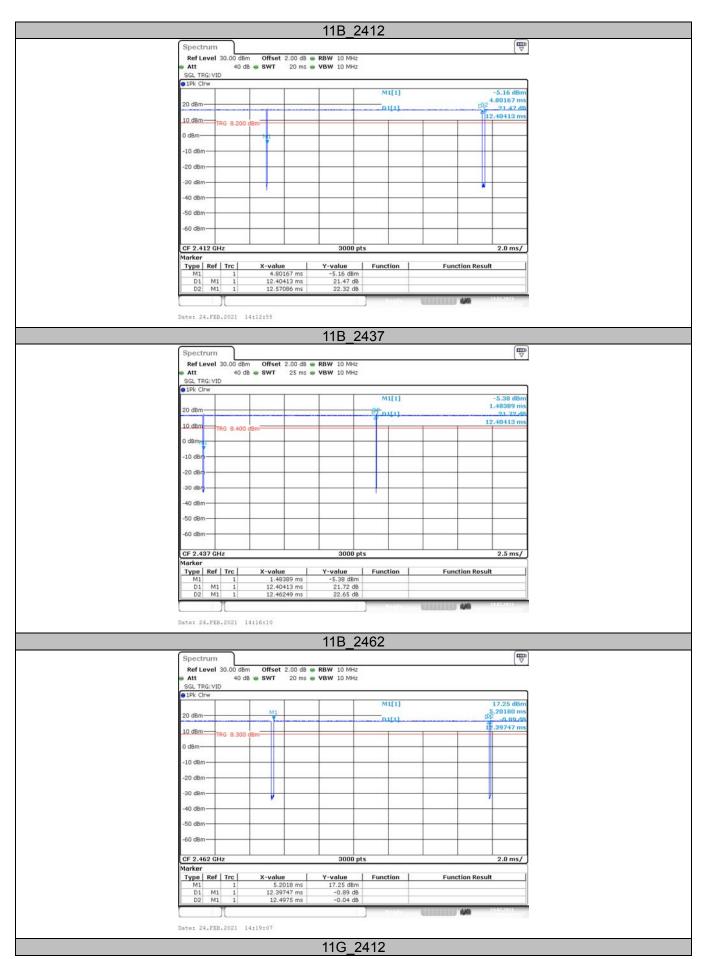
For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China: yz.cnca.cn



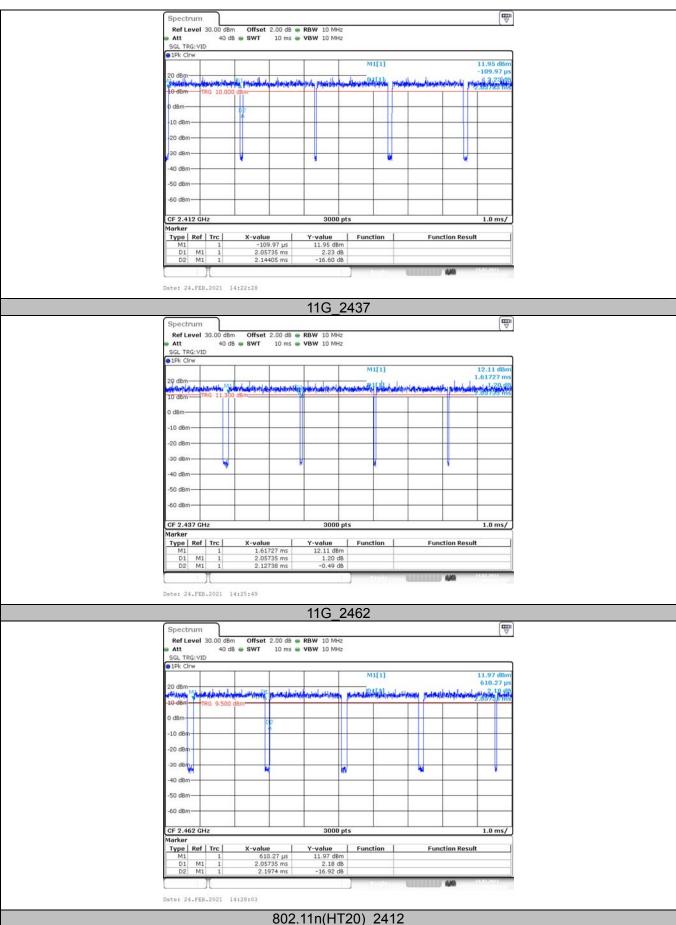


Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
802.11b	2412	12.40	12.57	98.67	0.08	1
	2437	12.40	12.46	99.53	0.08	1
	2462	12.40	12.50	99.20	0.08	1
802.11g	2412	2.06	2.14	95.96	0.49	1
	2437	2.06	2.13	96.71	0.49	1
	2462	2.06	2.20	93.63	0.49	1
802.11n(HT20)	2412	1.91	2.01	95.19	0.52	1
	2437	1.91	2.09	91.55	0.52	1
	2462	1.91	2.07	92.28	0.52	1
802.11n(HT40)	2422	0.94	1.07	87.54	1.06	3
	2437	0.94	1.06	88.36	1.06	3
	2452	0.94	1.09	86.24	1.06	3

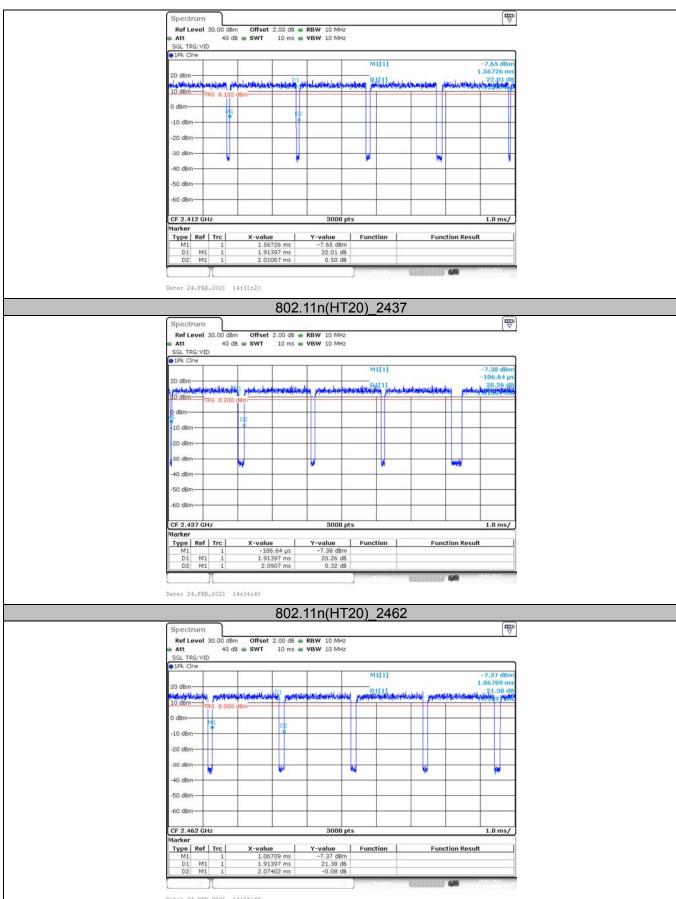






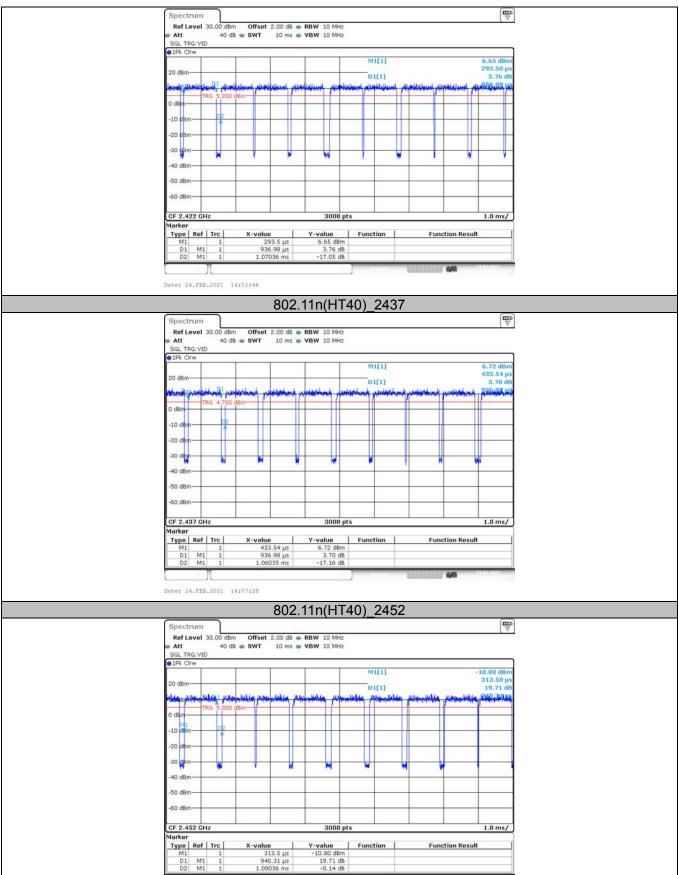




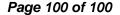


802.11n(HT40) 2422











3.9. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C 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 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.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) 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 6dBi.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.





For anti-fake verification, please visit the official website of Certification and

Accreditation Administration of the People's Republic of China: yz.cnca.cn