

## TEST REPORT

**Product** : Testo Control Unit  
**Trade mark** :   
**Model/Type reference** : 0480 0069  
**Serial Number** : N/A  
**Report Number** : EED32K00112103  
**FCC ID** : WAF-04800069  
**Date of Issue** : Jul. 25, 2018  
**Test Standards** : 47 CFR Part 15 Subpart C  
**Test result** : PASS

Prepared for:

**Testo SE & Co. KGaA**  
**Testo-Strasse 1, Lenzkirch 79853, Germany**

Prepared by:

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Date:

Jul. 25, 2018

Check No.:3096309230



## 2 Version

Version No.	Date	Description
00	Jul. 25, 2018	Original

### 3 Test Summary

Test Item	Test Requirement	Test method	Result
<b>Antenna Requirement</b>	47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
<b>AC Power Line Conducted Emission</b>	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
<b>Conducted Peak Output Power</b>	47 CFR Part 15 Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
<b>6dB Occupied Bandwidth</b>	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
<b>Power Spectral Density</b>	47 CFR Part 15 Subpart C Section 15.247 (e)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
<b>Band-edge for RF Conducted Emissions</b>	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
<b>RF Conducted Spurious Emissions</b>	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
<b>Radiated Spurious Emissions</b>	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
<b>Restricted bands around fundamental frequency (Radiated Emission)</b>	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.

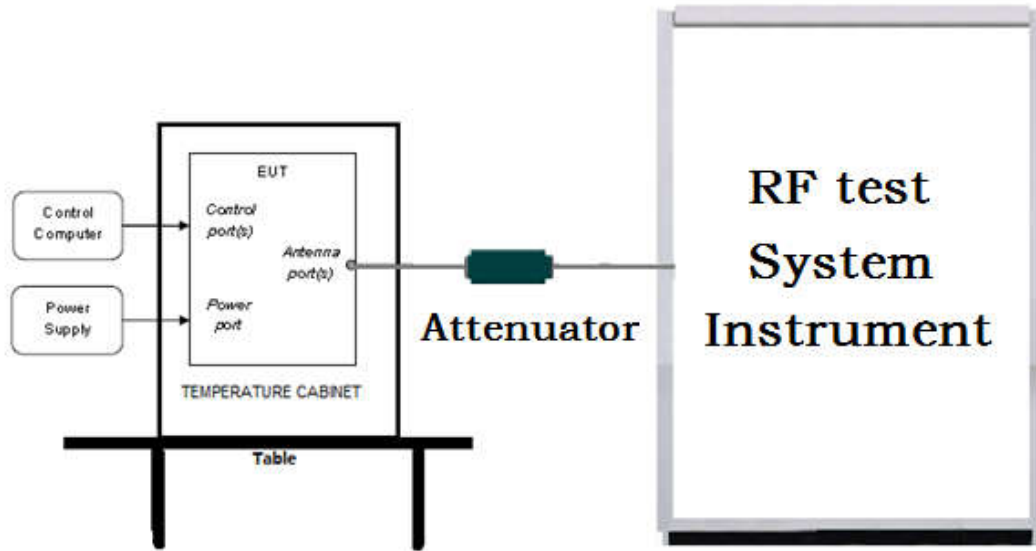
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## 5 Test Requirement

### 5.1 Test setup

#### 5.1.1 For Conducted test setup



#### 5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

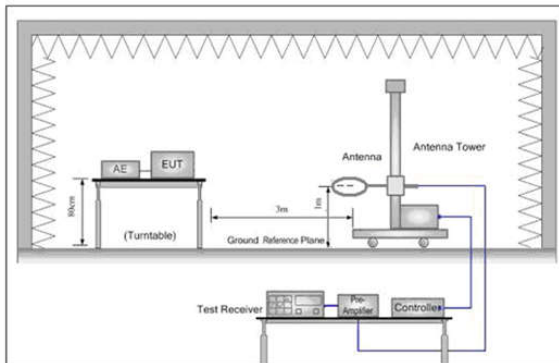


Figure 1. Below 30MHz

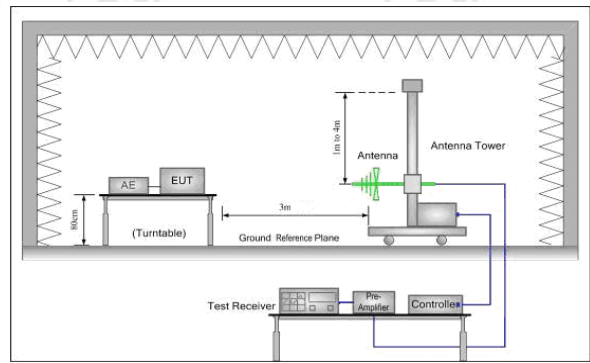


Figure 2. 30MHz to 1GHz

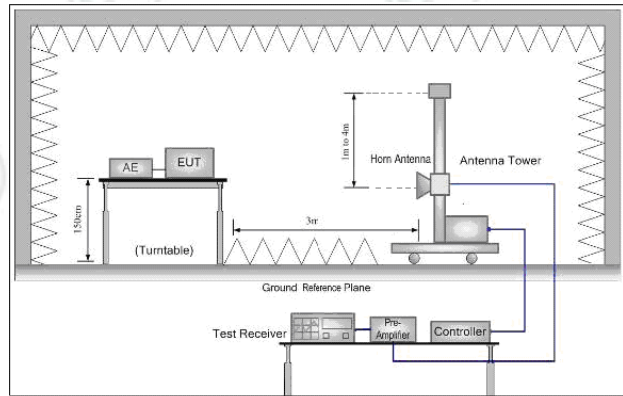
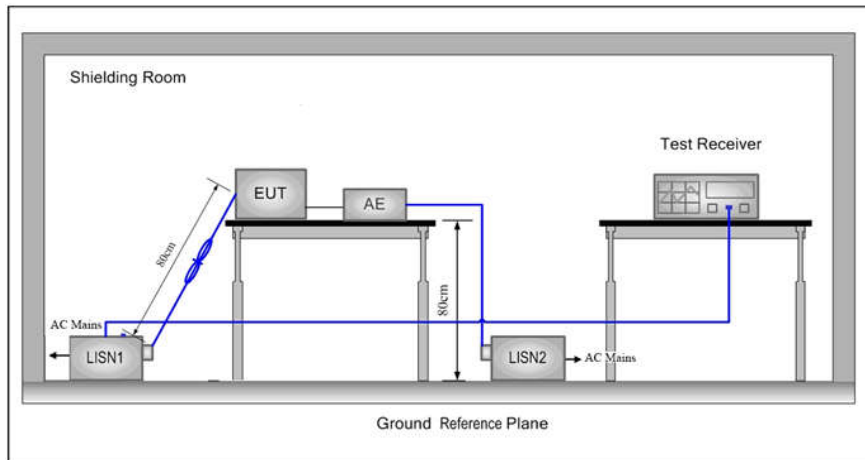


Figure 3. Above 1GHz

### 5.1.3 For Conducted Emissions test setup

#### Conducted Emissions setup



## 5.2 Test Environment

Operating Environment:	
Temperature:	23.1 °C
Humidity:	45% 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
802.11n(HT40)	2422MHz ~2452 MHz	Channel 1	Channel 4	Channel7
		2422MHz	2437MHz	2452MHz
TX mode:	The EUT transmitted the continuous signal at the specific channel(s).			

Test mode:

Pre-scan under all rate at lowest channel 1

<b>Mode</b>	<b>802.11b</b>				X				
<b>Data Rate</b>	<b>1Mbps</b>	<b>2Mbps</b>	<b>5.5Mbps</b>	<b>11Mbps</b>					
Power(dBm)	16.87	16.55	15.81	15.01					
<b>Mode</b>	<b>802.11g</b>								
<b>Data Rate</b>	<b>6Mbps</b>	<b>9Mbps</b>	<b>12Mbps</b>	<b>18Mbps</b>	<b>24Mbps</b>	<b>36Mbps</b>	<b>48Mbps</b>	<b>54Mbps</b>	
Power(dBm)	19.86	19.45	19.21	19.01	18.84	18.51	17.95	17.45	
<b>Mode</b>	<b>802.11n (HT20)</b>								
<b>Data Rate</b>	<b>6.5Mbps</b>	<b>13Mbps</b>	<b>19.5Mbps</b>	<b>26Mbps</b>	<b>39Mbps</b>	<b>52Mbps</b>	<b>58.5Mbps</b>	<b>65Mbps</b>	
Power(dBm)	20.01	19.85	19.27	19.00	18.84	18.45	18.20	18.04	
<b>Mode</b>	<b>802.11n (HT40)</b>								
<b>Data Rate</b>	<b>13.5Mbps</b>	<b>27Mbps</b>	<b>40.5Mbps</b>	<b>54Mbps</b>	<b>81Mbps</b>	<b>108Mbps</b>	<b>121.5Mbps</b>	<b>135Mbps</b>	
Power(dBm)	18.03	18.00	17.86	17.45	17.31	17.01	16.84	16.38	

Through Pre-scan, 1Mbps 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:	Testo SE & Co. KGaA
Address of Applicant:	Testo-Strasse 1, Lenzkirch 79853, Germany
Manufacturer:	Shenzhen Phonemax Technology Co., Ltd.
Address of Manufacturer:	5F, East block, LaoBing Building, Xingye Road, Xixiang, Bao'an District, Shenzhen
Factory:	Shenzhen Newsun Technology Co., Ltd
Address of Factory:	5F, Block A1, Zhongtai Information Industrial Park, No. 2 Dezheng Road, Shilong Community, Shiyuan Street, Bao'an District, Shenzhen

### 6.2 General Description of EUT

Product Name:	Testo Control Unit	
Model No.(EUT):	0480 0069	
Trade Mark:		
EUT Supports Radios application:	BT: 4.0 BT Dual mode, 2402MHz to 2480MHz WiFi: IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz GPS: 1559MHz to 1610MHz	
Power Supply:	Adapter	Model: 0554 1104 Input: 100-240V~50/60Hz, 0.2A Output: 5.0V --- 1.0A
	Battery	Rechargeable Li-ion Battery 3.8V, 2150mAh, 8.17Wh
USB cable:	200cm(shielded)	
Sample Received Date:	May 11, 2018	
Sample tested Date:	May 11, 2018 to Jul. 25, 2018	

### 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:	IEEE for 802.11b:17 (manufacturer declare) IEEE for 802.11g/n(HT20 ):11 (manufacturer declare) IEEE for 802.11n(HT40):10 (manufacturer declare)
Test Software of EUT:	Android version 6.0(manufacturer declare)
Antenna Type and Gain:	Antenna Type: MONOPOLE Antenna Gain: 2.3dBi
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		
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 independently.

#### 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.

FCC Designation No.: CN1164

#### 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 x 10 <sup>-8</sup>
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

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	05-26-2017 05-25-2018	05-25-2018 05-24-2019
Temperature/ Humidity Indicator	Belida	TT-512	A19	01-24-2018	01-23-2019
LISN	R&S	ENV216	100098	05-11-2018	05-10-2019

RF Conducted test					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Signal Generator	Keysight	E8257D	MY53401106	03-13-2018	03-12-2019
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-13-2018	03-12-2019
Signal Generator	Keysight	N5182B	MY53051549	03-13-2018	03-12-2019
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-10-2018	01-09-2019
power meter & power sensor	R&S	OSP120	101374	04-11-2018	04-10-2019
RF control unit	JS Tonscend	JS0806-2	2015860006	03-13-2018	03-12-2019

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	---	06-04-2016	06-03-2019
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-484	06-05-2018	06-04-2019
Preamplifier	JS Tonscend	EMC051845SE	980380	01-19-2018	01-18-2019
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015 07-18-2018	07-18-2018 07-17-2019
Loop Antenna	ETS	6502	00071730	06-22-2017	06-21-2019
Spectrum Analyzer	R&S	FSP40	100416	05-11-2018	05-10-2019
Receiver	R&S	ESCI	100435	05-26-2018 05-25-2018	05-25-2018 05-24-2019
LISN	schwarzbeck	NNBM8125	81251547	05-11-2018	05-10-2019
LISN	schwarzbeck	NNBM8125	81251548	05-11-2018	05-10-2019
Signal Generator	Agilent	E4438C	MY45095744	03-13-2018	03-12-2019
Signal Generator	Keysight	E8257D	MY53401106	03-13-2018	03-12-2019
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-02-2018	05-01-2019
Communication test set	Agilent	E5515C	GB47050534	03-16-2018	03-15-2019
Cable line	Fulai(7M)	SF106	5219/6A	01-10-2018	01-09-2019
Cable line	Fulai(6M)	SF106	5220/6A	01-10-2018	01-09-2019
Cable line	Fulai(3M)	SF106	5216/6A	01-10-2018	01-09-2019
Cable line	Fulai(3M)	SF106	5217/6A	01-10-2018	01-09-2019
Communication test set	R&S	CMW500	152394	03-16-2018	03-15-2019
High-pass filter	Sinoscite	FL3CX03WG18NM1 2-0398-002	---	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX01CA09CL12 -0395-001	---	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX01CA08CL12 -0393-001	---	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX02CA04CL12 -0396-002	---	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX02CA03CL12 -0394-001	---	01-10-2018	01-09-2019

## 8 Radio Technical Requirements Specification

### Reference documents for testing:

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

### Test Results List:

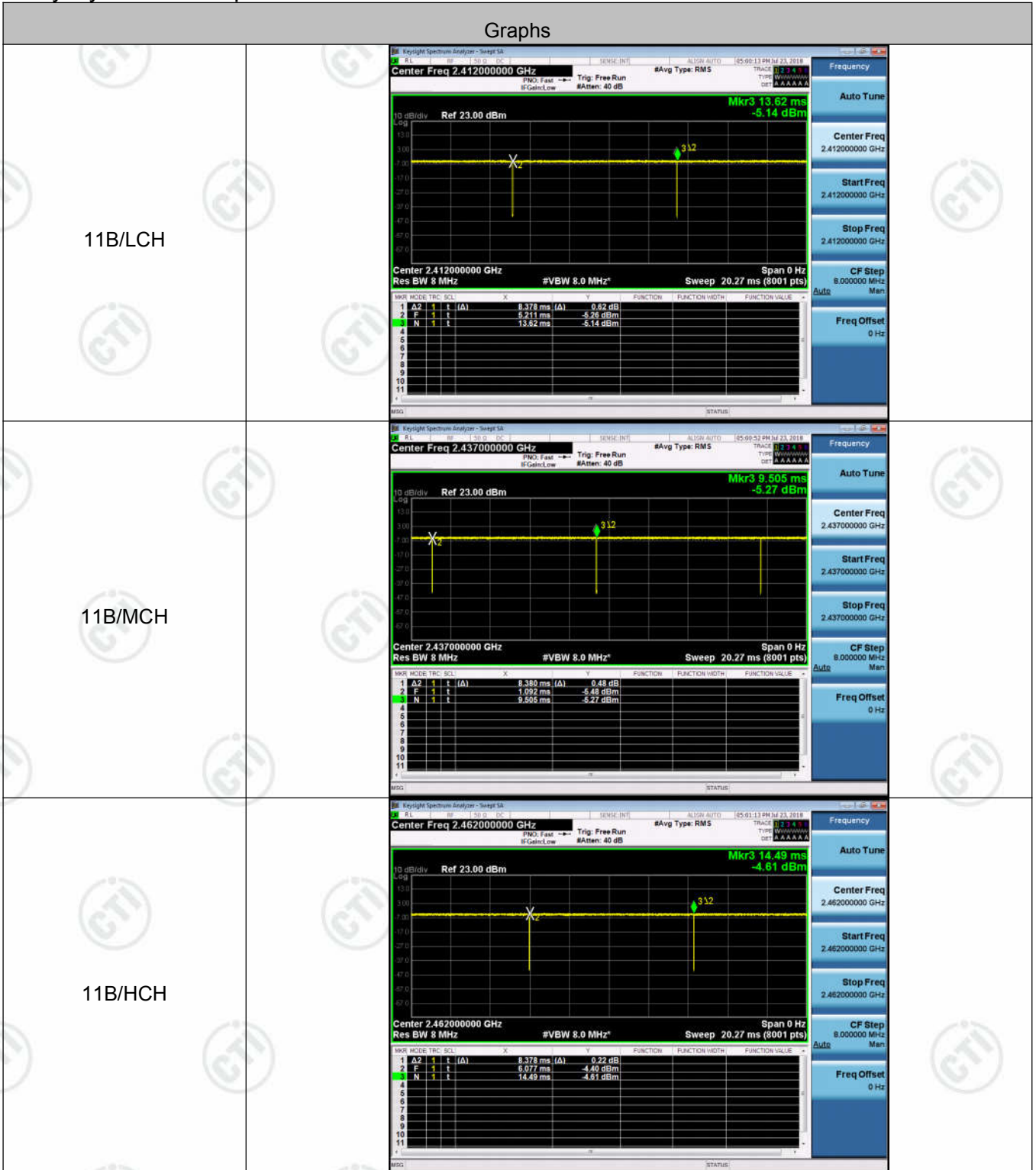
Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	PASS	Appendix A)
Part15C Section 15.247 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10	Band-edge for RF Conducted Emissions	PASS	Appendix C)
Part15C Section 15.247(d)	ANSI C63.10	RF Conducted Spurious Emissions	PASS	Appendix D)
Part15C Section 15.247 (e)	ANSI C63.10	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**

Duty Cycle

Test Mode	Channel	Duty Cycle[%]	Verdict
11B	LCH	99.58	PASS
11B	MCH	99.61	PASS
11B	HCH	99.58	PASS
11G	LCH	96.99	PASS
11G	MCH	97.16	PASS
11G	HCH	97.16	PASS
11N20SISO	LCH	96.96	PASS
11N20SISO	MCH	96.96	PASS
11N20SISO	HCH	96.96	PASS
11N40SISO	LCH	94.05	PASS
11N40SISO	MCH	94.05	PASS
11N40SISO	HCH	94.07	PASS

Duty Cycle Test Graph





<p>11N20SISO/LCH</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.412000000 GHz</p> <p>Stop Freq 2.412000000 GHz</p> <p>CF Step 8.000000 MHz</p> <p>Freq Offset 0 Hz</p>
<p>11N20SISO/MCH</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.437000000 GHz</p> <p>Stop Freq 2.437000000 GHz</p> <p>CF Step 8.000000 MHz</p> <p>Freq Offset 0 Hz</p>
<p>11N20SISO/HCH</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.462000000 GHz</p> <p>Start Freq 2.462000000 GHz</p> <p>Stop Freq 2.462000000 GHz</p> <p>CF Step 8.000000 MHz</p> <p>Freq Offset 0 Hz</p>



<p>11N40SISO/LCH</p>	<p>Center Freq 2.422000000 GHz Mkr3 1.196 ms -15.24 dBm Center 2.422000000 GHz Res BW 8 MHz #VBW 8.0 MHz* Sweep 20.27 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>AZ</td> <td>1</td> <td>t</td> <td>(A)</td> <td>840.9 μs</td> <td>(A)</td> <td></td> <td>2.06 dB</td> </tr> <tr> <td>2</td> <td>F</td> <td>1</td> <td>t</td> <td></td> <td>514.3 μs</td> <td></td> <td></td> <td>-15.19 dBm</td> </tr> <tr> <td>N</td> <td>1</td> <td>t</td> <td></td> <td></td> <td>1.196 ms</td> <td></td> <td></td> <td>-15.24 dBm</td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	AZ	1	t	(A)	840.9 μs	(A)		2.06 dB	2	F	1	t		514.3 μs			-15.19 dBm	N	1	t			1.196 ms			-15.24 dBm
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																													
1	AZ	1	t	(A)	840.9 μs	(A)		2.06 dB																													
2	F	1	t		514.3 μs			-15.19 dBm																													
N	1	t			1.196 ms			-15.24 dBm																													
<p>11N40SISO/MCH</p>	<p>Center Freq 2.437000000 GHz Mkr3 737.2 μs -14.61 dBm Center 2.437000000 GHz Res BW 8 MHz #VBW 8.0 MHz* Sweep 20.27 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>AZ</td> <td>1</td> <td>t</td> <td>(A)</td> <td>840.9 μs</td> <td>(A)</td> <td></td> <td>2.73 dB</td> </tr> <tr> <td>2</td> <td>F</td> <td>1</td> <td>t</td> <td></td> <td>55.71 μs</td> <td></td> <td></td> <td>-14.77 dBm</td> </tr> <tr> <td>N</td> <td>1</td> <td>t</td> <td></td> <td></td> <td>737.2 μs</td> <td></td> <td></td> <td>-14.61 dBm</td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	AZ	1	t	(A)	840.9 μs	(A)		2.73 dB	2	F	1	t		55.71 μs			-14.77 dBm	N	1	t			737.2 μs			-14.61 dBm
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																													
1	AZ	1	t	(A)	840.9 μs	(A)		2.73 dB																													
2	F	1	t		55.71 μs			-14.77 dBm																													
N	1	t			737.2 μs			-14.61 dBm																													
<p>11N40SISO/HCH</p>	<p>Center Freq 2.452000000 GHz Mkr3 1.196 ms -14.96 dBm Center 2.452000000 GHz Res BW 8 MHz #VBW 8.0 MHz* Sweep 20.27 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>AZ</td> <td>1</td> <td>t</td> <td>(A)</td> <td>843.5 μs</td> <td>(A)</td> <td></td> <td>2.32 dB</td> </tr> <tr> <td>2</td> <td>F</td> <td>1</td> <td>t</td> <td></td> <td>511.7 μs</td> <td></td> <td></td> <td>-14.86 dBm</td> </tr> <tr> <td>N</td> <td>1</td> <td>t</td> <td></td> <td></td> <td>1.196 ms</td> <td></td> <td></td> <td>-14.96 dBm</td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	AZ	1	t	(A)	843.5 μs	(A)		2.32 dB	2	F	1	t		511.7 μs			-14.86 dBm	N	1	t			1.196 ms			-14.96 dBm
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																													
1	AZ	1	t	(A)	843.5 μs	(A)		2.32 dB																													
2	F	1	t		511.7 μs			-14.86 dBm																													
N	1	t			1.196 ms			-14.96 dBm																													

**Result Table**

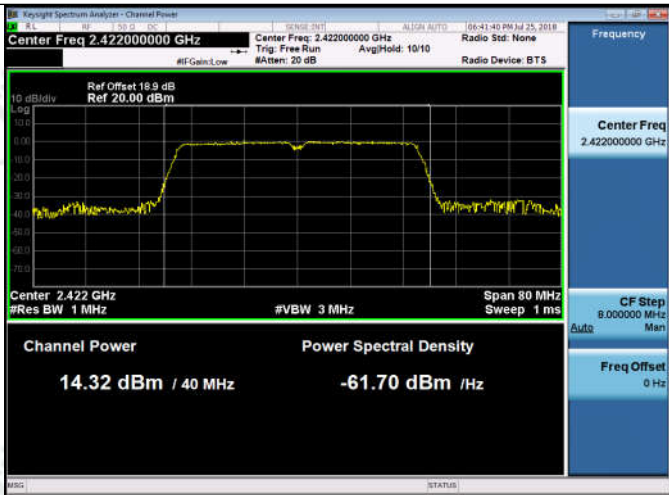
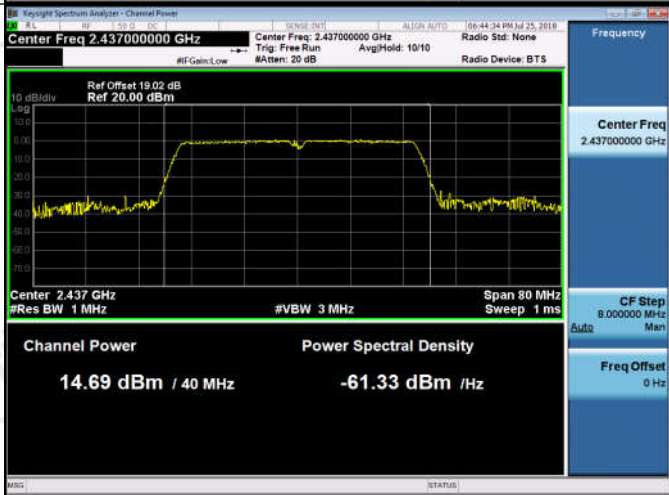
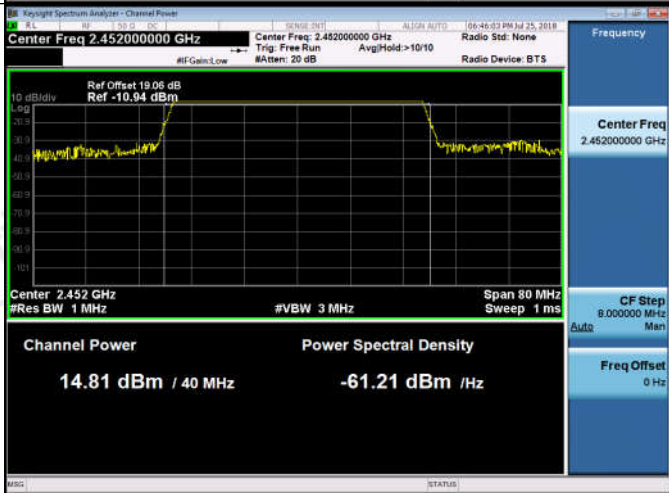
Mode	Channel	Conducted Peak Output Power [dBm]	Av.Power [dBm]	Verdict
11B	LCH	16.87	16.83	PASS
11B	MCH	17.08	17	PASS
11B	HCH	16.41	16.37	PASS
11G	LCH	15.23	15.22	PASS
11G	MCH	15.49	15.48	PASS
11G	HCH	15.8	15.79	PASS
11N20SISO	LCH	15.23	15.22	PASS
11N20SISO	MCH	15.48	15.47	PASS
11N20SISO	HCH	15.88	15.87	PASS
11N40SISO	LCH	14.32	14.23	PASS
11N40SISO	MCH	14.69	14.67	PASS
11N40SISO	HCH	14.81	14.78	PASS

**Test Graph**



<p>11G/LCH</p>	<p>Keysight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.412000000 GHz</p> <p>Ref Offset: 19.06 dB, Ref: 20.00 dBm</p> <p>Channel Power: 15.23 dBm / 20 MHz</p> <p>Power Spectral Density: -57.78 dBm / Hz</p>	<p>Frequency</p> <p>Center Freq: 2.412000000 GHz</p> <p>CF Step: 4.000000 MHz</p> <p>Freq Offset: 0 Hz</p>
<p>11G/MCH</p>	<p>Keysight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.437000000 GHz</p> <p>Ref Offset: 19.02 dB, Ref: 20.00 dBm</p> <p>Channel Power: 15.49 dBm / 20 MHz</p> <p>Power Spectral Density: -57.52 dBm / Hz</p>	<p>Frequency</p> <p>Center Freq: 2.437000000 GHz</p> <p>CF Step: 4.000000 MHz</p> <p>Freq Offset: 0 Hz</p>
<p>11G/HCH</p>	<p>Keysight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.462000000 GHz</p> <p>Ref Offset: 19.06 dB, Ref: -10.94 dBm</p> <p>Channel Power: 15.80 dBm / 20 MHz</p> <p>Power Spectral Density: -57.22 dBm / Hz</p>	<p>Frequency</p> <p>Center Freq: 2.462000000 GHz</p> <p>CF Step: 4.000000 MHz</p> <p>Freq Offset: 0 Hz</p>

<p>11N20SISO/LCH</p>	<p>KeySight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.412000000 GHz</p> <p>Ref Offset: 19.06 dB Ref: -10.94 dBm</p> <p>Center: 2.412 GHz #Res BW: 1 MHz #VBW: 3 MHz Span: 40 MHz Sweep: 1 ms</p> <p>Channel Power: 15.23 dBm / 20 MHz Power Spectral Density: -57.78 dBm / Hz</p>	<p>Frequency</p> <p>Center Freq: 2.412000000 GHz</p> <p>CF Step: 4000000 MHz Auto Man</p> <p>Freq Offset: 0 Hz</p>
<p>11N20SISO/MCH</p>	<p>KeySight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.437000000 GHz</p> <p>Ref Offset: 19.02 dB Ref: 20.00 dBm</p> <p>Center: 2.437 GHz #Res BW: 1 MHz #VBW: 3 MHz Span: 40 MHz Sweep: 1 ms</p> <p>Channel Power: 15.48 dBm / 20 MHz Power Spectral Density: -57.53 dBm / Hz</p>	<p>Frequency</p> <p>Center Freq: 2.437000000 GHz</p> <p>CF Step: 4000000 MHz Auto Man</p> <p>Freq Offset: 0 Hz</p>
<p>11N20SISO/HCH</p>	<p>KeySight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.462000000 GHz</p> <p>Ref Offset: 19.06 dB Ref: 20.00 dBm</p> <p>Center: 2.462 GHz #Res BW: 1 MHz #VBW: 3 MHz Span: 40 MHz Sweep: 1 ms</p> <p>Channel Power: 15.88 dBm / 20 MHz Power Spectral Density: -57.13 dBm / Hz</p>	<p>Frequency</p> <p>Center Freq: 2.462000000 GHz</p> <p>CF Step: 4000000 MHz Auto Man</p> <p>Freq Offset: 0 Hz</p>

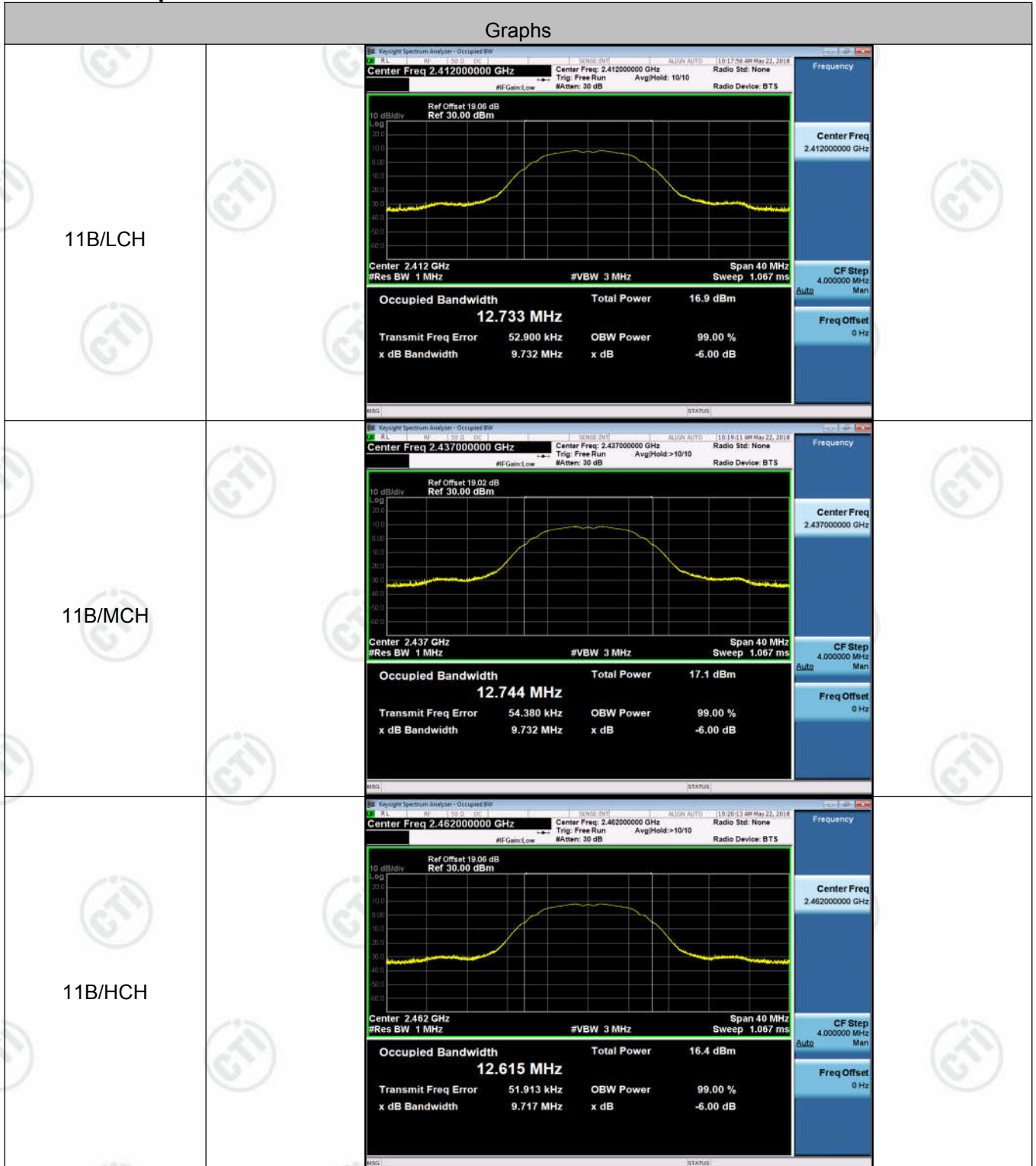
<p>11N40SISO/LCH</p>	 <p>Keysight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.422000000 GHz</p> <p>Channel Power: 14.32 dBm / 40 MHz</p> <p>Power Spectral Density: -61.70 dBm / Hz</p>
<p>11N40SISO/MCH</p>	 <p>Keysight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.437000000 GHz</p> <p>Channel Power: 14.69 dBm / 40 MHz</p> <p>Power Spectral Density: -61.33 dBm / Hz</p>
<p>11N40SISO/HCH</p>	 <p>Keysight Spectrum Analyzer - Channel Power</p> <p>Center Freq: 2.452000000 GHz</p> <p>Channel Power: 14.81 dBm / 40 MHz</p> <p>Power Spectral Density: -61.21 dBm / Hz</p>

**Appendix B): 6dB Occupied Bandwidth**

**Result Table**

Mode	Channel	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict	Remark
11B	LCH	9.732	12.733	PASS	Peak detector
11B	MCH	9.732	12.744	PASS	
11B	HCH	9.717	12.615	PASS	
11G	LCH	16.35	16.493	PASS	
11G	MCH	16.35	16.497	PASS	
11G	HCH	16.35	16.496	PASS	
11N20SISO	LCH	17.61	17.652	PASS	
11N20SISO	MCH	17.58	17.659	PASS	
11N20SISO	HCH	17.59	17.642	PASS	
11N40SISO	LCH	35.79	36.046	PASS	
11N40SISO	MCH	36.02	36.050	PASS	
11N40SISO	HCH	36.03	36.055	PASS	

**Test Graph**





<p>11G/LCH</p>	<p>KeySight Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.412000000 GHz</p> <p>Center Freq: 2.412000000 GHz</p> <p>Ref Offset: 19.06 dB</p> <p>Ref: 30.00 dBm</p> <p>Center: 2.412 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 40 MHz</p> <p>Sweep: 4.267 ms</p> <p>Occupied Bandwidth: 16.493 MHz</p> <p>Total Power: 13.2 dBm</p> <p>Transmit Freq Error: 32.378 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 16.35 MHz</p> <p>x dB: -6.00 dB</p>
<p>11G/MCH</p>	<p>KeySight Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.437000000 GHz</p> <p>Center Freq: 2.437000000 GHz</p> <p>Ref Offset: 19.02 dB</p> <p>Ref: 30.00 dBm</p> <p>Center: 2.437 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 40 MHz</p> <p>Sweep: 4.267 ms</p> <p>Occupied Bandwidth: 16.497 MHz</p> <p>Total Power: 13.3 dBm</p> <p>Transmit Freq Error: 26.794 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 16.35 MHz</p> <p>x dB: -6.00 dB</p>
<p>11G/HCH</p>	<p>KeySight Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.462000000 GHz</p> <p>Center Freq: 2.462000000 GHz</p> <p>Ref Offset: 19.06 dB</p> <p>Ref: 30.00 dBm</p> <p>Center: 2.462 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 40 MHz</p> <p>Sweep: 4.267 ms</p> <p>Occupied Bandwidth: 16.496 MHz</p> <p>Total Power: 13.8 dBm</p> <p>Transmit Freq Error: 32.466 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 16.35 MHz</p> <p>x dB: -6.00 dB</p>

<p>11N20SISO/LCH</p>	<p>Center Freq 2.412000000 GHz</p> <p>Center Freq: 2.412000000 GHz</p> <p>Center Freq 2.412 GHz</p> <p>Res BW 100 kHz</p> <p>Span 40 MHz</p> <p>Sweep 4.267 ms</p> <p>Occupied Bandwidth 17.652 MHz</p> <p>Total Power 12.8 dBm</p> <p>Transmit Freq Error 29.186 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 17.61 MHz</p> <p>x dB -6.00 dB</p>
<p>11N20SISO/MCH</p>	<p>Center Freq 2.437000000 GHz</p> <p>Center Freq: 2.437000000 GHz</p> <p>Center Freq 2.437 GHz</p> <p>Res BW 100 kHz</p> <p>Span 40 MHz</p> <p>Sweep 4.267 ms</p> <p>Occupied Bandwidth 17.659 MHz</p> <p>Total Power 13.0 dBm</p> <p>Transmit Freq Error 31.823 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 17.58 MHz</p> <p>x dB -6.00 dB</p>
<p>11N20SISO/HCH</p>	<p>Center Freq 2.462000000 GHz</p> <p>Center Freq: 2.462000000 GHz</p> <p>Center Freq 2.462 GHz</p> <p>Res BW 100 kHz</p> <p>Span 40 MHz</p> <p>Sweep 4.267 ms</p> <p>Occupied Bandwidth 17.642 MHz</p> <p>Total Power 13.4 dBm</p> <p>Transmit Freq Error 35.076 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 17.59 MHz</p> <p>x dB -6.00 dB</p>

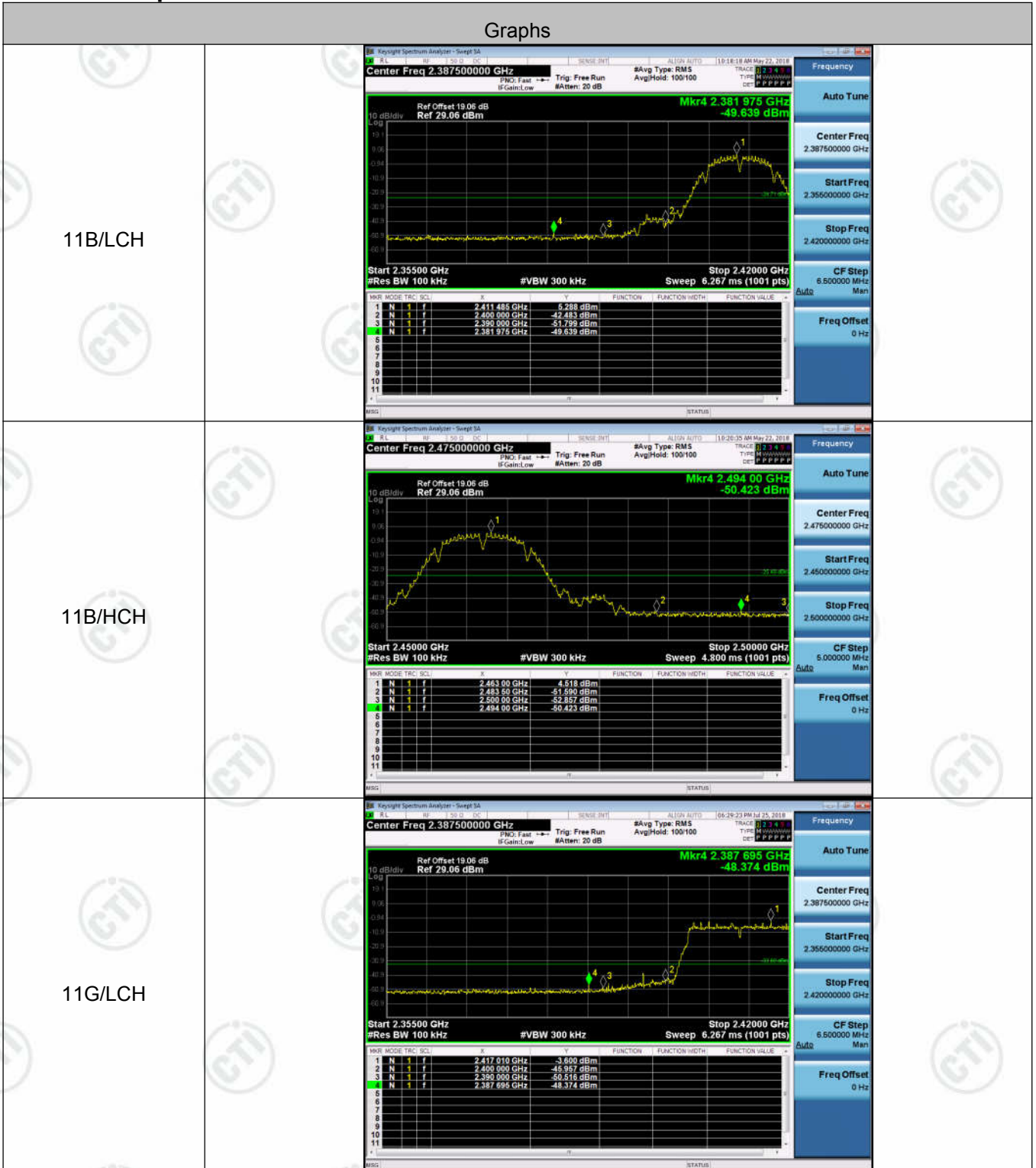
<p>11N40SISO/LCH</p>	<p>Center Freq 2.422000000 GHz</p> <p>Center Freq: 2.422000000 GHz</p> <p>Center 2.422 GHz</p> <p>Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 80 MHz</p> <p>Sweep 8 ms</p> <p>Occupied Bandwidth 36.046 MHz</p> <p>Total Power 13.0 dBm</p> <p>Transmit Freq Error 57.737 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 35.79 MHz</p> <p>x dB -6.00 dB</p>
<p>11N40SISO/MCH</p>	<p>Center Freq 2.437000000 GHz</p> <p>Center Freq: 2.437000000 GHz</p> <p>Center 2.437 GHz</p> <p>Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 80 MHz</p> <p>Sweep 8 ms</p> <p>Occupied Bandwidth 36.050 MHz</p> <p>Total Power 13.4 dBm</p> <p>Transmit Freq Error 48.437 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 36.02 MHz</p> <p>x dB -6.00 dB</p>
<p>11N40SISO/HCH</p>	<p>Center Freq 2.452000000 GHz</p> <p>Center Freq: 2.452000000 GHz</p> <p>Center 2.452 GHz</p> <p>Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 80 MHz</p> <p>Sweep 8 ms</p> <p>Occupied Bandwidth 36.055 MHz</p> <p>Total Power 13.3 dBm</p> <p>Transmit Freq Error 67.057 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 36.03 MHz</p> <p>x dB -6.00 dB</p>

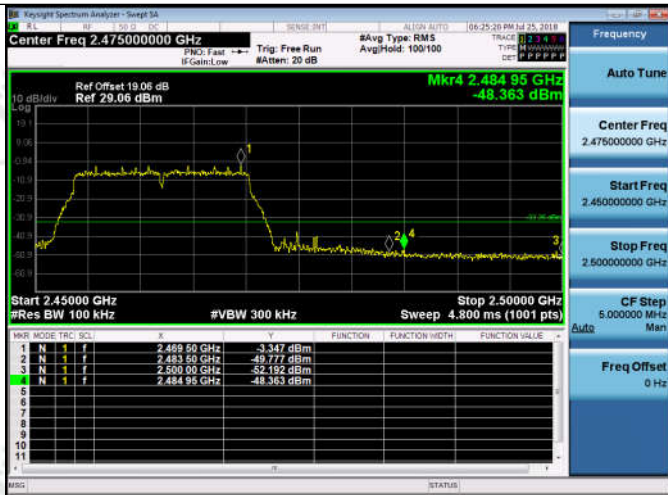
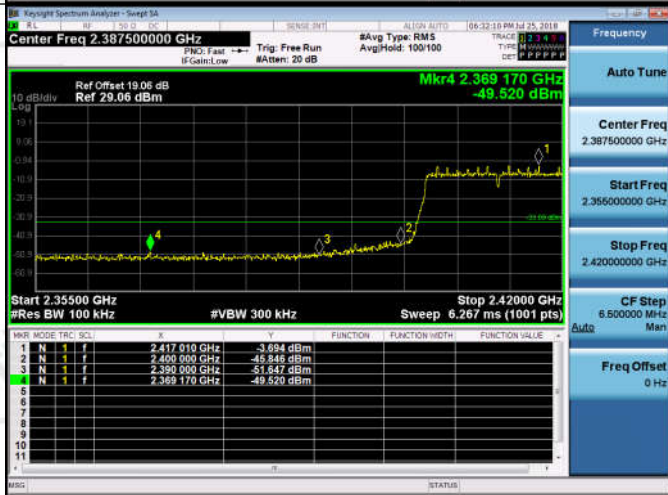
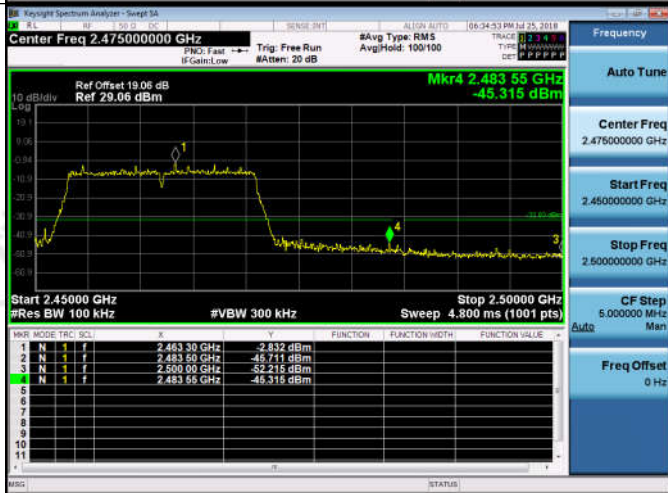
## Appendix C): Band-edge for RF Conducted Emissions

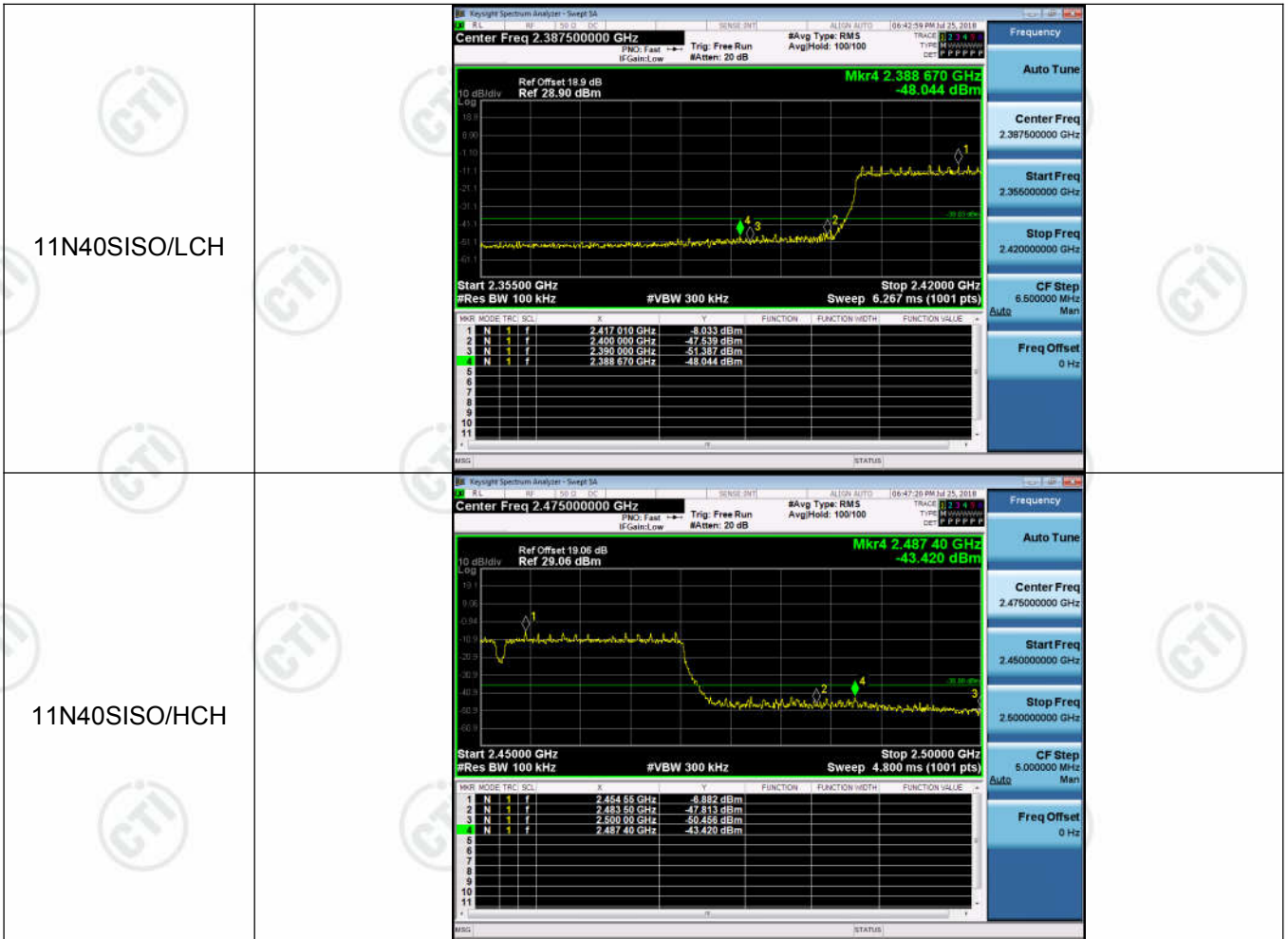
Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	5.288	-49.639	-24.71	PASS
11B	HCH	4.518	-50.423	-25.48	PASS
11G	LCH	-3.600	-48.374	-33.6	PASS
11G	HCH	-3.347	-48.363	-33.35	PASS
11N20SISO	LCH	-3.694	-49.520	-33.69	PASS
11N20SISO	HCH	-2.832	-45.315	-32.83	PASS
11N40SISO	LCH	-8.033	-48.044	-38.03	PASS
11N40SISO	HCH	-6.882	-43.420	-36.88	PASS

**Test Graph**



<p>11G/HCH</p>	
<p>11N20SISO/LCH</p>	
<p>11N20SISO/HCH</p>	



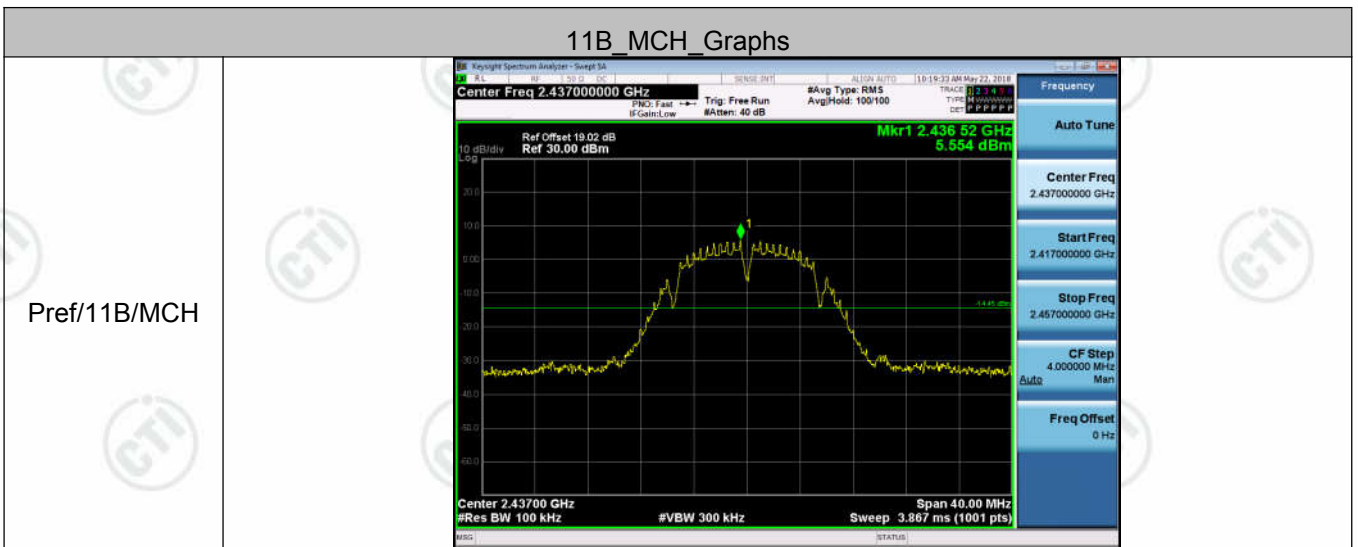
## Appendix D): RF Conducted Spurious Emissions

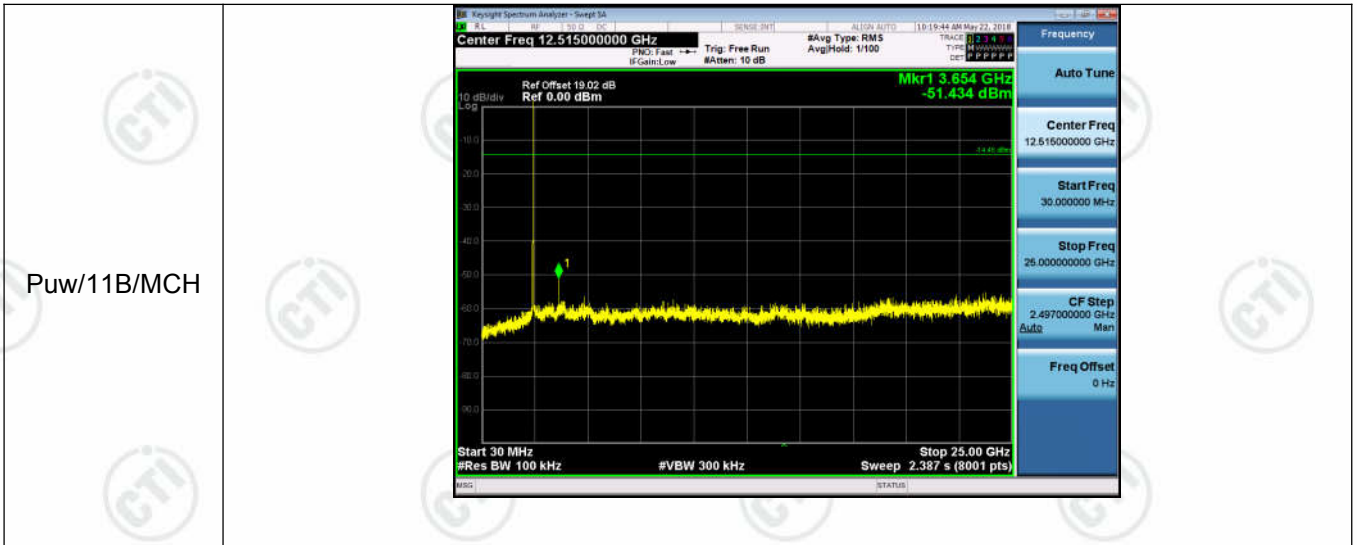
**Result Table**

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
11B	LCH	5.262	<Limit	PASS
11B	MCH	5.554	<Limit	PASS
11B	HCH	4.64	<Limit	PASS
11G	LCH	2.232	<Limit	PASS
11G	MCH	4.268	<Limit	PASS
11G	HCH	3.99	<Limit	PASS
11N20SISO	LCH	2.277	<Limit	PASS
11N20SISO	MCH	3.137	<Limit	PASS
11N20SISO	HCH	4.219	<Limit	PASS
11N40SISO	LCH	-3.954	<Limit	PASS
11N40SISO	MCH	-3.478	<Limit	PASS
11N40SISO	HCH	-3.223	<Limit	PASS

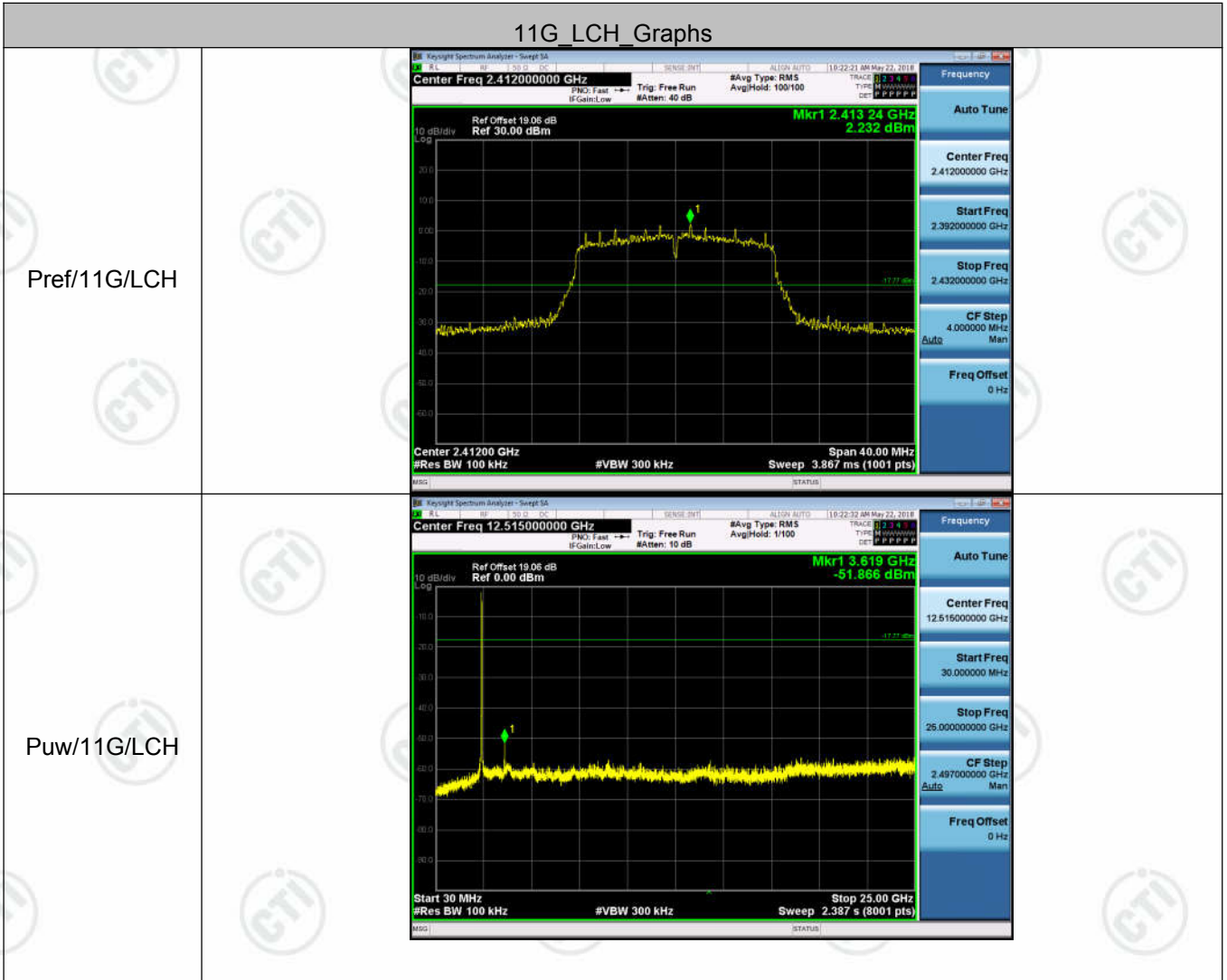


**Test Graph**

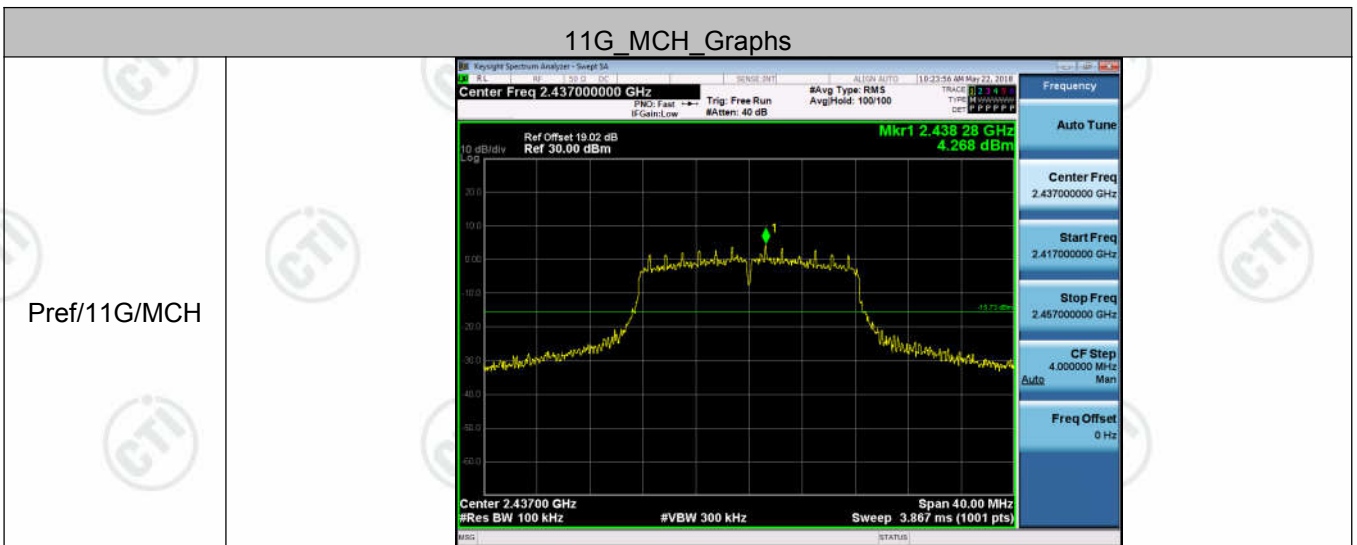


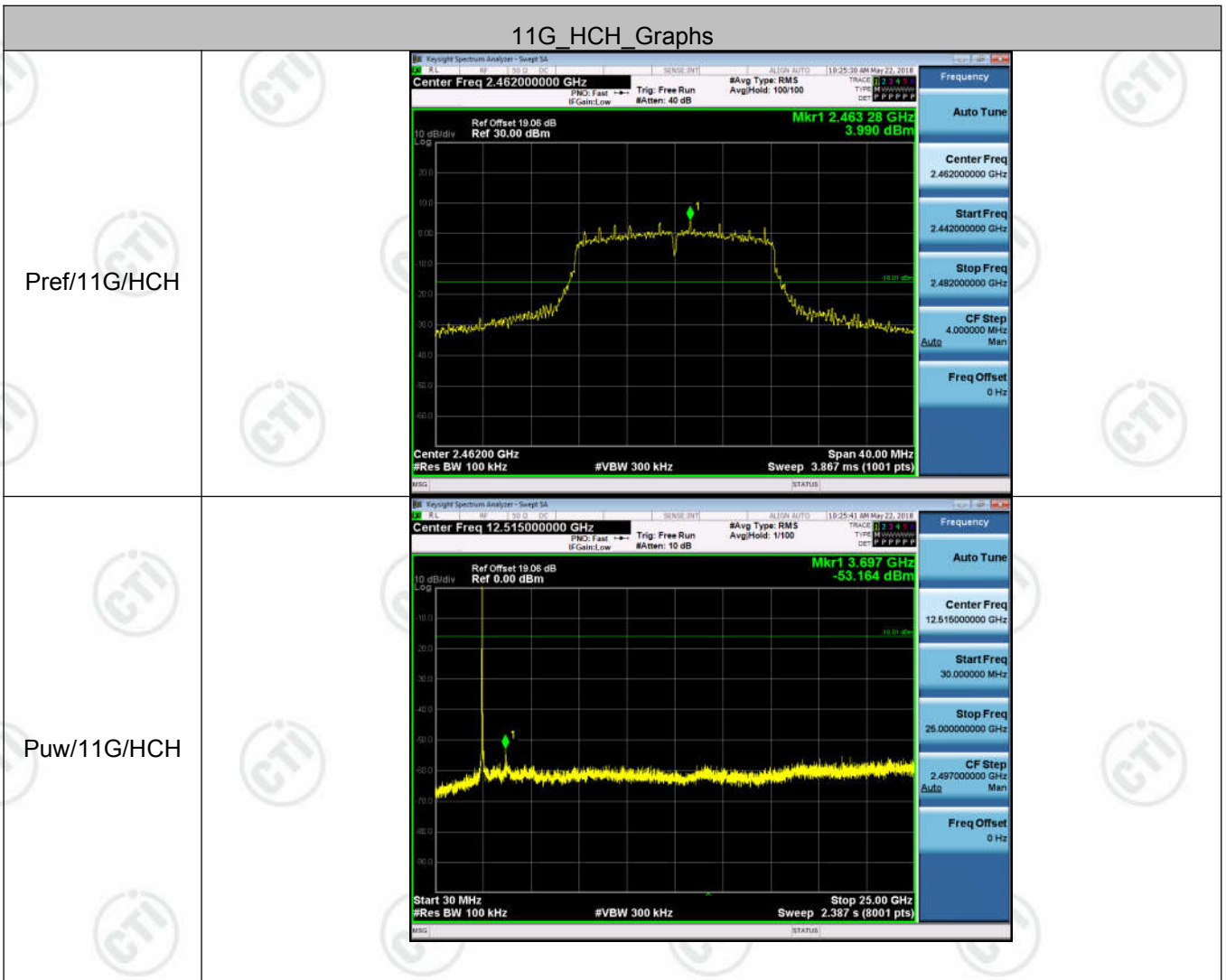
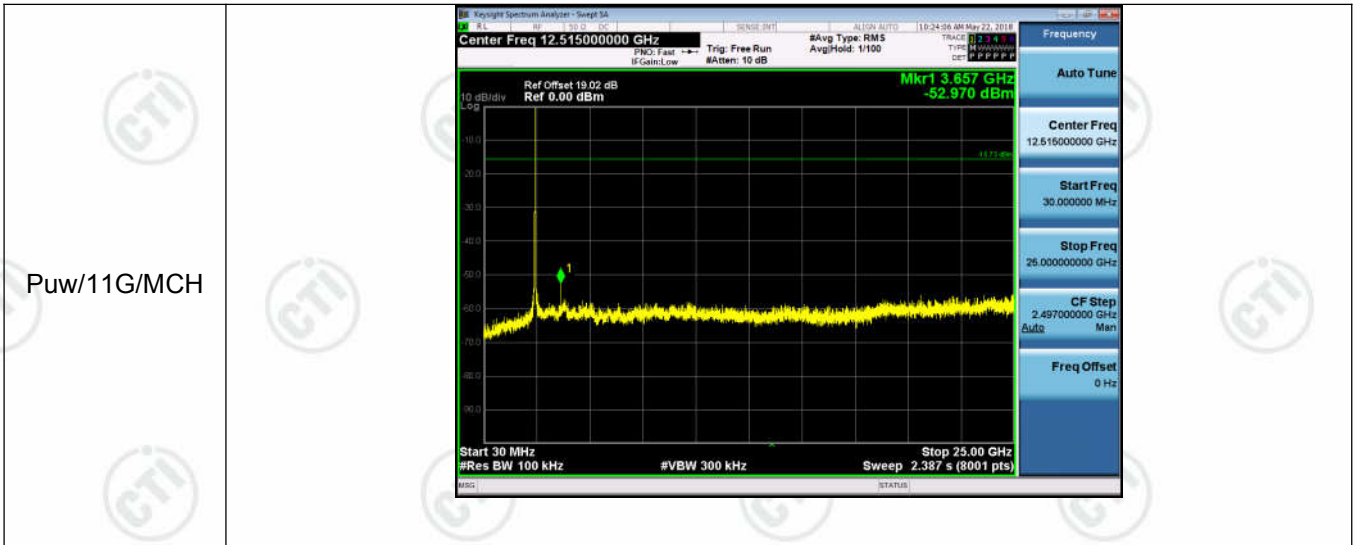


11G\_LCH\_Graphs



11G\_MCH\_Graphs



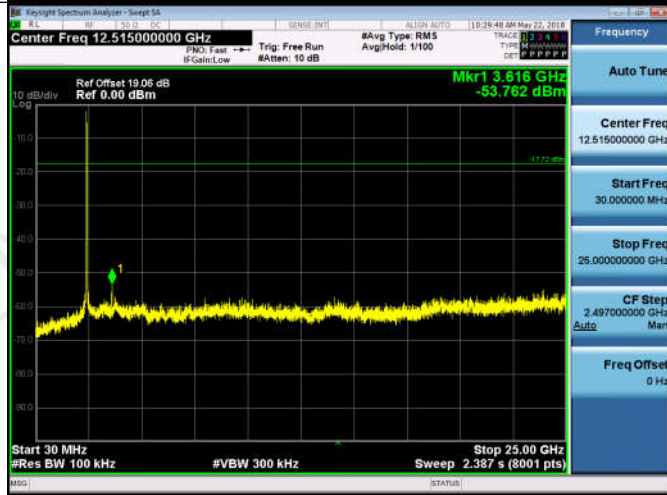


11N20SISO LCH\_Graphs

Pref/11N20SISO/LCH



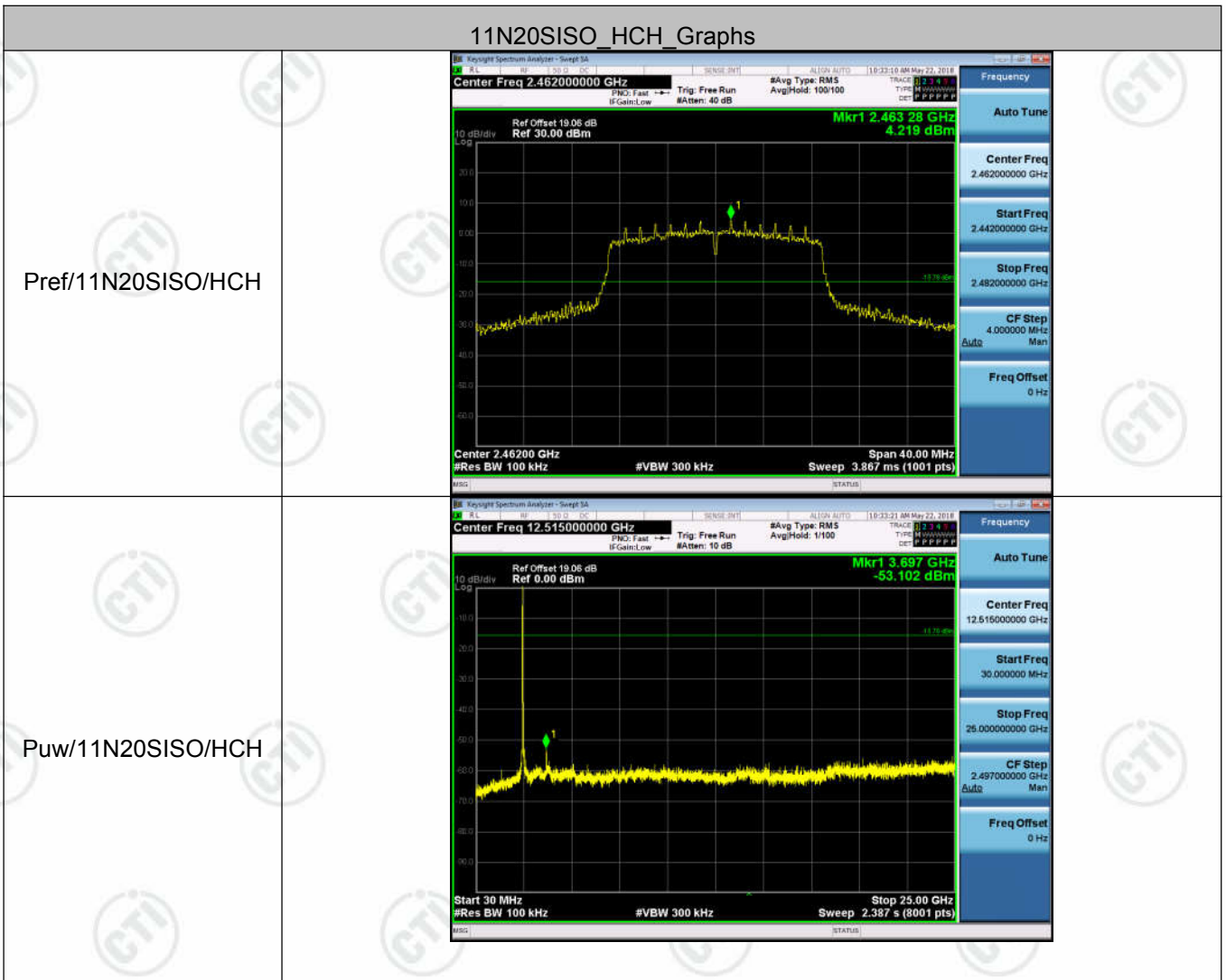
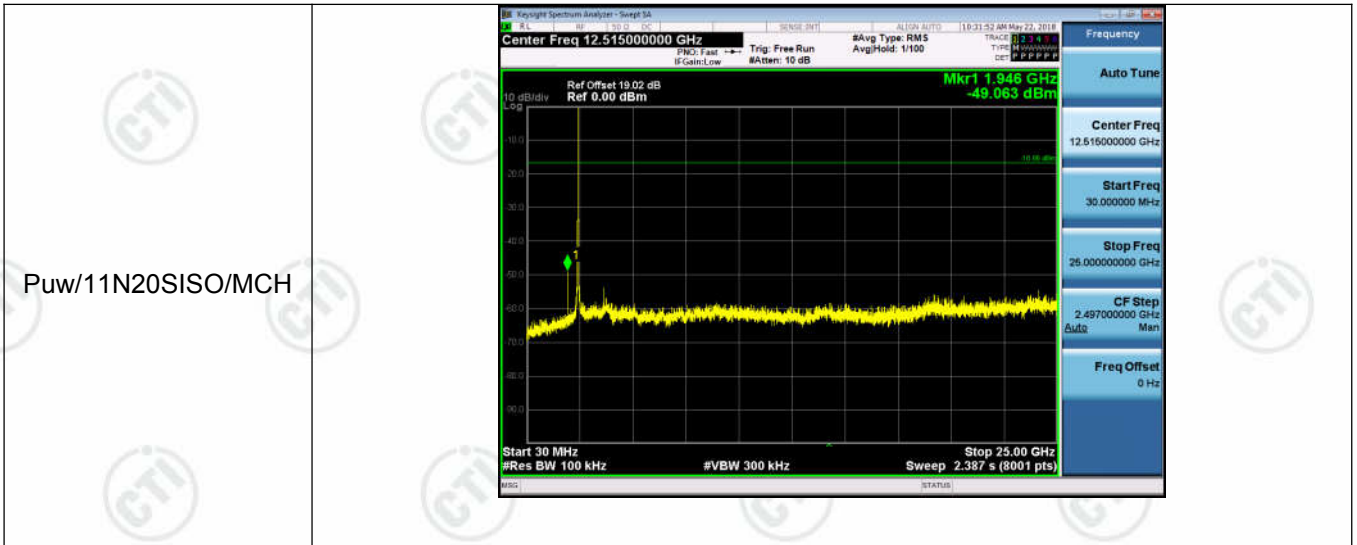
/11N20SISO/LCH



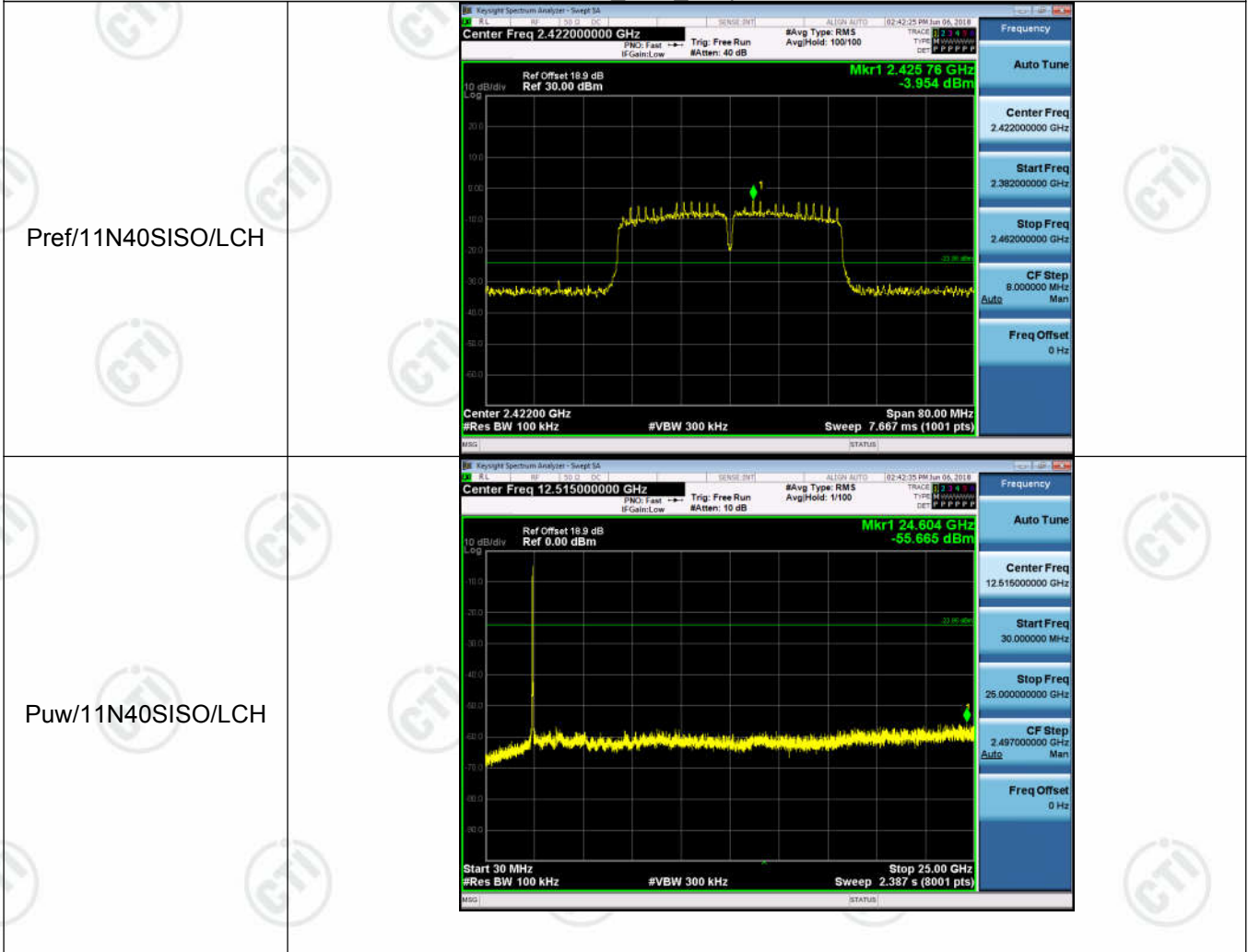
11N20SISO\_MCH\_Graphs

Pref/11N20SISO/MCH

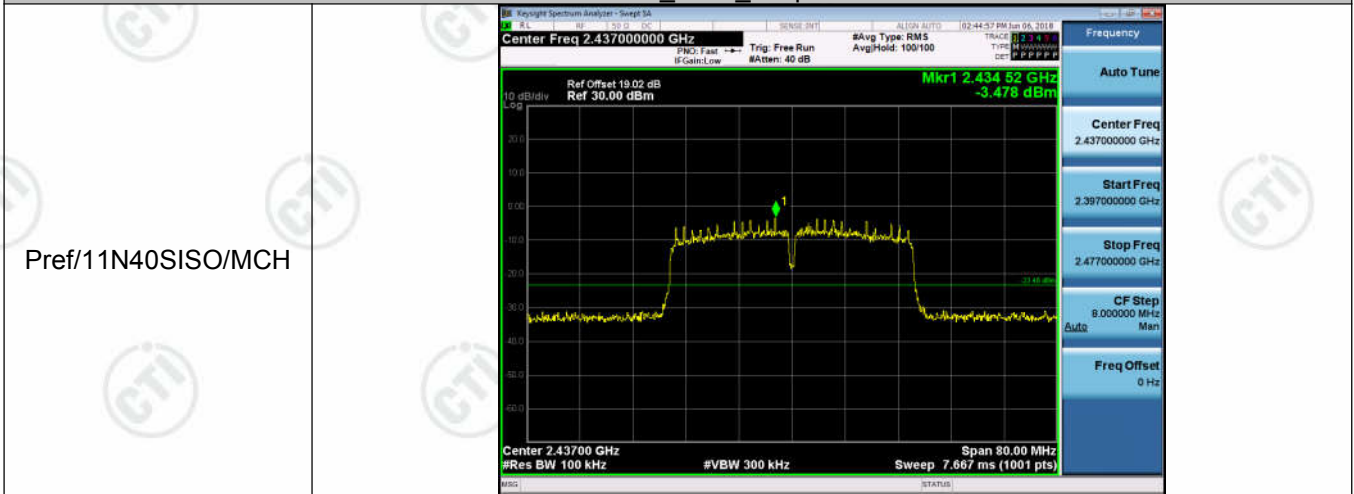




11N40SISO LCH\_Graphs



11N40SISO\_MCH\_Graphs







## Appendix E): Power Spectral Density

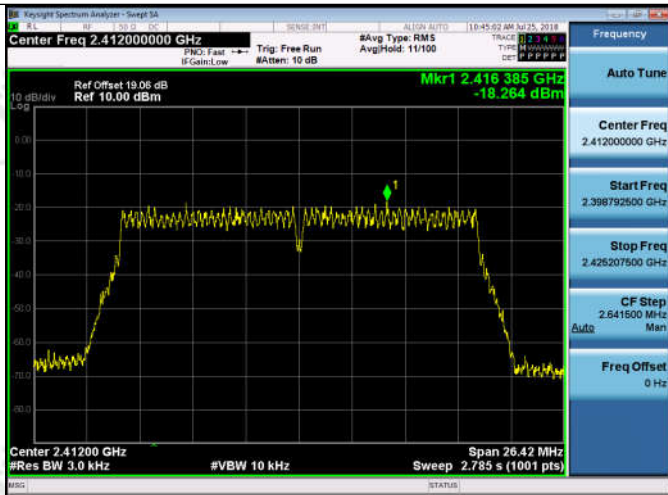
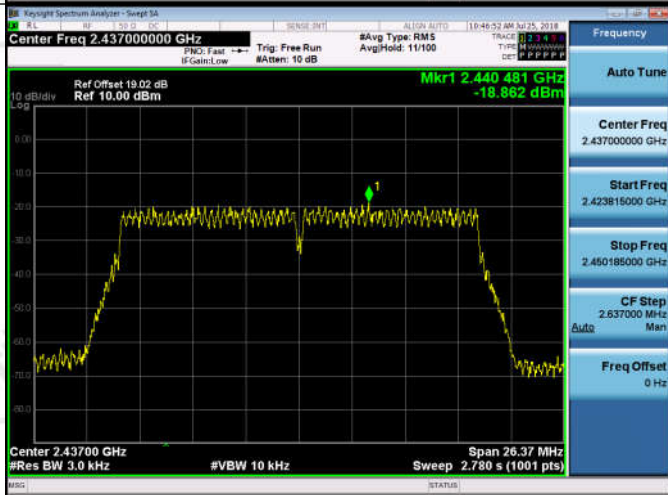
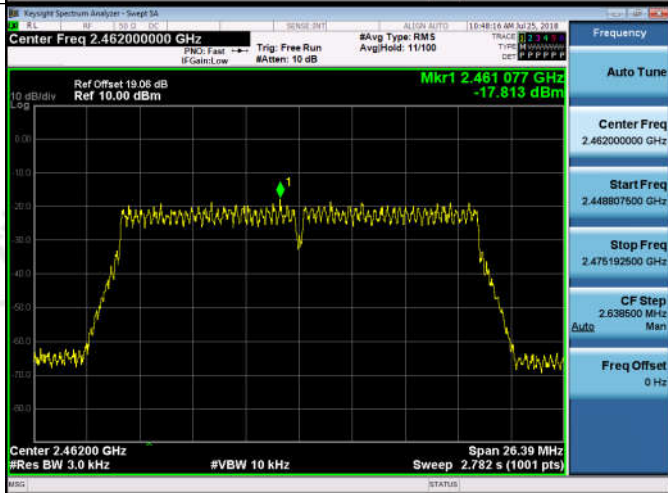
Result Table

Mode	Channel	Power Spectral Density[dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	LCH	-9.629	8	PASS
11B	MCH	-8.401	8	PASS
11B	HCH	-8.835	8	PASS
11G	LCH	-18.350	8	PASS
11G	MCH	-18.132	8	PASS
11G	HCH	-17.337	8	PASS
11N20SISO	LCH	-18.264	8	PASS
11N20SISO	MCH	-18.862	8	PASS
11N20SISO	HCH	-17.813	8	PASS
11N40SISO	LCH	-21.049	8	PASS
11N40SISO	MCH	-21.346	8	PASS
11N40SISO	HCH	-19.564	8	PASS

**Test Graph**



<p>11G/LCH</p>	
<p>11G/MCH</p>	
<p>11G/HCH</p>	

<p>11N20SISO/LCH</p>	
<p>11N20SISO/MCH</p>	
<p>11N20SISO/HCH</p>	

<p>11N40SISO/LCH</p>	
<p>11N40SISO/MCH</p>	
<p>11N40SISO/HCH</p>	

## 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 MONOPOLE and no consideration of replacement. The best case gain of the antenna is 2.3dBi.

### Appendix G): AC Power Line Conducted Emission

<p>Test Procedure:</p>	<p>Test frequency range :150KHz-30MHz</p> <ol style="list-style-type: none"> <li>1)The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>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.</li> <li>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,</li> <li>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.</li> <li>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.</li> </ol>														
<p>Limit:</p>	<table border="1" data-bbox="464 1093 1332 1312"> <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. NOTE : The lower limit is applicable at the transition frequency</p>	Frequency range (MHz)	Limit (dBμV)		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 (dBμV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													

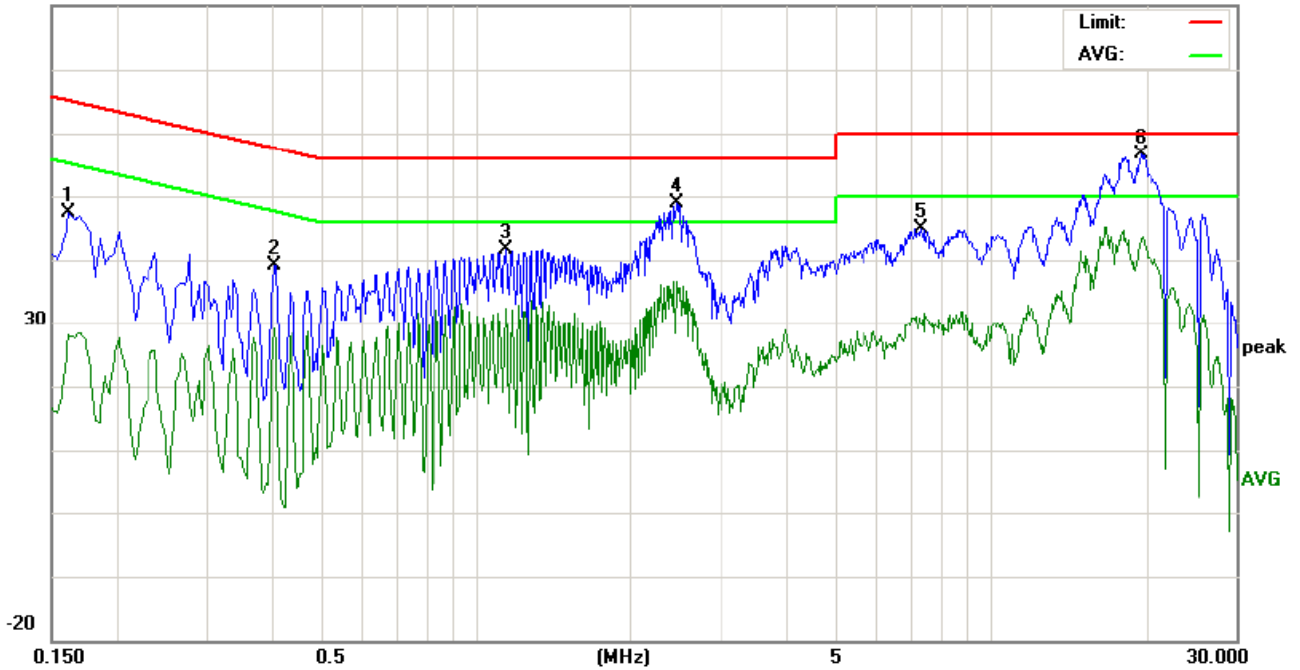
#### Measurement Data

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:

80.0 dBuV

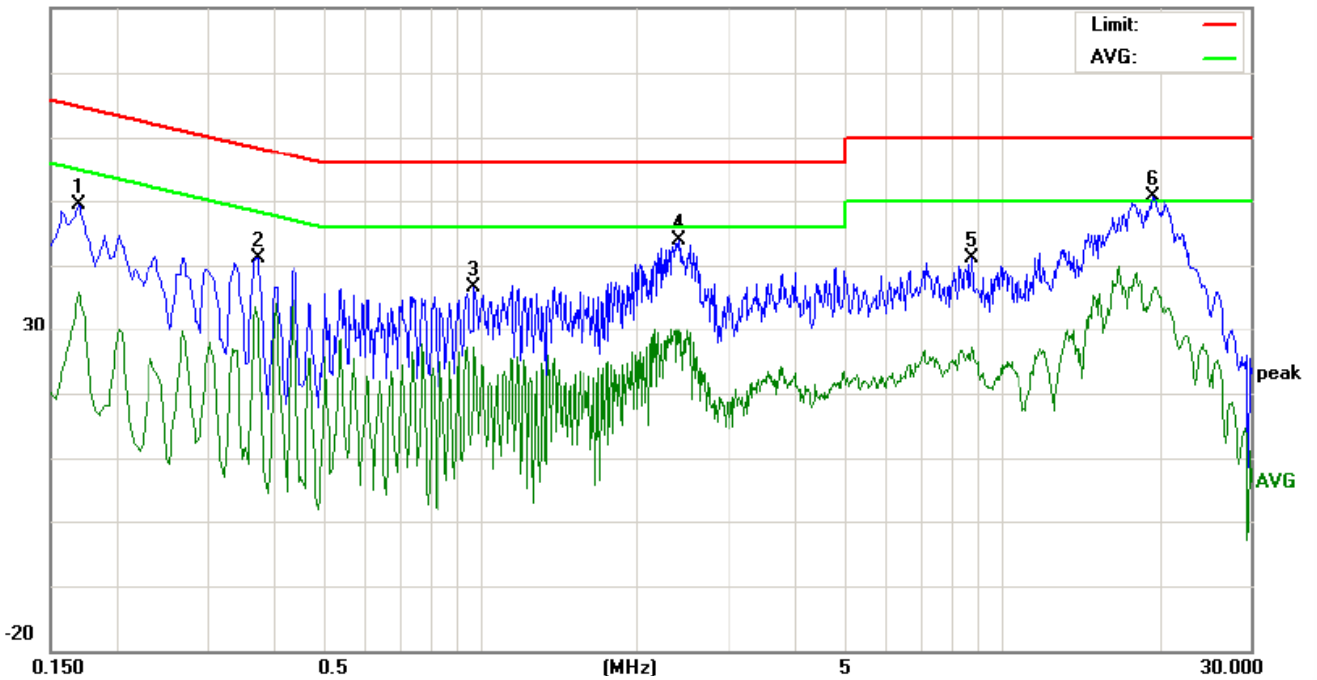


No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1620	37.53	34.76	18.30	9.75	47.28	44.51	28.05	65.36	55.36	-20.85	-27.31	P	
2	0.4060	29.49	26.87	19.36	9.75	39.24	36.62	29.11	57.73	47.73	-21.11	-18.62	P	
3	1.1420	31.90	28.41	22.62	9.72	41.62	38.13	32.34	56.00	46.00	-17.87	-13.66	P	
4	2.4539	39.07	36.07	26.93	9.70	48.77	45.77	36.63	56.00	46.00	-10.23	-9.37	P	
5	7.3540	35.32	32.14	20.18	9.64	44.96	41.78	29.82	60.00	50.00	-18.22	-20.18	P	
6	19.5500	46.65	42.36	33.06	10.06	56.71	52.42	43.12	60.00	50.00	-7.58	-6.88	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	0.1700	39.64	36.88	26.20	9.74	49.38	46.62	35.94	64.96	54.96	-18.34	-19.02	P	
2	0.3740	31.45	28.12	21.87	9.76	41.21	37.88	31.63	58.41	48.41	-20.53	-16.78	P	
3	0.9780	26.98	23.78	17.32	9.73	36.71	33.51	27.05	56.00	46.00	-22.49	-18.95	P	
4	2.3980	34.12	30.74	20.17	9.71	43.83	40.45	29.88	56.00	46.00	-15.55	-16.12	P	
5	8.7340	31.37	28.43	17.50	9.72	41.09	38.15	27.22	60.00	50.00	-21.85	-22.78	P	
6	19.4380	40.54	38.01	25.86	10.05	50.59	48.06	35.91	60.00	50.00	-11.94	-14.09	P	

Notes:

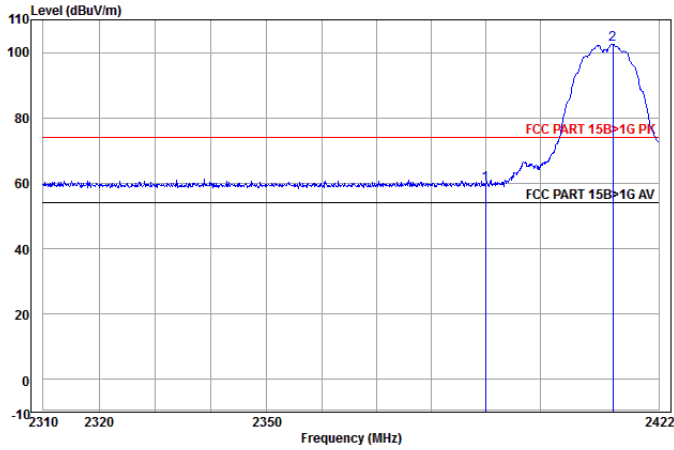
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

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

Receiver Setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>120kHz</td> <td>300kHz</td> <td>Quasi-peak</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak</td> </tr> <tr> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average</td> </tr> </tbody> </table>	Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak	Above 1GHz	Peak	1MHz	3MHz	Peak	Peak	1MHz	10Hz	Average	
Frequency	Detector	RBW	VBW	Remark																	
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak																	
Above 1GHz	Peak	1MHz	3MHz	Peak																	
	Peak	1MHz	10Hz	Average																	
Test Procedure:	<p><b>Below 1GHz test procedure as below:</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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</li> </ol> <p><b>Above 1GHz test procedure as below:</b></p> <ol style="list-style-type: none"> <li>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).</li> <li>Test the EUT in the lowest channel , the Highest channel</li> <li>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.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> </ol>																				
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dB<math>\mu</math>V/m @3m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td> <td>40.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>88MHz-216MHz</td> <td>43.5</td> <td>Quasi-peak Value</td> </tr> <tr> <td>216MHz-960MHz</td> <td>46.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>960MHz-1GHz</td> <td>54.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>54.0</td> <td>Average Value</td> </tr> <tr> <td>74.0</td> <td>Peak Value</td> </tr> </tbody> </table>	Frequency	Limit (dB $\mu$ 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
Frequency	Limit (dB $\mu$ 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																			

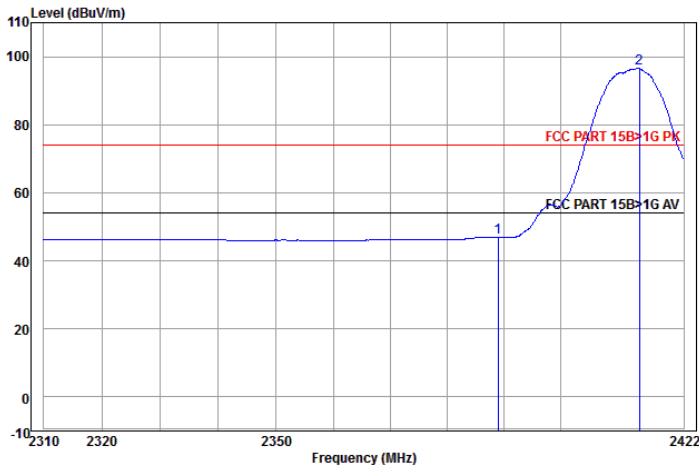
**Test plot as follows:**

Worse case mode:	802.11b (1Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



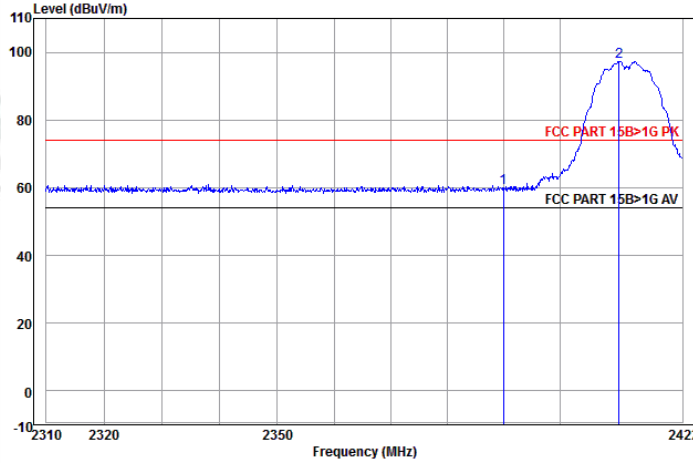
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit	Over	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	24.03	59.63	74.00	-14.37	Horizontal	Peak
2 pp	2413.529	32.58	3.08	66.88	102.54	74.00	28.54	Horizontal	Peak

Worse case mode:	802.11b (1Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Average



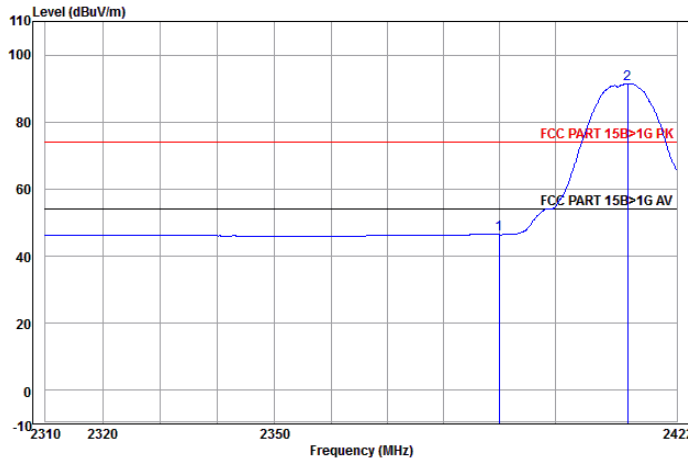
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit	Over	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2389.000	32.53	3.07	11.25	46.85	54.00	-7.15	Horizontal	Average
2 pp	2414.101	32.58	3.08	60.81	96.47	54.00	42.47	Horizontal	Average

Worse case mode:	802.11b (1Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



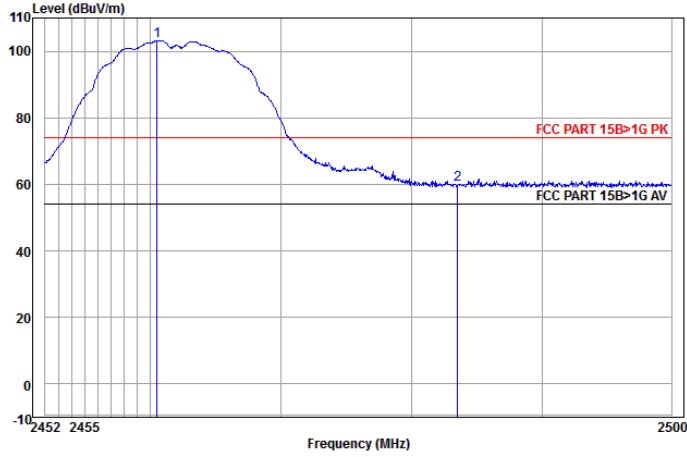
	Ant Freq	Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	24.21	59.81	74.00	-14.19	Vertical	Peak
2 pp	2410.560	32.57	3.08	61.60	97.25	74.00	23.25	Vertical	Peak

Worse case mode:	802.11b (1Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Vertical	Remark: Average



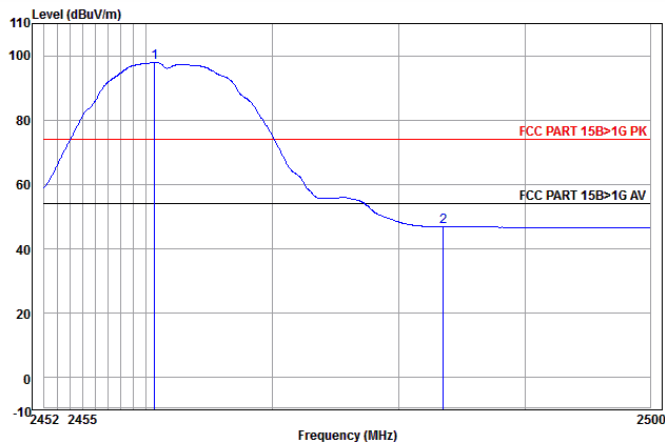
	Ant Freq	Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	10.82	46.42	54.00	-7.58	Vertical	Average
2 pp	2413.072	32.58	3.08	55.71	91.37	54.00	37.37	Vertical	Average

Worse case mode:	802.11b (1Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



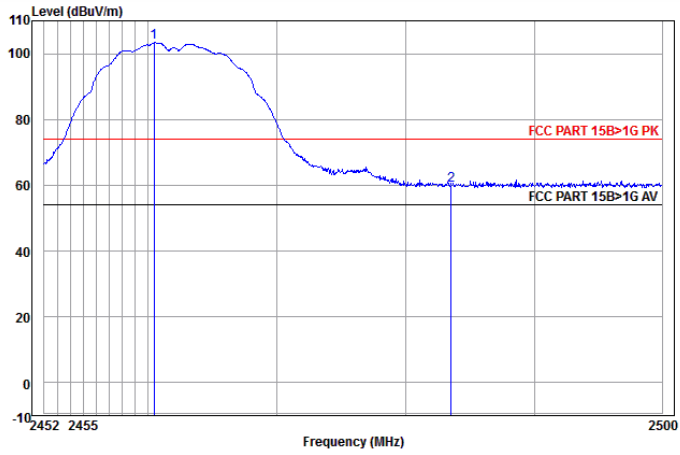
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2460.524	32.67	3.11	67.47	103.25	74.00	29.25	Horizontal	Peak
2	2483.500	32.71	3.12	24.12	59.95	74.00	-14.05	Horizontal	Peak

Worse case mode:	802.11b (1Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Horizontal	Remark: Average



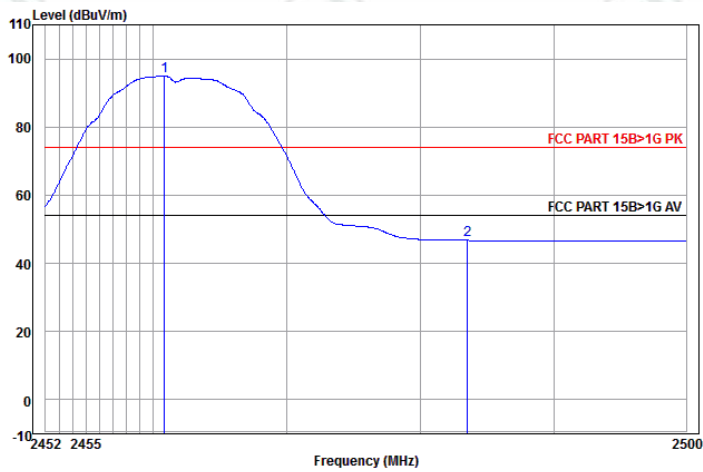
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2460.667	32.67	3.11	62.26	98.04	54.00	44.04	Horizontal	Average
2	2483.500	32.71	3.12	11.04	46.87	54.00	-7.13	Horizontal	Average

Worse case mode:	802.11b (1Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



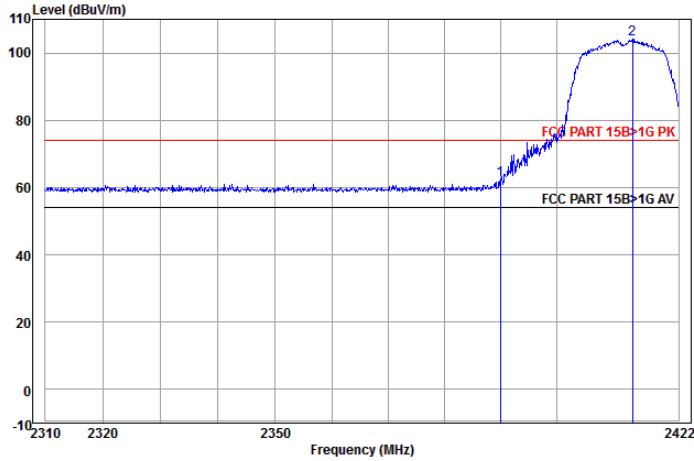
	Ant Freq	Cable Factor	Cable Loss	Read Level	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2460.476	32.67	3.11	67.53	103.31	74.00	29.31	Vertical Peak
2	2483.500	32.71	3.12	24.10	59.93	74.00	-14.07	Vertical Peak

Worse case mode:	802.11b (1Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Vertical	Remark: Average



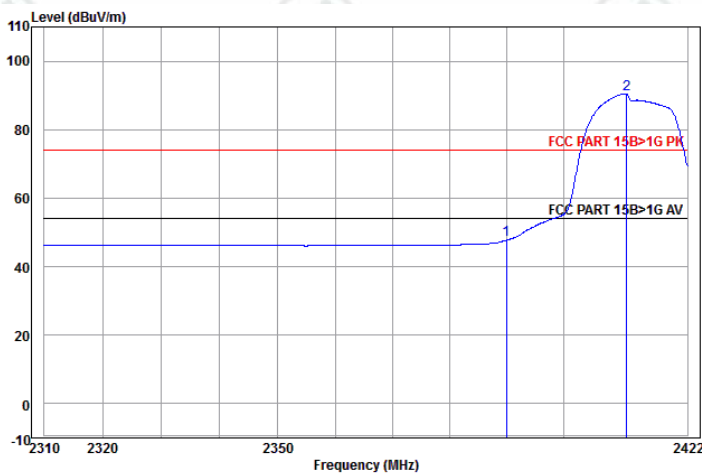
	Ant Freq	Cable Factor	Cable Loss	Read Level	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2460.858	32.67	3.11	59.32	95.10	54.00	41.10	Vertical Average
2	2483.500	32.71	3.12	10.90	46.73	54.00	-7.27	Vertical Average

Worse case mode:	802.11g (6Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



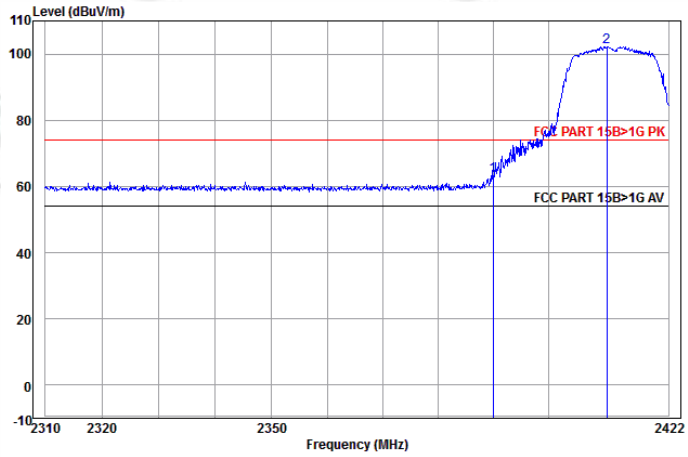
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	26.52	62.12	74.00	-11.88	Horizontal	Peak
2 pp	2413.643	32.58	3.08	68.43	104.09	74.00	30.09	Horizontal	Peak

Worse case mode:	802.11g (6Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Average



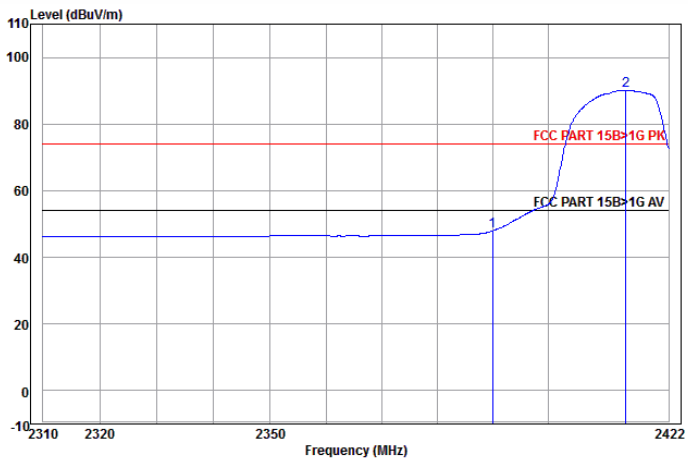
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	12.12	47.72	54.00	-6.28	Horizontal	Average
2 pp	2411.245	32.58	3.08	54.79	90.45	54.00	36.45	Horizontal	Average

Worse case mode:	802.11g (6Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



	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	2390.000	32.53	3.07	27.73	63.33	74.00	-10.67	Vertical	Peak
2 pp	2410.674	32.58	3.08	66.61	102.27	74.00	28.27	Vertical	Peak

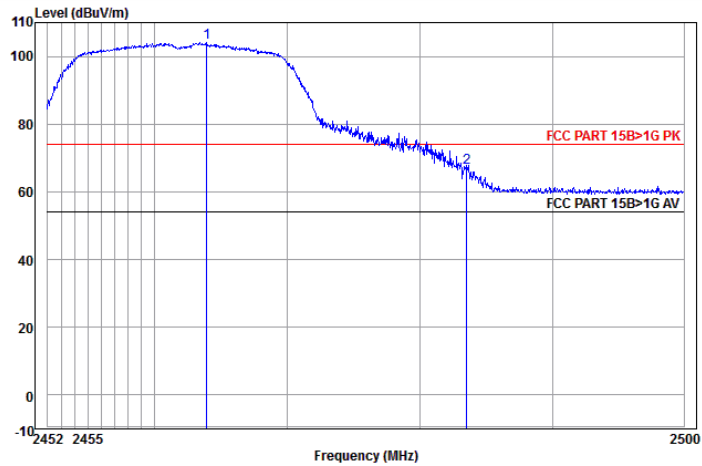
Worse case mode:	802.11g (6Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Vertical	Remark: Average



	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	2390.000	32.53	3.07	12.44	48.04	54.00	-5.96	Vertical	Average
2 pp	2414.215	32.58	3.08	54.47	90.13	54.00	36.13	Vertical	Average

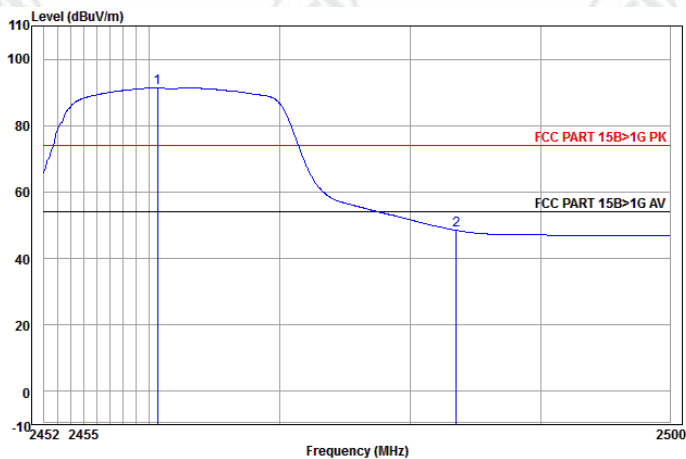


Worse case mode:	802.11g (6Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



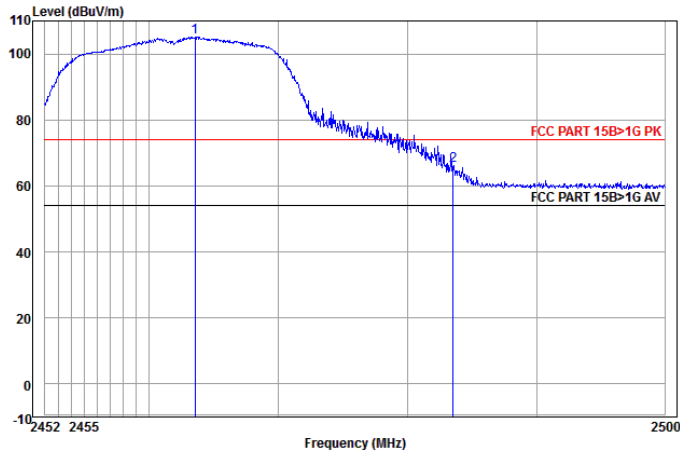
	Ant Freq	Cable Factor	Cable Loss	Read Level	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2463.913	32.68	3.11	68.20	103.99	74.00	29.99	Horizontal Peak
2	2483.500	32.71	3.12	31.19	67.02	74.00	-6.98	Horizontal Peak

Worse case mode:	802.11g (6Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Horizontal	Remark: Average



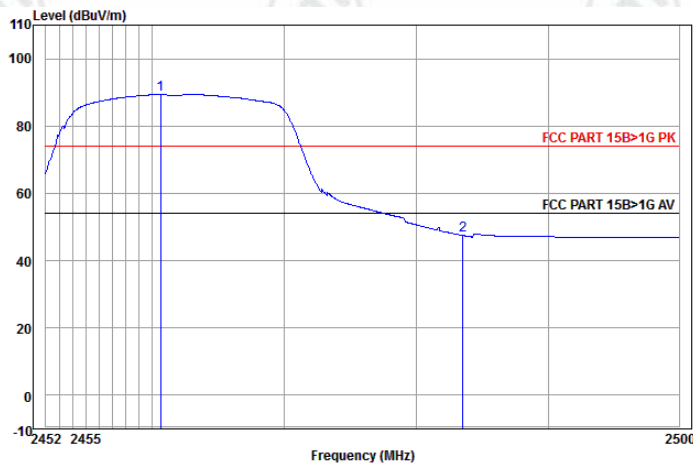
	Ant Freq	Cable Factor	Cable Loss	Read Level	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2460.619	32.67	3.11	55.69	91.47	54.00	37.47	Horizontal Average
2	2483.500	32.71	3.12	12.68	48.51	54.00	-5.49	Horizontal Average

Worse case mode:	802.11g (6Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



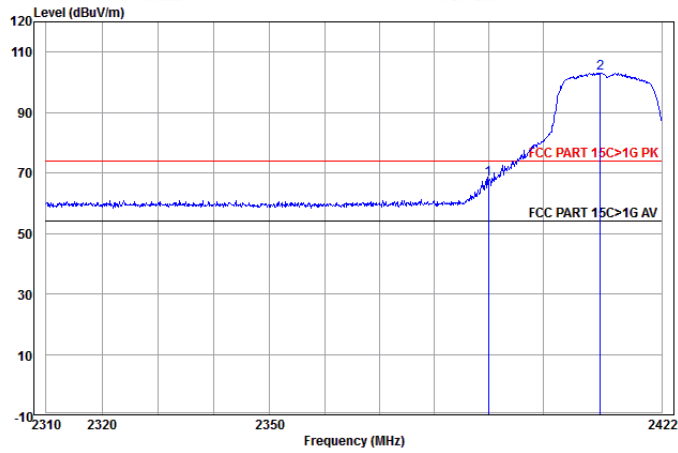
	Ant Freq	Cable Factor	Cable Loss	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	pp 2463.531	32.68	3.11	69.34	105.13	74.00	31.13	Vertical	Peak
2	2483.500	32.71	3.12	30.47	66.30	74.00	-7.70	Vertical	Peak

Worse case mode:	802.11g (6Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Vertical	Remark: Average



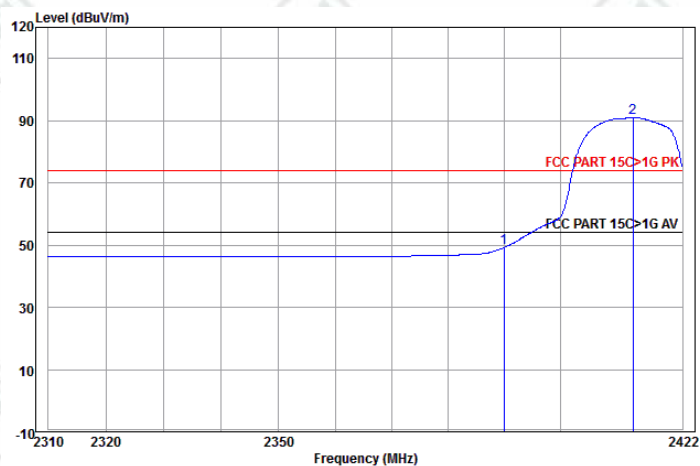
	Ant Freq	Cable Factor	Cable Loss	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	pp 2460.619	32.67	3.11	53.69	89.47	54.00	35.47	Vertical	Average
2	2483.500	32.71	3.12	11.68	47.51	54.00	-6.49	Vertical	Average

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



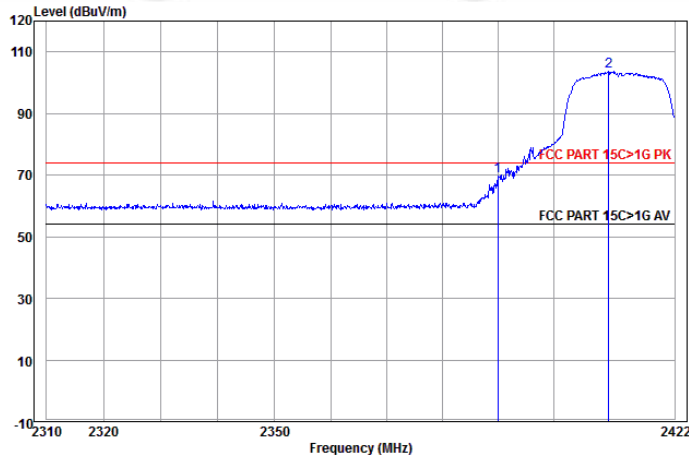
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	32.50	68.10	74.00	-5.90	Horizontal	Peak
2	2412.560	32.57	3.08	67.48	103.13	74.00	29.13	Horizontal	Peak

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Average



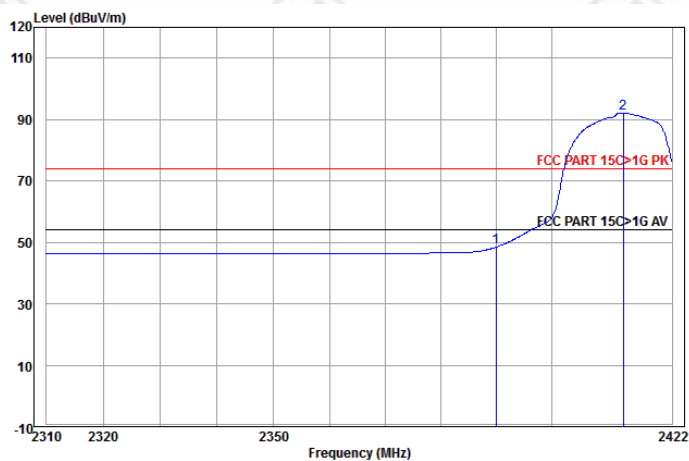
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	13.63	49.23	54.00	-4.77	Horizontal	Average
2	2413.072	32.58	3.08	55.36	91.02	54.00	37.02	Horizontal	Average

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



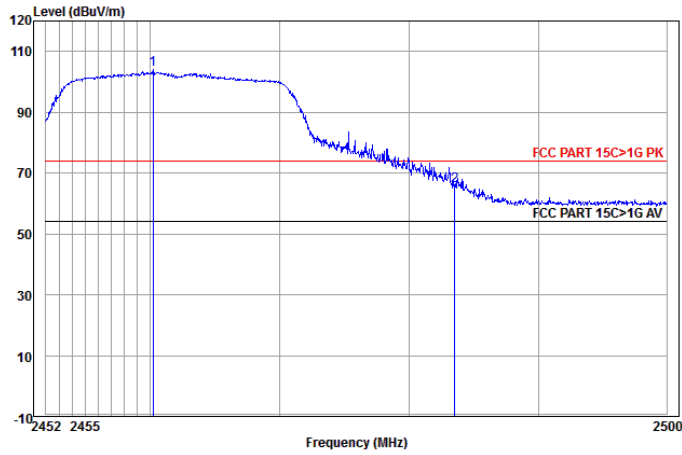
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	34.23	69.83	74.00	-4.17	Vertical	Peak
2 pp	2409.989	32.57	3.08	68.06	103.71	74.00	29.71	Vertical	Peak

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2412MHz	Test channel: Lowest	Polarization: Vertical	Remark: Average



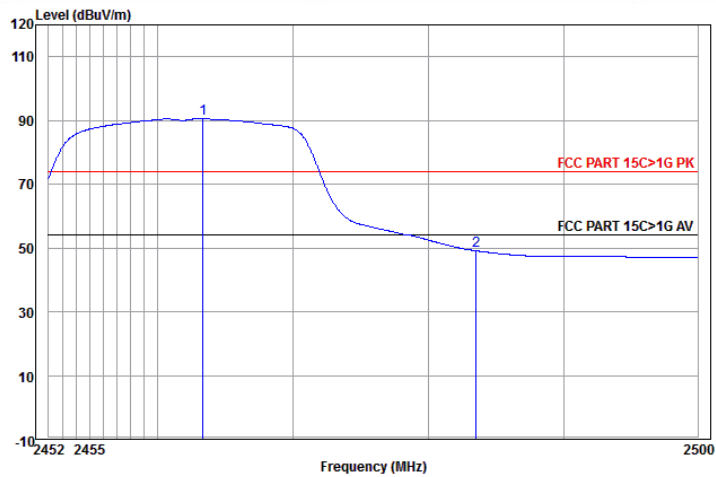
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	12.83	48.43	54.00	-5.57	Vertical	Average
2 pp	2413.072	32.58	3.08	56.34	92.00	54.00	38.00	Vertical	Average

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



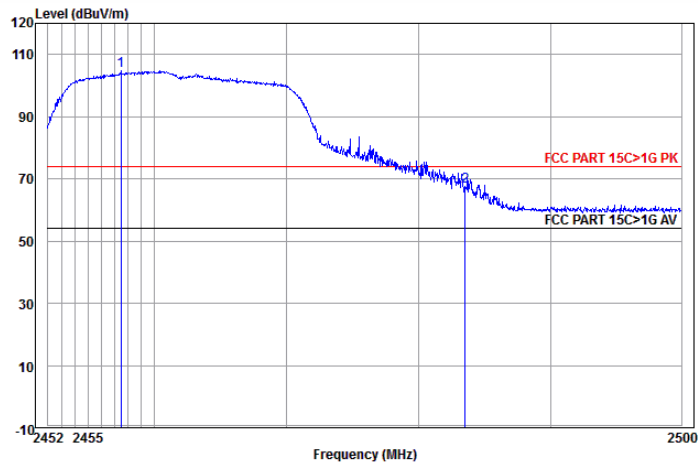
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2460.238	32.67	3.11	68.42	104.20	74.00	30.20	Horizontal	Peak
2	2483.500	32.71	3.12	29.86	65.69	74.00	-8.31	Horizontal	Peak

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Horizontal	Remark: Average



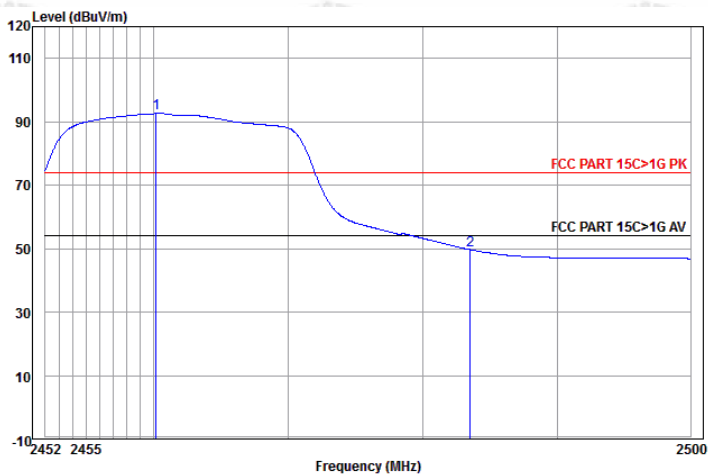
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2463.340	32.68	3.11	54.78	90.57	54.00	36.57	Horizontal	Average
2	2483.500	32.71	3.12	13.23	49.06	54.00	-4.94	Horizontal	Average

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



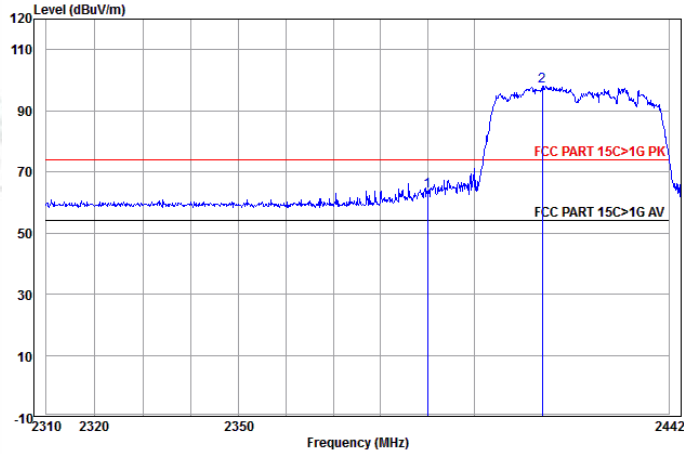
	Ant Freq	Cable Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2457.473	32.67	3.10	69.00	104.77	74.00	30.77	Vertical Peak
2	2483.500	32.71	3.12	31.81	67.64	74.00	-6.36	Vertical Peak

Worse case mode:	802.11n(HT20) (6.5Mbps)		
Frequency: 2462MHz	Test channel: Highest	Polarization: Vertical	Remark: Average



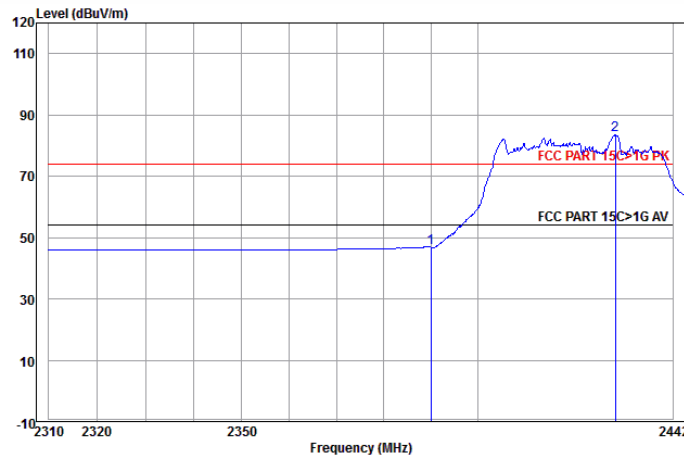
	Ant Freq	Cable Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2460.190	32.67	3.11	56.87	92.65	54.00	38.65	Vertical Average
2	2483.500	32.71	3.12	13.80	49.63	54.00	-4.37	Vertical Average

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2422MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



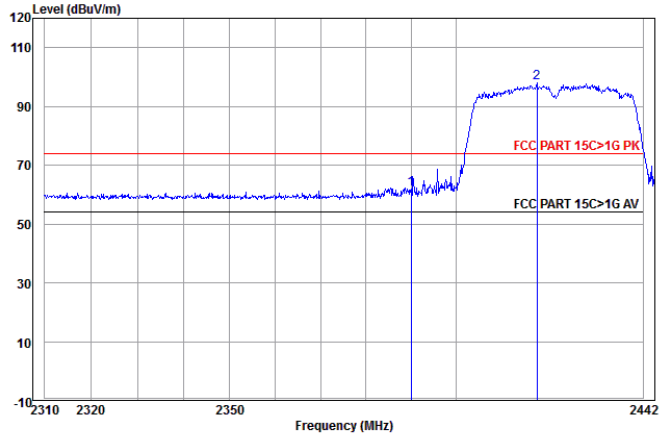
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	27.98	63.58	74.00	-10.42	Horizontal	Peak
2	2414.650	32.58	3.08	62.30	97.96	74.00	23.96	Horizontal	Peak

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2422MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Average



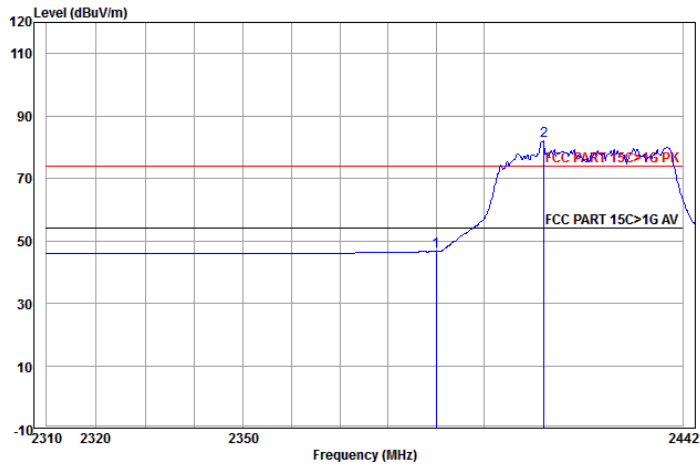
	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	11.19	46.79	54.00	-7.21	Horizontal	Average
2	2429.615	32.61	3.09	47.98	83.68	54.00	29.68	Horizontal	Average

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2422MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	26.31	61.91	74.00	-12.09	Vertical	Peak
2 pp	2418.063	32.59	3.08	62.39	98.06	74.00	24.06	Vertical	Peak

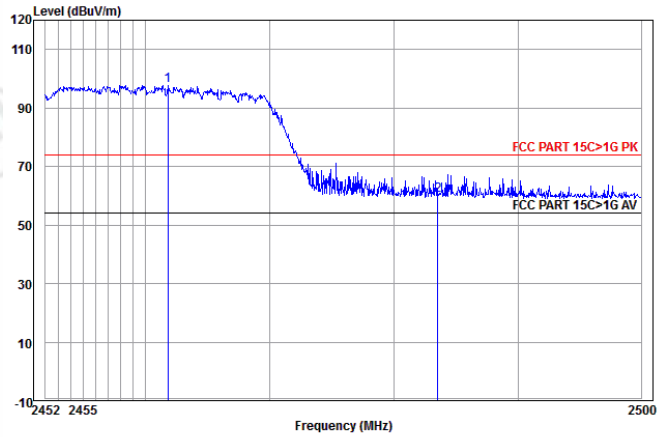
Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2422MHz	Test channel: Lowest	Polarization: Vertical	Remark: Average



	Ant Freq	Cable Factor	Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	11.02	46.62	54.00	-7.38	Vertical	Average
2 pp	2412.662	32.58	3.08	46.44	82.10	54.00	28.10	Vertical	Average

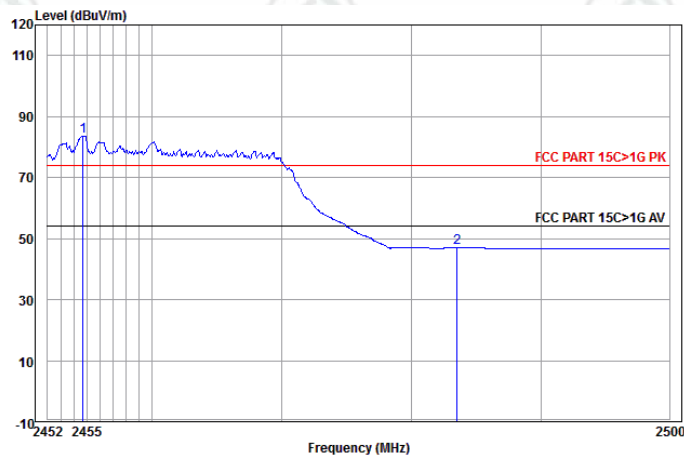


Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2452MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



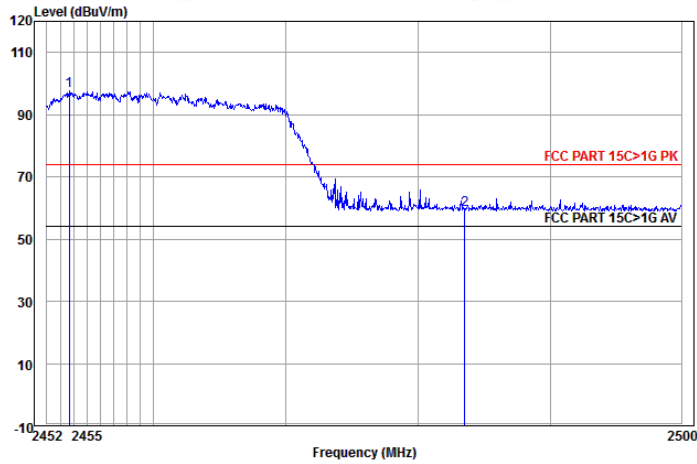
	Ant Freq	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2461.812	32.67	3.11	62.01	97.79	74.00	23.79	Horizontal	Peak
2	2483.500	32.71	3.12	24.32	60.15	74.00	-13.85	Horizontal	Peak

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2452MHz	Test channel: Highest	Polarization: Horizontal	Remark: Average



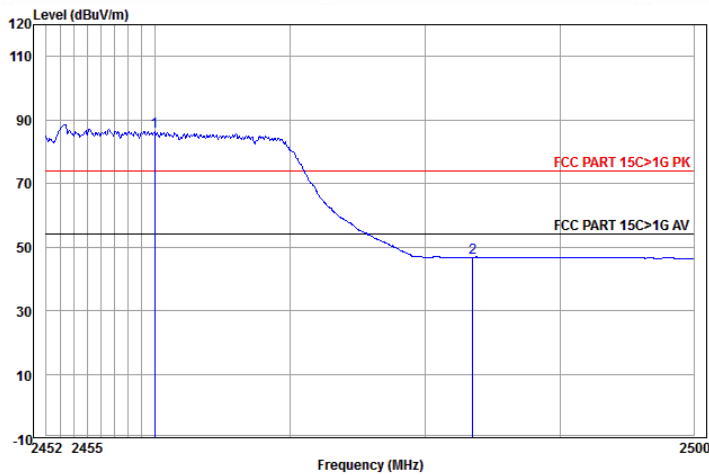
	Ant Freq	Cable Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2454.711	32.66	3.10	47.91	83.67	54.00	29.67	Horizontal	Average
2	2483.500	32.71	3.12	11.08	46.91	54.00	-7.09	Horizontal	Average

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2452MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



	Ant 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 pp	2453.664	32.66	3.10	61.79	97.55	74.00	23.55	Vertical	Peak
2	2483.500	32.71	3.12	23.69	59.52	74.00	-14.48	Vertical	Peak

Worse case mode:	802.11n(HT40) (13.5Mbps)		
Frequency: 2452MHz	Test channel: Highest	Polarization: Vertical	Remark: Average



	Ant 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 pp	2459.951	32.67	3.11	50.67	86.45	54.00	32.45	Vertical	Average
2	2483.500	32.71	3.12	11.00	46.83	54.00	-7.17	Vertical	Average

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) ; 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:**

- 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 (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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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:**

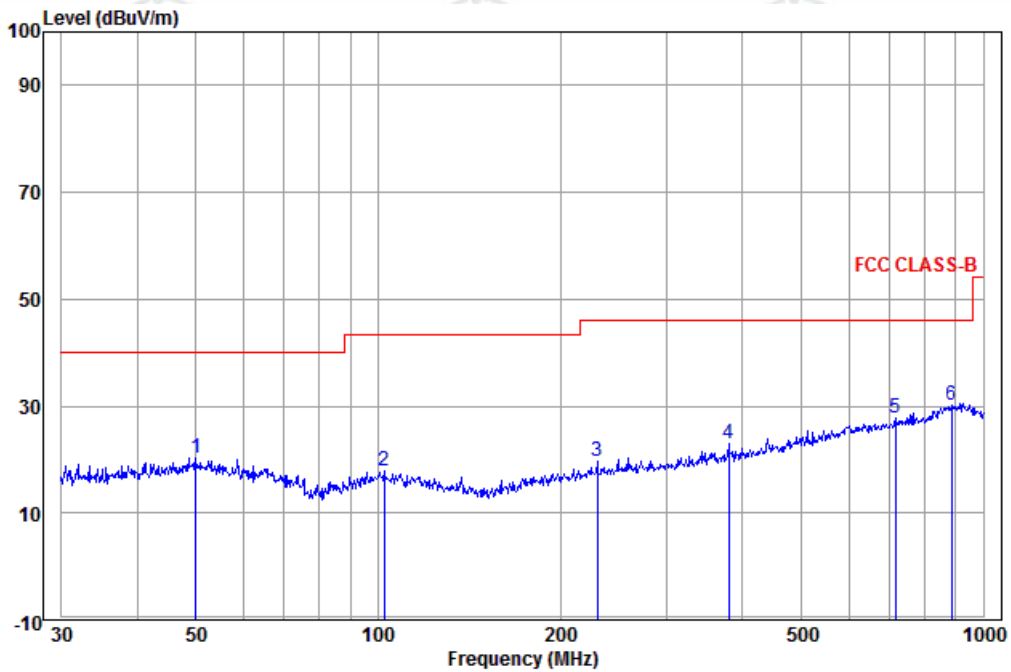
- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter( Above 18GHz the distance is 1 meter and table is 1.5 meter)..
- Test the EUT in the lowest channel ,the middle channel ,the Highest channel
- The radiation 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	Field strength (microvolt/meter)	Limit (dB $\mu$ 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.

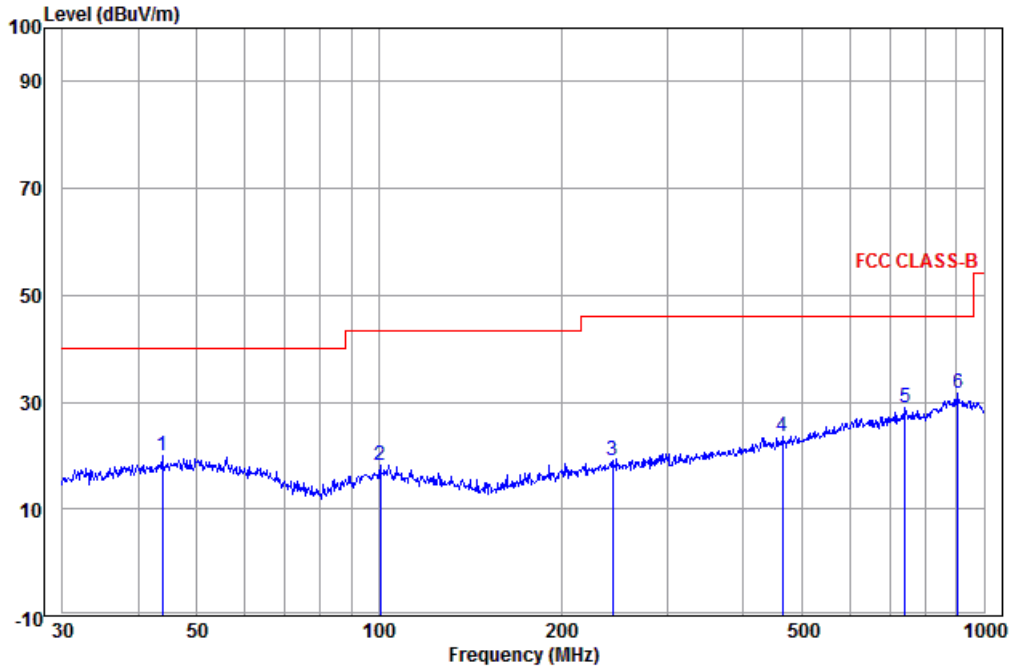
**Radiated Spurious Emissions test Data:  
Radiated Emission below 1GHz**

30MHz~1GHz (QP)		
Test mode:	Transmitting	Vertical



	Ant Freq	Cable Factor	Cable Loss	Read Level	Limit Level	Over Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	50.057	14.59	0.11	5.58	20.28	40.00	-19.72	Vertical	QP
2	102.360	12.29	0.59	5.11	17.99	43.50	-25.51	Vertical	QP
3	230.099	12.19	1.25	6.17	19.61	46.00	-26.39	Vertical	QP
4	379.914	14.89	1.32	6.83	23.04	46.00	-22.96	Vertical	QP
5	716.682	19.24	2.19	6.39	27.82	46.00	-18.18	Vertical	QP
6 pp	887.610	21.91	2.48	5.74	30.13	46.00	-15.87	Vertical	QP

Test mode:	Transmitting	Horizontal
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	Ant 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	43.812	14.13	0.07	5.70	19.90	40.00	-20.10	Horizontal	QP
2	100.581	12.45	0.59	5.27	18.31	43.50	-25.19	Horizontal	QP
3	243.377	12.47	1.31	5.27	19.05	46.00	-26.95	Horizontal	QP
4	463.970	16.40	1.48	5.74	23.62	46.00	-22.38	Horizontal	QP
5	739.661	19.42	2.41	7.11	28.94	46.00	-17.06	Horizontal	QP
6	pp 906.482	22.09	2.47	7.19	31.75	46.00	-14.25	Horizontal	QP

**Transmitter Emission above 1GHz**

Test mode: 802.11b(1Mbps)			Test Frequency: 2412MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1254.268	30.35	1.94	44.31	49.15	37.13	74.00	-36.87	Pass	Horizontal
1800.416	31.40	2.64	43.68	47.57	37.93	74.00	-36.07	Pass	Horizontal
4824.000	34.73	6.02	44.60	49.30	45.45	74.00	-28.55	Pass	Horizontal
6032.401	35.92	7.43	44.50	49.68	48.53	74.00	-25.47	Pass	Horizontal
7236.000	36.42	6.94	44.80	48.11	46.67	74.00	-27.33	Pass	Horizontal
9648.000	37.93	7.01	45.57	46.69	46.06	74.00	-27.94	Pass	Horizontal
1299.773	30.46	2.01	44.25	48.98	37.20	74.00	-36.80	Pass	Vertical
1597.401	31.05	2.41	43.89	48.96	38.53	74.00	-35.47	Pass	Vertical
4824.000	34.73	6.02	44.60	48.28	44.43	74.00	-29.57	Pass	Vertical
6032.401	35.92	7.43	44.50	50.07	48.92	74.00	-25.08	Pass	Vertical
7236.000	36.42	6.94	44.80	46.89	45.45	74.00	-28.55	Pass	Vertical
9648.000	37.93	7.01	45.57	47.32	46.69	74.00	-27.31	Pass	Vertical

Test mode: 802.11b(1Mbps)			Test Frequency: 2437MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1283.335	30.42	1.99	44.27	48.33	36.47	74.00	-37.53	Pass	Horizontal
1553.293	30.97	2.35	43.94	48.90	38.28	74.00	-35.72	Pass	Horizontal
4874.000	34.84	6.12	44.60	49.28	45.64	74.00	-28.36	Pass	Horizontal
5821.207	35.77	7.26	44.52	49.28	47.79	74.00	-26.21	Pass	Horizontal
7311.000	36.43	6.86	44.86	47.28	45.71	74.00	-28.29	Pass	Horizontal
9748.000	38.03	7.10	45.55	46.17	45.75	74.00	-28.25	Pass	Horizontal
1173.943	30.16	1.82	44.42	48.99	36.55	74.00	-37.45	Pass	Vertical
1533.648	30.93	2.33	43.96	49.01	38.31	74.00	-35.69	Pass	Vertical
4874.000	34.84	6.12	44.60	48.57	44.93	74.00	-29.07	Pass	Vertical
6001.768	35.90	7.44	44.50	49.29	48.13	74.00	-25.87	Pass	Vertical
7311.000	36.43	6.86	44.86	47.29	45.72	74.00	-28.28	Pass	Vertical
9748.000	38.03	7.10	45.55	46.94	46.52	74.00	-27.48	Pass	Vertical

Test mode: 802.11b(1Mbps)			Test Frequency: 2462MHz			Remark: Peak			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1225.860	30.29	1.90	44.35	48.76	36.60	74.00	-37.40	Pass	Horizontal
1561.221	30.99	2.36	43.93	48.06	37.48	74.00	-36.52	Pass	Horizontal
4924.000	34.94	6.22	44.60	47.09	43.65	74.00	-30.35	Pass	Horizontal
6032.401	35.92	7.43	44.50	49.84	48.69	74.00	-25.31	Pass	Horizontal
7386.000	36.44	6.78	44.92	47.32	45.62	74.00	-28.38	Pass	Horizontal
9848.000	38.14	7.19	45.53	47.79	47.59	74.00	-26.41	Pass	Horizontal
1276.818	30.41	1.98	44.28	49.21	37.32	74.00	-36.68	Pass	Vertical
1565.200	30.99	2.37	43.92	48.26	37.70	74.00	-36.30	Pass	Vertical
4924.000	34.94	6.22	44.60	46.98	43.54	74.00	-30.46	Pass	Vertical
6017.064	35.91	7.44	44.50	49.24	48.09	74.00	-25.91	Pass	Vertical
7386.000	36.44	6.78	44.92	48.59	46.89	74.00	-27.11	Pass	Vertical
9848.000	38.14	7.19	45.53	47.44	47.24	74.00	-26.76	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 (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1238.405	30.32	1.92	44.33	49.22	37.13	74.00	-36.87	Pass	Horizontal
1525.860	30.92	2.32	43.97	49.31	38.58	74.00	-35.42	Pass	Horizontal
4824.000	34.73	6.02	44.60	48.71	44.86	74.00	-29.14	Pass	Horizontal
5603.126	35.60	7.04	44.54	48.94	47.04	74.00	-26.96	Pass	Horizontal
7236.000	36.42	6.94	44.80	47.63	46.19	74.00	-27.81	Pass	Horizontal
9648.000	37.93	7.01	45.57	46.47	45.84	74.00	-28.16	Pass	Horizontal
1280.072	30.41	1.98	44.27	48.68	36.80	74.00	-37.20	Pass	Vertical
1549.344	30.96	2.35	43.94	48.51	37.88	74.00	-36.12	Pass	Vertical
4824.000	34.73	6.02	44.60	47.79	43.94	74.00	-30.06	Pass	Vertical
6032.401	35.92	7.43	44.50	49.33	48.18	74.00	-25.82	Pass	Vertical
7236.000	36.42	6.94	44.80	48.32	46.88	74.00	-27.12	Pass	Vertical
9648.000	37.93	7.01	45.57	47.06	46.43	74.00	-27.57	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 $\mu$ V)	Final test level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1263.883	30.38	1.96	44.29	48.74	36.79	74.00	-37.21	Pass	Horizontal
1491.300	30.85	2.28	44.01	49.00	38.12	74.00	-35.88	Pass	Horizontal
4874.000	34.84	6.12	44.60	49.01	45.37	74.00	-28.63	Pass	Horizontal
5836.044	35.78	7.28	44.52	49.50	48.04	74.00	-25.96	Pass	Horizontal
7311.000	36.43	6.86	44.86	47.26	45.69	74.00	-28.31	Pass	Horizontal
9748.000	38.03	7.10	45.55	46.93	46.51	74.00	-27.49	Pass	Horizontal
1112.837	30.01	1.72	44.51	49.13	36.35	74.00	-37.65	Pass	Vertical
1413.674	30.70	2.17	44.10	49.00	37.77	74.00	-36.23	Pass	Vertical
4874.000	34.84	6.12	44.60	49.29	45.65	74.00	-28.35	Pass	Vertical
5660.469	35.64	7.10	44.53	49.91	48.12	74.00	-25.88	Pass	Vertical
7311.000	36.43	6.86	44.86	47.16	45.59	74.00	-28.41	Pass	Vertical
9748.000	38.03	7.10	45.55	48.22	47.80	74.00	-26.20	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 $\mu$ V)	Final test level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1079.357	29.92	1.66	44.57	49.01	36.02	74.00	-37.98	Pass	Horizontal
1521.981	30.91	2.32	43.97	48.63	37.89	74.00	-36.11	Pass	Horizontal
4924.000	34.94	6.22	44.60	48.23	44.79	74.00	-29.21	Pass	Horizontal
5850.919	35.79	7.29	44.51	49.83	48.40	74.00	-25.60	Pass	Horizontal
7386.000	36.44	6.78	44.92	47.35	45.65	74.00	-28.35	Pass	Horizontal
9848.000	38.14	7.19	45.53	47.71	47.51	74.00	-26.49	Pass	Horizontal
1238.405	30.32	1.92	44.33	48.51	36.42	74.00	-37.58	Pass	Vertical
1518.111	30.90	2.31	43.98	48.64	37.87	74.00	-36.13	Pass	Vertical
4924.000	34.94	6.22	44.60	47.29	43.85	74.00	-30.15	Pass	Vertical
6032.401	35.92	7.43	44.50	49.42	48.27	74.00	-25.73	Pass	Vertical
7386.000	36.44	6.78	44.92	49.47	47.77	74.00	-26.23	Pass	Vertical
9848.000	38.14	7.19	45.53	47.58	47.38	74.00	-26.62	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 $\mu$ V)	Final test level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1228.984	30.29	1.91	44.34	48.42	36.28	74.00	-37.72	Pass	Horizontal
1545.405	30.96	2.35	43.95	49.01	38.37	74.00	-35.63	Pass	Horizontal
4824.000	34.73	6.02	44.60	48.38	44.53	74.00	-29.47	Pass	Horizontal
5836.044	35.78	7.28	44.52	49.39	47.93	74.00	-26.07	Pass	Horizontal
7236.000	36.42	6.94	44.80	47.30	45.86	74.00	-28.14	Pass	Horizontal
9648.000	37.93	7.01	45.57	45.70	45.07	74.00	-28.93	Pass	Horizontal
1293.173	30.44	2.00	44.25	48.83	37.02	74.00	-36.98	Pass	Vertical
1565.200	30.99	2.37	43.92	48.71	38.15	74.00	-35.85	Pass	Vertical
4824.000	34.73	6.02	44.60	48.44	44.59	74.00	-29.41	Pass	Vertical
5462.297	35.49	6.89	44.55	49.43	47.26	74.00	-26.74	Pass	Vertical
7236.000	36.42	6.94	44.80	47.89	46.45	74.00	-27.55	Pass	Vertical
9648.000	37.93	7.01	45.57	45.98	45.35	74.00	-28.65	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 $\mu$ V)	Final test level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1270.334	30.39	1.97	44.29	48.81	36.88	74.00	-37.12	Pass	Horizontal
1706.700	31.24	2.54	43.77	48.13	38.14	74.00	-35.86	Pass	Horizontal
4874.000	34.84	6.12	44.60	47.69	44.05	74.00	-29.95	Pass	Horizontal
6032.401	35.92	7.43	44.50	49.98	48.83	74.00	-25.17	Pass	Horizontal
7311.000	36.43	6.86	44.86	47.97	46.40	74.00	-27.60	Pass	Horizontal
9748.000	38.03	7.10	45.55	46.58	46.16	74.00	-27.84	Pass	Horizontal
1257.465	30.36	1.95	44.30	48.50	36.51	74.00	-37.49	Pass	Vertical
1537.557	30.94	2.34	43.96	48.91	38.23	74.00	-35.77	Pass	Vertical
4874.000	34.84	6.12	44.60	48.24	44.60	74.00	-29.40	Pass	Vertical
5821.207	35.77	7.26	44.52	48.99	47.50	74.00	-26.50	Pass	Vertical
7311.000	36.43	6.86	44.86	47.36	45.79	74.00	-28.21	Pass	Vertical
9748.000	38.03	7.10	45.55	47.08	46.66	74.00	-27.34	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 (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1251.079	30.35	1.94	44.31	48.79	36.77	74.00	-37.23	Pass	Horizontal
1450.122	30.77	2.22	44.06	49.21	38.14	74.00	-35.86	Pass	Horizontal
4924.000	34.94	6.22	44.60	47.20	43.76	74.00	-30.24	Pass	Horizontal
5850.919	35.79	7.29	44.51	49.46	48.03	74.00	-25.97	Pass	Horizontal
7386.000	36.44	6.78	44.92	48.14	46.44	74.00	-27.56	Pass	Horizontal
9848.000	38.14	7.19	45.53	48.67	48.47	74.00	-25.53	Pass	Horizontal
1303.086	30.46	2.02	44.24	48.62	36.86	74.00	-37.14	Pass	Vertical
1828.125	31.44	2.67	43.66	48.64	39.09	74.00	-34.91	Pass	Vertical
4924.000	34.94	6.22	44.60	47.31	43.87	74.00	-30.13	Pass	Vertical
6412.427	36.12	7.33	44.54	49.40	48.31	74.00	-25.69	Pass	Vertical
7386.000	36.44	6.78	44.92	47.50	45.80	74.00	-28.20	Pass	Vertical
9848.000	38.14	7.19	45.53	46.88	46.68	74.00	-27.32	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 (dBμV)	Final test level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1267.104	30.38	1.96	44.29	48.85	36.90	74.00	-37.10	Pass	Horizontal
1711.050	31.25	2.54	43.77	48.02	38.04	74.00	-35.96	Pass	Horizontal
4844.000	34.77	6.06	44.60	47.86	44.09	74.00	-29.91	Pass	Horizontal
6017.064	35.91	7.44	44.50	49.37	48.22	74.00	-25.78	Pass	Horizontal
7266.000	36.43	6.91	44.82	47.11	45.63	74.00	-28.37	Pass	Horizontal
9688.000	37.97	7.05	45.56	47.23	46.69	74.00	-27.31	Pass	Horizontal
1238.405	30.32	1.92	44.33	49.03	36.94	74.00	-37.06	Pass	Vertical
1392.247	30.65	2.14	44.13	49.09	37.75	74.00	-36.25	Pass	Vertical
4844.000	34.77	6.06	44.60	49.93	46.16	74.00	-27.84	Pass	Vertical
6063.190	35.93	7.42	44.51	49.35	48.19	74.00	-25.81	Pass	Vertical
7266.000	36.43	6.91	44.82	46.76	45.28	74.00	-28.72	Pass	Vertical
9688.000	37.97	7.05	45.56	47.06	46.52	74.00	-27.48	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 $\mu$ V)	Final test level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1198.095	30.22	1.86	44.39	48.40	36.09	74.00	-37.91	Pass	Horizontal
1491.300	30.85	2.28	44.01	48.35	37.47	74.00	-36.53	Pass	Horizontal
4874.000	34.84	6.12	44.60	48.40	44.76	74.00	-29.24	Pass	Horizontal
5806.408	35.76	7.25	44.52	49.73	48.22	74.00	-25.78	Pass	Horizontal
7311.000	36.43	6.86	44.86	47.40	45.83	74.00	-28.17	Pass	Horizontal
9748.000	38.03	7.10	45.55	46.63	46.21	74.00	-27.79	Pass	Horizontal
1293.173	30.44	2.00	44.25	49.11	37.30	74.00	-36.70	Pass	Vertical
1782.177	31.37	2.62	43.70	48.22	38.51	74.00	-35.49	Pass	Vertical
4874.000	34.84	6.12	44.60	48.77	45.13	74.00	-28.87	Pass	Vertical
6032.401	35.92	7.43	44.50	49.76	48.61	74.00	-25.39	Pass	Vertical
7311.000	36.43	6.86	44.86	47.84	46.27	74.00	-27.73	Pass	Vertical
9748.000	38.03	7.10	45.55	46.52	46.10	74.00	-27.90	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 $\mu$ V)	Final test level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Result	Antenna Polaxis
1254.268	30.35	1.94	44.31	49.61	37.59	74.00	-36.41	Pass	Horizontal
1621.985	31.10	2.44	43.86	48.63	38.31	74.00	-35.69	Pass	Horizontal
4904.000	34.90	6.18	44.60	48.64	45.12	74.00	-28.88	Pass	Horizontal
6047.776	35.93	7.43	44.51	50.15	49.00	74.00	-25.00	Pass	Horizontal
7356.000	36.44	6.81	44.90	48.21	46.56	74.00	-27.44	Pass	Horizontal
9808.000	38.10	7.16	45.54	48.73	48.45	74.00	-25.55	Pass	Horizontal
1254.268	30.35	1.94	44.31	49.61	37.59	74.00	-36.41	Pass	Vertical
1514.252	30.90	2.31	43.98	49.51	38.74	74.00	-35.26	Pass	Vertical
4904.000	34.90	6.18	44.60	48.46	44.94	74.00	-29.06	Pass	Vertical
5836.044	35.78	7.28	44.52	49.06	47.60	74.00	-26.40	Pass	Vertical
7356.000	36.44	6.81	44.90	47.64	45.99	74.00	-28.01	Pass	Vertical
9808.000	38.10	7.16	45.54	48.73	48.45	74.00	-25.55	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) ; 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 model No.: 0480 0069



**Radiated spurious emission Test Setup-1(9K-30M)**



**Radiated spurious emission Test Setup-2(30M-1G)**



**Radiated spurious emission Test Setup-3(Above 1GHz)**



**Conducted Emissions Test Setup**

## PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No.EED32K00112101 for EUT external and internal photos.

\*\*\* End of Report \*\*\*

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