

TEST REPORT

Product : ECH relay
Trade mark : ECH
Model/Type reference : Refer to chapter 3
Serial Number : N/A
Report Number : EED32J00120203
FCC ID : 2AJOC-EHC1
Date of Issue: : Oct. 20, 2017
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

ECH (Changzhou) Medical Instrument Co., Ltd.
No. 65, West Huiling Rd., Zouqu County Zhonglou
District, Changzhou, Jiangsu

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 lan

Kevin lan (Project Engineer)

Reviewed by:

Kevin Yang

Kevin yang (Reviewer)

Approved by:

Sheek Luo

Sheek Luo (Lab supervisor)

Date:

Oct. 20, 2017

Check No.: :2827502834



2 Version

Version No.	Date	Description
00	Oct. 20, 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	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10-2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10-2013	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: The tested sample(s) and the sample information are provided by the client.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

According to whether there are Ethernet, they can be divided into two categories. There are the Ethernet for one kind, the other kind without Ethernet. The models without the Ethernet, there will be the Bluetooth and WLAN. The models with the Ethernet also have Bluetooth and WLAN. but if the Ethernet is connected to the router, the WLAN will can't transfer data by firmware. Except the color and the appearance are different, all of them are the same.

The Model No. Below with the Ethernet, only the model ECH-c1-WLSD-C was tested, since except the color of appearance are different, all the others are the same.

Model No.: ECH-c1-WLSD-C, ECH-c1-WLSD-B, ECH-c1-WL-C, ECH-c1-WL-B, ECH-c1-WLD-B, ECH-c1-WLD-C, ECH-c1-WSD-B, ECH-c1-WSD-C, ECH-c1-W-B, ECH-c1-W-C, ECH-c1-WD-C, ECH-c1-WD-B.

The Model No. Below without the Ethernet, only the model ECH-c1-LSD-C was tested, except the color of appearance are different, all the others are the same.

Model No.: ECH-c1-LSD-C, ECH-c1-LSD-B, ECH-c1-L-C, ECH-c1-L-B, ECH-c1-LD-C, ECH-c1-LD-B.

The model ECH-c1-WLSD-C were fully tested, the model ECH-c1-LSD-C was only tested the Output Power and the Radiated Spurious Emissions, other tests data please refer to the model ECH-c1-WLSD-C.

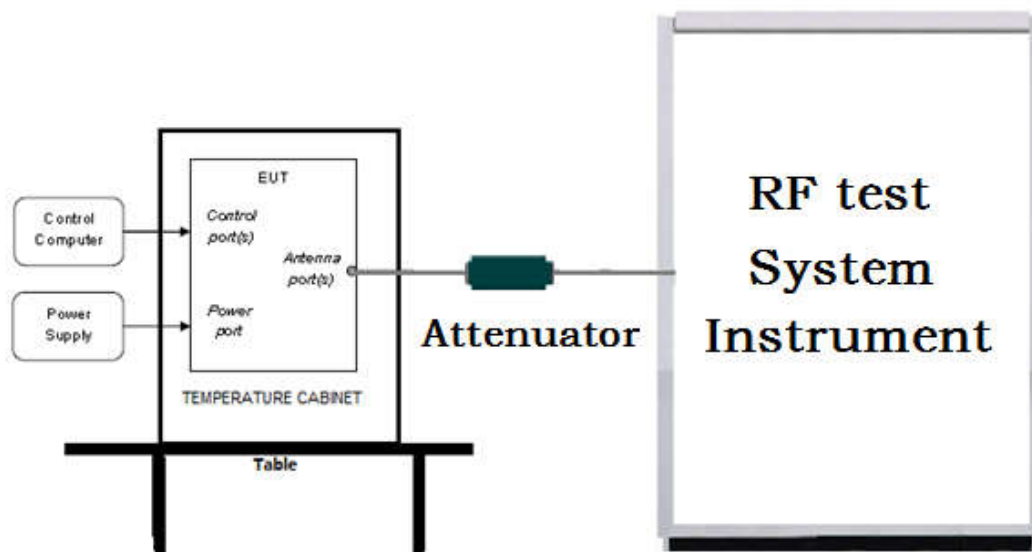
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

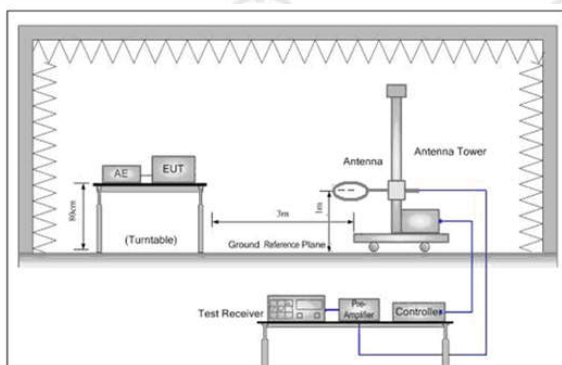


Figure 1. Below 30MHz

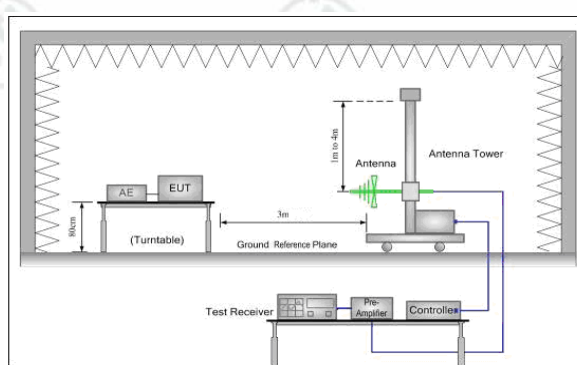


Figure 2. 30MHz to 1GHz

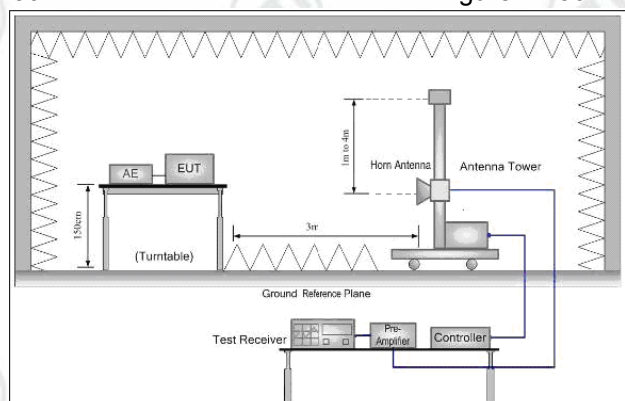
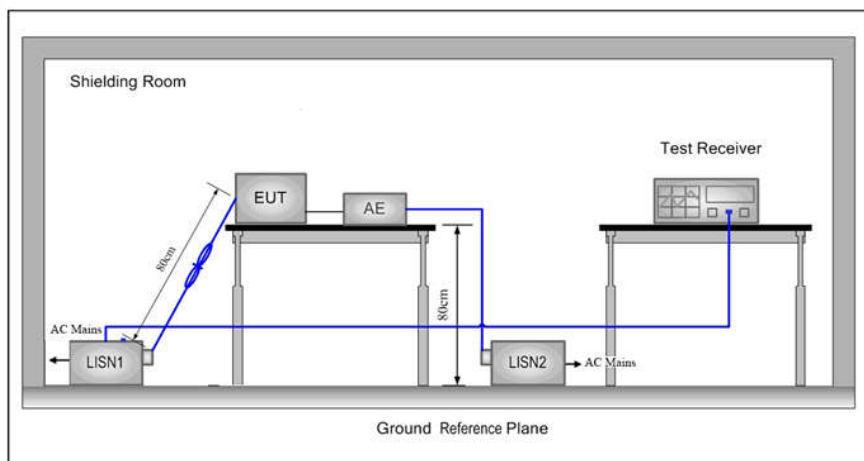


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	25.4 °C
Humidity:	51 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	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 in transmitting mode with all kind of modulation and all kind of data rate.			

Test mode:

Pre-scan under all rate at lowest channel 1

Mode	802.11b							
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
Power(dBm)	17.01	17.19	17.31	17.43				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power(dBm)	21.61	21.50	21.39	21.22	21.10	20.98	20.91	20.84
Mode	802.11n (HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power(dBm)	21.50	21.40	21.29	21.14	21.03	20.95	20.88	20.72

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:	ECH (Changzhou) Medical Instrument Co., Ltd.
Address of Applicant:	No. 65, West Huiling Rd., Zouqu County Zhonglou District, Changzhou, Jiangsu
Manufacturer:	ECH (Changzhou) Medical Instrument Co., Ltd.
Address of Manufacturer:	No. 65, West Huiling Rd., Zouqu County Zhonglou District, Changzhou, Jiangsu
Factory:	Shanghai Chenguo Electronic Technology Co., Ltd.
Address of Factory:	Shanghai Fengxian Fengpu Industrial Zone, 518 Far East Road

6.2 General Description of EUT

Product Name:	ECH relay
Model No.(EUT):	Refer to chapter 3
Test Mode No.:	ECH-c1-WLSD-C,ECH-c1-LSD-C
Trade Mark:	ECH
EUT Supports Radios application	BT: 4.0 BT Signal mode, 2402-2480MHz Wi-Fi: 802.11 b/g/n(20M), 2412MHz-2462MHz
Power Supply:	DC 5V by USB port
USB Micro-B Plug cable:	137.5cm(Unshielded)
Sample Received Date:	Jun. 16, 2017
Sample tested Date:	Jun. 16, 2017 to Sep. 13, 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)						
Test Power Grade:	N/A						
Test Software of EUT:	N/A						
Antenna Type and Gain:	Antenna Type: PCB antenna, Gain: 3dBi						
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		

6.4 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name		Manufacture	model	serial number	Supplied by
AE1	Power Adapter	TIANYIN electronics CO., LTD.	TPA-46050200UU	N/A	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, China518101

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

No tests were sub-contracted.

FCC Designation No.: CN1164

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	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Communication test set test set	Agilent	N4010A	MY51400230	03-14-2017	03-13-2018
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-14-2017	03-13-2018
Signal Generator	Keysight	N5182B	MY53051549	03-14-2017	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-11-2017	01-10-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-11-2017	01-10-2018
DC Power	Keysight	E3642A	MY54436035	03-14-2017	03-13-2018
PC-1	Lenovo	R4960d	---	04-01-2017	03-31-2018
power meter & power sensor	R&S	OSP120	101374	03-14-2017	03-13-2018
RF control unit	JS Tonscend	JS0806-2	158060006	03-14-2017	03-13-2018
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	03-14-2017	03-13-2018

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100009	06-14-2017	06-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	03-14-2017	03-13-2018
Communication test set	R&S	CMW500	152394	03-14-2017	03-13-2018
LISN	R&S	ENV216	100098	06-13-2017	06-12-2018
LISN	schwarzbeck	NNLK8121	8121-529	06-13-2017	06-12-2018
Voltage Probe	R&S	ESH2-Z3	--	06-13-2017	06-11-2020
Current Probe	R&S	EZ17	100106	06-13-2017	06-12-2018
ISN	TESEQ GmbH	ISN T800	30297	02-23-2017	02-22-2018

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model 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	SCHWARZBEC K	VULB9163	9163-484	05-23-2017	05-22-2018
Microwave Preamplifier	Agilent	8449B	3008A02425	02-16-2017	02-15-2018
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015	07-18-2018
Loop Antenna	ETS	6502	00071730	06-22-2017	06-21-2019
Microwave Preamplifier	A.H.SYSTEMS	PAP-1840-60	6041.6042	06-30-2015	06-28-2018
Horn Antenna	A.H.SYSTEMS	SAS-574 374	---	06-30-2015	06-28-2018
Spectrum Analyzer	R&S	FSP40	100416	06-13-2017	06-12-2018
Receiver	R&S	ESCI	100435	06-14-2017	06-13-2018
Multi device Controller	maturo	NCD/070/10711 112	---	01-11-2017	01-10-2018
LISN	schwarzbeck	NNBM8125	81251547	06-13-2017	06-12-2018
LISN	schwarzbeck	NNBM8125	81251548	06-13-2017	06-12-2018
Signal Generator	Agilent	E4438C	MY45095744	03-14-2017	03-13-2018
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	03-14-2017	03-13-2018
Cable line	Fulai(7M)	SF106	5219/6A	01-11-2017	01-10-2018
Cable line	Fulai(6M)	SF106	5220/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5216/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5217/6A	01-11-2017	01-10-2018
Communication test set	R&S	CMW500	152394	03-14-2017	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-11-2017	01-10-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	01-11-2017	01-10-2018

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 Unlicensed 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

Test Model No.:ECH-c1-WLSD-C

Result Table

Mode	Channel	Conducted Peak Output Power [dBm]	Verdict
11B	LCH	17.43	PASS
11B	MCH	16.78	PASS
11B	HCH	15.68	PASS
11G	LCH	21.61	PASS
11G	MCH	21.21	PASS
11G	HCH	20.30	PASS
11N20SISO	LCH	21.50	PASS
11N20SISO	MCH	21.10	PASS
11N20SISO	HCH	20.28	PASS

Test Model No.:ECH-c1-LSD-C

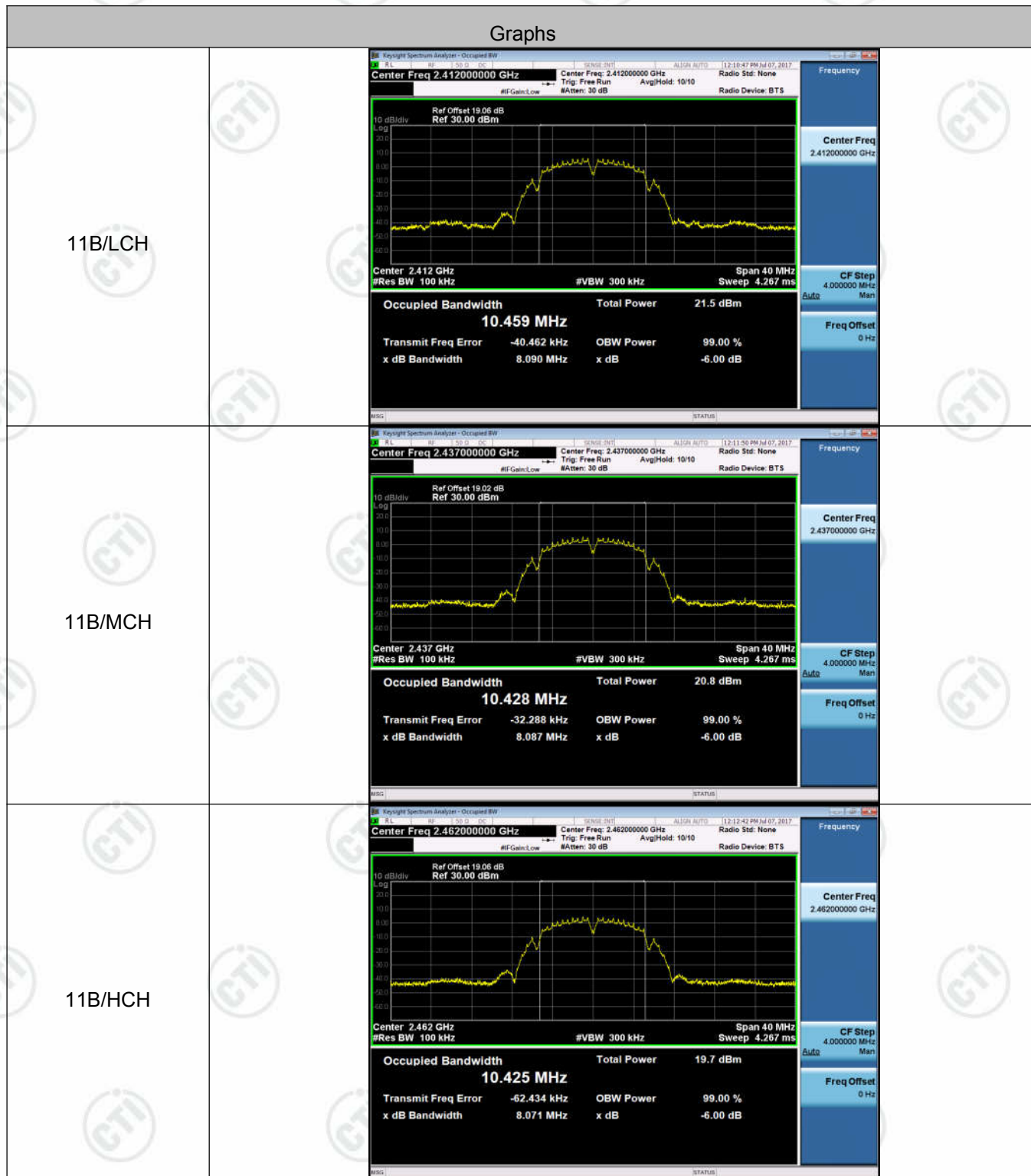
Result Table

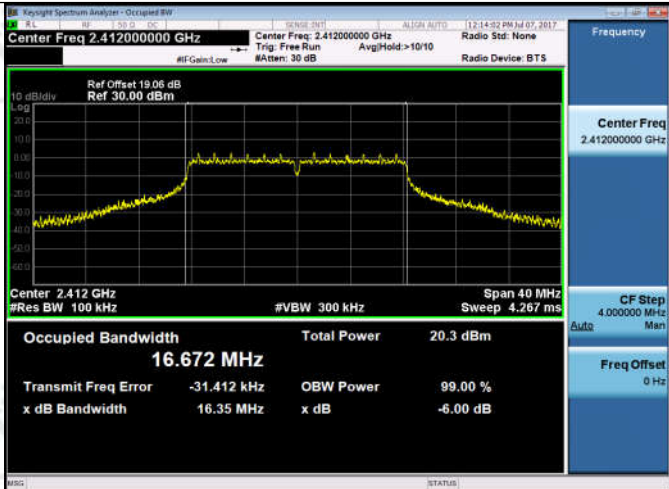
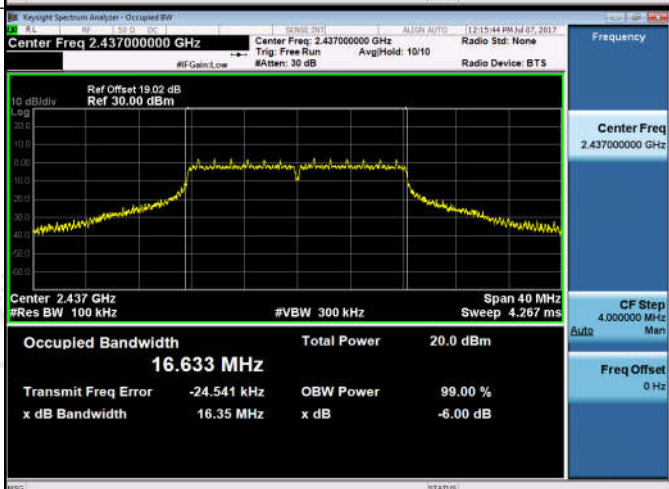
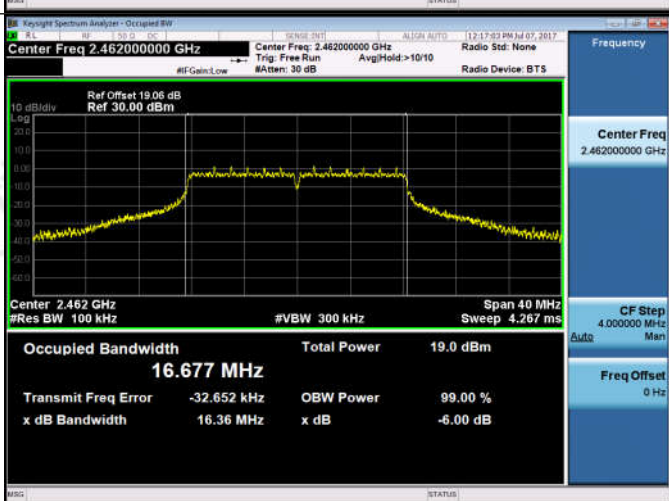
Mode	Channel	Conducted Peak Output Power [dBm]	Verdict
11B	LCH	16.67	PASS
11B	MCH	16.28	PASS
11B	HCH	14.58	PASS
11G	LCH	19.82	PASS
11G	MCH	19.68	PASS
11G	HCH	19.15	PASS
11N20SISO	LCH	20.12	PASS
11N20SISO	MCH	19.84	PASS
11N20SISO	HCH	19.21	PASS

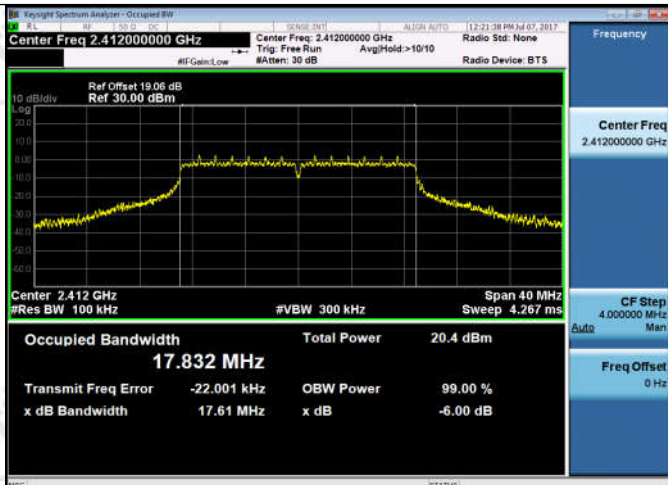
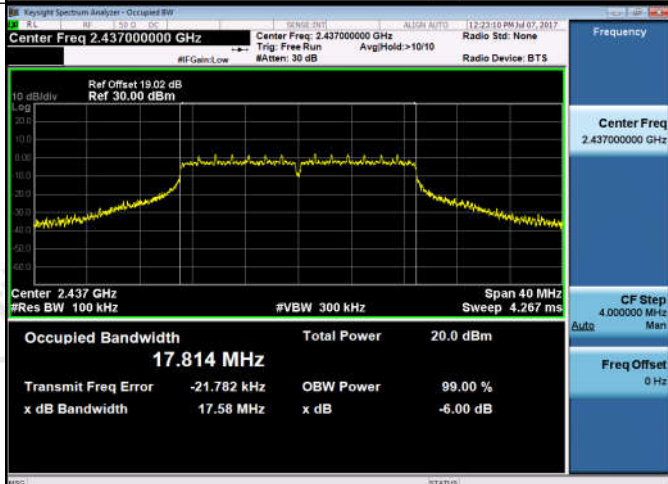
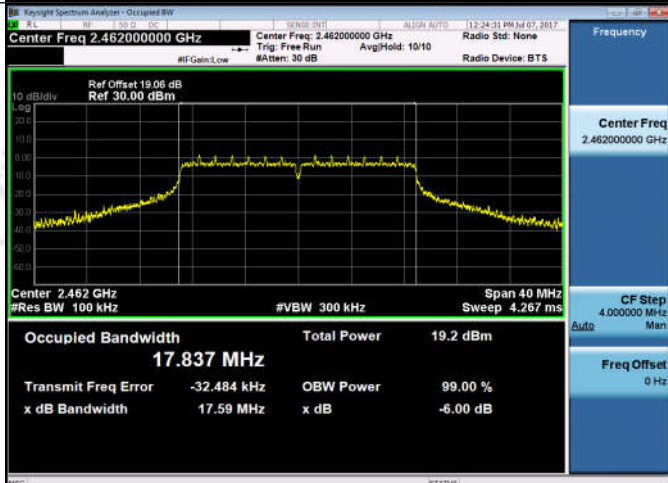
Appendix B): 6dB Occupied Bandwidth Result Table

Mode	Channel	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict	Remark
11B	LCH	8.090	10.459	PASS	Peak detector
11B	MCH	8.087	10.428	PASS	
11B	HCH	8.071	10.425	PASS	
11G	LCH	16.35	16.672	PASS	
11G	MCH	16.35	16.633	PASS	
11G	HCH	16.36	16.677	PASS	
11N20SISO	LCH	17.61	17.832	PASS	
11N20SISO	MCH	17.58	17.814	PASS	
11N20SISO	HCH	17.59	17.837	PASS	

Test Graph



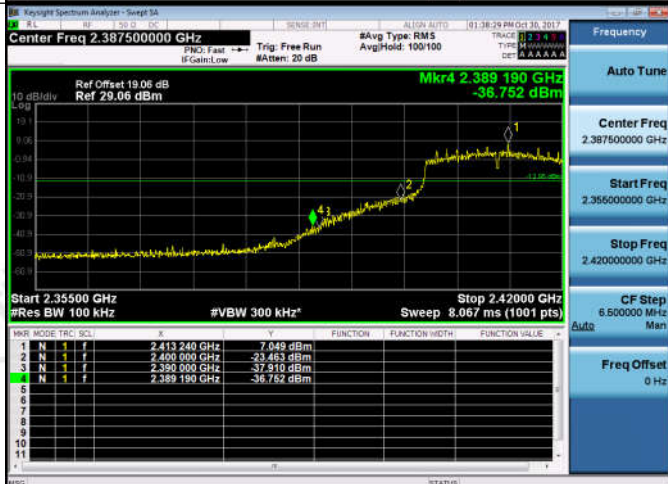
11G/LCH	 Keyight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz ALIGN AUTO 12:14:52 PM Jul 07, 2017 Ref Offset 19.06 dB Ref 30.00 dBm Center 2.412 GHz Span 40 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms Occupied Bandwidth 16.672 MHz Total Power 20.3 dBm Transmit Freq Error -31.412 kHz OBW Power 99.00 % x dB Bandwidth 16.35 MHz x dB -6.00 dB
11G/MCH	 Keyight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz ALIGN AUTO 12:15:44 PM Jul 07, 2017 Ref Offset 19.02 dB Ref 30.00 dBm Center 2.437 GHz Span 40 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms Occupied Bandwidth 16.633 MHz Total Power 20.0 dBm Transmit Freq Error -24.541 kHz OBW Power 99.00 % x dB Bandwidth 16.35 MHz x dB -6.00 dB
11G/HCH	 Keyight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz ALIGN AUTO 12:17:53 PM Jul 07, 2017 Ref Offset 19.06 dB Ref 30.00 dBm Center 2.462 GHz Span 40 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms Occupied Bandwidth 16.677 MHz Total Power 19.0 dBm Transmit Freq Error -32.652 kHz OBW Power 99.00 % x dB Bandwidth 16.36 MHz x dB -6.00 dB

11N20SISO/LCH	 Keyight Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz ALIGN AUTO 12-23-18 PM 14 07, 2017 Ref Offset 19.06 dB Ref 30.00 dBm Center 2.412 GHz Span 40 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms Occupied Bandwidth 17.832 MHz Total Power 20.4 dBm Transmit Freq Error -22.001 kHz OBW Power 99.00 % x dB Bandwidth 17.61 MHz x dB -6.00 dB
11N20SISO/MCH	 Keyight Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz ALIGN AUTO 12-23-18 PM 14 07, 2017 Ref Offset 19.02 dB Ref 30.00 dBm Center 2.437 GHz Span 40 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms Occupied Bandwidth 17.814 MHz Total Power 20.0 dBm Transmit Freq Error -21.782 kHz OBW Power 99.00 % x dB Bandwidth 17.58 MHz x dB -6.00 dB
11N20SISO/HCH	 Keyight Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz ALIGN AUTO 12-24-18 PM 14 07, 2017 Ref Offset 19.06 dB Ref 30.00 dBm Center 2.462 GHz Span 40 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms Occupied Bandwidth 17.837 MHz Total Power 19.2 dBm Transmit Freq Error -32.484 kHz OBW Power 99.00 % x dB Bandwidth 17.59 MHz 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	7.393	-50.536	-12.61	PASS
11B	HCH	7.234	-49.264	-12.77	PASS
11G	LCH	6.564	-37.834	-13.44	PASS
11G	HCH	5.910	-34.808	-14.09	PASS
11N20SISO	LCH	7.049	-36.752	-12.95	PASS
11N20SISO	HCH	5.779	-32.245	-14.22	PASS

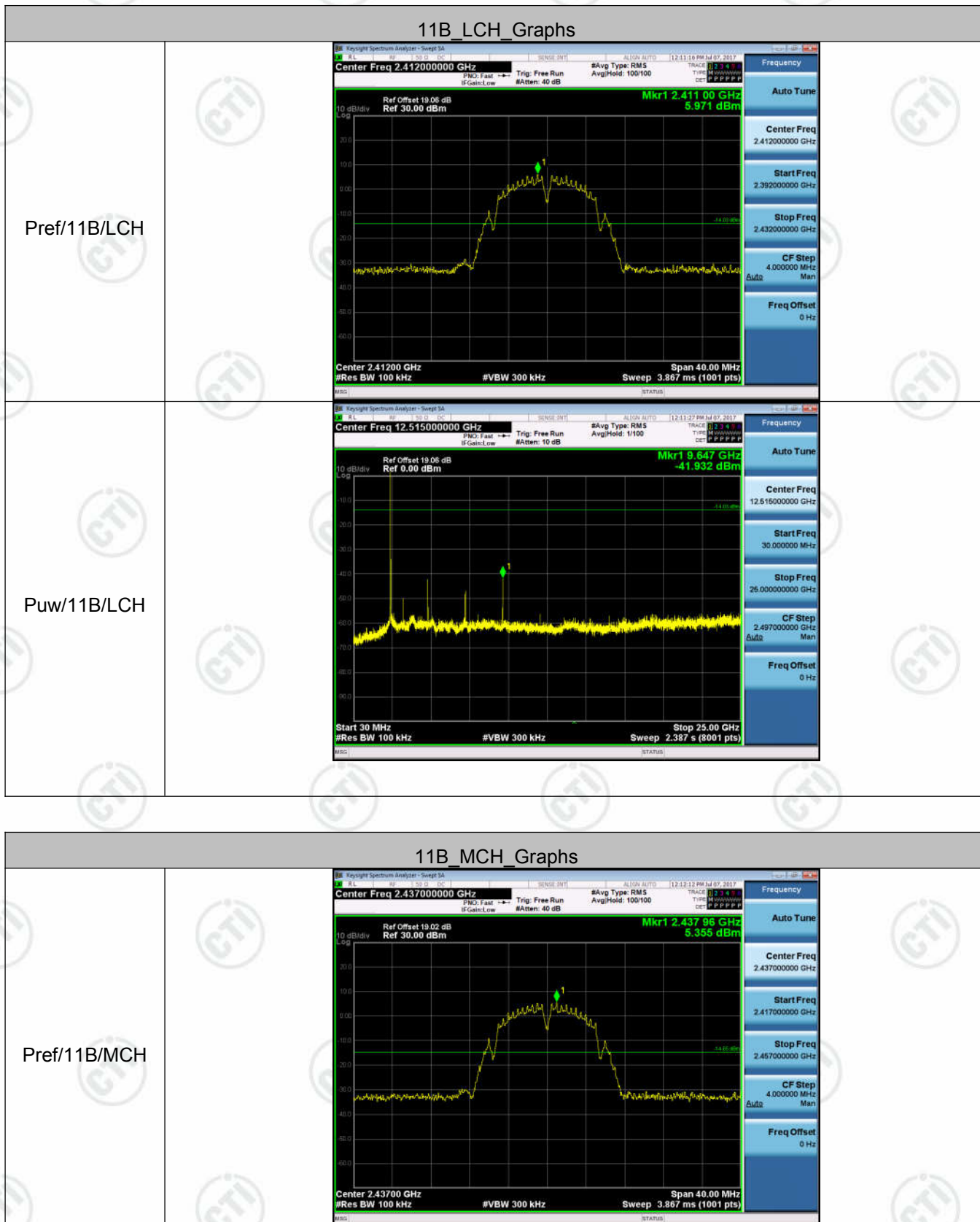
11G/HCH	
11N20SISO/LCH	
11N20SISO/HCH	

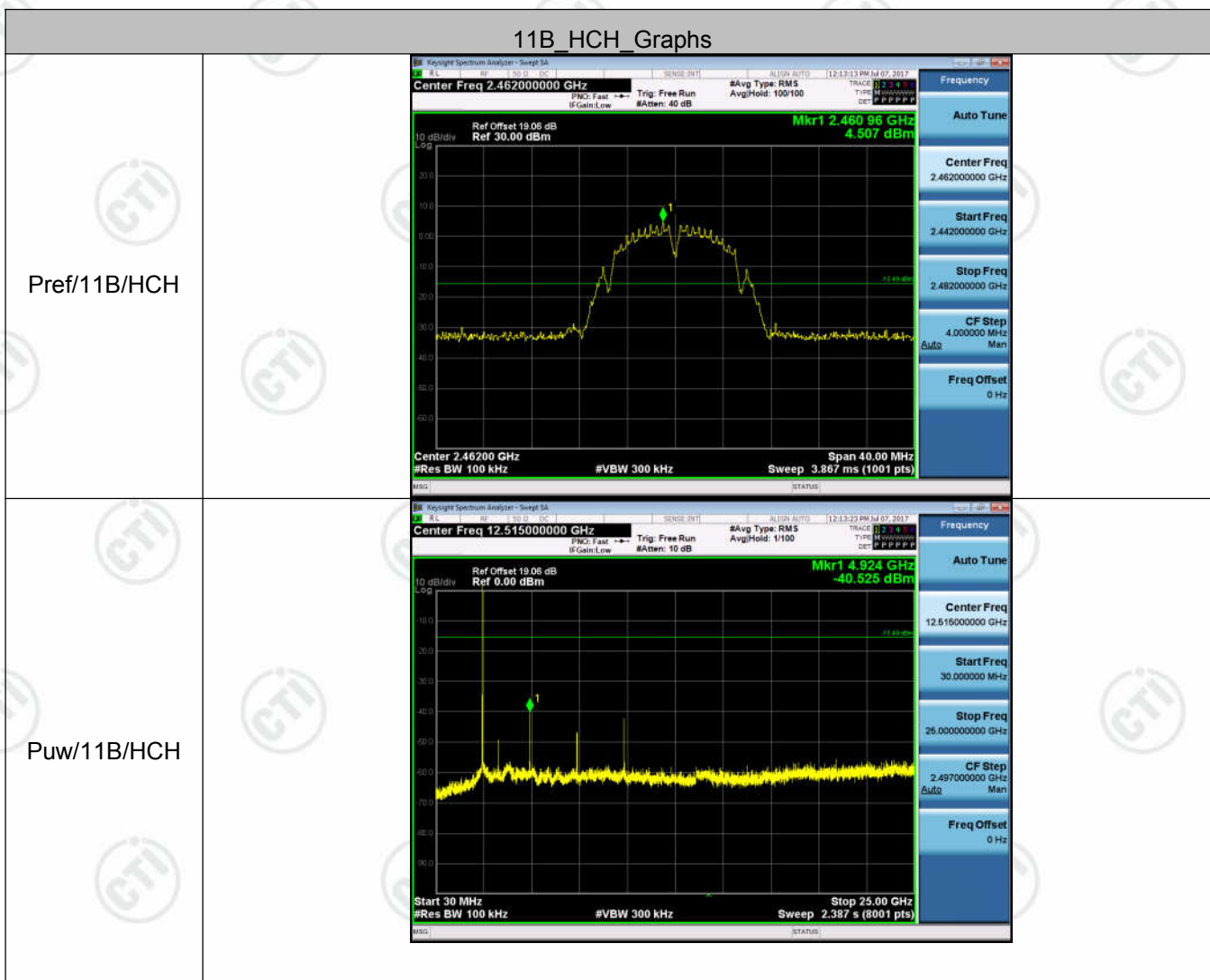
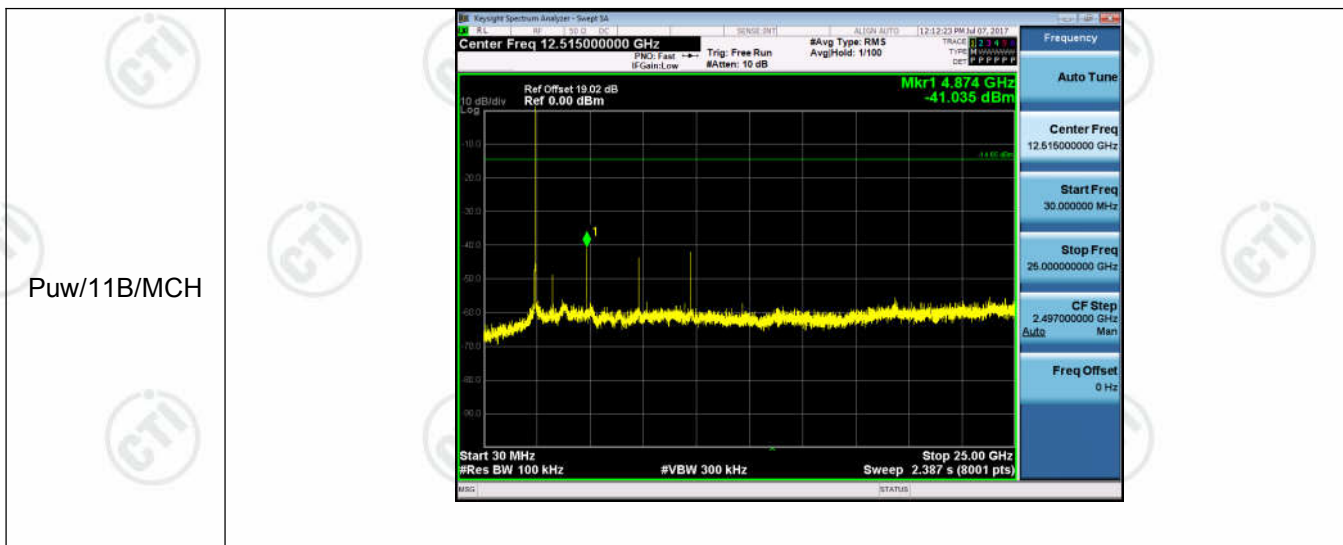
Appendix D): RF Conducted Spurious Emissions

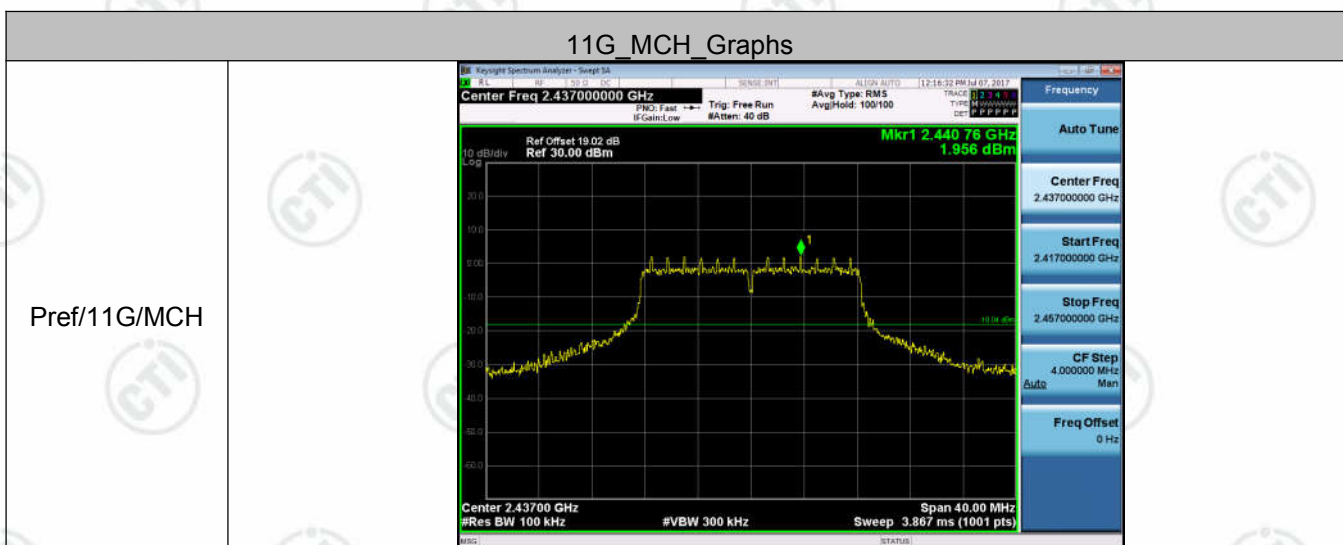
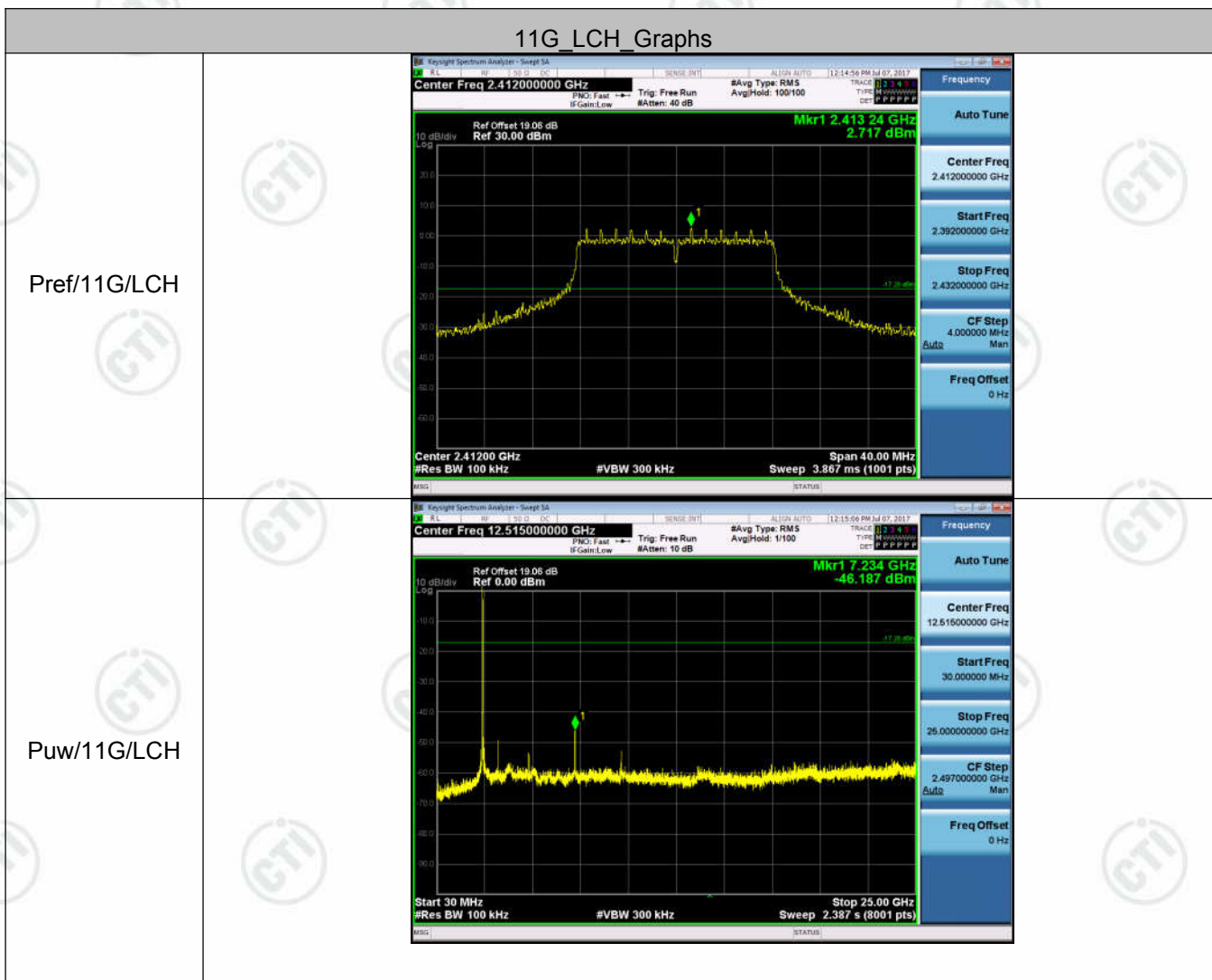
Result Table

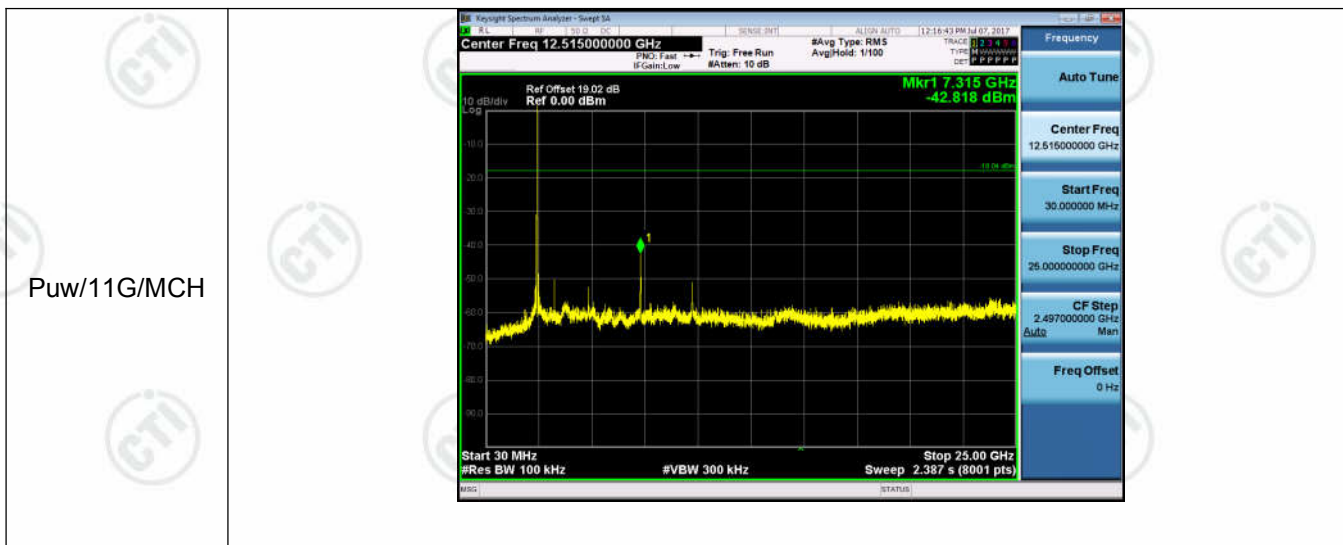
Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
11B	LCH	5.971	<Limit	PASS
11B	MCH	5.355	<Limit	PASS
11B	HCH	4.507	<Limit	PASS
11G	LCH	2.717	<Limit	PASS
11G	MCH	1.956	<Limit	PASS
11G	HCH	1.15	<Limit	PASS
11N20SISO	LCH	2.383	<Limit	PASS
11N20SISO	MCH	2.279	<Limit	PASS
11N20SISO	HCH	1.373	<Limit	PASS

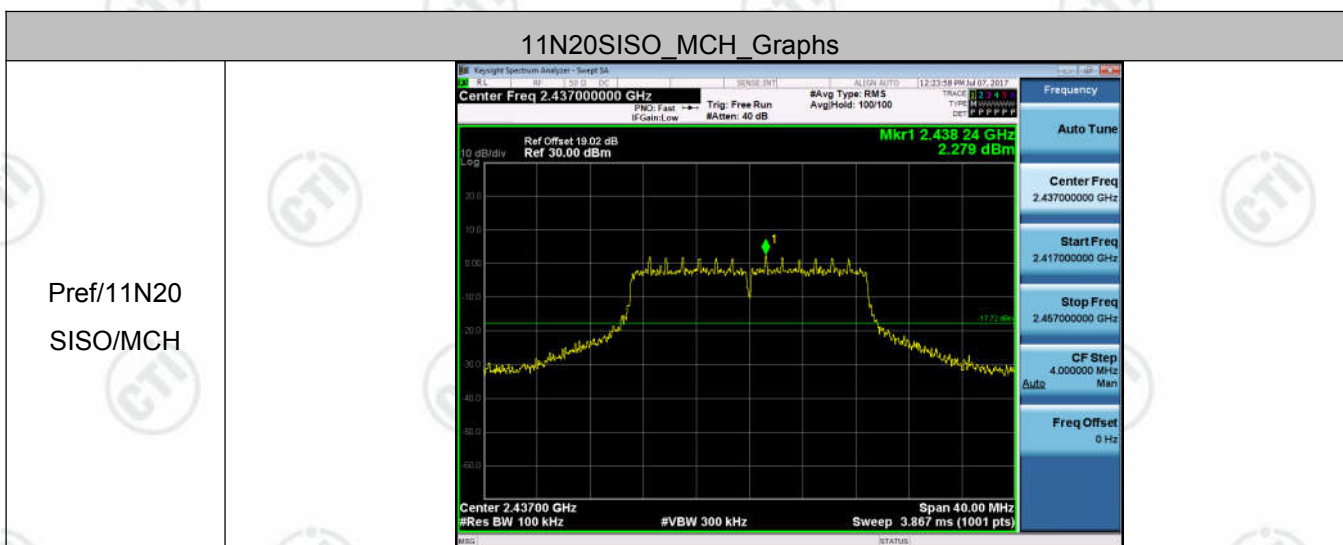
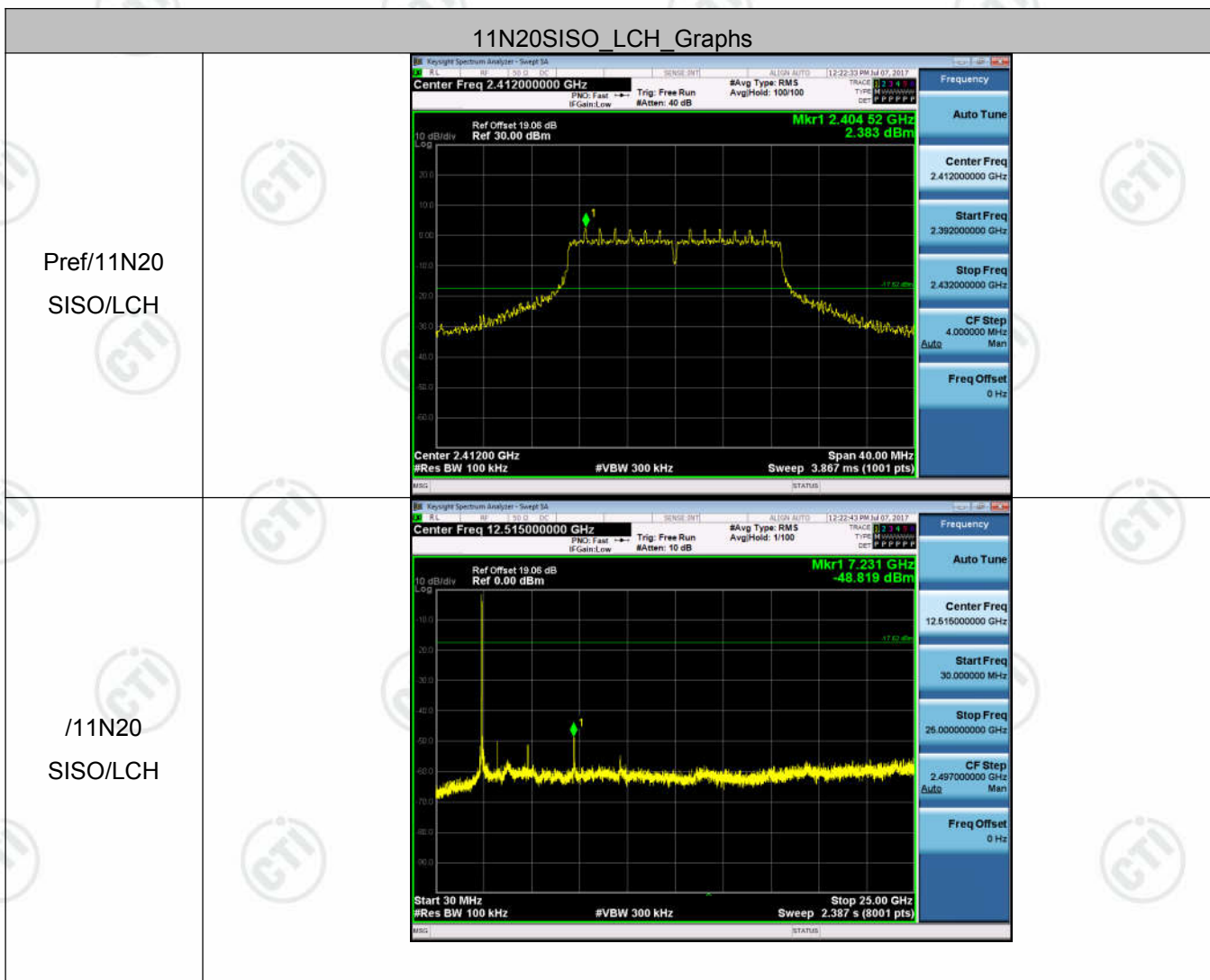
Test Graph

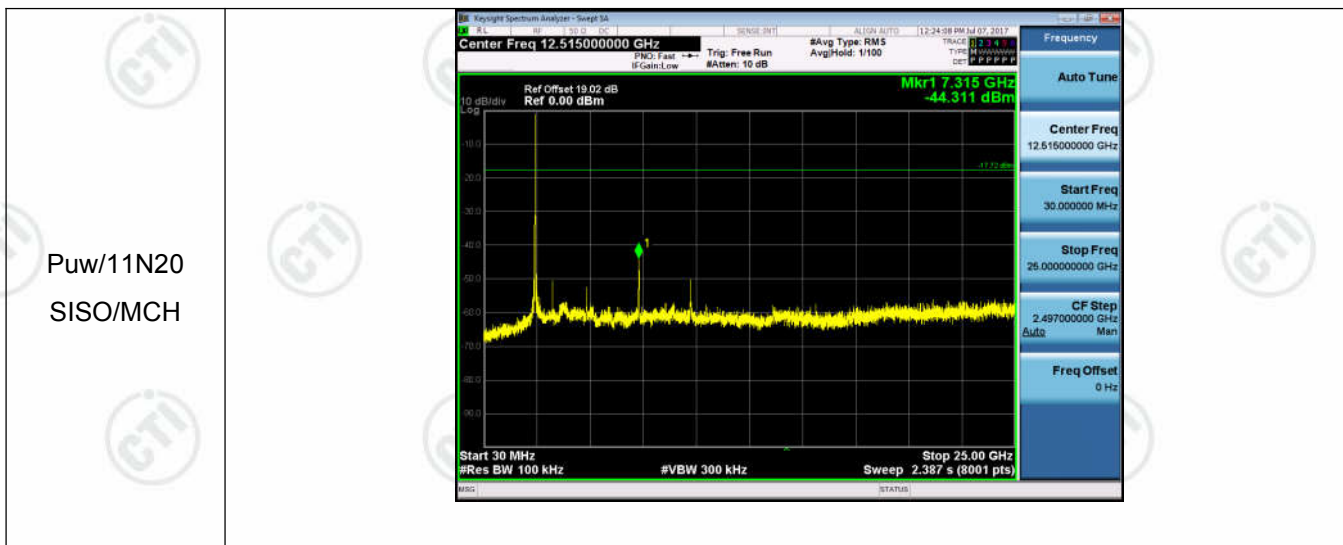




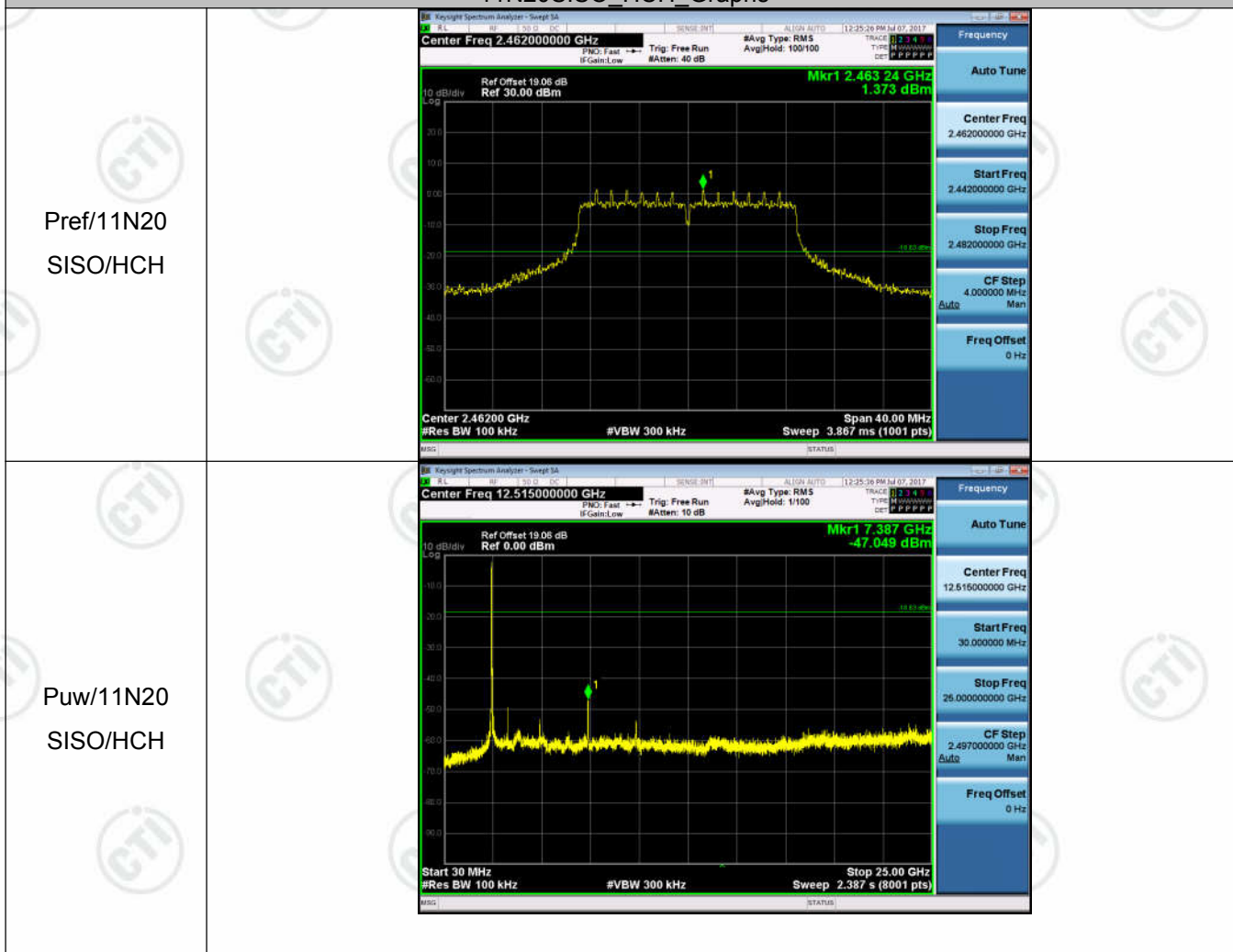








11N20SISO_HCH_Graphs

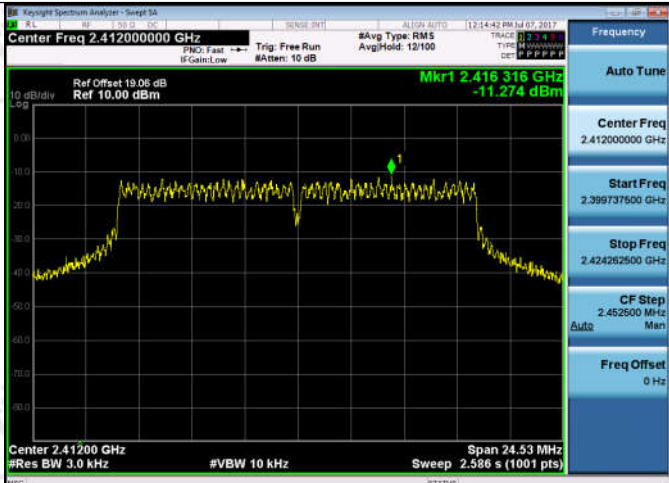
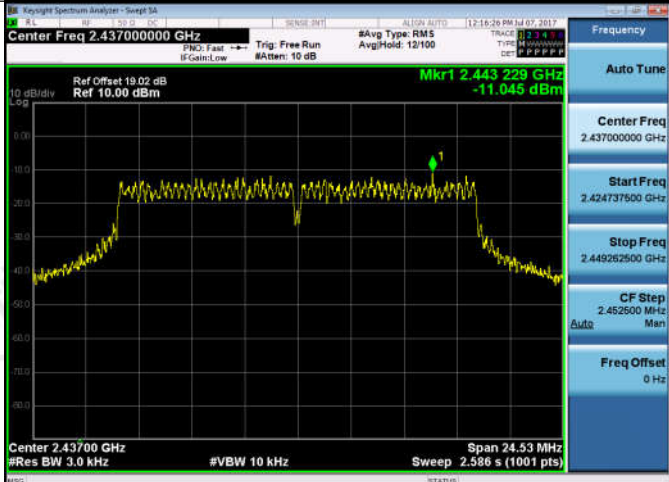
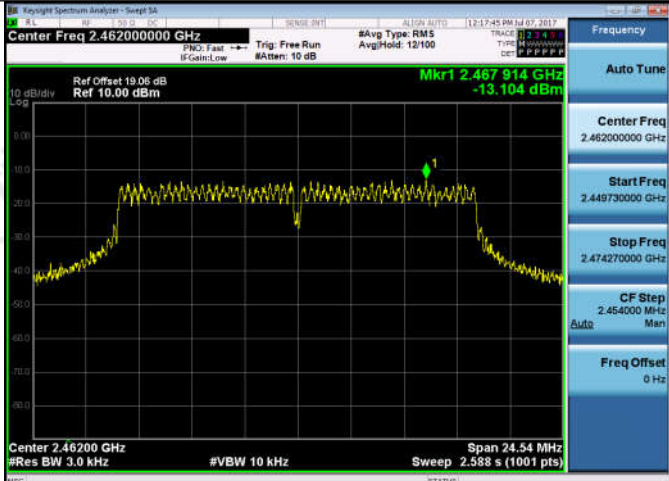


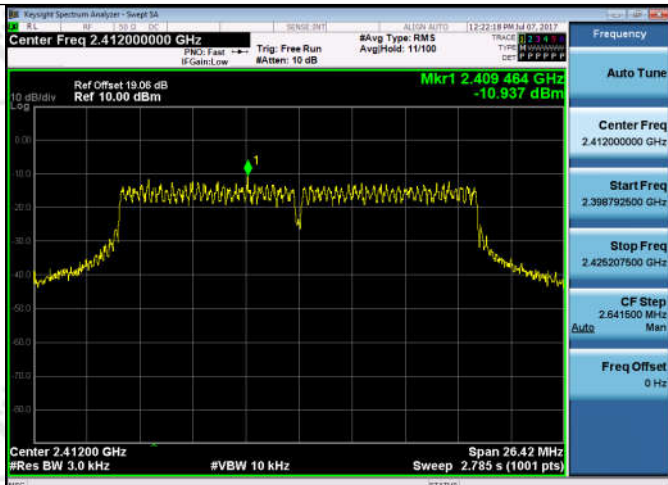
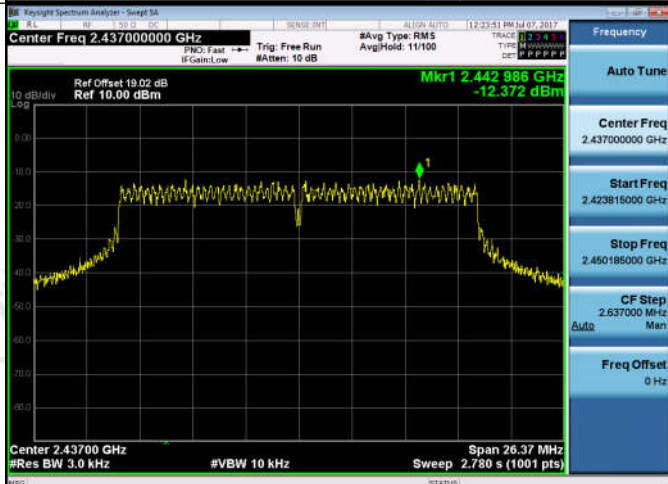
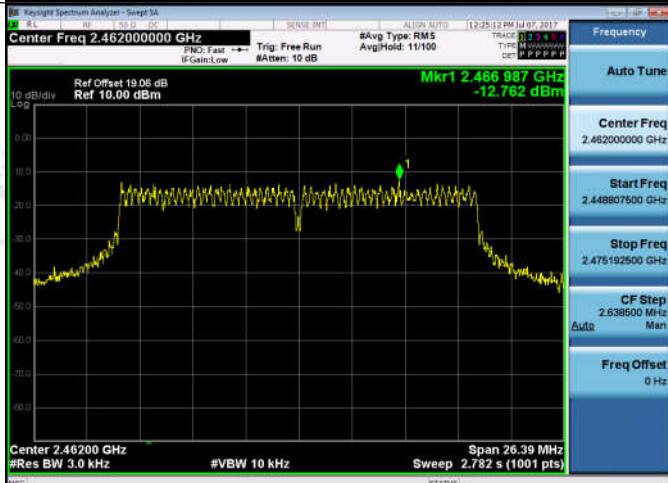
Appendix E): Power Spectral Density Result Table

Mode	Channel	Power Spectral Density [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	LCH	-7.614	8	PASS
11B	MCH	-8.005	8	PASS
11B	HCH	-7.728	8	PASS
11G	LCH	-11.274	8	PASS
11G	MCH	-11.045	8	PASS
11G	HCH	-13.104	8	PASS
11N20SISO	LCH	-10.937	8	PASS
11N20SISO	MCH	-12.372	8	PASS
11N20SISO	HCH	-12.762	8	PASS

Test Graph



11G/LCH	
11G/MCH	
11G/HCH	

11N20SISO/LCH	
11N20SISO/MCH	
11N20SISO/HCH	

Appendix F): Antenna Requirement

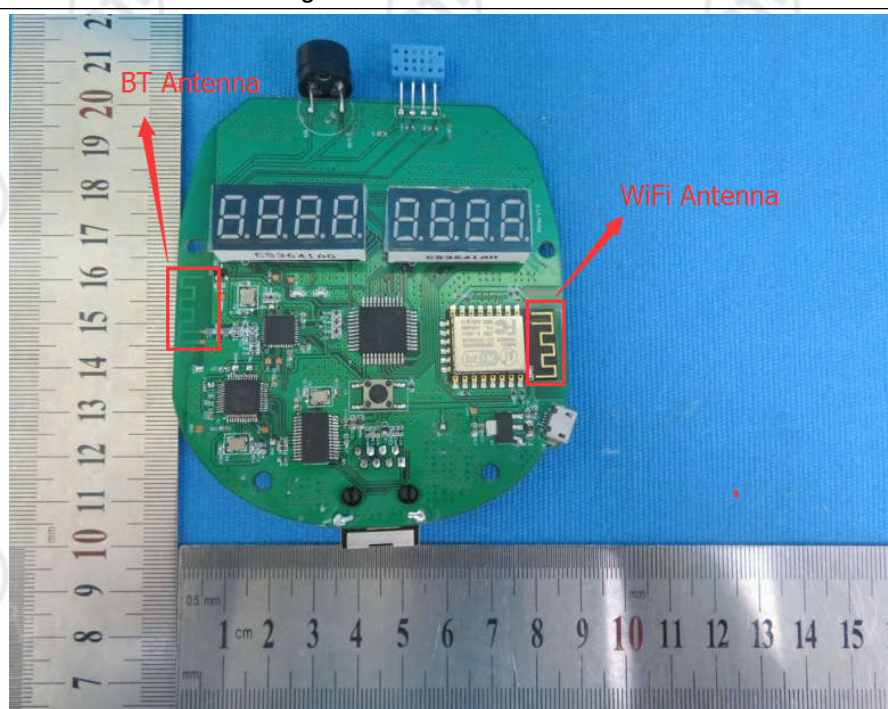
15.203 requirement:

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 3dBi.

Appendix G): AC Power Line Conducted Emission

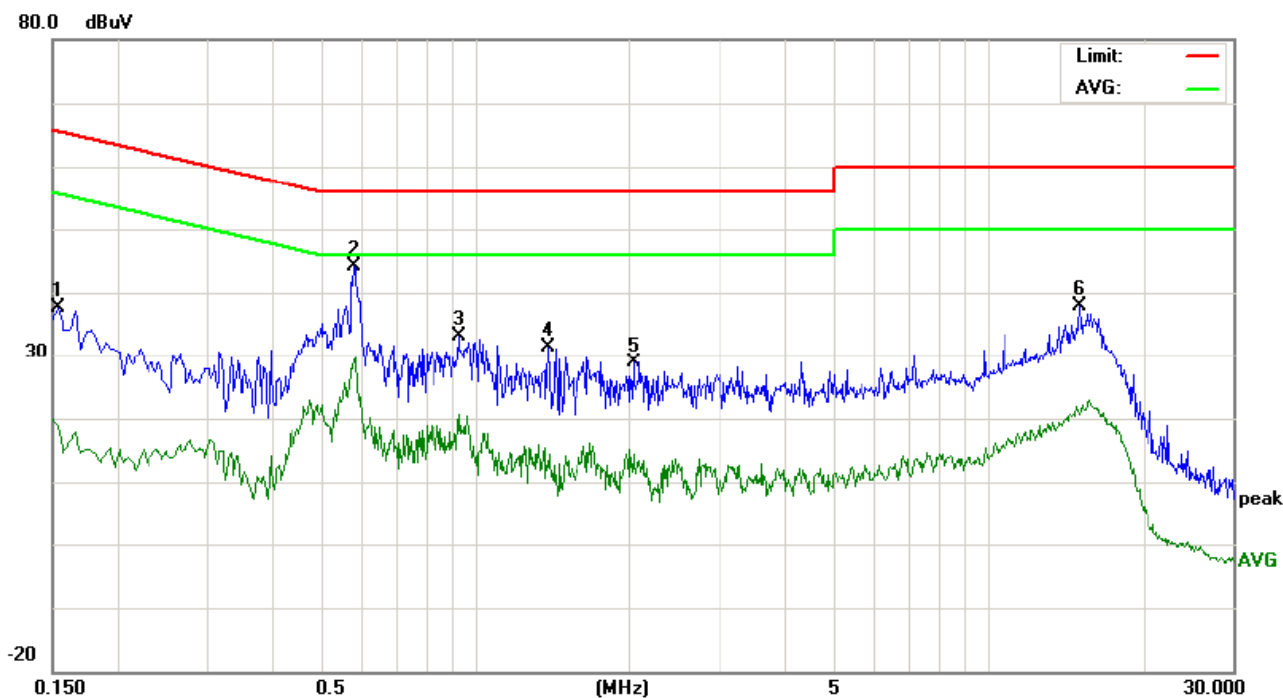
Test Procedure:	Test frequency range :150KHZ-30MHZ 1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of 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. 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, 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. 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.																
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><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></table> * The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. NOTE : The lower limit is applicable at the transition frequency			Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
5-30	60	50															

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.

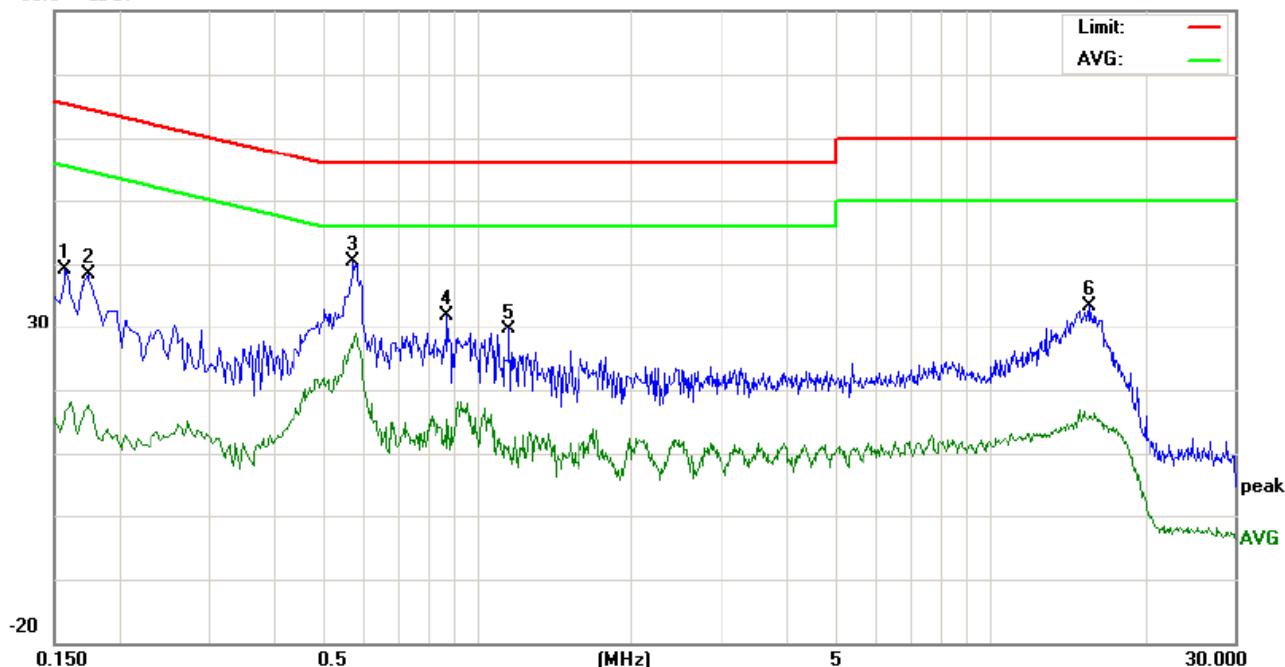
Live line:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1539	27.91	22.15	5.98	9.76	37.67	31.91	15.74	65.78	55.78	-33.87	-40.04	P	
2	0.5820	34.30	29.09	18.10	9.74	44.04	38.83	27.84	56.00	46.00	-17.17	-18.16	P	
3	0.9300	23.31	17.07	7.36	9.71	33.02	26.78	17.07	56.00	46.00	-29.22	-28.93	P	
4	1.3860	21.59	13.31	3.19	9.66	31.25	22.97	12.85	56.00	46.00	-33.03	-33.15	P	
5	2.0420	19.27	12.22	2.12	9.72	28.99	21.94	11.84	56.00	46.00	-34.06	-34.16	P	
6	15.1260	27.76	19.06	9.11	10.01	37.77	29.07	19.12	60.00	50.00	-30.93	-30.88	P	

Neutral line:

80.0 dBuV



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1580	29.33	21.84	4.99	9.76	39.09	31.60	14.75	65.56	55.56	-33.96	-40.81	P	
2	0.1740	28.57	19.76	3.60	9.74	38.31	29.50	13.34	64.76	54.76	-35.26	-41.42	P	
3	0.5740	30.57	25.27	17.31	9.74	40.31	35.01	27.05	56.00	46.00	-20.99	-18.95	P	
4	0.8780	22.16	13.73	1.79	9.75	31.91	23.48	11.54	56.00	46.00	-32.52	-34.46	P	
5	1.1580	19.96	11.24	-0.43	9.64	29.60	20.88	9.21	56.00	46.00	-35.12	-36.79	P	
6	15.6540	23.33	14.56	4.10	10.03	33.36	24.59	14.13	60.00	50.00	-35.41	-35.87	P	

Notes:

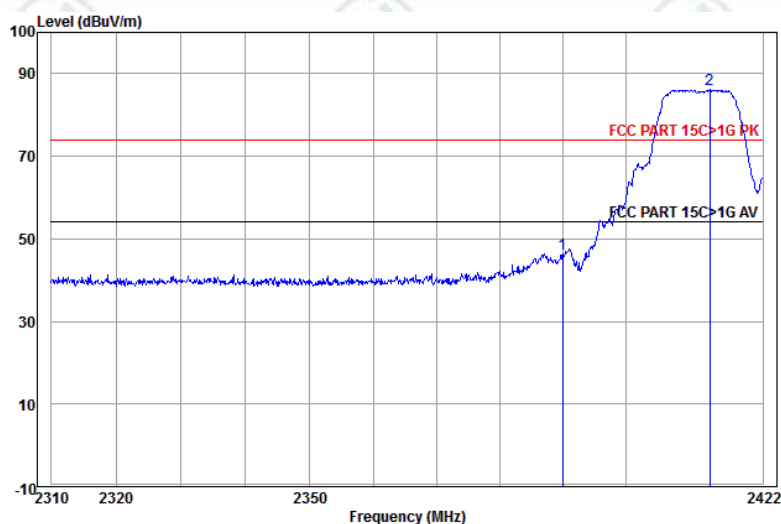
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

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

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Test Procedure:	Below 1GHz test procedure as below: - 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. - The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. - 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. - 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 table was turned from 0 degrees to 360 degrees to find the maximum reading. - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. - 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 Above 1GHz test procedure as below: - Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre). - Test the EUT in the lowest channel , the Highest channel - 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. - Repeat above procedures until all frequencies measured was complete.				
Limit:	Frequency	Limit (dBuV/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		

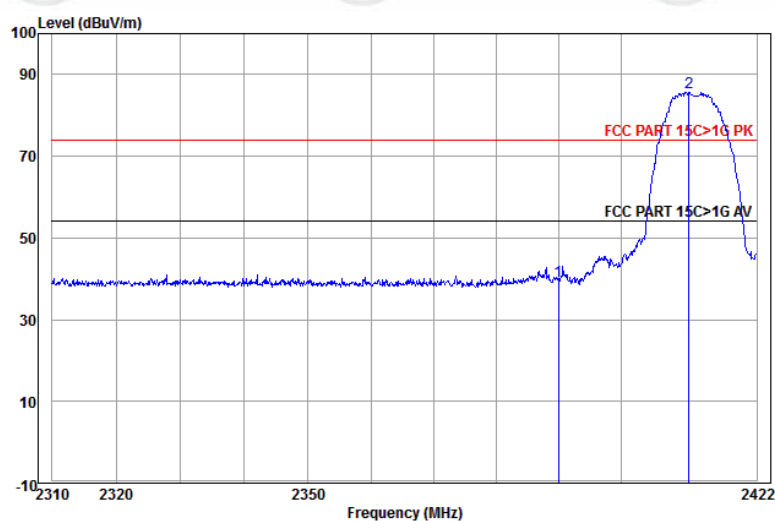
Test plot as follows:

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



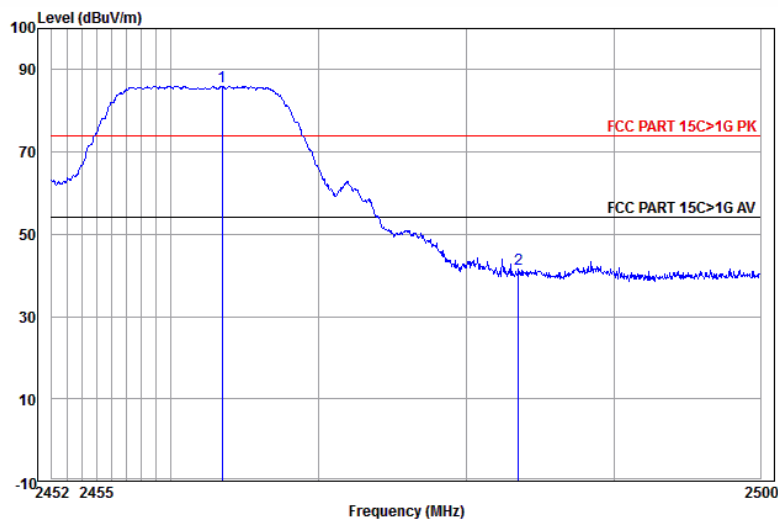
	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	44.03	3.07	54.66	46.23	74.00	-27.77	Horizontal	
2 pp	2413.529	32.58	44.06	3.08	94.47	86.07	74.00	12.07	Horizontal	

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



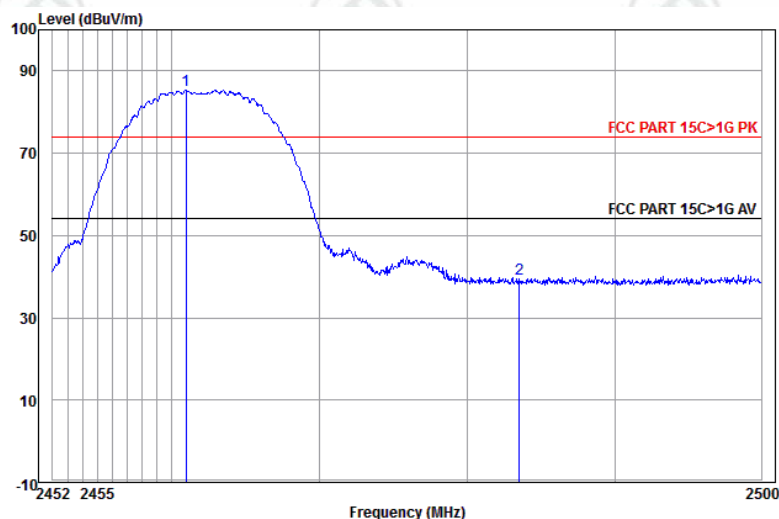
	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	44.03	3.07	48.00	39.57	74.00	-34.43	Vertical	
2 pp	2411.016	32.58	44.05	3.08	93.92	85.53	74.00	11.53	Vertical	

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



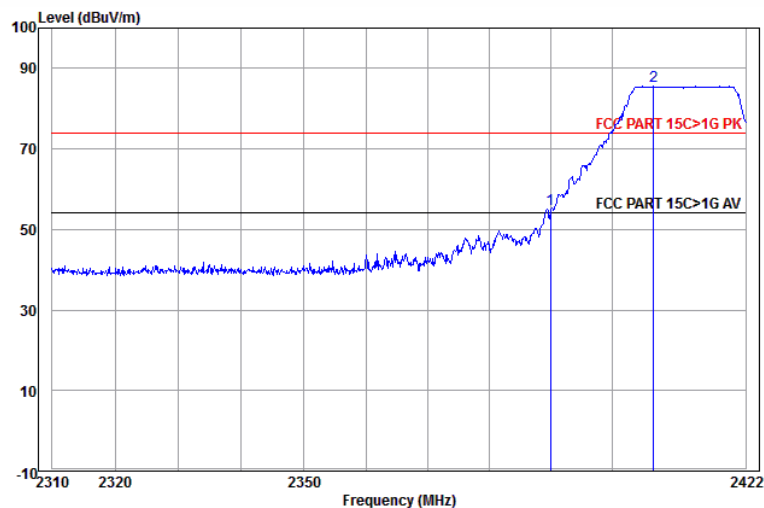
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2463.435	32.68	44.12	3.11	94.31	85.98	74.00	11.98	Horizontal
2	2483.500	32.71	44.14	3.12	49.77	41.46	74.00	-32.54	Horizontal

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



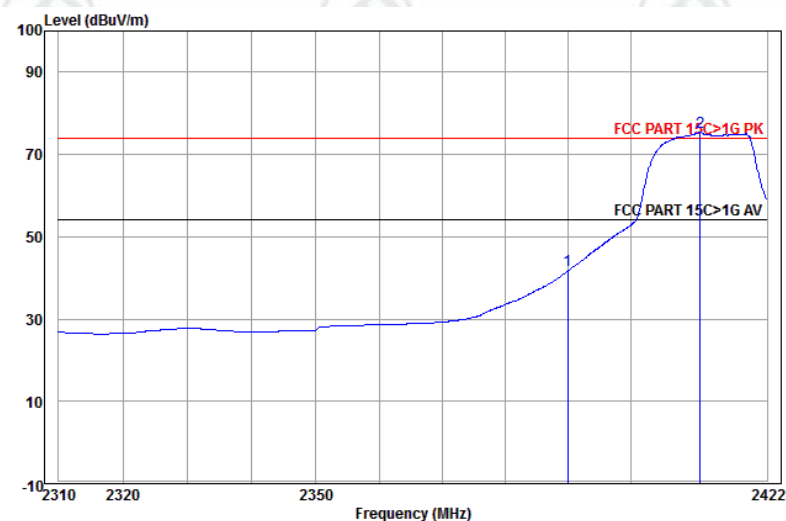
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2460.953	32.67	44.11	3.11	93.72	85.39	74.00	11.39	Vertical
2	2483.500	32.71	44.14	3.12	47.70	39.39	74.00	-34.61	Vertical

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



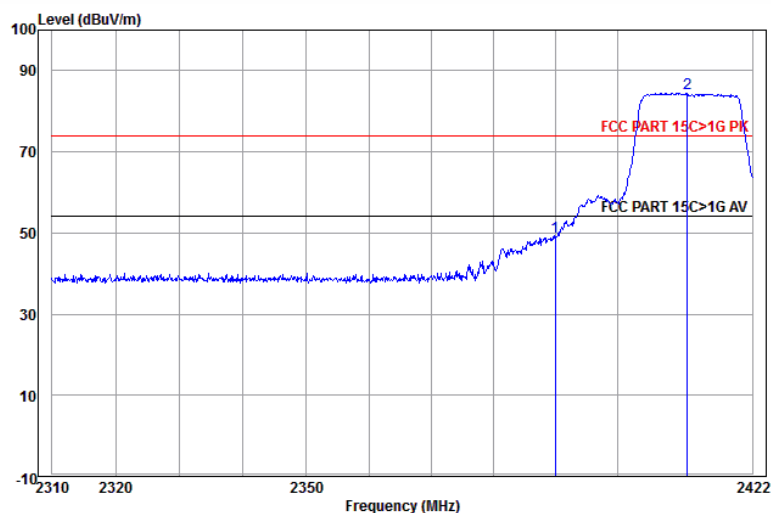
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dB		
1	2390.000	32.53	44.03	3.07	63.43	55.00	74.00	-19.00	Horizontal
2 pp	2406.796	32.57	44.05	3.08	93.93	85.53	74.00	11.53	Horizontal

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



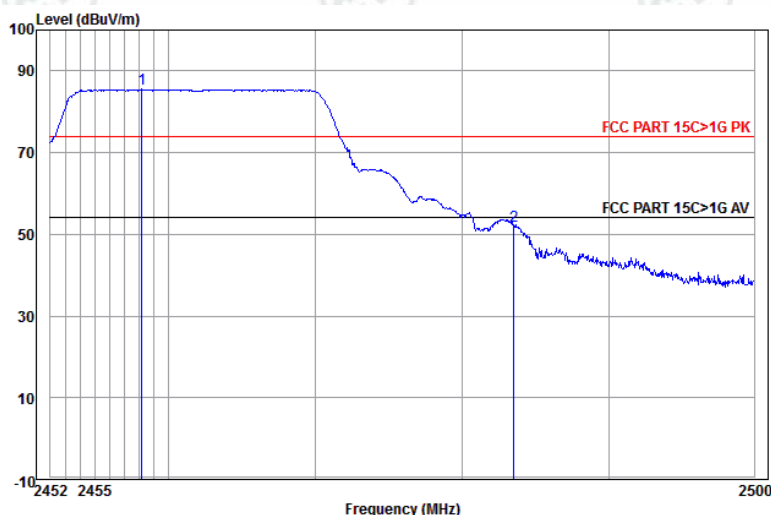
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dB		
1	2390.000	32.53	44.03	3.07	50.15	41.72	74.00	-32.28	Horizontal Average
2 pp	2411.245	32.58	44.05	3.08	83.77	75.38	74.00	1.38	Horizontal Average

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



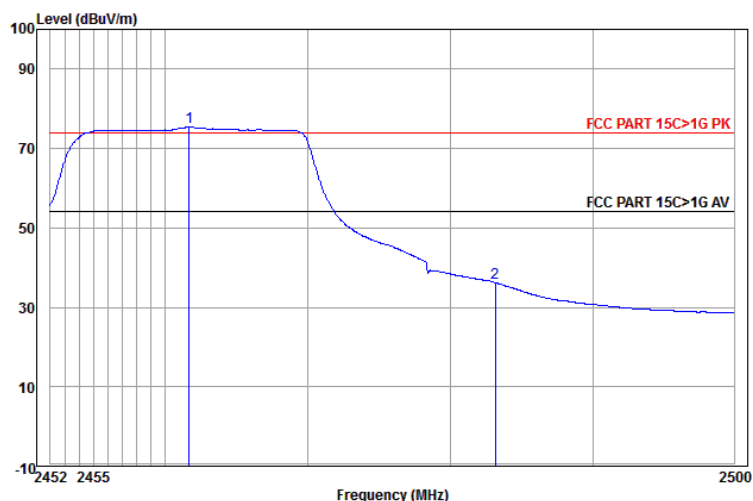
	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	44.03	3.07	57.47	49.04	74.00	-24.96	Vertical	
2 pp	2411.359	32.58	44.05	3.08	92.81	84.42	74.00	10.42	Vertical	

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



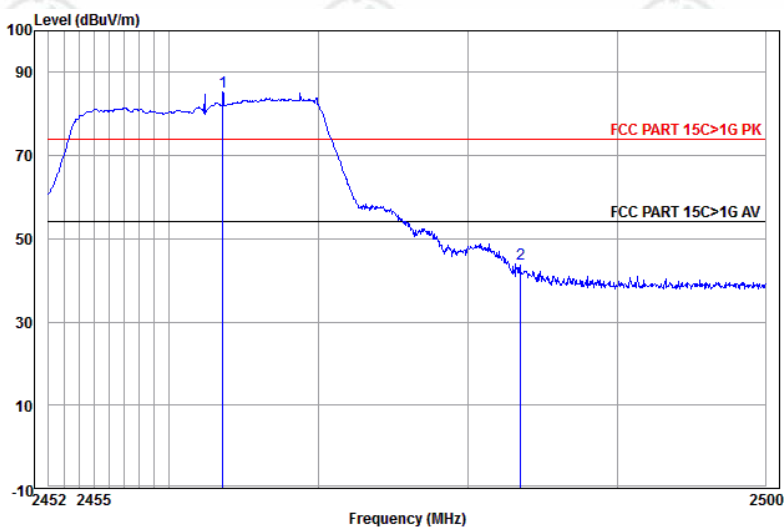
	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2458.188	32.67	44.11	3.10	93.80	85.46	74.00	11.46	Horizontal	
2	2483.500	32.71	44.14	3.12	60.37	52.06	74.00	-21.94	Horizontal	

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



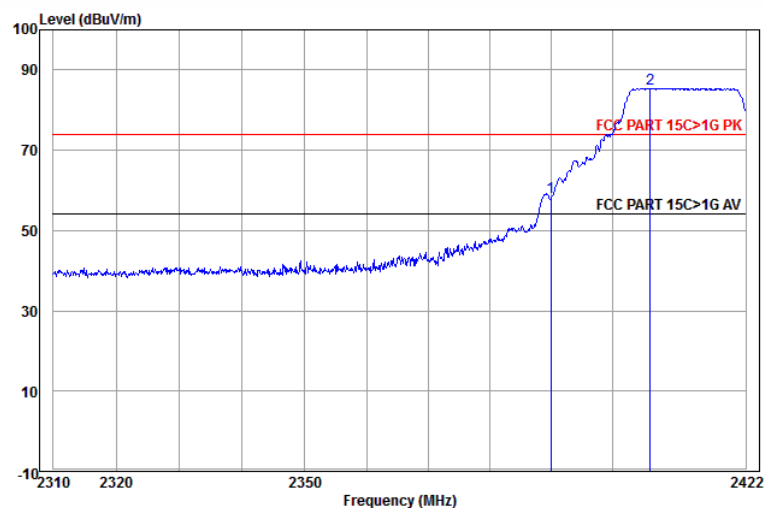
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2461.669	32.67	44.11	3.11	83.86	75.53	74.00	1.53	Horizontal Average
2	2483.142	32.71	44.14	3.12	44.50	36.19	74.00	-37.81	Horizontal Average

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



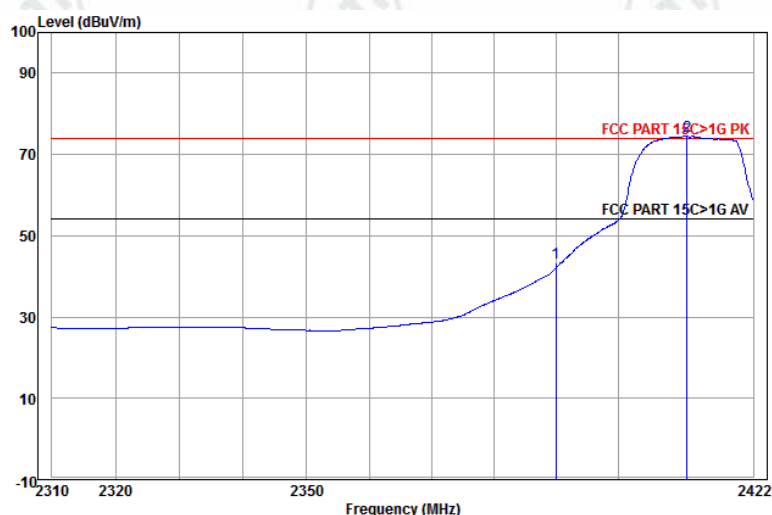
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2463.579	32.68	44.12	3.11	93.71	85.38	74.00	11.38	Vertical
2	2483.500	32.71	44.14	3.12	52.20	43.89	74.00	-30.11	Vertical

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



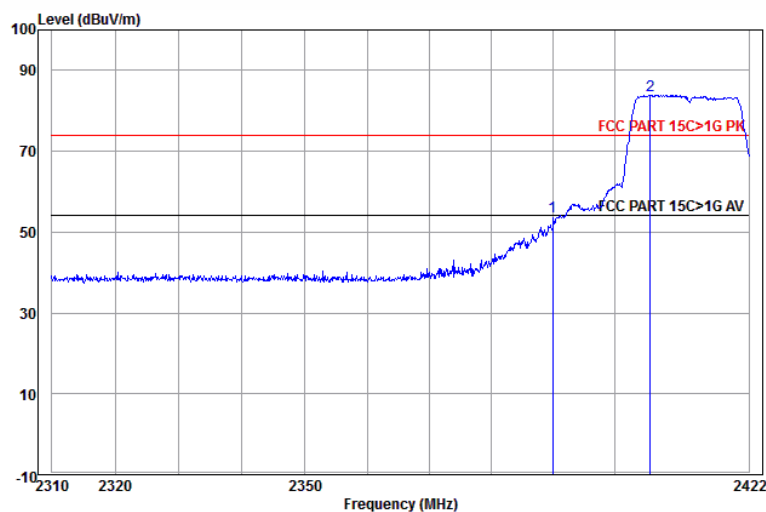
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	44.03	3.07	66.84	58.41	74.00	-15.59	Horizontal
2 pp	2406.227	32.57	44.05	3.08	93.81	85.41	74.00	11.41	Horizontal

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



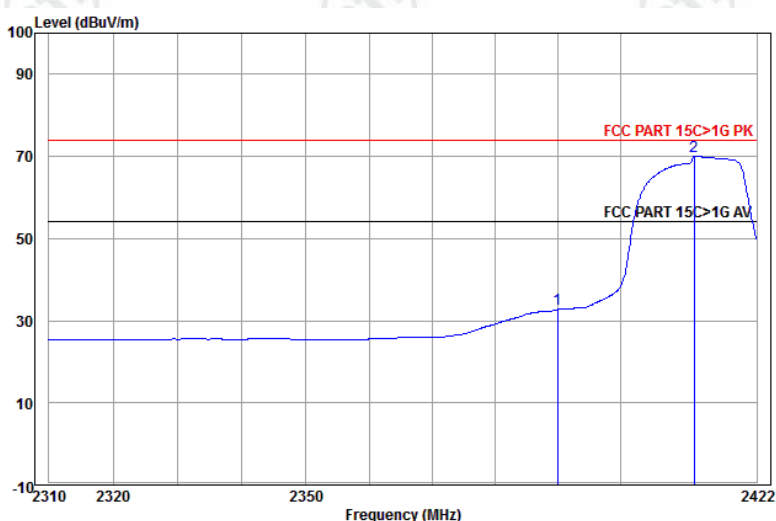
	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	44.03	3.07	51.92	43.49	74.00	-30.51	Horizontal Average
2 pp	2411.245	32.58	44.05	3.08	82.94	74.55	74.00	0.55	Horizontal Average

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



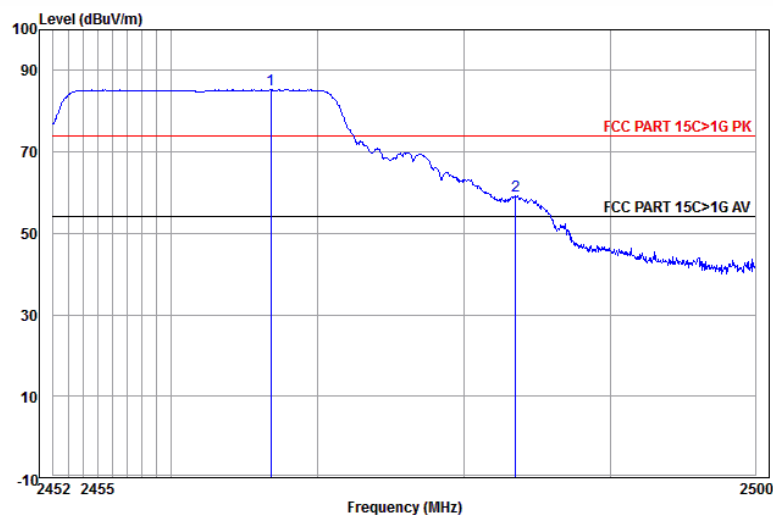
	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	44.03	3.07	62.18	53.75	74.00	-20.25	Vertical	
2 pp	2405.885	32.57	44.05	3.08	92.30	83.90	74.00	9.90	Vertical	

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



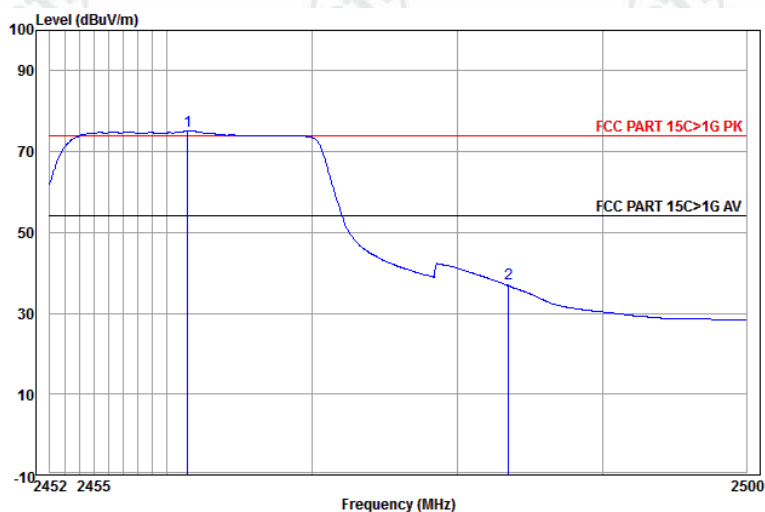
	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	44.03	3.07	41.29	32.86	74.00	-41.14	Vertical	Average
2 pp	2411.930	32.58	44.05	3.08	78.53	70.14	74.00	-3.86	Vertical	Average

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



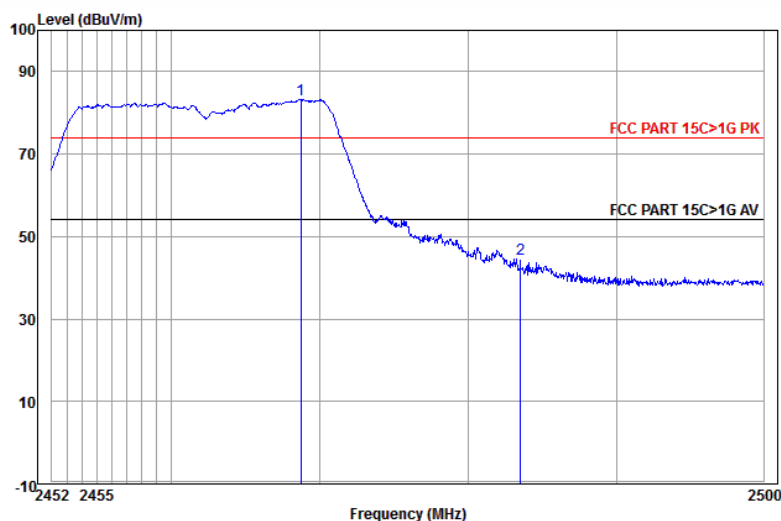
	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2466.781	32.68	44.12	3.11	93.65	85.32	74.00	11.32	Horizontal	
2	2483.500	32.71	44.14	3.12	67.69	59.38	74.00	-14.62	Horizontal	

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



	Ant Freq	Preamp Factor	Cable Factor	Cable Loss	Read Level	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2461.430	32.67	44.11	3.11	83.45	75.12	74.00	1.12	Horizontal	Average
2	2483.500	32.71	44.14	3.12	45.68	37.37	74.00	-36.63	Horizontal	Average

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



	Ant Freq	Preamp Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2468.694	32.69	44.12	3.11	91.52	83.20	74.00	9.20	Vertical
2	2483.500	32.71	44.14	3.12	52.91	44.60	74.00	-29.40	Vertical

Note:

1) Through Pre-scan transmitting mode and charge+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),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	120 kHz	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 table 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 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).. 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 (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	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.				

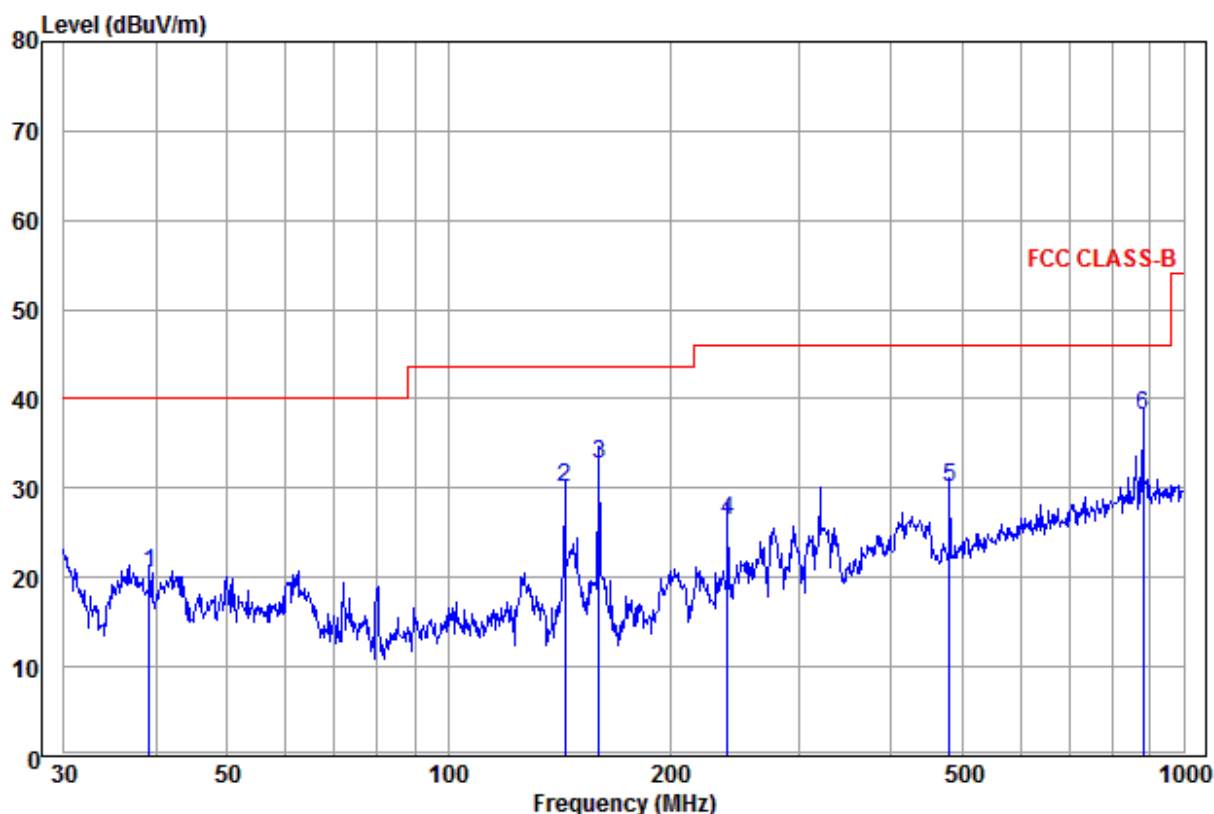
Radiated Spurious Emissions test Data:

Radiated Emission below 1GHz

Test Model No.:ECH-c1-WLSD-C

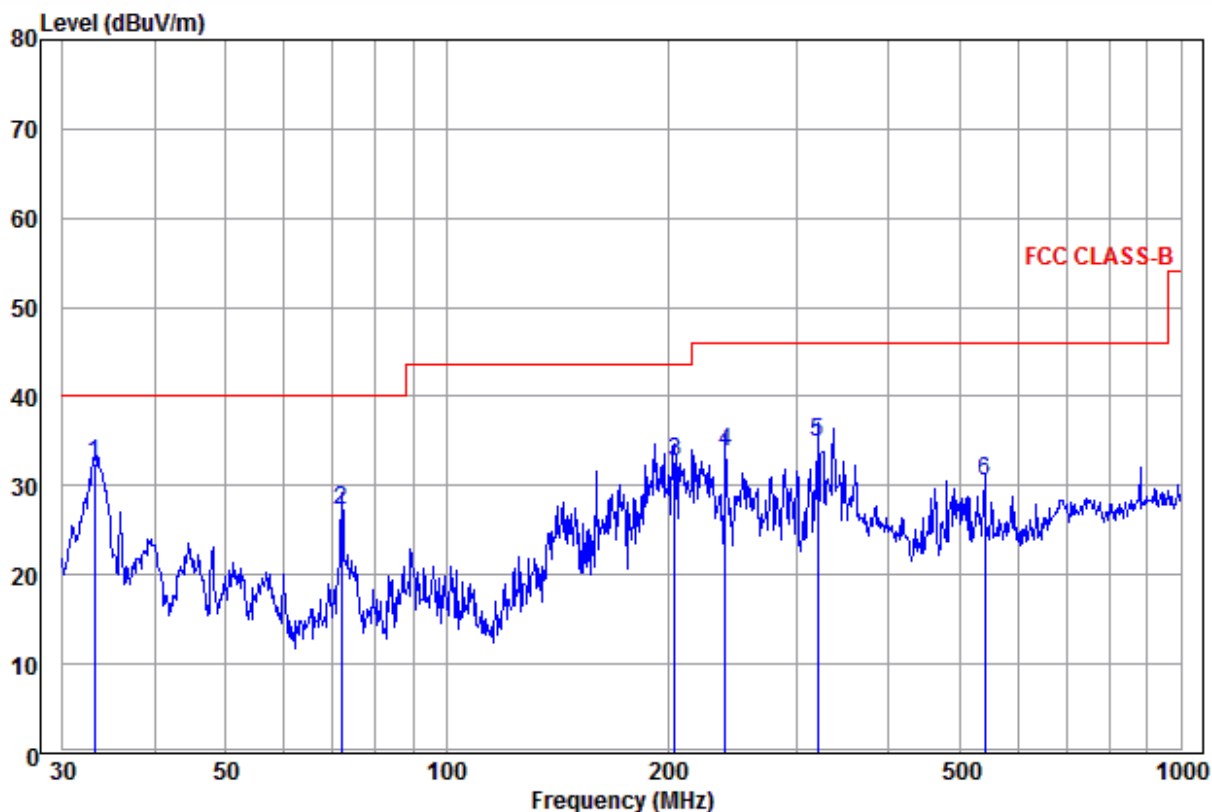
30MHz~1GHz (QP)

Test mode:	Transmitting	Vertical
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	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	39.162	12.27	0.05	8.15	20.47	40.00	-19.53	Vertical	QP
2	143.830	8.14	0.61	21.29	30.04	43.50	-13.46	Vertical	QP
3	160.346	8.54	0.72	23.44	32.70	43.50	-10.80	Vertical	QP
4	239.987	11.82	1.30	13.30	26.42	46.00	-19.58	Vertical	QP
5	480.528	16.86	1.50	11.77	30.13	46.00	-15.87	Vertical	QP
6 pp	881.407	21.67	2.48	13.89	38.04	46.00	-7.96	Vertical	QP

Test mode:	Transmitting	Horizontal
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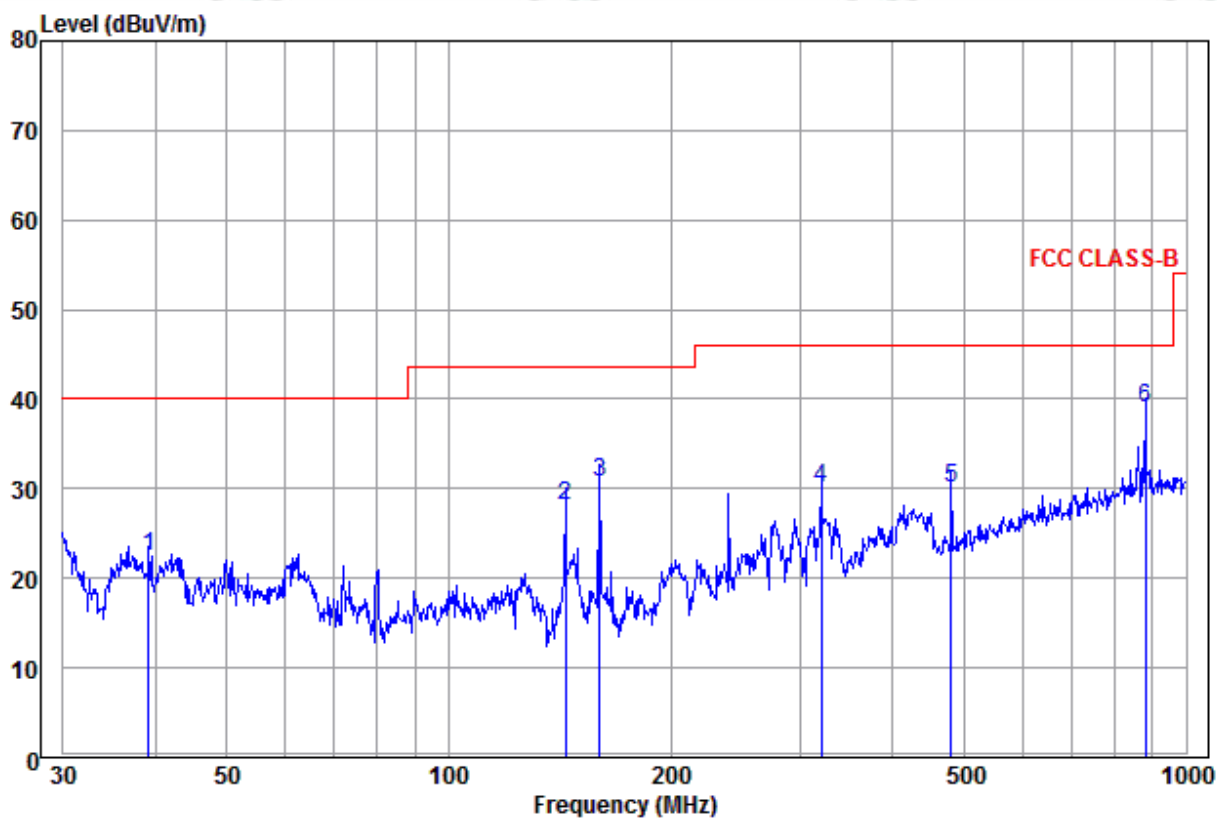


	Ant Freq	Cable Factor	Read Loss	Level	Level	Limit	Over	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	33.095	11.21	0.08	21.22	32.51	40.00	-7.49	Horizontal	QP
2	71.832	8.77	0.28	18.26	27.31	40.00	-12.69	Horizontal	QP
3	204.238	11.09	1.12	20.38	32.59	43.50	-10.91	Horizontal	QP
4	239.987	11.82	1.30	20.62	33.74	46.00	-12.26	Horizontal	QP
5	319.937	13.92	1.17	19.88	34.97	46.00	-11.03	Horizontal	QP
6	541.373	17.87	1.54	11.08	30.49	46.00	-15.51	Horizontal	QP

Test Model No.:ECH-c1-LSD-C

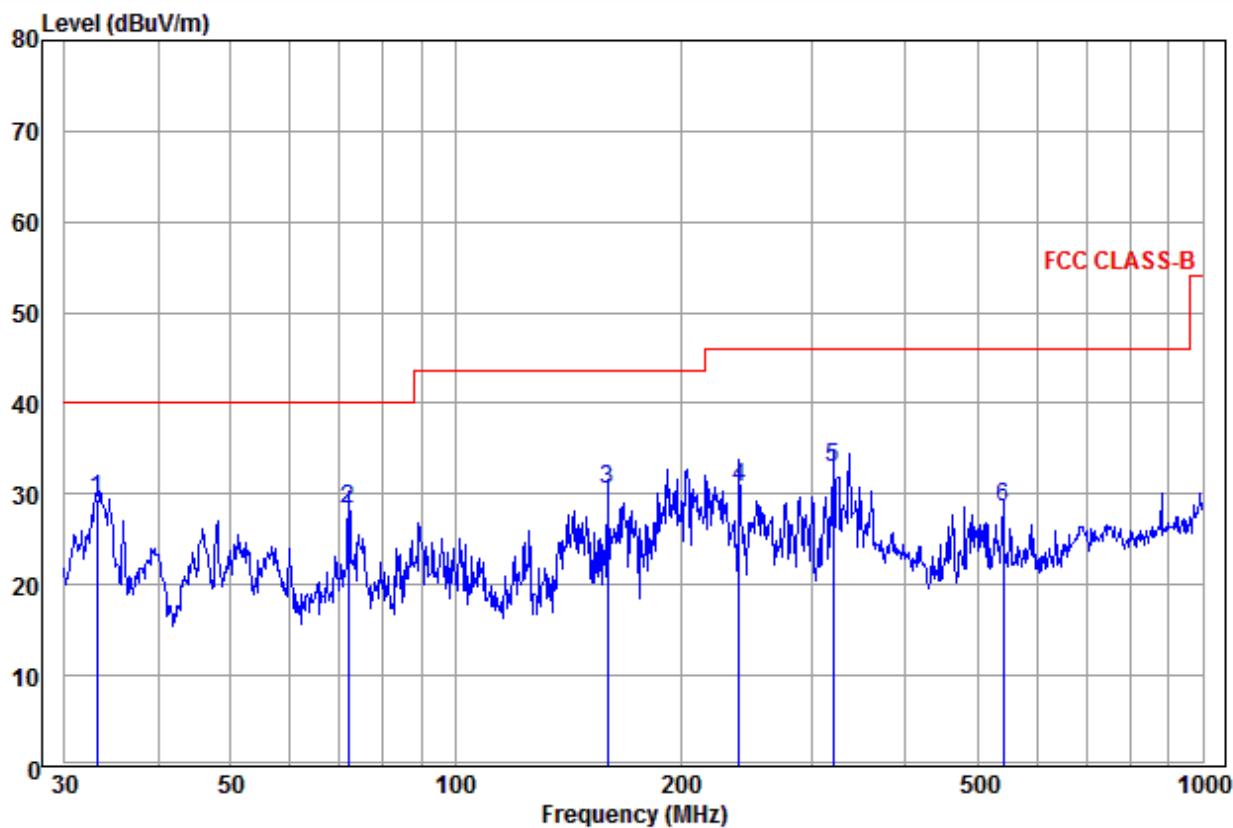
30MHz~1GHz (QP)

Test mode:	Transmitting	Vertical
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	Ant Freq	Cable Factor	Loss	Read Level	Limit Level	Over Limit	Pol/Phase	Remark
	MHz		dB	dBuV	dBuV/m	dBuV/m	dB	
1	39.162	12.27	0.05	10.15	22.47	40.00	-17.53	Vertical QP
2	143.830	8.14	0.61	19.29	28.04	43.50	-15.46	Vertical QP
3	160.346	8.54	0.72	21.44	30.70	43.50	-12.80	Vertical QP
4	319.937	13.92	1.17	15.09	30.18	46.00	-15.82	Vertical QP
5	480.528	16.86	1.50	11.77	30.13	46.00	-15.87	Vertical QP
6 pp	881.407	21.67	2.48	14.89	39.04	46.00	-6.96	Vertical QP

Test mode:	Transmitting	Horizontal
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	Ant Freq	Cable Factor	Read Loss	Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	33.095	11.21	0.08	18.22	29.51	40.00	-10.49	Horizontal	QP
2	71.832	8.77	0.28	19.26	28.31	40.00	-11.69	Horizontal	QP
3	159.784	8.50	0.72	21.35	30.57	43.50	-12.93	Horizontal	QP
4	239.987	11.82	1.30	17.62	30.74	46.00	-15.26	Horizontal	QP
5	319.937	13.92	1.17	17.88	32.97	46.00	-13.03	Horizontal	QP
6	541.373	17.87	1.54	9.08	28.49	46.00	-17.51	Horizontal	QP

Transmitter Emission above 1GHz
Test Model No.:ECH-c1-WLSD-C

Test mode: 802.11b(11Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1263.883	30.38	44.29	1.96	47.39	35.44	74.00	-38.56	Pass	Horizontal
3216.838	33.41	44.68	3.56	47.43	39.72	74.00	-34.28	Pass	Horizontal
4824.000	34.73	44.60	6.02	52.77	48.92	74.00	-25.08	Pass	Horizontal
7236.000	36.42	44.80	6.94	51.00	49.56	74.00	-24.44	Pass	Horizontal
9648.000	37.93	45.57	7.01	51.07	50.44	74.00	-23.56	Pass	Horizontal
11872.880	39.56	44.89	10.71	44.81	50.19	74.00	-23.81	Pass	Horizontal
1235.257	30.31	44.33	1.92	47.53	35.43	74.00	-38.57	Pass	Vertical
3216.838	33.41	44.68	3.56	47.65	39.94	74.00	-34.06	Pass	Vertical
4824.000	34.73	44.60	6.02	53.76	49.91	74.00	-24.09	Pass	Vertical
7236.000	36.42	44.80	6.94	51.62	50.18	74.00	-23.82	Pass	Vertical
9648.000	37.93	45.57	7.01	50.72	50.09	74.00	-23.91	Pass	Vertical
11515.680	39.46	44.85	10.20	45.18	49.99	74.00	-24.01	Pass	Vertical

Test mode: 802.11b(11Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1350.362	30.57	44.18	2.09	45.43	33.91	74.00	-40.09	Pass	Horizontal
3258.042	33.37	44.67	3.60	48.77	41.07	74.00	-32.93	Pass	Horizontal
4874.000	34.84	44.60	6.12	51.35	47.71	74.00	-26.29	Pass	Horizontal
7311.000	36.43	44.86	6.86	50.38	48.81	74.00	-25.19	Pass	Horizontal
9748.000	38.03	45.55	7.10	47.33	46.91	74.00	-27.09	Pass	Horizontal
11994.380	39.60	44.90	10.88	43.47	49.05	74.00	-24.95	Pass	Horizontal
1453.818	30.78	44.05	2.23	46.67	35.63	74.00	-38.37	Pass	Vertical
3258.042	33.37	44.67	3.60	47.29	39.59	74.00	-34.41	Pass	Vertical
4874.000	34.84	44.60	6.12	51.97	48.33	74.00	-25.67	Pass	Vertical
7311.000	36.43	44.86	6.86	44.43	42.86	74.00	-31.14	Pass	Vertical
9748.000	38.03	45.55	7.10	48.93	48.51	74.00	-25.49	Pass	Vertical
11994.380	39.60	44.90	10.88	44.29	49.87	74.00	-24.13	Pass	Vertical

Test mode: 802.11b(11Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1533.648	30.93	43.96	2.33	46.65	35.95	74.00	-38.05	Pass	Horizontal
3299.775	33.34	44.67	3.63	48.72	41.02	74.00	-32.98	Pass	Horizontal
4924.000	34.94	44.60	6.22	53.20	49.76	74.00	-24.24	Pass	Horizontal
7386.000	36.44	44.92	6.78	48.67	46.97	74.00	-27.03	Pass	Horizontal
9848.000	38.14	45.53	7.19	48.65	48.45	74.00	-25.55	Pass	Horizontal
11994.380	39.60	44.90	10.88	43.92	49.50	74.00	-24.50	Pass	Horizontal
1251.079	30.35	44.31	1.94	46.39	34.37	74.00	-39.63	Pass	Vertical
3299.775	33.34	44.67	3.63	46.74	39.04	74.00	-34.96	Pass	Vertical
4924.000	34.94	44.60	6.22	53.69	50.25	74.00	-23.75	Pass	Vertical
7386.000	36.44	44.92	6.78	45.51	43.81	74.00	-30.19	Pass	Vertical
9848.000	38.14	45.53	7.19	49.64	49.44	74.00	-24.56	Pass	Vertical
11842.690	39.55	44.88	10.67	44.28	49.62	74.00	-24.38	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1289.885	30.43	44.26	2.00	46.73	34.90	74.00	-39.10	Pass	Horizontal
3216.838	33.41	44.68	3.56	48.44	40.73	74.00	-33.27	Pass	Horizontal
4824.000	34.73	44.60	6.02	52.42	48.57	74.00	-25.43	Pass	Horizontal
7236.000	36.42	44.80	6.94	51.20	49.76	74.00	-24.24	Pass	Horizontal
9648.000	37.93	45.57	7.01	46.93	46.30	74.00	-27.70	Pass	Horizontal
12055.600	39.58	44.88	10.87	44.96	50.53	74.00	-23.47	Pass	Horizontal
1541.476	30.95	43.95	2.34	47.70	37.04	74.00	-36.96	Pass	Vertical
3216.838	33.41	44.68	3.56	47.60	39.89	74.00	-34.11	Pass	Vertical
4824.000	34.73	44.60	6.02	52.80	48.95	74.00	-25.05	Pass	Vertical
7236.000	36.42	44.80	6.94	48.19	46.75	74.00	-27.25	Pass	Vertical
9648.000	37.93	45.57	7.01	47.60	46.97	74.00	-27.03	Pass	Vertical
11994.380	39.60	44.90	10.88	44.55	50.13	74.00	-23.87	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1260.670	30.37	44.30	1.95	46.43	34.45	74.00	-39.55	Pass	Horizontal
3258.042	33.37	44.67	3.60	48.03	40.33	74.00	-33.67	Pass	Horizontal
4874.000	34.84	44.60	6.12	52.33	48.69	74.00	-25.31	Pass	Horizontal
7311.000	36.43	44.86	6.86	51.27	49.70	74.00	-24.30	Pass	Horizontal
9748.000	38.03	45.55	7.10	49.11	48.69	74.00	-25.31	Pass	Horizontal
12117.140	39.56	44.86	10.85	44.53	50.08	74.00	-23.92	Pass	Horizontal
1296.469	30.45	44.25	2.01	45.32	33.53	74.00	-40.47	Pass	Vertical
3258.042	33.37	44.67	3.60	46.44	38.74	74.00	-35.26	Pass	Vertical
4874.000	34.84	44.60	6.12	51.24	47.60	74.00	-26.40	Pass	Vertical
7311.000	36.43	44.86	6.86	48.47	46.90	74.00	-27.10	Pass	Vertical
9748.000	38.03	45.55	7.10	47.83	47.41	74.00	-26.59	Pass	Vertical
12429.540	39.47	44.77	10.73	44.05	49.48	74.00	-24.52	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1424.511	30.72	44.09	2.19	45.71	34.53	74.00	-39.47	Pass	Horizontal
3299.775	33.34	44.67	3.63	45.83	38.13	74.00	-35.87	Pass	Horizontal
4924.000	34.94	44.60	6.22	51.82	48.38	74.00	-25.62	Pass	Horizontal
7386.000	36.44	44.92	6.78	49.67	47.97	74.00	-26.03	Pass	Horizontal
9848.000	38.14	45.53	7.19	47.44	47.24	74.00	-26.76	Pass	Horizontal
11994.380	39.60	44.90	10.88	43.34	48.92	74.00	-25.08	Pass	Horizontal
1343.505	30.55	44.19	2.08	46.20	34.64	74.00	-39.36	Pass	Vertical
3299.775	33.34	44.67	3.63	45.64	37.94	74.00	-36.06	Pass	Vertical
4924.000	34.94	44.60	6.22	51.81	48.37	74.00	-25.63	Pass	Vertical
7386.000	36.44	44.92	6.78	49.63	47.93	74.00	-26.07	Pass	Vertical
9848.000	38.14	45.53	7.19	49.97	49.77	74.00	-24.23	Pass	Vertical
11872.880	39.56	44.89	10.71	44.91	50.29	74.00	-23.71	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1241.562	30.32	44.33	1.93	46.39	34.31	74.00	-39.69	Pass	Horizontal
3216.838	33.41	44.68	3.56	46.55	38.84	74.00	-35.16	Pass	Horizontal
4824.000	34.73	44.60	6.02	52.82	48.97	74.00	-25.03	Pass	Horizontal
7236.000	36.42	44.80	6.94	50.13	48.69	74.00	-25.31	Pass	Horizontal
9648.000	37.93	45.57	7.01	49.92	49.29	74.00	-24.71	Pass	Horizontal
11963.890	39.59	44.90	10.84	44.55	50.08	74.00	-23.92	Pass	Horizontal
1364.182	30.60	44.16	2.11	44.98	33.53	74.00	-40.47	Pass	Vertical
3241.498	33.38	44.67	3.58	44.72	37.01	74.00	-36.99	Pass	Vertical
4824.000	34.73	44.60	6.02	54.02	50.17	74.00	-23.83	Pass	Vertical
7236.000	36.42	44.80	6.94	48.03	46.59	74.00	-27.41	Pass	Vertical
9648.000	37.93	45.57	7.01	47.56	46.93	74.00	-27.07	Pass	Vertical
11994.380	39.60	44.90	10.88	43.35	48.93	74.00	-25.07	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1495.101	30.86	44.00	2.28	45.36	34.50	74.00	-39.50	Pass	Horizontal
3258.042	33.37	44.67	3.60	45.99	38.29	74.00	-35.71	Pass	Horizontal
4874.000	34.84	44.60	6.12	51.60	47.96	74.00	-26.04	Pass	Horizontal
7311.000	36.43	44.86	6.86	49.89	48.32	74.00	-25.68	Pass	Horizontal
9748.000	38.03	45.55	7.10	48.95	48.53	74.00	-25.47	Pass	Horizontal
11842.690	39.55	44.88	10.67	42.67	48.01	74.00	-25.99	Pass	Horizontal
1364.182	30.60	44.16	2.11	44.34	32.89	74.00	-41.11	Pass	Vertical
3258.042	33.37	44.67	3.60	44.36	36.66	74.00	-37.34	Pass	Vertical
4874.000	34.84	44.60	6.12	51.26	47.62	74.00	-26.38	Pass	Vertical
7311.000	36.43	44.86	6.86	46.56	44.99	74.00	-29.01	Pass	Vertical
9748.000	38.03	45.55	7.10	47.67	47.25	74.00	-26.75	Pass	Vertical
11752.600	39.53	44.88	10.54	43.47	48.66	74.00	-25.34	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)				Test Frequency: 2462MHz			Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1498.912	30.87	44.00	2.29	43.77	32.93	74.00	-41.07	Pass	Horizontal
3299.775	33.34	44.67	3.63	45.17	37.47	74.00	-36.53	Pass	Horizontal
4924.000	34.94	44.60	6.22	48.89	45.45	74.00	-28.55	Pass	Horizontal
7386.000	36.44	44.92	6.78	47.49	45.79	74.00	-28.21	Pass	Horizontal
9848.000	38.14	45.53	7.19	48.54	48.34	74.00	-25.66	Pass	Horizontal
11933.470	39.58	44.89	10.80	41.21	46.70	74.00	-27.30	Pass	Horizontal
1228.984	30.29	44.34	1.91	46.72	34.58	74.00	-39.42	Pass	Vertical
3299.775	33.34	44.67	3.63	46.57	38.87	74.00	-35.13	Pass	Vertical
4924.000	34.94	44.60	6.22	52.22	48.78	74.00	-25.22	Pass	Vertical
7386.000	36.44	44.92	6.78	48.83	47.13	74.00	-26.87	Pass	Vertical
9848.000	38.14	45.53	7.19	47.86	47.66	74.00	-26.34	Pass	Vertical
11933.470	39.58	44.89	10.80	43.87	49.36	74.00	-24.64	Pass	Vertical

Test Model No.:ECH-c1-LSD-C

Test mode: 802.11b(11Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1115.673	30.02	44.51	1.72	45.57	32.80	74.00	-41.20	Pass	Horizontal
3738.129	32.99	44.62	3.99	45.01	37.37	74.00	-36.63	Pass	Horizontal
4824.000	34.73	44.60	6.02	51.55	47.70	74.00	-26.30	Pass	Horizontal
7236.000	36.42	44.80	6.94	50.30	48.86	74.00	-25.14	Pass	Horizontal
9648.000	37.93	45.57	7.01	50.60	49.97	74.00	-24.03	Pass	Horizontal
11872.880	39.56	44.89	10.71	44.45	49.83	74.00	-24.17	Pass	Horizontal
1378.143	30.63	44.14	2.13	46.24	34.86	74.00	-39.14	Pass	Vertical
3653.463	33.05	44.63	3.93	45.17	37.52	74.00	-36.48	Pass	Vertical
4824.000	34.73	44.60	6.02	52.58	48.73	74.00	-25.27	Pass	Vertical
7236.000	36.42	44.80	6.94	50.61	49.17	74.00	-24.83	Pass	Vertical
9648.000	37.93	45.57	7.01	49.75	49.12	74.00	-24.88	Pass	Vertical
11994.380	39.60	44.90	10.88	43.51	49.09	74.00	-24.91	Pass	Vertical

Test mode: 802.11b(11Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1773.127	31.35	43.71	2.61	43.61	33.86	74.00	-40.14	Pass	Horizontal
3258.042	33.37	44.67	3.60	47.77	40.07	74.00	-33.93	Pass	Horizontal
4874.000	34.84	44.60	6.12	50.60	46.96	74.00	-27.04	Pass	Horizontal
7311.000	36.43	44.86	6.86	49.80	48.23	74.00	-25.77	Pass	Horizontal
9748.000	38.03	45.55	7.10	46.41	45.99	74.00	-28.01	Pass	Horizontal
11994.380	39.60	44.90	10.88	42.85	48.43	74.00	-25.57	Pass	Horizontal
1597.401	31.05	43.89	2.41	44.71	34.28	74.00	-39.72	Pass	Vertical
3552.582	33.13	44.64	3.85	46.14	38.48	74.00	-35.52	Pass	Vertical
4874.000	34.84	44.60	6.12	51.01	47.37	74.00	-26.63	Pass	Vertical
7311.000	36.43	44.86	6.86	43.55	41.98	74.00	-32.02	Pass	Vertical
9748.000	38.03	45.55	7.10	48.38	47.96	74.00	-26.04	Pass	Vertical
11994.380	39.60	44.90	10.88	43.80	49.38	74.00	-24.62	Pass	Vertical

Test mode: 802.11b(11Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1533.648	30.93	43.96	2.33	46.33	35.63	74.00	-38.37	Pass	Horizontal
3299.775	33.34	44.67	3.63	48.13	40.43	74.00	-33.57	Pass	Horizontal
4924.000	34.94	44.60	6.22	52.66	49.22	74.00	-24.78	Pass	Horizontal
7386.000	36.44	44.92	6.78	48.16	46.46	74.00	-27.54	Pass	Horizontal
9848.000	38.14	45.53	7.19	47.98	47.78	74.00	-26.22	Pass	Horizontal
11994.380	39.60	44.90	10.88	43.54	49.12	74.00	-24.88	Pass	Horizontal
1424.511	30.72	44.09	2.19	45.36	34.18	74.00	-39.82	Pass	Vertical
3709.691	33.01	44.63	3.97	45.15	37.50	74.00	-36.50	Pass	Vertical
4924.000	34.94	44.60	6.22	53.15	49.71	74.00	-24.29	Pass	Vertical
7386.000	36.44	44.92	6.78	45.13	43.43	74.00	-30.57	Pass	Vertical
9848.000	38.14	45.53	7.19	49.33	49.13	74.00	-24.87	Pass	Vertical
12178.980	39.54	44.84	10.82	42.74	48.26	74.00	-25.74	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1537.557	30.94	43.96	2.34	46.36	35.68	74.00	-38.32	Pass	Horizontal
3216.838	33.41	44.68	3.56	48.03	40.32	74.00	-33.68	Pass	Horizontal
4824.000	34.73	44.60	6.02	52.61	48.76	74.00	-25.24	Pass	Horizontal
7236.000	36.42	44.80	6.94	50.01	48.57	74.00	-25.43	Pass	Horizontal
9648.000	37.93	45.57	7.01	46.16	45.53	74.00	-28.47	Pass	Horizontal
12055.600	39.58	44.88	10.87	44.32	49.89	74.00	-24.11	Pass	Horizontal
1506.563	30.88	43.99	2.30	46.30	35.49	74.00	-38.51	Pass	Vertical
3216.838	33.41	44.68	3.56	47.12	39.41	74.00	-34.59	Pass	Vertical
4824.000	34.73	44.60	6.02	52.28	48.43	74.00	-25.57	Pass	Vertical
7236.000	36.42	44.80	6.94	47.83	46.39	74.00	-27.61	Pass	Vertical
9648.000	37.93	45.57	7.01	47.15	46.52	74.00	-27.48	Pass	Vertical
11994.380	39.60	44.90	10.88	44.13	49.71	74.00	-24.29	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1668.044	31.18	43.81	2.49	46.16	36.02	74.00	-37.98	Pass	Horizontal
3258.042	33.37	44.67	3.60	48.15	40.45	74.00	-33.55	Pass	Horizontal
4874.000	34.84	44.60	6.12	52.05	48.41	74.00	-25.59	Pass	Horizontal
7311.000	36.43	44.86	6.86	51.05	49.48	74.00	-24.52	Pass	Horizontal
9748.000	38.03	45.55	7.10	48.85	48.43	74.00	-25.57	Pass	Horizontal
12117.140	39.56	44.86	10.85	44.29	49.84	74.00	-24.16	Pass	Horizontal
1545.405	30.96	43.95	2.35	44.89	34.25	74.00	-39.75	Pass	Vertical
3258.042	33.37	44.67	3.60	45.85	38.15	74.00	-35.85	Pass	Vertical
4874.000	34.84	44.60	6.12	50.81	47.17	74.00	-26.83	Pass	Vertical
7311.000	36.43	44.86	6.86	47.90	46.33	74.00	-27.67	Pass	Vertical
9748.000	38.03	45.55	7.10	47.34	46.92	74.00	-27.08	Pass	Vertical
12429.540	39.47	44.77	10.73	43.62	49.05	74.00	-24.95	Pass	Vertical

Test mode: 802.11g(6Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1326.513	30.52	44.21	2.05	44.35	32.71	74.00	-41.29	Pass	Horizontal
3200.502	33.42	44.68	3.55	44.08	36.37	74.00	-37.63	Pass	Horizontal
4924.000	34.94	44.60	6.22	51.39	47.95	74.00	-26.05	Pass	Horizontal
7386.000	36.44	44.92	6.78	49.15	47.45	74.00	-26.55	Pass	Horizontal
9848.000	38.14	45.53	7.19	46.96	46.76	74.00	-27.24	Pass	Horizontal
11782.550	39.54	44.88	10.58	42.82	48.06	74.00	-25.94	Pass	Horizontal
1399.353	30.67	44.12	2.15	44.22	32.92	74.00	-41.08	Pass	Vertical
3299.775	33.34	44.67	3.63	44.99	37.29	74.00	-36.71	Pass	Vertical
4924.000	34.94	44.60	6.22	51.15	47.71	74.00	-26.29	Pass	Vertical
7386.000	36.44	44.92	6.78	49.07	47.37	74.00	-26.63	Pass	Vertical
9848.000	38.14	45.53	7.19	49.11	48.91	74.00	-25.09	Pass	Vertical
11872.880	39.56	44.89	10.71	43.96	49.34	74.00	-24.66	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)				Test Frequency: 2412MHz			Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1663.803	31.17	43.82	2.49	45.24	35.08	74.00	-38.92	Pass	Horizontal
3653.463	33.05	44.63	3.93	43.73	36.08	74.00	-37.92	Pass	Horizontal
4824.000	34.73	44.60	6.02	52.89	49.04	74.00	-24.96	Pass	Horizontal
7236.000	36.42	44.80	6.94	49.05	47.61	74.00	-26.39	Pass	Horizontal
9648.000	37.93	45.57	7.01	49.34	48.71	74.00	-25.29	Pass	Horizontal
11963.890	39.59	44.90	10.84	43.88	49.41	74.00	-24.59	Pass	Horizontal
1424.511	30.72	44.09	2.19	43.58	32.40	74.00	-41.60	Pass	Vertical
3241.498	33.38	44.67	3.58	43.88	36.17	74.00	-37.83	Pass	Vertical
4824.000	34.73	44.60	6.02	53.46	49.61	74.00	-24.39	Pass	Vertical
7236.000	36.42	44.80	6.94	47.52	46.08	74.00	-27.92	Pass	Vertical
9648.000	37.93	45.57	7.01	47.11	46.48	74.00	-27.52	Pass	Vertical
11994.380	39.60	44.90	10.88	42.88	48.46	74.00	-25.54	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)				Test Frequency: 2437MHz			Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1280.072	30.41	44.27	1.98	43.57	31.69	74.00	-42.31	Pass	Horizontal
3258.042	33.37	44.67	3.60	45.34	37.64	74.00	-36.36	Pass	Horizontal
4874.000	34.84	44.60	6.12	51.23	47.59	74.00	-26.41	Pass	Horizontal
7311.000	36.43	44.86	6.86	49.36	47.79	74.00	-26.21	Pass	Horizontal
9748.000	38.03	45.55	7.10	48.53	48.11	74.00	-25.89	Pass	Horizontal
11842.690	39.55	44.88	10.67	42.48	47.82	74.00	-26.18	Pass	Horizontal
1529.749	30.93	43.96	2.33	44.18	33.48	74.00	-40.52	Pass	Vertical
3258.042	33.37	44.67	3.60	43.88	36.18	74.00	-37.82	Pass	Vertical
4874.000	34.84	44.60	6.12	50.89	47.25	74.00	-26.75	Pass	Vertical
7311.000	36.43	44.86	6.86	45.68	44.11	74.00	-29.89	Pass	Vertical
9748.000	38.03	45.55	7.10	46.91	46.49	74.00	-27.51	Pass	Vertical
11752.600	39.53	44.88	10.54	42.95	48.14	74.00	-25.86	Pass	Vertical

Test mode: 802.11n(HT20)(6.5Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1498.912	30.87	44.00	2.29	43.45	32.61	74.00	-41.39	Pass	Horizontal
3299.775	33.34	44.67	3.63	44.68	36.98	74.00	-37.02	Pass	Horizontal
4924.000	34.94	44.60	6.22	48.12	44.68	74.00	-29.32	Pass	Horizontal
7386.000	36.44	44.92	6.78	46.58	44.88	74.00	-29.12	Pass	Horizontal
9848.000	38.14	45.53	7.19	48.31	48.11	74.00	-25.89	Pass	Horizontal
11933.470	39.58	44.89	10.80	40.89	46.38	74.00	-27.62	Pass	Horizontal
1280.072	30.41	44.27	1.98	44.25	32.37	74.00	-41.63	Pass	Vertical
3299.775	33.34	44.67	3.63	45.88	38.18	74.00	-35.82	Pass	Vertical
4924.000	34.94	44.60	6.22	51.65	48.21	74.00	-25.79	Pass	Vertical
7386.000	36.44	44.92	6.78	47.61	45.91	74.00	-28.09	Pass	Vertical
9848.000	38.14	45.53	7.19	47.46	47.26	74.00	-26.74	Pass	Vertical
11933.470	39.58	44.89	10.80	42.95	48.44	74.00	-25.56	Pass	Vertical

Note:

1) Through Pre-scan transmitting mode and charge+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) ; 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

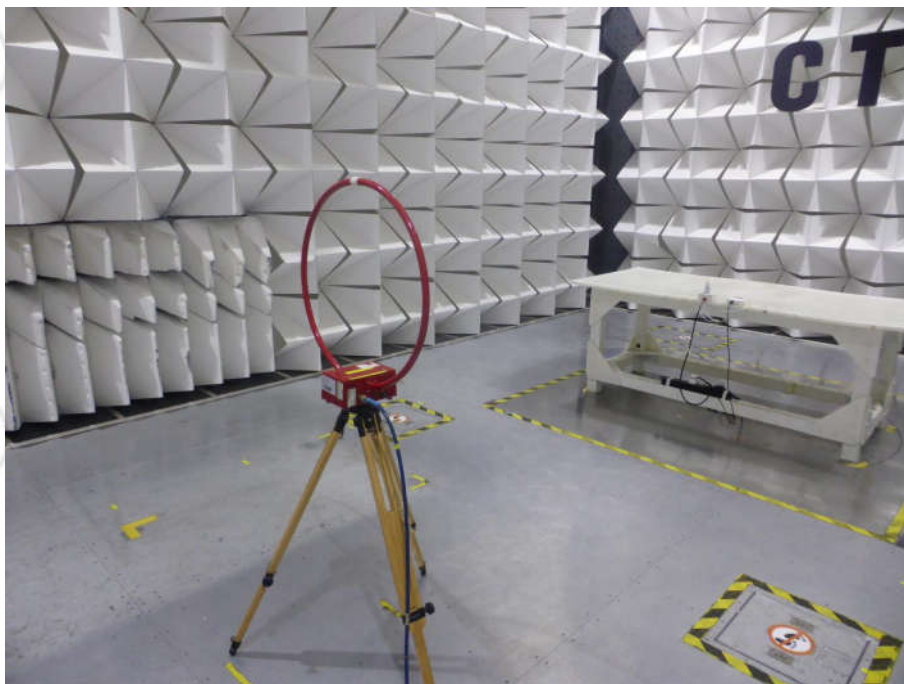
Test model No.:ECH-c1-WLSD-C



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



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



Radiated spurious emission Test Setup-3 (Below 30MHz)



Conducted Emissions Test Setup

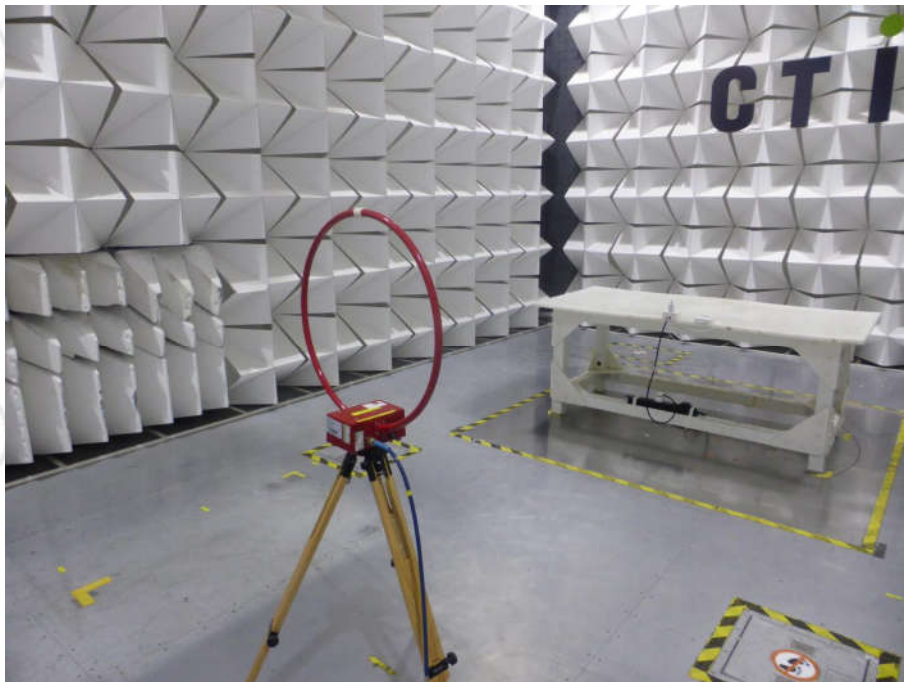
Test model No.:ECH-c1-LSD-C



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



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



Radiated spurious emission Test Setup-3 (Below 30MHz)

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32J00120202 for EUT external and internal photos.

*** End of Report ***

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