

# FCC Test Report

**FCC ID** : R3USCBT25  
**Product Description** : USB Gaming Headset with Bluetooth  
**Model No.** : SCBT25  
**Brand Name** : EPOS  
**Applicant** : DSEA A/S  
**Address** : Kongebakken 9, DK-2765 Smørum, Denmark  
**Factory** : Charter Media (Dongguan) Co., Ltd.  
**Address** : Dabandi Industrial Zone, Daning District,  
Humen Town. Dongguan City, Guangdong  
523930, P.R.C  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Jan. 26, 2021  
**Tested Date** : Feb. 04 ~ Feb. 22, 2021

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

  
Along Chen / Assistant Manager

Approved by:

  
Gary Chang / Manager



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## Table of Contents

<b>1</b>	<b>GENERAL DESCRIPTION .....</b>	<b>5</b>
1.1	Information.....	5
1.2	Local Support Equipment List .....	8
1.3	Test Setup Chart .....	8
1.4	The Equipment List .....	9
1.5	Test Standards .....	11
1.6	Reference Guidance .....	11
1.7	Deviation from Test Standard and Measurement Procedure.....	11
1.8	Measurement Uncertainty .....	11
<b>2</b>	<b>TEST CONFIGURATION.....</b>	<b>12</b>
2.1	Testing Facility .....	12
2.2	The Worst Test Modes and Channel Details .....	12
<b>3</b>	<b>TRANSMITTER TEST RESULTS .....</b>	<b>13</b>
3.1	Conducted Emissions.....	13
3.2	Unwanted Emissions into Restricted Frequency Bands .....	16
3.3	Unwanted Emissions into Non-Restricted Frequency Bands .....	33
3.4	Conducted Output Power .....	41
3.5	Number of Hopping Frequency .....	44
3.6	20dB and Occupied Bandwidth.....	48
3.7	Channel Separation.....	55
3.8	Number of Dwell Time.....	62
<b>4</b>	<b>TEST LABORATORY INFORMATION .....</b>	<b>67</b>

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## Release Record

Report No.	Version	Description	Issued Date
FR112601AD	Rev. 01	Initial issue	Apr. 20, 2021

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.792MHz 31.45 (Margin -14.55dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2483.50MHz 42.56 (Margin -11.44dB) - AV	Pass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(1)	Conducted Output Power	Power [dBm]: 11.42	Pass
15.247(a)(1)(iii)	Number of Hopping Channels	Meet the requirement of limit	Pass
15.247(a)(1)	Hopping Channel Separation	Meet the requirement of limit	Pass
15.247(a)(1)(iii)	Dwell Time	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

### Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

### Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

# 1 General Description

## 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number	Data Rate
2400-2483.5	BR	2402-2480	0-78 [79]	1 Mbps
2400-2483.5	EDR	2402-2480	0-78 [79]	2 Mbps
2400-2483.5	EDR	2402-2480	0-78 [79]	3 Mbps

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.  
 Note 2: Bluetooth BR uses a GFSK.  
 Note 3: Bluetooth EDR uses a combination of  $\pi/4$ -DQPSK and 8DPSK.

### 1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Gain (dBi)
1	FJK	metal rod antenna	IFA	No	3

### 1.1.3 Power Supply Type of Equipment under Test (EUT)

<b>Power Supply Type</b>	5Vdc from host 3.7Vdc from battery
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### 1.1.4 Accessories

No.	Equipment	Description
1	Battery	Brand: Sennheiser Model: AHB552826TPC Rating: 3.7Vdc, 335mA
2	USB cable	Brand: EPOS Model: EPUL2001 Power line: 2m shielded without core
3	Audio Cable	Brand: EPOS Model: EPAL2001 Power line: 1.5m non-shielded without core

### 1.1.5 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	---	---

### 1.1.6 Test Tool and Duty Cycle

<b>Test Tool</b>	BlueTest3(Qualcomm Host Tools), Version: 3.2.2.144 Bluetooth Simulator: R&S, CMW270	
<b>Modulation Mode</b>	<b>Duty Cycle Of Test Signal (%)</b>	<b>Duty Factor (dB)</b>
DH5	77.99%	1.08
2DH5	78.08%	1.07
3DH5	77.99%	1.08

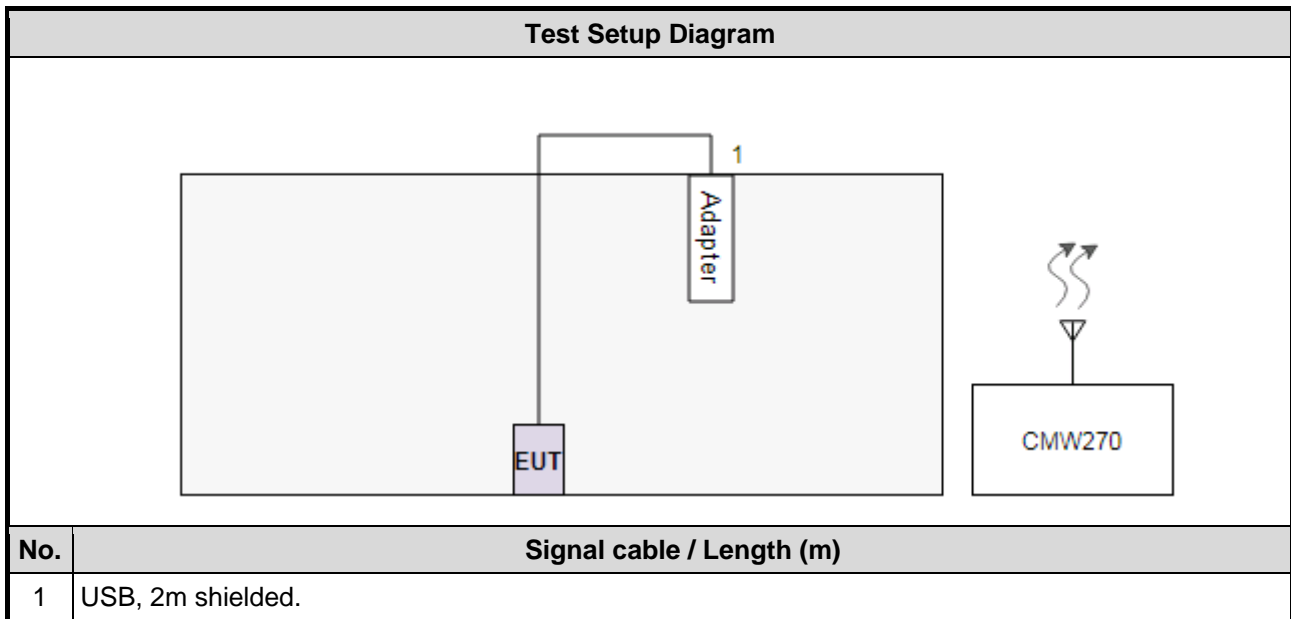
### 1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)		
	2402	2441	2480
GFSK/1Mbps	default	default	default
$\pi/4$ -DQPSK /2Mbps	default	default	default
8DPSK/3Mbps	default	default	default

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Adapter	Samsung	ETA-U90JWS	---	---
2	Notebook	DELL	Latitude E5470	DoC	---

## 1.3 Test Setup Chart



Note: The notebook is disconnected from EUT and removed from test table when EUT is set to transmit continuously.



## 1.4 The Equipment List

<b>Test Item</b>	Conducted Emission				
<b>Test Site</b>	Conduction room 1 / (CO01-WS)				
<b>Test Data</b>	Feb. 22, 2021				
<b>Instrument</b>	<b>Brand</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Receiver	R&S	ESR3	101658	Feb. 08, 2021	Feb. 07, 2022
LISN	R&S	ENV216	101579	Mar. 12, 2020	Mar. 11, 2021
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 21, 2020	Oct. 20, 2021
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	Radiated Emission				
<b>Test Site</b>	966 chamber 3 / (03CH03-WS)				
<b>Test Data</b>	Feb. 04 ~ Feb. 09, 2021				
<b>Instrument</b>	<b>Brand</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2020	Dec. 03, 2021
Receiver	R&S	ESR3	101657	Feb. 14, 2020	Feb. 13, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 29, 2020	Apr. 28, 2021
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Dec. 22, 2020	Dec. 21, 2021
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 06, 2020	Nov. 05, 2021
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 17, 2020	Nov. 16, 2021
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 06, 2020	Oct. 05, 2021
Preamplifier	EMC	EMC02325	980187	Aug. 05, 2020	Aug. 04, 2021
Preamplifier	Agilent	83017A	MY39501309	Sep. 02, 2020	Sep. 01, 2021
Preamplifier	EMC	EMC184045B	980192	Jul. 21, 2020	Jul. 20, 2021
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Sep. 26, 2020	Sep. 25, 2021
RF cable-8M	EMC	EMC104-SM-SM-8000	181107	Sep. 26, 2020	Sep. 25, 2021
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Sep. 26, 2020	Sep. 25, 2021
LF cable-0.8M	EMC	EMC8D-NM-NM-8000	EMC8D-NM-NM-800-001	Sep. 26, 2020	Sep. 25, 2021
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Sep. 26, 2020	Sep. 25, 2021
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Sep. 26, 2020	Sep. 25, 2021
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	RF Conducted				
<b>Test Site</b>	(TH01-WS)				
<b>Test Data</b>	Feb. 17, 2021				
<b>Instrument</b>	<b>Brand</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Spectrum Analyzer	R&S	FSV40	101063	Apr. 30, 2020	Apr. 29, 2021
Power Meter	Anritsu	ML2495A	1241002	Nov. 04, 2020	Nov. 03, 2021
Power Sensor	Anritsu	MA2411B	1207366	Nov. 04, 2020	Nov. 03, 2021
DC POWER SOURCE	GW INSTRON	GPC-6030D	GES855395	Nov. 09, 2020	Nov. 08, 2021
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 04, 2020	Dec. 03, 2021
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Wireless connectivity tester	ROHDE&SCHWARZ	CMW270	100856	Nov. 02, 2020	Nov. 01, 2021
Note: Calibration Interval of instruments listed above is one year.					

## 1.5 Test Standards

47 CFR FCC Part 15.247

ANSI C63.10-2013

## 1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

## 1.7 Deviation from Test Standard and Measurement Procedure

None

## 1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ( $k=2$ )).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	$\pm 34.130$ Hz
Conducted power	$\pm 0.808$ dB
Power density	$\pm 0.583$ dB
Conducted emission	$\pm 2.715$ dB
AC conducted emission	$\pm 2.92$ dB
Radiated emission $\leq 1$ GHz	$\pm 3.96$ dB
Radiated emission $> 1$ GHz	$\pm 4.51$ dB
Time	$\pm 0.1\%$

## 2 Test Configuration

### 2.1 Testing Facility

<b>Test Laboratory</b>	International Certification Corporation
<b>Test Site</b>	CO01-WS, TH01-WS
<b>Address of Test Site</b>	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)
<b>Test Site</b>	03CH03-WS
<b>Address of Test Site</b>	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 333, Taiwan (R.O.C.)

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- ISED#: 10807A
- CAB identifier: TW2732

### 2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)	Data Rate (Mbps)	Test Configuration
Conducted Emissions Radiated Emissions ≤ 1GHz	GFSK	2402	1Mbps	---
Radiated Emissions > 1GHz	GFSK 8DPSK	2402, 2441, 2480 2402, 2441, 2480	1Mbps 3Mbps	---
Conducted Output Power	GFSK π/4 DQPSK 8DPSK	2402, 2441, 2480 2402, 2441, 2480 2402, 2441, 2480	1Mbps 2Mbps 3Mbps	---
Number of Hopping Channels	GFSK π/4 DQPSK 8DPSK	2402~2480 2402~2480 2402~2480	1Mbps 2Mbps 3Mbps	---
Hopping Channel Separation 20dB and Occupied bandwidth	GFSK π/4 DQPSK 8DPSK	2402, 2441, 2480 2402, 2441, 2480 2402, 2441, 2480	1Mbps 2Mbps 3Mbps	---
Dwell Time	GFSK π/4 DQPSK 8DPSK	2402 2402 2402	1Mbps 2Mbps 3Mbps	---

**NOTE:** The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.

## 3 Transmitter Test Results

### 3.1 Conducted Emissions

#### 3.1.1 Limit of Conducted Emissions

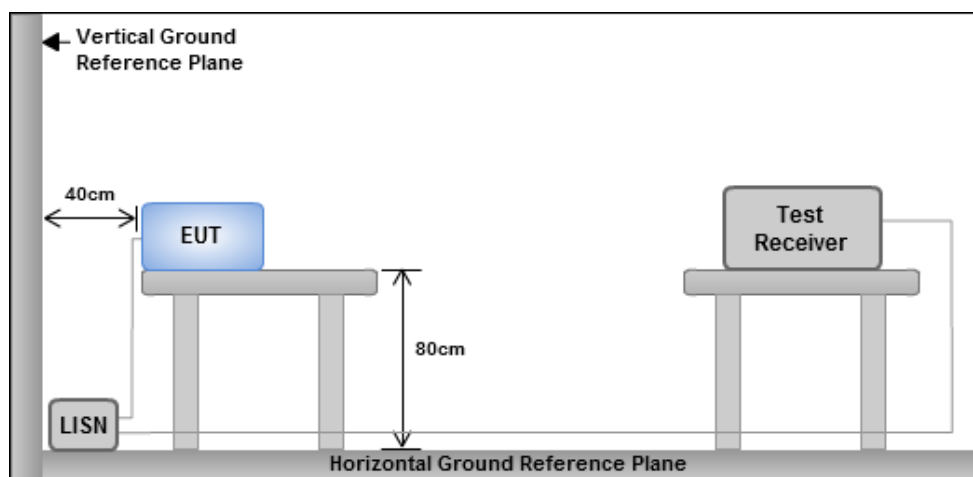
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: \* Decreases with the logarithm of the frequency.

#### 3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50  $\Omega$  LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

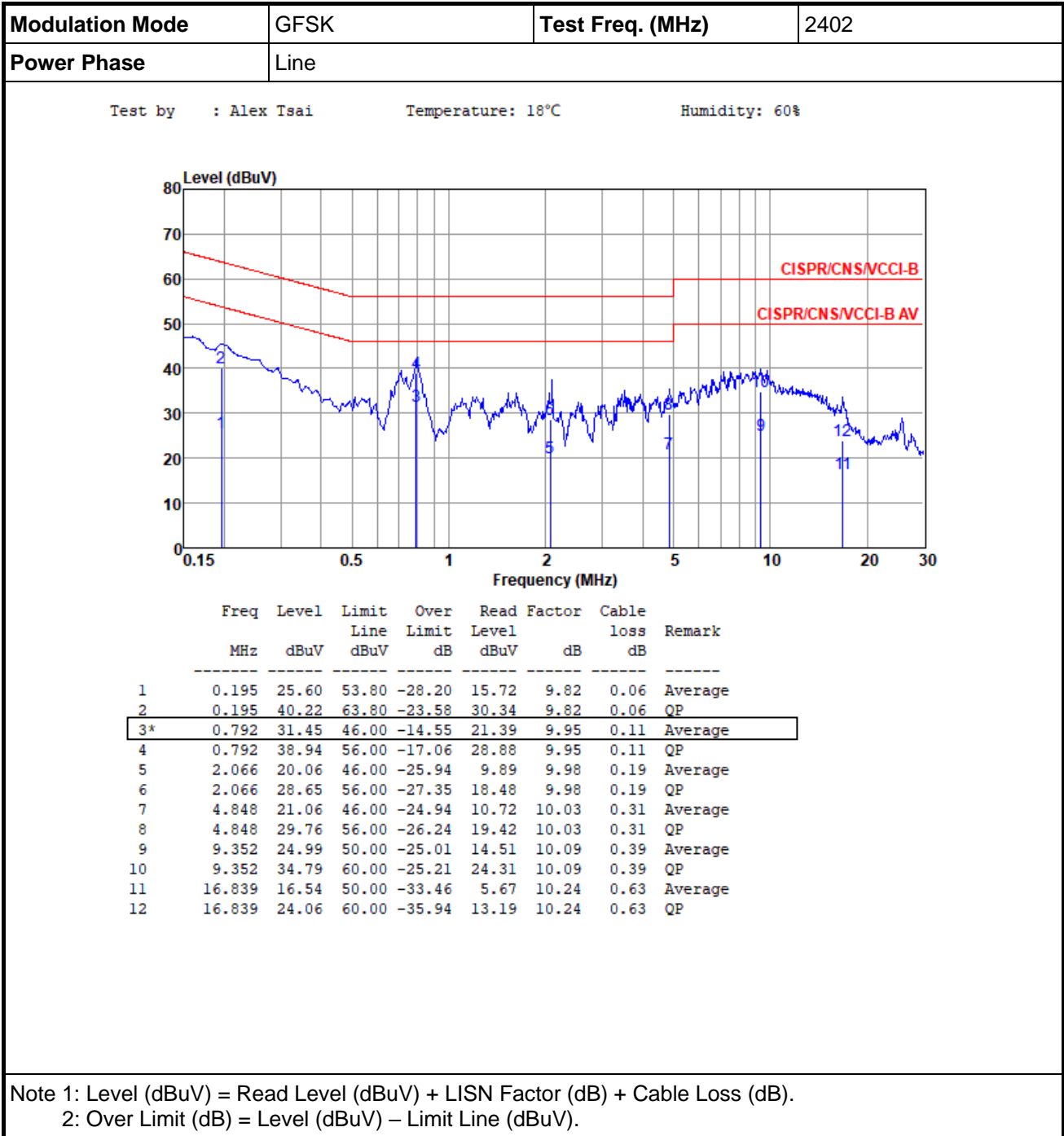
#### 3.1.3 Test Setup



Note: 1. Support units were connected to second LISN.

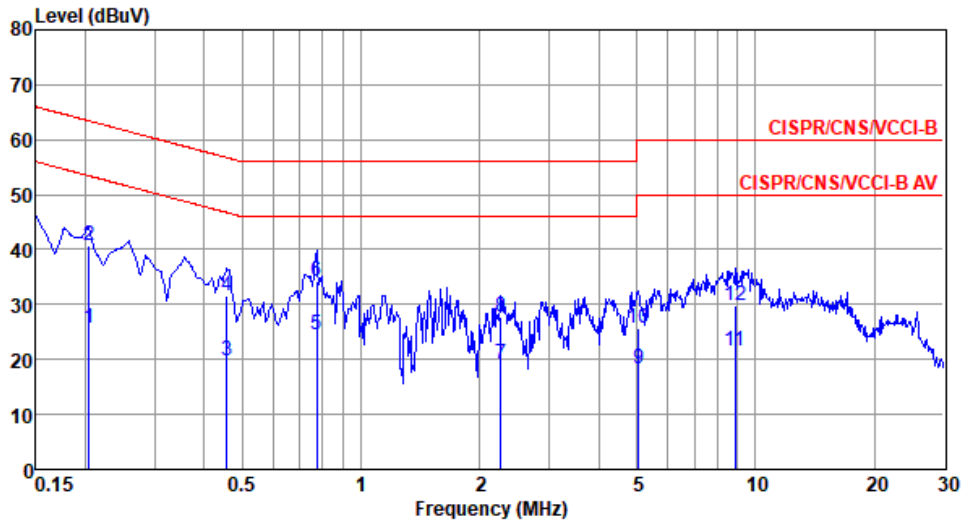
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.1.4 Test Result of Conducted Emissions



<b>Modulation Mode</b>	GFSK	<b>Test Freq. (MHz)</b>	2402
<b>Power Phase</b>	Neutral		

Test by : Alex Tsai      Temperature: 18°C      Humidity: 60%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Remark
1	0.204	25.69	53.45	-27.76	15.83	9.80	0.06	Average
2	0.204	40.74	63.45	-22.71	30.88	9.80	0.06	QP
3	0.456	19.83	46.76	-26.93	9.91	9.83	0.09	Average
4	0.456	31.55	56.76	-25.21	21.63	9.83	0.09	QP
5*	0.773	24.49	46.00	-21.51	14.54	9.84	0.11	Average
6	0.773	34.30	56.00	-21.70	24.35	9.84	0.11	QP
7	2.261	19.17	46.00	-26.83	9.05	9.92	0.20	Average
8	2.261	27.64	56.00	-28.36	17.52	9.92	0.20	QP
9	5.058	18.20	50.00	-31.80	7.92	9.96	0.32	Average
10	5.058	25.81	60.00	-34.19	15.53	9.96	0.32	QP
11	8.869	21.65	50.00	-28.35	11.22	10.04	0.39	Average
12	8.869	29.76	60.00	-30.24	19.33	10.04	0.39	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).  
 Note 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

## 3.2 Unwanted Emissions into Restricted Frequency Bands

### 3.2.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

**Note 1:**  
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

**Note 2:**  
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.



### 3.2.2 Test Procedures

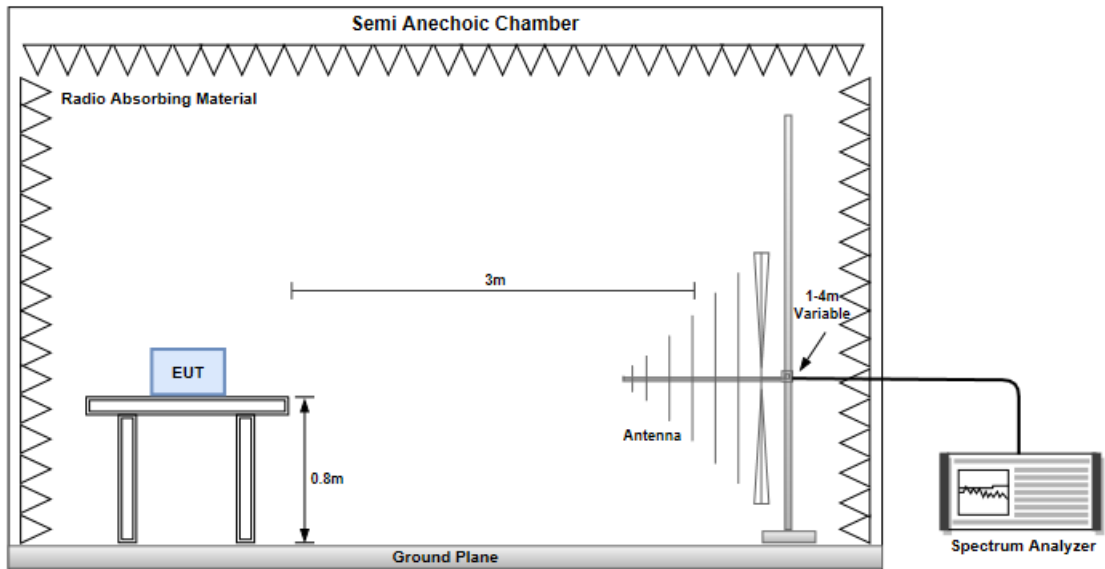
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

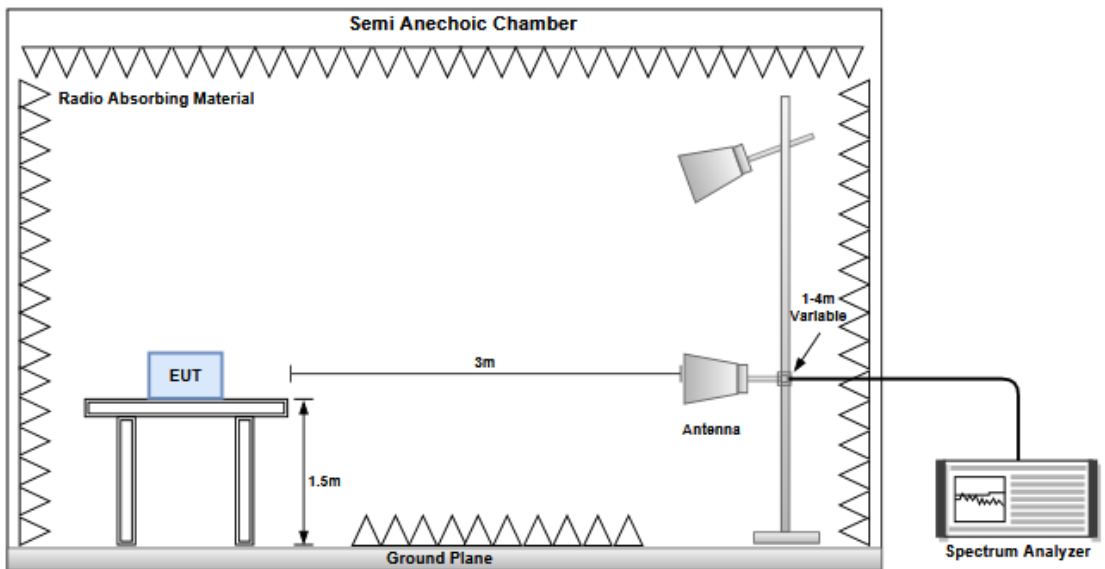
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. Radiated emission above 1GHz / Peak value  
RBW=1MHz, VBW=3MHz and Peak detector  
Radiated emission above 1GHz / Average value for harmonics  
The average value is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula for DH5 packet type which has worst duty factor:
3.
$$20\log(\text{Duty cycle}) = 20\log \frac{1\text{s} / 1600 * 5}{100\text{ ms}} = -30.1\text{dB}$$
4. Radiated emission above 1GHz / Average value for other emissions  
RBW=1MHz, VBW=1/T and Peak detector

### 3.2.3 Test Setup

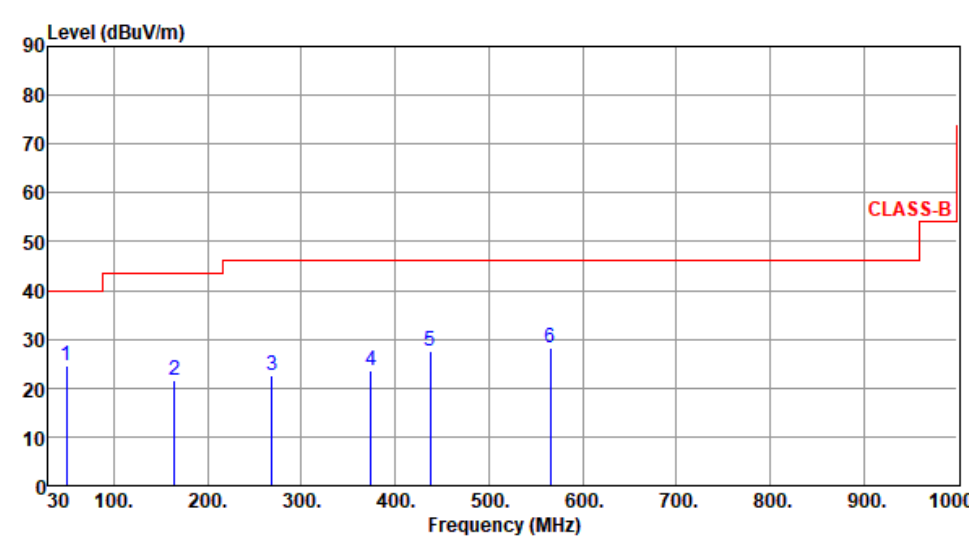
#### Radiated Emissions below 1 GHz



#### Radiated Emissions above 1 GHz

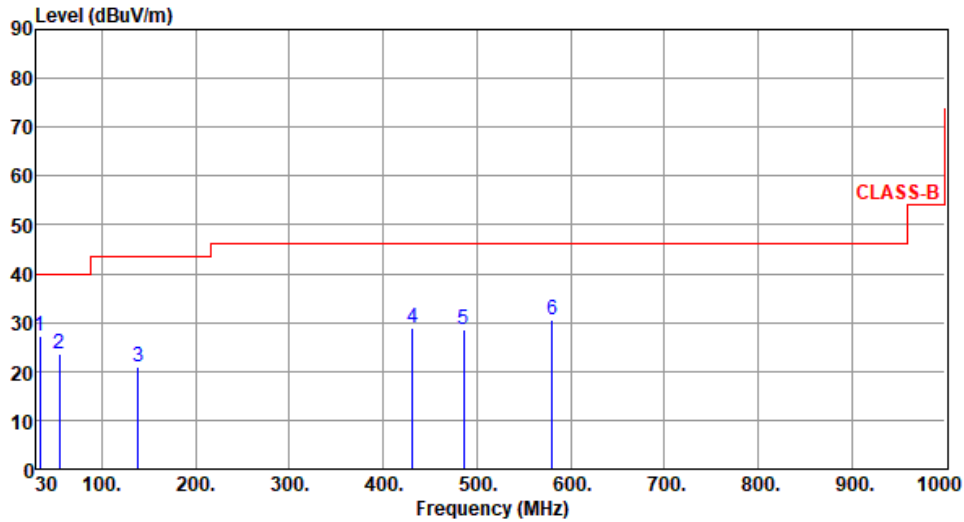


### 3.2.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2402																																																																
Polarization	Horizontal																																																																		
Test By : Roger Lu      Temperature(°C):23      Humidity(%):61																																																																			
																																																																			
	<table border="1"> <thead> <tr> <th>Freq. MHz</th> <th>Emission level dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>SA reading dBuV</th> <th>Factor dB</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>49.40</td> <td>40.00</td> <td>-15.36</td> <td>33.43</td> <td>-8.79</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>2</td> <td>164.83</td> <td>43.50</td> <td>-21.99</td> <td>30.53</td> <td>-9.02</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3</td> <td>268.62</td> <td>46.00</td> <td>-23.49</td> <td>32.11</td> <td>-9.60</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4</td> <td>374.35</td> <td>46.00</td> <td>-22.40</td> <td>30.11</td> <td>-6.51</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5</td> <td>437.40</td> <td>46.00</td> <td>-18.40</td> <td>32.08</td> <td>-4.48</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>6</td> <td>565.44</td> <td>46.00</td> <td>-17.63</td> <td>30.53</td> <td>-2.16</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> </tbody> </table>	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	49.40	40.00	-15.36	33.43	-8.79	Peak	---	---	2	164.83	43.50	-21.99	30.53	-9.02	Peak	---	---	3	268.62	46.00	-23.49	32.11	-9.60	Peak	---	---	4	374.35	46.00	-22.40	30.11	-6.51	Peak	---	---	5	437.40	46.00	-18.40	32.08	-4.48	Peak	---	---	6	565.44	46.00	-17.63	30.53	-2.16	Peak	---	---			
Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																											
1	49.40	40.00	-15.36	33.43	-8.79	Peak	---	---																																																											
2	164.83	43.50	-21.99	30.53	-9.02	Peak	---	---																																																											
3	268.62	46.00	-23.49	32.11	-9.60	Peak	---	---																																																											
4	374.35	46.00	-22.40	30.11	-6.51	Peak	---	---																																																											
5	437.40	46.00	-18.40	32.08	-4.48	Peak	---	---																																																											
6	565.44	46.00	-17.63	30.53	-2.16	Peak	---	---																																																											
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m). Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.																																																																			

<b>Modulation</b>	GFSK	<b>Test Freq. (MHz)</b>	2402
<b>Polarization</b>	Vertical		

Test By :Roger Lu      Temperature(°C):23      Humidity(%):61



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	33.88	27.10	40.00	-12.90	37.09	-9.99	Peak	---	---
2	54.25	23.51	40.00	-16.49	32.46	-8.95	Peak	---	---
3	138.64	21.07	43.50	-22.43	30.45	-9.38	Peak	---	---
4	431.58	28.86	46.00	-17.14	33.62	-4.76	Peak	---	---
5	485.90	28.57	46.00	-17.43	32.08	-3.51	Peak	---	---
6	579.99	30.68	46.00	-15.32	32.04	-1.36	Peak	---	---

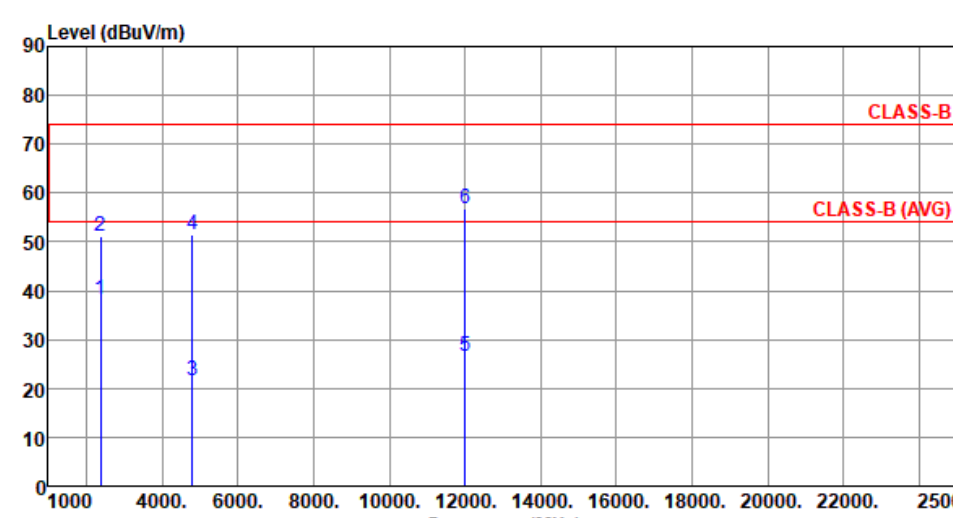
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

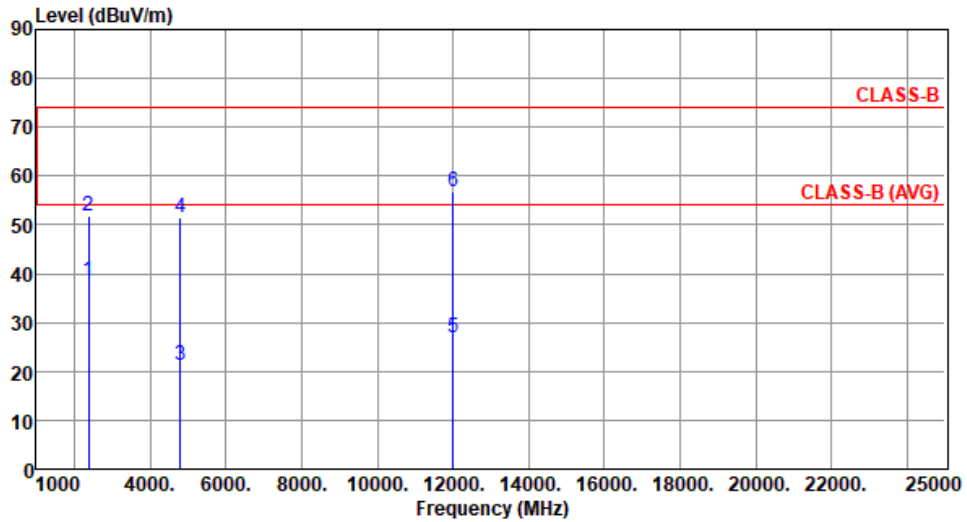
### 3.2.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

<b>Modulation</b>	GFSK	<b>Test Freq. (MHz)</b>	2402						
<b>Polarization</b>	Horizontal								
Test By :BRAD WU      Temperature(°C):22      Humidity(%):65									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2390.00	38.11	54.00	-15.89	39.77	-1.66	Average	100	235
2	2390.00	51.28	74.00	-22.72	52.94	-1.66	Peak	100	235
3	4804.00	21.46	54.00	-32.54	16.46	5.00	Average	261	208
4	4804.00	51.56	74.00	-22.44	46.56	5.00	Peak	261	208
5	12010.00	26.65	54.00	-27.35	11.97	14.68	Average	100	61
6	12010.00	56.75	74.00	-17.25	42.07	14.68	Peak	100	61

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)  
\*Factor includes antenna factor , cable loss and amplifier gain  
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation</b>	GFSK	<b>Test Freq. (MHz)</b>	2402
<b>Polarization</b>	Vertical		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.48	54.00	-15.52	40.14	-1.66	Average	269	231
2	2390.00	51.69	74.00	-22.31	53.35	-1.66	Peak	269	231
3	4804.00	21.36	54.00	-32.64	16.36	5.00	Average	100	182
4	4804.00	51.46	74.00	-22.54	46.46	5.00	Peak	100	182
5	12010.00	26.84	54.00	-27.16	12.16	14.68	Average	100	48
6	12010.00	56.94	74.00	-17.06	42.26	14.68	Peak	100	48

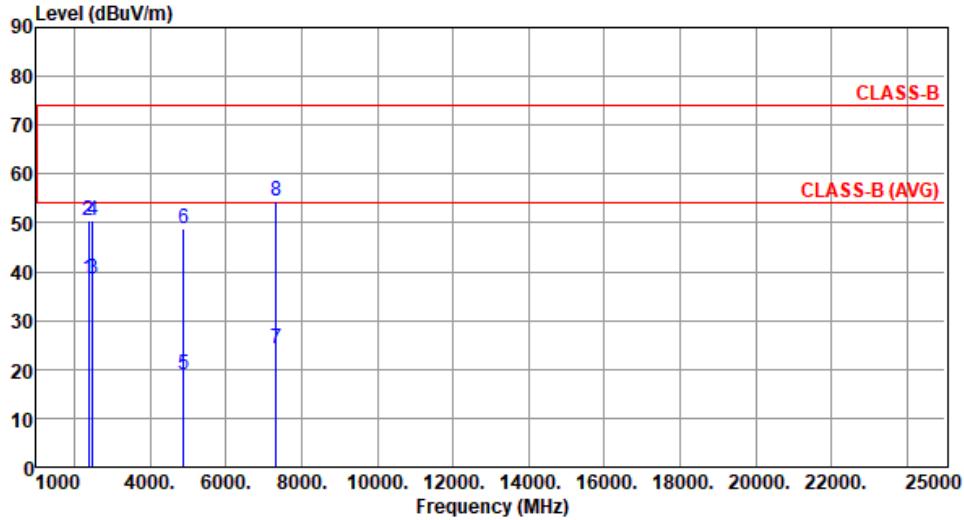
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation</b>	GFSK	<b>Test Freq. (MHz)</b>	2441
<b>Polarization</b>	Horizontal		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.54	54.00	-15.46	40.20	-1.66	Average	100	231
2	2390.00	50.56	74.00	-23.44	52.22	-1.66	Peak	100	231
3	2483.50	38.47	54.00	-15.53	40.33	-1.86	Average	100	231
4	2483.50	50.52	74.00	-23.48	52.38	-1.86	Peak	100	231
5	4882.00	18.86	54.00	-35.14	13.79	5.07	Average	288	195
6	4882.00	48.96	74.00	-25.04	43.89	5.07	Peak	288	195
7	7323.00	24.26	54.00	-29.74	13.86	10.40	Average	100	236
8	7323.00	54.36	74.00	-19.64	43.96	10.40	Peak	100	236

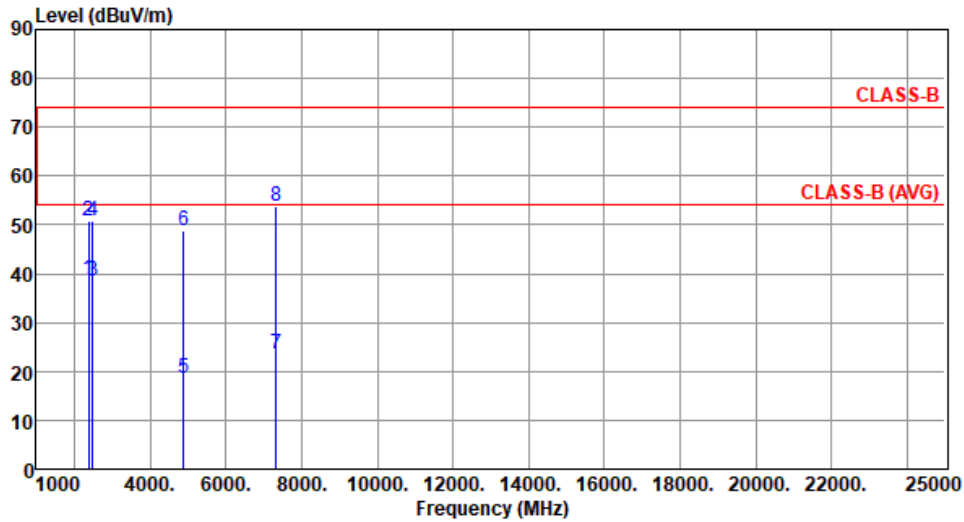
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation</b>	GFSK	<b>Test Freq. (MHz)</b>	2441
<b>Polarization</b>	Vertical		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.82	54.00	-15.18	40.48	-1.66	Average	264	234
2	2390.00	50.91	74.00	-23.09	52.57	-1.66	Peak	264	234
3	2483.50	38.62	54.00	-15.38	40.48	-1.86	Average	264	234
4	2483.50	50.88	74.00	-23.12	52.74	-1.86	Peak	264	234
5	4882.00	18.75	54.00	-35.25	13.68	5.07	Average	100	175
6	4882.00	48.85	74.00	-25.15	43.78	5.07	Peak	100	175
7	7323.00	23.59	54.00	-30.41	13.19	10.40	Average	115	24
8	7323.00	53.69	74.00	-20.31	43.29	10.40	Peak	115	24

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

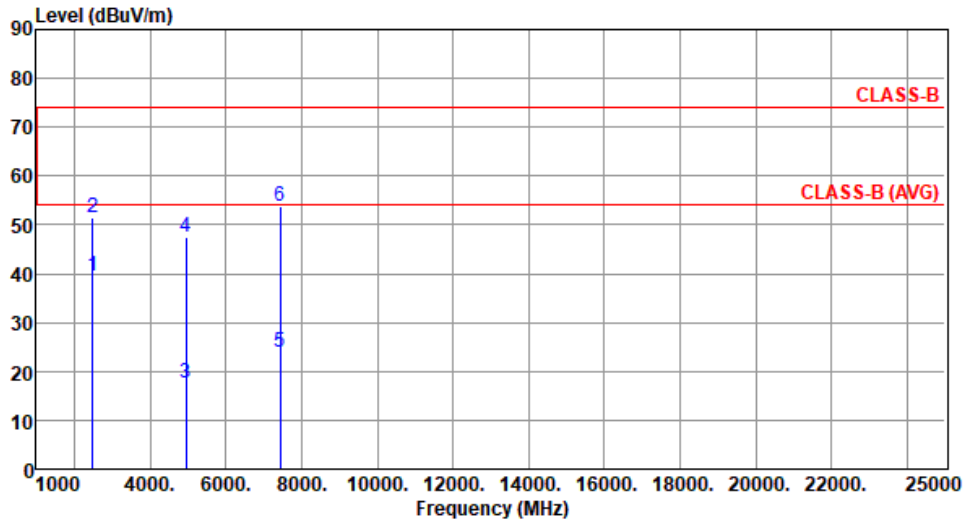
\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



<b>Modulation</b>	GFSK	<b>Test Freq. (MHz)</b>	2480
<b>Polarization</b>	Horizontal		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.45	54.00	-14.55	41.31	-1.86	Average	100	223
2	2483.50	51.36	74.00	-22.64	53.22	-1.86	Peak	100	223
3	4960.00	17.45	54.00	-36.55	12.15	5.30	Average	268	191
4	4960.00	47.55	74.00	-26.45	42.25	5.30	Peak	268	191
5	7440.00	23.84	54.00	-30.16	13.69	10.15	Average	155	224
6	7440.00	53.94	74.00	-20.06	43.79	10.15	Peak	155	224

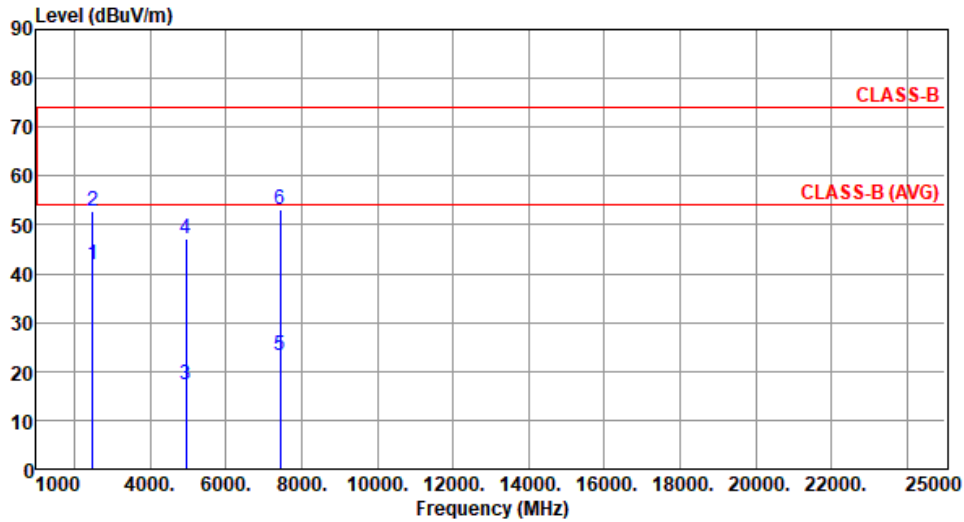
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

<b>Modulation</b>	GFSK	<b>Test Freq. (MHz)</b>	2480
<b>Polarization</b>	Vertical		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



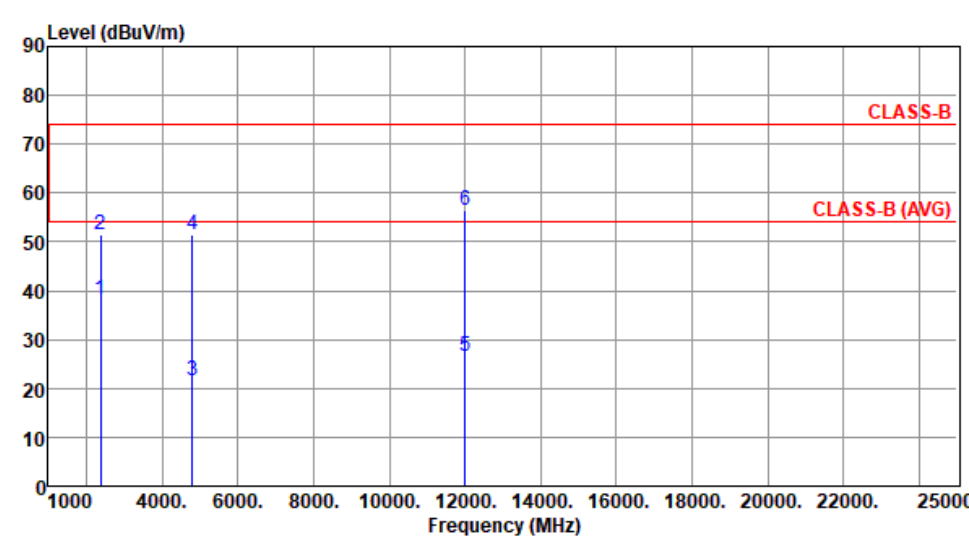
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	41.93	54.00	-12.07	43.79	-1.86	Average	265	238
2	2483.50	52.66	74.00	-21.34	54.52	-1.86	Peak	265	238
3	4960.00	17.18	54.00	-36.82	11.88	5.30	Average	100	182
4	4960.00	47.28	74.00	-26.72	41.98	5.30	Peak	100	182
5	7440.00	23.19	54.00	-30.81	13.04	10.15	Average	116	44
6	7440.00	53.29	74.00	-20.71	43.14	10.15	Peak	116	44

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

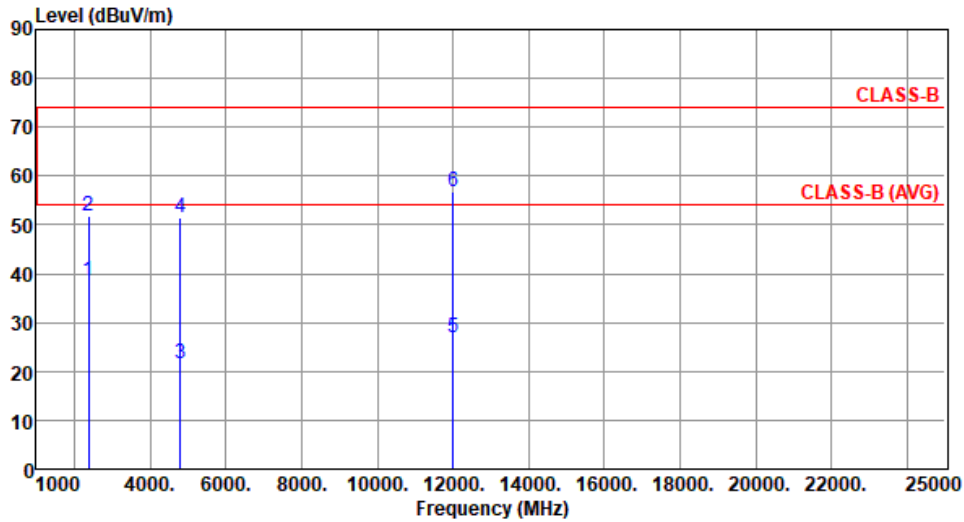
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

### 3.2.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

<b>Modulation</b>	8DPSK	<b>Test Freq. (MHz)</b>	2402						
<b>Polarization</b>	Horizontal								
Test By :BRAD WU      Temperature(°C):22      Humidity(%):65									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2390.00	38.26	54.00	-15.74	39.92	-1.66	Average	100	241
2	2390.00	51.39	74.00	-22.61	53.05	-1.66	Peak	100	241
3	4804.00	21.54	54.00	-32.46	16.54	5.00	Average	258	211
4	4804.00	51.64	74.00	-22.36	46.64	5.00	Peak	258	211
5	12010.00	26.52	54.00	-27.48	11.84	14.68	Average	100	59
6	12010.00	56.62	74.00	-17.38	41.94	14.68	Peak	100	59
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)  *Factor includes antenna factor , cable loss and amplifier gain  Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									

<b>Modulation</b>	8DPSK	<b>Test Freq. (MHz)</b>	2402
<b>Polarization</b>	Vertical		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.69	54.00	-15.31	40.35	-1.66	Average	268	235
2	2390.00	51.94	74.00	-22.06	53.60	-1.66	Peak	268	235
3	4804.00	21.52	54.00	-32.48	16.52	5.00	Average	100	184
4	4804.00	51.62	74.00	-22.38	46.62	5.00	Peak	100	184
5	12010.00	26.79	54.00	-27.21	12.11	14.68	Average	100	51
6	12010.00	56.89	74.00	-17.11	42.21	14.68	Peak	100	51

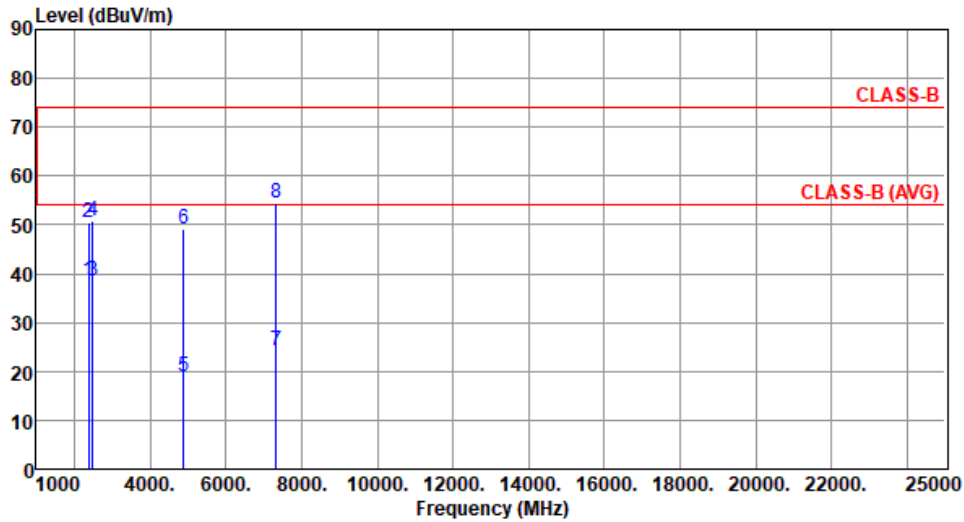
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation</b>	8DPSK	<b>Test Freq. (MHz)</b>	2441
<b>Polarization</b>	Horizontal		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.61	54.00	-15.39	40.27	-1.66	Average	100	239
2	2390.00	50.64	74.00	-23.36	52.30	-1.66	Peak	100	239
3	2483.50	38.51	54.00	-15.49	40.37	-1.86	Average	100	239
4	2483.50	50.65	74.00	-23.35	52.51	-1.86	Peak	100	239
5	4882.00	19.04	54.00	-34.96	13.97	5.07	Average	285	192
6	4882.00	49.14	74.00	-24.86	44.07	5.07	Peak	285	192
7	7323.00	24.35	54.00	-29.65	13.95	10.40	Average	100	248
8	7323.00	54.45	74.00	-19.55	44.05	10.40	Peak	100	248

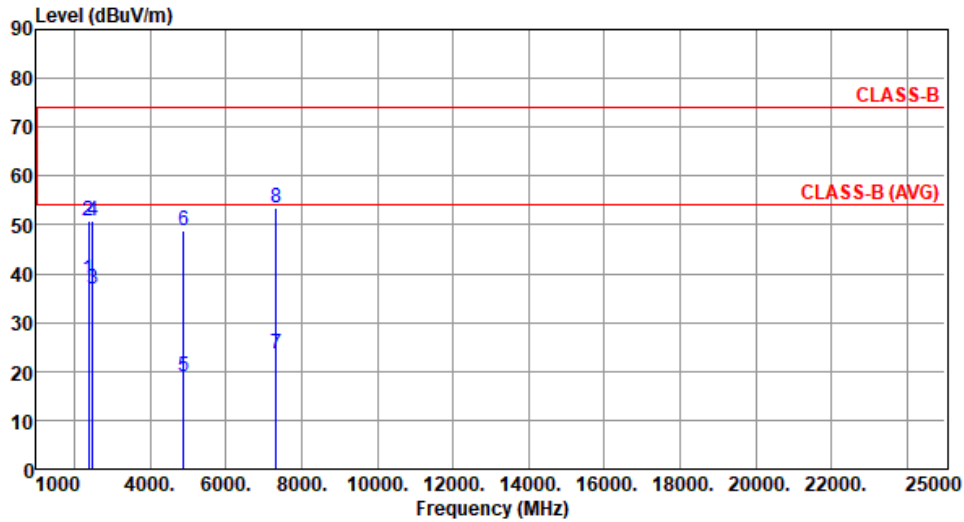
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation</b>	8DPSK	<b>Test Freq. (MHz)</b>	2441
<b>Polarization</b>	Vertical		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.96	54.00	-15.04	40.62	-1.66	Average	261	245
2	2390.00	50.95	74.00	-23.05	52.61	-1.66	Peak	261	245
3	2483.50	36.74	54.00	-17.26	38.60	-1.86	Average	261	245
4	2483.50	50.96	74.00	-23.04	52.82	-1.86	Peak	261	245
5	4882.00	18.81	54.00	-35.19	13.74	5.07	Average	100	168
6	4882.00	48.91	74.00	-25.09	43.84	5.07	Peak	100	168
7	7323.00	23.52	54.00	-30.48	13.12	10.40	Average	108	26
8	7323.00	53.62	74.00	-20.38	43.22	10.40	Peak	108	26

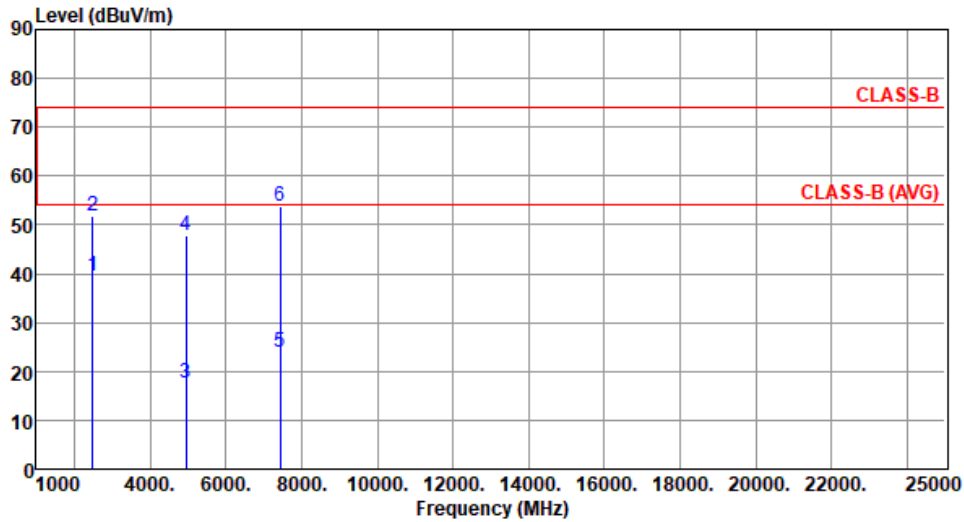
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation</b>	8DPSK	<b>Test Freq. (MHz)</b>	2480
<b>Polarization</b>	Horizontal		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.62	54.00	-14.38	41.48	-1.86	Average	100	229
2	2483.50	51.86	74.00	-22.14	53.72	-1.86	Peak	100	229
3	4960.00	17.58	54.00	-36.42	12.28	5.30	Average	261	194
4	4960.00	47.68	74.00	-26.32	42.38	5.30	Peak	261	194
5	7440.00	23.79	54.00	-30.21	13.64	10.15	Average	149	212
6	7440.00	53.89	74.00	-20.11	43.74	10.15	Peak	149	212

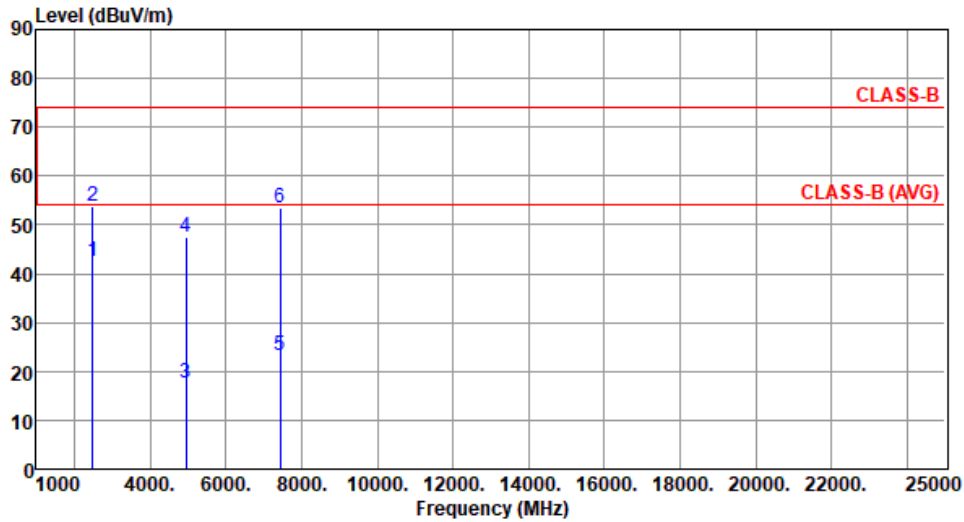
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation</b>	8DPSK	<b>Test Freq. (MHz)</b>	2480
<b>Polarization</b>	Vertical		

Test By :BRAD WU      Temperature(°C):22      Humidity(%):65



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	42.56	54.00	-11.44	44.42	-1.86	Average	266	234
2	2483.50	53.92	74.00	-20.08	55.78	-1.86	Peak	266	234
3	4960.00	17.44	54.00	-36.56	12.14	5.30	Average	100	162
4	4960.00	47.54	74.00	-26.46	42.24	5.30	Peak	100	162
5	7440.00	23.26	54.00	-30.74	13.11	10.15	Average	110	31
6	7440.00	53.36	74.00	-20.64	43.21	10.15	Peak	110	31

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).



### 3.3 Unwanted Emissions into Non-Restricted Frequency Bands

#### 3.3.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

#### 3.3.2 Test Procedures

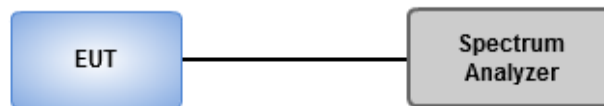
##### Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

##### Emission level measurement

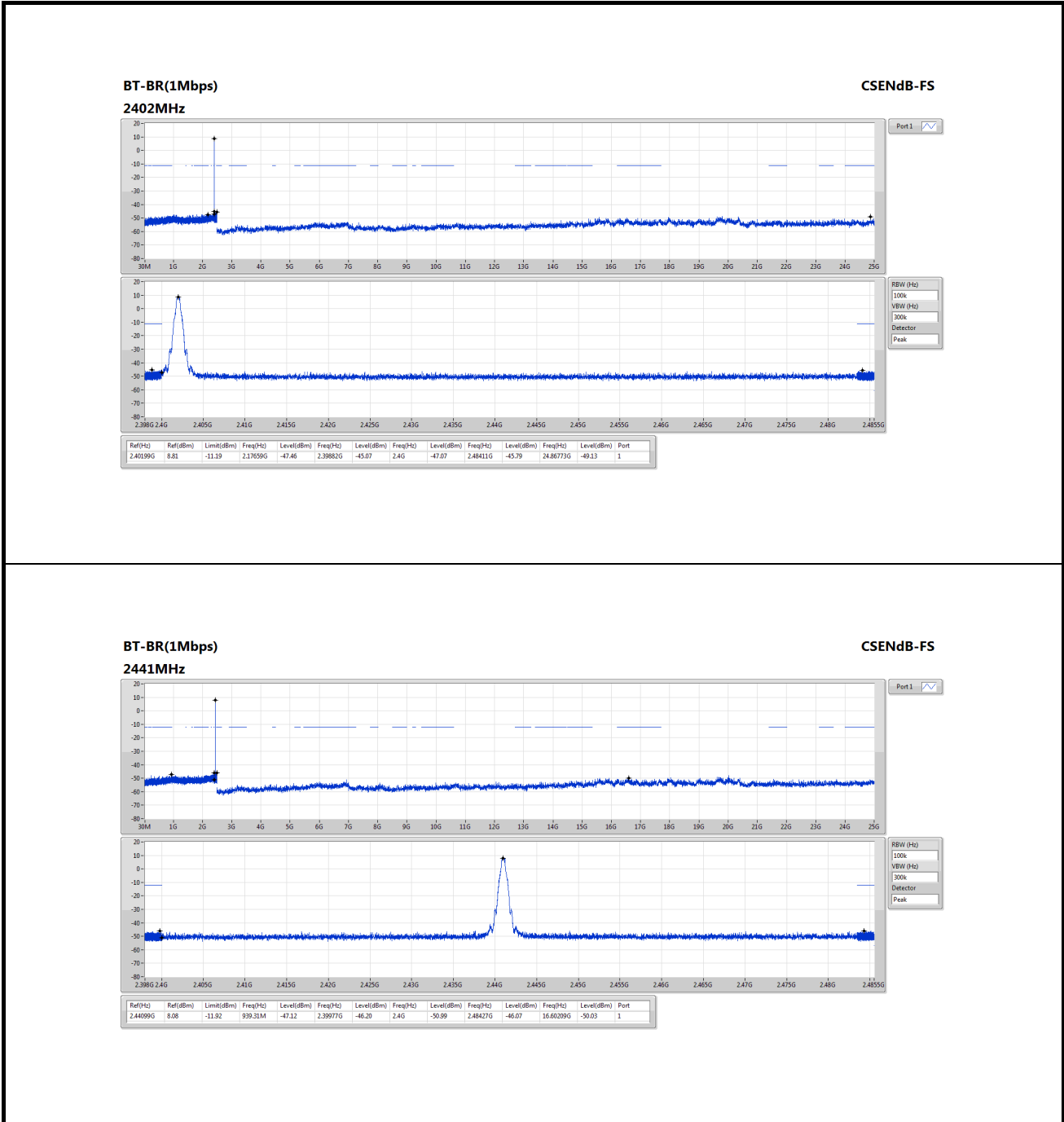
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

#### 3.3.3 Test Setup



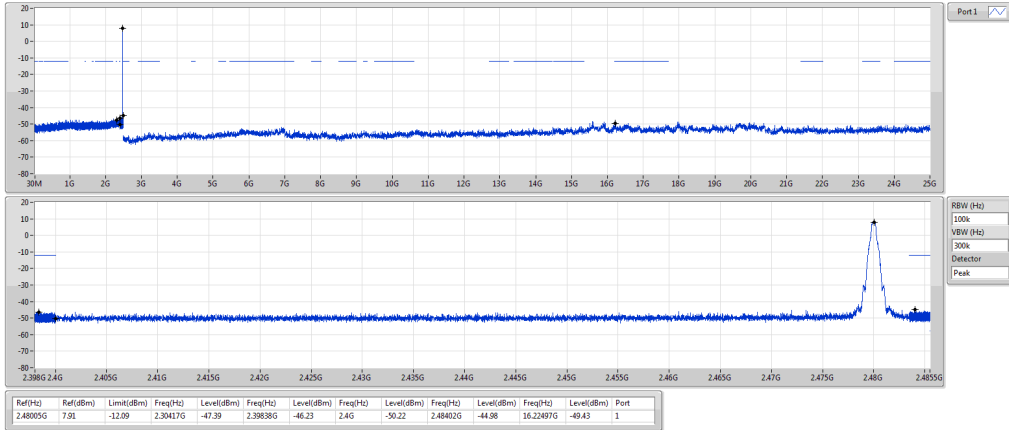
### 3.3.4 Unwanted Emissions into Non-Restricted Frequency Bands

Ambient Condition	22°C / 64%	Tested By	Brad Wu
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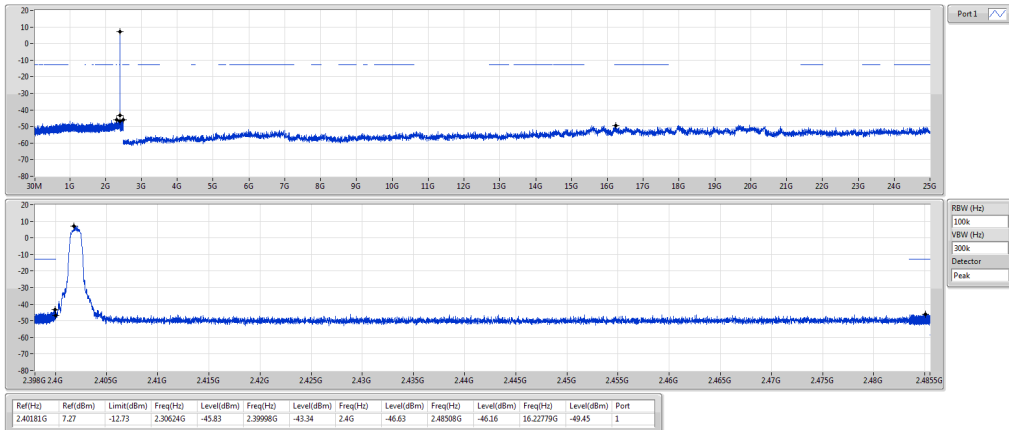
**BT-BR(1Mbps)**  
**2480MHz**

CSEndB-FS



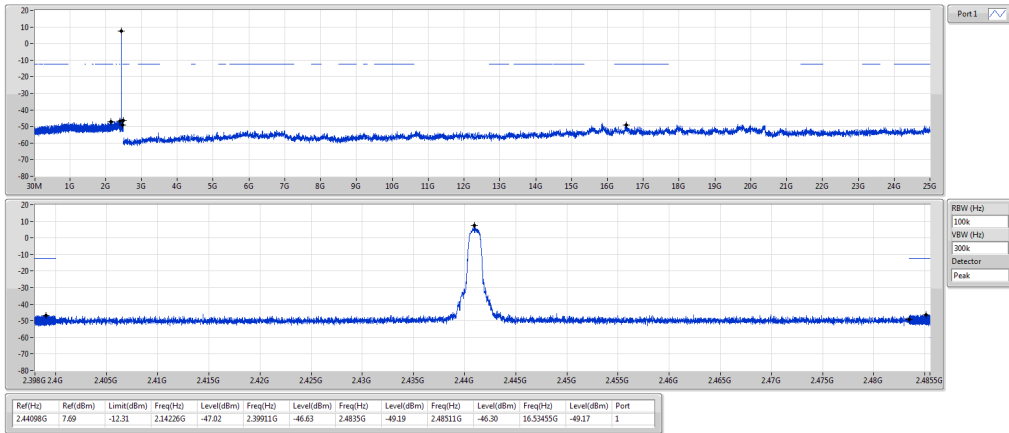
**BT-EDR(2Mbps)**  
**2402MHz**

CSEndB-FS



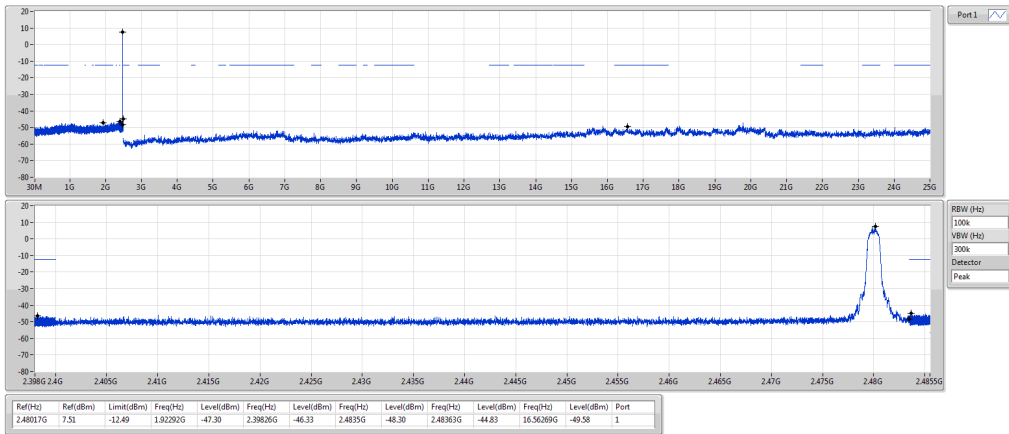
BT-EDR(2Mbps)  
2441MHz

CSEndB-FS



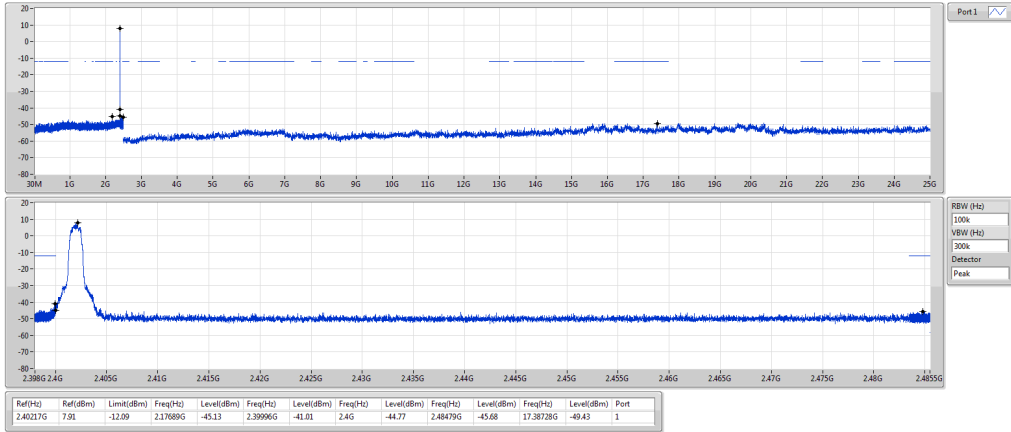
BT-EDR(2Mbps)  
2480MHz

CSEndB-FS



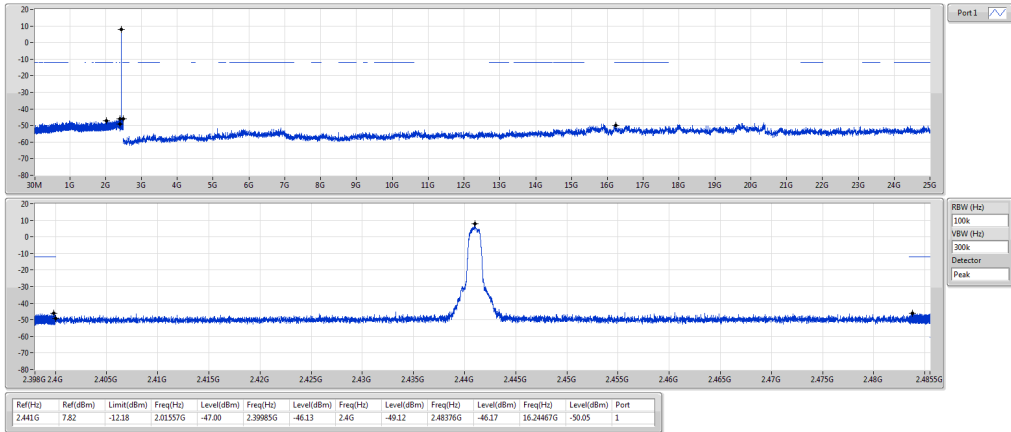
**BT-EDR(3Mbps)**  
**2402MHz**

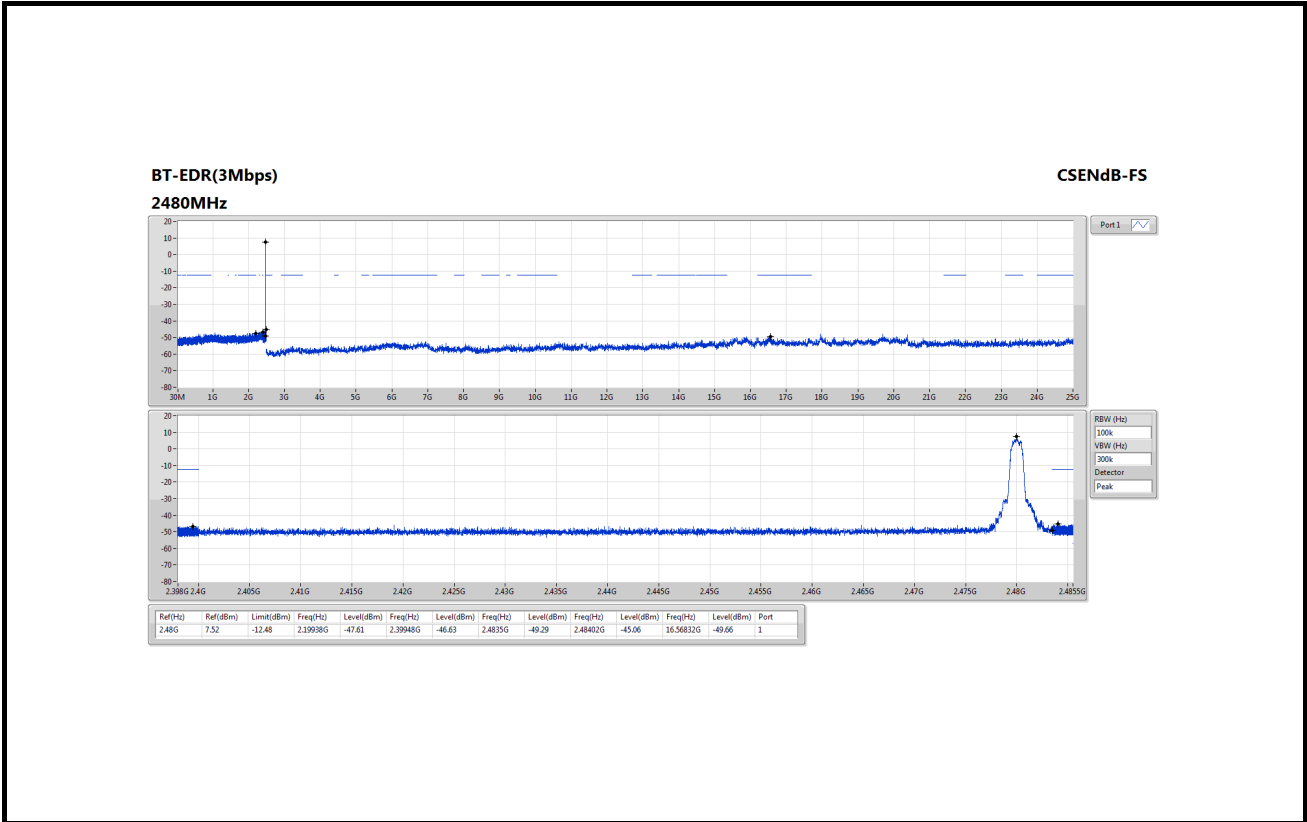
CSEndB-FS



**BT-EDR(3Mbps)**  
**2441MHz**

CSEndB-FS

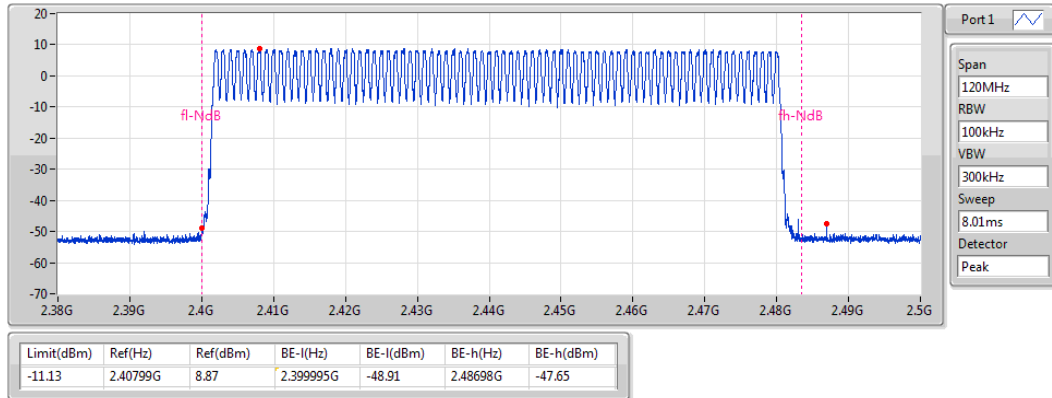




### BT-BR(1Mbps)

2402MHz

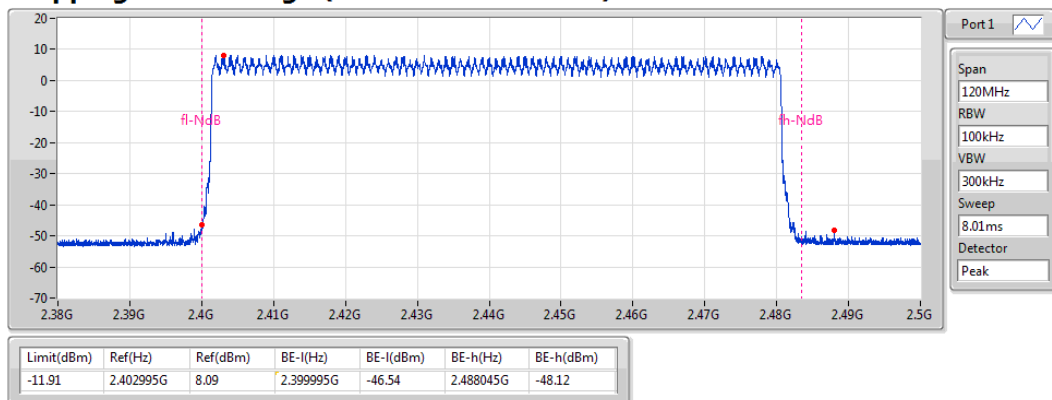
#### Hopping Ch Bandedge (Non-restricted Band)



### BT-EDR(2Mbps)

2402MHz

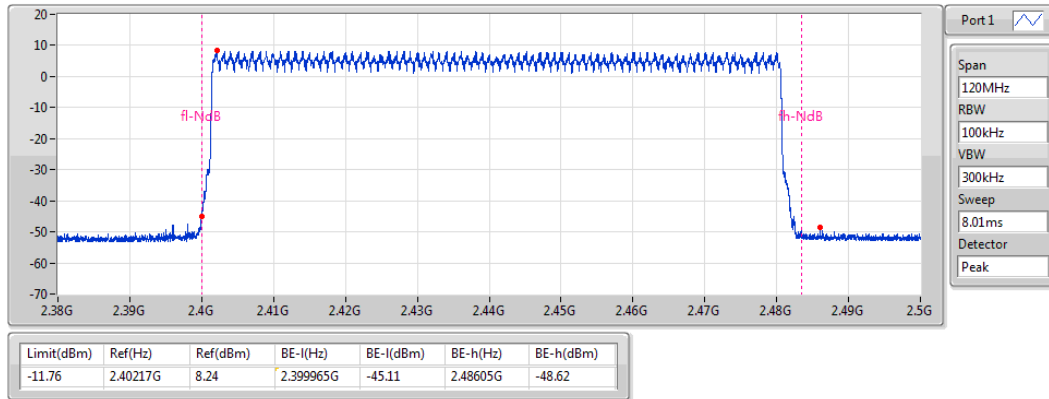
#### Hopping Ch Bandedge (Non-restricted Band)



### BT-EDR(3Mbps)

2402MHz

### Hopping Ch Bandedge (Non-restricted Band)





## 3.4 Conducted Output Power

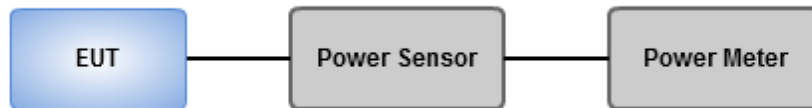
### 3.4.1 Limit of Conducted Output Power

- 1 Watt  
For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band.
- 0.125 Watt  
For all other frequency hopping systems in the 2400–2483.5 MHz band.
- 0.125 Watt  
For Frequency hopping systems operating in the 2400–2483.5 MHz band have hopping channel carrier frequencies that are separated by two-thirds of the 20 dB bandwidth of the hopping channel.

### 3.4.2 Test Procedures

1. A wideband power meter is used for power measurement. Bandwidth of power sensor and meter is 50MHz
2. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power

### 3.4.3 Test Setup



### 3.4.4 Test Result of Conducted Output Power

<b>Ambient Condition</b>	22°C / 64%	<b>Tested By</b>	Brad Wu
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#### Summary of Peak Conducted Output Power

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	9.45	0.00881
BT-EDR(2Mbps)	10.93	0.01239
BT-EDR(3Mbps)	11.42	0.01387

#### Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	3.00	9.45	21.00
2441MHz	Pass	3.00	9.31	21.00
2480MHz	Pass	3.00	9.13	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	3.00	10.93	21.00
2441MHz	Pass	3.00	10.80	21.00
2480MHz	Pass	3.00	10.65	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	3.00	11.42	21.00
2441MHz	Pass	3.00	11.29	21.00
2480MHz	Pass	3.00	11.12	21.00

DG = Directional Gain; Port X = Port X output power

**Summary of Conducted (Average) Output Power**

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	9.39	0.00869
BT-EDR(2Mbps)	8.43	0.00697
BT-EDR(3Mbps)	8.41	0.00693

**Result**

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	3.00	9.39	-
2441MHz	Pass	3.00	9.24	-
2480MHz	Pass	3.00	9.06	-
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	3.00	8.43	-
2441MHz	Pass	3.00	8.28	-
2480MHz	Pass	3.00	8.11	-
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	3.00	8.41	-
2441MHz	Pass	3.00	8.29	-
2480MHz	Pass	3.00	8.10	-

Note: Average power is for reference only.

## 3.5 Number of Hopping Frequency

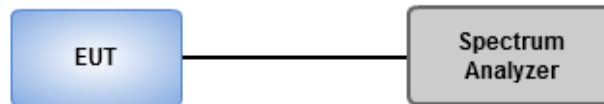
### 3.5.1 Limit of Number of Hopping Frequency

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

### 3.5.2 Test Procedures

1. Set RBW = 100kHz, VBW = 300kHz, Sweep time = Auto, Detector = Peak Trace max hold.
2. Allow trace to stabilize.

### 3.5.3 Test Setup



### 3.5.4 Test Result of Number of Hopping Frequency

<b>Ambient Condition</b>	22°C / 64%	<b>Tested By</b>	Brad Wu
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#### Summary

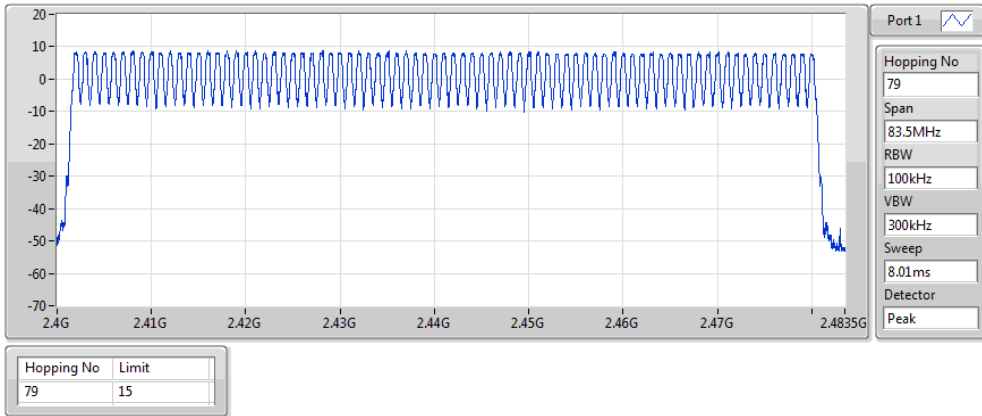
Mode	Max-Hop No
2.4-2.4835GHz	-
BT-BR(1Mbps)	79
BT-EDR(2Mbps)	79
BT-EDR(3Mbps)	79

#### Result

Mode	Result	Hopping No	Limit
BT-BR(1Mbps)	-	-	-
2402MHz	Pass	79	15
BT-EDR(2Mbps)	-	-	-
2402MHz	Pass	79	15
BT-EDR(3Mbps)	-	-	-
2402MHz	Pass	79	15

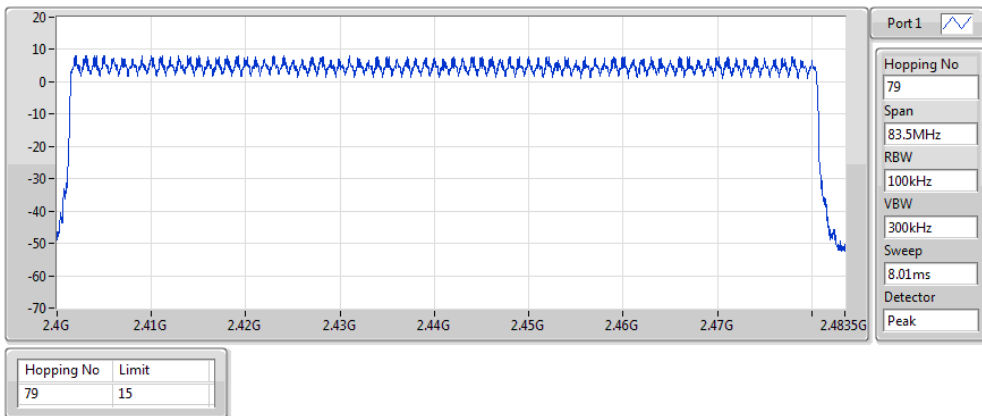
**BT-BR(1Mbps)**  
**2402MHz**

**Hopping-FS**



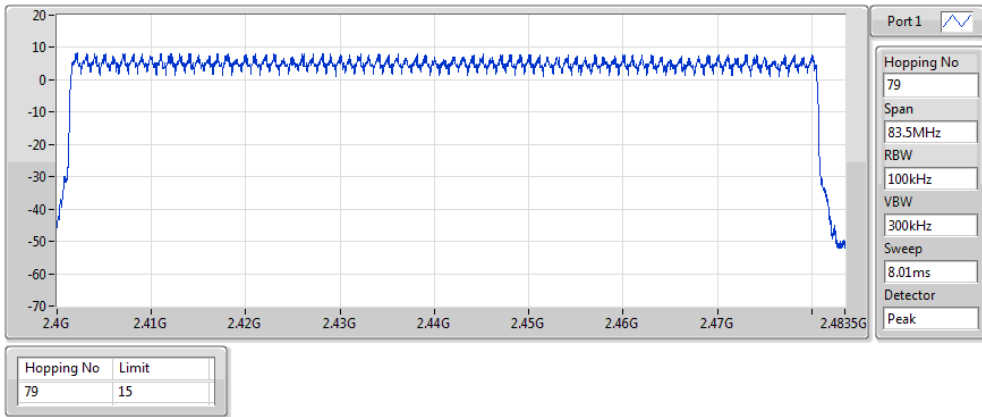
**BT-EDR(2Mbps)**  
**2402MHz**

**Hopping-FS**



**BT-EDR(3Mbps)  
2402MHz**

**Hopping-FS**



## 3.6 20dB and Occupied Bandwidth

### 3.6.1 Test Procedures

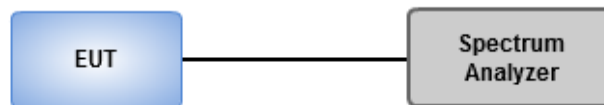
#### 20dB Bandwidth

1. Set RBW=20kHz, VBW=100kHz, Sweep time = Auto, Detector=Peak , Trace max hold
2. Allow trace to stabilize
3. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

#### Occupied Bandwidth

1. Set RBW=20kHz, VBW=100kHz for other modes, Sweep time = Auto, Detector=Sample , Trace max hold
2. Allow trace to stabilize
3. Use Occupied bandwidth function of spectrum analyzer to measuring 99% occupied bandwidth

### 3.6.2 Test Setup





### 3.6.3 Test result of 20dB and Occupied Bandwidth

<b>Ambient Condition</b>	22°C / 64%	<b>Tested By</b>	Brad Wu
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#### Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-BR(1Mbps)	938.406k	875.543k	876KF1D	927.536k	868.307k
BT-EDR(2Mbps)	1.333M	1.205M	1M21G1D	1.326M	1.198M
BT-EDR(3Mbps)	1.337M	1.205M	1M21G1D	1.308M	1.205M

Max-N dB = Maximum 20dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;  
Min-N dB = Minimum 20dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

#### Result

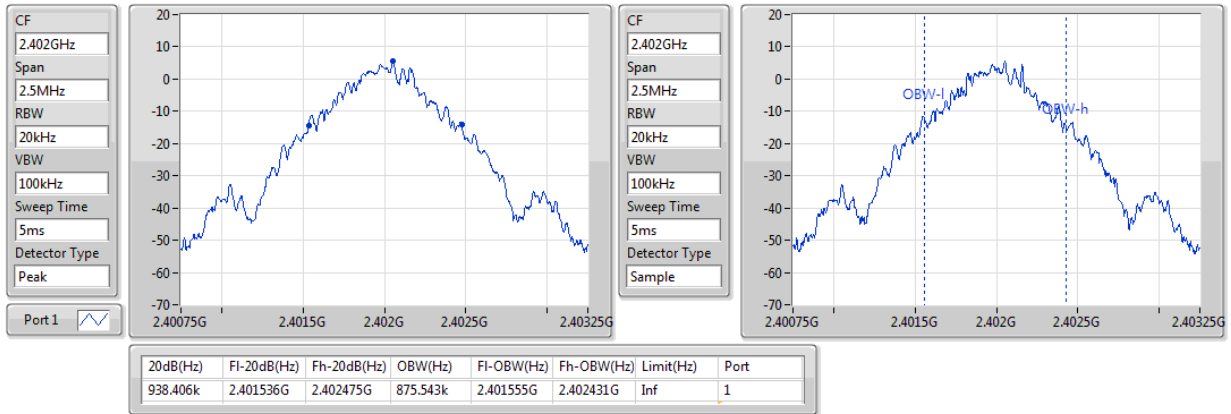
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	938.406k	875.543k
2441MHz	Pass	Inf	927.536k	875.543k
2480MHz	Pass	Inf	934.783k	868.307k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.326M	1.198M
2441MHz	Pass	Inf	1.326M	1.205M
2480MHz	Pass	Inf	1.333M	1.205M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.333M	1.205M
2441MHz	Pass	Inf	1.308M	1.205M
2480MHz	Pass	Inf	1.337M	1.205M

Port X-N dB = Port X 20dB down bandwidth;  
Port X-OBW = Port X 99% occupied bandwidth

### BT-BR(1Mbps)

### EBW-FS

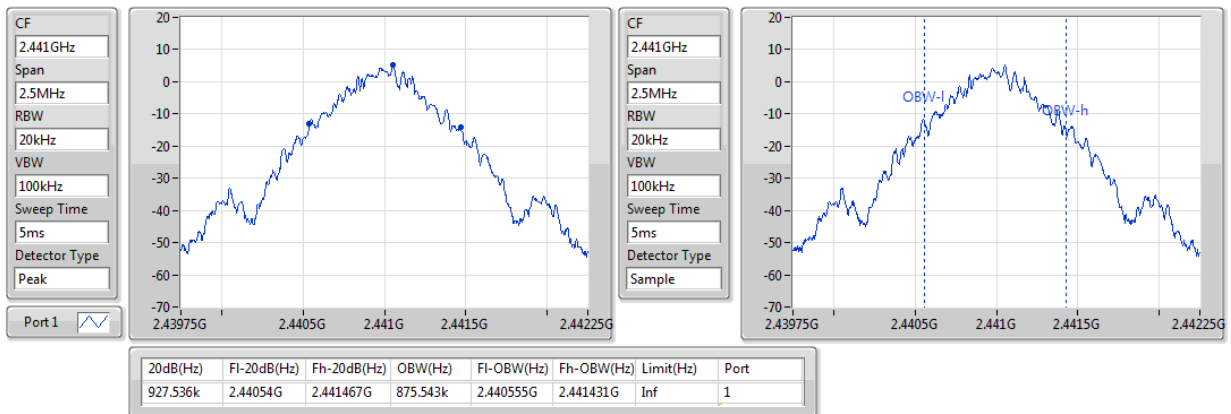
2402MHz



### BT-BR(1Mbps)

### EBW-FS

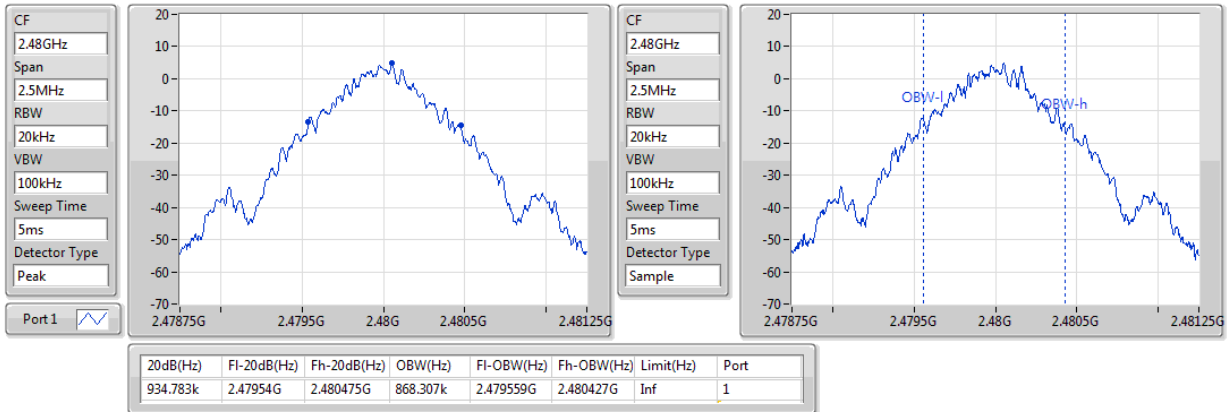
2441MHz



### BT-BR(1Mbps)

### EBW-FS

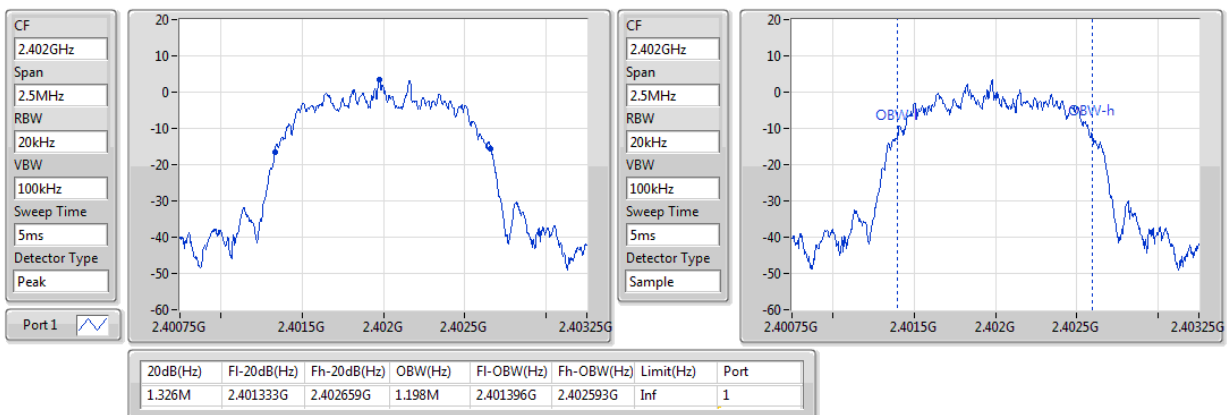
#### 2480MHz



### BT-EDR(2Mbps)

### EBW-FS

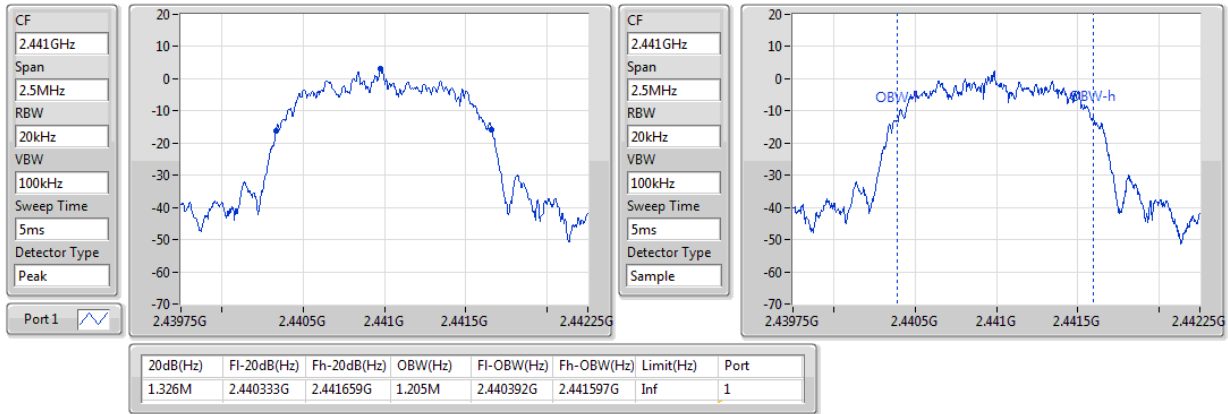
#### 2402MHz



### BT-EDR(2Mbps)

### EBW-FS

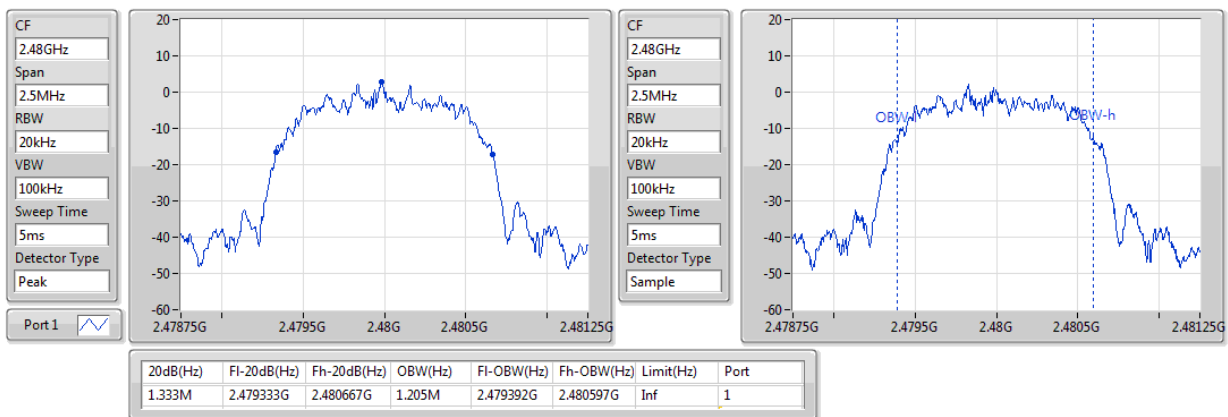
2441MHz



### BT-EDR(2Mbps)

### EBW-FS

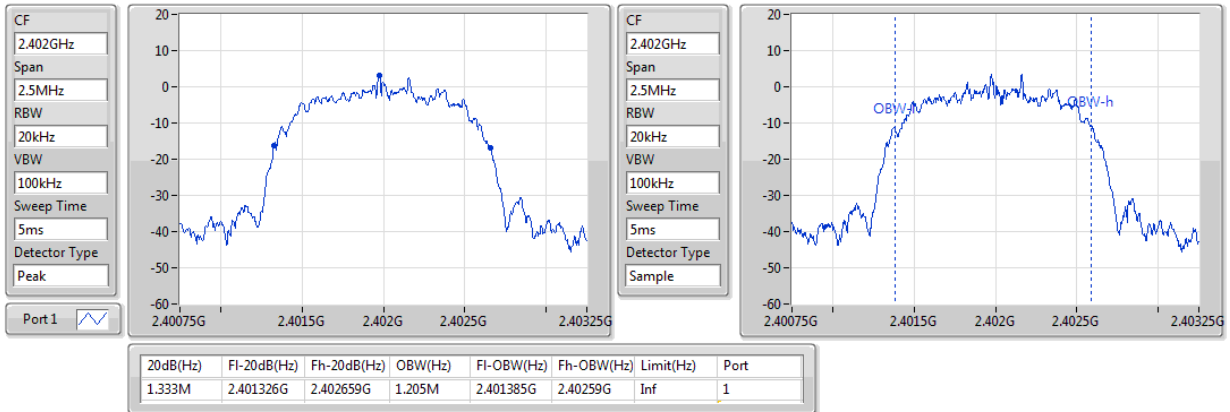
2480MHz



### BT-EDR(3Mbps)

### EBW-FS

2402MHz



### BT-EDR(3Mbps)

### EBW-FS

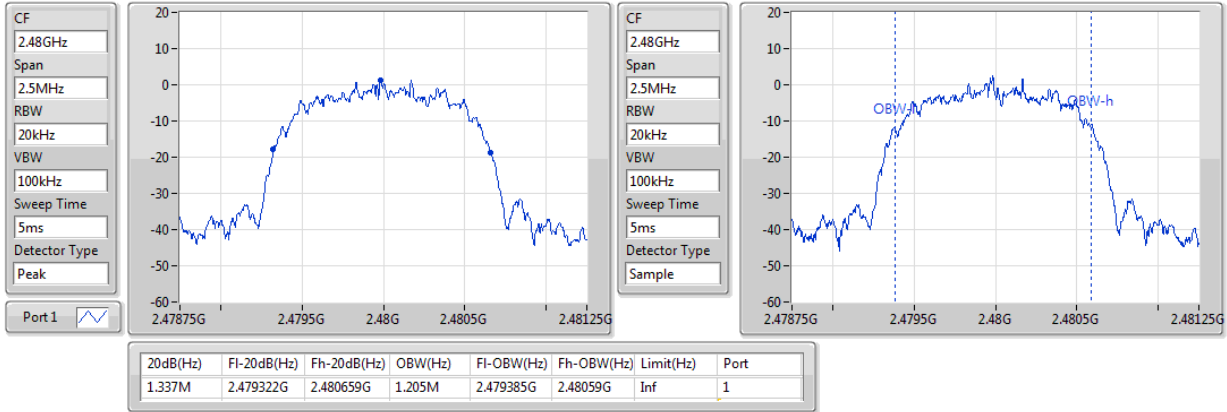
2441MHz



**BT-EDR(3Mbps)**

**EBW-FS**

**2480MHz**



## 3.7 Channel Separation

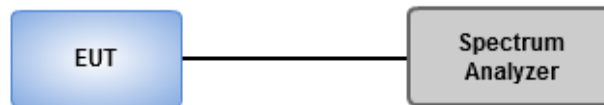
### 3.7.1 Limit of Channel Separation

- Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.
- Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

### 3.7.2 Test Procedures

1. Set RBW=30kHz, VBW=100kHz, Sweep time = Auto, Detector=Peak Trace max hold
2. Allow trace to stabilize
3. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The EUT shall show compliance with the appropriate regulatory limit

### 3.7.3 Test Setup



### 3.7.4 Test result of Channel Separation

<b>Ambient Condition</b>	22°C / 64%	<b>Tested By</b>	Brad Wu
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#### Summary

Mode	Max-Space (Hz)	Min-Space (Hz)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	1M	1M
BT-EDR(2Mbps)	1M	1M
BT-EDR(3Mbps)	1.004348M	1M

#### Result

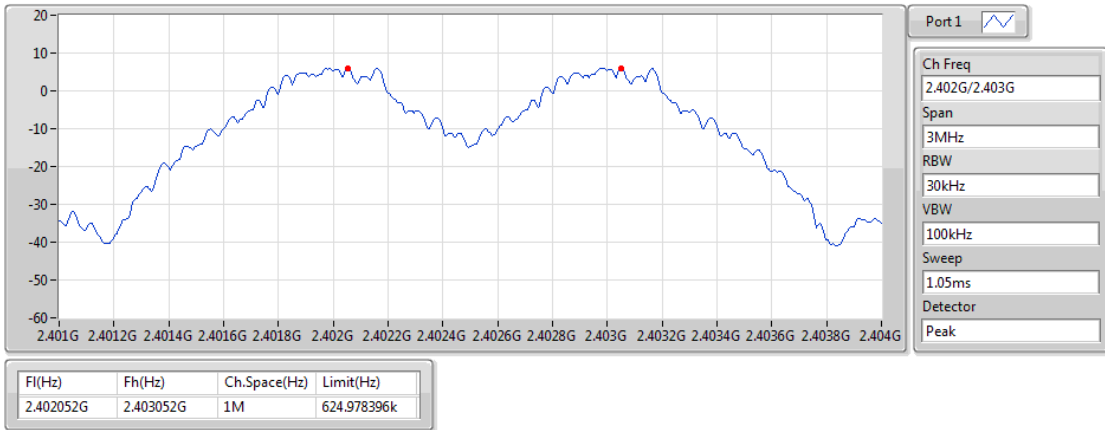
Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.402052G	2.403052G	1M	624.978396k
2441MHz	Pass	2.441052G	2.442052G	1M	617.738976k
2480MHz	Pass	2.479052G	2.480052G	1M	622.565478k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.401987G	2.402987G	1M	883.116k
2441MHz	Pass	2.440987G	2.441987G	1M	883.116k
2480MHz	Pass	2.478987G	2.479987G	1M	887.778k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.401983G	2.402987G	1.004348M	887.778k
2441MHz	Pass	2.440983G	2.441987G	1.004348M	871.128k
2480MHz	Pass	2.478987G	2.479987G	1M	890.442k



**BT-BR(1Mbps)**

**Channel Separation-FS**

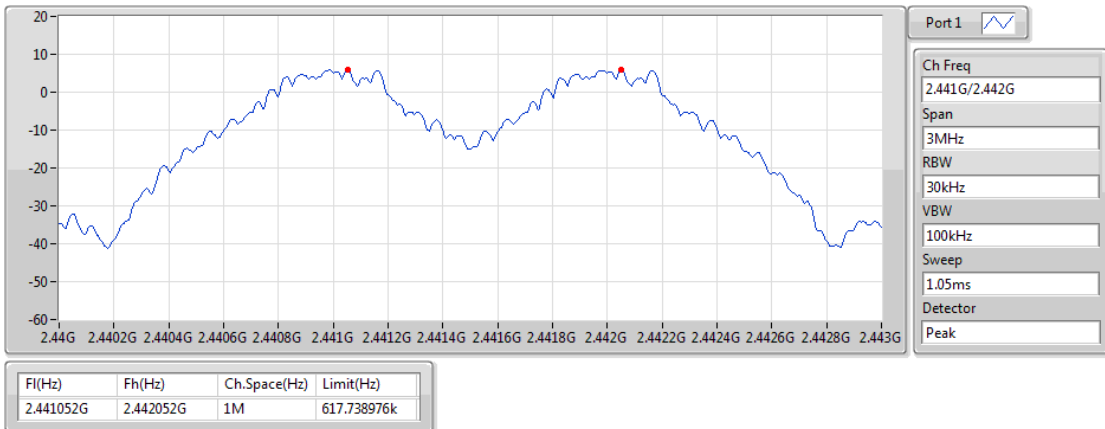
**2.402G/2.403GHz**



**BT-BR(1Mbps)**

**Channel Separation-FS**

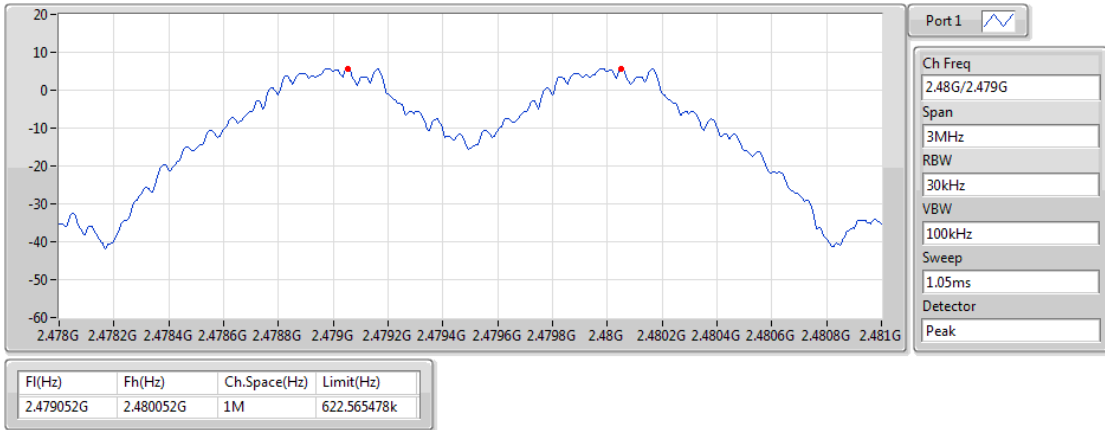
**2.441G/2.442GHz**



### BT-BR(1Mbps)

### Channel Separation-FS

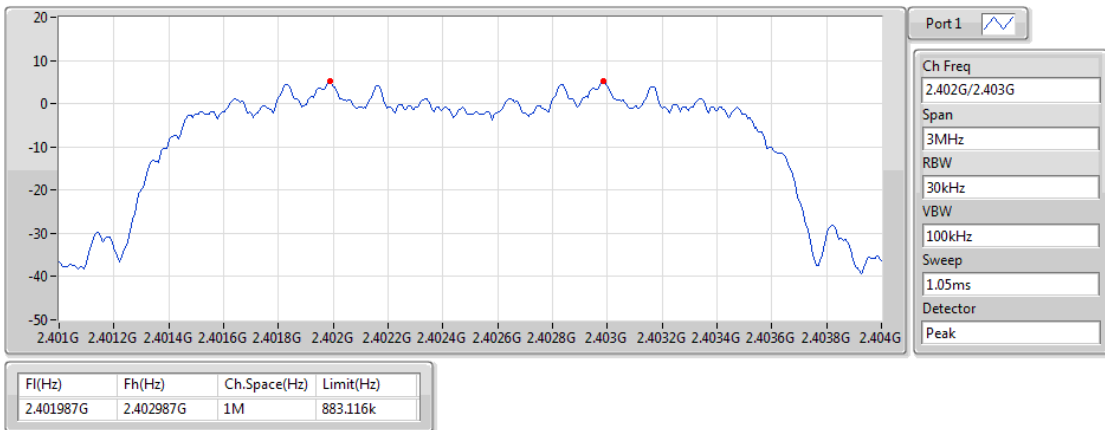
2.48G/2.479GHz



### BT-EDR(2Mbps)

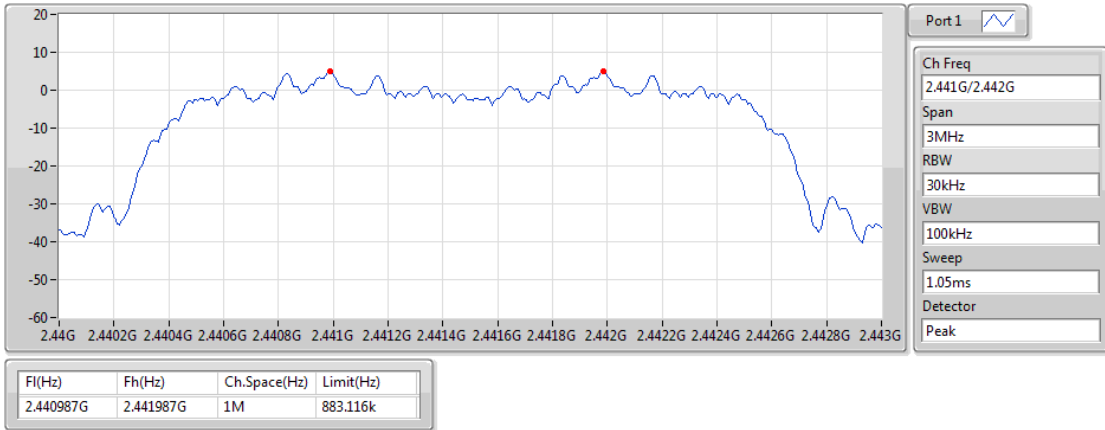
### Channel Separation-FS

2.402G/2.403GHz



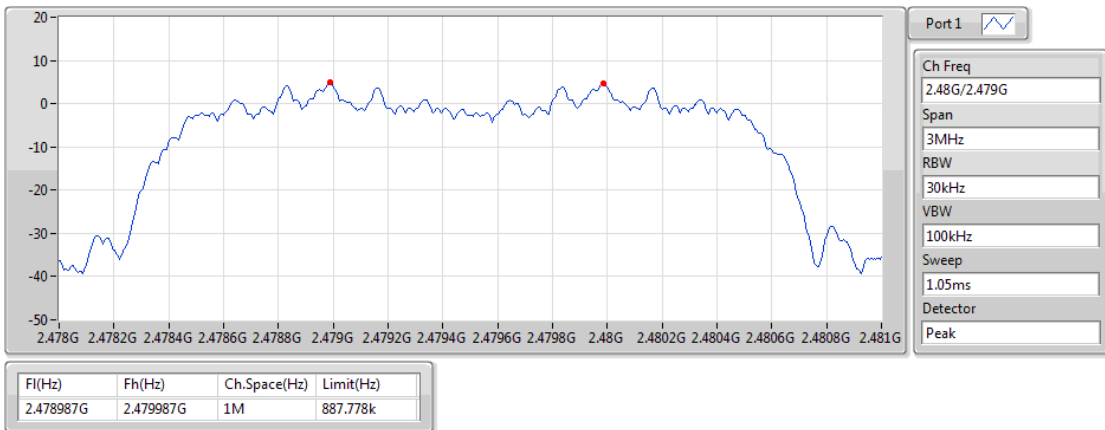
**BT-EDR(2Mbps)**  
**2.441G/2.442GHz**

**Channel Separation-FS**



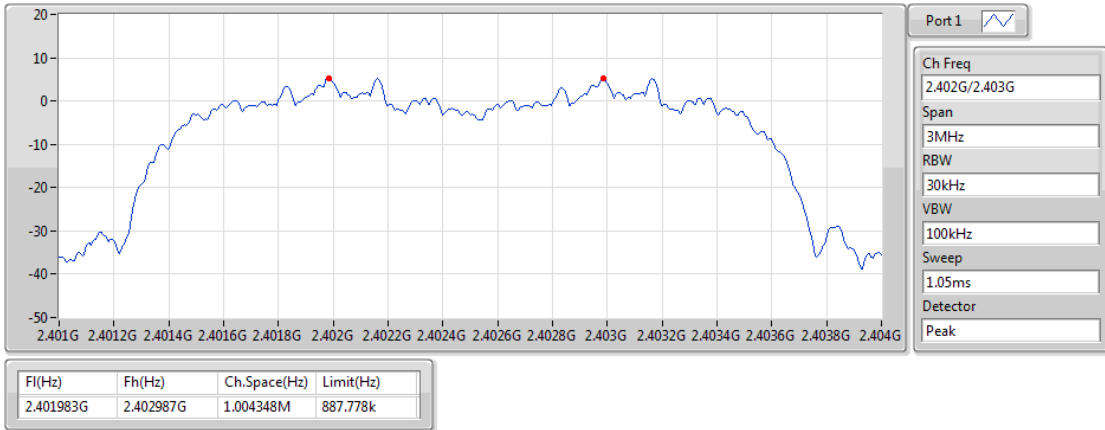
**BT-EDR(2Mbps)**  
**2.48G/2.479GHz**

**Channel Separation-FS**



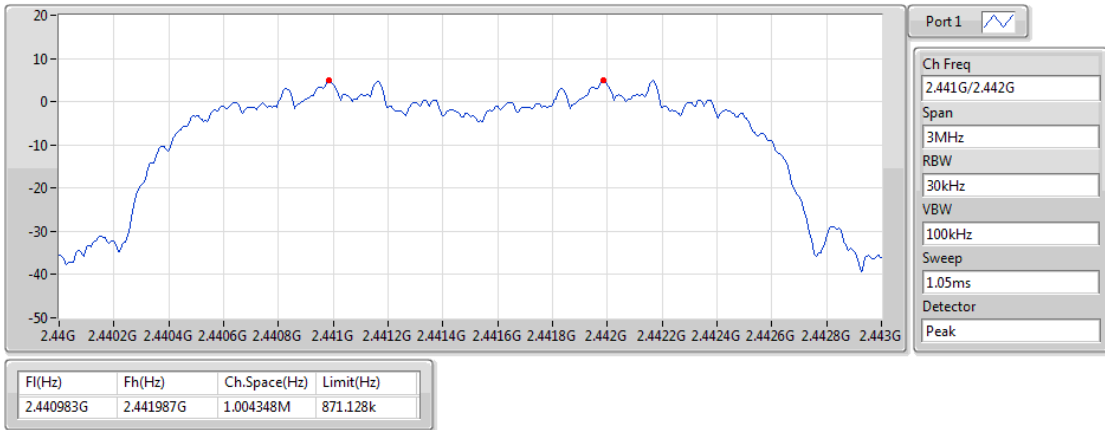
**BT-EDR(3Mbps)**  
**2.402G/2.403GHz**

**Channel Separation-FS**



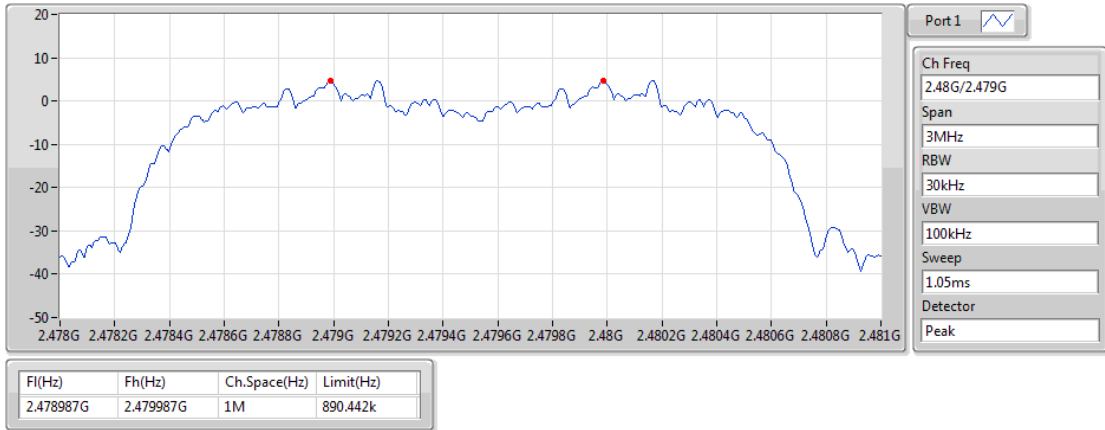
**BT-EDR(3Mbps)**  
**2.441G/2.442GHz**

**Channel Separation-FS**



**BT-EDR(3Mbps)  
2.48G/2.479GHz**

**Channel Separation-FS**



## 3.8 Number of Dwell Time

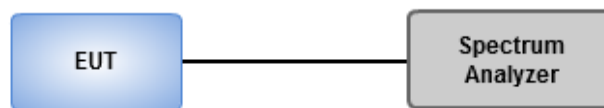
### 3.8.1 Limit of Dwell time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

### 3.8.2 Test Procedures

1. Set RBW=300 kHz, VBW=1 MHz, Sweep time=8 ms, Detector=Peak, Span=0 Hz, Trace max hold.
2. Enable gating and trigger function of spectrum analyzer to measure burst on time.
3. Set RBW=300 kHz, VBW=1 MHz, Sweep time=5 s / 2 s, Detector=Peak, Span=0 Hz, Trace max hold.
4. Enable gating and trigger function of spectrum analyzer to measure burst on number of transmission.
5. Set RBW=300 kHz, VBW=1 MHz, Sweep time=31.6 s / 8 s, Detector=Peak, Span=0 Hz, Trace max hold.
6. Enable gating and trigger function of spectrum analyzer to measure burst on number of transmission of entire time cycle.

### 3.8.3 Test Setup



### 3.8.4 Test Result of Dwell Time

<b>Ambient Condition</b>	22°C / 64%	<b>Tested By</b>	Brad Wu
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#### Summary

Mode	Max-Dwell (s)
2.4-2.4835GHz	-
BT-BR(1Mbps)	347.57156m_DH5
BT-EDR(2Mbps)	330.0462m_DH5
BT-EDR(3Mbps)	311.81774m_DH5
BT-BR-AFH(1Mbps)	289.45m_DH5-AFH
BT-EDR-AFH(2Mbps)	313.335m_DH5-AFH
BT-EDR-AFH(3Mbps)	313.443m_DH5-AFH

#### Result/ Non AFH mode

Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (ms)	Number of transmission in a 5 s
BT-BR(1Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	31.6	0.34757	0.4	2.89450	19
BT-EDR(2Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	31.6	0.33005	0.4	2.90125	18
BT-EDR(3Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	31.6	0.31182	0.4	2.90225	17

Note 1: Dwell time =Number of transmission in a 5 second x Tx On Time x 6.32

Note 2: DH5 was the worst mode.

#### Result/ AFH mode

Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (ms)	Number of transmission in a 2 s
BT-BR-AFH(1Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.28945	0.4	2.89450	25
BT-EDR-AFH(2Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.31334	0.4	2.90125	27
BT-EDR-AFH(3Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.31344	0.4	2.90225	27

Note 1: Dwell time =Number of transmission in a 2 second x Tx On Time x 4

Note 2: DH5 was the worst mode.

**BT-BR(1Mbps)**  
**2402MHz**

**Dwell-FS**



**BT-EDR(2Mbps)**  
**2402MHz**

**Dwell-FS**

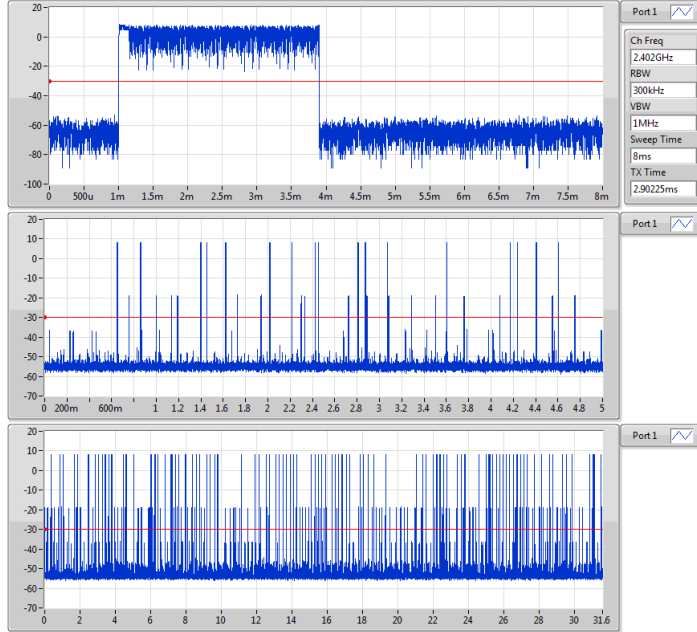




**BT-EDR(3Mbps)**

**Dwell-FS**

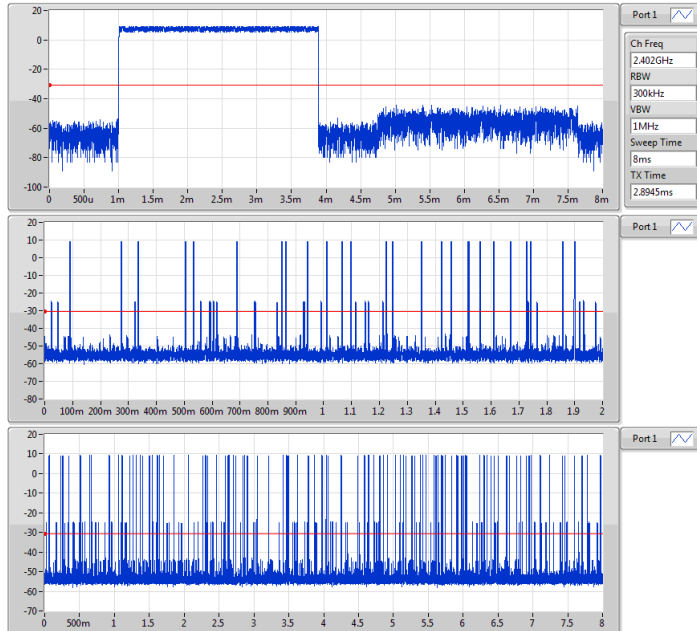
**2402MHz**



**BT-BR-AFH(1Mbps)**

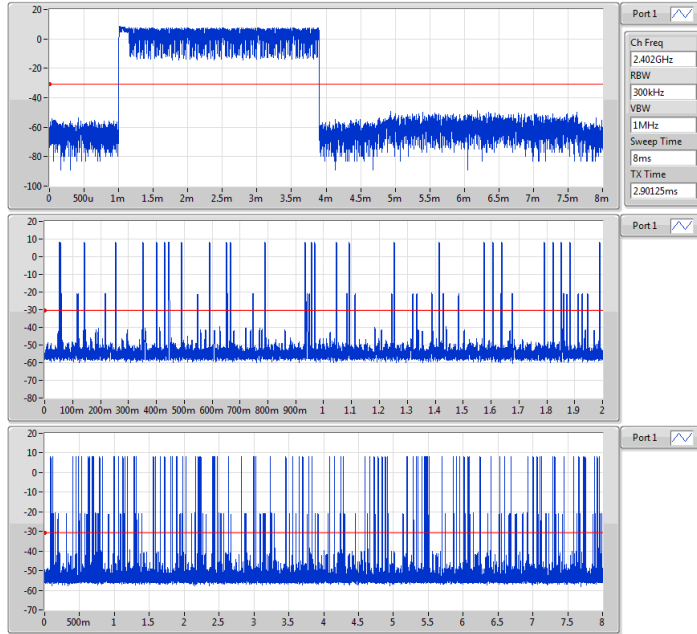
**Dwell-FS**

**2402MHz**



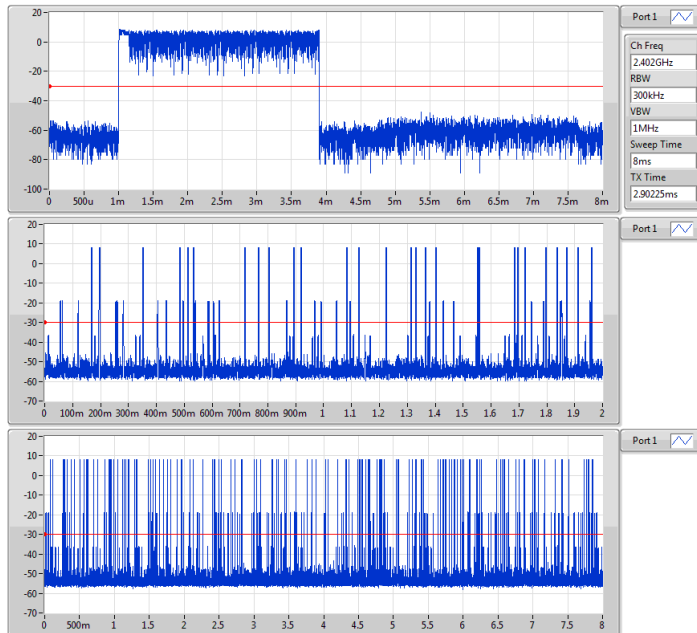
**BT-EDR-AFH(2Mbps)**  
**2402MHz**

**Dwell-FS**



**BT-EDR-AFH(3Mbps)**  
**2402MHz**

**Dwell-FS**



## 4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

### **Linkou**

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou  
District, New Taipei City, Taiwan  
(R.O.C.)

### **Kwei Shan**

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd St.,  
Kwei Shan Dist., Tao Yuan City  
33381, Taiwan (R.O.C.)

### **Kwei Shan Site II**

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd  
St., Kwei Shan Dist., Tao Yuan  
City 333, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC\_Service@icertifi.com.tw

==END==