

## TEST REPORT

**Product** : Beyond Tablet Mini Edition  
**Trade mark** : Beyond Screen  
**Model/Type reference** : BYM002  
**Serial Number** : N/A  
**Report Number** : EED32K00140001  
**FCC ID** : 2AK5X-BTM6362  
**Date of Issue** : Jul. 03, 2018  
**Test Standards** : 47 CFR Part 15Subpart C  
**Test result** : PASS

Prepared for:

**Beyond Screen Limited**  
**Suite 603, Building 6, Fulltech Plaza, No. 33 North Guangshun Street,**  
**Beijing, 100102, China**

Prepared by:

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Date:

Jul. 03, 2018

Check No.: 1022500401

## 2 Version

Version No.	Date	Description
00	Jul. 03, 2018	Original

### 3 Test Summary

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

The Beyond Tablet Mini Edition has two color appearance, the electrical circuit design, layout, and operational principle were identical for two color appearance, only the color is different.

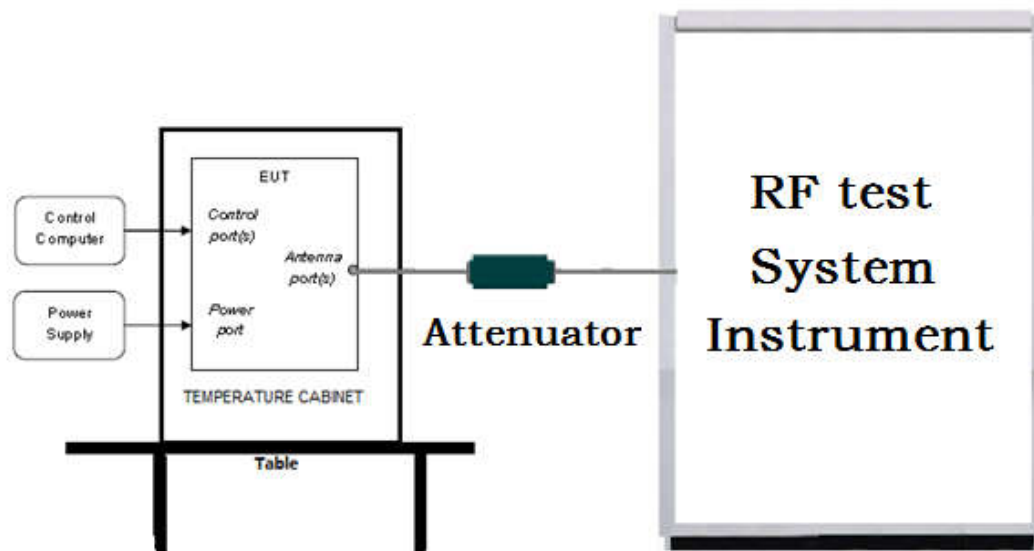
## 4 Content

<b>1 COVER PAGE</b>	<b>1</b>
<b>2 VERSION</b>	<b>2</b>
<b>3 TEST SUMMARY</b>	<b>3</b>
<b>4 CONTENT</b>	<b>4</b>
<b>5 TEST REQUIREMENT</b>	<b>5</b>
5.1 TEST SETUP	5
5.1.1 For Conducted test setup	5
5.1.2 For Radiated Emissions test setup	5
5.1.3 For Conducted Emissions test setup	6
5.2 TEST ENVIRONMENT	6
5.3 TEST CONDITION	6
<b>6 GENERAL INFORMATION</b>	<b>7</b>
6.1 CLIENT INFORMATION	7
6.2 GENERAL DESCRIPTION OF EUT	7
6.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD	7
6.4 DESCRIPTION OF SUPPORT UNITS	8
6.5 TEST LOCATION	8
6.6 DEVIATION FROM STANDARDS	8
6.7 ABNORMALITIES FROM STANDARD CONDITIONS	8
6.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER	8
6.9 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2)	9
<b>7 EQUIPMENT LIST</b>	<b>10</b>
<b>8 RADIO TECHNICAL REQUIREMENTS SPECIFICATION</b>	<b>12</b>
Appendix A): 6dB Occupied Bandwidth	13
Appendix B): Conducted Peak Output Power	15
Appendix C): Band-edge for RF Conducted Emissions	17
Appendix D): RF Conducted Spurious Emissions	19
Appendix E): Power Spectral Density	22
Appendix F): Antenna Requirement	24
Appendix G): AC Power Line Conducted Emission	25
Appendix H): Restricted bands around fundamental frequency (Radiated)	30
Appendix I): Radiated Spurious Emissions	35
<b>PHOTOGRAPHS OF TEST SETUP</b>	<b>40</b>
<b>PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS</b>	<b>40</b>

## 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:

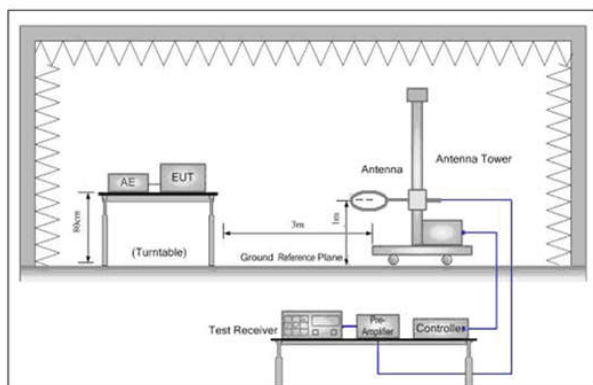


Figure 1. Below 30MHz

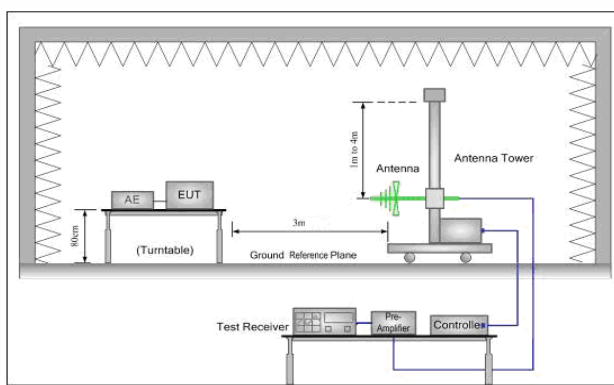


Figure 2. 30MHz to 1GHz

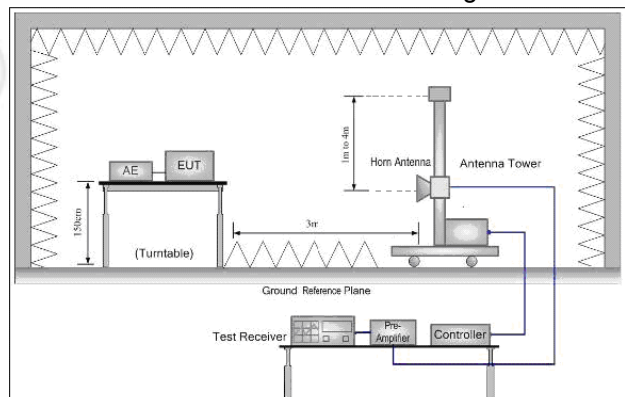
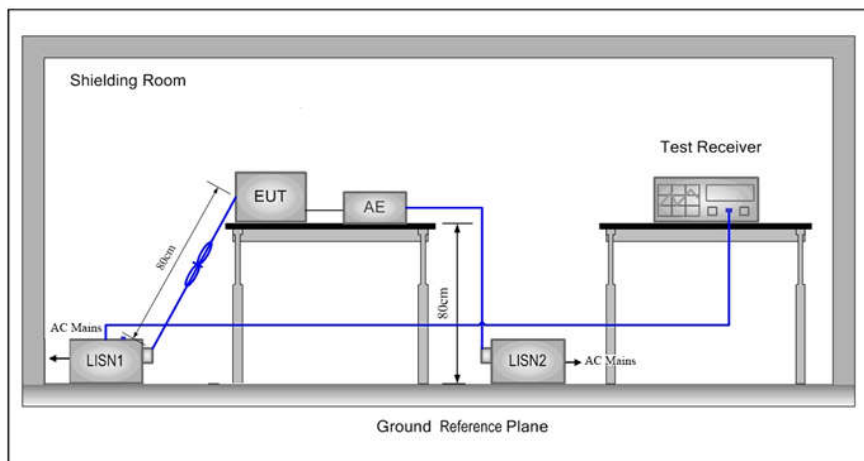


Figure 3. Above 1GHz



### 5.1.3 For Conducted Emissions test setup

#### Conducted Emissions setup



## 5.2 Test Environment

Operating Environment:	
Temperature:	26.4 °C
Humidity:	60% RH
Atmospheric Pressure:	1010mbar

## 5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
GFSK	2402MHz ~2480 MHz	Channel 1	Channel 20	Channel 40
		2402MHz	2440MHz	2480MHz
TX mode:	The EUT transmitted the continuous signal at the specific channel(s).			

## 6 General Information

### 6.1 Client Information

Applicant:	Beyond Screen Limited
Address of Applicant:	Suite 603, Building 6, Fulltech Plaza, No. 33 North Guangshun Street, Beijing, 100102, China
Manufacturer:	Beyond Screen Limited
Address of Manufacturer:	Suite 603, Building 6, Fulltech Plaza, No. 33 North Guangshun Street, Beijing, 100102, China
Factory:	Shenzhen RuiYi Electronic Science and Technology Co., Ltd.
Address of Factory:	4th Floor, No.1, Area A, Tangtou Third Industrial Park, Shiyang Village, Baoan District, Shenzhen City, Guangdong Province, 518108, China

### 6.2 General Description of EUT

Product Name:	Beyond Tablet Mini Edition
Model No.(EUT):	BYM002
Trade mark:	Beyond Screen
EUT Supports Radios application:	Wi-Fi: 802.11 b/g/n(20M)/n(40M) , 2412MHz-2462MHz BT:4.0 BT Dual mode, 2402MHz to 2480MHz NFC :13.56MHz
Power Supply:	DC 12V and AC 120V/60Hz
Sample Received Date:	Jun. 04, 2018
Sample tested Date:	Jun. 04, 2018 to Jun. 29, 2018

### 6.3 Product Specification subjective to this standard

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	4.0
Modulation Technique:	DSSS
Modulation Type:	GFSK
Number of Channel:	40
Sample Type:	Portable production
Test Power Grade:	N/A(manufacturer declare )
Test Software of EUT:	SoFia RFTTestTool V1.1(manufacturer declare )
Hardware Version:	BY3.LRB_V1.0, BY3.TB_V0.3(manufacturer declare )
Software version:	V1.0(manufacturer declare )
Antenna Type:	PCB Antenna
Antenna Gain:	1.5dBi
Power Source:	Battery: 8.4V, 8000mAh
Test Voltage:	DC 12V and AC 120V/60Hz
USB cable:	100cm

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
3	2406MHz	13	2426MHz	23	2446MHz	33	2466MHz
4	2408MHz	14	2428MHz	24	2448MHz	34	2468MHz
5	2410MHz	15	2430MHz	25	2450MHz	35	2470MHz
6	2412MHz	16	2432MHz	26	2452MHz	36	2472MHz
7	2414MHz	17	2434MHz	27	2454MHz	37	2474MHz
8	2416MHz	18	2436MHz	28	2456MHz	38	2476MHz
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

## 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 33683668 Fax: +86 (0) 755 33683385

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	$7.9 \times 10^{-8}$
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	03-13-2018	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	FL3CX03WG 18NM12- 0398-002	---	01-10-2018	01-09-2019
High-pass filter	MICRO- TRONICS	SPA-F- 63029-4	---	01-10-2018	01-09-2019
DC Power	Keysight	E3642A	MY54426035	03-13-2018	03-12-2019
power meter & power sensor	R&S	OSP120	101374	03-13-2018	03-12-2019
RF control unit	JS Tonscend	JS0806-2	158060006	03-13-2018	03-12-2019
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	03-13-2018	03-12-2019

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	05-25-2018	05-24-2019
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-02-2018	05-01-2019
LISN	schwarzbeck	NNLK8121	8121-529	05-11-2018	05-10-2019

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	9163-617	03-29-2018	03-28-2019
Preamplifier	JS Tonscend	EMC051845 SE	980380	01-19-2018	01-18-2019
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015	07-18-2018
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	05-25-2018	05-24-2019
Multi device Controller	maturo	NCD/070/107 11112	---	05-02-2018	05-01-2019
Signal Generator	Keysight	E8257D	MY53401106	03-13-2018	03-12-2019
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-02-2018	05-01-2019
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
High-pass filter	Sinoscite	FL3CX03WG 18NM12-0398-002	---	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 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix A)
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	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	K ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix I)

## Appendix A): 6dB Occupied Bandwidth

### Test Result

Mode	Channel	6dB Bandwidth [MHz]	99% OBW[MHz]	Verdict	Remark
BLE	LCH	0.7459	1.0569	PASS	Peak detector
BLE	MCH	0.7344	1.0699	PASS	
BLE	HCH	0.7458	1.0603	PASS	



## Test Graphs

Graphs	
LCH	<p>Keyight Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.402000000 GHz</p> <p>Ref Offset: 19.08 dB Ref: 10.00 dBm</p> <p>Center 2.402 GHz #Res BW 100 kHz</p> <p>Occupied Bandwidth: <b>1.0569 MHz</b></p> <p>Total Power: 6.85 dBm</p> <p>Transmit Freq Error: 153.49 kHz</p> <p>x dB Bandwidth: 745.9 kHz</p>
MCH	<p>Keyight Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.440000000 GHz</p> <p>Ref Offset: 19.02 dB Ref: 29.02 dBm</p> <p>Center 2.44 GHz #Res BW 100 kHz</p> <p>Occupied Bandwidth: <b>1.0699 MHz</b></p> <p>Total Power: 7.19 dBm</p> <p>Transmit Freq Error: 155.44 kHz</p> <p>x dB Bandwidth: 734.4 kHz</p>
HCH	<p>Keyight Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.480000000 GHz</p> <p>Ref Offset: 19.05 dB Ref: 29.05 dBm</p> <p>Center 2.48 GHz #Res BW 100 kHz</p> <p>Occupied Bandwidth: <b>1.0603 MHz</b></p> <p>Total Power: 7.65 dBm</p> <p>Transmit Freq Error: 159.76 kHz</p> <p>x dB Bandwidth: 745.8 kHz</p>

## Appendix B): Conducted Peak Output Power

### Test Result

Mode	Channel	Conduct Peak Power[dBm]	Verdict
BLE	LCH	0.787	PASS
BLE	MCH	1.381	PASS
BLE	HCH	2.295	PASS

## Test Graphs

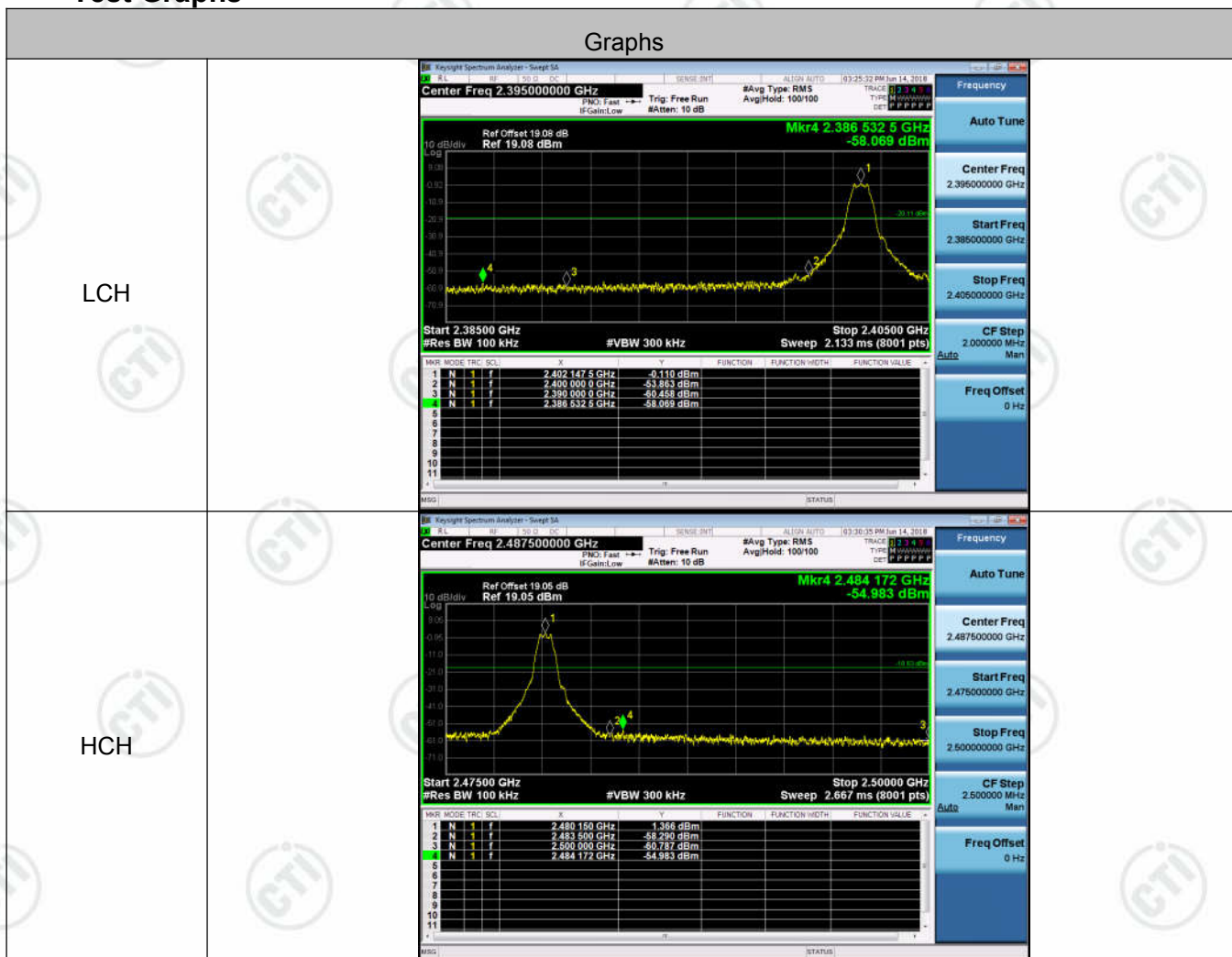


## Appendix C): Band-edge for RF Conducted Emissions

Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BLE	LCH	-0.110	-58.069	-20.11	PASS
BLE	HCH	1.366	-54.983	-18.63	PASS

## Test Graphs



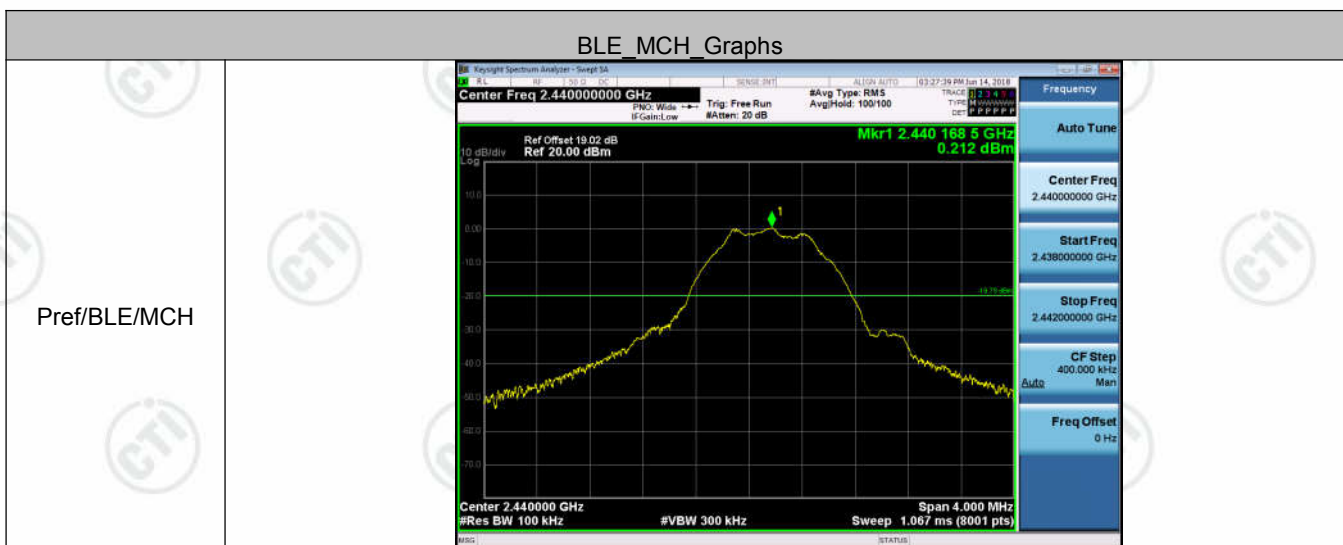
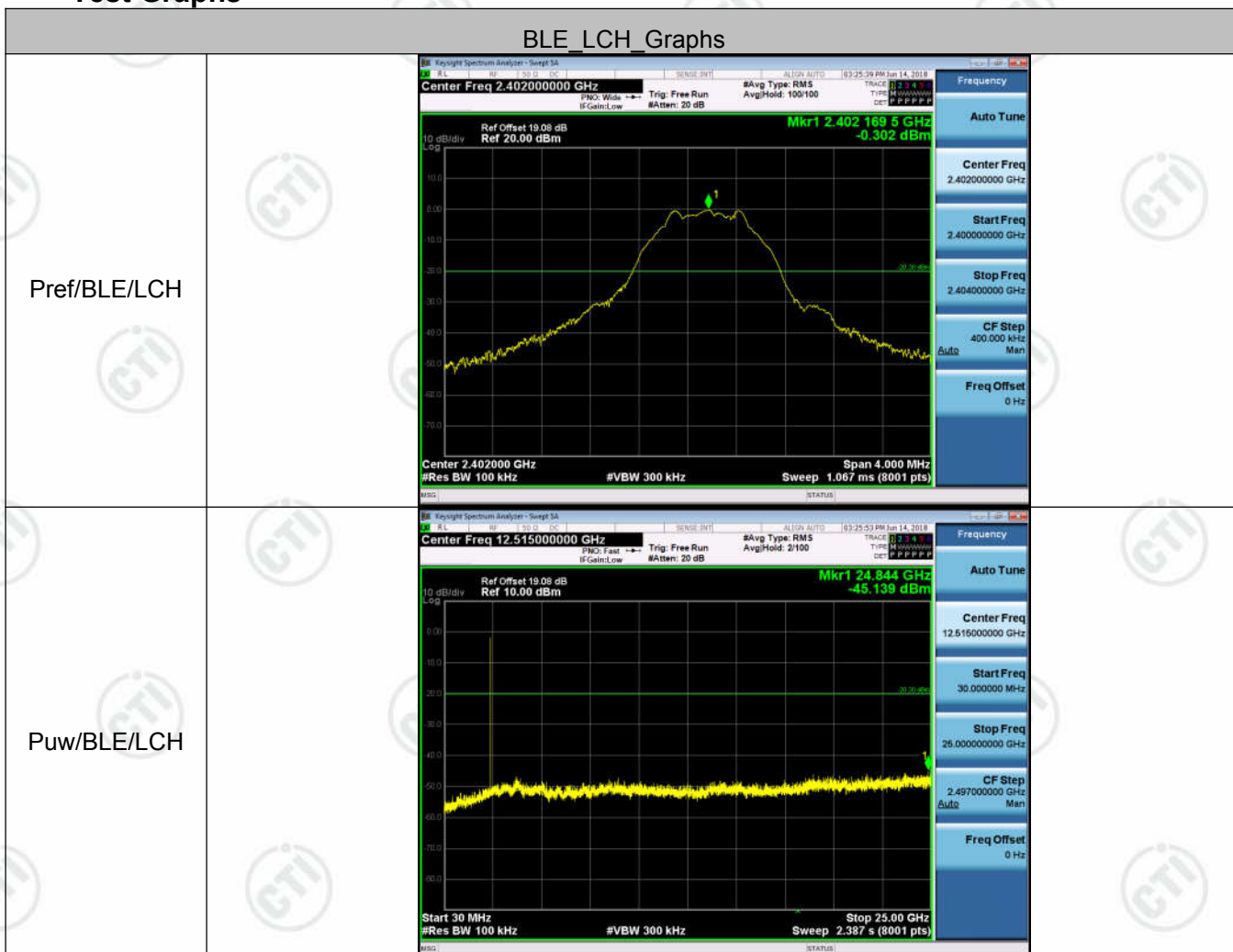


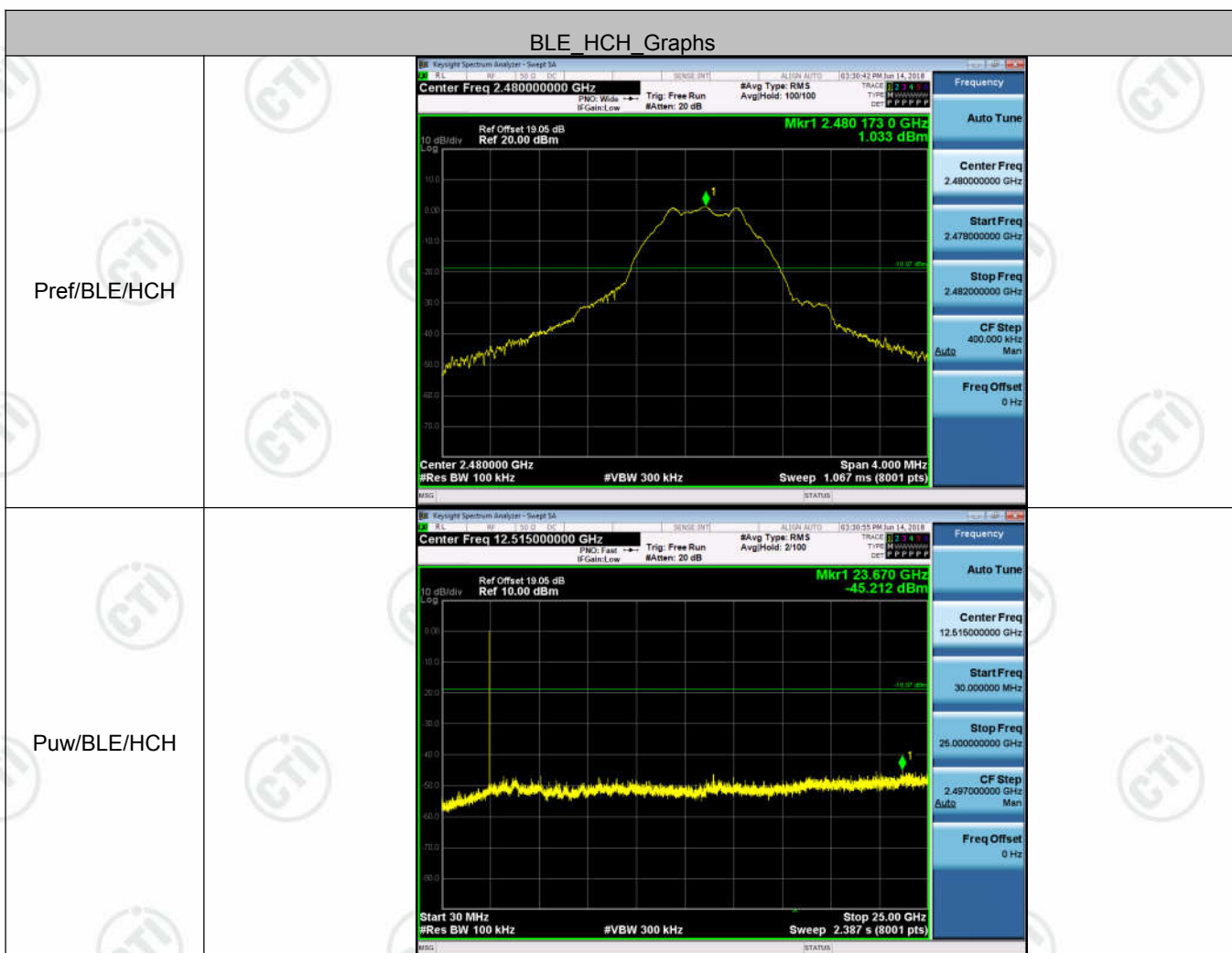
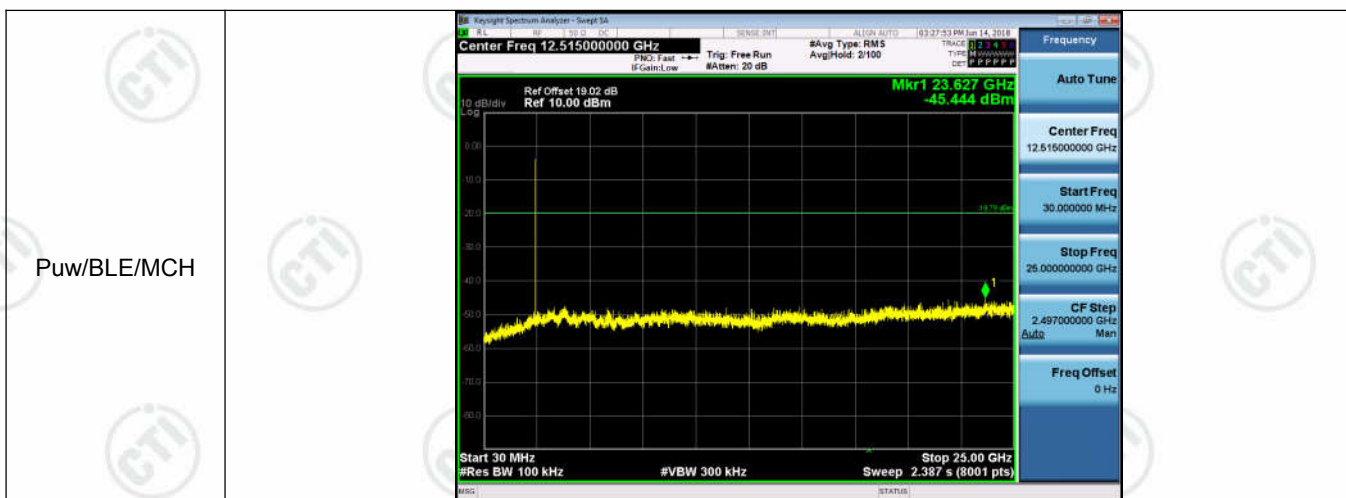
## Appendix D): RF Conducted Spurious Emissions

**Result Table**

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
BLE	LCH	-0.302	<Limit	PASS
BLE	MCH	0.212	<Limit	PASS
BLE	HCH	1.033	<Limit	PASS

## Test Graphs



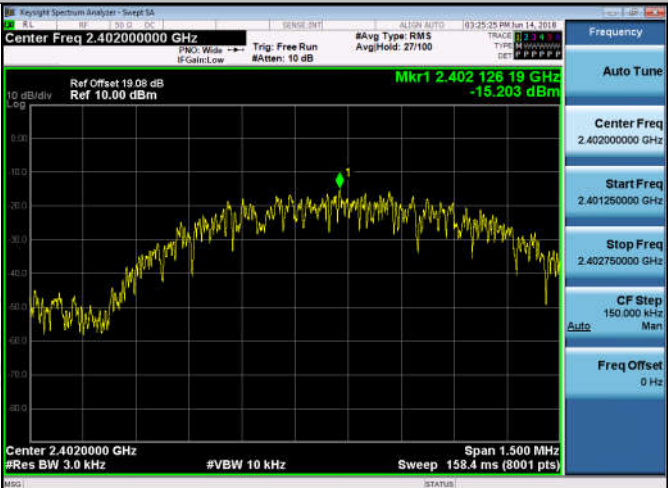
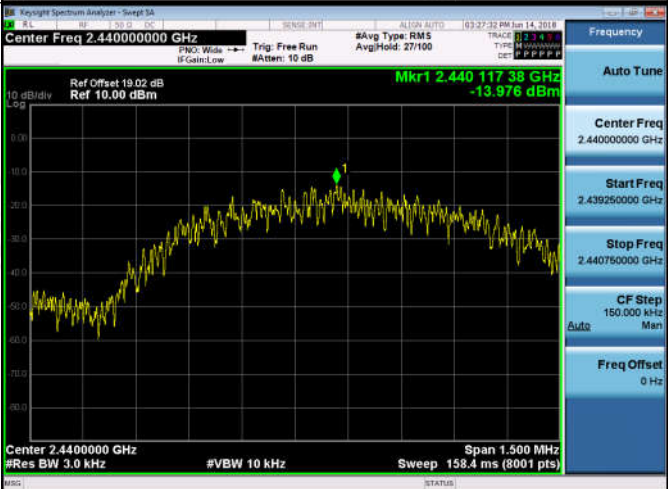
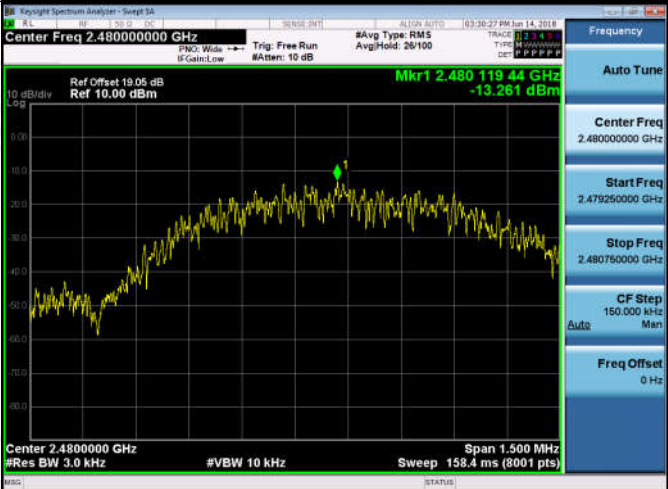


## Appendix E): Power Spectral Density

Result Table

Mode	Channel	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
BLE	LCH	-15.203	8	PASS
BLE	MCH	-13.976	8	PASS
BLE	HCH	-13.261	8	PASS

## Test Graphs

Graphs	
LCH	
MCH	
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.

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.5dBi.

## Appendix G): AC Power Line Conducted Emission

Test Procedure:	<p>Test frequency range :150KHz-30MHz</p> <p>1)The mains terminal disturbance voltage test was conducted in a shielded room.</p> <p>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 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.</p> <p>3)The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</p> <p>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</p> <p>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.</p>														
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</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> <p>* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.</p> <p>NOTE : The lower limit is applicable at the transition frequency</p>	Frequency range (MHz)	Limit (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													

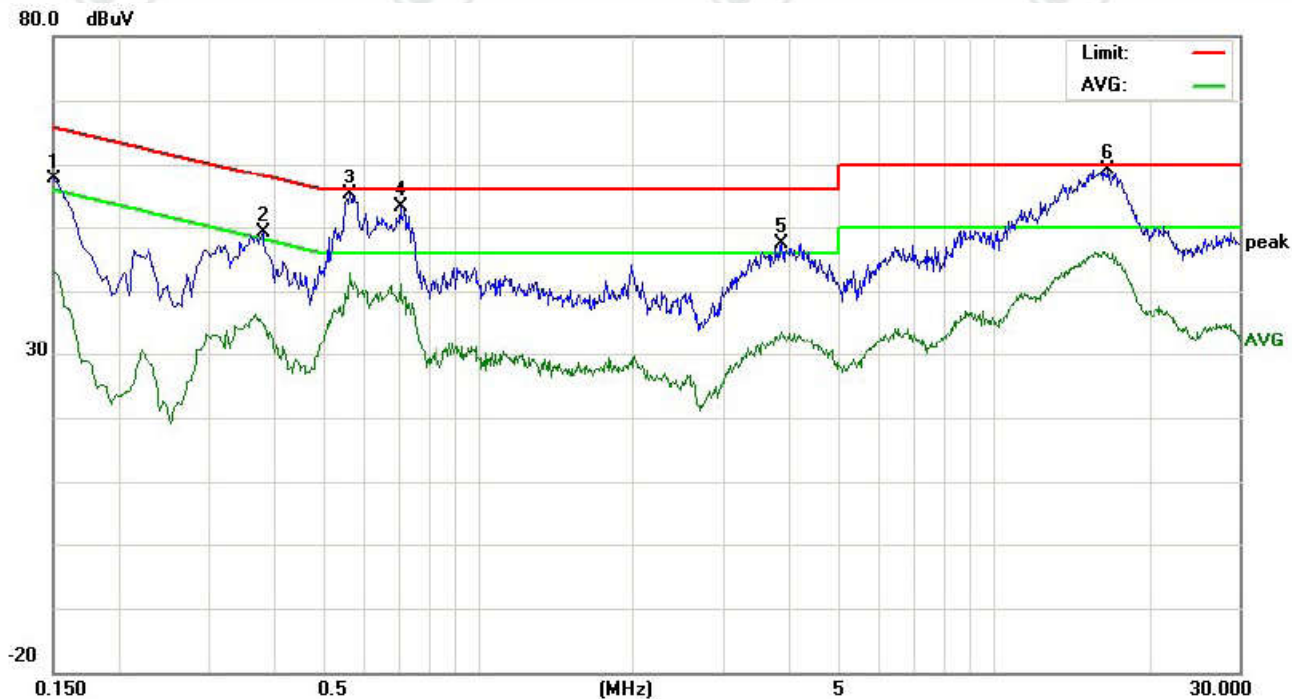
### Measurement Data

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.

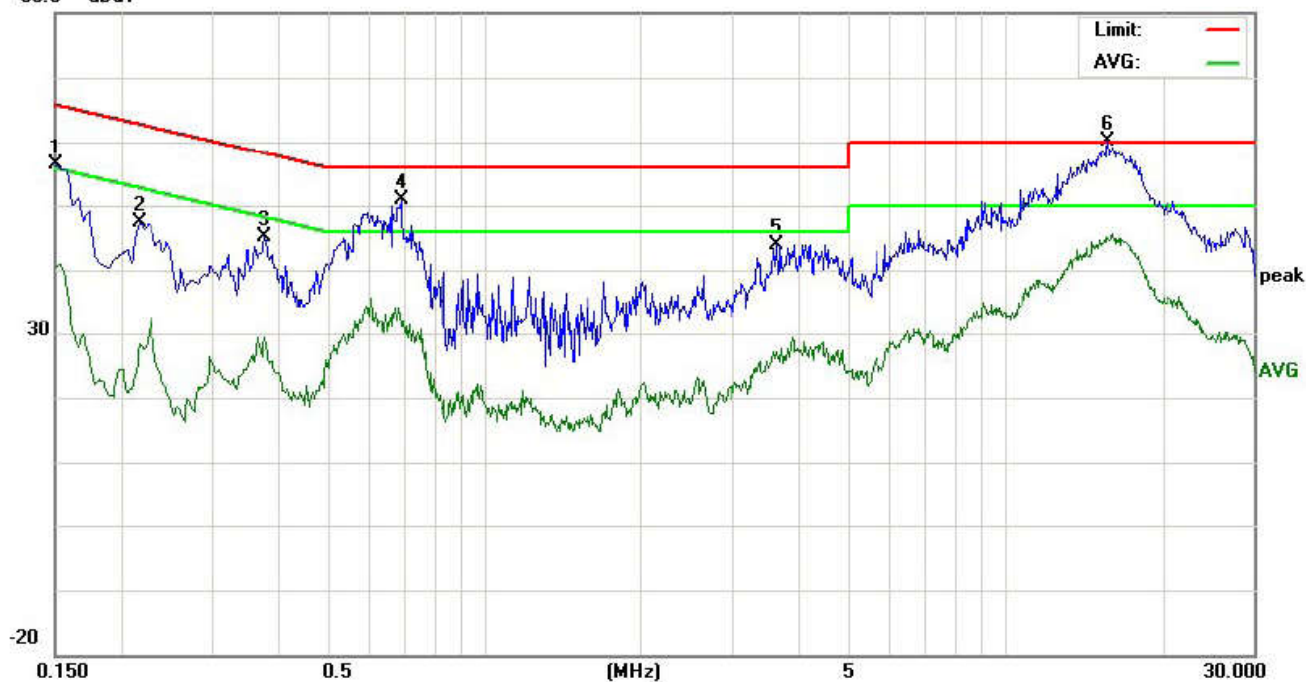
GE0151U-050300

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	0.1499	47.82	44.32	33.34	9.77	57.59	54.09	43.11	66.00	56.00	-11.91	-12.89	P	
2	0.3820	39.37	36.89	25.11	9.76	49.13	46.65	34.87	58.23	48.23	-11.58	-13.36	P	
3	0.5660	45.43	41.78	30.82	9.74	55.17	51.52	40.56	56.00	46.00	-4.48	-5.44	P	
4	0.7060	43.30	38.42	28.31	9.75	53.05	48.17	38.06	56.00	46.00	-7.83	-7.94	P	
5	3.8860	37.80	34.58	23.99	9.66	47.46	44.24	33.65	56.00	46.00	-11.76	-12.35	P	
6	16.6980	49.10	42.85	33.74	10.03	59.13	52.88	43.77	60.00	50.00	-7.12	-6.23	P	

Neutral line:  
80.0 dBuV

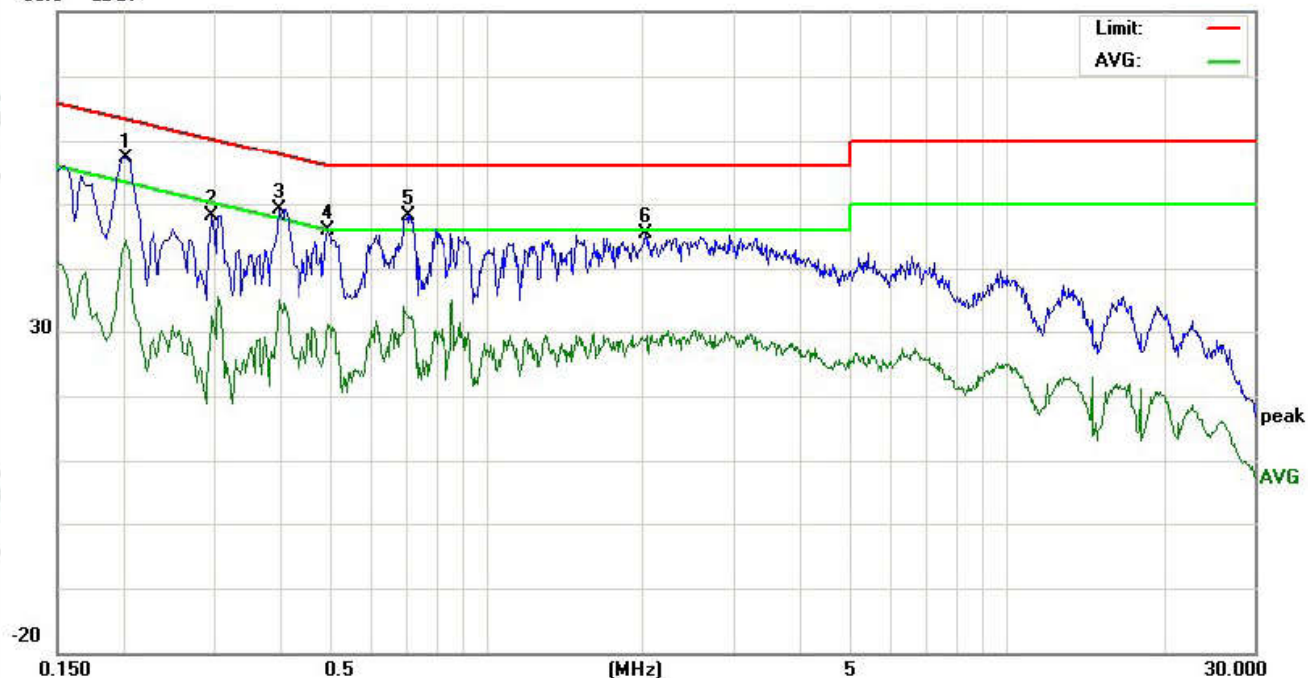


No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1500	46.57	43.68	30.80	9.77	56.34	53.45	40.57	65.99	55.99	-12.54	-15.42	P	
2	0.2180	37.64	34.58	18.63	9.72	47.36	44.30	28.35	62.89	52.89	-18.59	-24.54	P	
3	0.3780	35.45	32.56	19.52	9.76	45.21	42.32	29.28	58.32	48.32	-16.00	-19.04	P	
4	0.6900	41.06	38.55	22.05	9.75	50.81	48.30	31.80	56.00	46.00	-7.70	-14.20	P	
5	3.6500	34.28	31.59	17.52	9.66	43.94	41.25	27.18	56.00	46.00	-14.75	-18.82	P	
6	15.7940	50.18	43.14	33.39	10.02	60.20	53.16	43.41	60.00	50.00	-6.84	-6.59	P	

QC01

Live line:

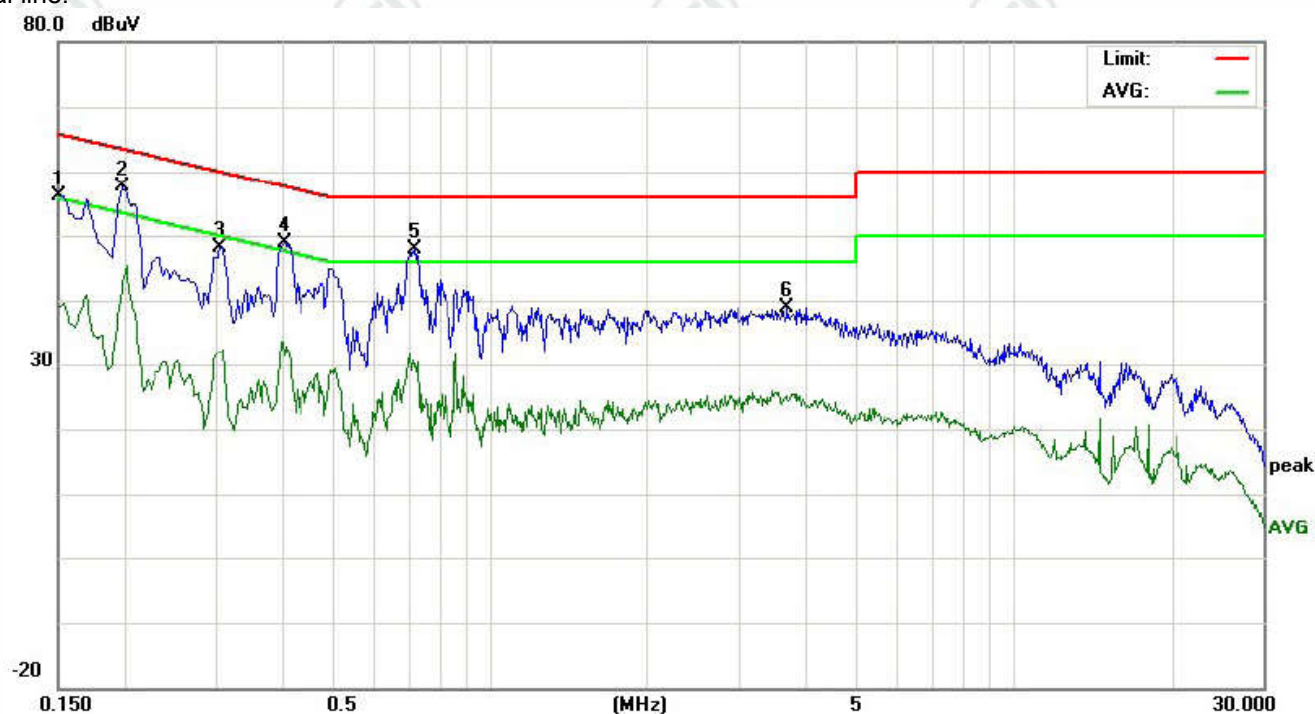
80.0 dBuV



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	0.2020	47.46	44.26	34.75	9.71	57.17	53.97	44.46	63.52	53.52	-9.55	-9.06	P	
2	0.2980	38.33	35.28	22.85	9.78	48.11	45.06	32.63	60.30	50.30	-15.24	-17.67	P	
3	0.3980	39.49	36.47	25.39	9.75	49.24	46.22	35.14	57.89	47.89	-11.67	-12.75	P	
4	0.4980	36.08	33.26	21.43	9.71	45.79	42.97	31.14	56.03	46.03	-13.06	-14.89	P	
5	0.7100	38.39	35.78	22.62	9.75	48.14	45.53	32.37	56.00	46.00	-10.47	-13.63	P	
6	2.0260	35.67	32.56	18.95	9.72	45.39	42.28	28.67	56.00	46.00	-13.72	-17.33	P	



Neutral 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	0.1500	46.39	43.26	29.30	9.77	56.16	53.03	39.07	65.99	55.99	-12.96	-16.92	P	
2	0.1980	47.80	44.58	32.06	9.71	57.51	54.29	41.77	63.69	53.69	-9.40	-11.92	P	
3	0.3060	38.32	35.49	22.08	9.78	48.10	45.27	31.86	60.08	50.08	-14.81	-18.22	P	
4	0.4060	39.08	35.69	21.52	9.75	48.83	45.44	31.27	57.73	47.73	-12.29	-16.46	P	
5	0.7180	38.14	35.24	20.25	9.75	47.89	44.99	30.00	56.00	46.00	-11.01	-16.00	P	
6	3.7140	29.26	26.48	15.02	9.66	38.92	36.14	24.68	56.00	46.00	-19.86	-21.32	P	

Notes:

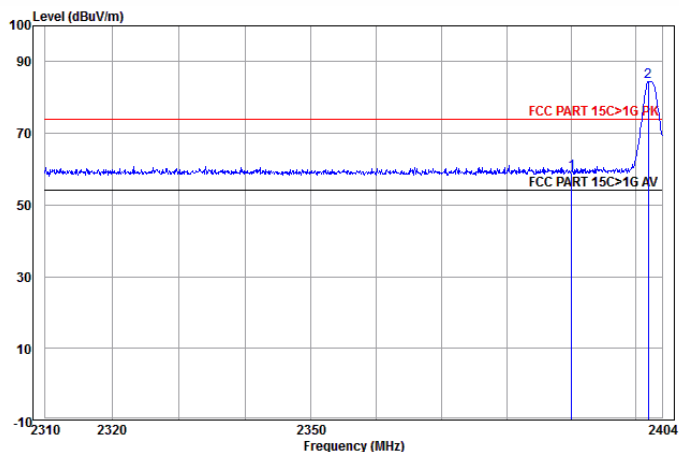
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

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

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	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:	Frequency	Limit (dBμV/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	

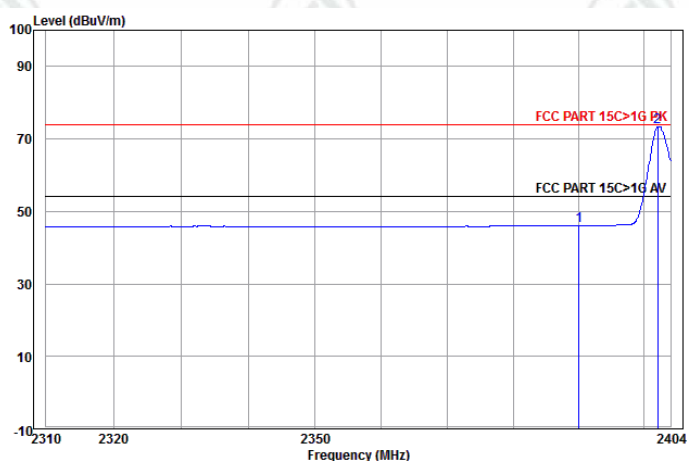
**Test plot as follows:**

Worse case mode:	GFSK		
Frequency: 2402MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



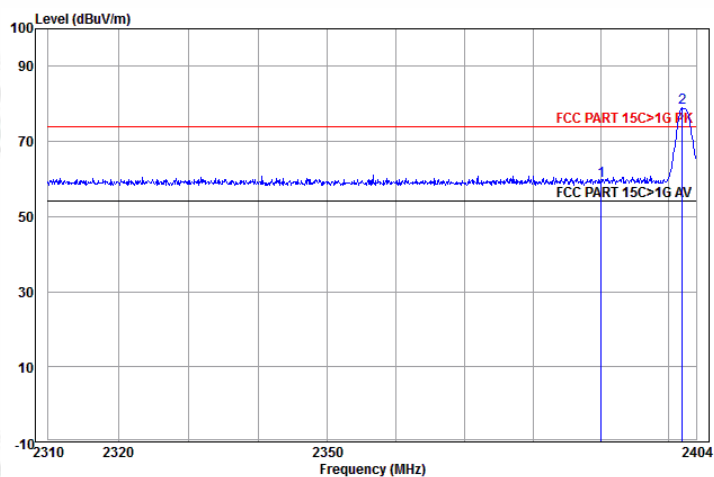
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	23.39	58.99	74.00	-15.01	Horizontal	Peak
2 pp	2401.891	32.56	3.07	48.93	84.56	74.00	10.56	Horizontal	Peak

Worse case mode:	GFSK		
Frequency: 2402MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Average



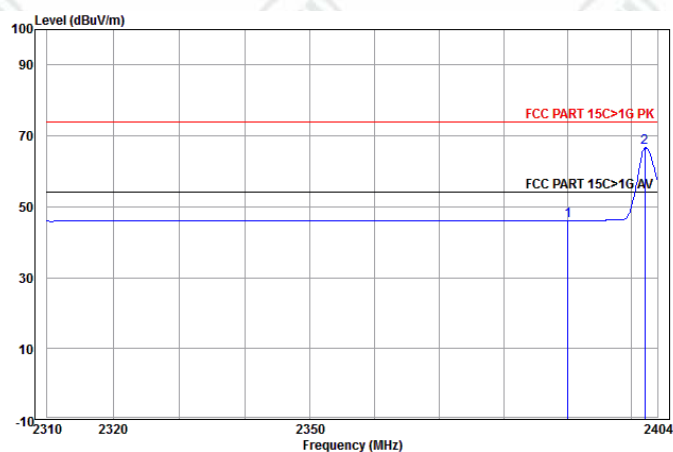
	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	3.07	10.51	46.11	54.00	-7.89	Horizontal	Average
2 pp	2402.083	32.56	3.07	37.80	73.43	54.00	19.43	Horizontal	Average

Worse case mode:	GFSK		
Frequency: 2402MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



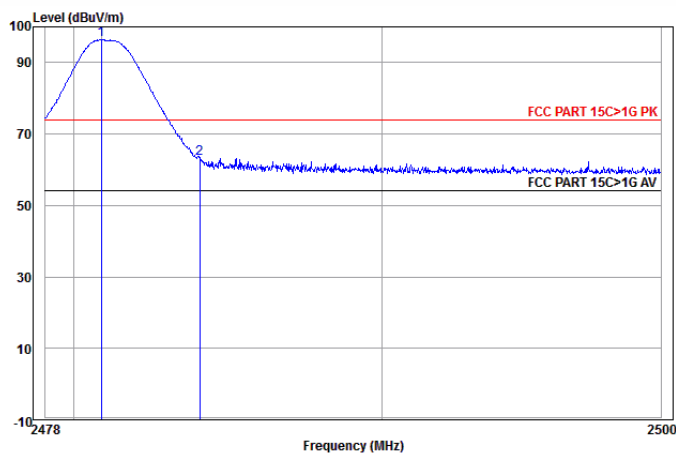
	Ant Freq	Cable Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	3.07	23.87	59.47	74.00	-14.53	Vertical Peak
2 pp	2401.987	32.56	3.07	43.25	78.88	74.00	4.88	Vertical Peak

Worse case mode:	GFSK		
Frequency: 2402MHz	Test channel: Lowest	Polarization: Vertical	Remark: Average



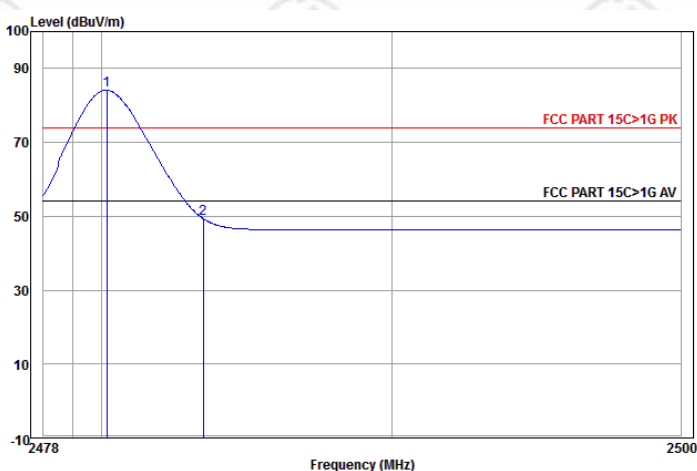
	Ant Freq	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	3.07	10.52	46.12	54.00	-7.88	Vertical Average
2 pp	2402.083	32.56	3.07	31.05	66.68	54.00	12.68	Vertical Average

Worse case mode:	GFSK		
Frequency: 2480MHz	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	2479.994	32.71	3.12	60.48	96.31	74.00	22.31	Horizontal	Peak
2	2483.500	32.71	3.12	27.36	63.19	74.00	-10.81	Horizontal	Peak

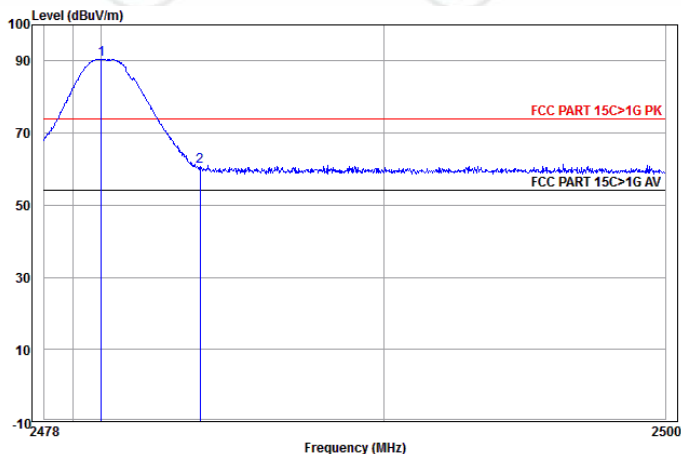
Worse case mode:	GFSK		
Frequency: 2480MHz	Test channel: Highest	Polarization: Horizontal	Remark: Average



	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	2480.191	32.71	3.12	48.32	84.15	54.00	30.15	Horizontal	Average
2	2483.500	32.71	3.12	13.65	49.48	54.00	-4.52	Horizontal	Average

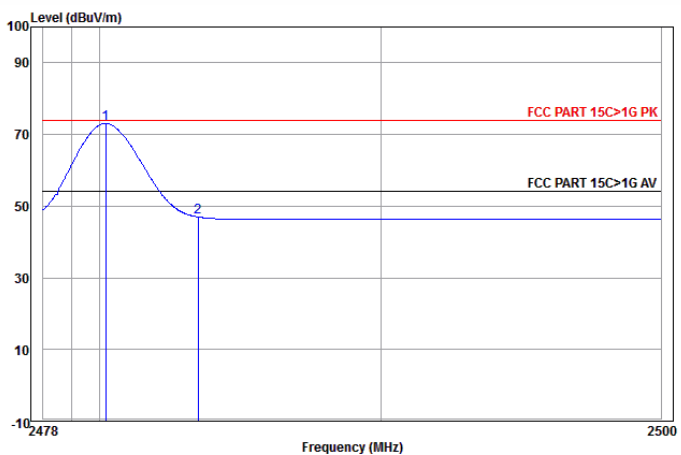


Worse case mode:	GFSK		
Frequency: 2480MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



	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 pp	2480.016	32.71	3.12	54.64	90.47	74.00	16.47	Vertical	Peak
2	2483.500	32.71	3.12	24.77	60.60	74.00	-13.40	Vertical	Peak

Worse case mode:	GFSK		
Frequency: 2480MHz	Test channel: Highest	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 pp	2480.213	32.71	3.12	37.31	73.14	54.00	19.14	Vertical	Average
2	2483.500	32.71	3.12	11.15	46.98	54.00	-7.02	Vertical	Average

**Note:**

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

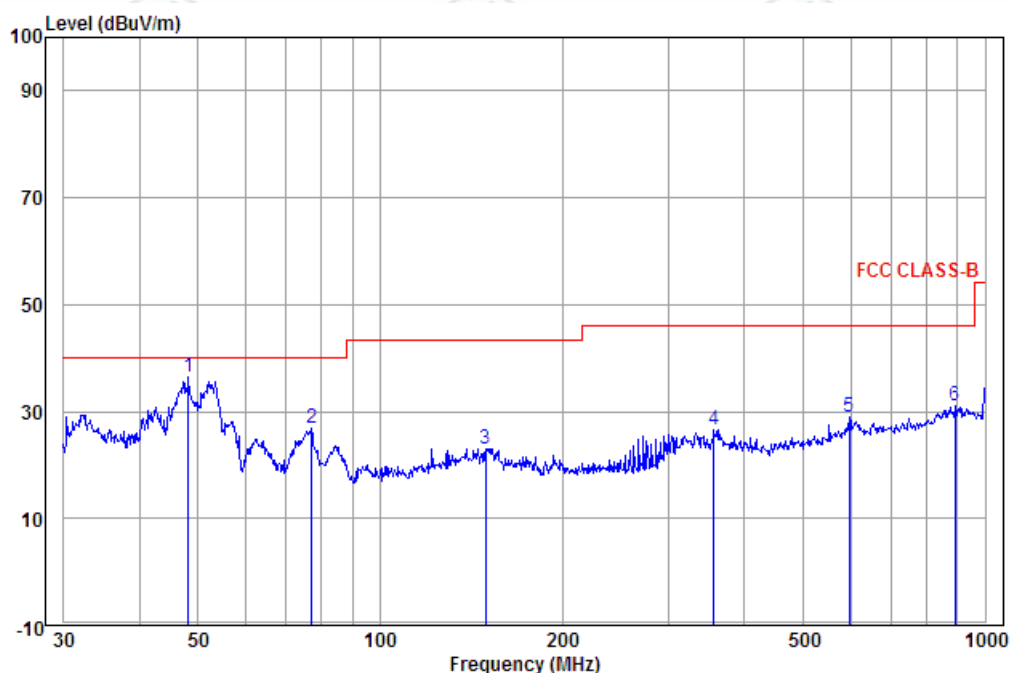
## Appendix I): Radiated Spurious Emissions

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:					
<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (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.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p>					
Above 1GHz test procedure as below:					
<p>g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter( Above 18GHz the distance is 1 meter and table is 1.5 meter).</p> <p>h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>					
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBμV/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**

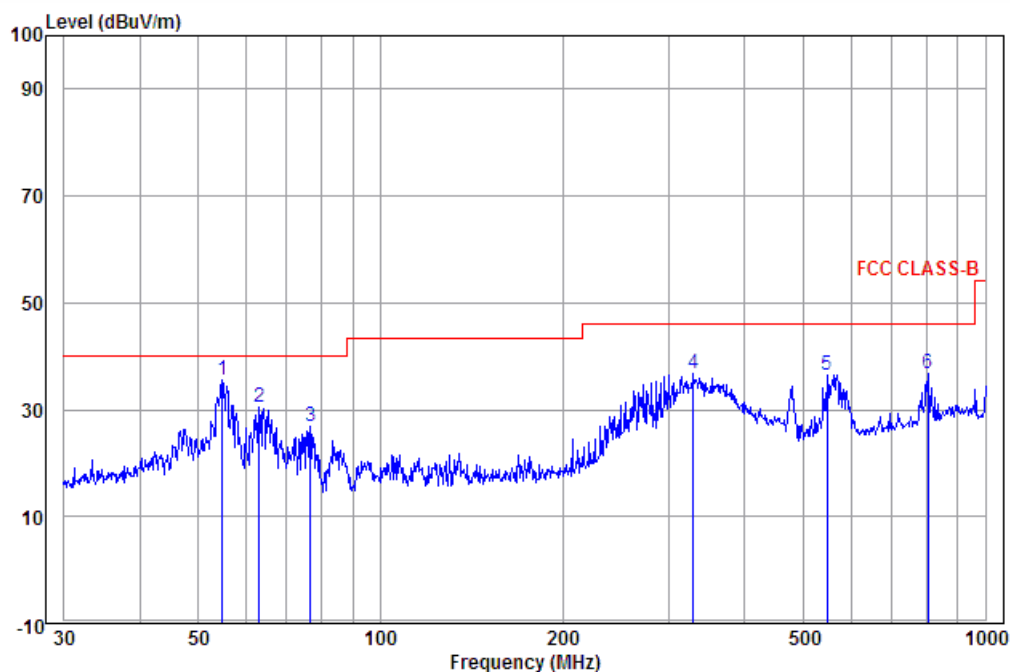
30MHz~1GHz (QP)

Test mode:	Transmitting	Vertical
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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	48.163	14.47	0.10	22.01	36.58	40.00	-3.42	Vertical	QP
2	77.051	9.11	0.37	17.48	26.96	40.00	-13.04	Vertical	QP
3	149.486	8.83	0.61	13.66	23.10	43.50	-20.40	Vertical	QP
4	356.676	14.51	1.32	10.75	26.58	46.00	-19.42	Vertical	QP
5	597.223	18.65	1.81	8.46	28.92	46.00	-17.08	Vertical	QP
6	890.728	21.96	2.48	6.52	30.96	46.00	-15.04	Vertical	QP

Test mode:	Transmitting	Horizontal
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		Ant	Cable	Read	Limit	Over		
	Freq	Factor	Loss	Level	Line	Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp	54.835	13.84	0.16	21.70	35.70	40.00	-4.30 Horizontal QP
2		63.092	12.22	0.22	17.95	30.39	40.00	-9.61 Horizontal QP
3		76.512	9.20	0.36	17.18	26.74	40.00	-13.26 Horizontal QP
4		329.039	14.00	1.22	21.47	36.69	46.00	-9.31 Horizontal QP
5		547.098	17.75	1.54	17.31	36.60	46.00	-9.40 Horizontal QP
6		804.603	19.94	2.46	14.46	36.86	46.00	-9.14 Horizontal QP

**Transmitter Emission above 1GHz**

Worse case mode:		GFSK		Test channel:		Lowest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1549.344	30.96	2.35	43.94	47.92	37.29	74.00	-36.71	Pass	H
2097.507	31.92	2.90	43.64	49.35	40.53	74.00	-33.47	Pass	H
4804.000	34.69	5.98	44.60	47.53	43.60	74.00	-30.40	Pass	H
5865.832	35.80	7.31	44.51	48.69	47.29	74.00	-26.71	Pass	H
7206.000	36.42	6.97	44.77	45.95	44.57	74.00	-29.43	Pass	H
9608.000	37.88	6.98	45.58	46.27	45.55	74.00	-28.45	Pass	H
1280.072	30.41	1.98	44.27	48.86	36.98	74.00	-37.02	Pass	V
2102.853	31.93	2.90	43.65	47.94	39.12	74.00	-34.88	Pass	V
3192.366	33.43	3.54	44.68	53.70	45.99	74.00	-28.01	Pass	V
4804.000	34.69	5.98	44.60	47.36	43.43	74.00	-30.57	Pass	V
7206.000	36.42	6.97	44.77	46.85	45.47	74.00	-28.53	Pass	V
9608.000	37.88	6.98	45.58	45.74	45.02	74.00	-28.98	Pass	V

Worse case mode:		GFSK		Test channel:		Middle	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
2024.074	31.76	2.86	43.54	48.06	39.14	74.00	-34.86	Pass	H
3003.173	33.60	3.36	44.70	50.25	42.51	74.00	-31.49	Pass	H
4880.000	34.85	6.13	44.60	47.51	43.89	74.00	-30.11	Pass	H
5895.771	35.82	7.34	44.51	48.90	47.55	74.00	-26.45	Pass	H
7320.000	36.43	6.85	44.87	47.41	45.82	74.00	-28.18	Pass	H
9760.000	38.05	7.12	45.55	46.19	45.81	74.00	-28.19	Pass	H
1786.719	31.37	2.62	43.70	48.03	38.32	74.00	-35.68	Pass	V
4880.000	34.85	6.13	44.60	47.16	43.54	74.00	-30.46	Pass	V
5504.170	35.52	6.93	44.55	48.89	46.79	74.00	-27.21	Pass	V
6078.644	35.94	7.42	44.51	48.49	47.34	74.00	-26.66	Pass	V
7320.000	36.43	6.85	44.87	47.25	45.66	74.00	-28.34	Pass	V
9760.000	38.05	7.12	45.55	46.75	46.37	74.00	-27.63	Pass	V



Worse case mode:		GFSK		Test channel:		Highest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
2086.856	31.90	2.89	43.63	48.22	39.38	74.00	-34.62	Pass	H
3112.129	33.50	3.47	44.69	50.18	42.46	74.00	-31.54	Pass	H
4960.000	35.02	6.29	44.60	47.35	44.06	74.00	-29.94	Pass	H
6267.190	36.04	7.37	44.53	48.79	47.67	74.00	-26.33	Pass	H
7440.000	36.45	6.73	44.97	46.98	45.19	74.00	-28.81	Pass	H
9920.000	38.22	7.26	45.52	46.79	46.75	74.00	-27.25	Pass	H
1818.842	31.43	2.66	43.66	48.39	38.82	74.00	-35.18	Pass	V
3184.250	33.43	3.53	44.68	50.98	43.26	74.00	-30.74	Pass	V
4960.000	35.02	6.29	44.60	47.41	44.12	74.00	-29.88	Pass	V
6063.190	35.93	7.42	44.51	48.92	47.76	74.00	-26.24	Pass	V
7440.000	36.45	6.73	44.97	46.42	44.63	74.00	-29.37	Pass	V
9920.000	38.22	7.26	45.52	47.58	47.54	74.00	-26.46	Pass	V

**Note:**

1) 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

2) 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

Refer to appendix for EUT Test setup-1.

## PHOTOGRAPHS OF EUT Constructional Details

Refer to appendix for EUT external and internal photos.

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

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