

TEST REPORT

Product : WisePad 2 Plus
Trade mark : BBPOS
Model/Type reference : WPP23
Serial Number : N/A
Report Number : EED32J00113704
FCC ID : 2AB7X-WPP23
Date of Issue : Jul. 11, 2017
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

BBPOS International Limited
Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road,
Tsuen Wan, NT, Hong Kong

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Tested By:

Tom-chen

Tom chen (Test Project)

Compiled by:

Kevin Yang

Kevin yang (Project Engineer)

Reviewed by:

Ware Xin

Ware xin (Reviewer)

Approved by:

Sheek Luo

Sheek Luo (Lab supervisor)

Date:

Jul. 11, 2017

Check No.:2496595088



2 Version

Version No.	Date	Description
00	Jul. 11, 2017	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 D01v04	PASS
6dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Power Spectral Density	47 CFR Part 15 Subpart C Section 15.247 (e)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
RF Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	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 sample(s) and the sample information are provided by the client.

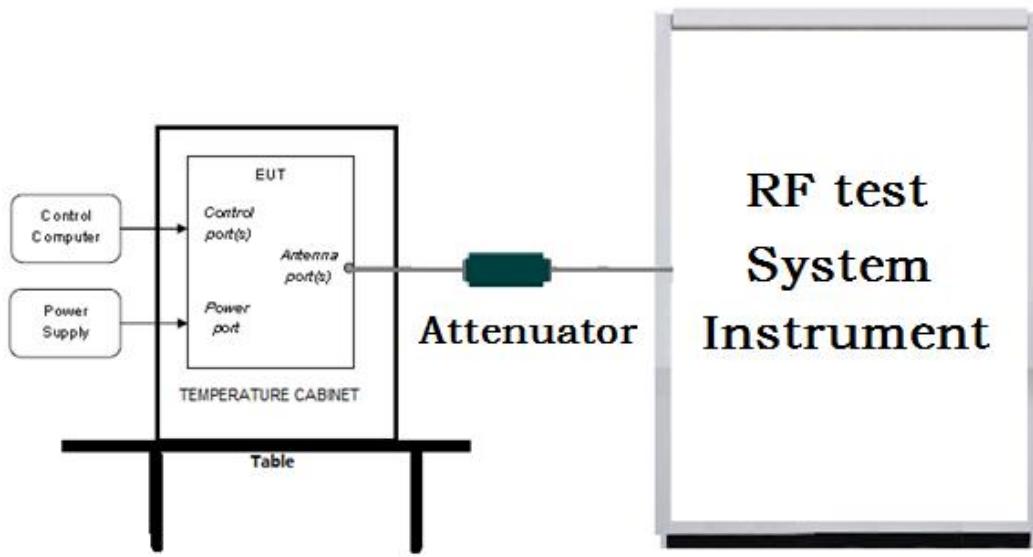
4 Content

1 COVER PAGE.....	1
2 VERSION.....	2
3 TEST SUMMARY.....	3
4 CONTENT.....	4
5 TEST REQUIREMENT.....	5
5.1 TEST SETUP.....	5
5.1.1 For Conducted test setup.....	5
5.1.2 For Radiated Emissions test setup.....	5
5.1.3 For Conducted Emissions test setup.....	6
5.2 TEST ENVIRONMENT.....	6
5.3 TEST CONDITION.....	6
6 GENERAL INFORMATION.....	7
6.1 CLIENT INFORMATION.....	7
6.2 GENERAL DESCRIPTION OF EUT.....	7
6.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD.....	7
6.4 DESCRIPTION OF SUPPORT UNITS.....	8
6.5 TEST FACILITY.....	8
6.6 DEVIATION FROM STANDARDS.....	8
6.7 ABNORMALITIES FROM STANDARD CONDITIONS.....	8
6.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	8
6.9 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2).....	8
7 EQUIPMENT LIST.....	9
8 RADIO TECHNICAL REQUIREMENTS SPECIFICATION.....	11
Appendix A): Conducted Peak Output Power.....	12
Appendix B): 6dB Occupied Bandwidth.....	13
Appendix C): Band-edge for RF Conducted Emissions.....	17
Appendix D): RF Conducted Spurious Emissions.....	20
Appendix E): Power Spectral Density.....	27
Appendix F): Antenna Requirement.....	31
Appendix G): AC Power Line Conducted Emission.....	32
Appendix H): Restricted bands around fundamental frequency (Radiated).....	35
Appendix I): Radiated Spurious Emissions.....	48
PHOTOGRAPHS OF TEST SETUP.....	56
PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS.....	58

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:

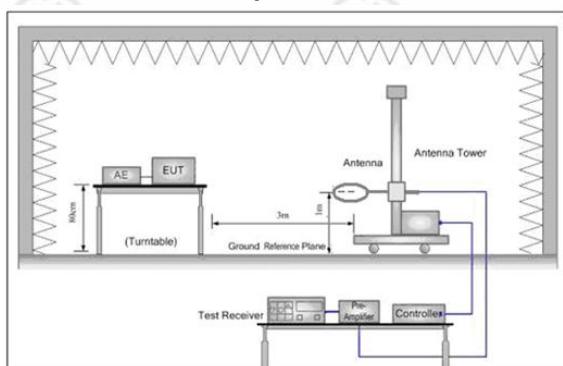


Figure 1. Below 30MHz

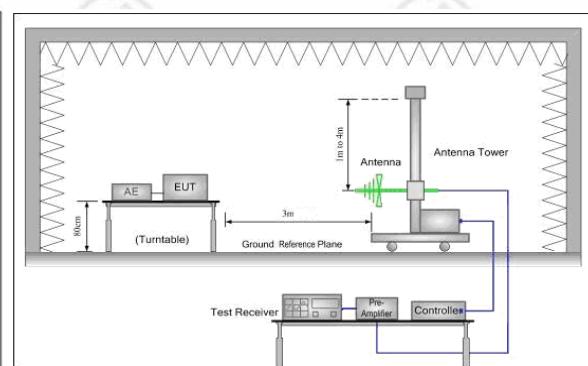


Figure 2. 30MHz to 1GHz

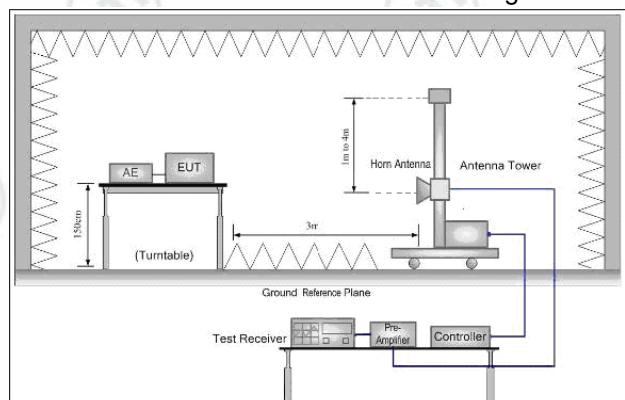
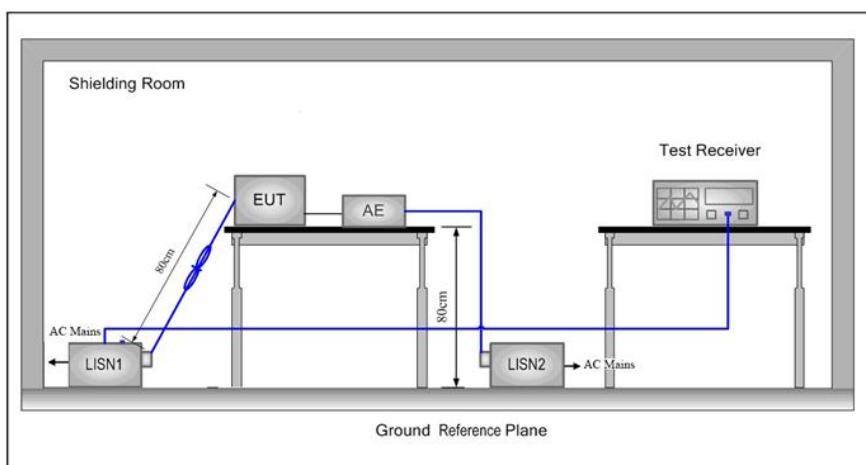


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:

Temperature:	21°C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar

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
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				802.11g			
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps	6Mbps	9Mbps	12Mbps	18Mbps
Power(dBm)	19.02	19.13	19.26	19.33	18.43	18.35	18.22	18.11
Mode	802.11n (HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power(dBm)	16.17	16.11	15.97	15.91	15.85	15.78	15.71	15.66

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);

6 General Information

6.1 Client Information

Applicant:	BBPOS International Limited
Address of Applicant:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong
Manufacturer:	BBPOS International Limited
Address of Manufacturer:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong

6.2 General Description of EUT

Product Name:	WisePad 2 Plus
Mode No.(EUT):	WPP23
Trade Mark:	BBPOS
EUT Supports Radios application:	Wlan 2.4GHz 802.11b/g/n(HT20)
Firmware version of the sample:	0.06.01.03
Hardware version of the sample:	V1.0.0
Power Supply:	DC 3.7V by Battery DC 5V by USB port
Battery	Li-polymer 3.7V, 1300mAh
Sample Received Date:	Jun. 7, 2017
Sample tested Date:	Jun. 7, 2017 to Jul. 5, 2017

6.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 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) : OFDM (64QAM, 16QAM, QPSK,BPSK)
Sample Type:	Portable
Test Power Grade:	N/A
Test Software of EUT:	BBPOS_FCC_0713 (Version: 20160713) comes from the desk of associated laptop
Antenna Type:	Monopole
Antenna Gain:	1dBi
Test Voltage:	DC 3.7V by Battery DC 5V by USB port

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		

6.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
laptop	LENOVO	E46L	FCC DOC	CTI
Mouse	L.Selectron	OP-200	FCC DOC	CTI

6.5 Test Facility

Test location

The test site a is located on *Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China*.

Test site at Centre Testing International Group Co., Ltd has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014.

The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

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.

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 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	03-13-2018
Communication test set test set	Agilent	N4010A	MY51400230	04-01-2016	03-13-2018
Spectrum Analyzer	Keysight	N9010A	MY54510339	04-01-2016	03-13-2018
Signal Generator	Keysight	N5182B	MY53051549	04-01-2016	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2018
DC Power	Keysight	E3642A	MY54436035	04-01-2016	03-31-2018
PC-1	Lenovo	R4960d	---	04-01-2016	03-31-2018
power meter & power sensor	R&S	OSP120	101374	04-01-2016	03-13-2018
RF control unit	JS Tonscend	JS0806-2	158060006	04-01-2016	03-13-2018
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	04-01-2016	03-31-2018

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	06-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-13-2018
Communication test set	R&S	CMW500	152394	04-01-2016	03-13-2018
LISN	R&S	ENV216	100098	06-16-2016	06-12-2018
LISN	schwarzbeck	NNLK8121	8121-529	06-16-2016	06-12-2018
Voltage Probe	R&S	ESH2-Z3	--	06-13-2017	06-12-2018
Current Probe	R&S	EZ17	100106	06-16-2016	06-12-2018
ISN	TESEQ GmbH	ISN T800	30297	01-29-2015	02-22-2018

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	05-22-2018
Microwave Preamplifier	Agilent	8449B	3008A02425	02-04-2016	02-15-2018
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	06-12-2018
Receiver	R&S	ESCI	100435	06-16-2016	06-13-2018
Multi device Controller	maturo	NCD/070/1071 1112	---	01-12-2016	01-11-2018
LISN	schwarzbeck	NNBM8125	81251547	06-16-2016	06-12-2018
LISN	schwarzbeck	NNBM8125	81251548	06-16-2016	06-12-2018
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-13-2018
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-13-2018
Cable line	Fulai(7M)	SF106	5219/6A	01-12-2016	01-11-2018
Cable line	Fulai(6M)	SF106	5220/6A	01-12-2016	01-11-2018
Cable line	Fulai(3M)	SF106	5216/6A	01-12-2016	01-11-2018
Cable line	Fulai(3M)	SF106	5217/6A	01-12-2016	01-11-2018
Communication test set	R&S	CMW500	152394	04-01-2016	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG1 8NM12-0398-002	---	01-12-2016	01-11-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2018
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-12-2016	01-11-2018
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-12-2016	01-11-2018
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-12-2016	01-11-2018
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	01-12-2016	01-11-2018

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	19.33	PASS
11B	MCH	18.61	PASS
11B	HCH	18.69	PASS
11G	LCH	18.43	PASS
11G	MCH	17.83	PASS
11G	HCH	17.90	PASS
11N20SISO	LCH	16.17	PASS
11N20SISO	MCH	15.56	PASS
11N20SISO	HCH	15.51	PASS

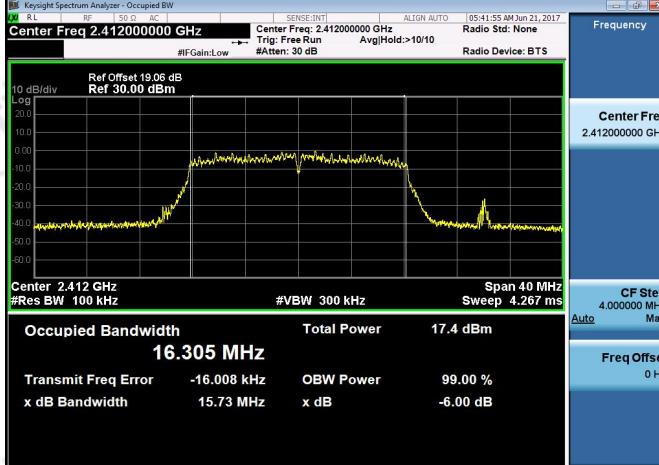
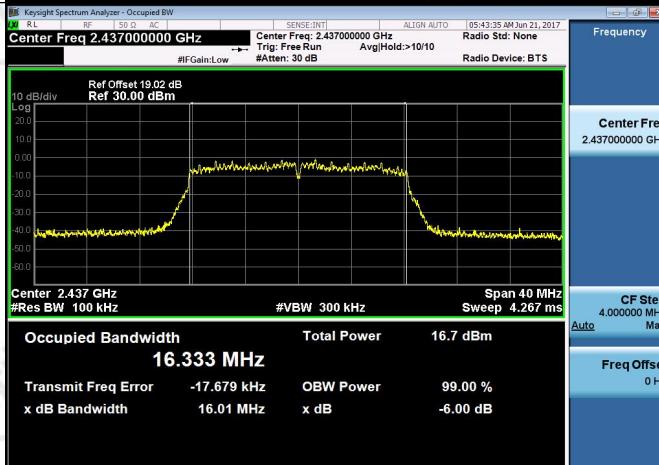
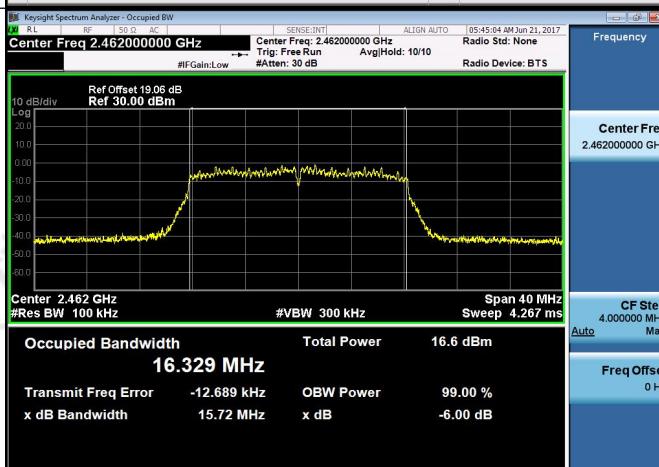
Appendix B): 6dB Occupied Bandwidth

Result Table

Mode	Channel	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict	Remark
11B	LCH	8.097	12.400	PASS	Peak detector
11B	MCH	7.546	12.392	PASS	
11B	HCH	7.761	12.386	PASS	
11G	LCH	15.730	16.305	PASS	
11G	MCH	16.010	16.333	PASS	
11G	HCH	15.720	16.329	PASS	
11N20SISO	LCH	16.340	17.516	PASS	
11N20SISO	MCH	16.400	17.546	PASS	
11N20SISO	HCH	16.340	17.509	PASS	

Test Graph



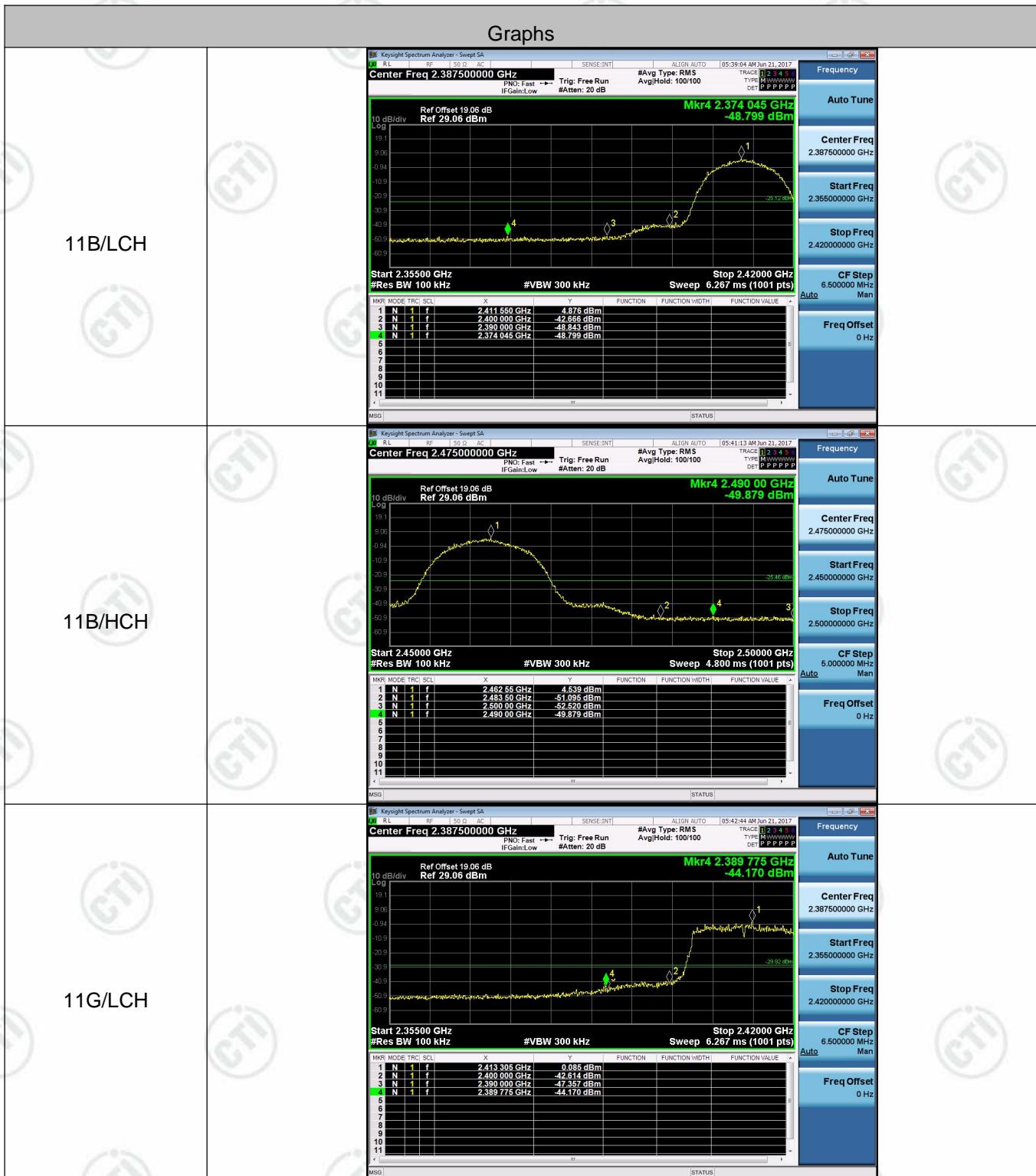
11G/LCH	 <p>Key parameters for 11G/LCH:</p> <ul style="list-style-type: none"> Center Freq: 2.412000000 GHz Occupied Bandwidth: 16.305 MHz Total Power: 17.4 dBm Transmit Freq Error: -16.008 kHz x dB Bandwidth: 15.73 MHz OBW Power: 99.00 % x dB: -6.00 dB
11G/MCH	 <p>Key parameters for 11G/MCH:</p> <ul style="list-style-type: none"> Center Freq: 2.437000000 GHz Occupied Bandwidth: 16.333 MHz Total Power: 16.7 dBm Transmit Freq Error: -17.679 kHz x dB Bandwidth: 16.01 MHz OBW Power: 99.00 % x dB: -6.00 dB
11G/HCH	 <p>Key parameters for 11G/HCH:</p> <ul style="list-style-type: none"> Center Freq: 2.462000000 GHz Occupied Bandwidth: 16.329 MHz Total Power: 16.6 dBm Transmit Freq Error: -12.689 kHz x dB Bandwidth: 15.72 MHz OBW Power: 99.00 % x dB: -6.00 dB

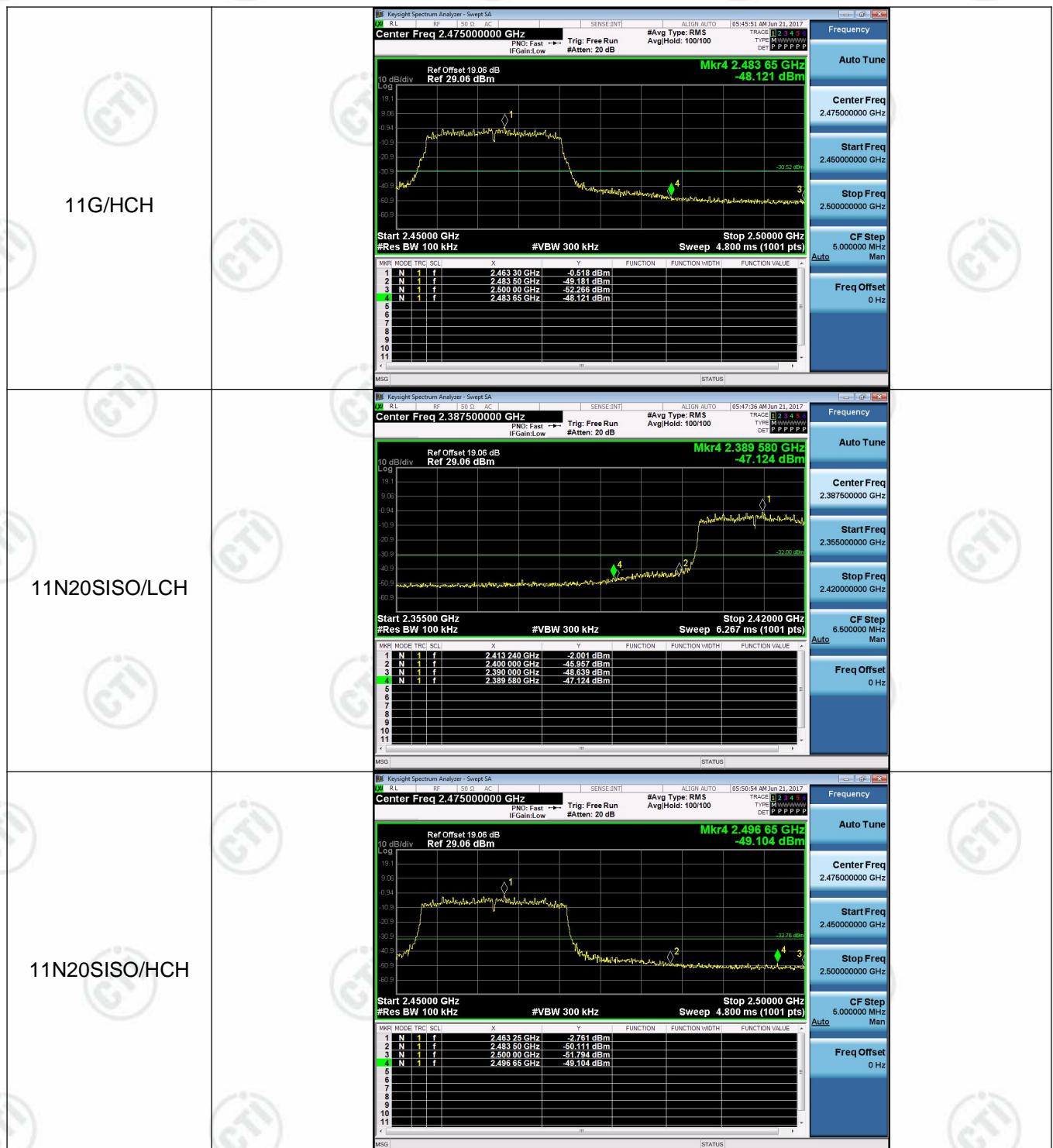
11N20SISO/LCH	<p>Key parameters for 11N20SISO/LCH:</p> <ul style="list-style-type: none"> Center Freq: 2.412000000 GHz Occupied Bandwidth: 17.516 MHz Total Power: 15.2 dBm Transmit Freq Error: -17.916 kHz x dB Bandwidth: 16.34 MHz OBW Power: 99.00 % x dB: -6.00 dB
11N20SISO/MCH	<p>Key parameters for 11N20SISO/MCH:</p> <ul style="list-style-type: none"> Center Freq: 2.437000000 GHz Occupied Bandwidth: 17.546 MHz Total Power: 14.5 dBm Transmit Freq Error: -25.504 kHz x dB Bandwidth: 16.40 MHz OBW Power: 99.00 % x dB: -6.00 dB
11N20SISO/HCH	<p>Key parameters for 11N20SISO/HCH:</p> <ul style="list-style-type: none"> Center Freq: 2.462000000 GHz Occupied Bandwidth: 17.509 MHz Total Power: 14.5 dBm Transmit Freq Error: -24.697 kHz x dB Bandwidth: 16.34 MHz OBW Power: 99.00 % x dB: -6.00 dB

Appendix C): Band-edge for RF Conducted Emissions**Result Table**

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	4.876	-48.799	-25.12	PASS
11B	HCH	4.539	-49.879	-25.46	PASS
11G	LCH	0.085	-44.170	-29.92	PASS
11G	HCH	-0.518	-48.121	-30.52	PASS
11N20SISO	LCH	-2.001	-47.124	-32.00	PASS
11N20SISO	HCH	-2.761	-49.104	-32.76	PASS

Test Graph



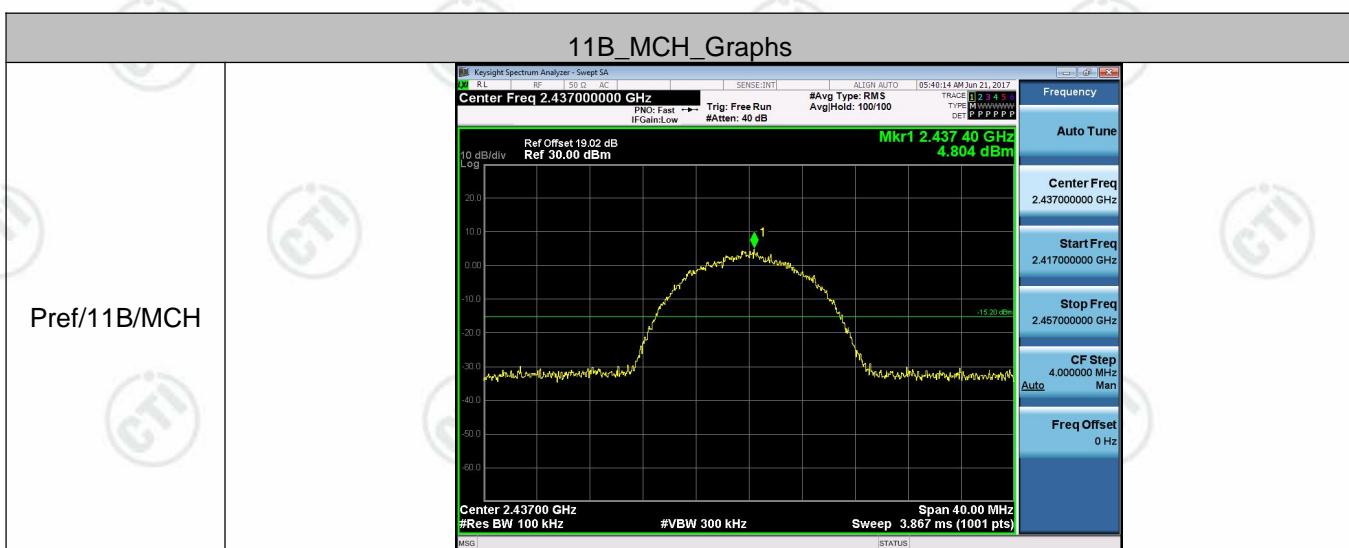
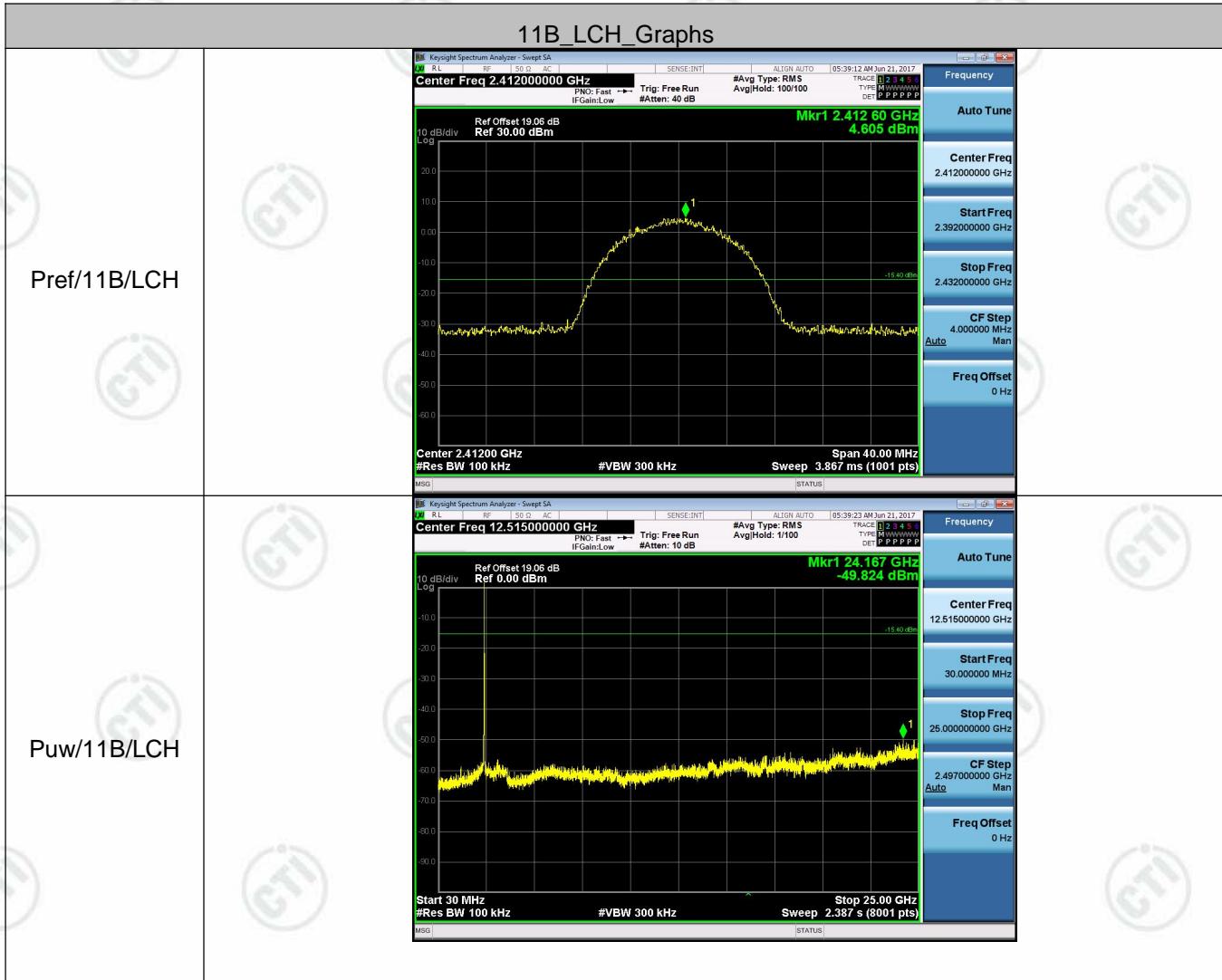


Appendix D): RF Conducted Spurious Emissions

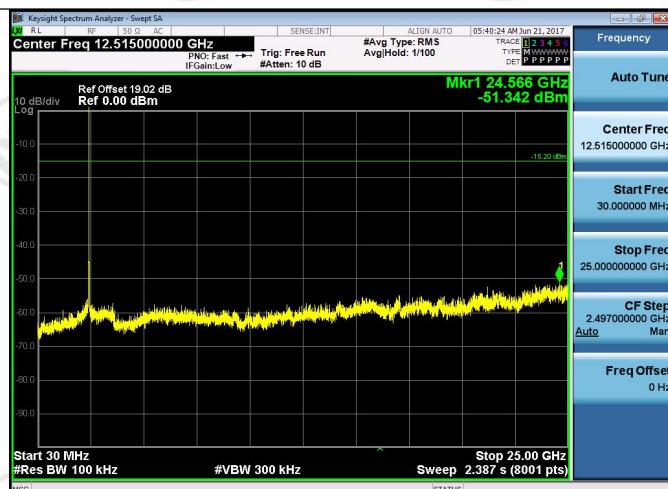
Result Table

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
11B	LCH	4.605	<Limit	PASS
11B	MCH	4.804	<Limit	PASS
11B	HCH	5.000	<Limit	PASS
11G	LCH	-0.134	<Limit	PASS
11G	MCH	-0.574	<Limit	PASS
11G	HCH	-0.395	<Limit	PASS
11N20SISO	LCH	-1.926	<Limit	PASS
11N20SISO	MCH	-2.773	<Limit	PASS
11N20SISO	HCH	-2.712	<Limit	PASS

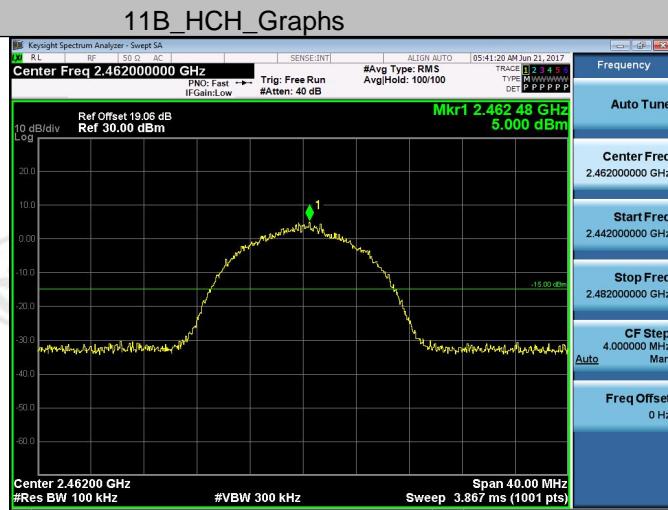
Test Graph



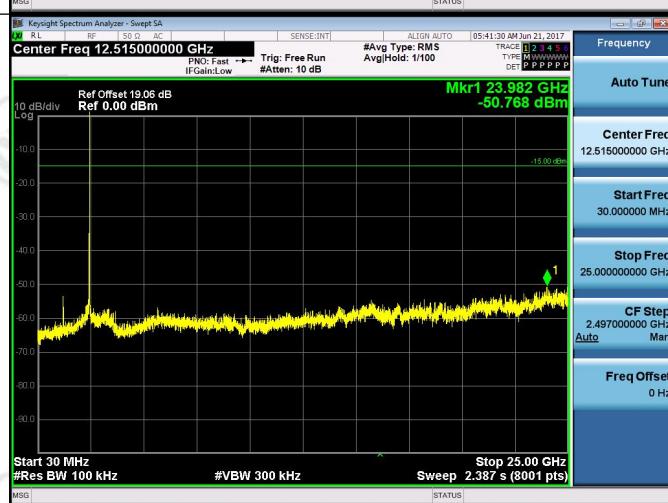
Puw/11B/MCH

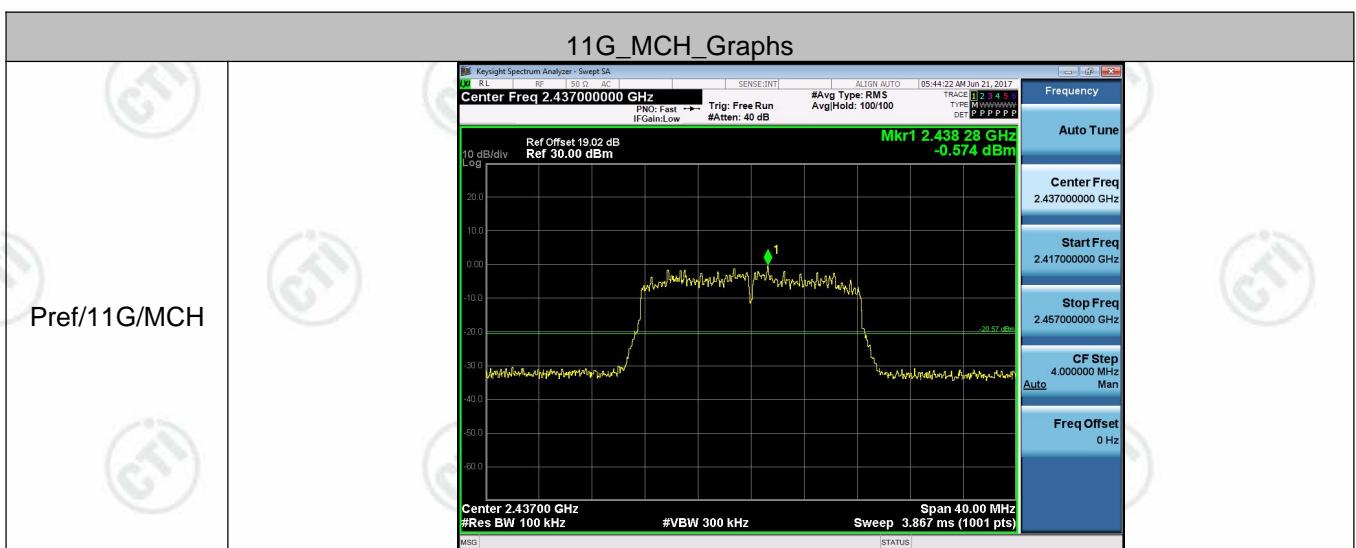
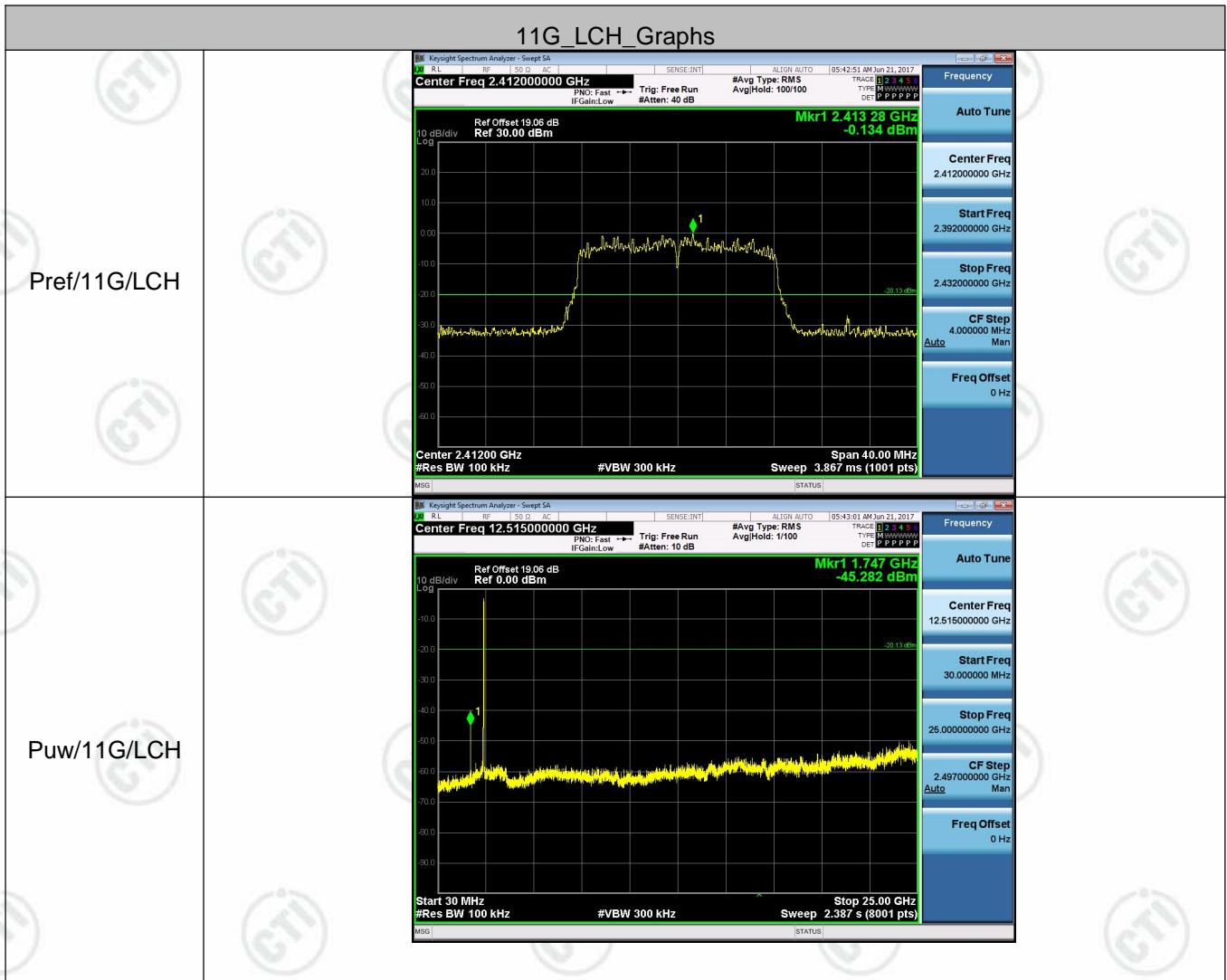


Pref/11B/HCH

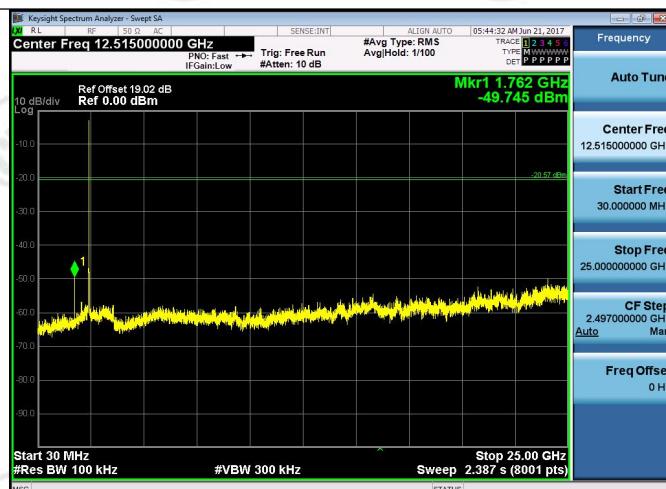


Puw/11B/HCH

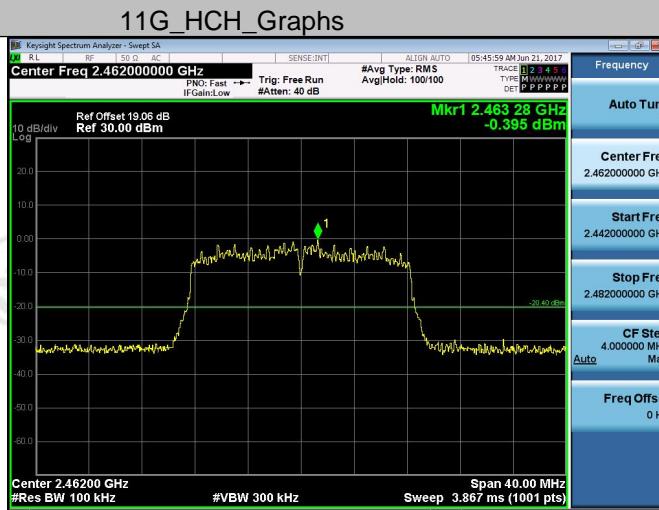




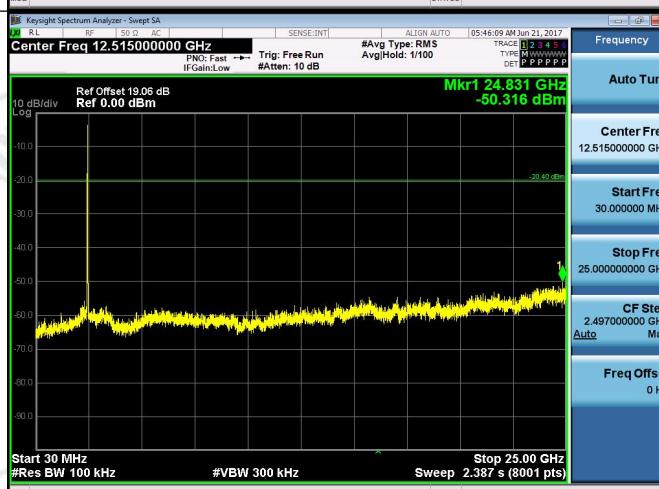
Puw/11G/MCH

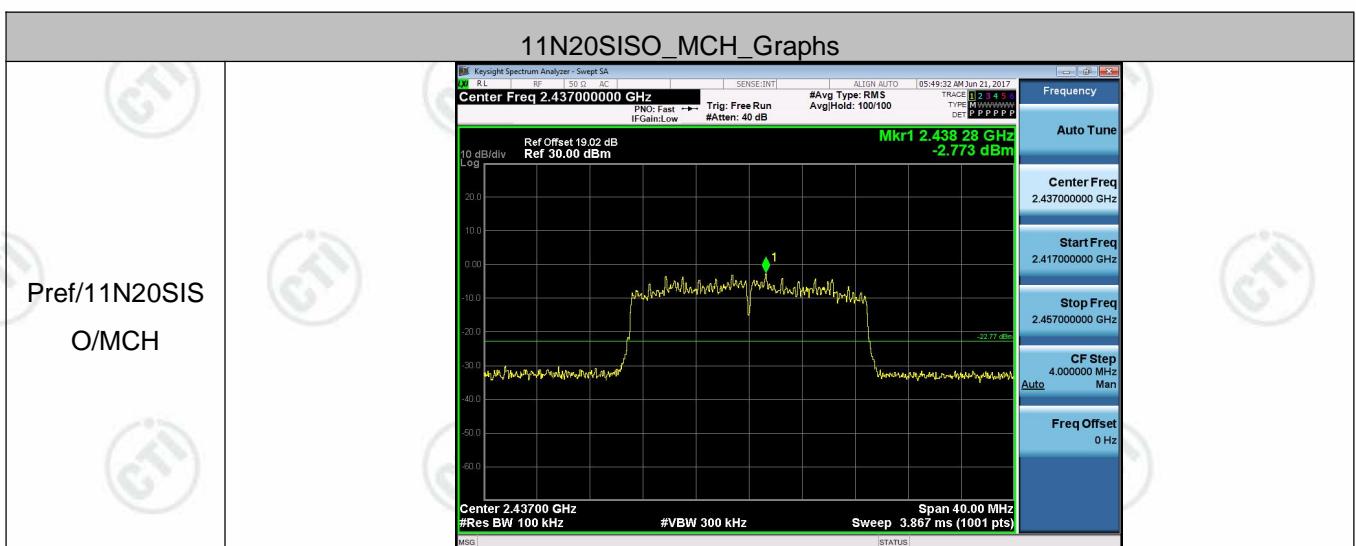
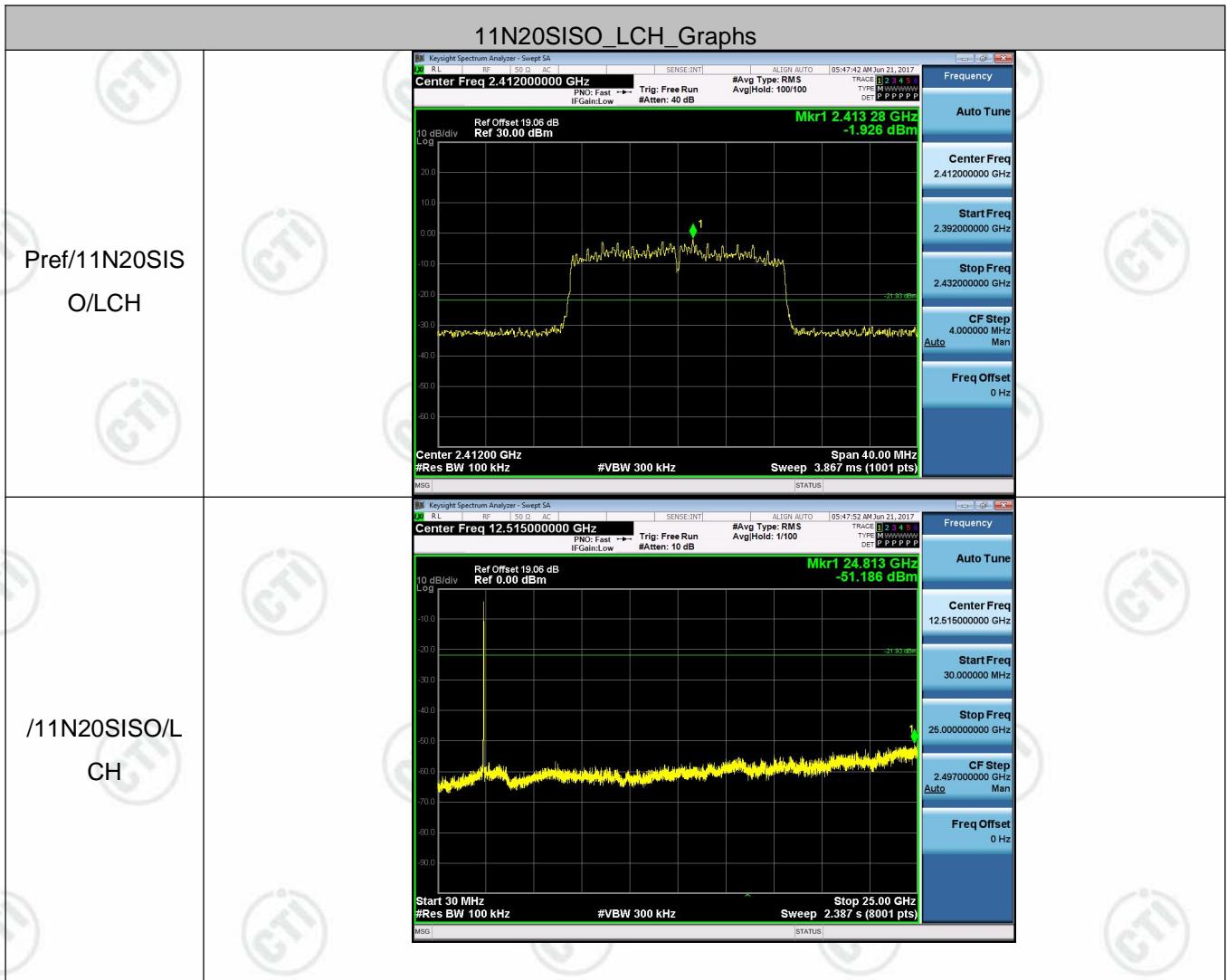


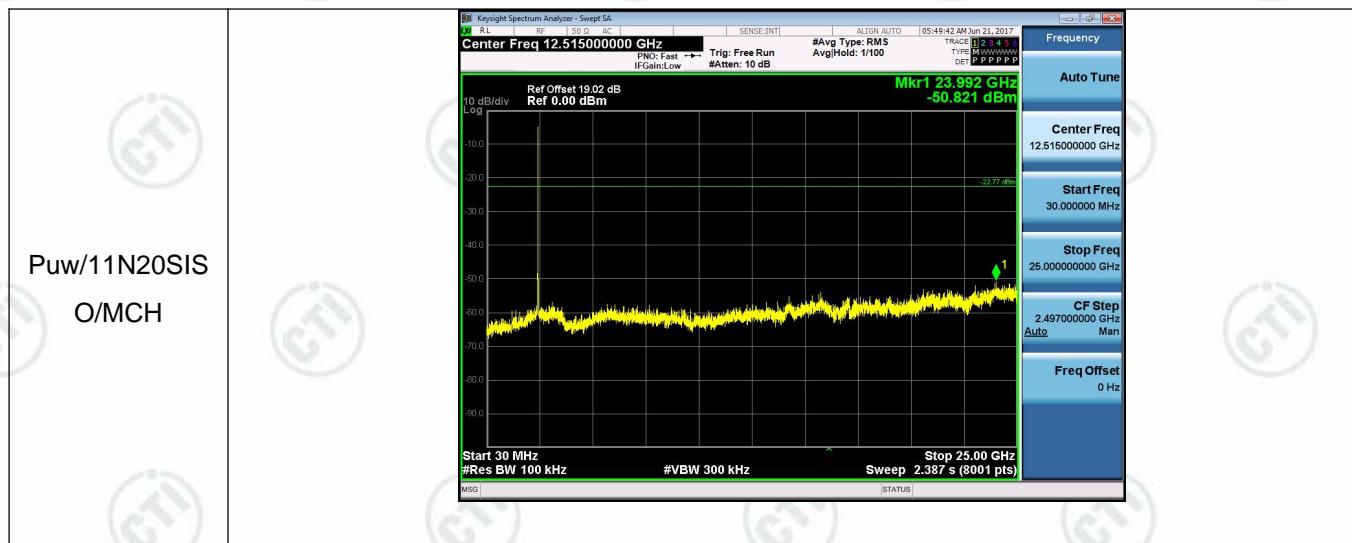
Pref/11G/HCH



Puw/11G/HCH







Appendix E): Power Spectral Density

Result Table

Mode	Channel	Power Spectral Density [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	LCH	-10.234	≤8	PASS
11B	MCH	-10.761	≤8	PASS
11B	HCH	-10.852	≤8	PASS
11G	LCH	-14.078	≤8	PASS
11G	MCH	-16.392	≤8	PASS
11G	HCH	-15.493	≤8	PASS
11N20SISO	LCH	-17.041	≤8	PASS
11N20SISO	MCH	-17.292	≤8	PASS
11N20SISO	HCH	-18.310	≤8	PASS

Test Graph

