

TEST REPORT

Product : LED lamp
Trade mark : iLuv
Model/Type reference : Rainbow8
Serial Number : N/A
Report Number : EED32I00145601
FCC ID : TZI-RAINBOW8
Date of Issue : Jul. 18, 2016
Test Standards : 47 CFR Part 15 Subpart C(2015)
Test result : PASS

Prepared for:

ARTS ELECTRONICS CO., LTD
No.1 ShangXing Road Shangjiao Community, Chang'an Town
Dongguan, China

Prepared by:

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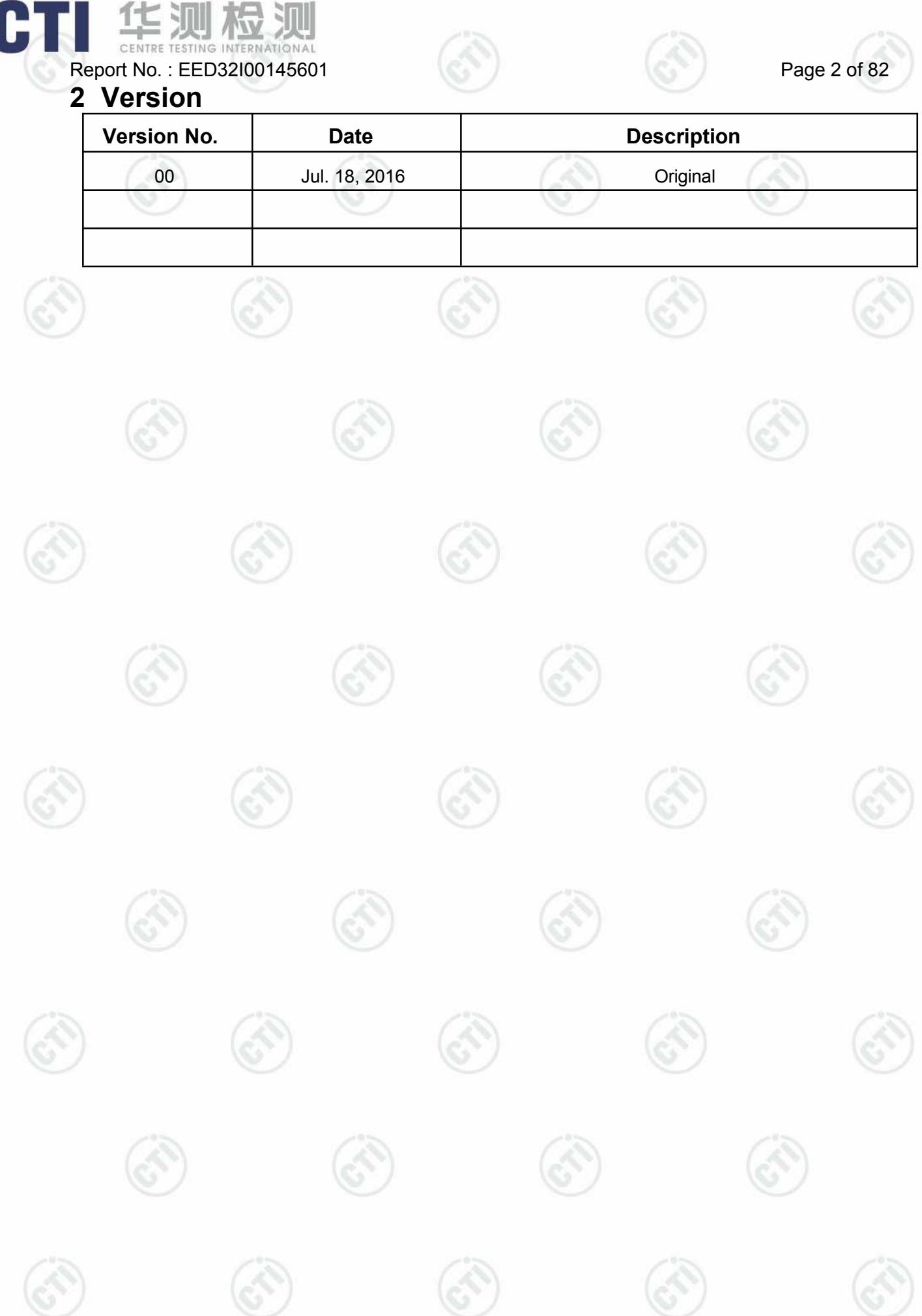
Jul. 18, 2016

Report Seal

Check No.: 1996207665

2 Version

Version No.	Date	Description
00	Jul. 18, 2016	Original



3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15 Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013/ KDB 558074 D01v03r05	PASS
6dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013/ KDB 558074 D01v03r05	PASS
Power Spectral Density	47 CFR Part 15 Subpart C Section 15.247 (e)	ANSI C63.10-2013/ KDB 558074 D01v03r05	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v03r05	PASS
RF Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v03r05	PASS
Radiated Spurious Emissions	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

Test according to ANSI C63.4-2014 & ANSI C63.10-2013.

The tested samples and the sample information are provided by the client.

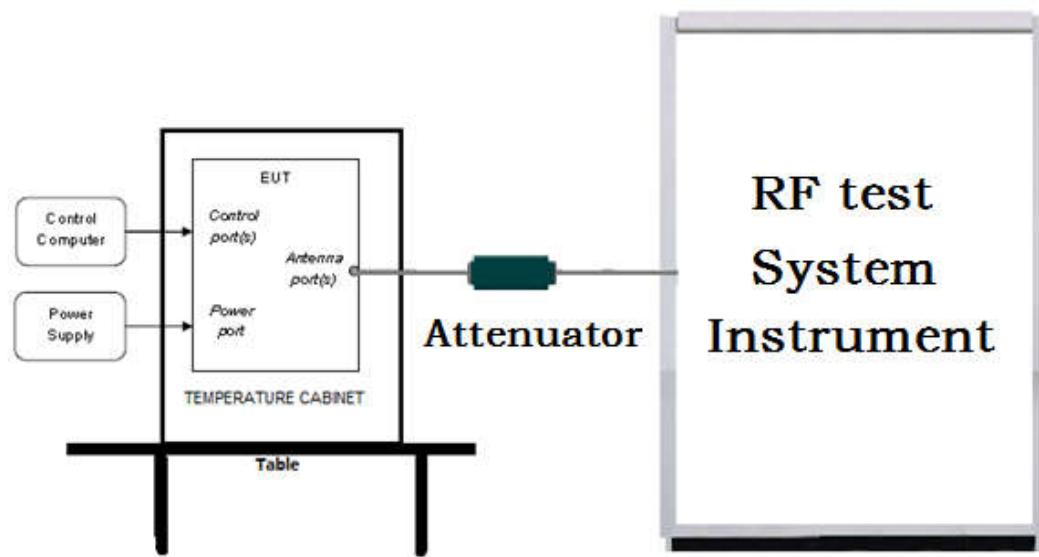
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

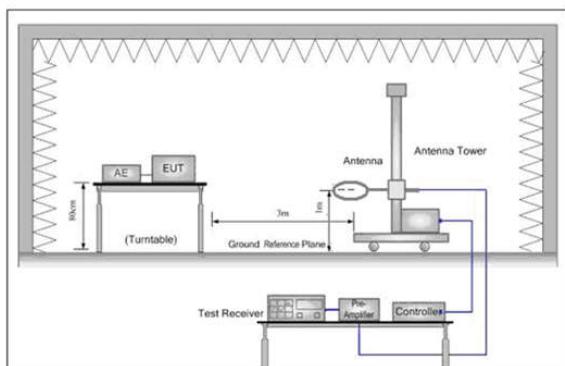


Figure 1. Below 30MHz

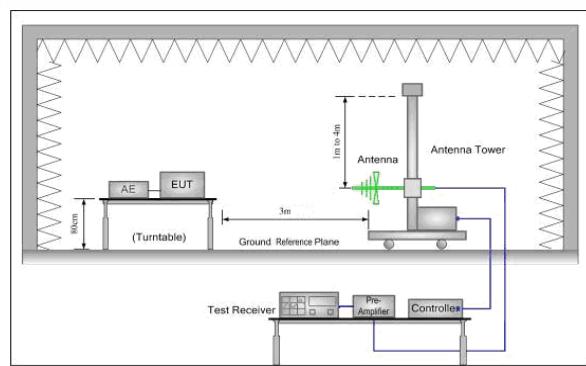


Figure 2. 30MHz to 1GHz

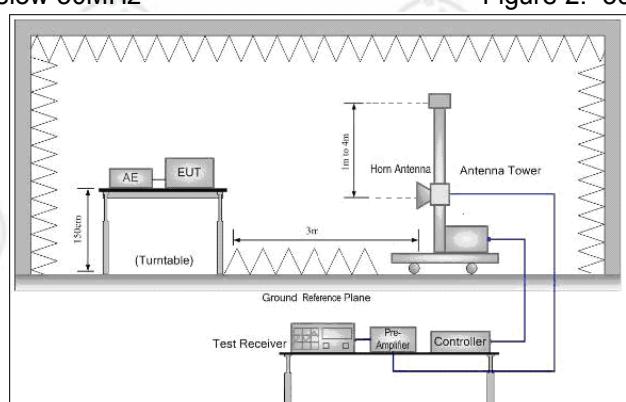
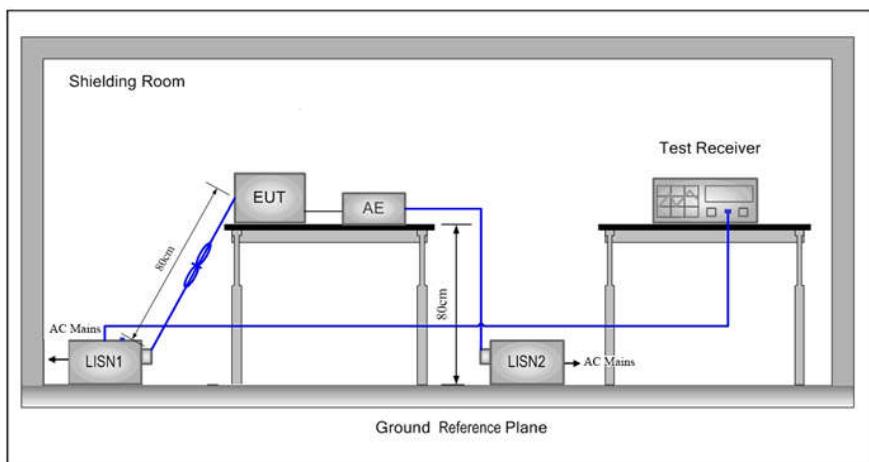


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:

Temperature:	23 °C
Humidity:	54% RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11b/g/n(HT20)	2412MHz ~2462 MHz	Channel 1	Channel 6	Channel11
		2412MHz	2437MHz	2462MHz
802.11n(HT40)	2422MHz ~2452 MHz	Channel 1	Channel 4	Channel7
		2422MHz	2437MHz	2452MHz
Transmitting mode:	Keep the EUT transmitted the continuous modulation test signal at the specific channel(s).			

Test mode:

Pre-scan under all rate at lowest channel 1

Mode		802.11b							
Data Rate		1Mbps	2Mbps	5.5Mbps	11Mbps				
Power(dBm)		14.20	14.29	14.29	14.3				
Mode		802.11g							
Data Rate		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power(dBm)		15.08	15.07	15.05	15.00	15.00	14.99	14.91	14.91
Mode		802.11n (HT20)							
Data Rate		6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power(dBm)		17.29	17.26	17.25	17.22	17.20	17.20	17.19	17.15
Mode		802.11n (HT40)							
Data Rate		13.5Mbps	27Mbps	40.5Mbps	54Mbps	81Mbps	108Mbps	121.5Mbps	135Mbps
Power(dBm)		17.36	17.34	17.33	17.28	17.25	17.25	17.23	17.21

Through Pre-scan, 11Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).

6 General Information

6.1 Client Information

Applicant:	ARTS ELECTRONICS CO., LTD
Address of Applicant:	No.1 ShangXing Road Shangjiao Community, Chang'an Town Dongguan, China
Manufacturer:	ARTS ELECTRONICS CO., LTD
Address of Manufacturer:	No.1 ShangXing Road Shangjiao Community, Chang'an Town Dongguan, China
Factory:	ARTS ELECTRONICS CO., LTD
Address of Factory:	No.1 ShangXing Road Shangjiao Community, Chang'an Town Dongguan, China

6.2 General Description of EUT

Product Name:	LED lamp
Model No.(EUT):	Rainbow8
Trade Mark:	iLuv
EUT Supports Radios application:	Wlan 2.4GHz 802.11b/g/n(HT20&HT40)
Power Supply:	AC 120V, 60Hz
Sample Received Date:	Jun, 24, 2016
Sample tested Date:	Jun, 24, 2016 to Jul. 18, 2016

6.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM, QPSK,BPSK)
Test Power Grade:	802.11b: 27; 802.11g: 30; 802.11n(HT20): 34; 802.11n(HT40): 34. (manufacturer declare)
Test Software of EUT:	UI-mptool.exe (manufacturer declare)
Antenna Type and Gain:	PIFA antenna
Antenna Gain:	2dBi
Test Voltage:	AC 120V, 60Hz

Operation Frequency each of channel(802.11b/g/n HT20)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Operation Frequency each of channel(802.11n HT40)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2422MHz	4	2437MHz	7	2452MHz
2	2427MHz	5	2442MHz		
3	2432MHz	6	2447MHz		

6.4 Description of Support Units

The EUT has been tested with associated equipment below

Description	Manufacturer	Model No.	Supplied by
Lamp holder	NA	NA	CTI

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385

No tests were sub-contracted.

6.6 Test Facility

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

CNAS-Lab Code: L1910

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

A2LA-Lab Cert. No. 3061.01

Centre Testing International Group Co., Ltd. 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: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 886427

Centre Testing International Group Co., Ltd. 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 886427.

IC-Registration No.: 7408A-2

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A-2 .

IC-Registration No.: 7408B-1

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B-1.

NEMKO-Aut. No.: ELA503

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The Radiation 3 & 10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

6.7 Deviation from Standards

None.

6.8 Abnormalities from Standard Conditions

None.

6.9 Other Information Requested by the Customer

None.

6.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

7 Equipment List

RF test system					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Communication test set test set	Agilent	N4010A	MY51400230	04-01-2016	03-31-2017
Spectrum Analyzer	Keysight	N9010A	MY54510339	04-01-2016	03-31-2017
Signal Generator	Keysight	N5182B	MY53051549	04-01-2016	03-31-2017
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2017
High-pass filter(6-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2017
DC Power	Keysight	E3642A	MY54436035	04-01-2016	03-31-2017
PC-1	Lenovo	R4960d	---	04-01-2016	03-31-2017
power meter & power sensor	R&S	OSP120	101374	04-01-2016	03-31-2017
RF control unit	JS Tonscend	JS0806-2	158060006	04-01-2016	03-31-2017
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	04-01-2016	03-31-2017

Conducted disturbance Test					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100009	06-16-2016	06-15-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	04-26-2017
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-31-2017
Communication test set	R&S	CMW500	152394	04-01-2016	03-31-2017
LISN	R&S	ENV216	100098	06-16-2016	06-15-2017
LISN	schwarzbeck	NNLK8121	8121-529	06-16-2016	06-15-2017
Voltage Probe	R&S	ESH2-Z3	--	07-09-2014	07-07-2017
Current Probe	R&S	EZ17	100106	06-16-2016	06-15-2017
ISN	TESEQ GmbH	ISN T800	30297	01-29-2015	01-27-2017

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-484	05-23-2016	05-22-2017
Microwave Preamplifier	Agilent	8449B	3008A02425	02-04-2016	02-03-2017
Horn Antenna	ETS-LINDGREN	3117	00057410	06-30-2015	06-28-2018
Horn Antenna	A.H.SYSTEMS	SAS-574	374	06-30-2015	06-28-2018
Loop Antenna	ETS	6502	00071730	07-30-2015	07-28-2017
Spectrum Analyzer	R&S	FSP40	100416	06-16-2016	06-15-2017
Receiver	R&S	ESCI	100435	06-16-2016	06-15-2017
Multi device Controller	maturo	NCD/070/1071 1112	---	01-12-2016	01-11-2017
LISN	schwarzbeck	NNBM8125	81251547	06-16-2016	06-15-2017
LISN	schwarzbeck	NNBM8125	81251548	06-16-2016	06-15-2017
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-31-2017
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	04-26-2017
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-31-2017
Cable line	Fulai(7M)	SF106	5219/6A	01-12-2016	01-11-2017
Cable line	Fulai(6M)	SF106	5220/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5216/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5217/6A	01-12-2016	01-11-2017
Communication test set	R&S	CMW500	152394	04-01-2016	03-31-2017
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG1 8NM12-0398-002	---	01-12-2016	01-11-2017
High-pass filter(6-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	01-12-2016	01-11-2017

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C (2015)	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicenced Wireless Devices

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (b)(3)	ANSI C63.10/ KDB 558074	Conducted Peak Output Power	PASS	Appendix A)
Part15C Section 15.247 (a)(2)	ANSI C63.10/ KDB 558074	6dB Occupied Bandwidth	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10/ KDB 558074	Band-edge for RF Conducted Emissions	PASS	Appendix C)
Part15C Section 15.247(d)	ANSI C63.10/ KDB 558074	RF Conducted Spurious Emissions	PASS	Appendix D)
Part15C Section 15.247 (e)	ANSI C63.10/ KDB 558074	Power Spectral Density	PASS	Appendix E)
Part15C Section 15.203/15.247 (c)	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15C Section 15.207	ANSI C63.10	AC Power Line Conducted Emission	PASS	Appendix G)
Part15C Section 15.205/15.209	ANSI C63.10	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix H)
Part15C Section 15.205/15.209	ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix I)

Appendix A): Conducted Peak Output Power

Test Procedure

1. The RF output of EUT was connected to the power meter by RF cable and 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. Measure the conducted output power and record the results in the test report.

Result Table

Mode	Channel	Conducted Peak Output Power [dBm]	Verdict
11B	LCH	14.3	PASS
11B	MCH	14.38	PASS
11B	HCH	14.48	PASS
11G	LCH	15.08	PASS
11G	MCH	15.08	PASS
11G	HCH	15	PASS
11N20SISO	LCH	17.29	PASS
11N20SISO	MCH	17.43	PASS
11N20SISO	HCH	17.11	PASS
11N40SISO	LCH	17.36	PASS
11N40SISO	MCH	17.49	PASS
11N40SISO	HCH	17.32	PASS

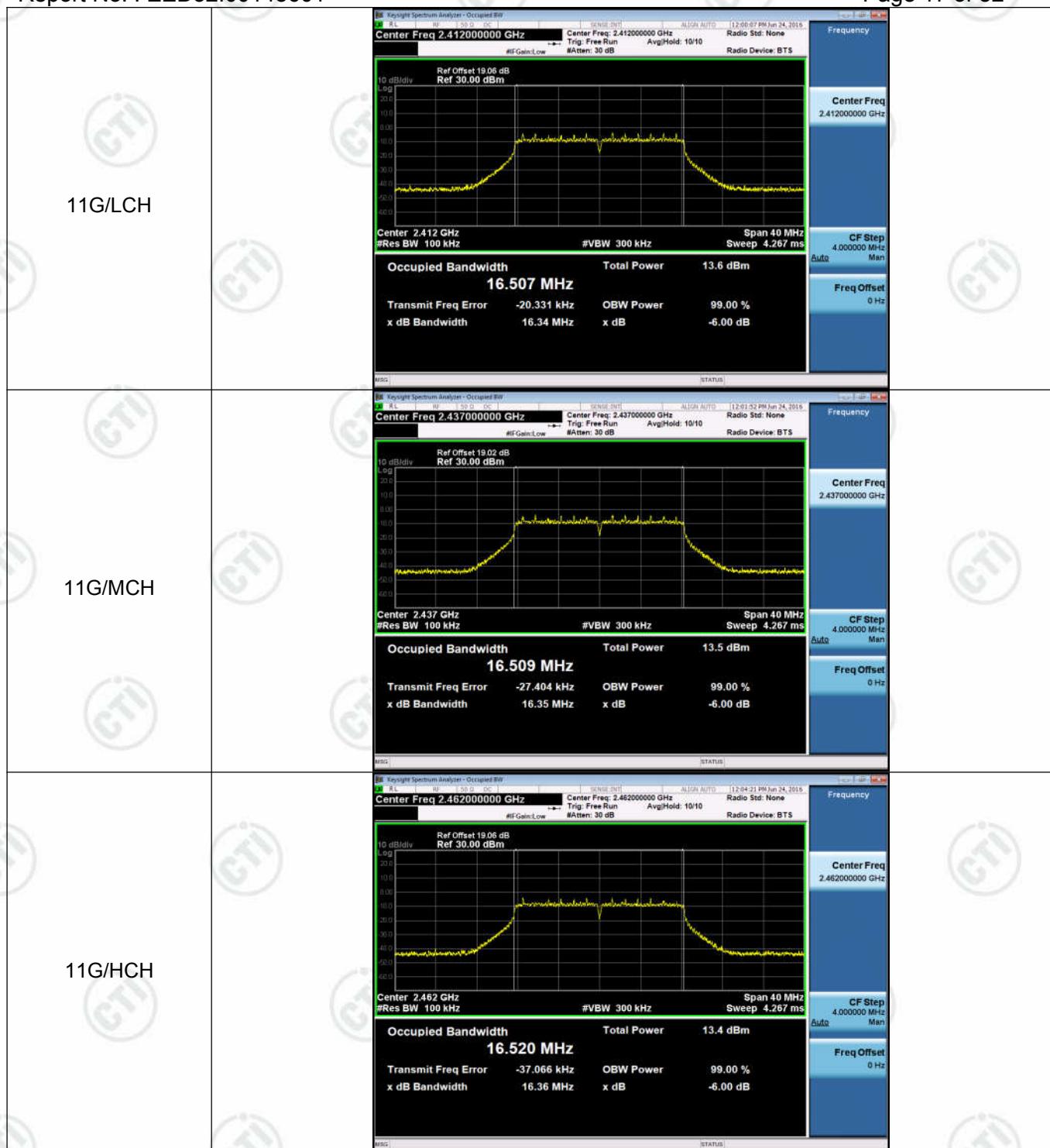
Appendix B): 6dB Occupied Bandwidth

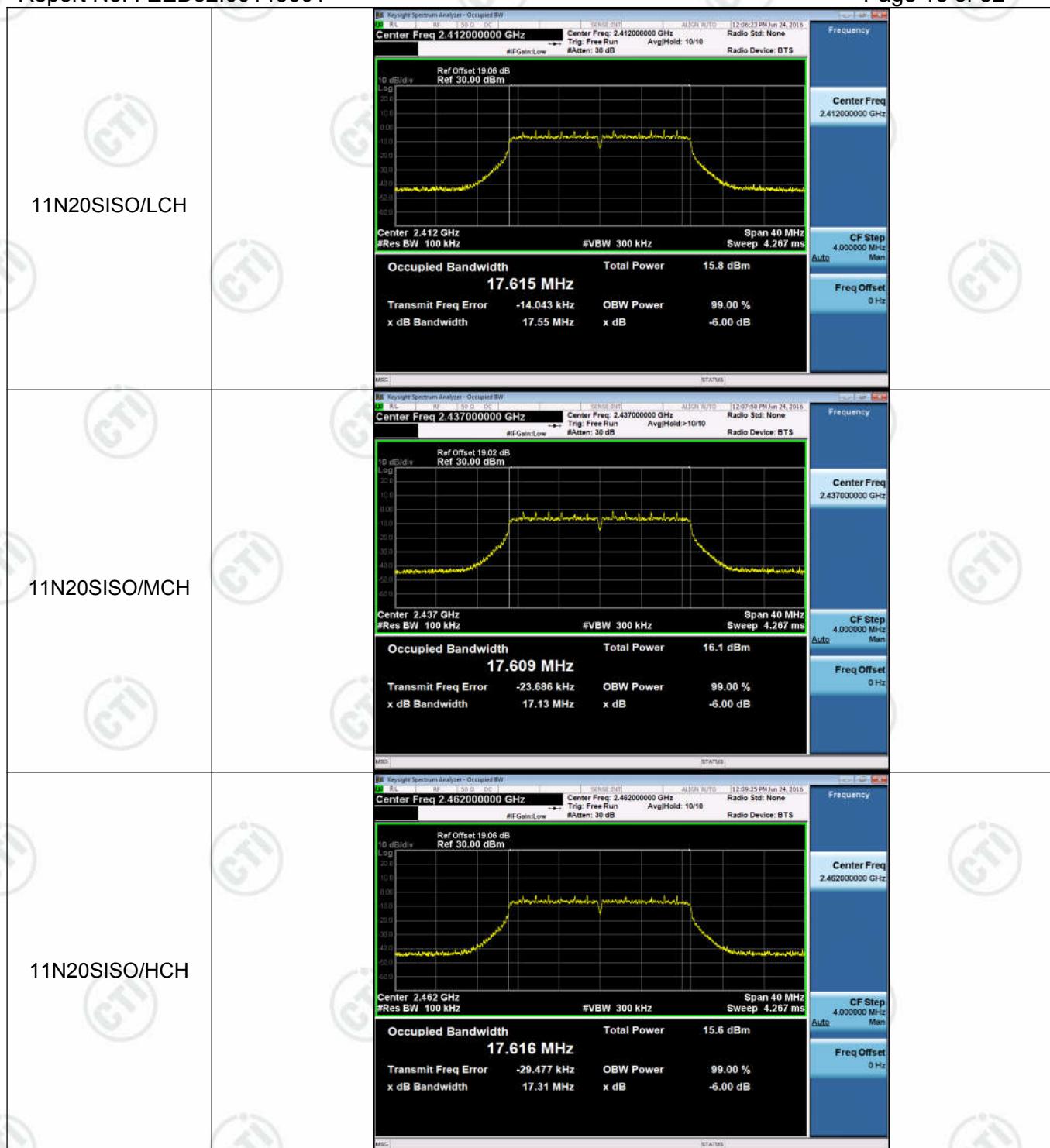
Result Table

Mode	Channel	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict	Remark
11B	LCH	9.075	13.699	PASS	Peak detector
11B	MCH	8.558	13.611	PASS	
11B	HCH	9.062	13.405	PASS	
11G	LCH	16.34	16.507	PASS	
11G	MCH	16.35	16.509	PASS	
11G	HCH	16.36	16.520	PASS	
11N20SISO	LCH	17.55	17.615	PASS	
11N20SISO	MCH	17.13	17.609	PASS	
11N20SISO	HCH	17.31	17.616	PASS	
11N40SISO	LCH	35.83	36.056	PASS	
11N40SISO	MCH	35.86	36.032	PASS	
11N40SISO	HCH	35.55	36.047	PASS	

Test Graph







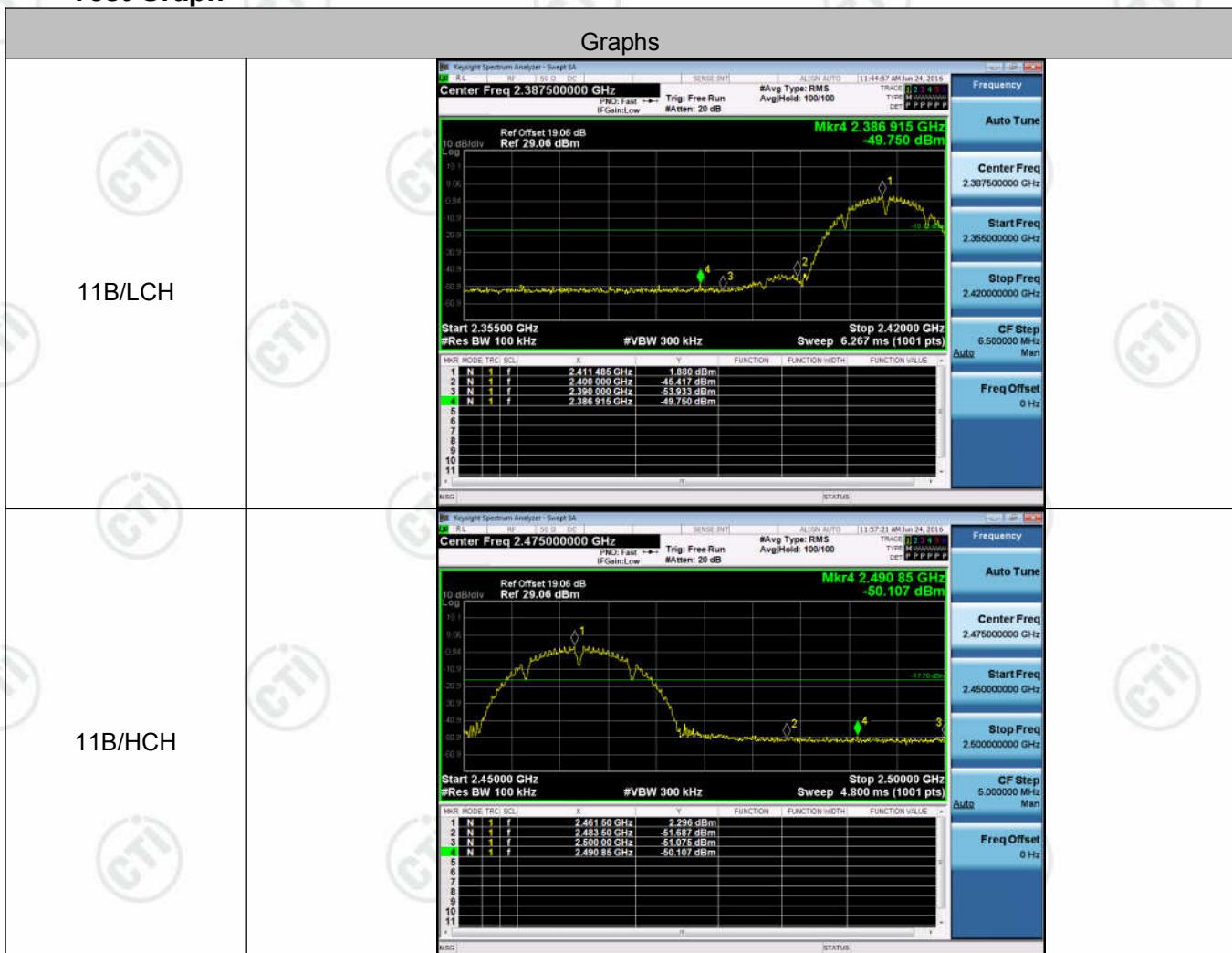
11N40SISO/LCH	<p>Keystream Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.422000000 GHz Center Freq: 2.422000000 GHz ALIGN AUTO Radio Std: None 12:14:58 PM Jun 24, 2019</p> <p>Ref Offset 18.9 dB Ref 30.00 dBm #IFGain:Low #Trig: Free Run #Avg/Hold: >10/10 Radio Device: BTS</p> <p>10 dB/div Log Ref Offset 18.9 dB Ref 30.00 dBm</p> <p>Center: 2.422 GHz #Res BW: 100 kHz #VBW: 300 kHz Span 80 MHz Sweep: 8 ms</p> <p>Occupied Bandwidth 36.056 MHz</p> <p>Transmit Freq Error -224 Hz OBW Power 99.00 %</p> <p>x dB Bandwidth 35.83 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>
11N40SISO/MCH	<p>Keystream Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz ALIGN AUTO Radio Std: None 12:18:00 PM Jun 24, 2019</p> <p>Ref Offset 18.02 dB Ref 30.00 dBm #IFGain:Low #Trig: Free Run #Avg/Hold: 10/10 Radio Device: BTS</p> <p>10 dB/div Log Ref Offset 18.02 dB Ref 30.00 dBm</p> <p>Center: 2.437 GHz #Res BW: 100 kHz #VBW: 300 kHz Span 80 MHz Sweep: 8 ms</p> <p>Occupied Bandwidth 36.032 MHz</p> <p>Transmit Freq Error -6.282 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 35.86 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>
11N40SISO/HCH	<p>Keystream Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.452000000 GHz Center Freq: 2.452000000 GHz ALIGN AUTO Radio Std: None 12:20:01 PM Jun 24, 2019</p> <p>Ref Offset 18.06 dB Ref 30.00 dBm #IFGain:Low #Trig: Free Run #Avg/Hold: 10/10 Radio Device: BTS</p> <p>10 dB/div Log Ref Offset 18.06 dB Ref 30.00 dBm</p> <p>Center: 2.452 GHz #Res BW: 100 kHz #VBW: 300 kHz Span 80 MHz Sweep: 8 ms</p> <p>Occupied Bandwidth 36.047 MHz</p> <p>Transmit Freq Error -39.773 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 35.55 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>

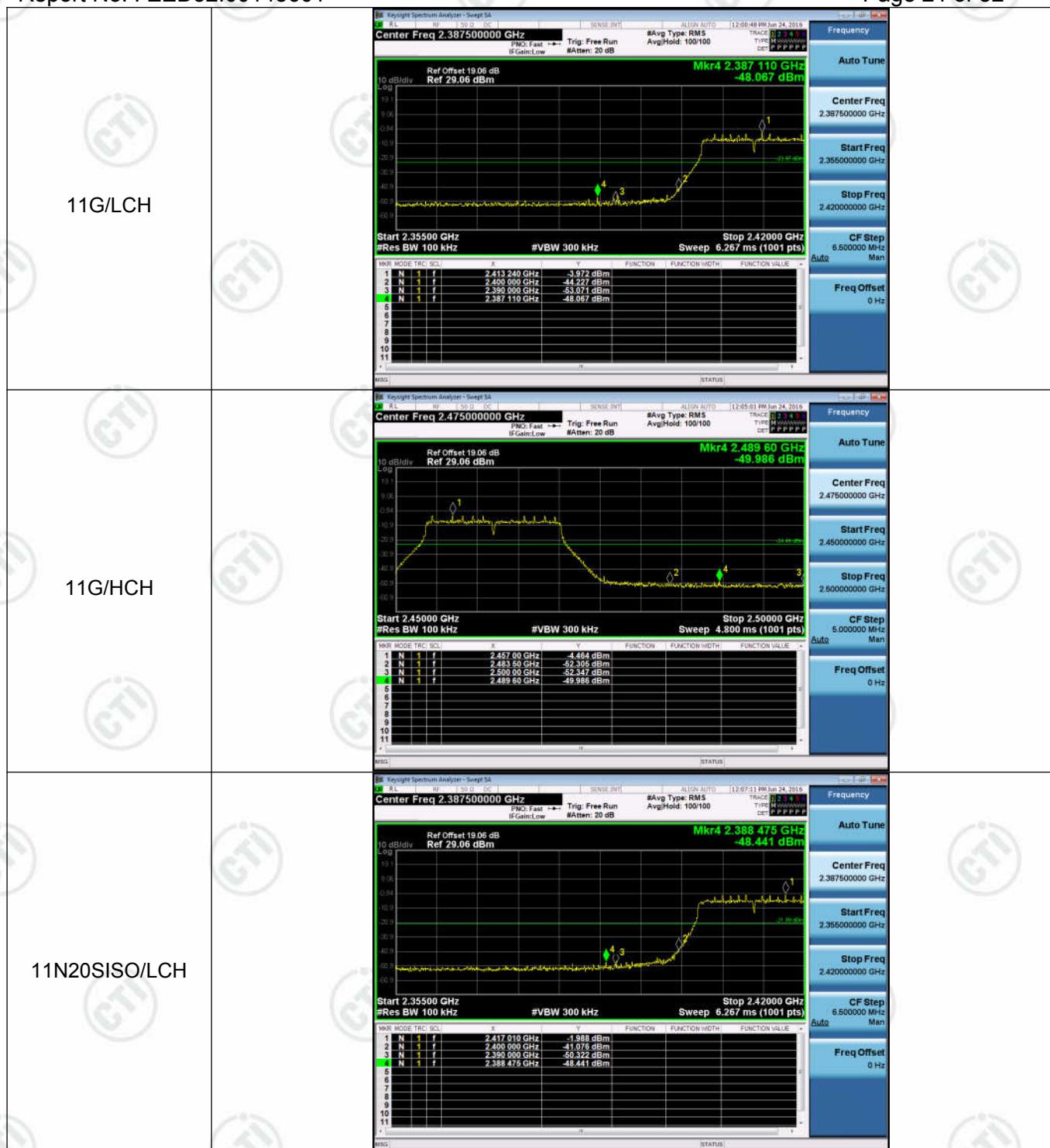
Appendix C): Band-edge for RF Conducted Emissions

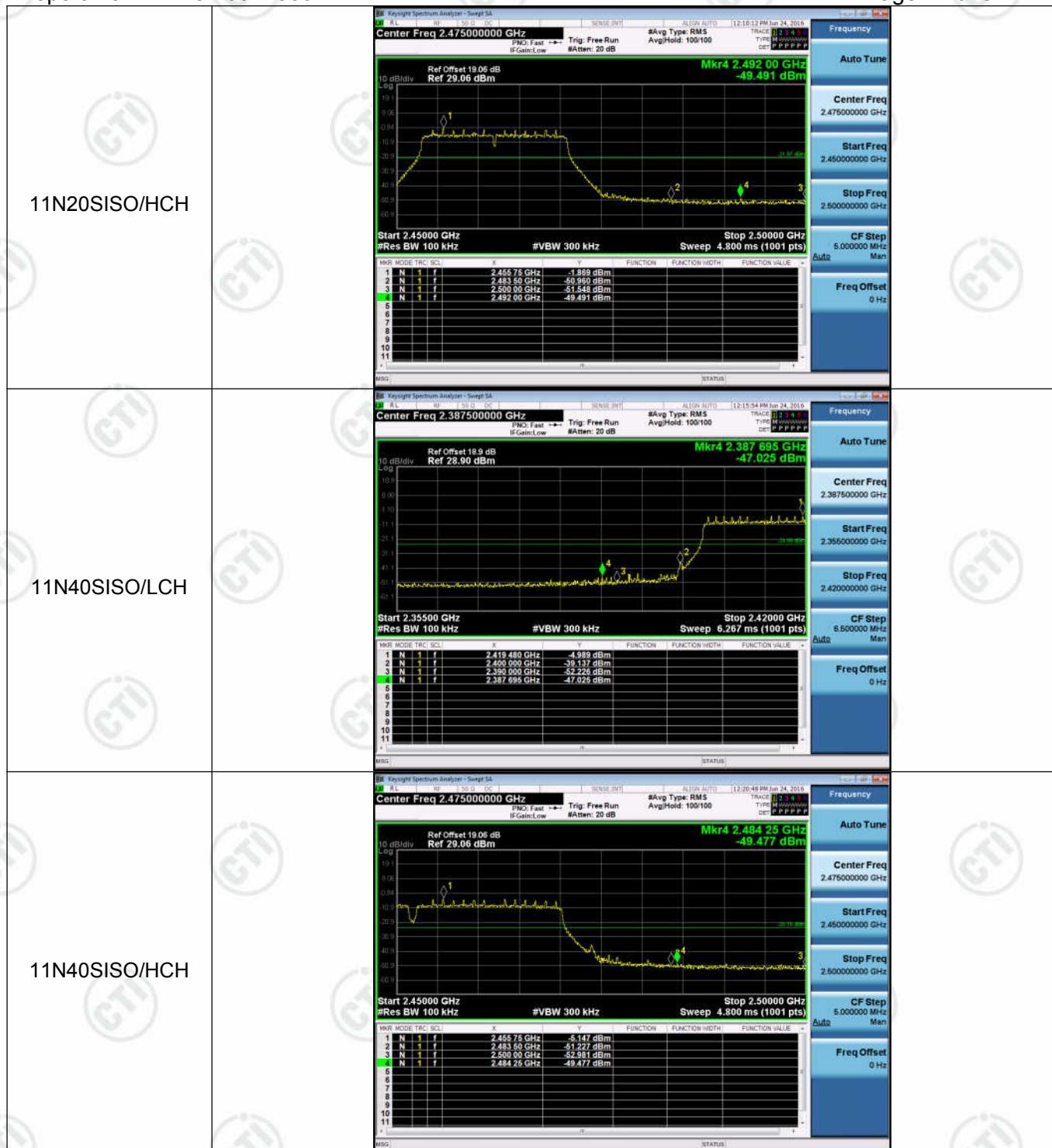
Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.880	-49.750	-18.12	PASS
11B	HCH	2.296	-50.107	-17.7	PASS
11G	LCH	-3.972	-48.067	-23.97	PASS
11G	HCH	-4.464	-49.986	-24.46	PASS
11N20SISO	LCH	-1.988	-48.441	-21.99	PASS
11N20SISO	HCH	-1.869	-49.491	-21.87	PASS
11N40SISO	LCH	-4.989	-47.025	-24.99	PASS
11N40SISO	HCH	-5.147	-49.477	-25.15	PASS

Test Graph





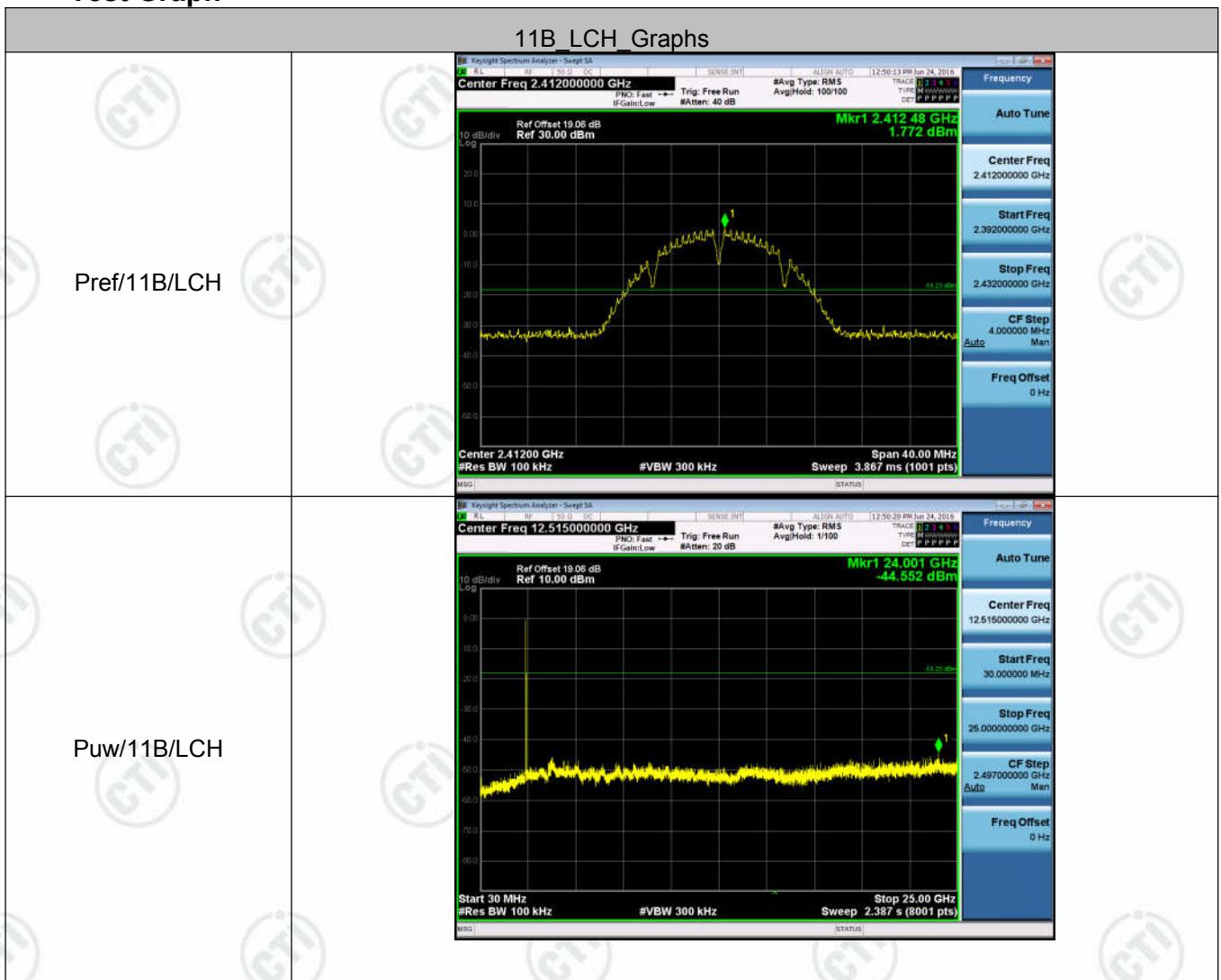


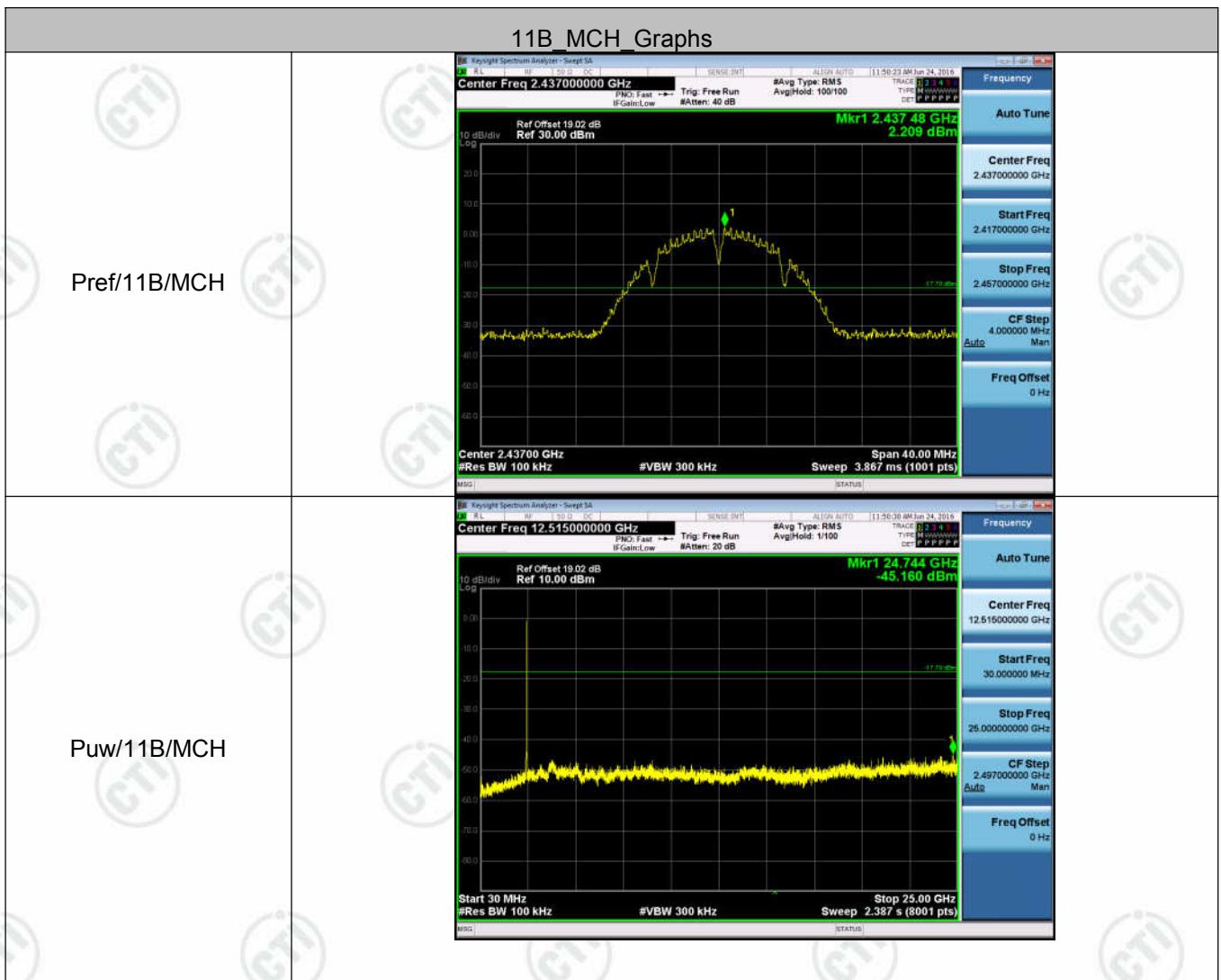
Appendix D): RF Conducted Spurious Emissions

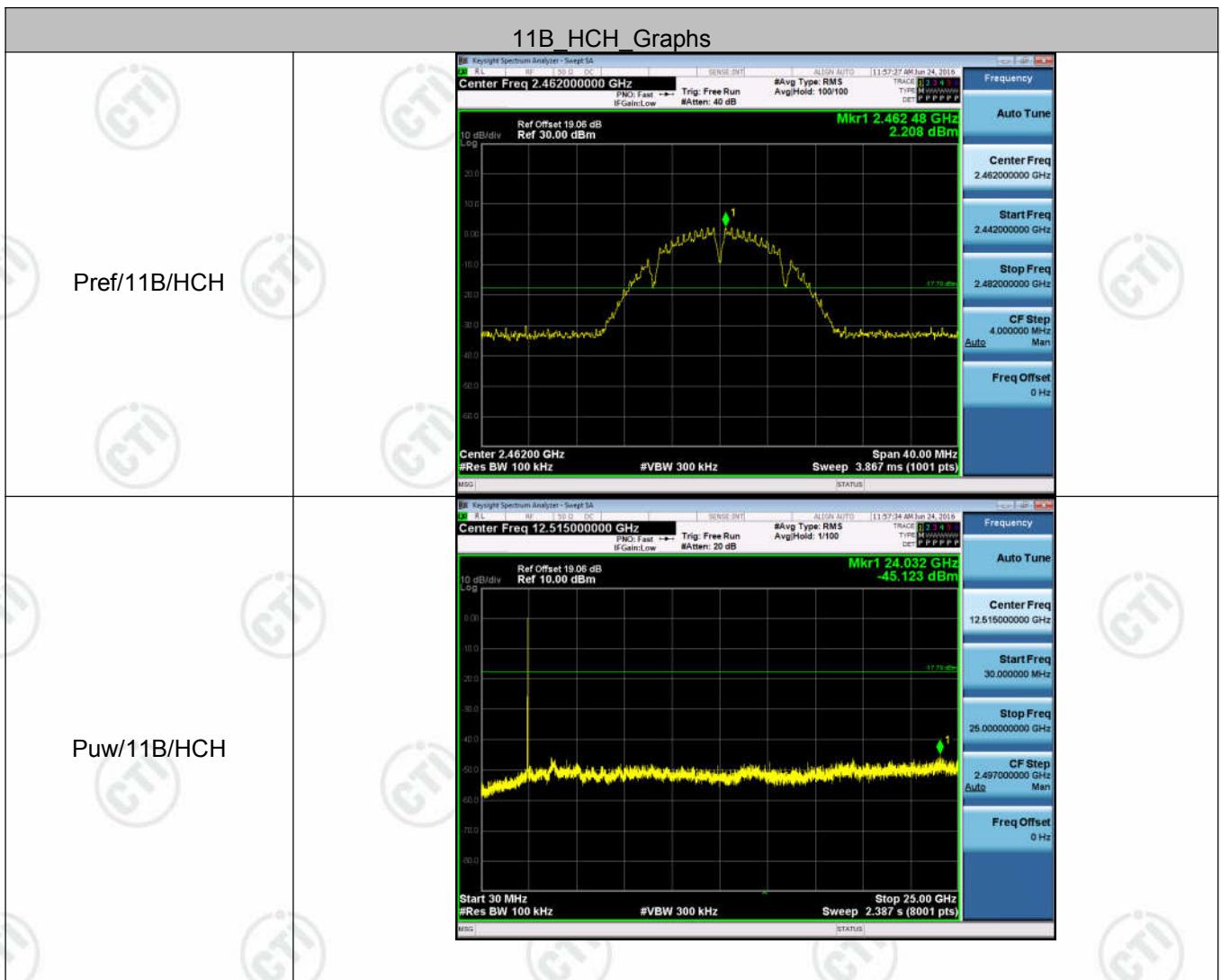
Result Table

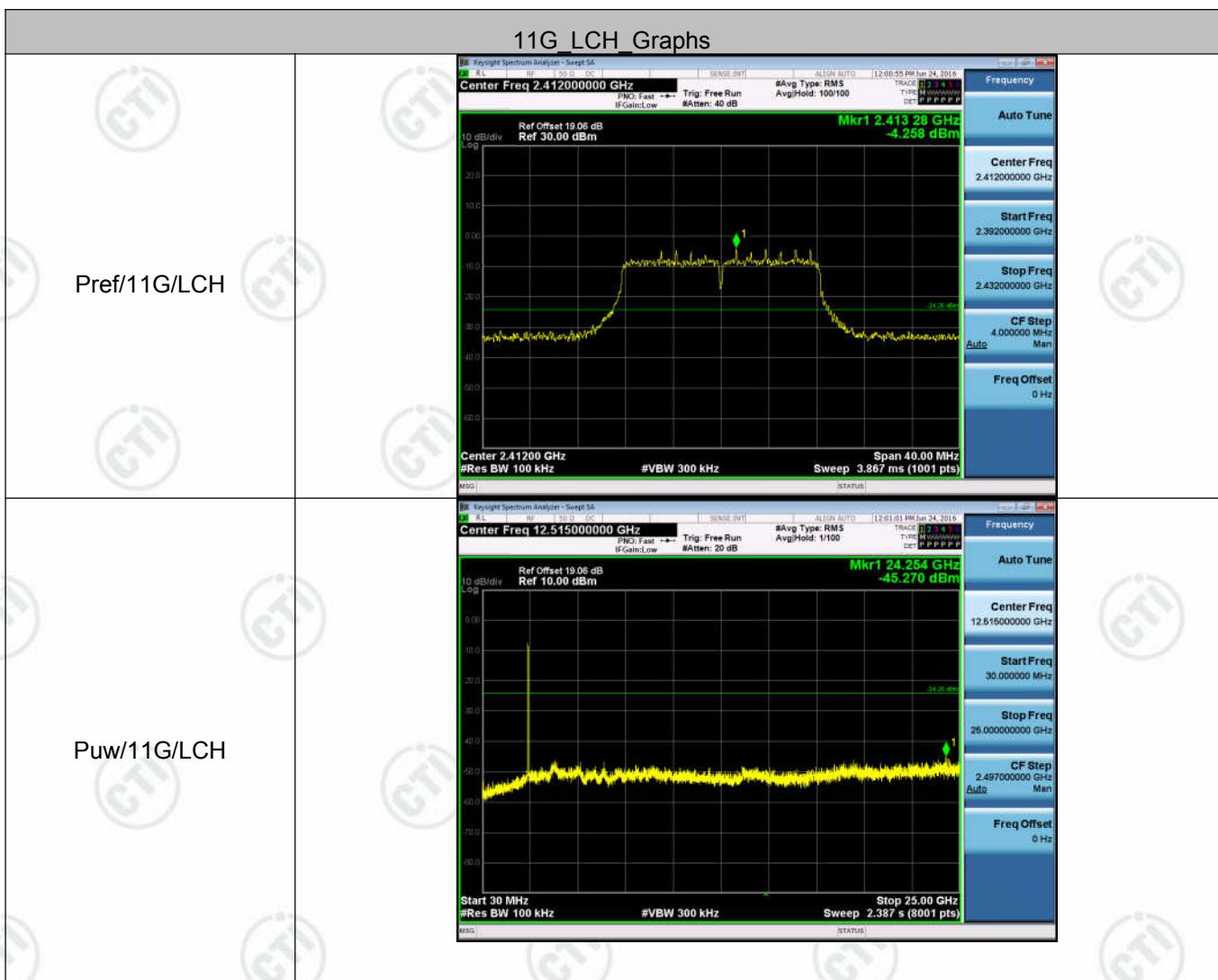
Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
11B	LCH	1.772	<Limit	PASS
11B	MCH	2.209	<Limit	PASS
11B	HCH	2.208	<Limit	PASS
11G	LCH	-4.258	<Limit	PASS
11G	MCH	-4.182	<Limit	PASS
11G	HCH	-3.845	<Limit	PASS
11N20SISO	LCH	-1.923	<Limit	PASS
11N20SISO	MCH	-1.331	<Limit	PASS
11N20SISO	HCH	-2.175	<Limit	PASS
11N40SISO	LCH	-4.844	<Limit	PASS
11N40SISO	MCH	-4.828	<Limit	PASS
11N40SISO	HCH	-4.263	<Limit	PASS

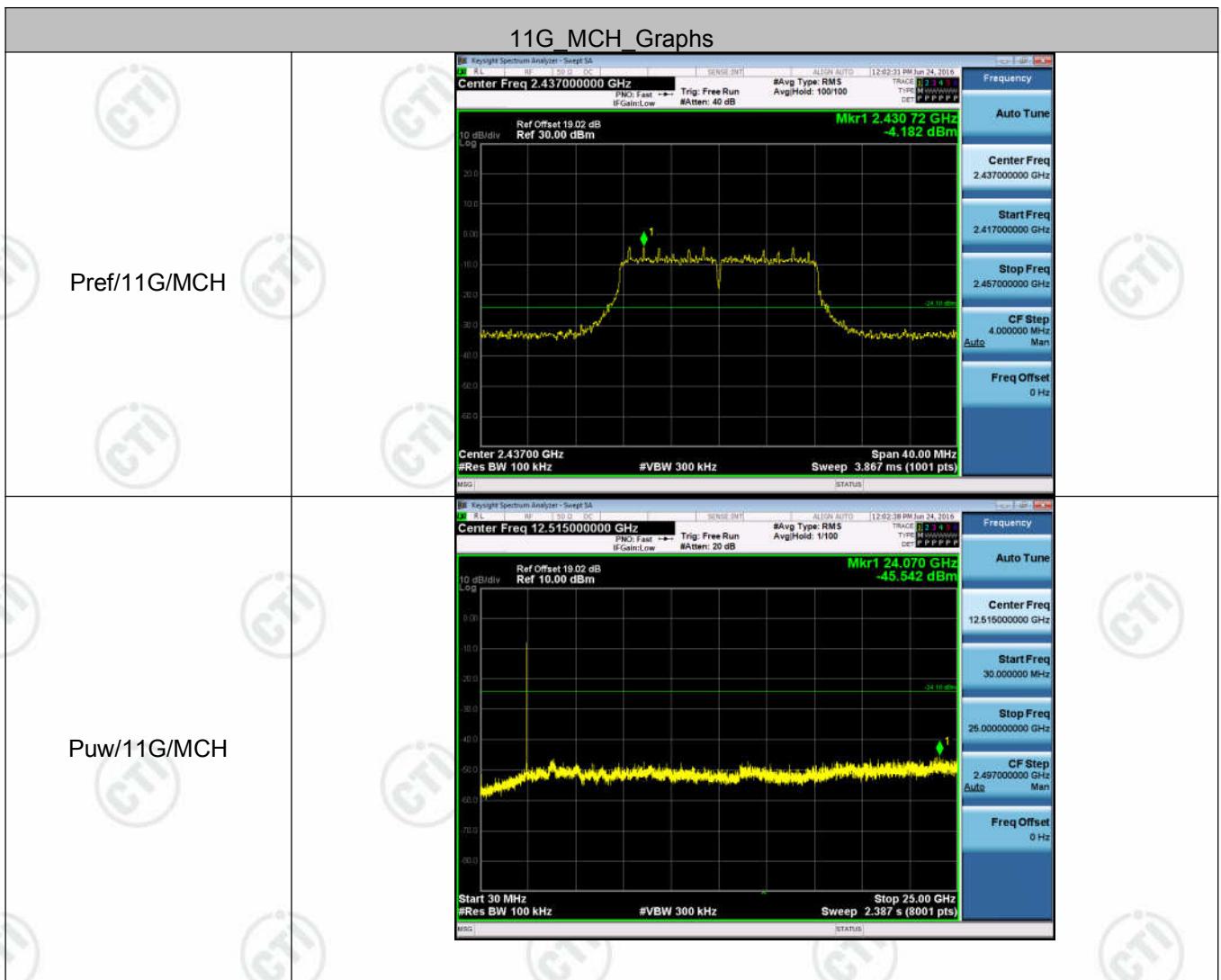
Test Graph

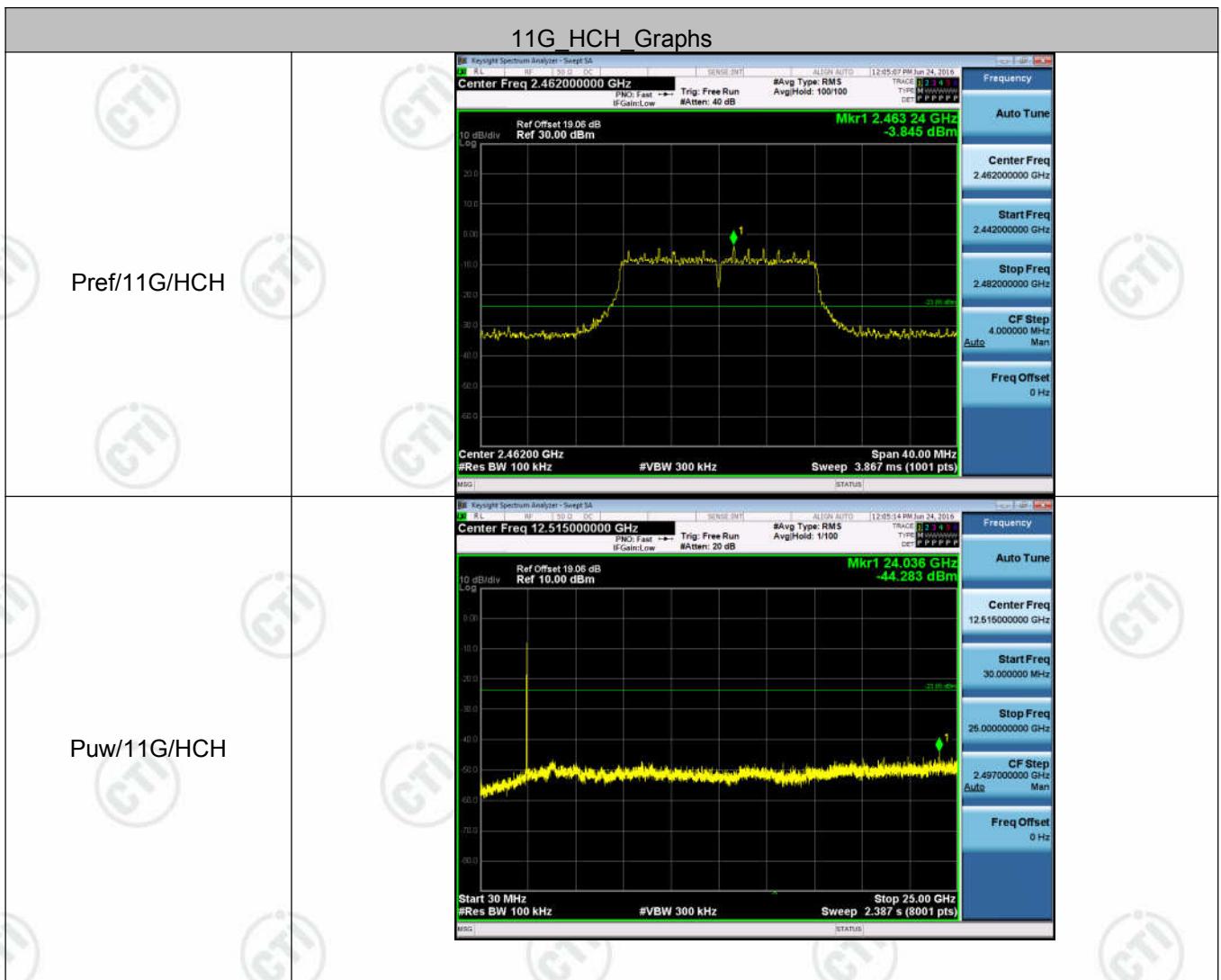


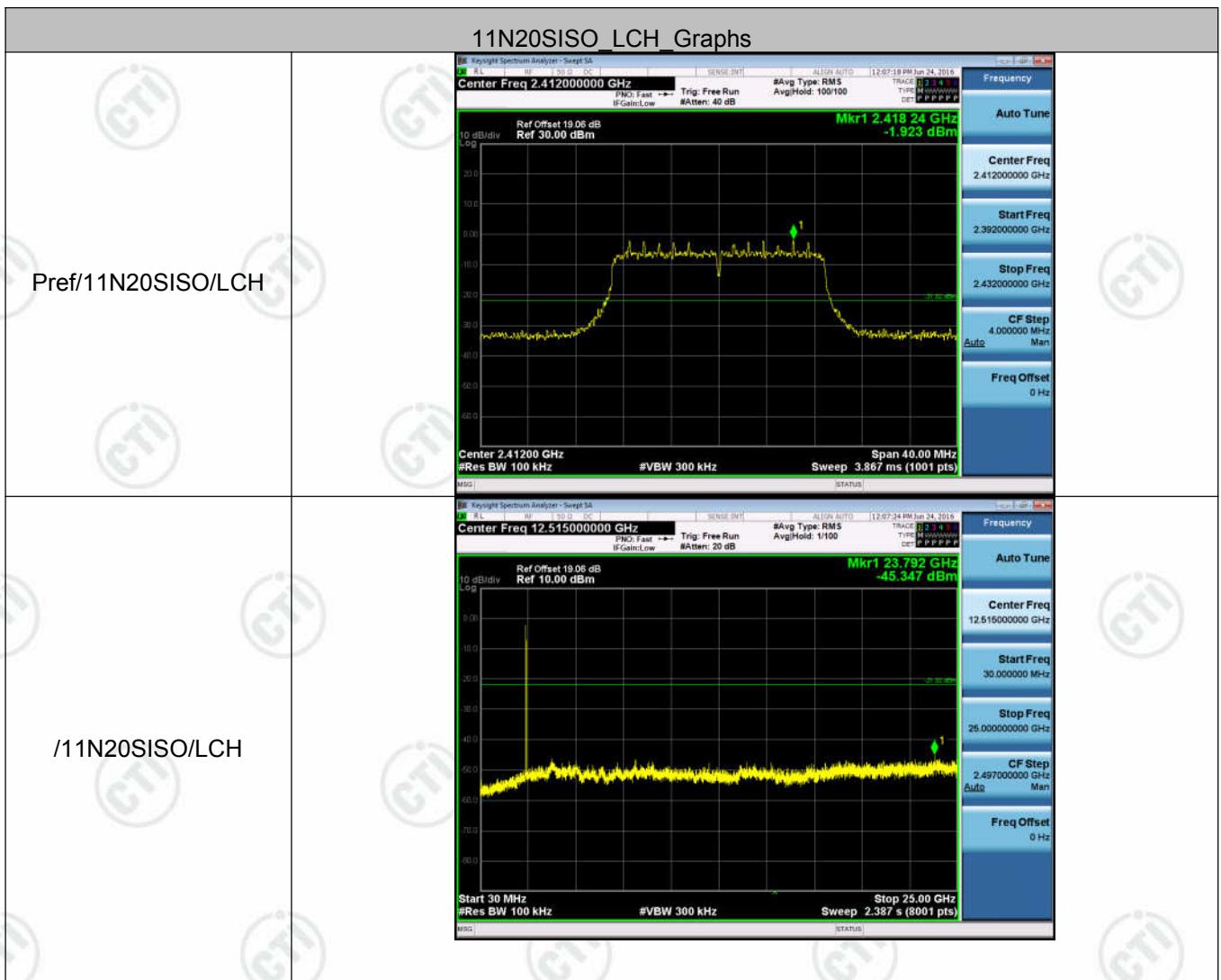


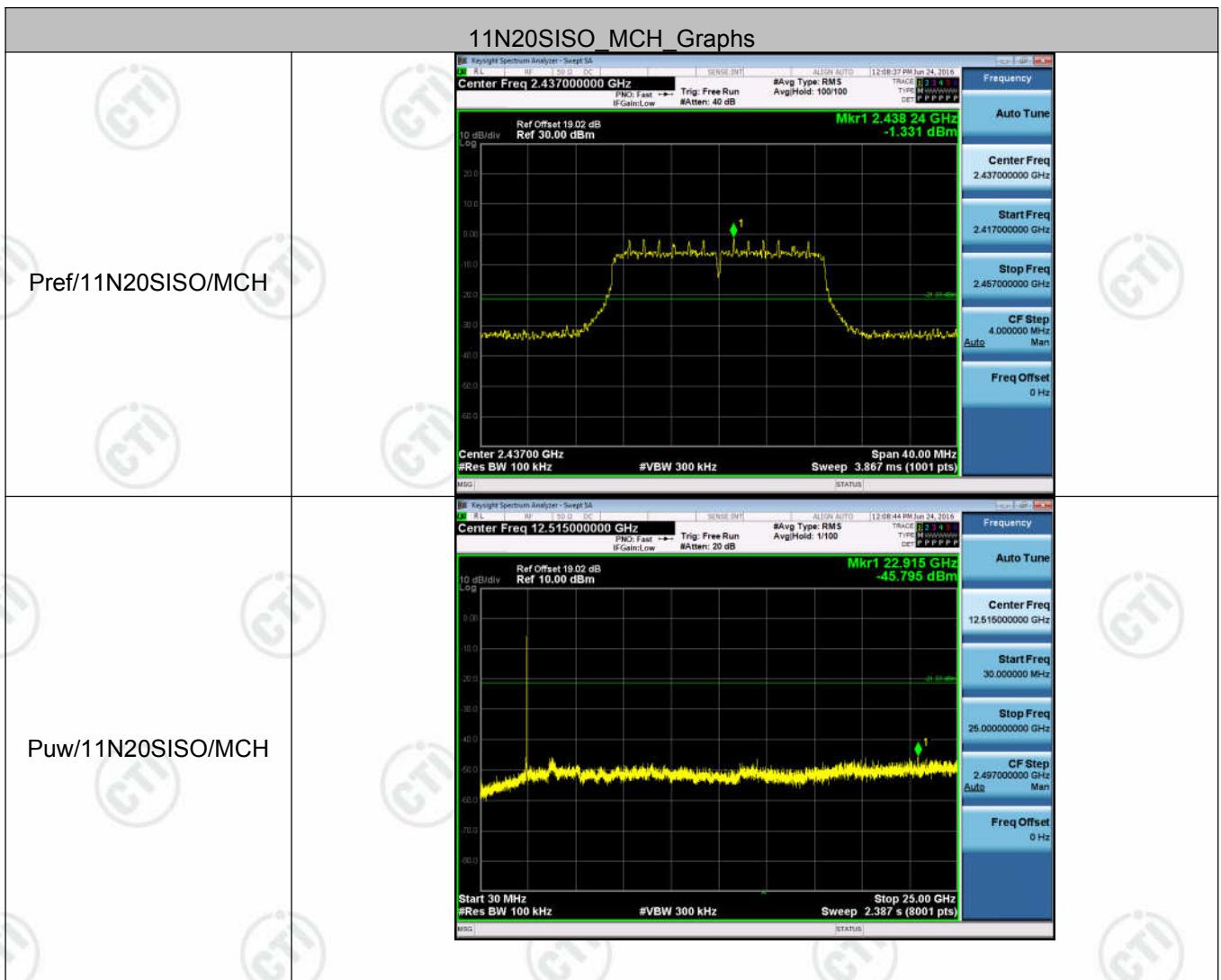


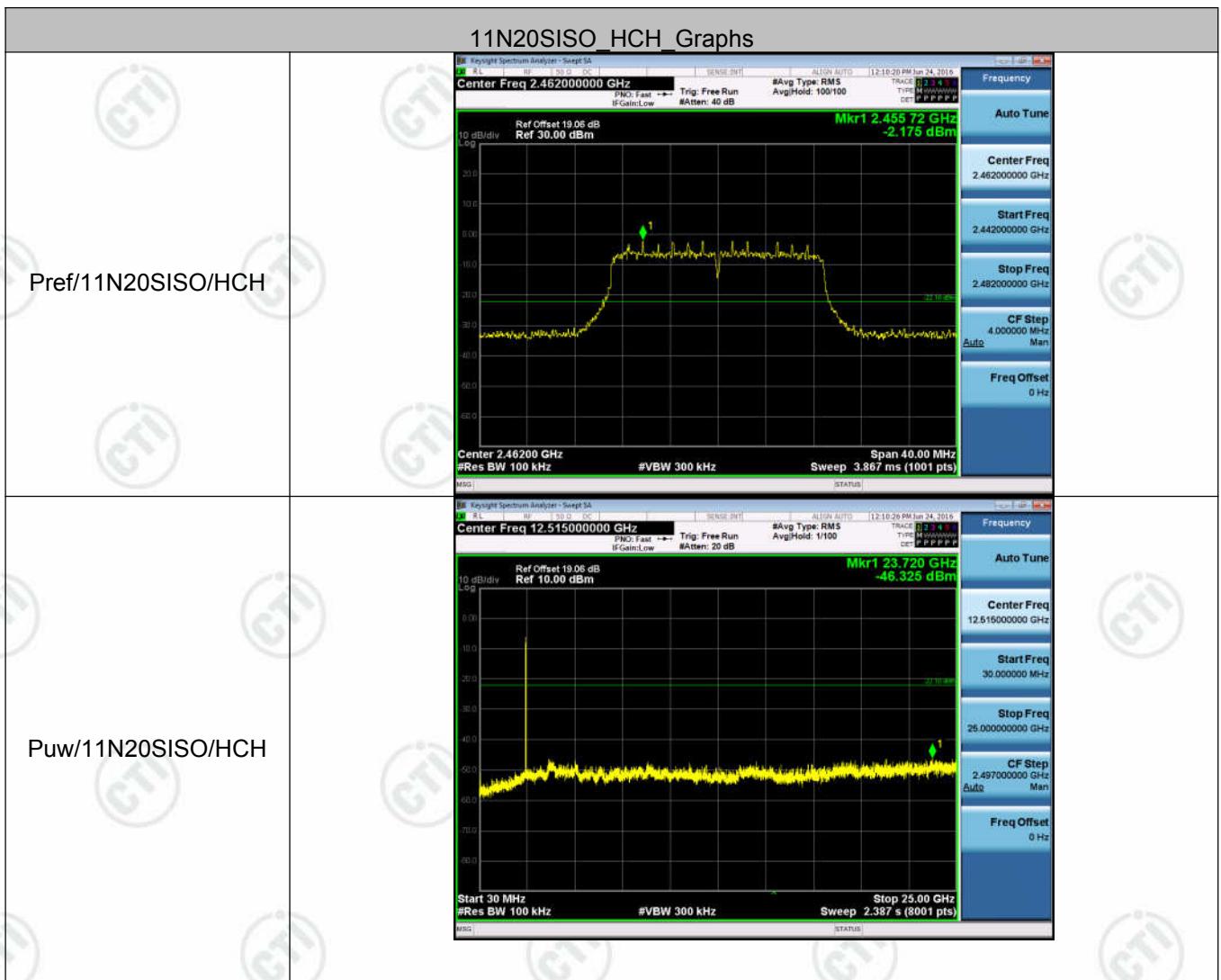


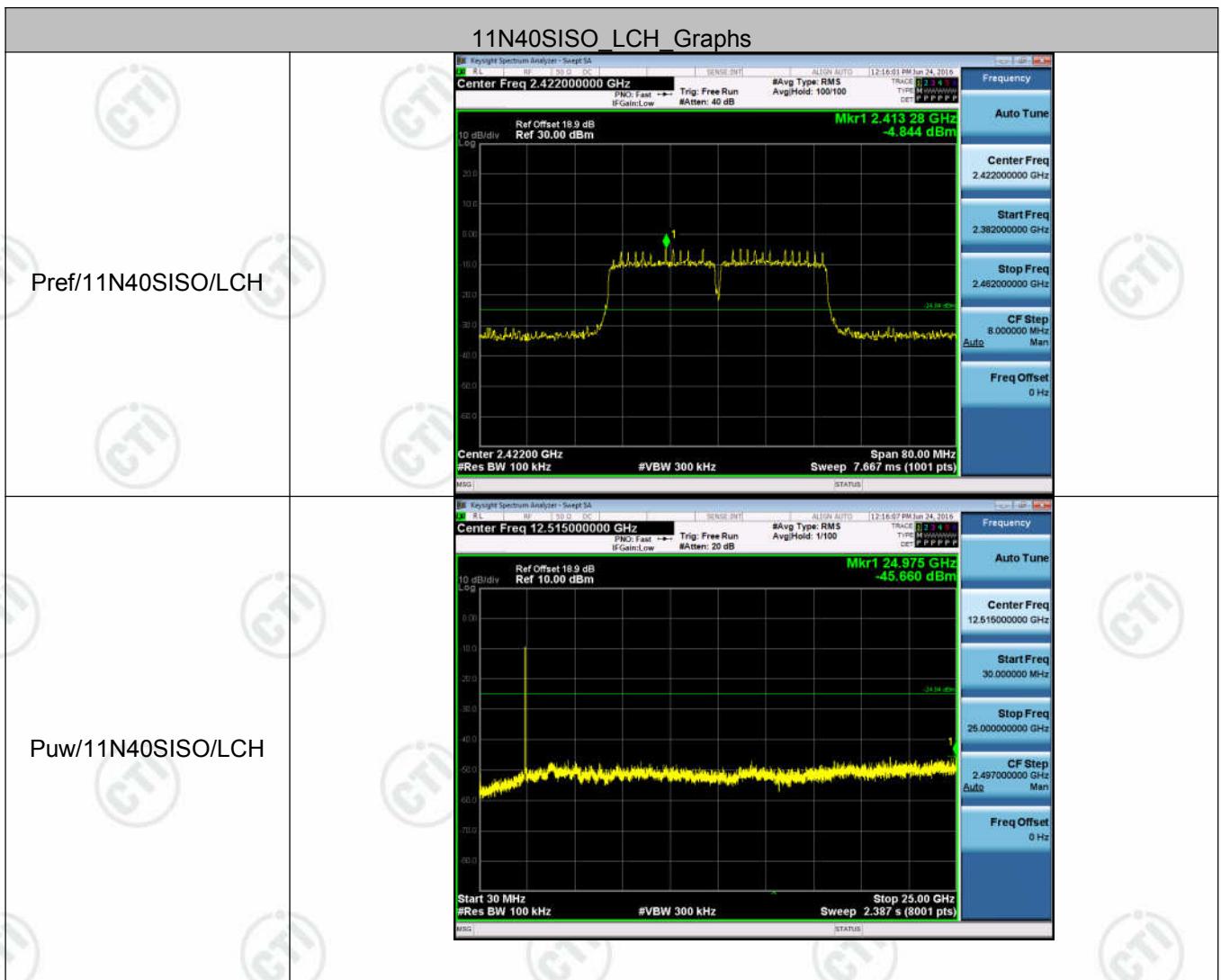


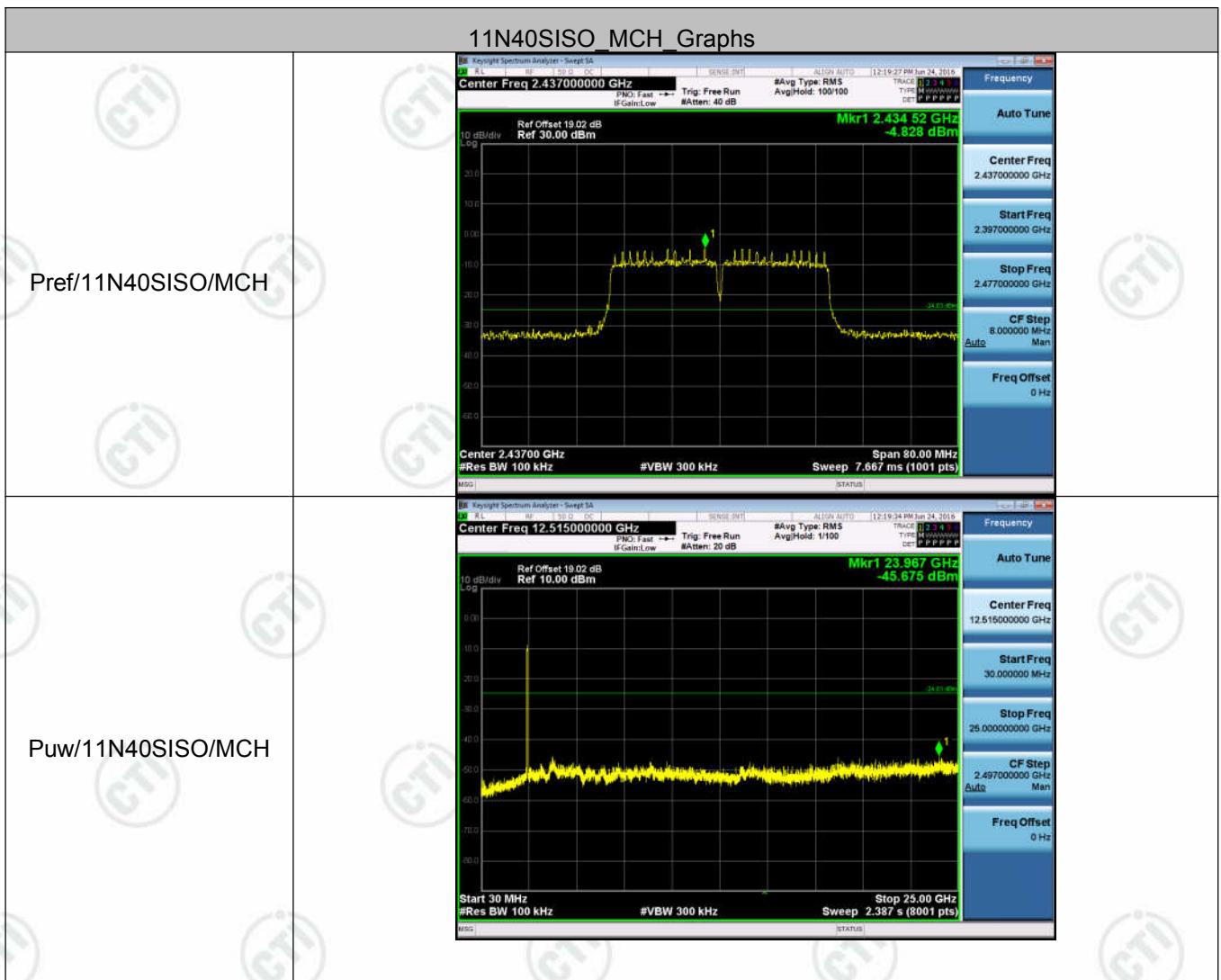


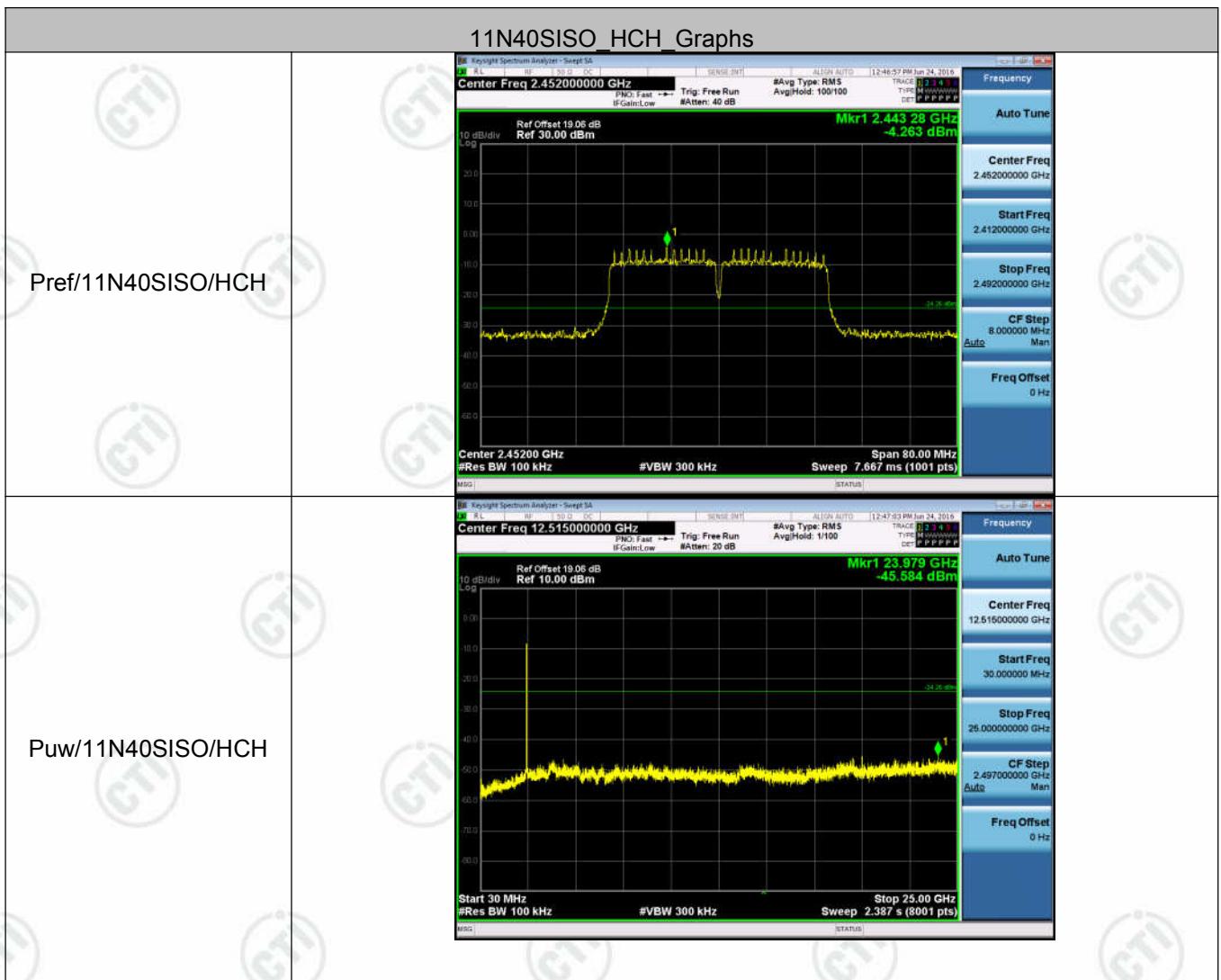












Appendix E): Power Spectral Density

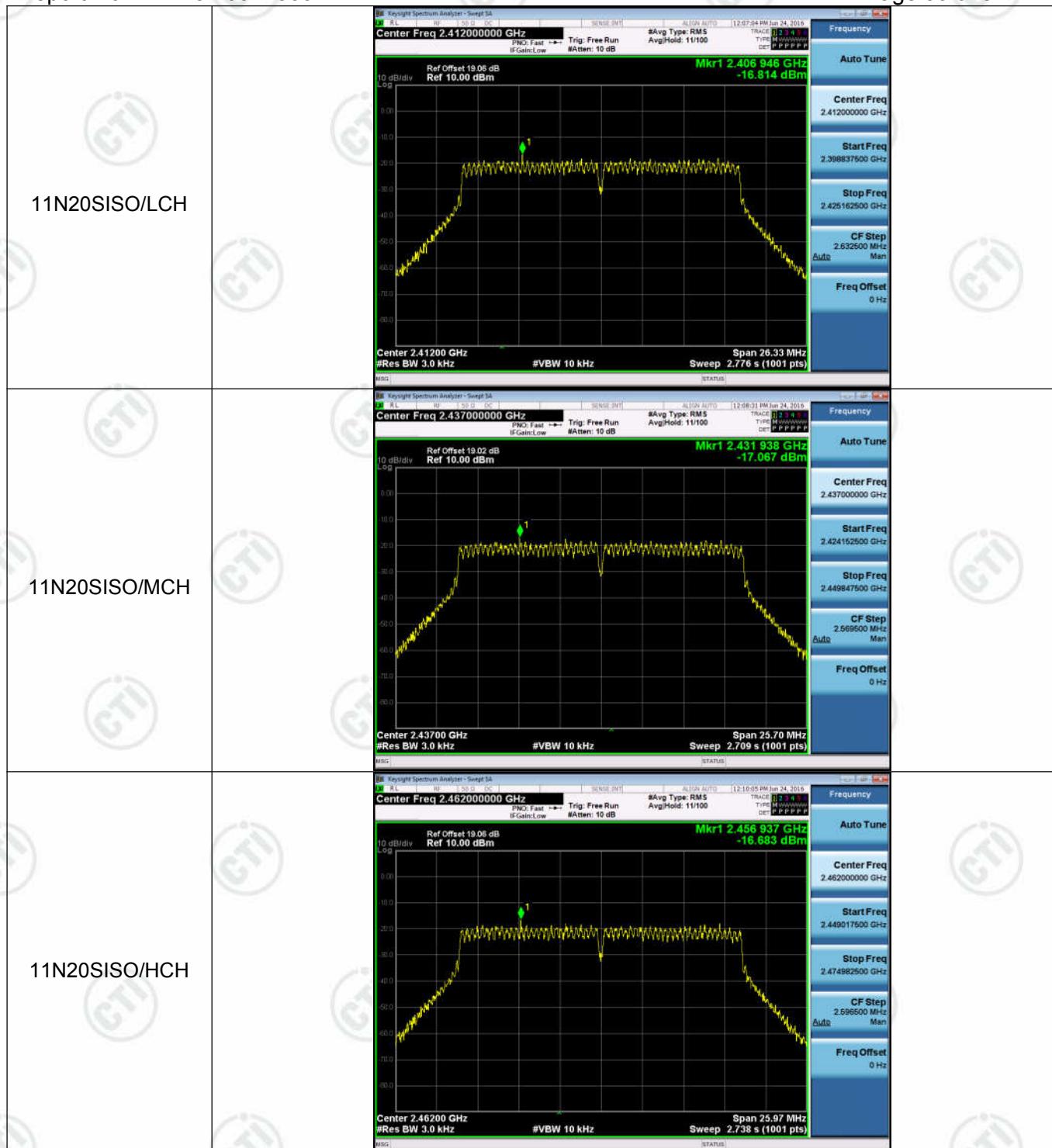
Result Table

Mode	Channel	Power Spectral Density [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	LCH	-15.134	8	PASS
11B	MCH	-14.444	8	PASS
11B	HCH	-14.888	8	PASS
11G	LCH	-20.700	8	PASS
11G	MCH	-20.451	8	PASS
11G	HCH	-20.094	8	PASS
11N20SISO	LCH	-16.814	8	PASS
11N20SISO	MCH	-17.067	8	PASS
11N20SISO	HCH	-16.683	8	PASS
11N40SISO	LCH	-20.068	8	PASS
11N40SISO	MCH	-20.053	8	PASS
11N40SISO	HCH	-20.681	8	PASS

Test Graph









Appendix F): Antenna Requirement

15.203 requirement:

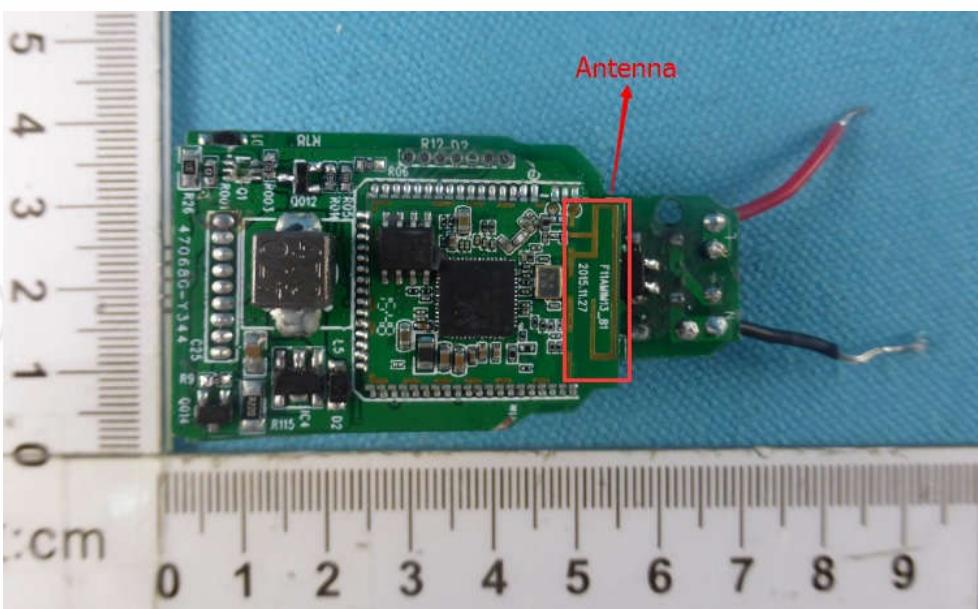
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.



Appendix G): AC Power Line Conducted Emission

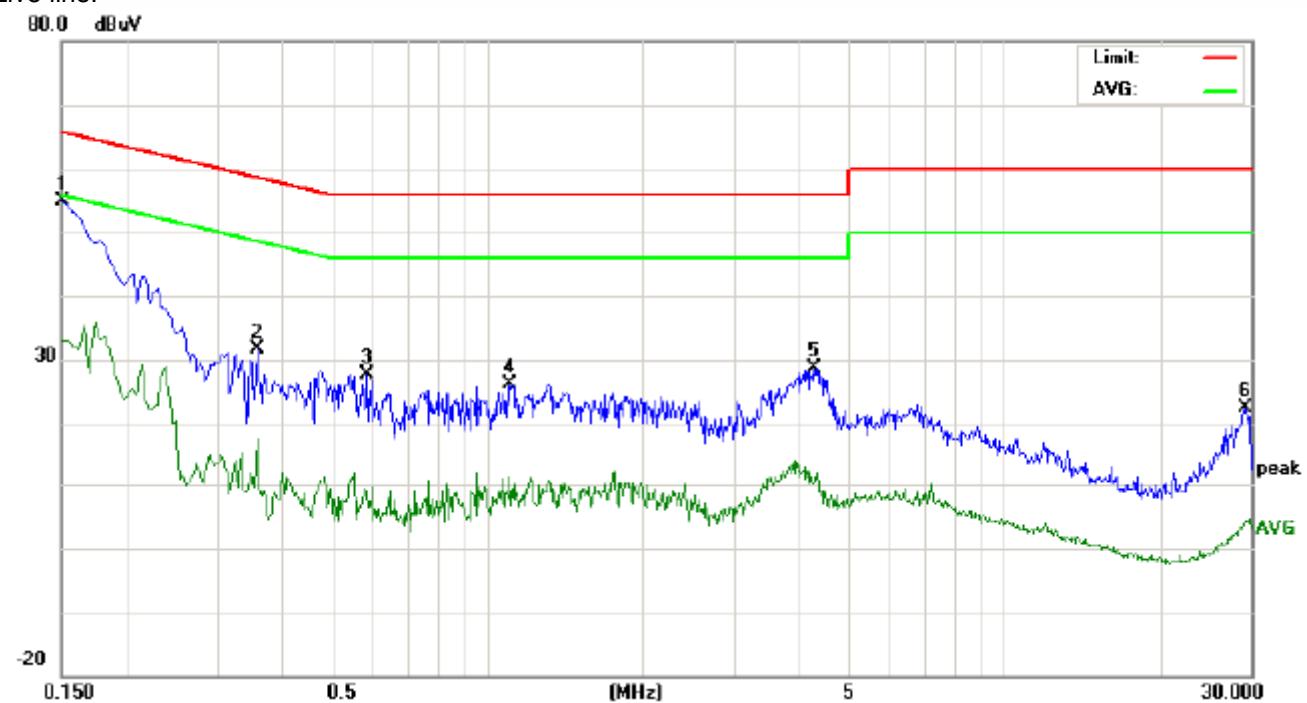
Test Procedure:	<p>Test frequency range :150KHz-30MHz</p> <p>1)The mains terminal disturbance voltage test was conducted in a shielded room.</p> <p>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</p> <p>3)The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</p> <p>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</p> <p>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.</p>																
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table> <p>* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.</p> <p>NOTE : The lower limit is applicable at the transition frequency</p>			Frequency range (MHz)	Limit (dB μ V)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dB μ V)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
5-30	60	50															

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

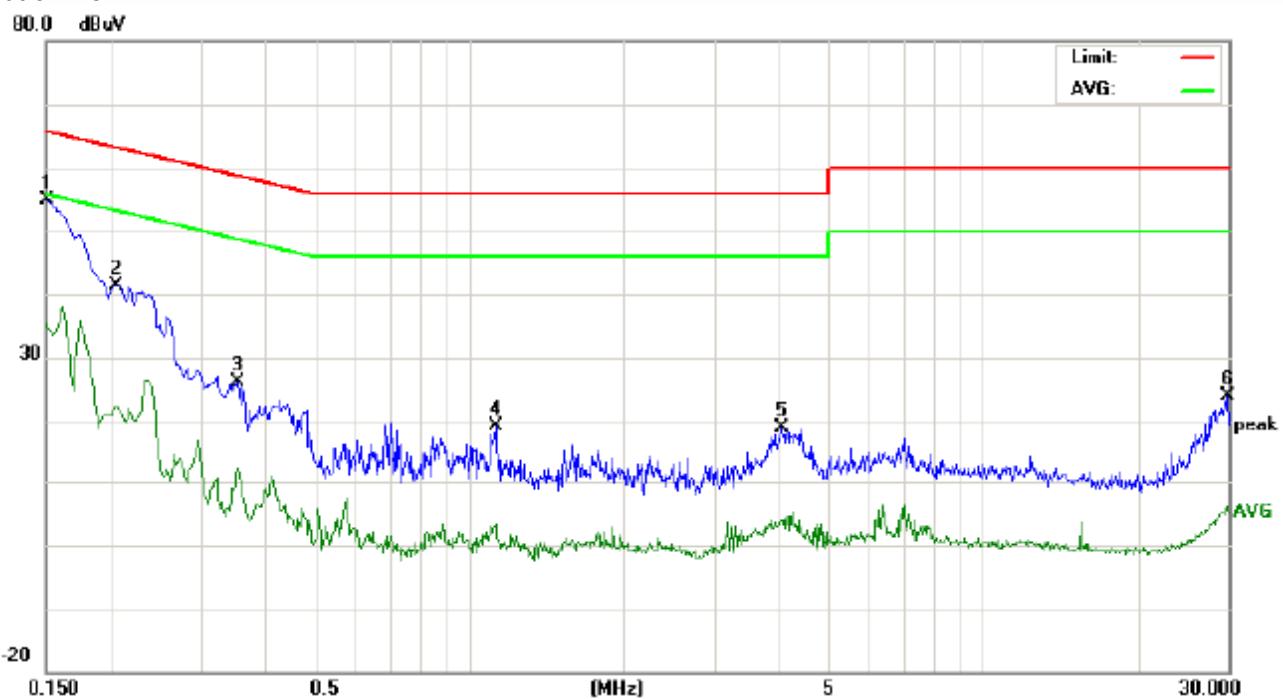
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



No.	Freq. MHz	Reading_Level (dBuV)		Correct Factor		Measurement (dBuV)		Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	Avg	dB	peak	QP	Avg	QP	Avg	QP	Avg	
1	0.1500	45.20	21.70	7.84	23.06	9.80	55.00	32.86	65.99	55.99	-10.99	-23.13	P
2	0.3580	21.70	17.74	-1.07	9.86	9.86	31.56	17.70	58.77	48.77	-27.21	-31.07	P
3	0.5860	17.74	15.78	-1.73	9.90	10.00	27.64	8.83	56.00	46.00	-28.36	-37.17	P
4	1.0940	15.78	18.71	0.70	10.00	10.00	25.78	8.27	56.00	46.00	-30.22	-37.73	P
5	4.2780	18.71	12.04	-5.98	10.31	10.31	28.71	10.70	56.00	46.00	-27.29	-35.30	P
6	29.2940	12.04	22.35	10.31	23.06	10.31	4.33	4.33	60.00	50.00	-37.65	-45.67	P

Neutral line:



No.	Freq. MHz	Reading Level (dBuV)			Correct Factor			Measurement (dBuV)			Limit (dBuV)			Margin (dB)	
		Peak	QP	Avg	dB	peak	QP	Avg	QP	Avg	QP	Avg	P/F	Comment	
1	0.1500	45.16			25.53	9.80	54.96		35.33	65.99	55.99	-11.03	-20.66	P	
2	0.2060	31.60			12.49	9.80	41.40		22.29	63.36	53.36	-21.96	-31.07	P	
3	0.3540	16.28			2.89	9.85	26.13		12.74	58.87	48.87	-32.74	-36.13	P	
4	1.1260	9.09			-6.73	10.00	19.09		3.27	56.00	46.00	-36.91	-42.73	P	
5	4.0620	8.85			-6.22	10.00	18.85		3.78	56.00	46.00	-37.15	-42.22	P	
6	29.8460	13.59			-4.29	10.30	23.89		6.01	60.00	50.00	-36.11	-43.99	P	

Notes:

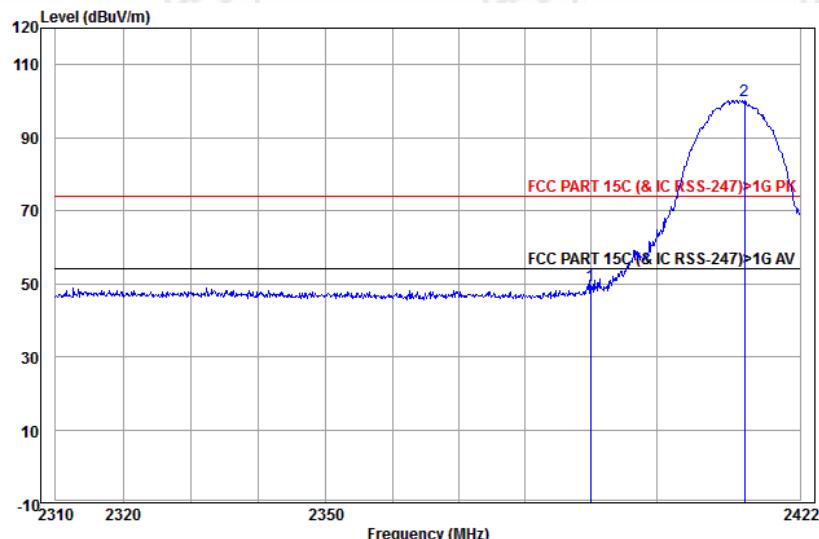
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

Appendix H): Restricted bands around fundamental frequency (Radiated)

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark		
Test Procedure:	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak		
	Above 1GHz	Peak	1MHz	3MHz	Peak		
		Peak	1MHz	10Hz	Average		
Below 1GHz test procedure as below:							
<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</p>							
Above 1GHz test procedure as below:							
<p>g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).</p> <p>h. Test the EUT in the lowest channel , the Highest channel</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>							
Limit:	Frequency	Limit (dB μ V/m @3m)		Remark			
	30MHz-88MHz	40.0		Quasi-peak Value			
	88MHz-216MHz	43.5		Quasi-peak Value			
	216MHz-960MHz	46.0		Quasi-peak Value			
	960MHz-1GHz	54.0		Quasi-peak Value			
	Above 1GHz	54.0		Average Value			
		74.0		Peak Value			

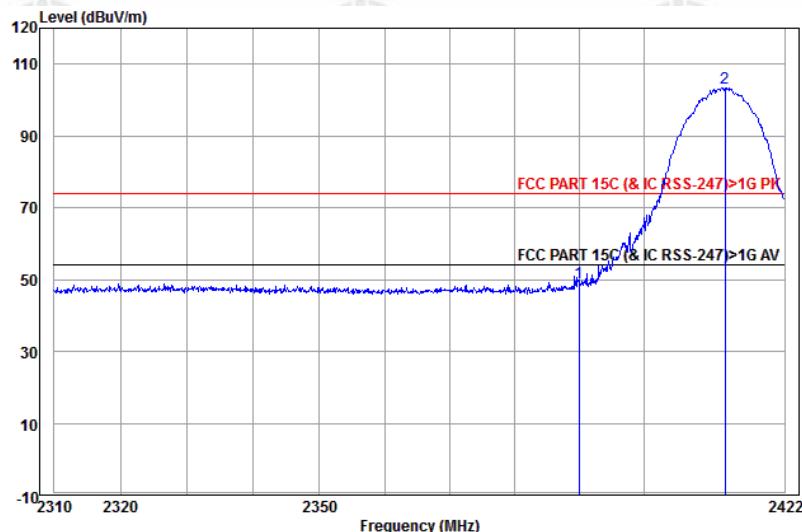
Test plot as follows:

Worse case mode:	802.11b (11Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



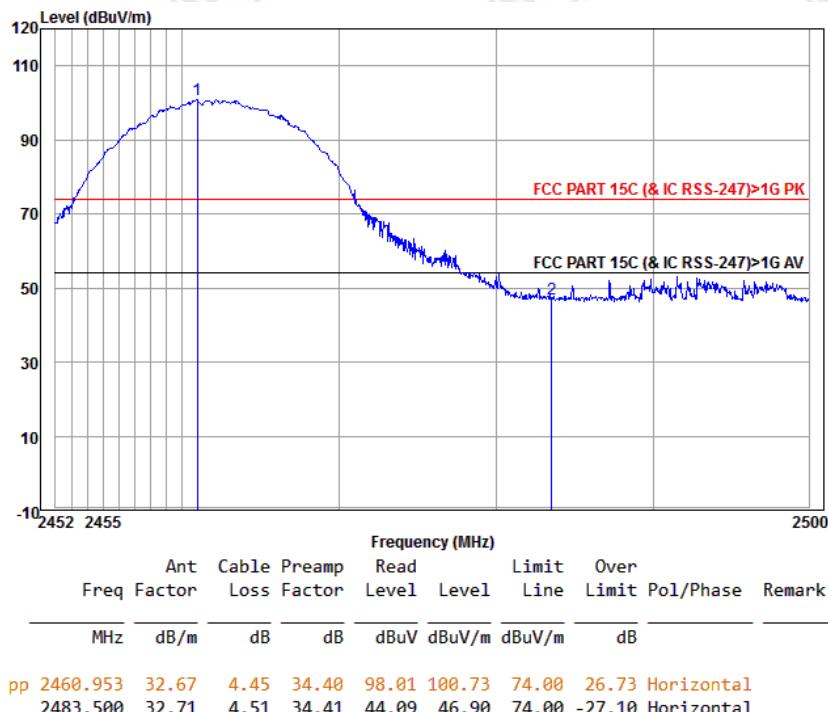
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Limit Level	Over Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	4.28	34.39	47.02	49.44	74.00	-24.56	Horizontal
2 pp	2413.529	32.58	4.34	34.39	97.65	100.18	74.00	26.18	Horizontal

Worse case mode:	802.11b (11Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak

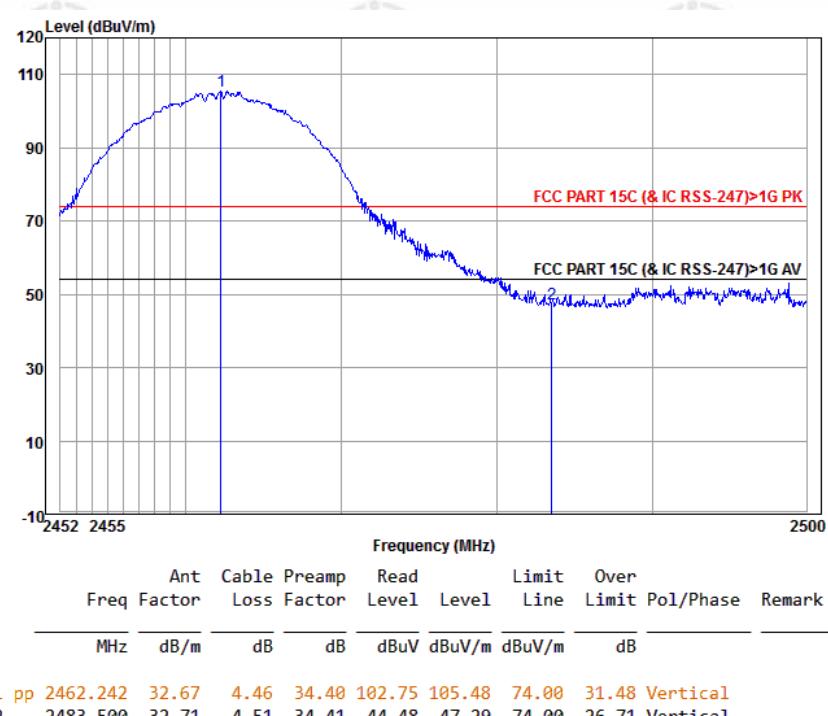


	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Limit Level	Over Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	4.28	34.39	46.85	49.27	74.00	-24.73	Vertical
2 pp	2412.729	32.58	4.34	34.39	100.85	103.38	74.00	29.38	Vertical

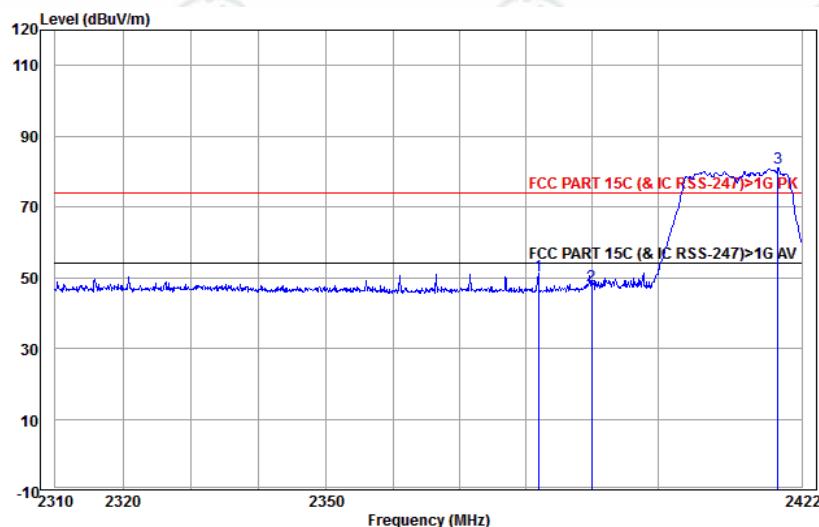
Worse case mode:	802.11b (11Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



Worse case mode:	802.11b (11Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak

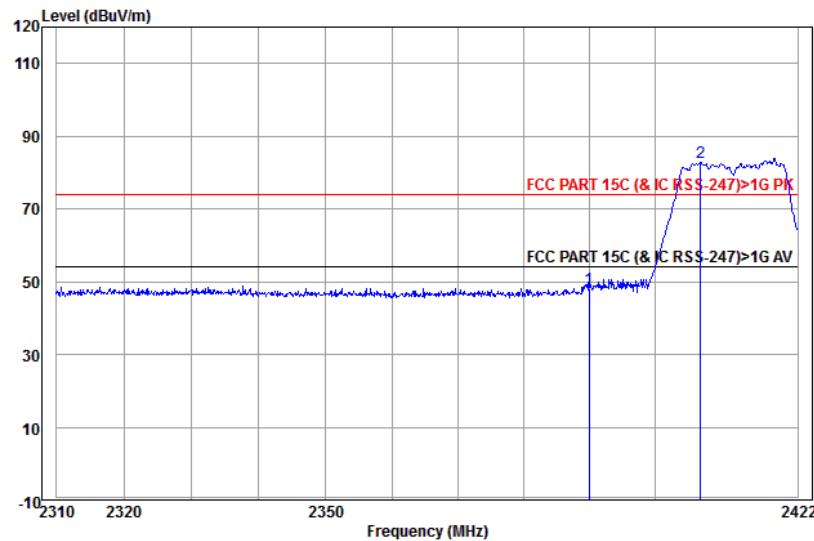


Worse case mode:	802.11g (6Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



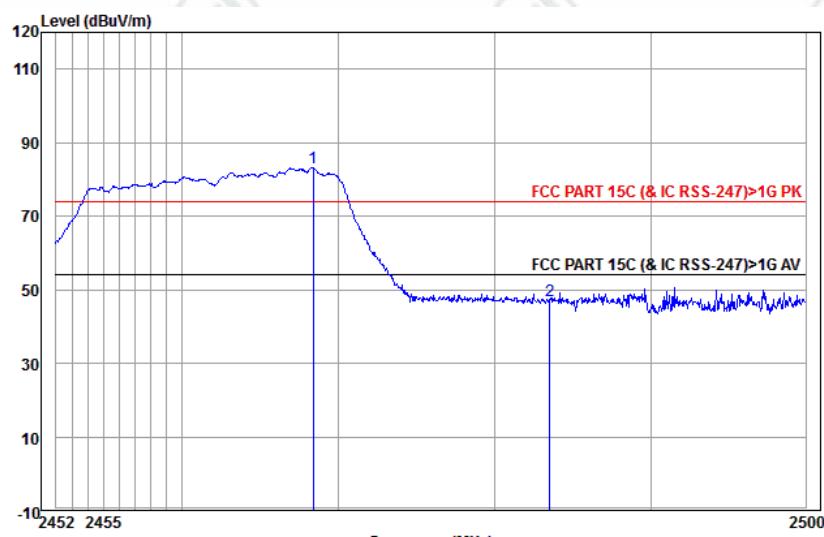
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Over Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2381.857	32.52	4.26	34.39	48.06	50.45	74.00	-23.55 Horizontal
2	2390.000	32.53	4.28	34.39	45.23	47.65	74.00	-26.35 Horizontal
3 pp	2418.333	32.59	4.35	34.39	78.44	80.99	74.00	6.99 Horizontal

Worse case mode:	802.11g (6Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



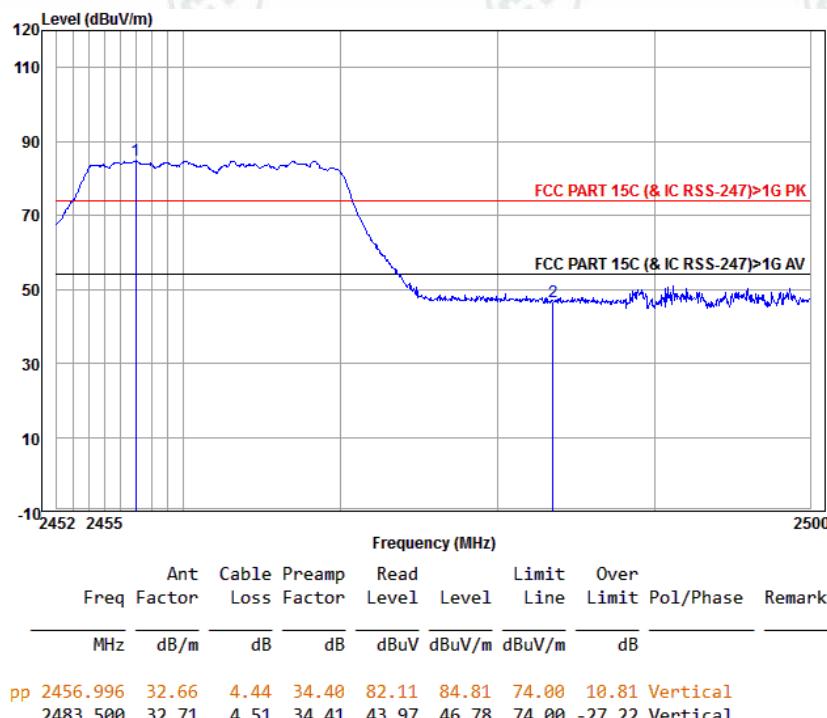
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Over Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	4.28	34.39	45.71	48.13	74.00	-25.87 Vertical
2 pp	2407.024	32.57	4.32	34.39	80.22	82.72	74.00	8.72 Vertical

Worse case mode:	802.11g (6Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak

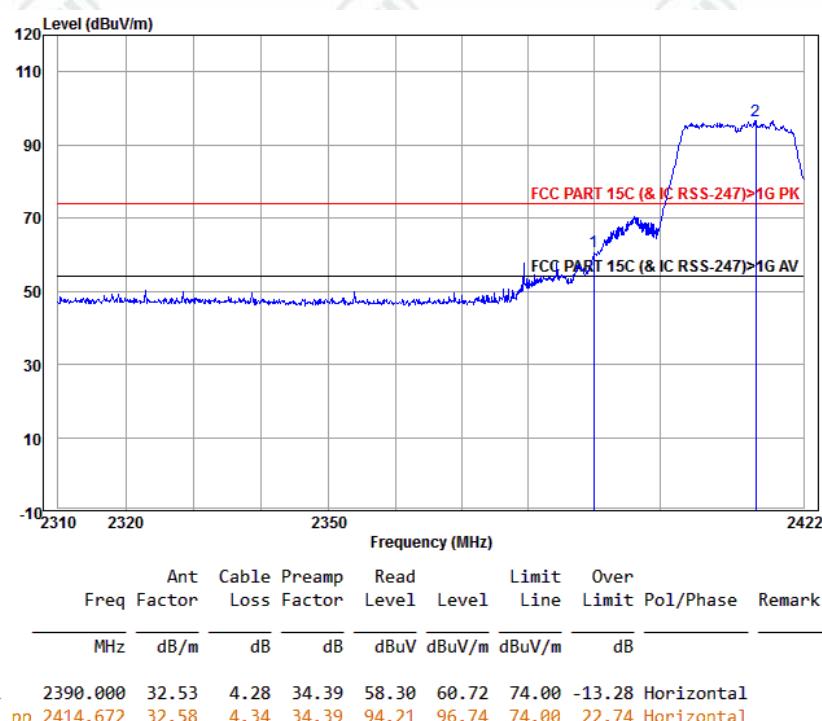


Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Limit Level	Line Limit	Over Limit	Pol/Phase	Remark
MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2468.359	32.69	4.47	34.40	80.54	83.30	74.00	9.30	Horizontal
2	2483.500	32.71	4.51	34.41	44.25	47.06	74.00	-26.94	Horizontal

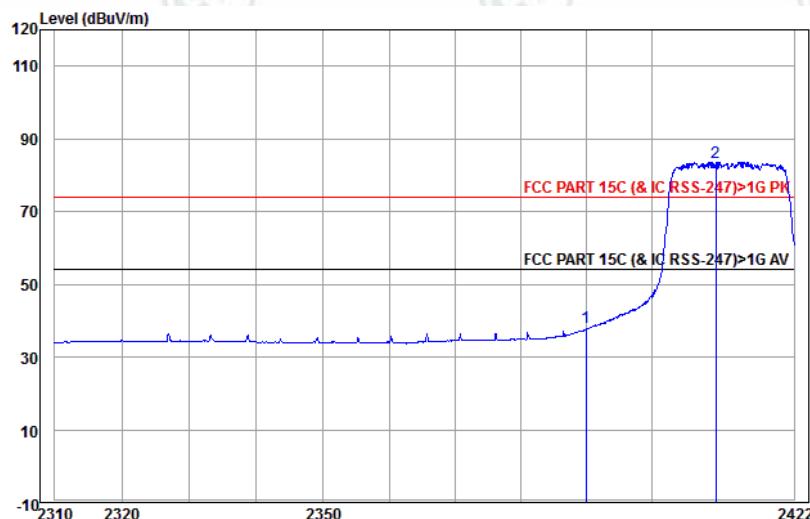
Worse case mode:	802.11g (6Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak

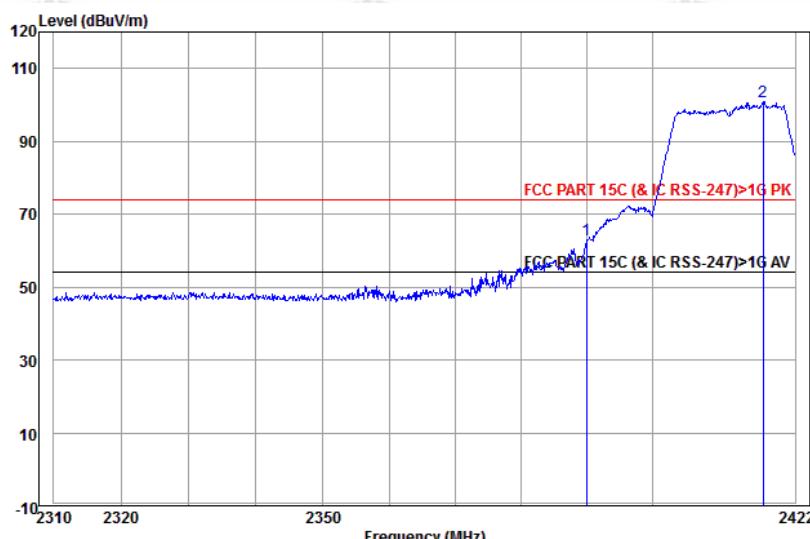


Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Average



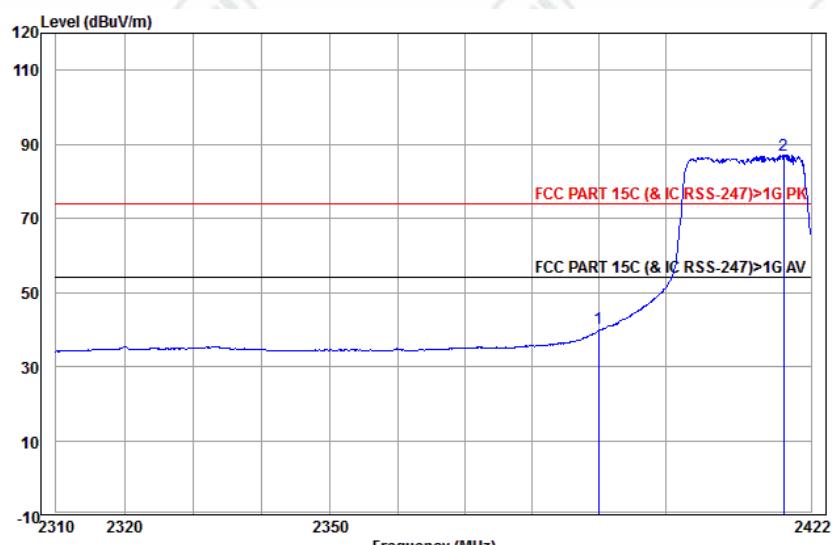
Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level		Limit Line	Over Limit	Over Line Pol/Phase	Remark	
				MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m
1	2390.000	32.53	4.28	34.39	35.61	38.03	54.00	-15.97	Horizontal	Average
2 pp	2409.875	32.57	4.33	34.39	81.05	83.56	54.00	29.56	Horizontal	Average

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



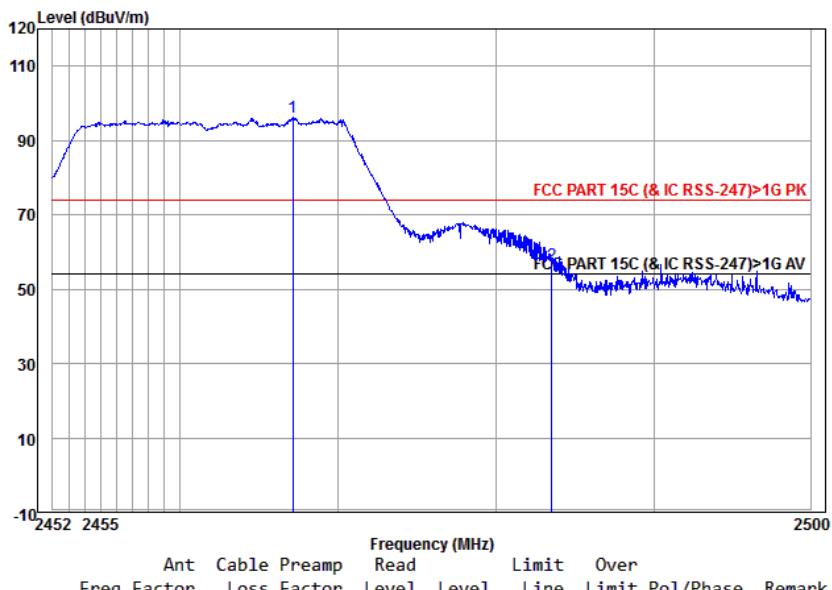
Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level		Limit Line	Over Limit	Over Line Pol/Phase	Remark	
				MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m
1	2390.000	32.53	4.28	34.39	60.47	62.89	74.00	-11.11	Vertical	
2 pp	2417.074	32.59	4.35	34.39	98.35	100.90	74.00	26.90	Vertical	

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Average



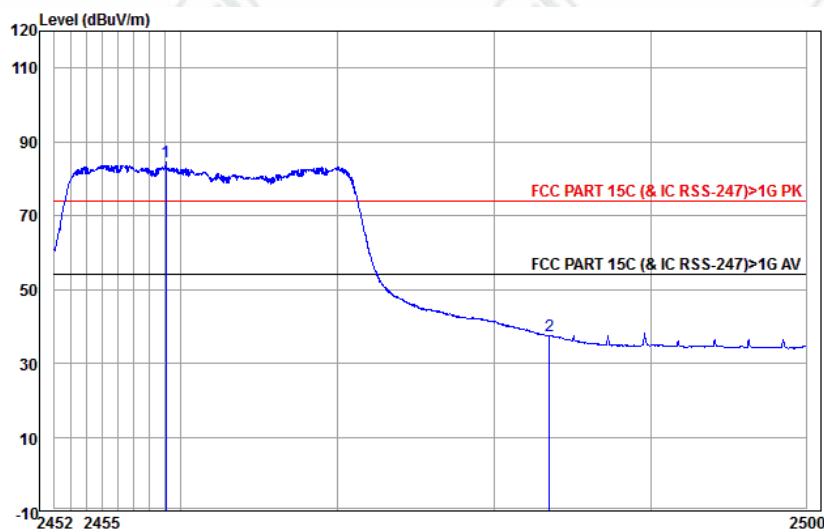
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	32.53	4.28	34.39	37.71	40.13	54.00	-13.87 Vertical Average
2 pp	2417.875	32.59	4.35	34.39	84.54	87.09	54.00	33.09 Vertical Average

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



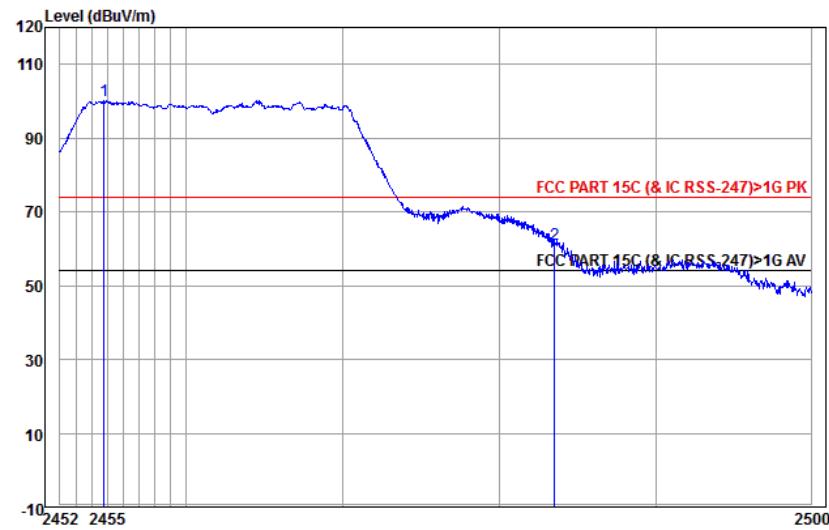
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2467.115	32.68	4.47	34.40	93.45	96.20	74.00	22.20 Horizontal
2	2483.500	32.71	4.51	34.41	53.67	56.48	74.00	-17.52 Horizontal

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Average



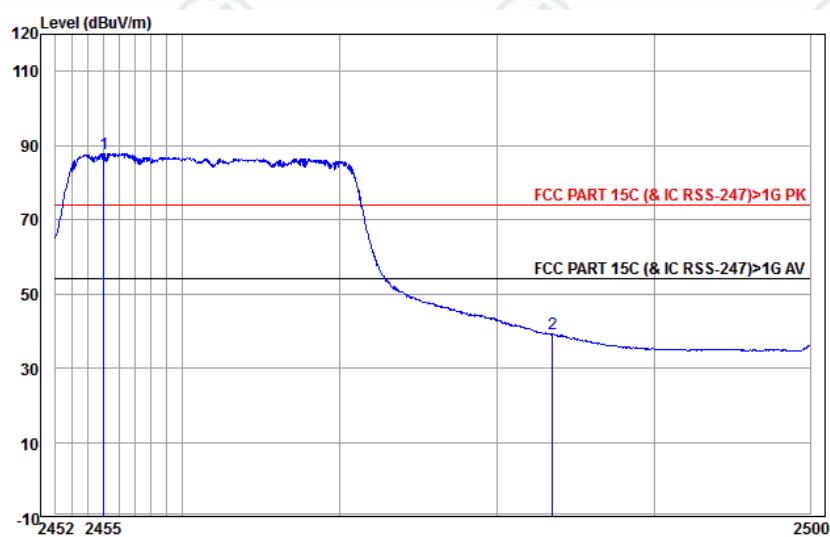
Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Limit		Over Line Limit	Over Pol/Phase	Remark	
					MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m
1 pp	2459.045	32.67	4.45	34.40	81.76	84.48	54.00	30.48	Horizontal	Average
2	2483.500	32.71	4.51	34.41	34.72	37.53	54.00	-16.47	Horizontal	Average

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



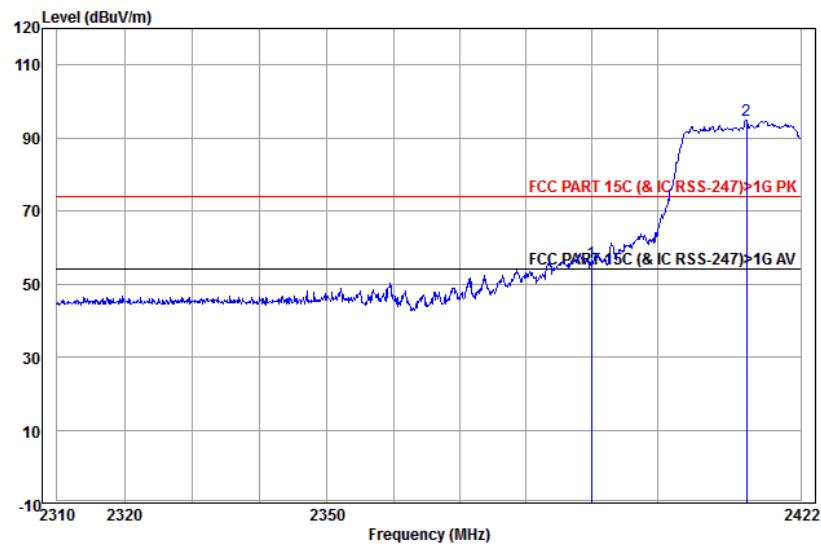
Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Limit		Over Line Limit	Over Pol/Phase	Remark	
					MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m
1 pp	2454.806	32.66	4.44	34.40	97.46	100.16	74.00	26.16	Vertical	
2	2483.500	32.71	4.51	34.41	58.26	61.07	74.00	-12.93	Vertical	

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Average



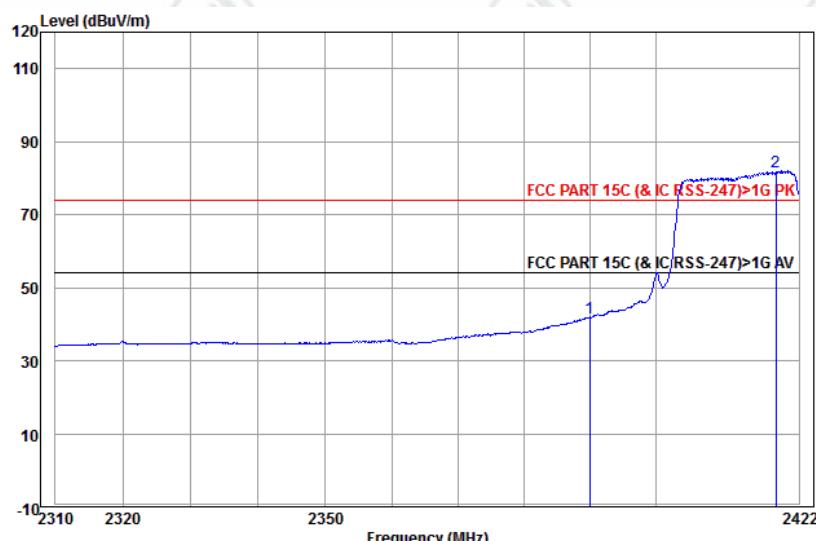
Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level		Limit Line	Over Limit	Over Line Pol/Phase	Remark	
				MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m
1 pp	2455.044	32.66	4.44	34.40	85.13	87.83	54.00	33.83	Vertical	Average
2	2483.500	32.71	4.51	34.41	36.28	39.09	54.00	-14.91	Vertical	Average

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



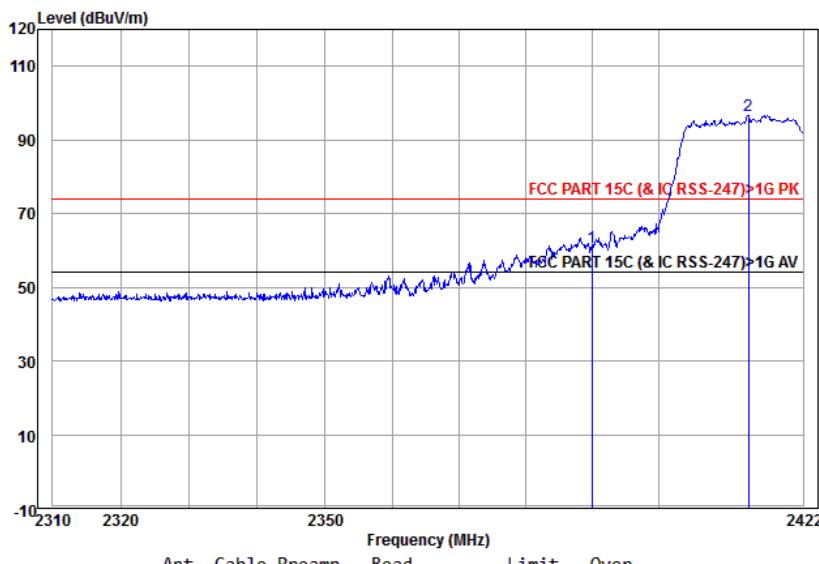
Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level		Limit Line	Over Limit	Over Line Pol/Phase	Remark	
				MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m
1	2390.000	32.53	4.28	34.39	53.37	55.79	74.00	-18.21	Horizontal	
2 pp	2413.643	32.58	4.34	34.39	92.25	94.78	74.00	20.78	Horizontal	

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Average



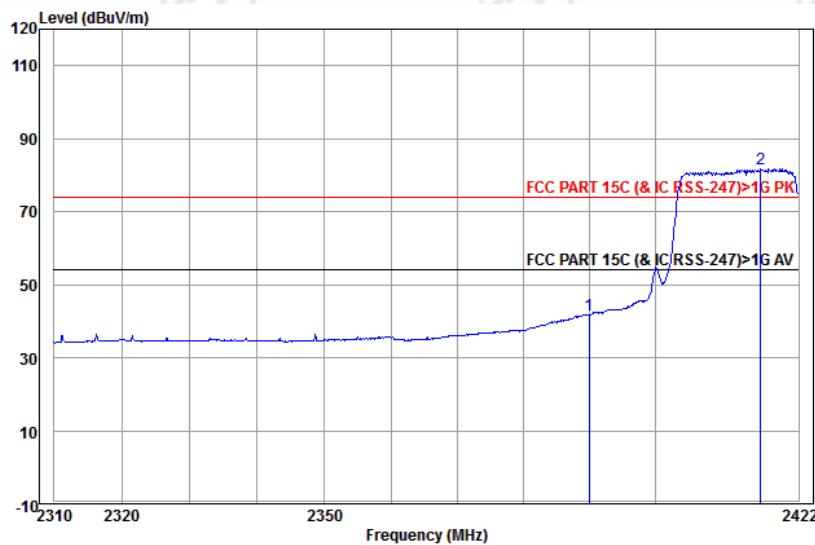
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	32.53	4.28	34.39	39.44	41.86	54.00	-12.14 Horizontal Average
2 pp	2418.448	32.59	4.35	34.39	79.28	81.83	54.00	27.83 Horizontal Average

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



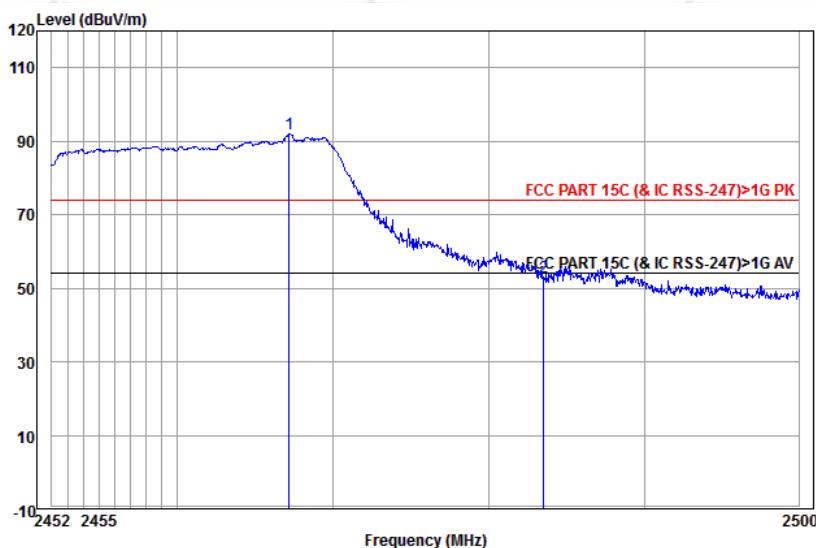
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	32.53	4.28	34.39	58.28	60.70	74.00	-13.30 Vertical
2 pp	2413.643	32.58	4.34	34.39	94.25	96.78	74.00	22.78 Vertical

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Average



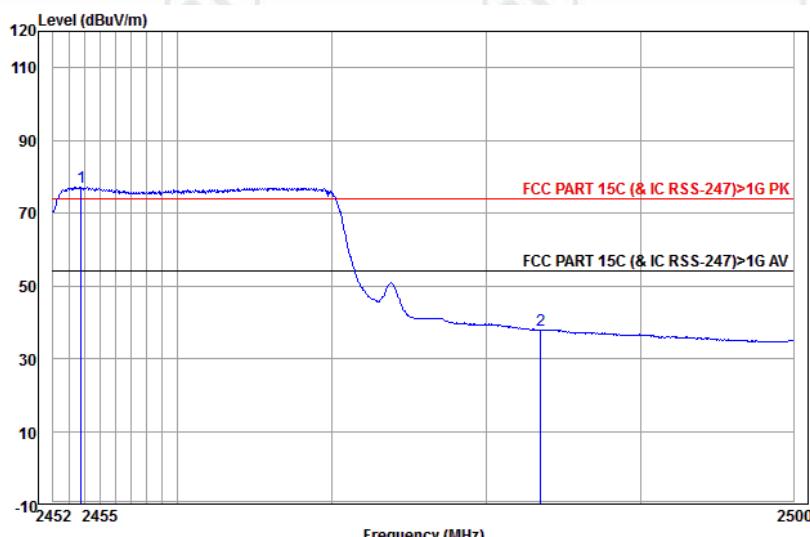
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	32.53	4.28	34.39	39.32	41.74	54.00	-12.26 Vertical Average
2 pp	2416.159	32.59	4.34	34.39	79.15	81.69	54.00	27.69 Vertical Average

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



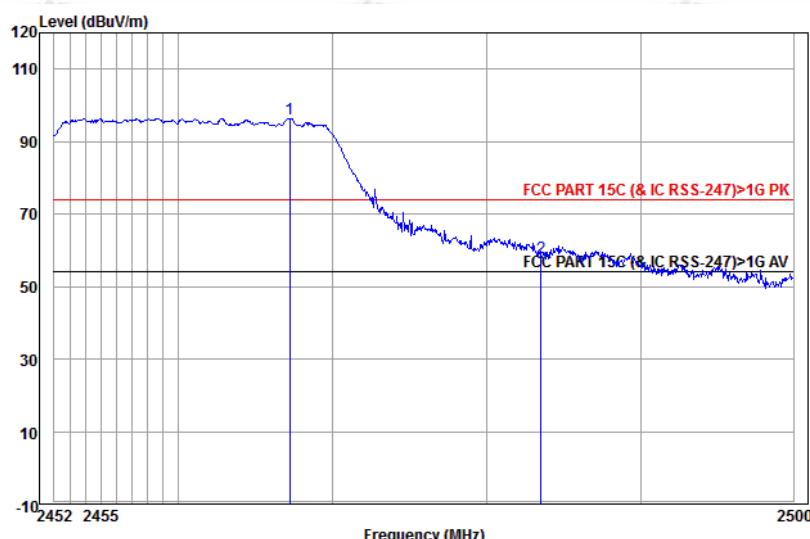
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Line Limit	Over Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2467.163	32.68	4.47	34.40	89.17	91.92	74.00	17.92 Horizontal
2	2483.500	32.71	4.51	34.41	50.09	52.90	74.00	-21.10 Horizontal

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Average



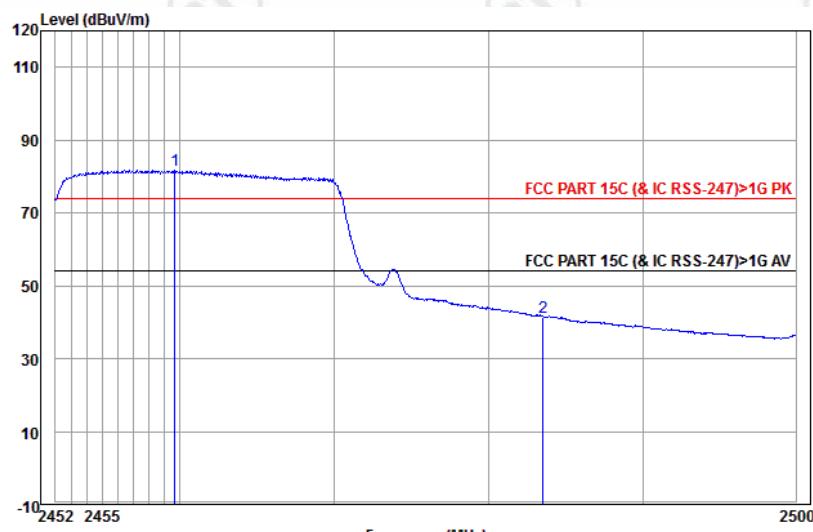
Freq	Ant Factor	Cable Loss	Preamp Factor	Read	Limit	Over	Pol/Phase	Remark
				Level	Level	Line Limit		
MHz	dB/m		dB	dBuV	dBuV/m	dBuV/m		
1 pp 2453.807	32.66	4.44	34.40	74.57	77.27	54.00	23.27	Horizontal Average
2 2483.500	32.71	4.51	34.41	35.04	37.85	54.00	-16.15	Horizontal Average

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



Freq	Ant Factor	Cable Loss	Preamp Factor	Read	Limit	Over	Pol/Phase	Remark
				Level	Level	Line Limit		
MHz	dB/m		dB	dBuV	dBuV/m	dBuV/m		
1 pp 2467.211	32.68	4.47	34.40	93.63	96.38	74.00	22.38	Vertical
2 2483.500	32.71	4.51	34.41	55.36	58.17	74.00	-15.83	Vertical

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Average



Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Limit Level	Line Limit	Over Limit	Pol/Phase	Remark
MHz	dB/m		dB	dBuV	dBuV/m	dBuV/m	dBuV/m		
1 pp	2459.665	32.67	4.45	34.40	79.01	81.73	54.00	27.73	Vertical Average
2	2483.500	32.71	4.51	34.41	38.57	41.38	54.00	-12.62	Vertical Average

Remark:

1) Through Pre-scan transmitter mode with all kind of modulation and data rate, find the 11Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40), and then Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

Appendix I): Radiated Spurious Emissions

Receiver Setup:		Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak		
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average		
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak		
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average		
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak		
Above 1GHz	Peak	1MHz	3MHz	Peak		
	Peak	1MHz	10Hz	Average		
Test Procedure:						
Below 1GHz test procedure as below:						
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.						
Above 1GHz test procedure as below:						
g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).. h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.						
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dB μ V/m)	Remark	Measurement distance (m)	
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300	
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30	
	1.705MHz-30MHz	30	-	-	30	
	30MHz-88MHz	100	40.0	Quasi-peak	3	
	88MHz-216MHz	150	43.5	Quasi-peak	3	
	216MHz-960MHz	200	46.0	Quasi-peak	3	
	960MHz-1GHz	500	54.0	Quasi-peak	3	
	Above 1GHz	500	54.0	Average	3	
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					

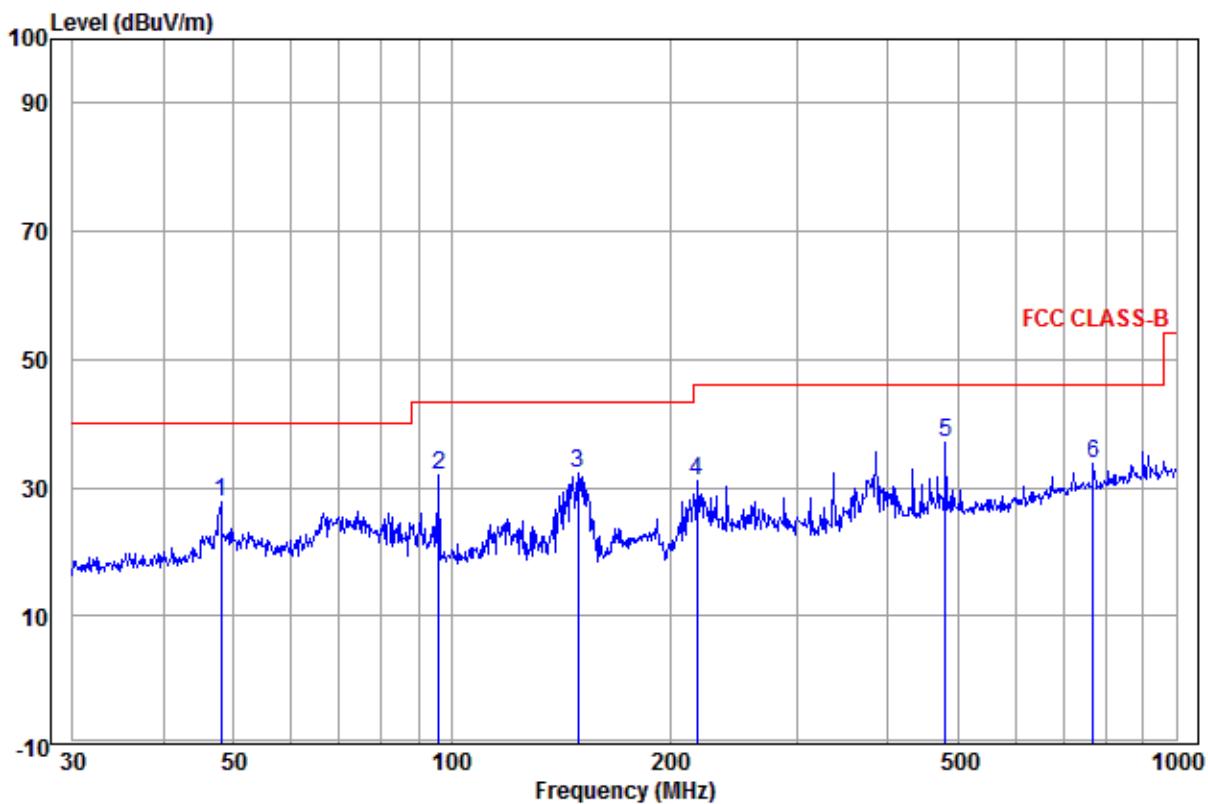
Radiated Spurious Emissions test Data: Radiated Emission below 1GHz

30MHz~1GHz (QP)

Test mode:

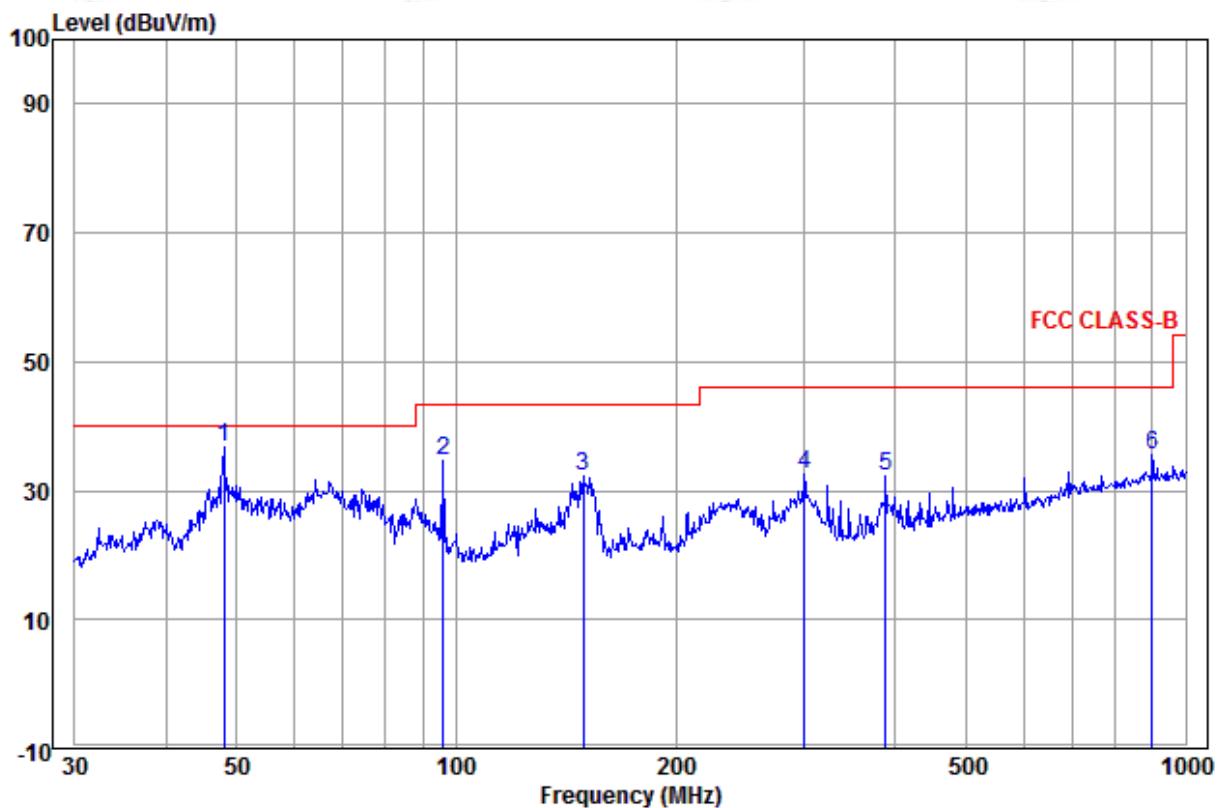
Transmitting

Horizontal



	Ant Freq	Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Over Pol/Phase	Remark
			MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	47.994	14.93	1.24	0.00	11.59	27.76	40.00	-12.24	Horizontal	
2	96.099	12.44	1.58	0.00	17.99	32.01	43.50	-11.49	Horizontal	
3	149.486	9.73	1.58	0.00	21.06	32.37	43.50	-11.13	Horizontal	
4	218.309	11.91	2.26	0.00	16.92	31.09	46.00	-14.91	Horizontal	
5 pp	480.528	17.91	3.08	0.00	16.15	37.14	46.00	-8.86	Horizontal	
6	768.748	21.23	3.94	0.00	8.62	33.79	46.00	-12.21	Horizontal	

Test mode:	Transmitting	Vertical
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	Ant Freq	Cable Factor	Preamp Loss	Read Level	Line Level	Over Line Limit	Over Line Limit Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	47.994	14.93	1.24	0.00	20.69	36.86	40.00	-3.14 Vertical
2	96.099	12.44	1.58	0.00	20.49	34.51	43.50	-8.99 Vertical
3	149.486	9.73	1.58	0.00	20.84	32.15	43.50	-11.35 Vertical
4	300.367	13.51	2.38	0.00	16.72	32.61	46.00	-13.39 Vertical
5	387.992	15.96	2.78	0.00	13.61	32.35	46.00	-13.65 Vertical
6	900.147	22.40	4.34	0.00	8.73	35.47	46.00	-10.53 Vertical

Transmitter Emission above 1GHz

Test mode: 802.11b(11Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1179.935	30.18	2.49	34.99	48.52	46.20	74	-27.80	Pass	Horizontal
1865.735	31.50	3.13	34.39	47.37	47.61	74	-26.39	Pass	Horizontal
3625.669	33.07	5.50	34.57	45.83	49.83	74	-24.17	Pass	Horizontal
4824.000	34.73	5.10	34.35	46.42	51.90	74	-22.10	Pass	Horizontal
7236.000	36.42	6.69	34.90	39.86	48.07	74	-25.93	Pass	Horizontal
9648.000	37.93	7.70	35.07	38.16	48.72	74	-25.28	Pass	Horizontal
1192.011	30.21	2.51	34.97	48.24	45.99	74	-28.01	Pass	Vertical
1851.542	31.48	3.12	34.40	46.77	46.97	74	-27.03	Pass	Vertical
4065.707	32.97	5.41	34.58	45.34	49.14	74	-24.86	Pass	Vertical
4824.000	34.73	5.10	34.35	46.42	51.90	74	-22.10	Pass	Vertical
7236.000	36.42	6.69	34.90	39.56	47.77	74	-26.23	Pass	Vertical
9648.000	37.93	7.70	35.07	37.01	47.57	74	-26.43	Pass	Vertical

Test mode: 802.11b(11Mbps)			Test Frequency: 2412MHz			Remark: Average			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
4824.000	34.73	5.10	34.35	44.41	49.89	54	-4.11	Pass	Horizontal
4824.000	34.73	5.10	34.35	44.31	49.79	54	-4.21	Pass	Vertical

Test mode: 802.11b(11Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1207.279	30.24	2.52	34.96	48.10	45.90	74	-28.10	Pass	Horizontal
1655.354	31.15	2.97	34.55	46.87	46.44	74	-27.56	Pass	Horizontal
3863.900	32.90	5.46	34.59	45.35	49.12	74	-24.88	Pass	Horizontal
4874.000	34.84	5.09	34.33	45.25	50.85	74	-23.15	Pass	Horizontal
7311.000	36.43	6.76	34.90	39.55	47.84	74	-26.16	Pass	Horizontal
9748.000	38.03	7.61	35.05	38.46	49.05	74	-24.95	Pass	Horizontal
1213.441	30.26	2.53	34.95	48.66	46.50	74	-27.50	Pass	Vertical
1668.044	31.18	2.98	34.54	47.06	46.68	74	-27.32	Pass	Vertical
3738.129	32.99	5.48	34.58	46.80	50.69	74	-23.31	Pass	Vertical
4874.000	34.84	5.09	34.33	45.35	50.95	74	-23.05	Pass	Vertical
7311.000	36.43	6.76	34.90	39.22	47.51	74	-26.49	Pass	Vertical
9748.000	38.03	7.61	35.05	37.42	48.01	74	-25.99	Pass	Vertical

Test mode: 802.11b(11Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1198.095	30.22	2.51	34.97	48.63	46.39	74	-27.61	Pass	Horizontal
1642.761	31.13	2.95	34.56	48.44	47.96	74	-26.04	Pass	Horizontal
3625.669	33.07	5.50	34.57	45.76	49.76	74	-24.24	Pass	Horizontal
4924.000	34.94	5.07	34.32	44.95	50.64	74	-23.36	Pass	Horizontal
7386.000	36.44	6.83	34.90	37.71	46.08	74	-27.92	Pass	Horizontal
9848.000	38.14	7.53	35.03	37.18	47.82	74	-26.18	Pass	Horizontal
1195.049	30.21	2.51	34.97	48.03	45.78	74	-28.22	Pass	Vertical
1621.985	31.10	2.94	34.57	47.16	46.63	74	-27.37	Pass	Vertical
3738.129	32.99	5.48	34.58	45.41	49.30	74	-24.70	Pass	Vertical
4924.000	34.94	5.07	34.32	44.95	50.64	74	-23.36	Pass	Vertical
7386.000	36.44	6.83	34.90	37.55	45.92	74	-28.08	Pass	Vertical
9848.000	38.14	7.53	35.03	38.10	48.74	74	-25.26	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1428.142	30.73	2.76	34.74	48.24	46.99	74	-27.01	Pass	Horizontal
1856.261	31.48	3.13	34.40	47.60	47.81	74	-26.19	Pass	Horizontal
3719.146	33.00	5.49	34.57	46.24	50.16	74	-23.84	Pass	Horizontal
4824.000	34.73	5.10	34.35	42.96	48.44	74	-25.56	Pass	Horizontal
7236.000	36.42	6.69	34.90	38.68	46.89	74	-27.11	Pass	Horizontal
9648.000	37.93	7.70	35.07	38.37	48.93	74	-25.07	Pass	Horizontal
1201.149	30.23	2.52	34.96	48.44	46.23	74	-27.77	Pass	Vertical
1846.834	31.47	3.12	34.40	47.36	47.55	74	-26.45	Pass	Vertical
3747.656	32.98	5.48	34.58	46.26	50.14	74	-23.86	Pass	Vertical
4824.000	34.73	5.10	34.35	43.77	49.25	74	-24.75	Pass	Vertical
7236.000	36.42	6.69	34.90	40.09	48.30	74	-25.70	Pass	Vertical
9648.000	37.93	7.70	35.07	38.00	48.56	74	-25.44	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1210.356	30.25	2.53	34.95	47.97	45.80	74	-28.20	Pass	Horizontal
1630.264	31.11	2.94	34.57	47.25	46.73	74	-27.27	Pass	Horizontal
4874.000	34.84	5.09	34.33	40.41	46.01	74	-27.99	Pass	Horizontal
6379.864	36.10	7.05	34.54	40.54	49.15	74	-24.85	Pass	Horizontal
7311.000	36.43	6.76	34.90	38.55	46.84	74	-27.16	Pass	Horizontal
9748.000	38.03	7.61	35.05	36.70	47.29	74	-26.71	Pass	Horizontal
1201.149	30.23	2.52	34.96	48.61	46.40	74	-27.60	Pass	Vertical
1642.761	31.13	2.95	34.56	46.62	46.14	74	-27.86	Pass	Vertical
3607.257	33.09	5.50	34.56	45.88	49.91	74	-24.09	Pass	Vertical
4874.000	34.84	5.09	34.33	42.82	48.42	74	-25.58	Pass	Vertical
7311.000	36.43	6.76	34.90	38.98	47.27	74	-26.73	Pass	Vertical
9748.000	38.03	7.61	35.05	37.73	48.32	74	-25.68	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1201.149	30.23	2.52	34.96	48.01	45.80	74	-28.20	Pass	Horizontal
1638.585	31.12	2.95	34.56	47.02	46.53	74	-27.47	Pass	Horizontal
4924.000	34.94	5.07	34.32	43.41	49.10	74	-24.90	Pass	Horizontal
7386.000	36.44	6.83	34.90	37.76	46.13	74	-27.87	Pass	Horizontal
9848.000	38.14	7.53	35.03	36.71	47.35	74	-26.65	Pass	Horizontal
11963.890	39.59	8.49	34.39	36.55	50.24	74	-23.76	Pass	Horizontal
1195.049	30.21	2.51	34.97	49.03	46.78	74	-27.22	Pass	Vertical
1837.456	31.46	3.11	34.41	47.49	47.65	74	-26.35	Pass	Vertical
4924.000	34.94	5.07	34.32	42.89	48.58	74	-25.42	Pass	Vertical
5895.771	35.82	7.20	34.30	40.50	49.22	74	-24.78	Pass	Vertical
7386.000	36.44	6.83	34.90	38.15	46.52	74	-27.48	Pass	Vertical
9848.000	38.14	7.53	35.03	37.02	47.66	74	-26.34	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1216.534	30.27	2.53	34.95	48.40	46.25	74	-27.75	Pass	Horizontal
1617.862	31.09	2.93	34.58	47.23	46.67	74	-27.33	Pass	Horizontal
4824.000	34.73	5.10	34.35	45.36	50.84	74	-23.16	Pass	Horizontal
7236.000	36.42	6.69	34.90	38.27	46.48	74	-27.52	Pass	Horizontal
9648.000	37.93	7.70	35.07	36.07	46.63	74	-27.37	Pass	Horizontal
11933.470	39.58	8.46	34.38	35.88	49.54	74	-24.46	Pass	Horizontal
1192.011	30.21	2.51	34.97	48.50	46.25	74	-27.75	Pass	Vertical
1837.456	31.46	3.11	34.41	48.16	48.32	74	-25.68	Pass	Vertical
4824.000	34.73	5.10	34.35	45.31	50.79	74	-23.21	Pass	Vertical
7236.000	36.42	6.69	34.90	35.68	43.89	74	-30.11	Pass	Vertical
9648.000	37.93	7.70	35.07	34.26	44.82	74	-29.18	Pass	Vertical
11933.470	39.58	8.46	34.38	34.71	48.37	74	-25.63	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1219.635	30.27	2.54	34.94	48.43	46.30	74	-27.70	Pass	Horizontal
1630.264	31.11	2.94	34.57	47.72	47.20	74	-26.80	Pass	Horizontal
4874.000	34.84	5.09	34.33	44.38	49.98	74	-24.02	Pass	Horizontal
7311.000	36.43	6.76	34.90	37.87	46.16	74	-27.84	Pass	Horizontal
9748.000	38.03	7.61	35.05	38.10	48.69	74	-25.31	Pass	Horizontal
11084.270	39.33	7.61	34.13	37.37	50.18	74	-23.82	Pass	Horizontal
1219.635	30.27	2.54	34.94	48.43	46.30	74	-27.70	Pass	Vertical
1630.264	31.11	2.94	34.57	47.72	47.20	74	-26.80	Pass	Vertical
4874.000	34.84	5.09	34.33	44.38	49.98	74	-24.02	Pass	Vertical
7311.000	36.43	6.76	34.90	38.63	46.92	74	-27.08	Pass	Vertical
9748.000	38.03	7.61	35.05	38.10	48.69	74	-25.31	Pass	Vertical
11903.140	39.57	8.43	34.37	37.12	50.75	74	-23.25	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1195.049	30.21	2.51	34.97	48.33	46.08	74	-27.92	Pass	Horizontal
1832.785	31.45	3.11	34.41	47.13	47.28	74	-26.72	Pass	Horizontal
4924.000	34.94	5.07	34.32	43.53	49.22	74	-24.78	Pass	Horizontal
7386.000	36.44	6.83	34.90	37.54	45.91	74	-28.09	Pass	Horizontal
9848.000	38.14	7.53	35.03	36.77	47.41	74	-26.59	Pass	Horizontal
11963.890	39.59	8.49	34.39	36.37	50.06	74	-23.94	Pass	Horizontal
1188.980	30.20	2.50	34.98	48.19	45.91	74	-28.09	Pass	Vertical
1638.585	31.12	2.95	34.56	48.55	48.06	74	-25.94	Pass	Vertical
4924.000	34.94	5.07	34.32	44.26	49.95	74	-24.05	Pass	Vertical
5956.109	35.87	7.33	34.30	41.64	50.54	74	-23.46	Pass	Vertical
7386.000	36.44	6.83	34.90	38.50	46.87	74	-27.13	Pass	Vertical
9848.000	38.14	7.53	35.03	37.81	48.45	74	-25.55	Pass	Vertical

Test mode: 802.11n(HT40)(13.5Mbps)			Test Frequency: 2422MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1198.095	30.22	2.51	34.97	48.55	46.31	74	-27.69	Pass	Horizontal
1634.419	31.12	2.95	34.56	47.35	46.86	74	-27.14	Pass	Horizontal
3728.625	33.00	5.48	34.58	46.61	50.51	74	-23.49	Pass	Horizontal
4844.000	34.77	5.10	34.34	44.75	50.28	74	-23.72	Pass	Horizontal
7266.000	36.43	6.72	34.90	37.93	46.18	74	-27.82	Pass	Horizontal
9688.000	37.97	7.66	35.06	36.66	47.23	74	-26.77	Pass	Horizontal
1198.095	30.22	2.51	34.97	47.89	45.65	74	-28.35	Pass	Vertical
1842.139	31.46	3.11	34.41	47.85	48.01	74	-25.99	Pass	Vertical
4213.211	33.34	5.35	34.53	45.18	49.34	74	-24.66	Pass	Vertical
4844.000	34.77	5.10	34.34	42.45	47.98	74	-26.02	Pass	Vertical
7266.000	36.43	6.72	34.90	39.16	47.41	74	-26.59	Pass	Vertical
9688.000	37.97	7.66	35.06	35.13	45.70	74	-28.30	Pass	Vertical

Test mode: 802.11n(HT40)(13.5Mbps)				Test Frequency: 2437MHz			Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1213.441	30.26	2.53	34.95	47.89	45.73	74	-28.27	Pass	Horizontal
1860.992	31.49	3.13	34.39	47.51	47.74	74	-26.26	Pass	Horizontal
3747.656	32.98	5.48	34.58	45.98	49.86	74	-24.14	Pass	Horizontal
4874.000	34.84	5.09	34.33	43.17	48.77	74	-25.23	Pass	Horizontal
7311.000	36.43	6.76	34.90	38.02	46.31	74	-27.69	Pass	Horizontal
9748.000	38.03	7.61	35.05	36.73	47.32	74	-26.68	Pass	Horizontal
1207.279	30.24	2.52	34.96	48.87	46.67	74	-27.33	Pass	Vertical
1646.948	31.14	2.96	34.55	47.13	46.68	74	-27.32	Pass	Vertical
4874.000	34.84	5.09	34.33	42.50	48.10	74	-25.90	Pass	Vertical
7311.000	36.43	6.76	34.90	36.70	44.99	74	-29.01	Pass	Vertical
9748.000	38.03	7.61	35.05	34.50	45.09	74	-28.91	Pass	Vertical
11903.140	39.57	8.43	34.37	35.29	48.92	74	-25.08	Pass	Vertical

Test mode: 802.11n(HT40)(13.5Mbps)				Test Frequency: 2452MHz			Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dB μ V)	Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1201.149	30.23	2.52	34.96	48.59	46.38	74	-27.62	Pass	Horizontal
1646.948	31.14	2.96	34.55	47.05	46.60	74	-27.40	Pass	Horizontal
3863.900	32.90	5.46	34.59	46.02	49.79	74	-24.21	Pass	Horizontal
4904.000	34.90	5.07	34.33	43.37	49.01	74	-24.99	Pass	Horizontal
7356.000	36.44	6.80	34.90	37.54	45.88	74	-28.12	Pass	Horizontal
9808.000	38.10	7.56	35.04	37.26	47.88	74	-26.12	Pass	Horizontal
1204.210	30.24	2.52	34.96	48.84	46.64	74	-27.36	Pass	Vertical
1617.862	31.09	2.93	34.58	47.32	46.76	74	-27.24	Pass	Vertical
4904.000	34.90	5.07	34.33	43.16	48.80	74	-25.20	Pass	Vertical
7356.000	36.44	6.80	34.90	39.87	48.21	74	-25.79	Pass	Vertical
9808.000	38.10	7.56	35.04	37.91	48.53	74	-25.47	Pass	Vertical
12210.020	39.53	8.50	34.25	36.69	50.47	74	-23.53	Pass	Vertical

Remark:

1) Through Pre-scan transmitting mode with all kind of modulation and data rate, find the 11Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40),and then Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

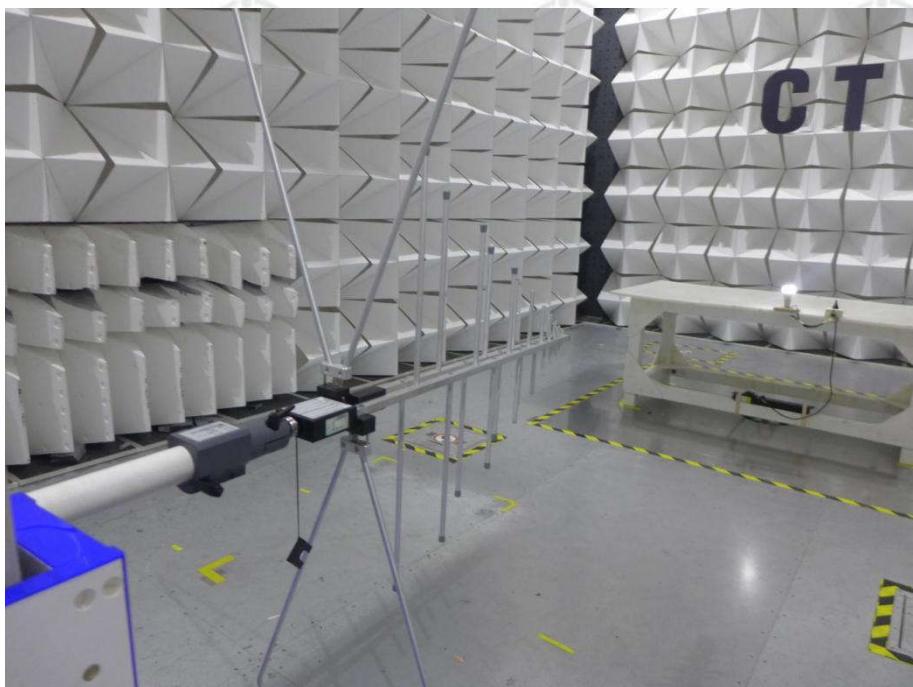
Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor- Antenna Factor-Cable Factor

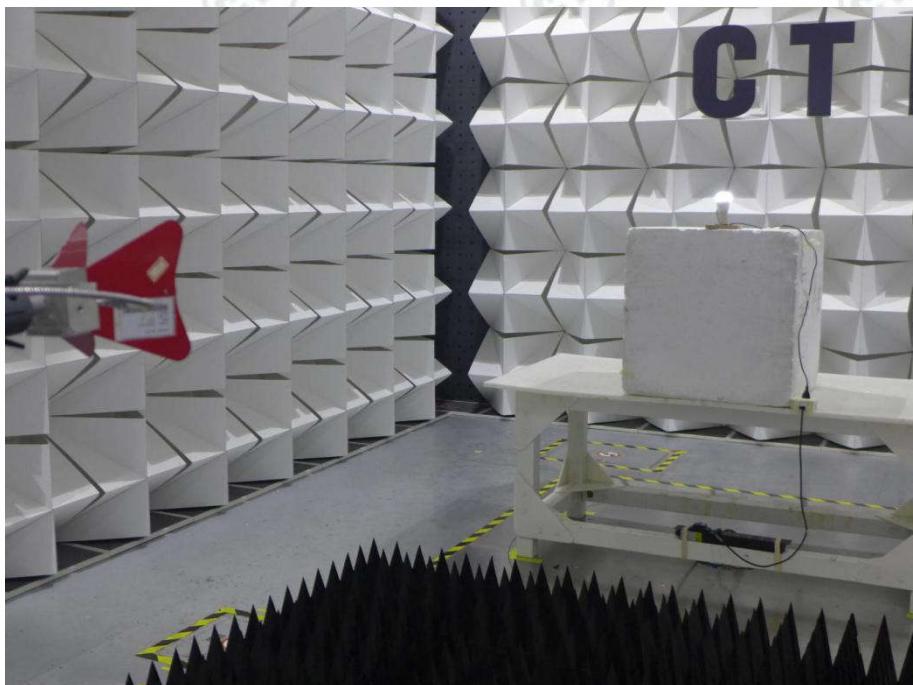
3) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

PHOTOGRAPHS OF TEST SETUP

Test mode No.: Rainbow8



Radiated spurious emission Test Setup-1(Below 1GHz)



Radiated spurious emission Test Setup-2(Above 1GHz)



Conducted Emissions Test Setup



PHOTOGRAPHS OF EUT Constructional Details

Test mode No.: Rainbow8



View of Product-1



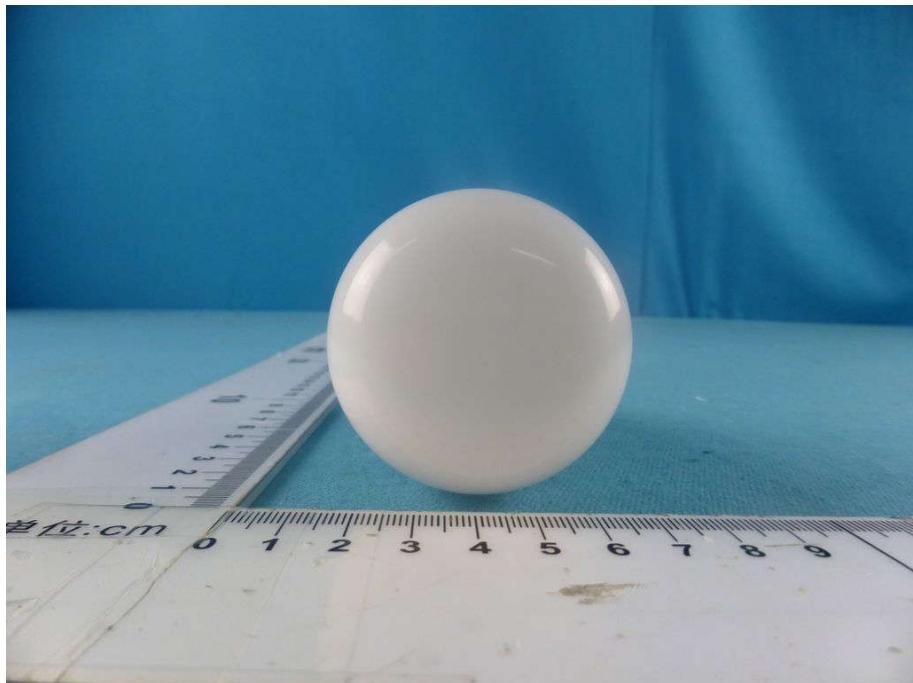
View of Product-2



View of Product-3



View of Product-4



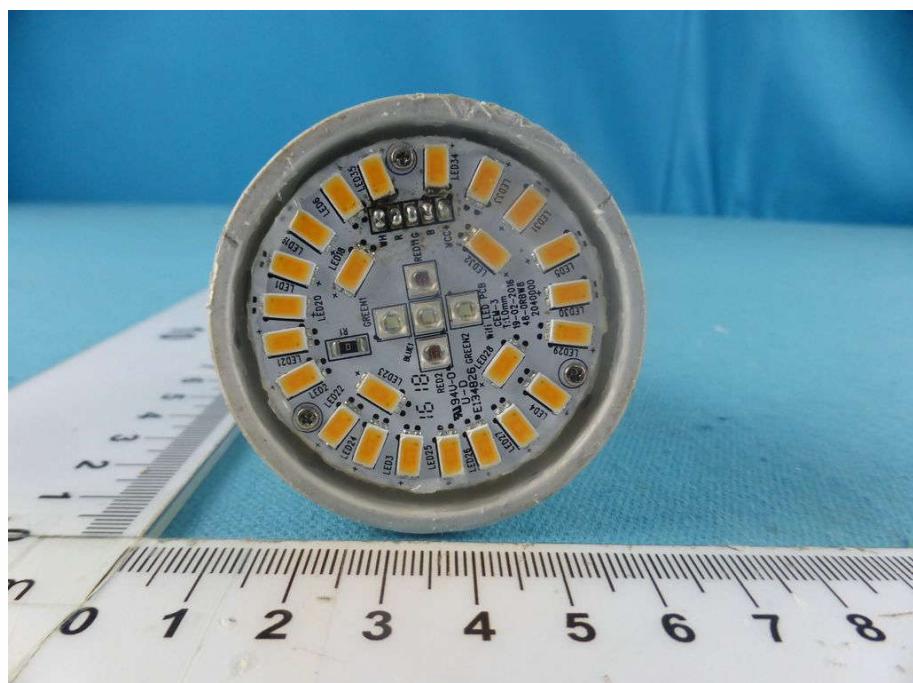
View of Product-5



View of Product-6



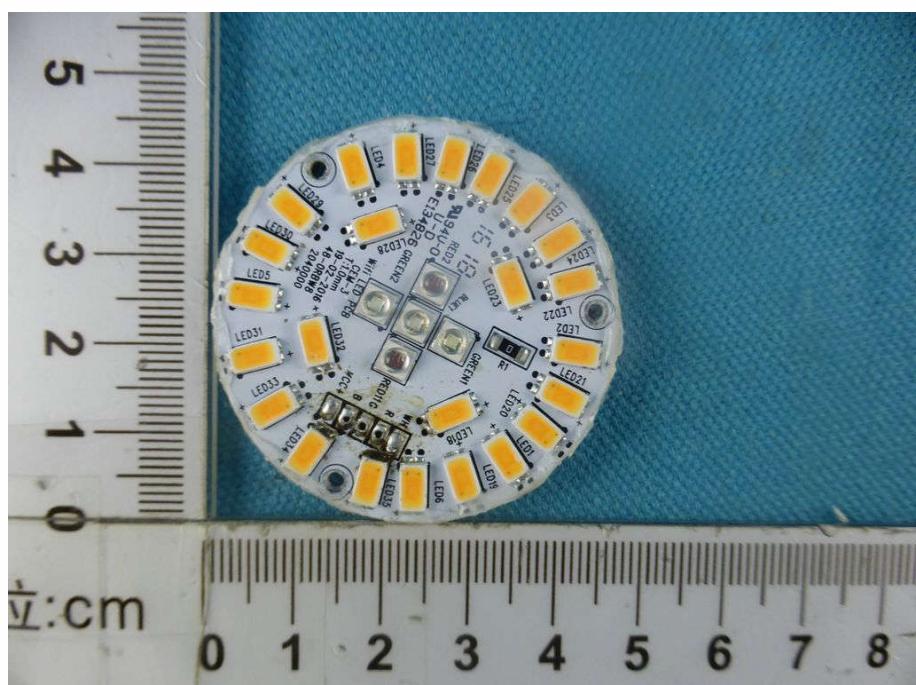
View of Product-7



View of Product-8



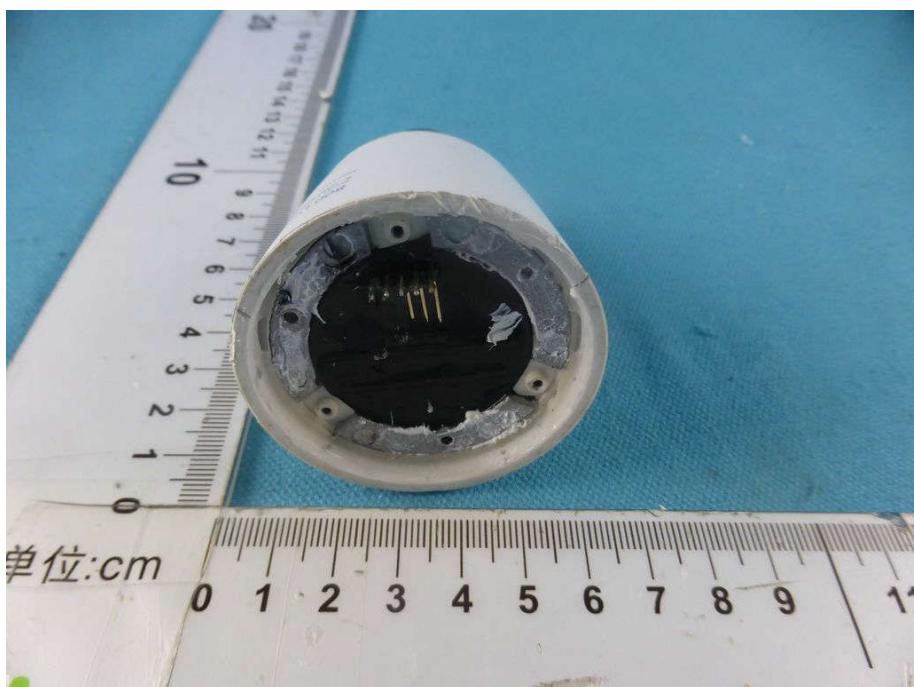
View of Product-9



View of Product-10



View of Product-11



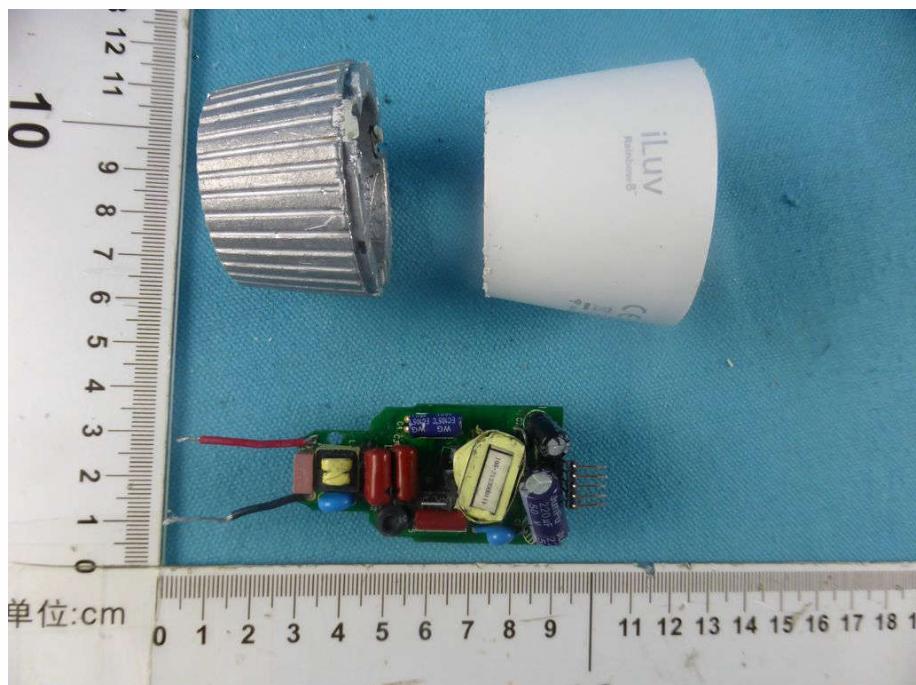
View of Product-12



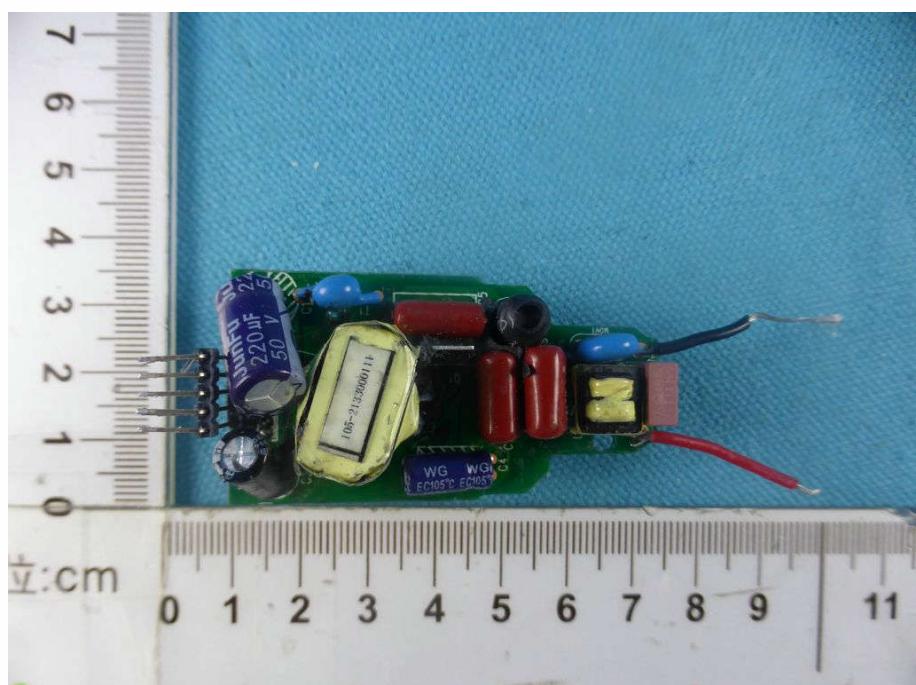
View of Product-13



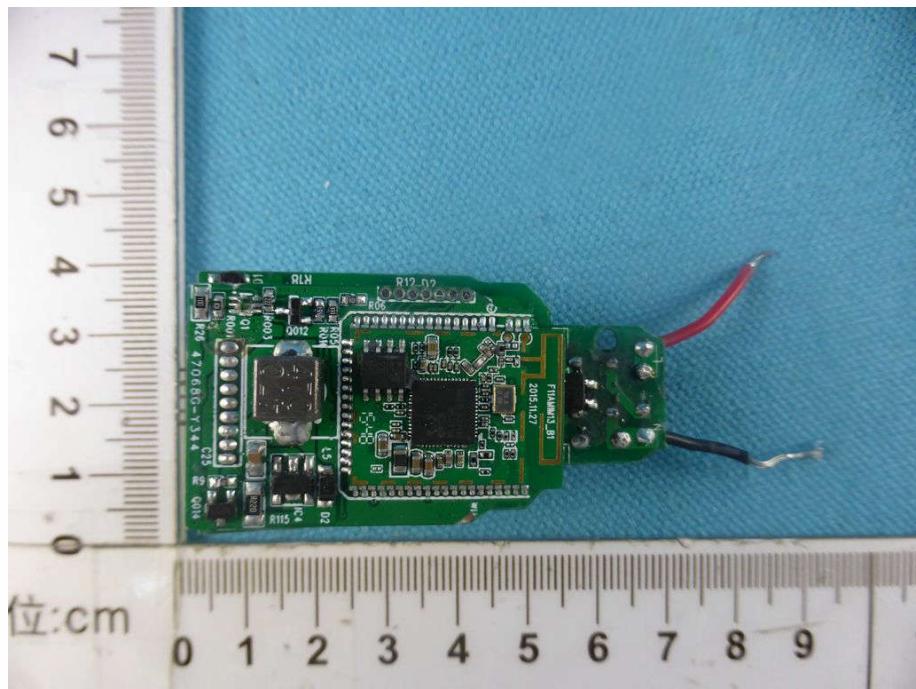
View of Product-14



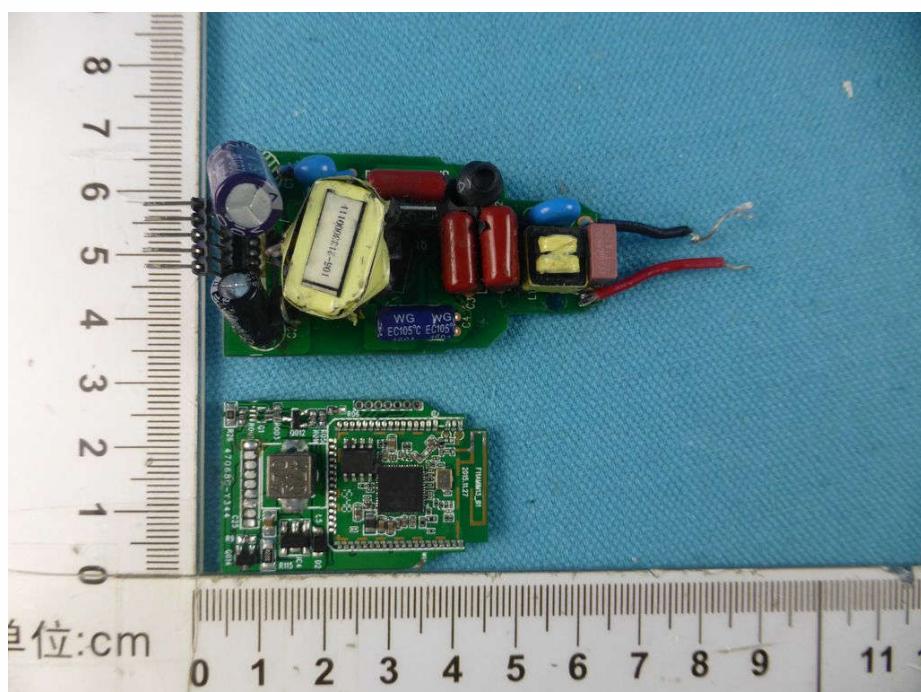
View of Product-15



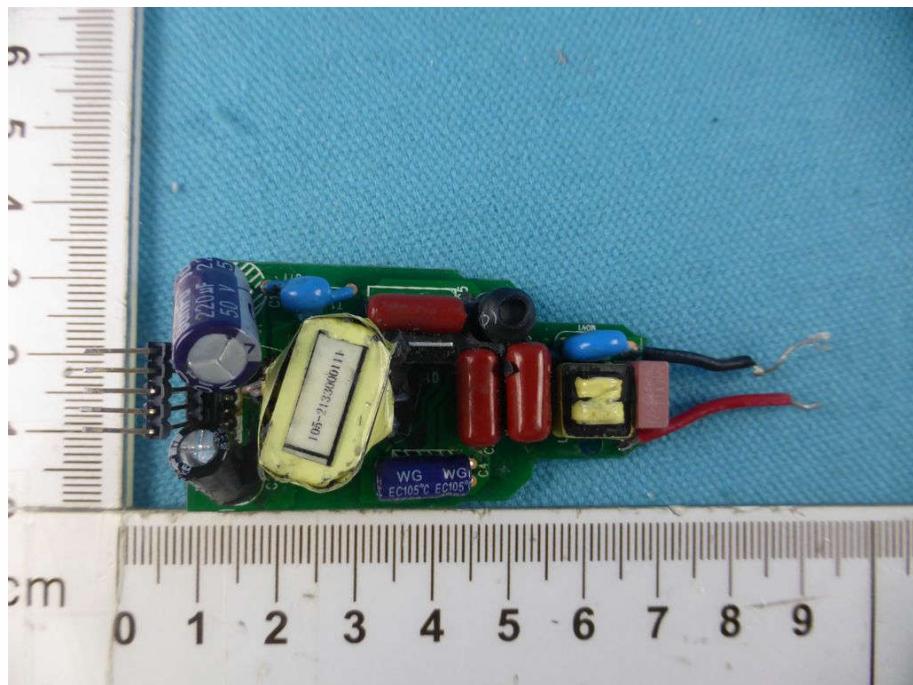
View of Product-16



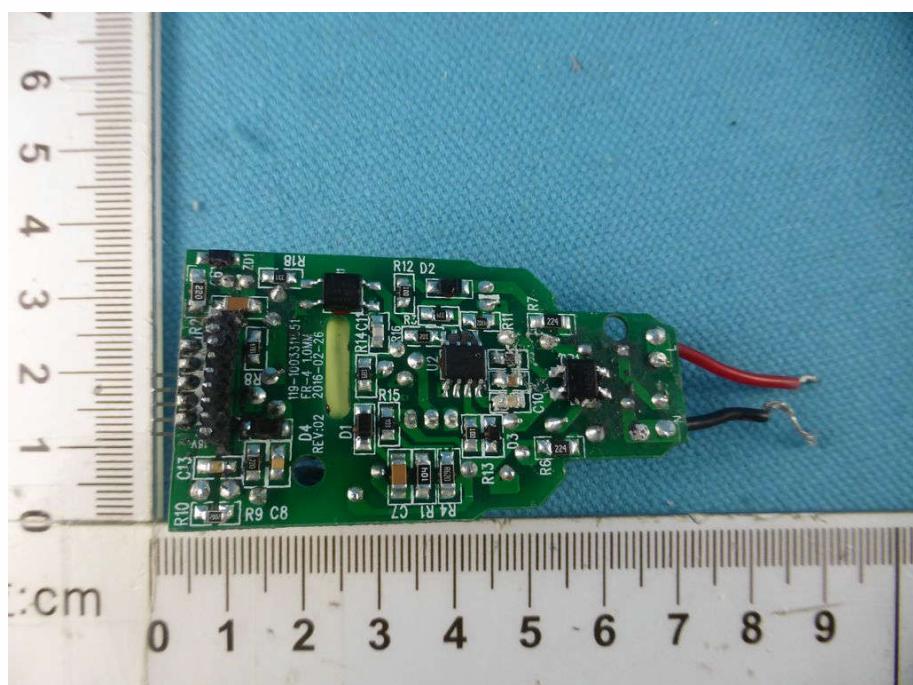
View of Product-17



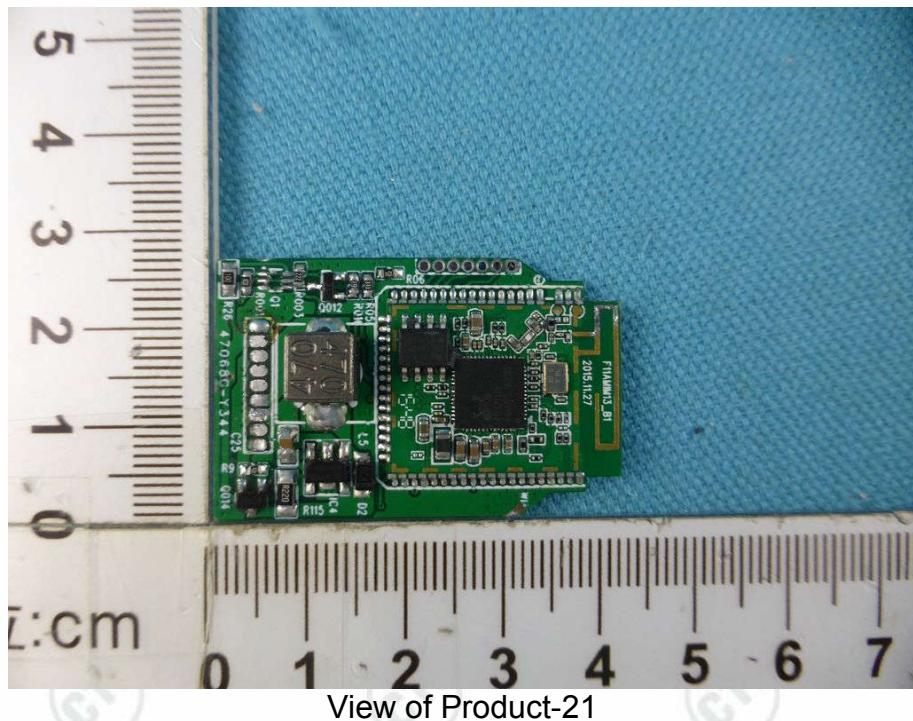
View of Product-18



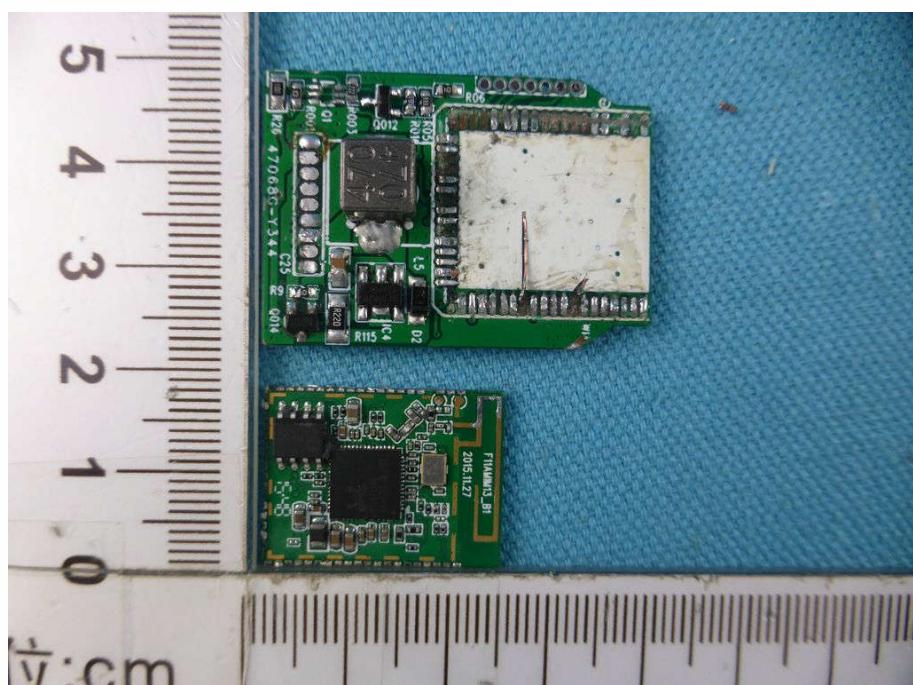
View of Product-19



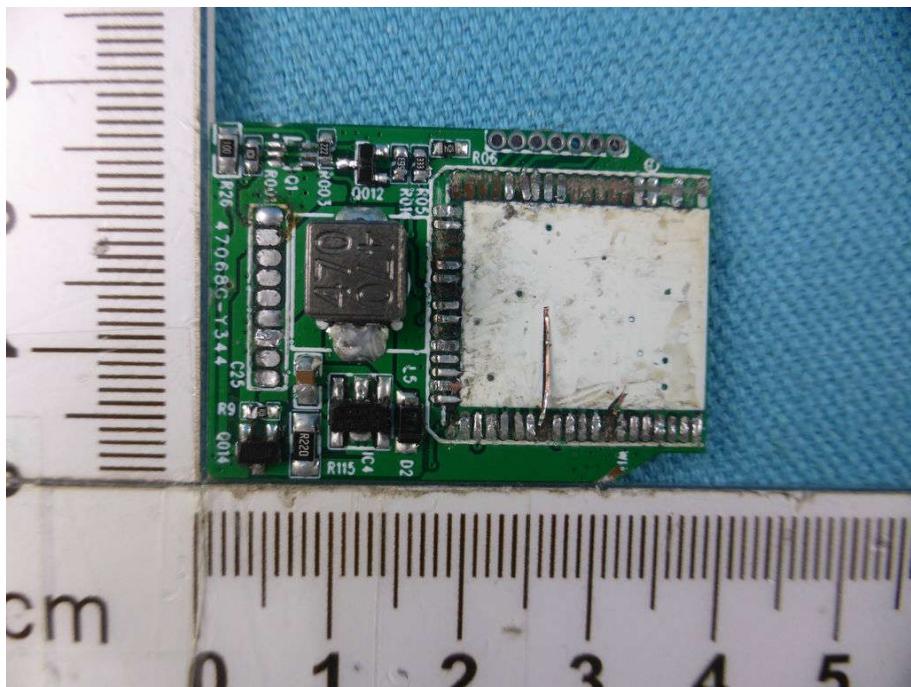
View of Product-20



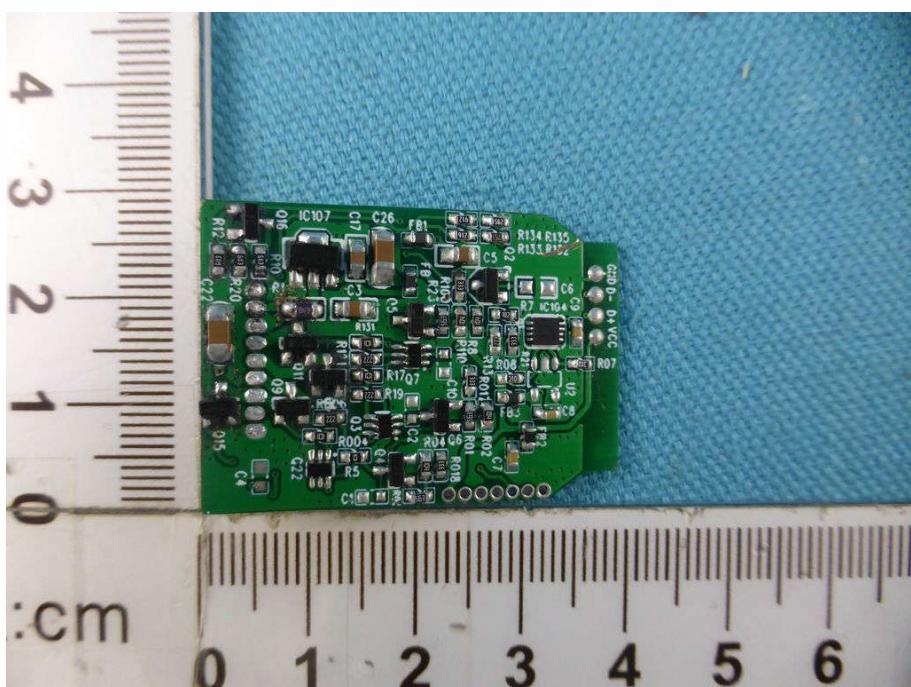
View of Product-21



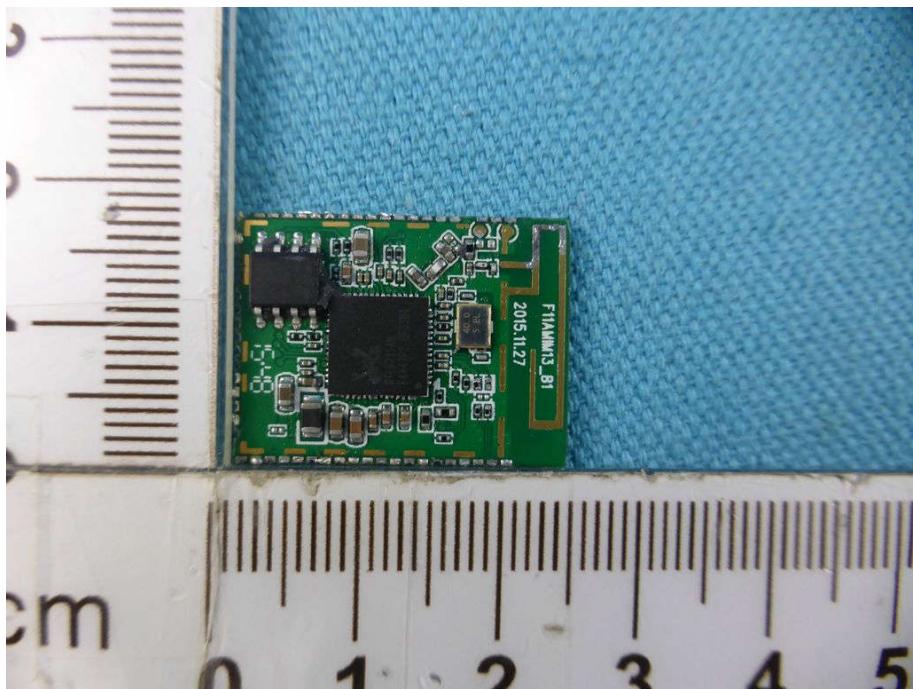
View of Product-22



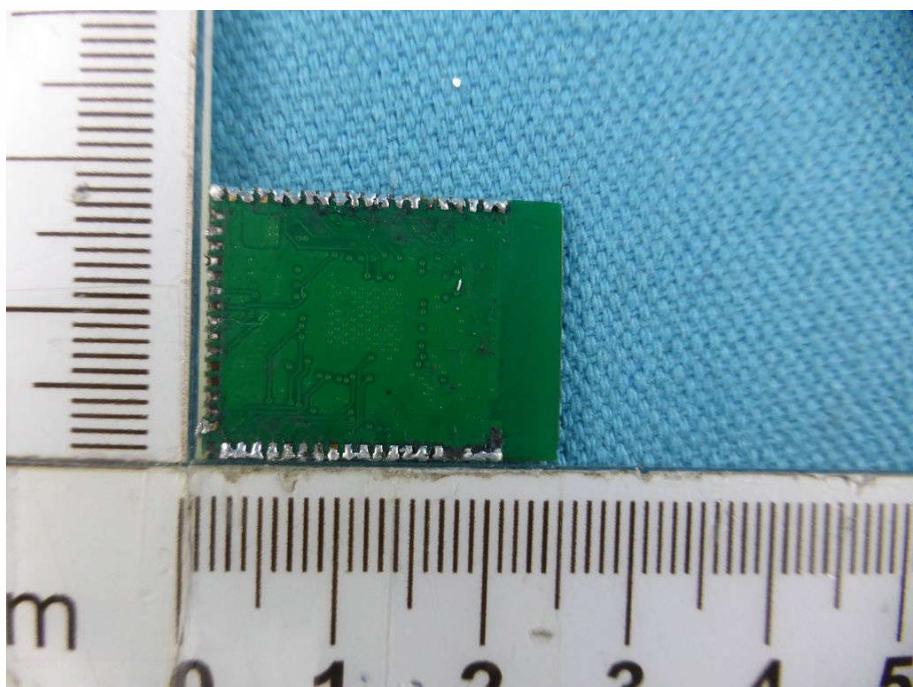
View of Product-23



View of Product-24



View of Product-25



View of Product-26

*** End of Report ***

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