

FCC C2PC Test Report

FCC ID : SQGBT700
Equipment : Class 1 Bluetooth Data Module
Model No. : BT740-SA, BT730-SA, BT740-SC, BT730-SC
(Refer to item 1.1.1 for more details)
Brand Name : Laird Connectivity
Applicant : Laird Connectivity, LLC.
Address : W66N220 Commerce Court, Cedarburg,
Wisconsin 53012, USA
Standard : 47 CFR FCC Part 15.247
Received Date : Mar. 25, 2021
Tested Date : Aug. 25 ~ Aug. 30, 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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Release Record

Report No.	Version	Description	Issued Date
FR332501-04	Rev. 01	Initial issue	Oct. 28, 2021

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.150MHz 53.09 (Margin -12.91dB) - QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2352.00MHz 52.46 (Margin -1.54dB) - AV	Pass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(1)	Conducted Output Power	Power [dBm]: 19.80	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

This is a Class II Permissive Change report (C2PC).

This report is issued as a supplementary report to original report no. FR332501. The modification is changing the balun + regulator, brand name, applicant and address. All test items have been performed and were recorded in the following sections.

1.1.1 Product Details

The following models are provided to this EUT.

Model	Description	Difference
BT740-SA	Class 1 Bluetooth Data Module	CCL Interface Express Subsystem 2.1+EDR. Integrated Antenna
BT740-SC	Class 1 Bluetooth Data Module	CCL Interface Express Subsystem 2.1+EDR. No integrated antenna, only u.FL RF connector for external antenna
BT730-SA	Class 1 Bluetooth Data Module	CSR Unified Stack 2.0EDR. Integrated Antenna.
BT730-SC	Class 1 Bluetooth Data Module	CSR Unified Stack 2.0EDR. No integrated antenna, only u.FL RF connector for external antenna

† Hardware is the same on all of these modules. Only difference is the Bluetooth firmware installed.
 † The above models, model **BT740-SA** and **BT740-SC** were selected as representative ones for the final test and only its data was recorded in this report.

1.1.2 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 V2.1	2402-2480	0-78 [79]	1 Mbps
2400-2483.5	EDR V2.1	2402-2480	0-78 [79]	2 Mbps
2400-2483.5	EDR V2.1	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.

1.1.3 Antenna Details

Ant. No.	EUT Model	Type	Gain (dBi)	Connector	ANT Brand/Model
1	BT740-SA BT730-SA	Chip	0.5	---	ACX/AT3216-B2R7HAAT
2	BT740-SC BT730-SC	ceramic Patch	2	UFL	EZURiO/ACC-008
3		PCB	2	UFL	Laird/NanoBlue-IP04(MAF94045)
4		Dipole	2	UFL	NEARSON/S181FL-L-RMM-2450S
5		Dipole	2	UFL	Laird/WTC2450-IP04-K
6		Dipole	1.5	UFL	Laird/WRR2400- IP04-B

Note: Ant 4 and Ant 5 had been pretested and found that Ant 4 was the worst case and was selected for final test

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3.3Vdc & 5Vdc from host
--------------------------	-------------------------

1.1.5 Accessories

N/A

1.1.6 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	---	---

1.1.7 Test Tool and Duty Cycle

Test Tool	BlueSuite, V 2_6_6 Simulator: Brand: R&S, Model: CMW270	
Modulation Mode	Duty Cycle Of Test Signal (%)	Duty Factor (dB)
DH5	82.08%	0.86
2DH5	82.08%	0.86
3DH5	82.08%	0.86

1.1.8 Power Index of Test Tool

Model: BT740-SA

Mode	Test Frequency (MHz)		
	GFSK/1Mbps	$\pi/4$ -DQPSK/2Mbps	8DPSK/3Mbps
2402	49	96	96
2441	51	96	96
2480	51	95	95

Model: BT740-SC

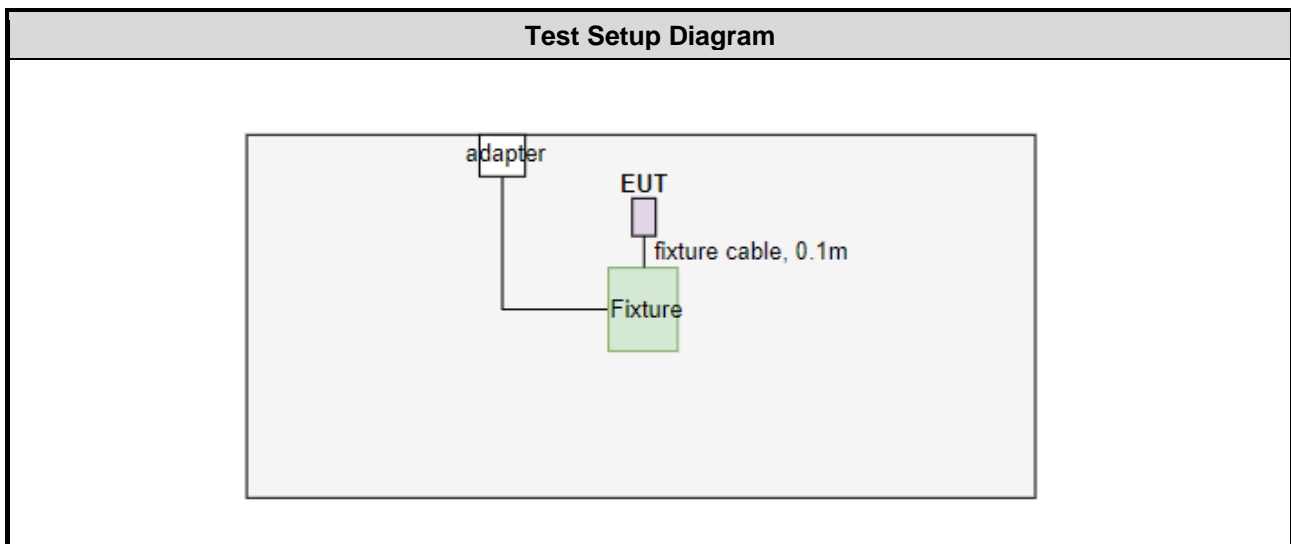
Mode	Test Frequency (MHz)		
	GFSK/1Mbps	$\pi/4$ -DQPSK/2Mbps	8DPSK/3Mbps
2402	48	92	92
2441	46	92	92
2480	45	92	92

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---
2	Fixture	---	---	---	Provided by applicant.

Note: The support notebook is connected to EUT with fixture by fixture cable and is disconnected from EUT and removed from test table after sending command to control the EUT for BT link.

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Aug. 30, 2021				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 08, 2021	Feb. 07, 2022
LISN	R&S	ENV216	101579	Mar. 17, 2021	Mar. 16, 2022
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Dec. 29, 2020	Dec. 28, 2021
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 21, 2020	Oct. 20, 2021
50 ohm terminal (Support Unit)	NA	50	04	May 25, 2021	May 24, 2022
Measurement Software	AUDIX	e3	6.120210k	NA	NA

Note: Calibration Interval of instruments listed above is one year.

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Aug. 25 ~ Aug. 26, 2021				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 12, 2021	Mar. 11, 2022
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2020	Dec. 03, 2021
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 17, 2020	Nov. 16, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jun. 30, 2021	Jun. 29, 2022
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 11, 2020	Dec. 10, 2021
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 06, 2020	Nov. 05, 2021
Preamplifier	EMC	EMC02325	980225	Jun. 29, 2021	Jun. 28, 2022
Preamplifier	Agilent	83017A	MY39501308	Sep. 26, 2020	Sep. 25, 2021
Preamplifier	EMC	EMC184045B	980192	Jul. 14, 2021	Jul. 13, 2022
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 06, 2020	Oct. 05, 2021
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 06, 2020	Oct. 05, 2021
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 06, 2020	Oct. 05, 2021
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 06, 2020	Oct. 05, 2021
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 06, 2020	Oct. 05, 2021
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 06, 2020	Oct. 05, 2021
Measurement Software	AUDIX	e3	6.120210g	NA	NA

Note: Calibration Interval of instruments listed above is one year.

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Aug. 30, 2021				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 19, 2021	Apr. 18, 2022
Power Meter	Anritsu	ML2495A	1241002	Nov. 04, 2020	Nov. 03, 2021
Power Sensor	Anritsu	MA2411B	1207366	Nov. 04, 2020	Nov. 03, 2021
Measurement Software	Sporton	SENSE-15247_FS	V5.10.7.11	NA	NA
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	± 34.130 Hz
Conducted power	± 0.808 dB
Power density	± 0.583 dB
Conducted emission	± 2.715 dB
AC conducted emission	± 2.92 dB
Radiated emission ≤ 1 GHz	± 3.41 dB
Radiated emission > 1 GHz	± 4.59 dB
Time	$\pm 0.1\%$

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

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

Note:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The worst case are listed as Note 3.
2. The EUT supports two DC voltage options, 3.3Vdc and 5Vdc. Both options were assessed and **5Vdc** was found to be the worst case and was selected for the final test.
3. The test configurations are listed as follows.
 Configuration 1: Model BT740-SA, Chip antenna, Z-plane
 Configuration 2: Model BT740-SC, ceramic Patch antenna, Y-plane
 Configuration 3: Model BT740-SC, PCB antenna, Y-plane
 Configuration 4: Model BT740-SC, Dipole antenna, Y-plane

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

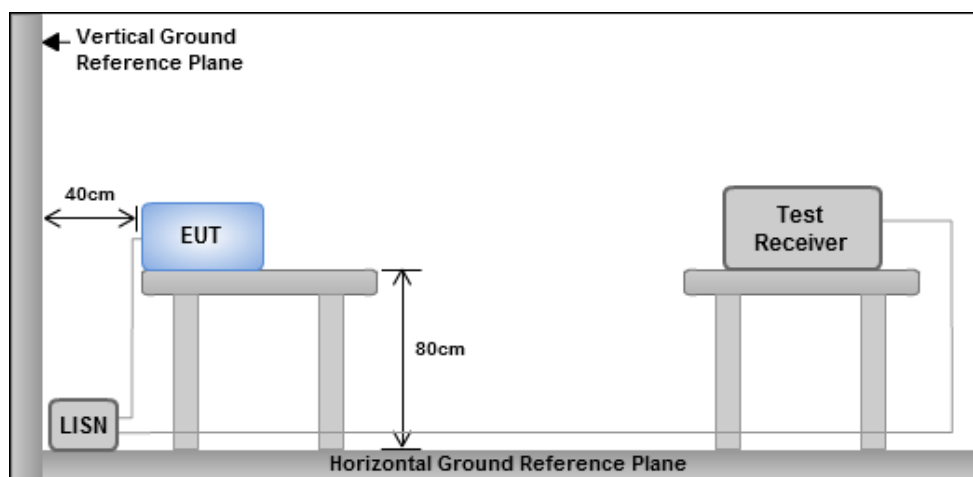
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

3.1.2 Test Procedures

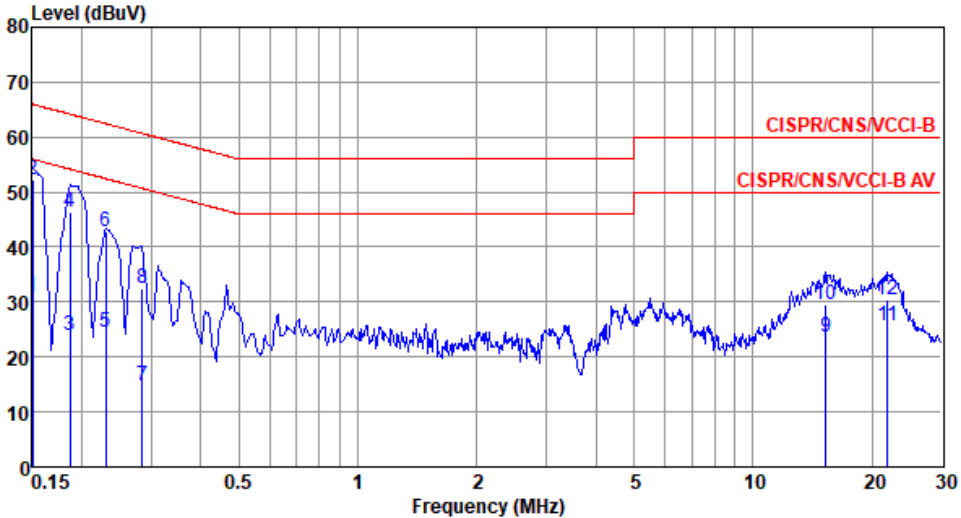
1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω 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



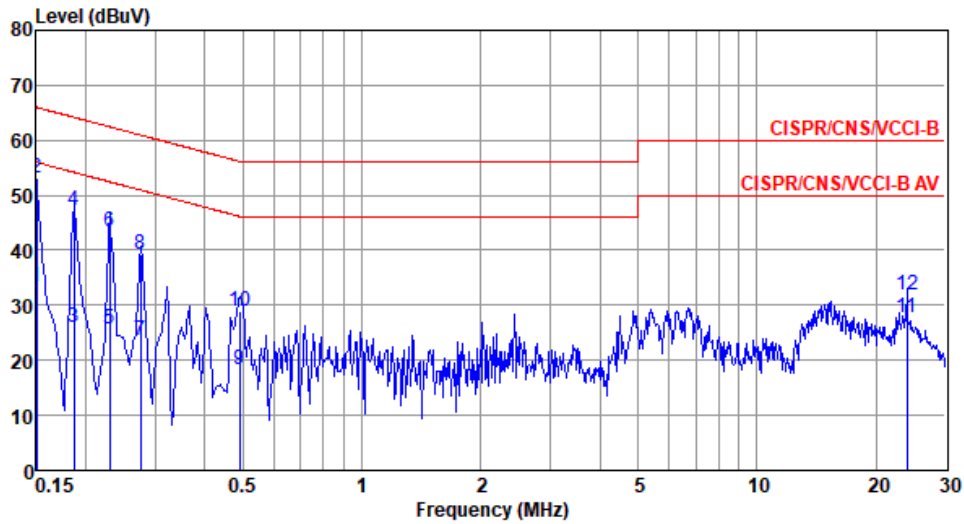
- Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

Modulation Mode	8DPSK	Test Freq. (MHz)	2480																																																																																																																					
Power Phase	Line																																																																																																																							
<p>Test by : Joe Liao Temperature: 22°C Humidity: 68%</p>																																																																																																																								
 <p>The graph displays the conducted emission levels in dBuV across a frequency range from 0.15 MHz to 30 MHz. Two red lines represent the CISPR/CNS/VCCI-B and CISPR/CNS/VCCI-B AV limits. A blue line shows the measured emission levels, with several peaks marked by vertical lines and numbered 1 through 12. The measured levels are generally below the limits, with some peaks near 0.15 MHz and 21.946 MHz.</p>																																																																																																																								
<table border="1"> <thead> <tr> <th></th> <th>Freq MHz</th> <th>Level dBuV</th> <th>Limit Line dBuV</th> <th>Over Limit dB</th> <th>Read Level dBuV</th> <th>Factor dB</th> <th>Cable loss dB</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.150</td> <td>30.85</td> <td>56.00</td> <td>-25.15</td> <td>20.97</td> <td>9.83</td> <td>0.05</td> <td>Average</td> </tr> <tr> <td>2*</td> <td>0.150</td> <td>52.12</td> <td>66.00</td> <td>-13.88</td> <td>42.24</td> <td>9.83</td> <td>0.05</td> <td>QP</td> </tr> <tr> <td>3</td> <td>0.186</td> <td>23.89</td> <td>54.20</td> <td>-30.31</td> <td>13.99</td> <td>9.84</td> <td>0.06</td> <td>Average</td> </tr> <tr> <td>4</td> <td>0.186</td> <td>46.25</td> <td>64.20</td> <td>-17.95</td> <td>36.35</td> <td>9.84</td> <td>0.06</td> <td>QP</td> </tr> <tr> <td>5</td> <td>0.230</td> <td>24.45</td> <td>52.44</td> <td>-27.99</td> <td>14.54</td> <td>9.85</td> <td>0.06</td> <td>Average</td> </tr> <tr> <td>6</td> <td>0.230</td> <td>42.71</td> <td>62.44</td> <td>-19.73</td> <td>32.80</td> <td>9.85</td> <td>0.06</td> <td>QP</td> </tr> <tr> <td>7</td> <td>0.285</td> <td>14.78</td> <td>50.68</td> <td>-35.90</td> <td>4.84</td> <td>9.87</td> <td>0.07</td> <td>Average</td> </tr> <tr> <td>8</td> <td>0.285</td> <td>32.52</td> <td>60.68</td> <td>-28.16</td> <td>22.58</td> <td>9.87</td> <td>0.07</td> <td>QP</td> </tr> <tr> <td>9</td> <td>15.307</td> <td>23.65</td> <td>50.00</td> <td>-26.35</td> <td>12.85</td> <td>10.20</td> <td>0.60</td> <td>Average</td> </tr> <tr> <td>10</td> <td>15.307</td> <td>29.63</td> <td>60.00</td> <td>-30.37</td> <td>18.83</td> <td>10.20</td> <td>0.60</td> <td>QP</td> </tr> <tr> <td>11</td> <td>21.946</td> <td>25.63</td> <td>50.00</td> <td>-24.37</td> <td>14.63</td> <td>10.32</td> <td>0.68</td> <td>Average</td> </tr> <tr> <td>12</td> <td>21.946</td> <td>30.48</td> <td>60.00</td> <td>-29.52</td> <td>19.48</td> <td>10.32</td> <td>0.68</td> <td>QP</td> </tr> </tbody> </table>					Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Remark	1	0.150	30.85	56.00	-25.15	20.97	9.83	0.05	Average	2*	0.150	52.12	66.00	-13.88	42.24	9.83	0.05	QP	3	0.186	23.89	54.20	-30.31	13.99	9.84	0.06	Average	4	0.186	46.25	64.20	-17.95	36.35	9.84	0.06	QP	5	0.230	24.45	52.44	-27.99	14.54	9.85	0.06	Average	6	0.230	42.71	62.44	-19.73	32.80	9.85	0.06	QP	7	0.285	14.78	50.68	-35.90	4.84	9.87	0.07	Average	8	0.285	32.52	60.68	-28.16	22.58	9.87	0.07	QP	9	15.307	23.65	50.00	-26.35	12.85	10.20	0.60	Average	10	15.307	29.63	60.00	-30.37	18.83	10.20	0.60	QP	11	21.946	25.63	50.00	-24.37	14.63	10.32	0.68	Average	12	21.946	30.48	60.00	-29.52	19.48	10.32	0.68	QP
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<p>Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB). Note 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).</p>																																																																																																																								

Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Neutral		

Test by : Joe Liao Temperature: 22°C Humidity: 68%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Remark
1	0.150	33.34	56.00	-22.66	23.47	9.82	0.05	Average
2*	0.150	53.09	66.00	-12.91	43.22	9.82	0.05	QP
3	0.186	26.02	54.20	-28.18	16.13	9.83	0.06	Average
4	0.186	47.19	64.20	-17.01	37.30	9.83	0.06	QP
5	0.230	25.60	52.44	-26.84	15.71	9.83	0.06	Average
6	0.230	43.52	62.44	-18.92	33.63	9.83	0.06	QP
7	0.276	23.58	50.94	-27.36	13.67	9.84	0.07	Average
8	0.276	39.15	60.94	-21.79	29.24	9.84	0.07	QP
9	0.491	18.34	46.14	-27.80	8.39	9.86	0.09	Average
10	0.491	28.81	56.14	-27.33	18.86	9.86	0.09	QP
11	24.000	27.74	50.00	-22.26	16.61	10.44	0.69	Average
12	24.000	31.87	60.00	-28.13	20.74	10.44	0.69	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 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

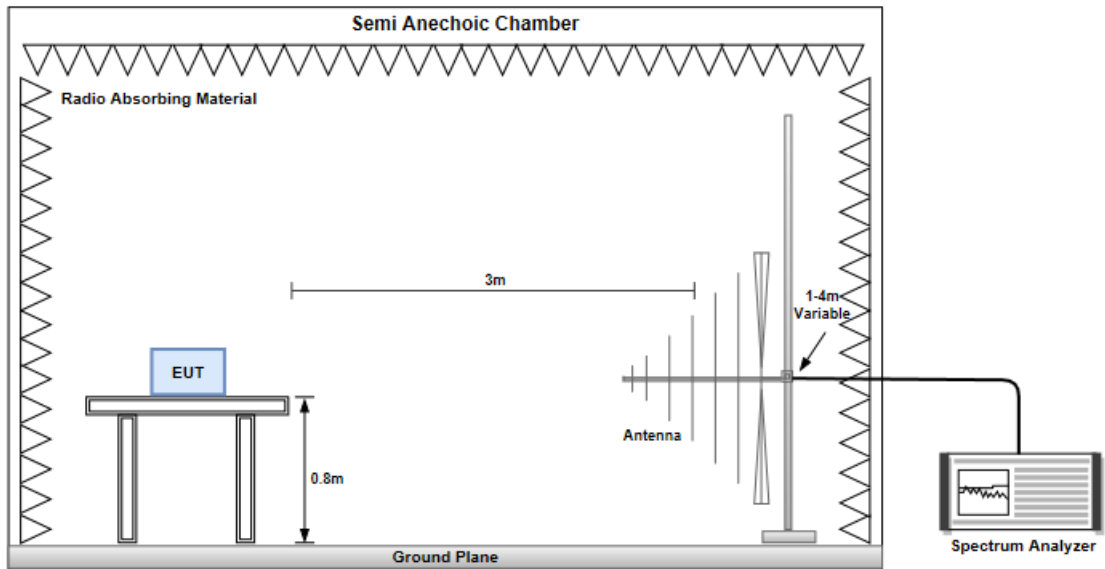
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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:

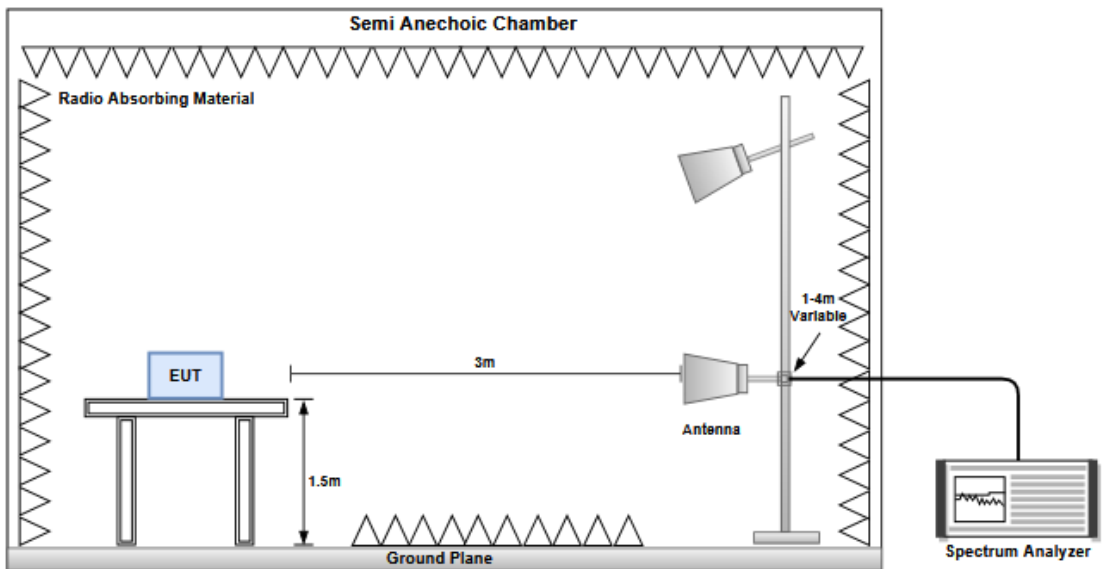
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. Radiated emission above 1GHz / Peak value
RBW=1MHz, VBW=3MHz and Peak detector
Radiated emission above 1GHz / Average value for harmonics
The average value is: Average = Peak value + 20log(Duty 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

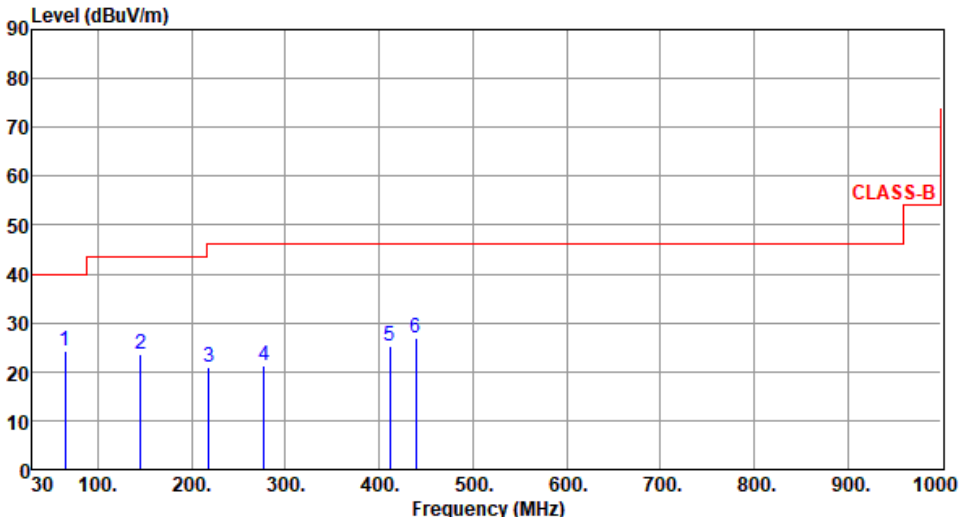


Radiated Emissions above 1 GHz



Configuration 1: Model BT740-SA, Chip antenna, Z-plane

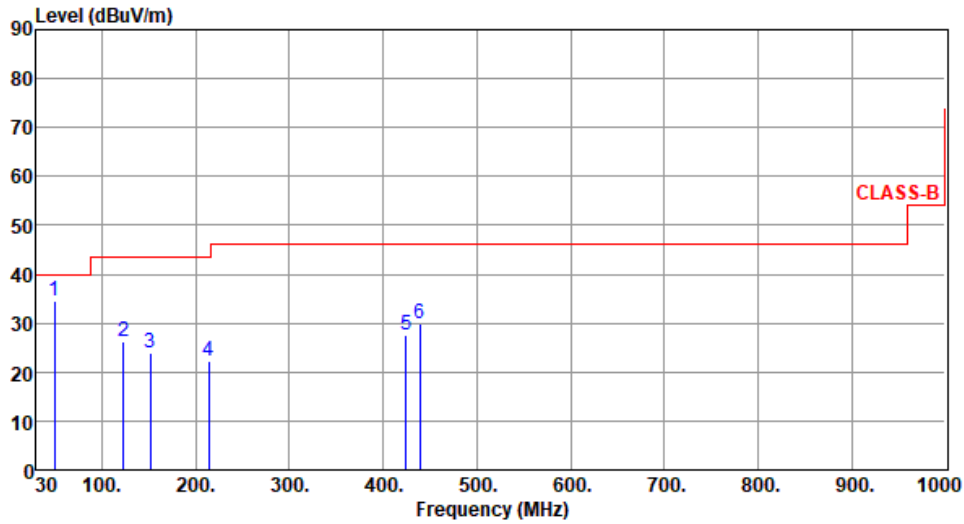
3.2.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2441						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):25 Humidity(%):66									
									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	64.92	24.33	40.00	-15.67	34.21	-9.88	Peak	---	---
2	145.43	23.48	43.50	-20.02	32.75	-9.27	Peak	---	---
3	218.18	20.76	46.00	-25.24	32.76	-12.00	Peak	---	---
4	277.35	21.39	46.00	-24.61	30.27	-8.88	Peak	---	---
5	411.21	25.21	46.00	-20.79	30.81	-5.60	Peak	---	---
6	439.34	26.90	46.00	-19.10	31.54	-4.64	Peak	---	---

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%) :66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	49.40	34.58	40.00	-5.42	43.16	-8.58	Peak	---	---
2	123.12	26.22	43.50	-17.28	36.76	-10.54	Peak	---	---
3	151.25	24.06	43.50	-19.44	32.93	-8.87	Peak	---	---
4	214.30	22.31	43.50	-21.19	34.31	-12.00	Peak	---	---
5	424.79	27.72	46.00	-18.28	32.80	-5.08	Peak	---	---
6	439.34	30.00	46.00	-16.00	34.64	-4.64	Peak	---	---

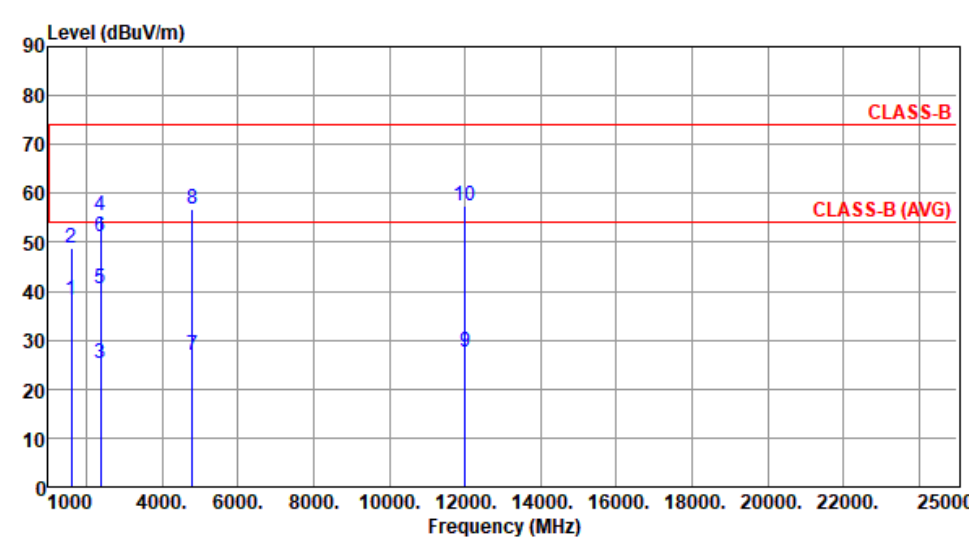
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*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.

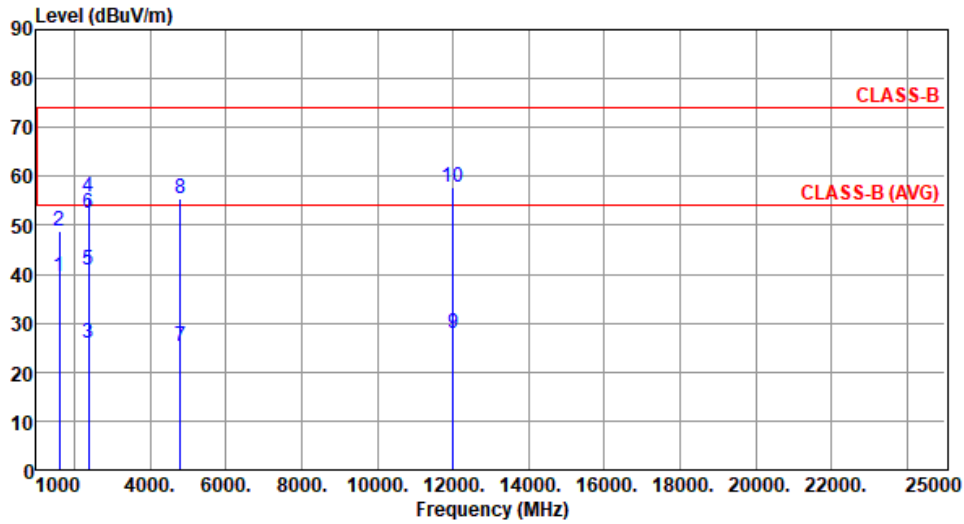
3.2.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

Modulation	GFSK	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):25 Humidity(%):66									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	38.27	54.00	-15.73	45.06	-6.79	Average	167	52
2	1601.00	48.85	74.00	-25.15	55.64	-6.79	Peak	167	52
3	2386.00	25.35	54.00	-28.65	28.13	-2.78	Average	100	194
4	2386.00	55.45	74.00	-18.55	58.23	-2.78	Peak	100	194
5	2390.00	40.52	54.00	-13.48	43.31	-2.79	Average	100	194
6	2390.00	51.20	74.00	-22.80	53.99	-2.79	Peak	100	194
7	4804.00	26.76	54.00	-27.24	23.26	3.50	Average	100	98
8	4804.00	56.86	74.00	-17.14	53.36	3.50	Peak	100	98
9	12010.00	27.41	54.00	-26.59	13.14	14.27	Average	100	330
10	12010.00	57.51	74.00	-16.49	43.24	14.27	Peak	100	330

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

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	39.42	54.00	-14.58	46.21	-6.79	Average	100	140
2	1601.00	48.90	74.00	-25.10	55.69	-6.79	Peak	100	140
3	2386.00	25.81	54.00	-28.19	28.59	-2.78	Average	106	192
4	2386.00	55.91	74.00	-18.09	58.69	-2.78	Peak	106	192
5	2390.00	41.01	54.00	-12.99	43.80	-2.79	Average	106	192
6	2390.00	52.62	74.00	-21.38	55.41	-2.79	Peak	106	192
7	4804.00	25.24	54.00	-28.76	21.74	3.50	Average	100	89
8	4804.00	55.34	74.00	-18.66	51.84	3.50	Peak	100	89
9	12010.00	27.82	54.00	-26.18	13.55	14.27	Average	204	228
10	12010.00	57.92	74.00	-16.08	43.65	14.27	Peak	204	228

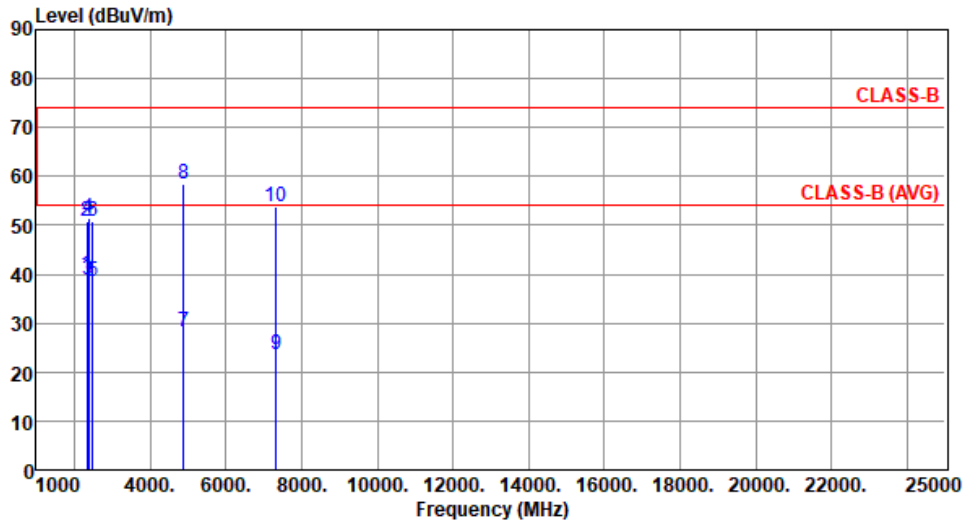
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	39.69	54.00	-14.31	42.44	-2.75	Average	105	189
2	2345.00	50.86	74.00	-23.14	53.61	-2.75	Peak	105	189
3	2390.00	38.74	54.00	-15.26	41.53	-2.79	Average	115	193
4	2390.00	51.52	74.00	-22.48	54.31	-2.79	Peak	115	193
5	2483.50	38.51	54.00	-15.49	41.25	-2.74	Average	115	193
6	2483.50	50.94	74.00	-23.06	53.68	-2.74	Peak	115	193
7	4882.00	28.24	54.00	-25.76	24.77	3.47	Average	101	106
8	4882.00	58.34	74.00	-15.66	54.87	3.47	Peak	101	106
9	7323.00	23.70	54.00	-30.30	14.67	9.03	Average	100	76
10	7323.00	53.80	74.00	-20.20	44.77	9.03	Peak	100	76

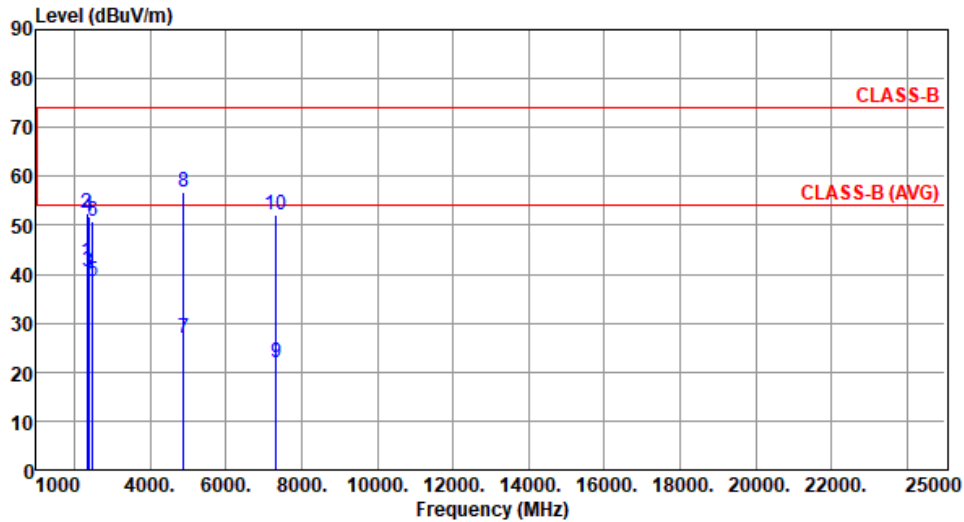
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	42.43	54.00	-11.57	45.18	-2.75	Average	110	192
2	2345.00	52.41	74.00	-21.59	55.16	-2.75	Peak	110	192
3	2390.00	40.37	54.00	-13.63	43.16	-2.79	Average	103	193
4	2390.00	51.77	74.00	-22.23	54.56	-2.79	Peak	103	193
5	2483.50	38.50	54.00	-15.50	41.24	-2.74	Average	103	193
6	2483.50	50.89	74.00	-23.11	53.63	-2.74	Peak	103	193
7	4882.00	26.85	54.00	-27.15	23.38	3.47	Average	100	91
8	4882.00	56.95	74.00	-17.05	53.48	3.47	Peak	100	91
9	7323.00	22.03	54.00	-31.97	13.00	9.03	Average	100	139
10	7323.00	52.13	74.00	-21.87	43.10	9.03	Peak	100	139

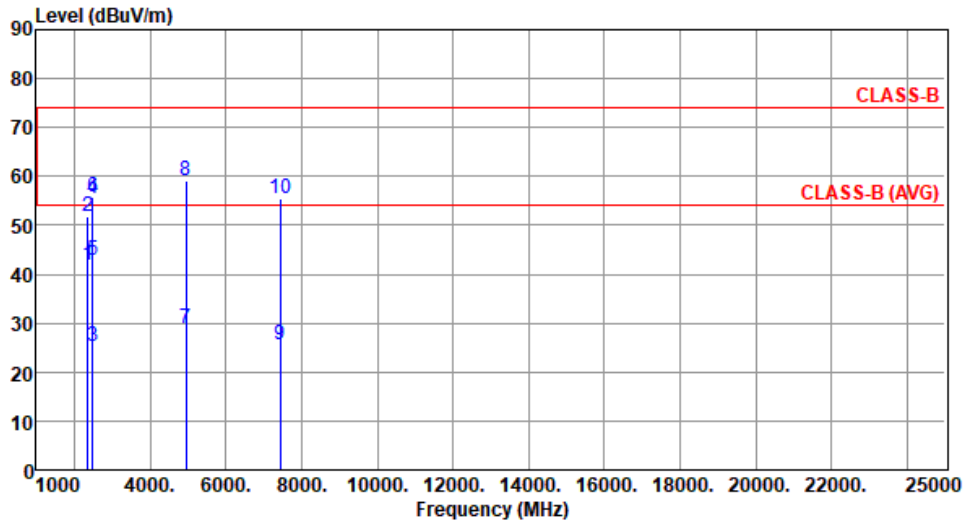
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	41.72	54.00	-12.28	44.47	-2.75	Average	100	69
2	2352.00	51.76	74.00	-22.24	54.51	-2.75	Peak	100	69
3	2483.50	25.24	54.00	-28.76	27.98	-2.74	Average	112	195
4	2483.50	55.34	74.00	-18.66	58.08	-2.74	Peak	112	195
5	2485.50	42.69	54.00	-11.31	45.43	-2.74	Average	112	195
6	2485.50	55.76	74.00	-18.24	58.50	-2.74	Peak	112	195
7	4960.00	29.04	54.00	-24.96	25.36	3.68	Average	100	112
8	4960.00	59.14	74.00	-14.86	55.46	3.68	Peak	100	112
9	7440.00	25.50	54.00	-28.50	16.52	8.98	Average	100	76
10	7440.00	55.60	74.00	-18.40	46.62	8.98	Peak	100	76

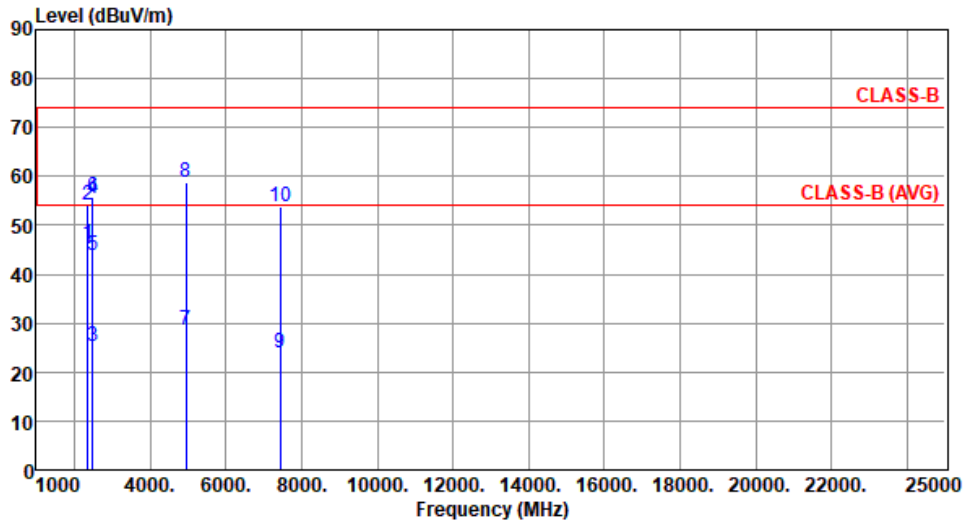
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



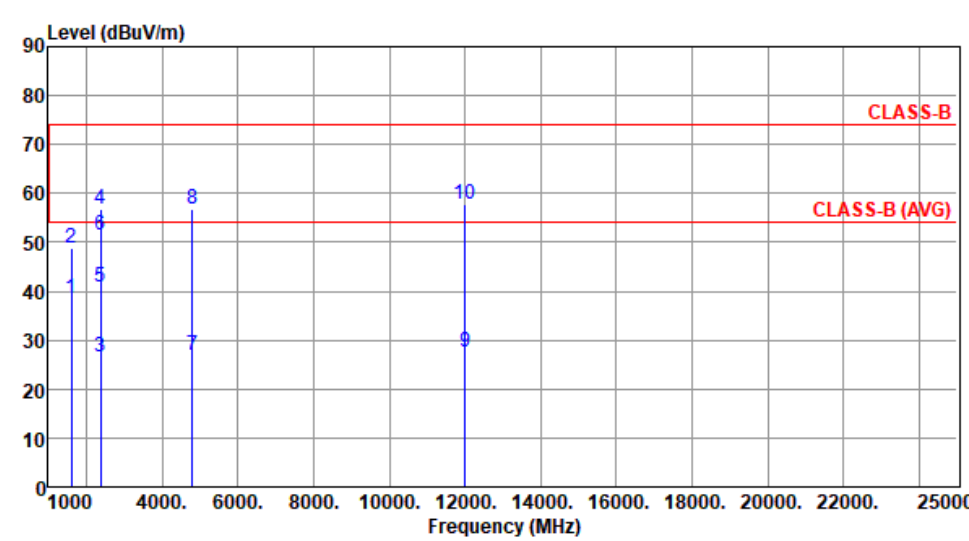
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	46.01	54.00	-7.99	48.76	-2.75	Average	111	183
2	2352.00	54.02	74.00	-19.98	56.77	-2.75	Peak	111	183
3	2483.50	25.28	54.00	-28.72	28.02	-2.74	Average	103	192
4	2483.50	55.38	74.00	-18.62	58.12	-2.74	Peak	103	192
5	2485.50	43.67	54.00	-10.33	46.41	-2.74	Average	103	192
6	2485.50	55.65	74.00	-18.35	58.39	-2.74	Peak	103	192
7	4960.00	28.57	54.00	-25.43	24.89	3.68	Average	100	11
8	4960.00	58.67	74.00	-15.33	54.99	3.68	Peak	100	11
9	7440.00	23.83	54.00	-30.17	14.85	8.98	Average	100	110
10	7440.00	53.93	74.00	-20.07	44.95	8.98	Peak	100	110

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

*Factor includes antenna factor , cable loss and amplifier gain

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

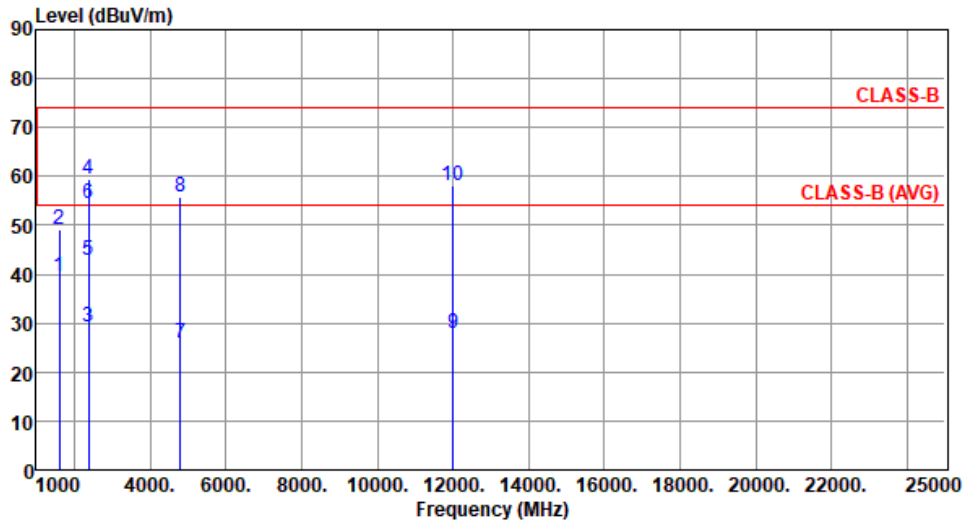
3.2.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

Modulation	8DPSK	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):25 Humidity(%):66									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	38.46	54.00	-15.54	45.25	-6.79	Average	165	49
2	1601.00	48.92	74.00	-25.08	55.71	-6.79	Peak	165	49
3	2386.00	26.72	54.00	-27.28	29.50	-2.78	Average	100	195
4	2386.00	56.82	74.00	-17.18	59.60	-2.78	Peak	100	195
5	2390.00	40.69	54.00	-13.31	43.48	-2.79	Average	100	195
6	2390.00	51.58	74.00	-22.42	54.37	-2.79	Peak	100	195
7	4804.00	26.85	54.00	-27.15	23.35	3.50	Average	100	102
8	4804.00	56.95	74.00	-17.05	53.45	3.50	Peak	100	102
9	12010.00	27.59	54.00	-26.41	13.32	14.27	Average	100	335
10	12010.00	57.69	74.00	-16.31	43.42	14.27	Peak	100	335

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

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	39.68	54.00	-14.32	46.47	-6.79	Average	100	195
2	1601.00	49.12	74.00	-24.88	55.91	-6.79	Peak	100	195
3	2386.00	29.24	54.00	-24.76	32.02	-2.78	Average	106	194
4	2386.00	59.34	74.00	-14.66	62.12	-2.78	Peak	106	194
5	2390.00	42.92	54.00	-11.08	45.71	-2.79	Average	106	194
6	2390.00	54.57	74.00	-19.43	57.36	-2.79	Peak	106	194
7	4804.00	25.82	54.00	-28.18	22.32	3.50	Average	100	91
8	4804.00	55.92	74.00	-18.08	52.42	3.50	Peak	100	91
9	12010.00	28.06	54.00	-25.94	13.79	14.27	Average	200	215
10	12010.00	58.16	74.00	-15.84	43.89	14.27	Peak	200	215

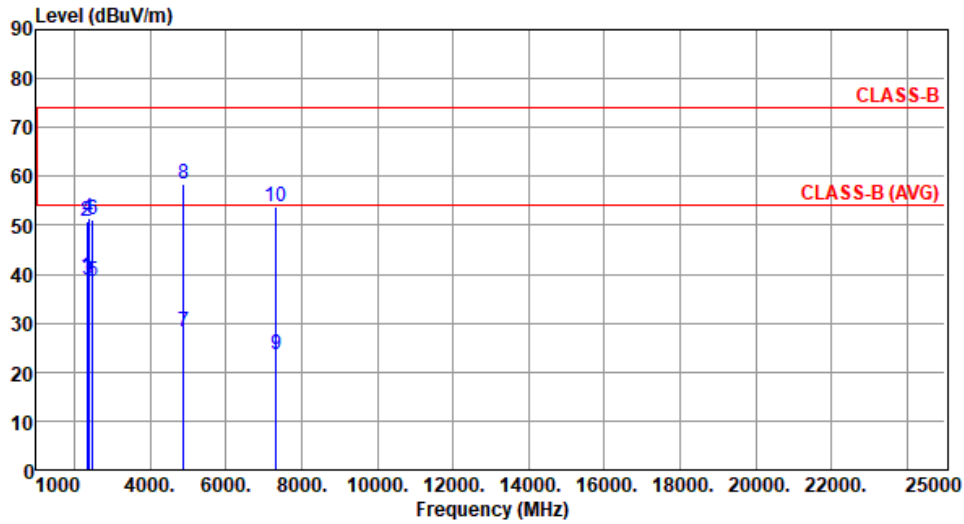
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	39.56	54.00	-14.44	42.31	-2.75	Average	110	186
2	2345.00	50.81	74.00	-23.19	53.56	-2.75	Peak	110	186
3	2390.00	38.85	54.00	-15.15	41.64	-2.79	Average	116	195
4	2390.00	51.64	74.00	-22.36	54.43	-2.79	Peak	116	195
5	2483.50	38.62	54.00	-15.38	41.36	-2.74	Average	116	195
6	2483.50	50.99	74.00	-23.01	53.73	-2.74	Peak	116	195
7	4882.00	28.36	54.00	-25.64	24.89	3.47	Average	100	101
8	4882.00	58.46	74.00	-15.54	54.99	3.47	Peak	100	101
9	7323.00	23.55	54.00	-30.45	14.52	9.03	Average	100	81
10	7323.00	53.65	74.00	-20.35	44.62	9.03	Peak	100	81

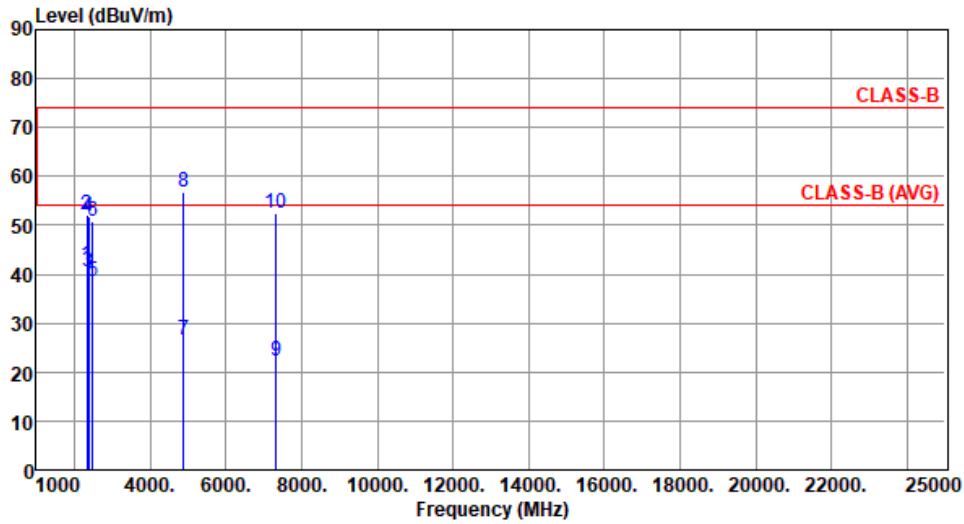
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	41.98	54.00	-12.02	44.73	-2.75	Average	100	215
2	2345.00	52.06	74.00	-21.94	54.81	-2.75	Peak	100	215
3	2390.00	40.39	54.00	-13.61	43.18	-2.79	Average	100	215
4	2390.00	51.82	74.00	-22.18	54.61	-2.79	Peak	100	215
5	2483.50	38.66	54.00	-15.34	41.40	-2.74	Average	100	215
6	2483.50	50.95	74.00	-23.05	53.69	-2.74	Peak	100	215
7	4882.00	26.58	54.00	-27.42	23.11	3.47	Average	100	88
8	4882.00	56.68	74.00	-17.32	53.21	3.47	Peak	100	88
9	7323.00	22.39	54.00	-31.61	13.36	9.03	Average	100	142
10	7323.00	52.49	74.00	-21.51	43.46	9.03	Peak	100	142

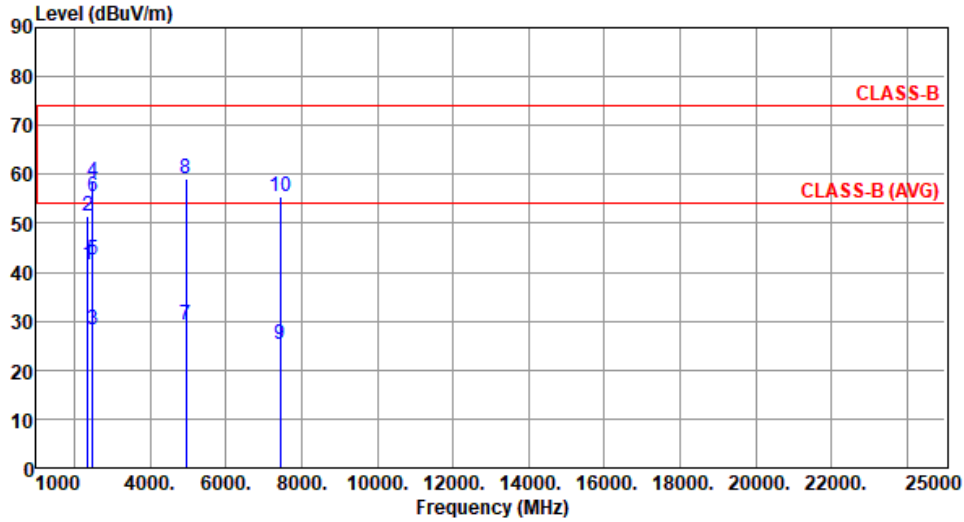
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66

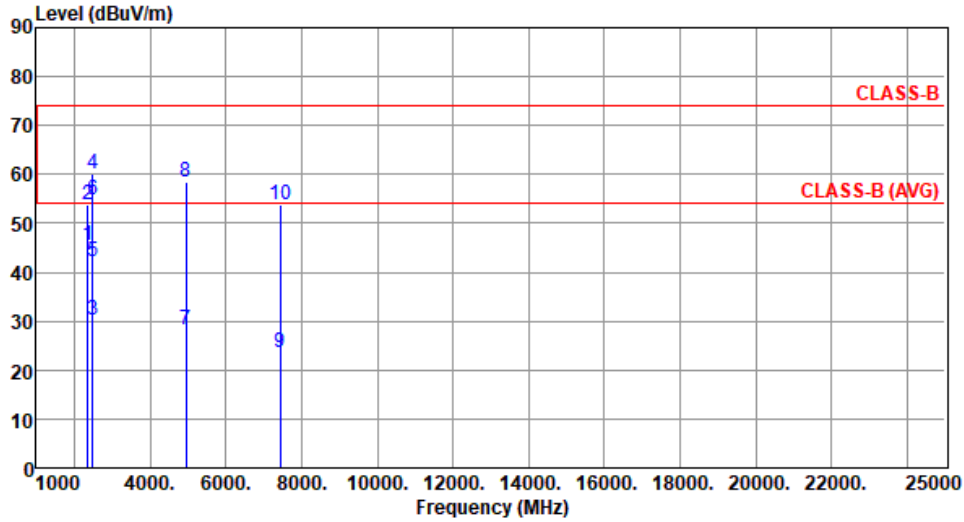


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	41.51	54.00	-12.49	44.26	-2.75	Average	100	62
2	2352.00	51.62	74.00	-22.38	54.37	-2.75	Peak	100	62
3	2483.50	28.35	54.00	-25.65	31.09	-2.74	Average	111	196
4	2483.50	58.45	74.00	-15.55	61.19	-2.74	Peak	111	196
5	2485.50	42.62	54.00	-11.38	45.36	-2.74	Average	111	196
6	2485.50	55.48	74.00	-18.52	58.22	-2.74	Peak	111	196
7	4960.00	29.12	54.00	-24.88	25.44	3.68	Average	100	114
8	4960.00	59.22	74.00	-14.78	55.54	3.68	Peak	100	114
9	7440.00	25.32	54.00	-28.68	16.34	8.98	Average	100	81
10	7440.00	55.42	74.00	-18.58	46.44	8.98	Peak	100	81

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	45.64	54.00	-8.36	48.39	-2.75	Average	106	201
2	2352.00	53.81	74.00	-20.19	56.56	-2.75	Peak	106	201
3	2483.50	30.11	54.00	-23.89	32.85	-2.74	Average	106	229
4	2483.50	60.21	74.00	-13.79	62.95	-2.74	Peak	106	229
5	2485.50	42.17	54.00	-11.83	44.91	-2.74	Average	106	229
6	2485.50	54.78	74.00	-19.22	57.52	-2.74	Peak	106	229
7	4960.00	28.32	54.00	-25.68	24.64	3.68	Average	100	16
8	4960.00	58.42	74.00	-15.58	54.74	3.68	Peak	100	16
9	7440.00	23.71	54.00	-30.29	14.73	8.98	Average	100	108
10	7440.00	53.81	74.00	-20.19	44.83	8.98	Peak	100	108

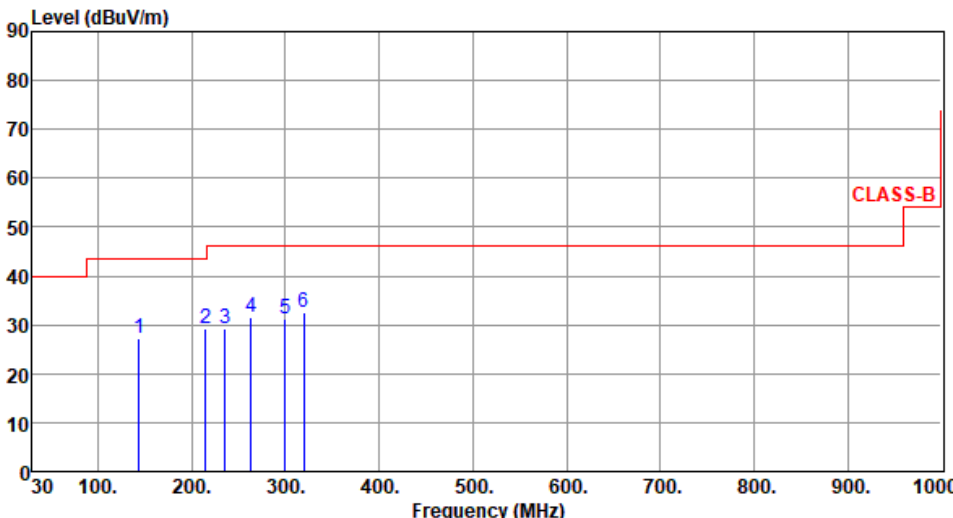
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

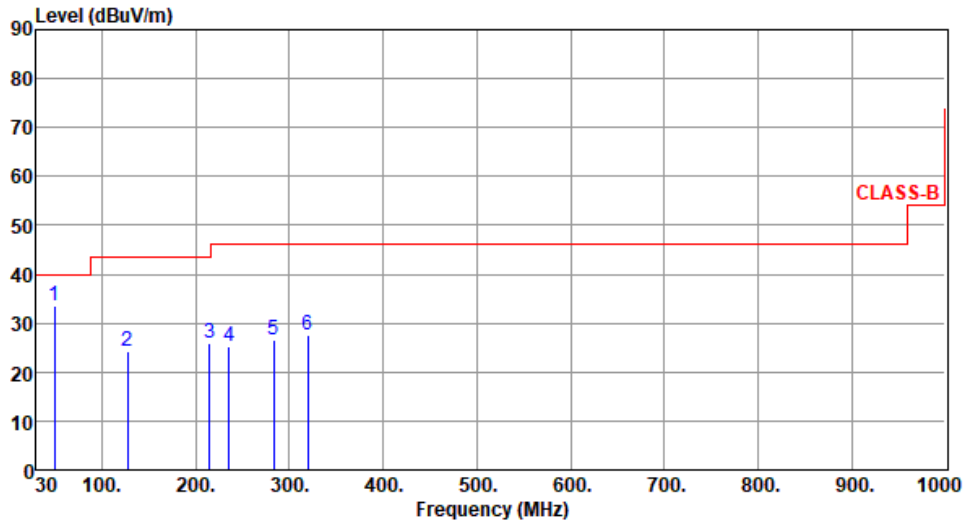
Configuration 2: Model BT740-SC, ceramic Patch antenna, Y-plane

3.2.7 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2441						
Polarization	Horizontal								
<p>Test By :Brad Wu Temperature(°C):25 Humidity(%):66</p>									
 <p>The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (30 to 1000). A red line represents the CLASS-B limit, which is constant at 40 dBuV/m from 30 MHz to 100 MHz, then steps up to 45 dBuV/m from 100 MHz to 1000 MHz. Six blue vertical lines represent emission peaks, labeled 1 through 6, with their respective frequencies and levels listed in the table below.</p>									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	143.49	27.38	43.50	-16.12	36.46	-9.08	Peak	---	---
2	215.27	29.12	43.50	-14.38	41.12	-12.00	Peak	---	---
3	235.64	29.06	46.00	-16.94	39.97	-10.91	Peak	---	---
4	263.77	31.51	46.00	-14.49	41.09	-9.58	Peak	---	---
5	299.66	31.32	46.00	-14.68	39.54	-8.22	Peak	---	---
6	320.03	32.55	46.00	-13.45	40.12	-7.57	Peak	---	---
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m) *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.</p>									

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%) :66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	49.40	33.64	40.00	-6.36	42.22	-8.58	Peak	---	---
2	127.00	24.29	43.50	-19.21	34.33	-10.04	Peak	---	---
3	215.27	26.06	43.50	-17.44	38.06	-12.00	Peak	---	---
4	235.64	25.28	46.00	-20.72	36.19	-10.91	Peak	---	---
5	283.17	26.66	46.00	-19.34	35.35	-8.69	Peak	---	---
6	320.03	27.40	46.00	-18.60	34.97	-7.57	Peak	---	---

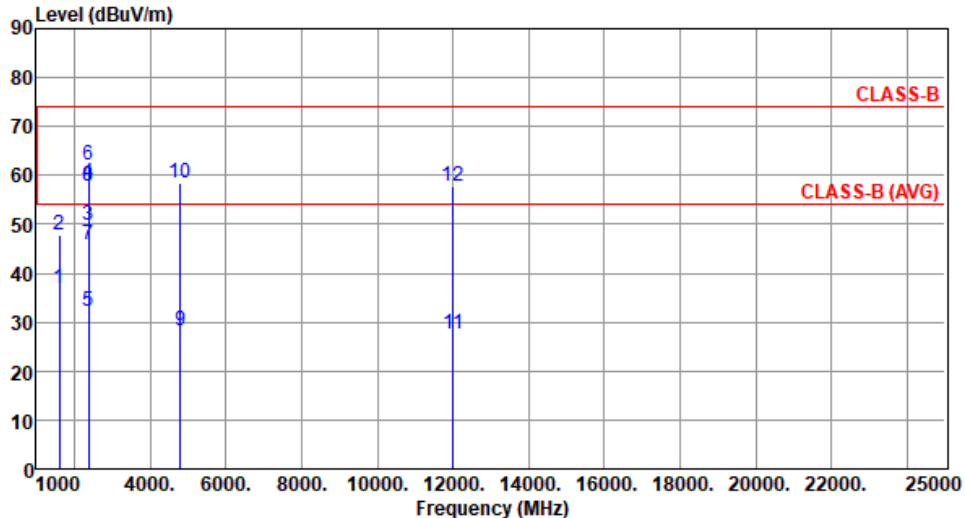
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*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.

3.2.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

Modulation	GFSK	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):24 Humidity(%):64									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	36.70	54.00	-17.30	43.49	-6.79	Average	266	6
2	1601.00	47.75	74.00	-26.25	54.54	-6.79	Peak	266	6
3	2370.00	49.69	54.00	-4.31	52.46	-2.77	Average	266	6
4	2370.00	58.31	74.00	-15.69	61.08	-2.77	Peak	266	6
5	2386.00	32.15	54.00	-21.85	34.93	-2.78	Average	289	22
6	2386.00	62.25	74.00	-11.75	65.03	-2.78	Peak	289	22
7	2390.00	45.73	54.00	-8.27	48.52	-2.79	Average	289	22
8	2390.00	57.77	74.00	-16.23	60.56	-2.79	Peak	289	22
9	4804.00	28.21	54.00	-25.79	24.71	3.50	Average	242	132
10	4804.00	58.31	74.00	-15.69	54.81	3.50	Peak	242	132
11	12010.00	27.71	54.00	-26.29	13.44	14.27	Average	100	308
12	12010.00	57.81	74.00	-16.19	43.54	14.27	Peak	100	308

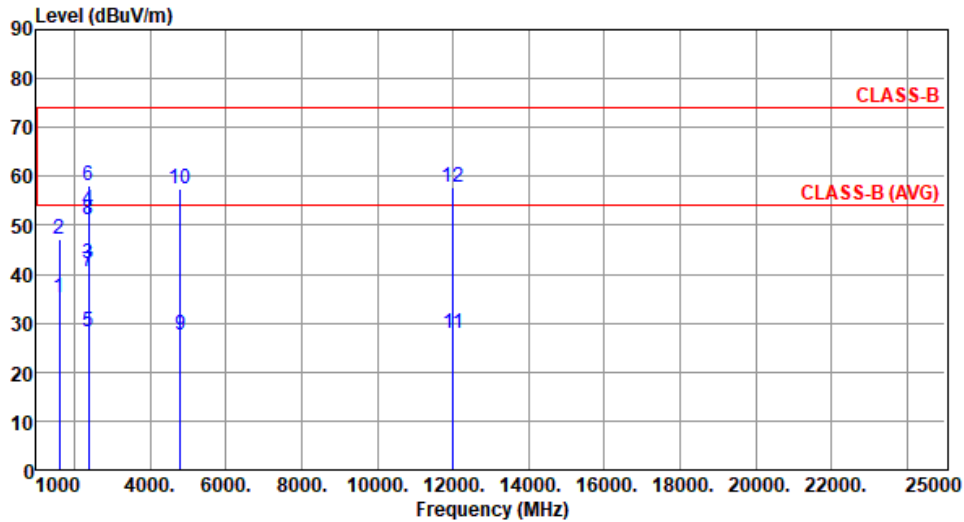
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	35.35	54.00	-18.65	42.14	-6.79	Average	100	216
2	1601.00	47.10	74.00	-26.90	53.89	-6.79	Peak	100	216
3	2370.00	42.05	54.00	-11.95	44.82	-2.77	Average	100	213
4	2370.00	53.11	74.00	-20.89	55.88	-2.77	Peak	100	213
5	2386.00	28.15	54.00	-25.85	30.93	-2.78	Average	100	213
6	2386.00	58.25	74.00	-15.75	61.03	-2.78	Peak	100	213
7	2390.00	40.36	54.00	-13.64	43.15	-2.79	Average	100	213
8	2390.00	51.17	74.00	-22.83	53.96	-2.79	Peak	100	213
9	4804.00	27.52	54.00	-26.48	24.02	3.50	Average	105	36
10	4804.00	57.62	74.00	-16.38	54.12	3.50	Peak	105	36
11	12010.00	27.81	54.00	-26.19	13.54	14.27	Average	100	113
12	12010.00	57.91	74.00	-16.09	43.64	14.27	Peak	100	113

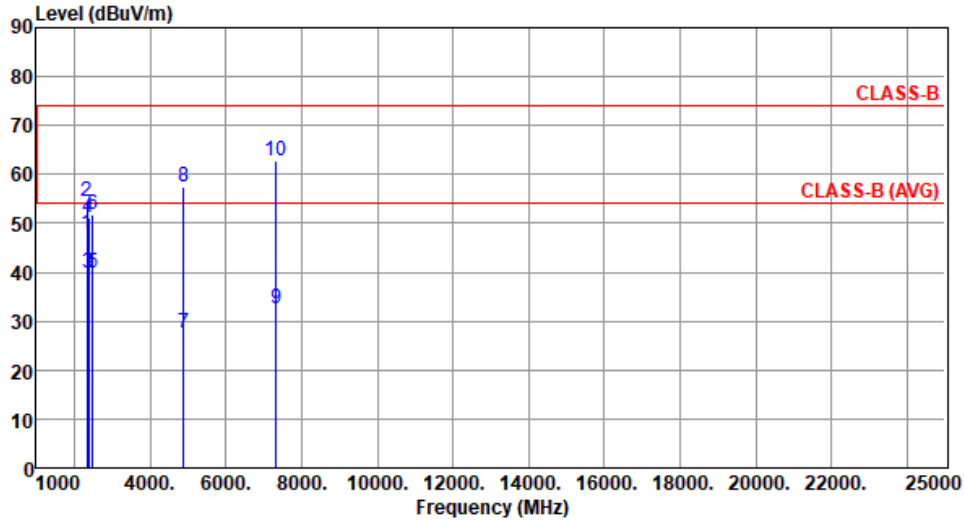
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	47.71	54.00	-6.29	50.46	-2.75	Average	350	16
2	2345.00	54.49	74.00	-19.51	57.24	-2.75	Peak	350	16
3	2390.00	39.71	54.00	-14.29	42.50	-2.79	Average	350	16
4	2390.00	51.02	74.00	-22.98	53.81	-2.79	Peak	350	16
5	2483.50	39.94	54.00	-14.06	42.68	-2.74	Average	350	16
6	2483.50	51.79	74.00	-22.21	54.53	-2.74	Peak	350	16
7	4882.00	27.48	54.00	-26.52	24.01	3.47	Average	256	335
8	4882.00	57.58	74.00	-16.42	54.11	3.47	Peak	256	335
9	7323.00	32.68	54.00	-21.32	23.65	9.03	Average	206	301
10	7323.00	62.78	74.00	-11.22	53.75	9.03	Peak	206	301

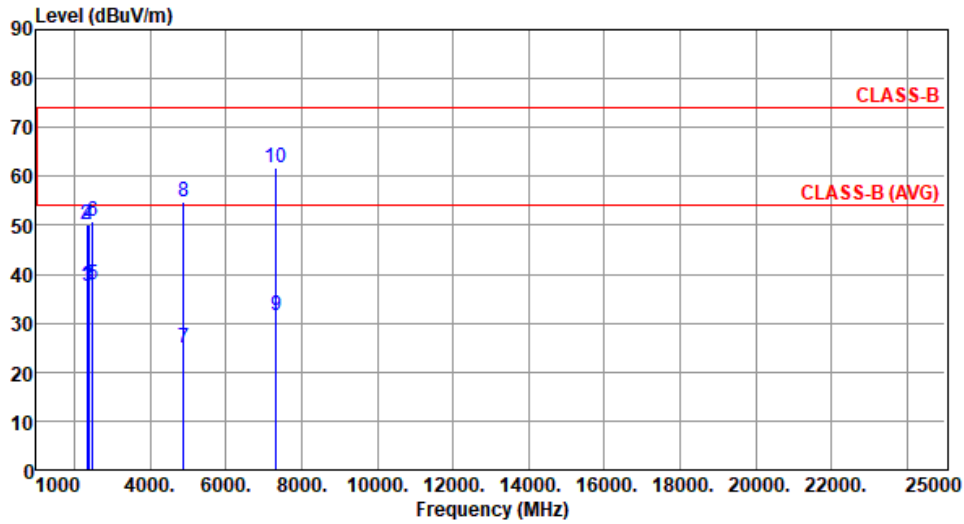
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	37.47	54.00	-16.53	40.22	-2.75	Average	114	198
2	2345.00	50.14	74.00	-23.86	52.89	-2.75	Peak	114	198
3	2390.00	37.57	54.00	-16.43	40.36	-2.79	Average	114	198
4	2390.00	50.05	74.00	-23.95	52.84	-2.79	Peak	114	198
5	2483.50	37.77	54.00	-16.23	40.51	-2.74	Average	114	198
6	2483.50	50.95	74.00	-23.05	53.69	-2.74	Peak	114	198
7	4882.00	24.80	54.00	-29.20	21.33	3.47	Average	115	33
8	4882.00	54.90	74.00	-19.10	51.43	3.47	Peak	115	33
9	7323.00	31.57	54.00	-22.43	22.54	9.03	Average	212	51
10	7323.00	61.67	74.00	-12.33	52.64	9.03	Peak	212	51

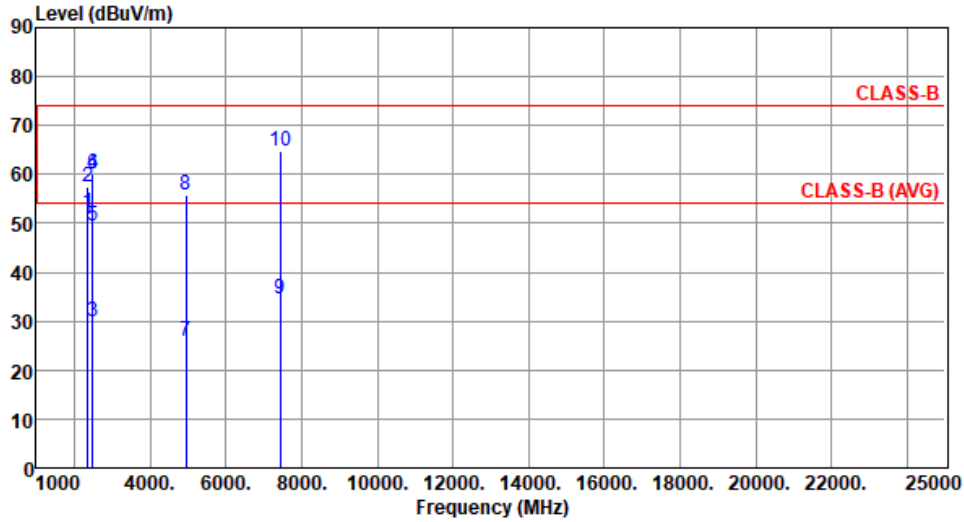
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	52.05	54.00	-1.95	54.80	-2.75	Average	335	13
2	2352.00	57.30	74.00	-16.70	60.05	-2.75	Peak	335	13
3	2483.50	30.02	54.00	-23.98	32.76	-2.74	Average	338	14
4	2483.50	60.12	74.00	-13.88	62.86	-2.74	Peak	338	14
5	2485.50	49.38	54.00	-4.62	52.12	-2.74	Average	338	14
6	2485.50	60.04	74.00	-13.96	62.78	-2.74	Peak	338	14
7	4960.00	25.74	54.00	-28.26	22.06	3.68	Average	242	343
8	4960.00	55.84	74.00	-18.16	52.16	3.68	Peak	242	343
9	7440.00	34.62	54.00	-19.38	25.64	8.98	Average	224	302
10	7440.00	64.72	74.00	-9.28	55.74	8.98	Peak	224	302

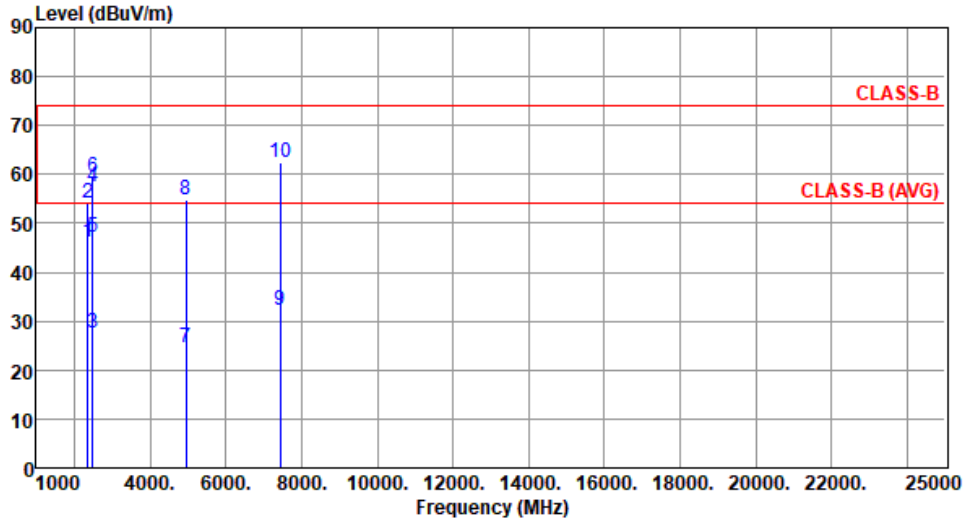
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



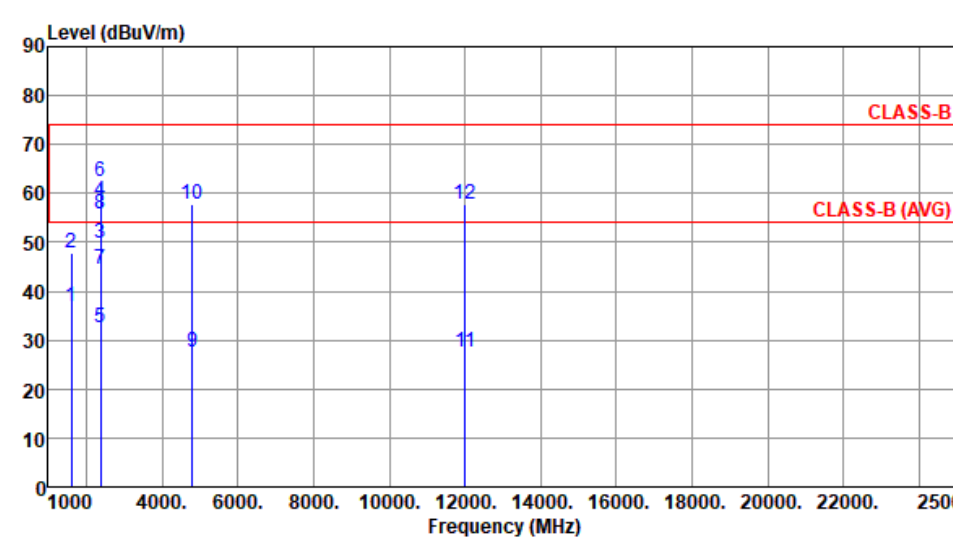
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	46.08	54.00	-7.92	48.83	-2.75	Average	110	156
2	2352.00	54.05	74.00	-19.95	56.80	-2.75	Peak	110	156
3	2483.50	27.51	54.00	-26.49	30.25	-2.74	Average	100	177
4	2483.50	57.61	74.00	-16.39	60.35	-2.74	Peak	100	177
5	2485.50	47.31	54.00	-6.69	50.05	-2.74	Average	100	177
6	2485.50	59.46	74.00	-14.54	62.20	-2.74	Peak	100	177
7	4960.00	24.58	54.00	-29.42	20.90	3.68	Average	116	41
8	4960.00	54.68	74.00	-19.32	51.00	3.68	Peak	116	41
9	7440.00	32.35	54.00	-21.65	23.37	8.98	Average	211	58
10	7440.00	62.45	74.00	-11.55	53.47	8.98	Peak	211	58

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

*Factor includes antenna factor , cable loss and amplifier gain

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

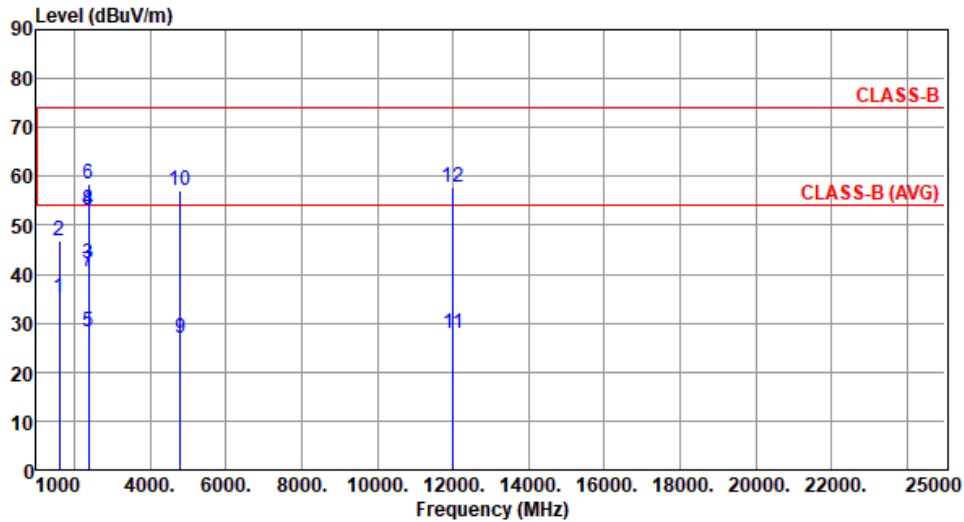
3.2.9 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

Modulation	8DPSK	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):24 Humidity(%):64									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	36.82	54.00	-17.18	43.61	-6.79	Average	265	9
2	1601.00	47.84	74.00	-26.16	54.63	-6.79	Peak	265	9
3	2370.00	49.87	54.00	-4.13	52.64	-2.77	Average	294	19
4	2370.00	58.45	74.00	-15.55	61.22	-2.77	Peak	294	19
5	2386.00	32.47	54.00	-21.53	35.25	-2.78	Average	294	19
6	2386.00	62.57	74.00	-11.43	65.35	-2.78	Peak	294	19
7	2390.00	44.37	54.00	-9.63	47.16	-2.79	Average	294	19
8	2390.00	55.69	74.00	-18.31	58.48	-2.79	Peak	294	19
9	4804.00	27.59	54.00	-26.41	24.09	3.50	Average	241	135
10	4804.00	57.69	74.00	-16.31	54.19	3.50	Peak	241	135
11	12010.00	27.55	54.00	-26.45	13.28	14.27	Average	100	311
12	12010.00	57.65	74.00	-16.35	43.38	14.27	Peak	100	311

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

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	35.29	54.00	-18.71	42.08	-6.79	Average	100	219
2	1601.00	46.98	74.00	-27.02	53.77	-6.79	Peak	100	219
3	2370.00	42.16	54.00	-11.84	44.93	-2.77	Average	100	215
4	2370.00	53.14	74.00	-20.86	55.91	-2.77	Peak	100	215
5	2386.00	28.38	54.00	-25.62	31.16	-2.78	Average	100	215
6	2386.00	58.48	74.00	-15.52	61.26	-2.78	Peak	100	215
7	2390.00	40.57	54.00	-13.43	43.36	-2.79	Average	100	215
8	2390.00	52.97	74.00	-21.03	55.76	-2.79	Peak	100	215
9	4804.00	26.88	54.00	-27.12	23.38	3.50	Average	104	39
10	4804.00	56.98	74.00	-17.02	53.48	3.50	Peak	104	39
11	12010.00	27.79	54.00	-26.21	13.52	14.27	Average	100	111
12	12010.00	57.89	74.00	-16.11	43.62	14.27	Peak	100	111

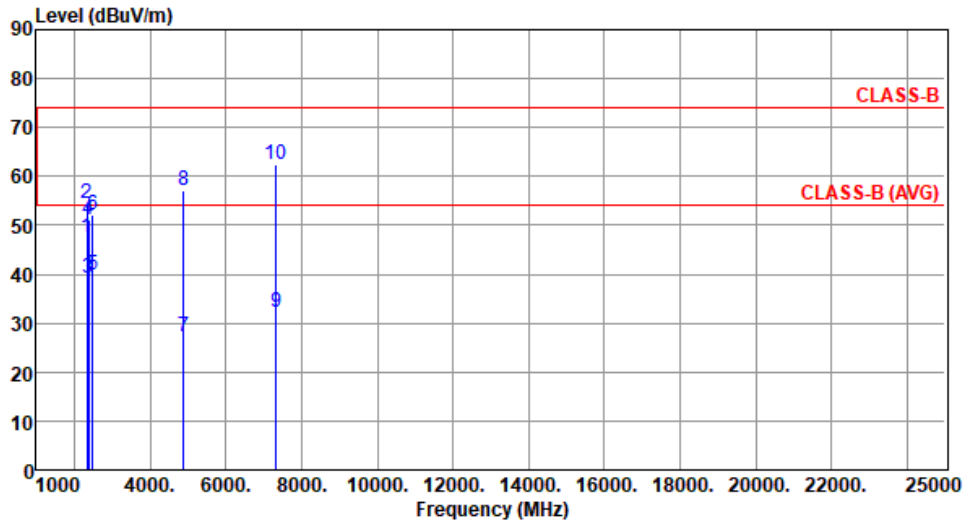
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	47.52	54.00	-6.48	50.27	-2.75	Average	352	15
2	2345.00	54.31	74.00	-19.69	57.06	-2.75	Peak	352	15
3	2390.00	39.26	54.00	-14.74	42.05	-2.79	Average	352	15
4	2390.00	51.29	74.00	-22.71	54.08	-2.79	Peak	352	15
5	2483.50	39.82	54.00	-14.18	42.56	-2.74	Average	352	15
6	2483.50	52.02	74.00	-21.98	54.76	-2.74	Peak	352	15
7	4882.00	27.14	54.00	-26.86	23.67	3.47	Average	251	339
8	4882.00	57.24	74.00	-16.76	53.77	3.47	Peak	251	339
9	7323.00	32.35	54.00	-21.65	23.32	9.03	Average	205	304
10	7323.00	62.45	74.00	-11.55	53.42	9.03	Peak	205	304

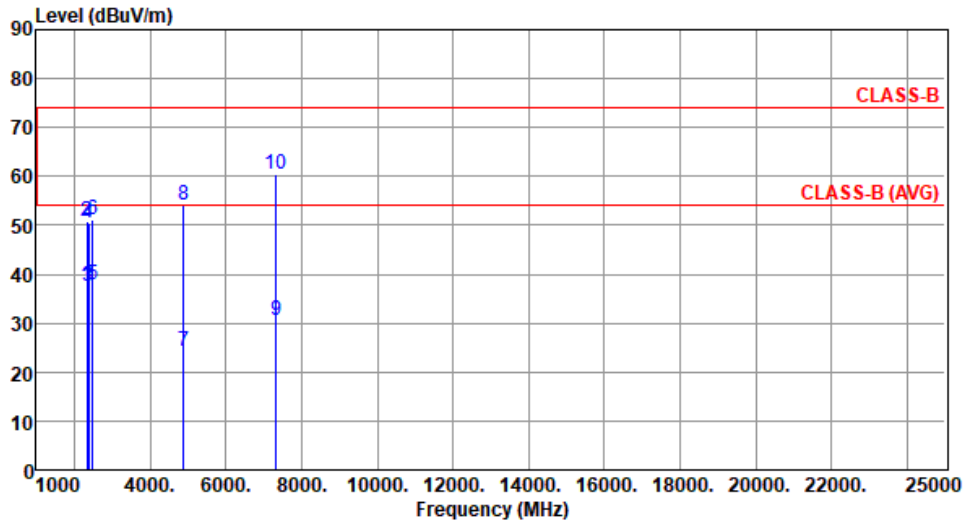
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	37.56	54.00	-16.44	40.31	-2.75	Average	112	199
2	2345.00	50.71	74.00	-23.29	53.46	-2.75	Peak	112	199
3	2390.00	37.66	54.00	-16.34	40.45	-2.79	Average	112	199
4	2390.00	50.47	74.00	-23.53	53.26	-2.79	Peak	112	199
5	2483.50	37.84	54.00	-16.16	40.58	-2.74	Average	112	199
6	2483.50	51.18	74.00	-22.82	53.92	-2.74	Peak	112	199
7	4882.00	24.14	54.00	-29.86	20.67	3.47	Average	116	35
8	4882.00	54.24	74.00	-19.76	50.77	3.47	Peak	116	35
9	7323.00	30.49	54.00	-23.51	21.46	9.03	Average	215	48
10	7323.00	60.59	74.00	-13.41	51.56	9.03	Peak	215	48

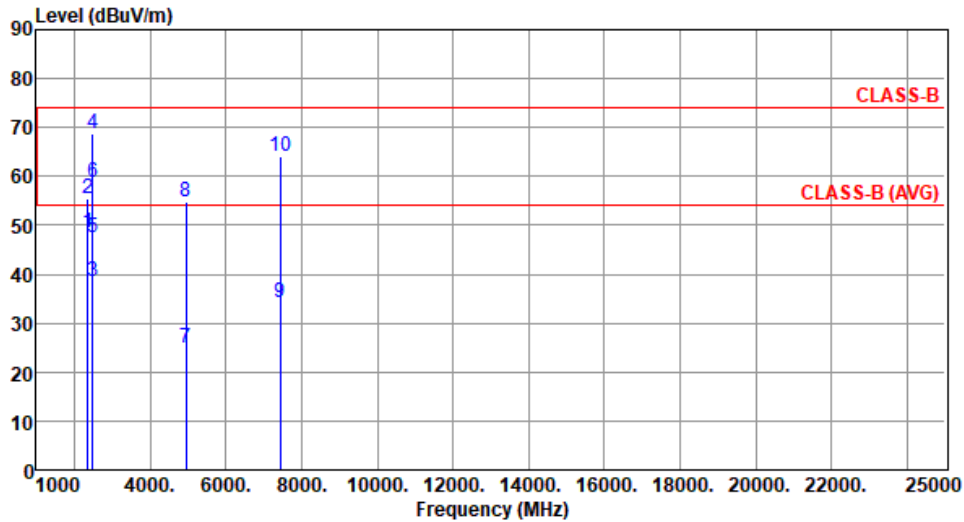
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	48.44	54.00	-5.56	51.19	-2.75	Average	339	13
2	2352.00	55.35	74.00	-18.65	58.10	-2.75	Peak	339	13
3	2483.50	38.57	54.00	-15.43	41.31	-2.74	Average	339	14
4	2483.50	68.67	74.00	-5.33	71.41	-2.74	Peak	339	14
5	2485.50	47.45	54.00	-6.55	50.19	-2.74	Average	339	14
6	2485.50	58.71	74.00	-15.29	61.45	-2.74	Peak	339	14
7	4960.00	24.81	54.00	-29.19	21.13	3.68	Average	245	341
8	4960.00	54.91	74.00	-19.09	51.23	3.68	Peak	245	341
9	7440.00	34.11	54.00	-19.89	25.13	8.98	Average	229	306
10	7440.00	64.21	74.00	-9.79	55.23	8.98	Peak	229	306

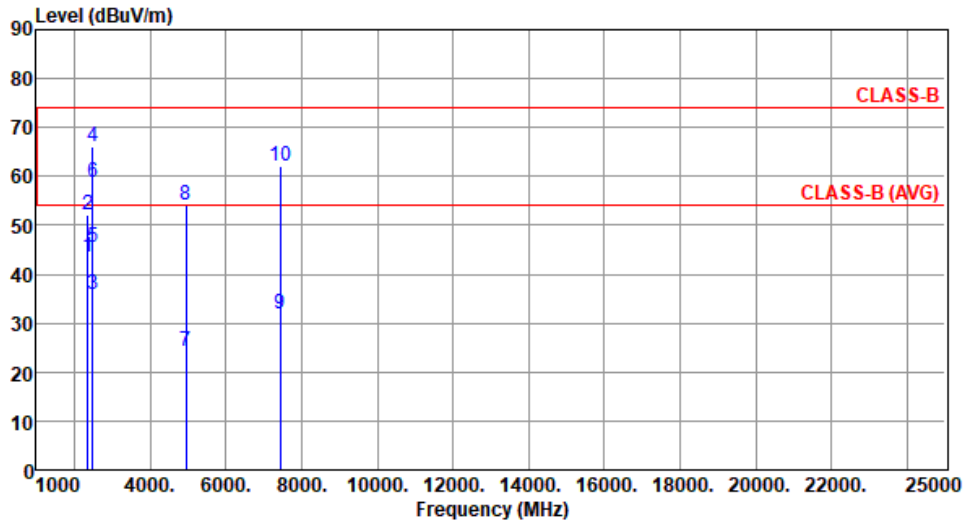
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	43.65	54.00	-10.35	46.40	-2.75	Average	110	158
2	2352.00	52.06	74.00	-21.94	54.81	-2.75	Peak	110	158
3	2483.50	36.01	54.00	-17.99	38.75	-2.74	Average	101	175
4	2483.50	66.11	74.00	-7.89	68.85	-2.74	Peak	101	175
5	2485.50	45.54	54.00	-8.46	48.28	-2.74	Average	101	175
6	2485.50	58.62	74.00	-15.38	61.36	-2.74	Peak	101	175
7	4960.00	24.15	54.00	-29.85	20.47	3.68	Average	115	39
8	4960.00	54.25	74.00	-19.75	50.57	3.68	Peak	115	39
9	7440.00	32.04	54.00	-21.96	23.06	8.98	Average	214	62
10	7440.00	62.14	74.00	-11.86	53.16	8.98	Peak	214	62

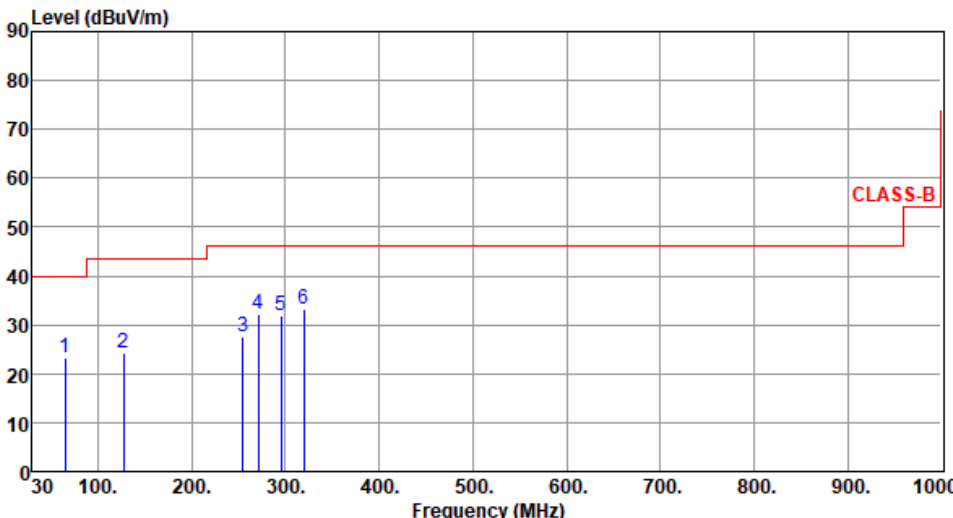
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

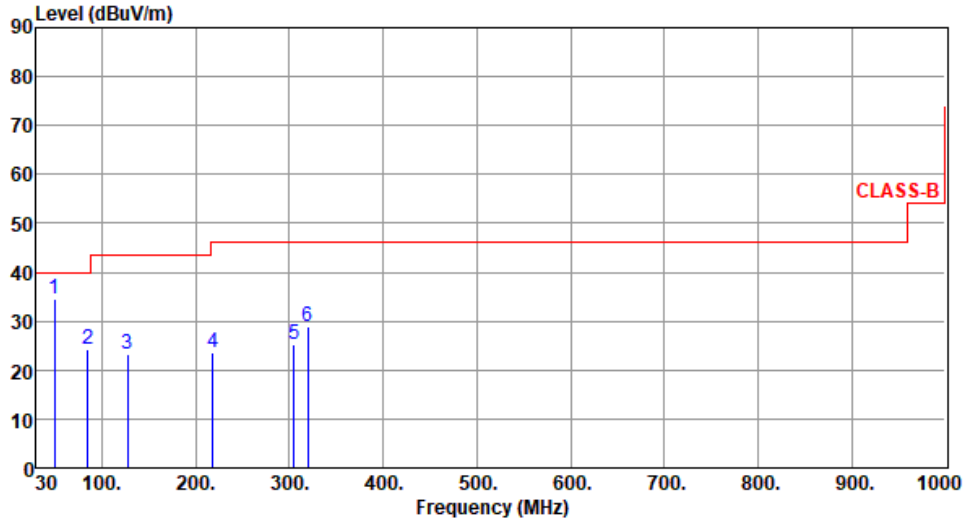
Configuration 3: Model BT740-SC, PCB antenna, Y-plane

3.2.10 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2441																																																																												
Polarization	Horizontal																																																																														
<p>Test By :Brad Wu Temperature(°C):25 Humidity(%):66</p>																																																																															
 <p>The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (30 to 1000). A red line represents the CLASS-B limit, which is constant at 40 dBuV/m from 30 MHz to 100 MHz, then steps up to 45 dBuV/m from 100 MHz to 1000 MHz. Six blue vertical lines represent emission peaks labeled 1 through 6, with their levels and frequencies listed in the table below.</p>																																																																															
	<table border="1"> <thead> <tr> <th></th> <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/m</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>64.92</td> <td>23.27</td> <td>40.00</td> <td>-16.73</td> <td>33.15</td> <td>-9.88</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>2</td> <td>127.00</td> <td>24.10</td> <td>43.50</td> <td>-19.40</td> <td>34.14</td> <td>-10.04</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3</td> <td>255.04</td> <td>27.67</td> <td>46.00</td> <td>-18.33</td> <td>37.60</td> <td>-9.93</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4</td> <td>271.53</td> <td>32.33</td> <td>46.00</td> <td>-13.67</td> <td>41.46</td> <td>-9.13</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5</td> <td>295.78</td> <td>31.75</td> <td>46.00</td> <td>-14.25</td> <td>40.05</td> <td>-8.30</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>6</td> <td>320.03</td> <td>33.35</td> <td>46.00</td> <td>-12.65</td> <td>40.92</td> <td>-7.57</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/m	Remark	ANT High cm	Turn Table deg	1	64.92	23.27	40.00	-16.73	33.15	-9.88	Peak	---	---	2	127.00	24.10	43.50	-19.40	34.14	-10.04	Peak	---	---	3	255.04	27.67	46.00	-18.33	37.60	-9.93	Peak	---	---	4	271.53	32.33	46.00	-13.67	41.46	-9.13	Peak	---	---	5	295.78	31.75	46.00	-14.25	40.05	-8.30	Peak	---	---	6	320.03	33.35	46.00	-12.65	40.92	-7.57	Peak	---	---								
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg																																																																						
1	64.92	23.27	40.00	-16.73	33.15	-9.88	Peak	---	---																																																																						
2	127.00	24.10	43.50	-19.40	34.14	-10.04	Peak	---	---																																																																						
3	255.04	27.67	46.00	-18.33	37.60	-9.93	Peak	---	---																																																																						
4	271.53	32.33	46.00	-13.67	41.46	-9.13	Peak	---	---																																																																						
5	295.78	31.75	46.00	-14.25	40.05	-8.30	Peak	---	---																																																																						
6	320.03	33.35	46.00	-12.65	40.92	-7.57	Peak	---	---																																																																						
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m) *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.</p>																																																																															

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	49.40	34.56	40.00	-5.44	43.14	-8.58	Peak	---	---
2	85.29	24.26	40.00	-15.74	38.77	-14.51	Peak	---	---
3	127.00	23.20	43.50	-20.30	33.24	-10.04	Peak	---	---
4	218.18	23.71	46.00	-22.29	35.71	-12.00	Peak	---	---
5	304.51	25.34	46.00	-20.66	33.45	-8.11	Peak	---	---
6	320.03	28.95	46.00	-17.05	36.52	-7.57	Peak	---	---

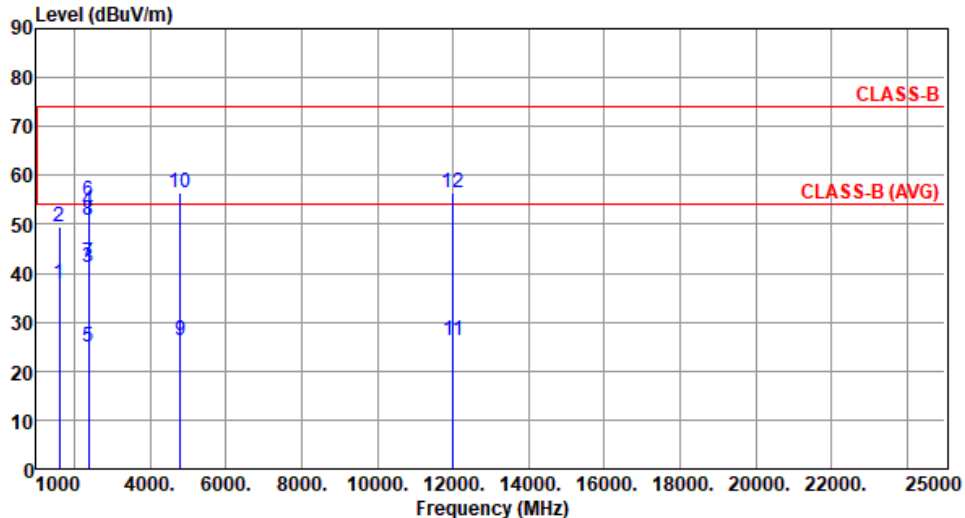
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*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.

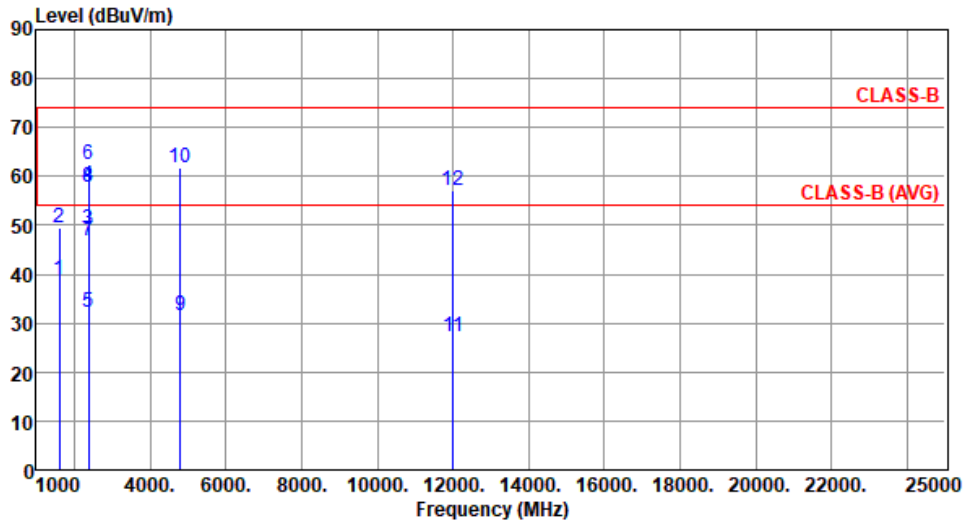
3.2.11 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

Modulation	GFSK	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):24 Humidity(%):64									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	37.98	54.00	-16.02	44.77	-6.79	Average	318	8
2	1601.00	49.33	74.00	-24.67	56.12	-6.79	Peak	318	8
3	2370.00	41.25	54.00	-12.75	44.02	-2.77	Average	318	38
4	2370.00	52.84	74.00	-21.16	55.61	-2.77	Peak	318	38
5	2386.00	24.86	54.00	-29.14	27.64	-2.78	Average	318	38
6	2386.00	54.96	74.00	-19.04	57.74	-2.78	Peak	318	38
7	2390.00	42.33	54.00	-11.67	45.12	-2.79	Average	318	38
8	2390.00	50.77	74.00	-23.23	53.56	-2.79	Peak	318	38
9	4804.00	26.39	54.00	-27.61	22.89	3.50	Average	268	135
10	4804.00	56.49	74.00	-17.51	52.99	3.50	Peak	268	135
11	12010.00	26.38	54.00	-27.62	12.11	14.27	Average	100	55
12	12010.00	56.48	74.00	-17.52	42.21	14.27	Peak	100	55

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

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	38.73	54.00	-15.27	45.52	-6.79	Average	119	74
2	1601.00	49.62	74.00	-24.38	56.41	-6.79	Peak	119	74
3	2370.00	49.07	54.00	-4.93	51.84	-2.77	Average	100	105
4	2370.00	58.04	74.00	-15.96	60.81	-2.77	Peak	100	105
5	2386.00	32.36	54.00	-21.64	35.14	-2.78	Average	100	105
6	2386.00	62.46	74.00	-11.54	65.24	-2.78	Peak	100	105
7	2390.00	46.71	54.00	-7.29	49.50	-2.79	Average	100	105
8	2390.00	57.86	74.00	-16.14	60.65	-2.79	Peak	100	105
9	4804.00	31.54	54.00	-22.46	28.04	3.50	Average	100	152
10	4804.00	61.64	74.00	-12.36	58.14	3.50	Peak	100	152
11	12010.00	27.12	54.00	-26.88	12.85	14.27	Average	100	36
12	12010.00	57.22	74.00	-16.78	42.95	14.27	Peak	100	36

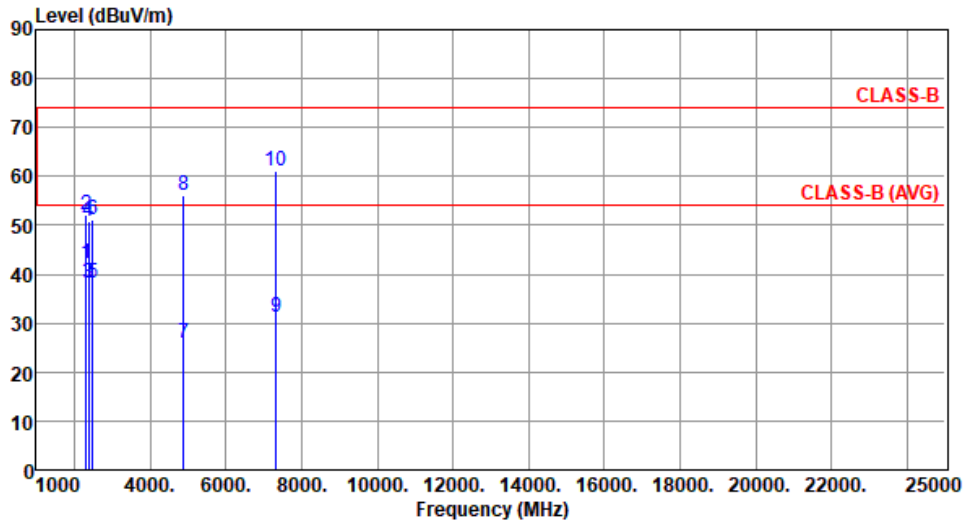
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2313.00	42.11	54.00	-11.89	44.77	-2.66	Average	309	36
2	2313.00	52.10	74.00	-21.90	54.76	-2.66	Peak	309	36
3	2390.00	38.07	54.00	-15.93	40.86	-2.79	Average	322	24
4	2390.00	50.86	74.00	-23.14	53.65	-2.79	Peak	322	24
5	2483.50	38.15	54.00	-15.85	40.89	-2.74	Average	322	24
6	2483.50	51.22	74.00	-22.78	53.96	-2.74	Peak	322	24
7	4882.00	25.86	54.00	-28.14	22.39	3.47	Average	275	122
8	4882.00	55.96	74.00	-18.04	52.49	3.47	Peak	275	122
9	7323.00	31.15	54.00	-22.85	22.12	9.03	Average	211	336
10	7323.00	61.25	74.00	-12.75	52.22	9.03	Peak	211	336

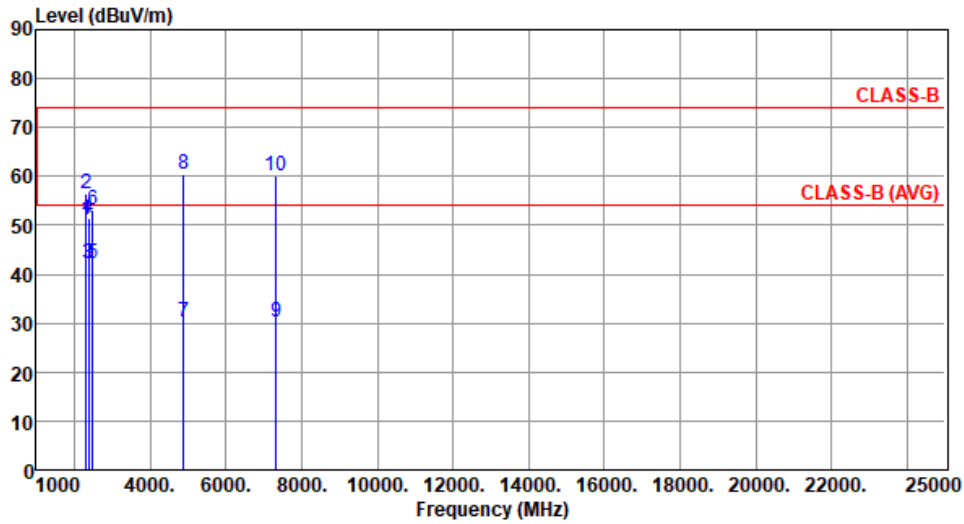
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2313.00	51.02	54.00	-2.98	53.68	-2.66	Average	128	101
2	2313.00	56.33	74.00	-17.67	58.99	-2.66	Peak	128	101
3	2390.00	42.23	54.00	-11.77	45.02	-2.79	Average	100	103
4	2390.00	51.59	74.00	-22.41	54.38	-2.79	Peak	100	103
5	2483.50	42.10	54.00	-11.90	44.84	-2.74	Average	100	103
6	2483.50	53.17	74.00	-20.83	55.91	-2.74	Peak	100	103
7	4882.00	30.27	54.00	-23.73	26.80	3.47	Average	110	151
8	4882.00	60.37	74.00	-13.63	56.90	3.47	Peak	110	151
9	7323.00	30.08	54.00	-23.92	21.05	9.03	Average	110	193
10	7323.00	60.18	74.00	-13.82	51.15	9.03	Peak	110	193

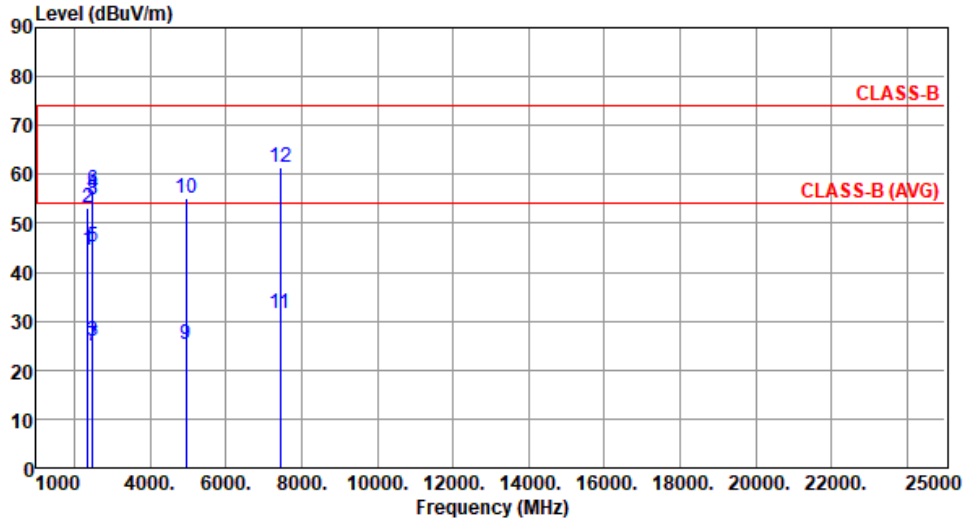
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64

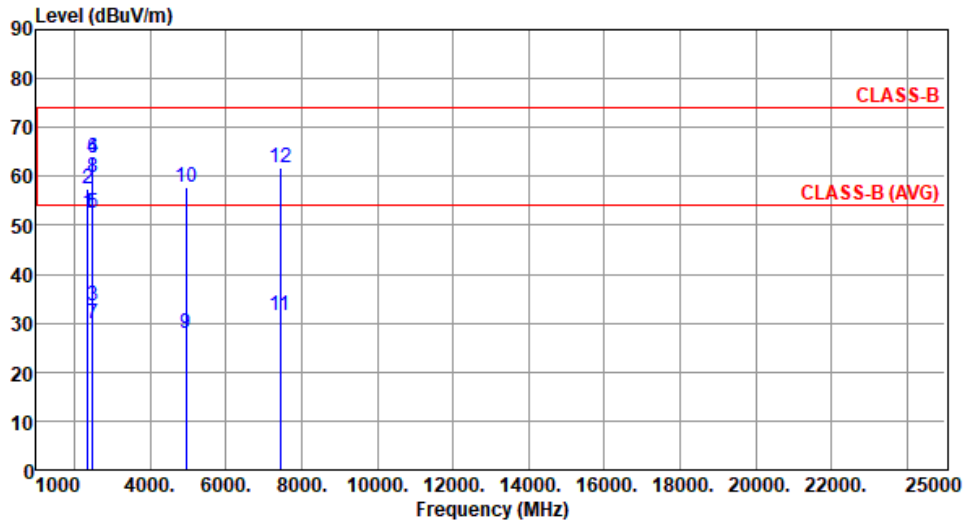


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	44.63	54.00	-9.37	47.38	-2.75	Average	309	33
2	2352.00	53.19	74.00	-20.81	55.94	-2.75	Peak	309	33
3	2483.50	26.02	54.00	-27.98	28.76	-2.74	Average	309	25
4	2483.50	56.12	74.00	-17.88	58.86	-2.74	Peak	309	25
5	2485.50	45.12	54.00	-8.88	47.86	-2.74	Average	309	25
6	2485.50	56.69	74.00	-17.31	59.43	-2.74	Peak	309	25
7	2496.00	24.84	54.00	-29.16	27.58	-2.74	Average	309	25
8	2496.00	54.94	74.00	-19.06	57.68	-2.74	Peak	309	25
9	4960.00	25.09	54.00	-28.91	21.41	3.68	Average	274	124
10	4960.00	55.19	74.00	-18.81	51.51	3.68	Peak	274	124
11	7440.00	31.49	54.00	-22.51	22.51	8.98	Average	212	338
12	7440.00	61.59	74.00	-12.41	52.61	8.98	Peak	212	338

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



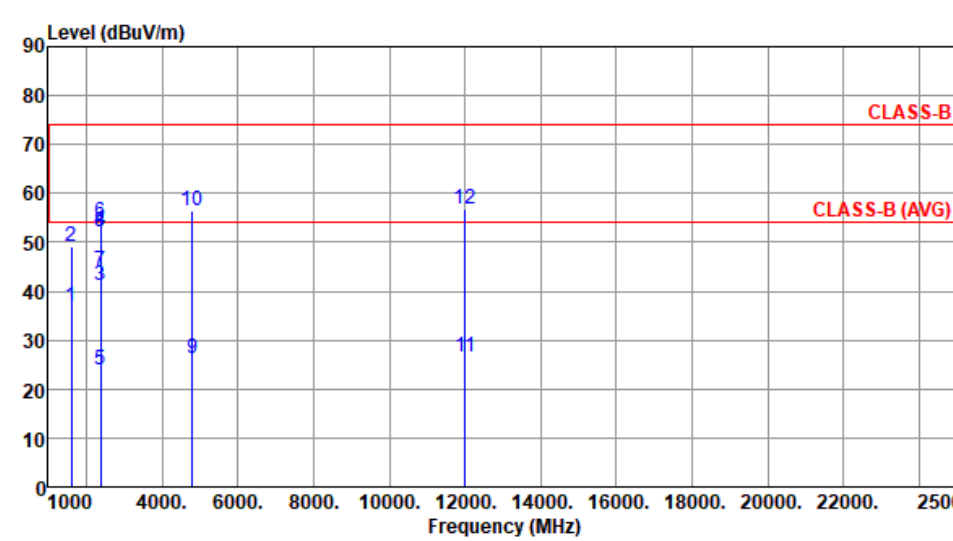
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	52.46	54.00	-1.54	55.21	-2.75	Average	110	103
2	2352.00	57.35	74.00	-16.65	60.10	-2.75	Peak	110	103
3	2483.50	33.57	54.00	-20.43	36.31	-2.74	Average	103	134
4	2483.50	63.67	74.00	-10.33	66.41	-2.74	Peak	103	134
5	2485.50	52.40	54.00	-1.60	55.14	-2.74	Average	103	134
6	2485.50	63.64	74.00	-10.36	66.38	-2.74	Peak	103	134
7	2496.00	29.80	54.00	-24.20	32.54	-2.74	Average	102	132
8	2496.00	59.90	74.00	-14.10	62.64	-2.74	Peak	102	132
9	4960.00	27.79	54.00	-26.21	24.11	3.68	Average	100	141
10	4960.00	57.89	74.00	-16.11	54.21	3.68	Peak	100	141
11	7440.00	31.51	54.00	-22.49	22.53	8.98	Average	100	193
12	7440.00	61.61	74.00	-12.39	52.63	8.98	Peak	100	193

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

*Factor includes antenna factor , cable loss and amplifier gain

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

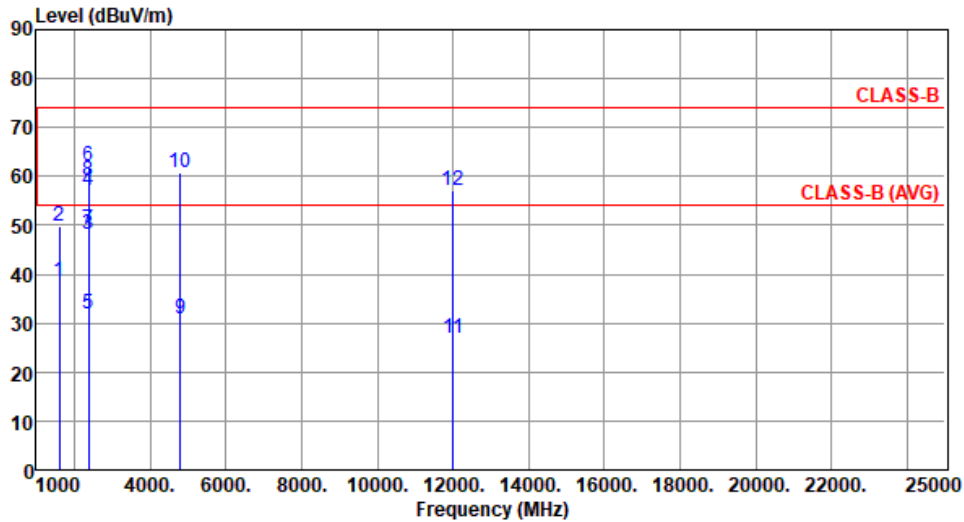
3.2.12 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

Modulation	8DPSK		Test Freq. (MHz)	2402					
Polarization	Horizontal								
Test By : Brad Wu		Temperature(°C): 24		Humidity(%): 64					
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	36.75	54.00	-17.25	43.54	-6.79	Average	320	7
2	1601.00	49.09	74.00	-24.91	55.88	-6.79	Peak	320	7
3	2370.00	41.22	54.00	-12.78	43.99	-2.77	Average	315	40
4	2370.00	52.56	74.00	-21.44	55.33	-2.77	Peak	315	40
5	2386.00	24.00	54.00	-30.00	26.78	-2.78	Average	315	40
6	2386.00	54.10	74.00	-19.90	56.88	-2.78	Peak	315	40
7	2390.00	44.09	54.00	-9.91	46.88	-2.79	Average	315	40
8	2390.00	52.07	74.00	-21.93	54.86	-2.79	Peak	315	40
9	4804.00	26.24	54.00	-27.76	22.74	3.50	Average	271	137
10	4804.00	56.34	74.00	-17.66	52.84	3.50	Peak	271	137
11	12010.00	26.56	54.00	-27.44	12.29	14.27	Average	100	60
12	12010.00	56.66	74.00	-17.34	42.39	14.27	Peak	100	60

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

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	38.54	54.00	-15.46	45.33	-6.79	Average	123	76
2	1601.00	49.98	74.00	-24.02	56.77	-6.79	Peak	123	76
3	2370.00	48.22	54.00	-5.78	50.99	-2.77	Average	100	104
4	2370.00	57.11	74.00	-16.89	59.88	-2.77	Peak	100	104
5	2386.00	31.98	54.00	-22.02	34.76	-2.78	Average	100	103
6	2386.00	62.08	74.00	-11.92	64.86	-2.78	Peak	100	103
7	2390.00	49.09	54.00	-4.91	51.88	-2.79	Average	100	101
8	2390.00	59.06	74.00	-14.94	61.85	-2.79	Peak	100	101
9	4804.00	30.73	54.00	-23.27	27.23	3.50	Average	100	155
10	4804.00	60.83	74.00	-13.17	57.33	3.50	Peak	100	155
11	12010.00	27.05	54.00	-26.95	12.78	14.27	Average	100	37
12	12010.00	57.15	74.00	-16.85	42.88	14.27	Peak	100	37

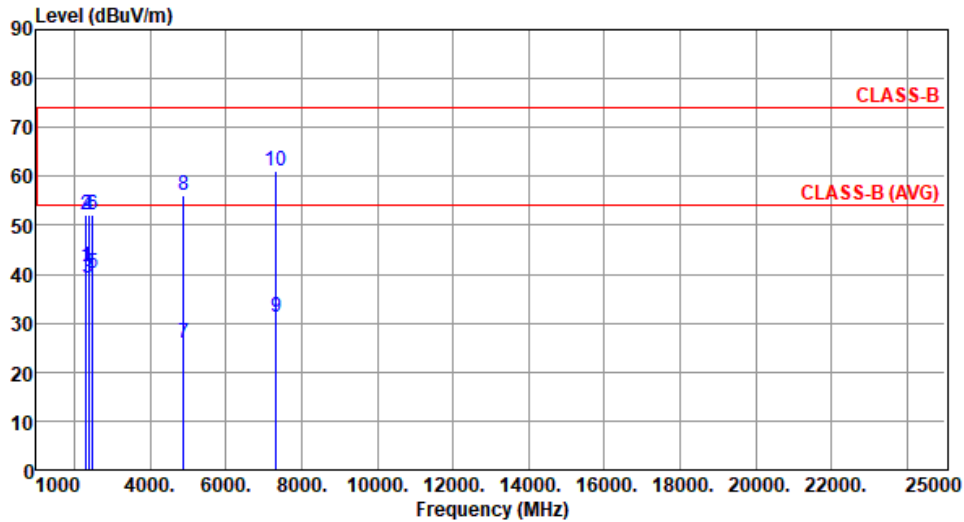
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2313.00	41.56	54.00	-12.44	44.22	-2.66	Average	313	34
2	2313.00	51.99	74.00	-22.01	54.65	-2.66	Peak	313	34
3	2390.00	39.09	54.00	-14.91	41.88	-2.79	Average	325	25
4	2390.00	52.08	74.00	-21.92	54.87	-2.79	Peak	325	25
5	2483.50	40.15	54.00	-13.85	42.89	-2.74	Average	325	25
6	2483.50	52.14	74.00	-21.86	54.88	-2.74	Peak	325	25
7	4882.00	26.02	54.00	-27.98	22.55	3.47	Average	277	127
8	4882.00	56.12	74.00	-17.88	52.65	3.47	Peak	277	127
9	7323.00	31.15	54.00	-22.85	22.12	9.03	Average	215	338
10	7323.00	61.25	74.00	-12.75	52.22	9.03	Peak	215	338

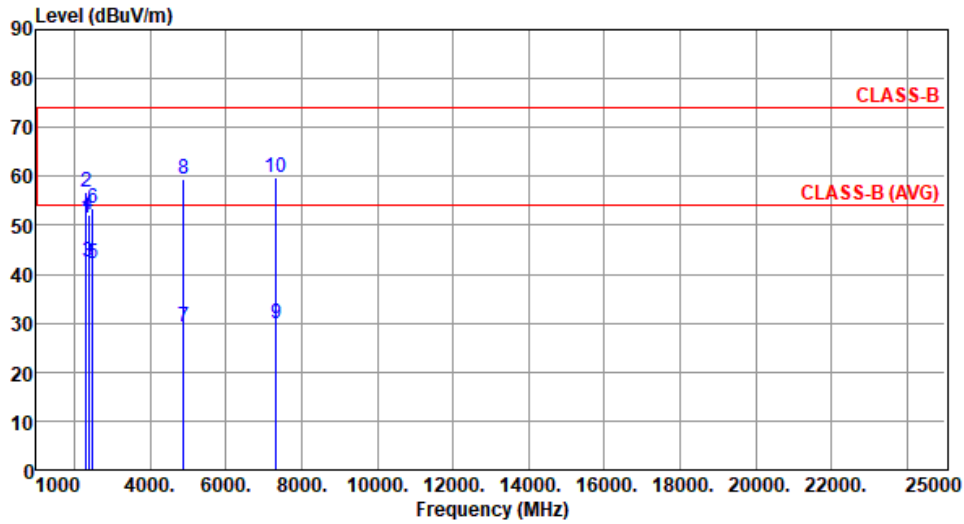
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2313.00	51.33	54.00	-2.67	53.99	-2.66	Average	132	99
2	2313.00	56.86	74.00	-17.14	59.52	-2.66	Peak	132	99
3	2390.00	42.58	54.00	-11.42	45.37	-2.79	Average	100	105
4	2390.00	52.06	74.00	-21.94	54.85	-2.79	Peak	100	105
5	2483.50	42.21	54.00	-11.79	44.95	-2.74	Average	100	105
6	2483.50	53.47	74.00	-20.53	56.21	-2.74	Peak	100	105
7	4882.00	29.34	54.00	-24.66	25.87	3.47	Average	105	148
8	4882.00	59.44	74.00	-14.56	55.97	3.47	Peak	105	148
9	7323.00	29.79	54.00	-24.21	20.76	9.03	Average	119	196
10	7323.00	59.89	74.00	-14.11	50.86	9.03	Peak	119	196

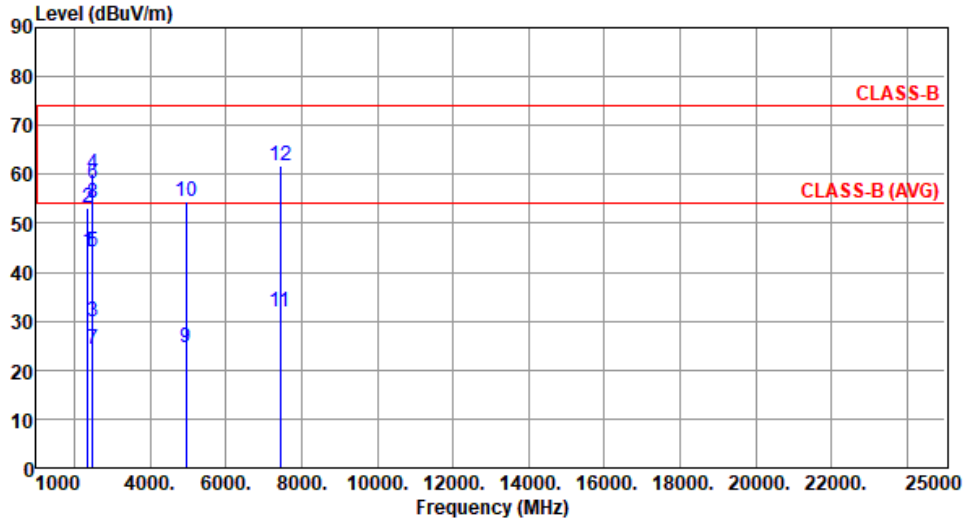
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	44.06	54.00	-9.94	46.81	-2.75	Average	315	39
2	2352.00	53.11	74.00	-20.89	55.86	-2.75	Peak	315	39
3	2483.50	30.03	54.00	-23.97	32.77	-2.74	Average	315	37
4	2483.50	60.13	74.00	-13.87	62.87	-2.74	Peak	315	37
5	2485.50	44.21	54.00	-9.79	46.95	-2.74	Average	315	37
6	2485.50	58.21	74.00	-15.79	60.95	-2.74	Peak	315	37
7	2496.00	24.11	54.00	-29.89	26.85	-2.74	Average	315	37
8	2496.00	54.21	74.00	-19.79	56.95	-2.74	Peak	315	37
9	4960.00	24.46	54.00	-29.54	20.78	3.68	Average	275	123
10	4960.00	54.56	74.00	-19.44	50.88	3.68	Peak	275	123
11	7440.00	31.83	54.00	-22.17	22.85	8.98	Average	213	341
12	7440.00	61.93	74.00	-12.07	52.95	8.98	Peak	213	341

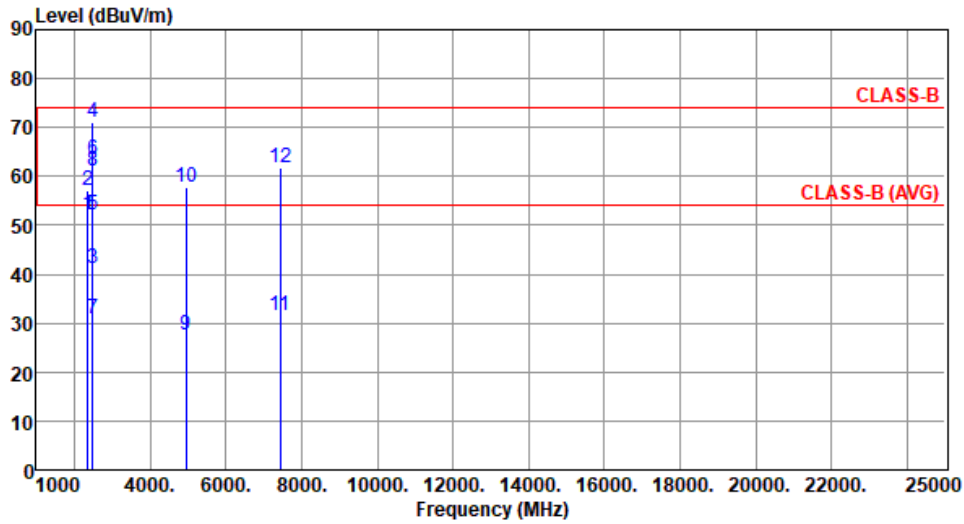
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	52.19	54.00	-1.81	54.94	-2.75	Average	102	105
2	2352.00	57.11	74.00	-16.89	59.86	-2.75	Peak	102	105
3	2483.50	41.10	54.00	-12.90	43.84	-2.74	Average	100	194
4	2483.50	71.20	74.00	-2.80	73.94	-2.74	Peak	100	194
5	2485.50	52.03	54.00	-1.97	54.77	-2.74	Average	104	137
6	2485.50	63.51	74.00	-10.49	66.25	-2.74	Peak	104	137
7	2496.00	31.04	54.00	-22.96	33.78	-2.74	Average	106	130
8	2496.00	61.14	74.00	-12.86	63.88	-2.74	Peak	106	130
9	4960.00	27.63	54.00	-26.37	23.95	3.68	Average	100	140
10	4960.00	57.73	74.00	-16.27	54.05	3.68	Peak	100	140
11	7440.00	31.65	54.00	-22.35	22.67	8.98	Average	100	190
12	7440.00	61.75	74.00	-12.25	52.77	8.98	Peak	100	190

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

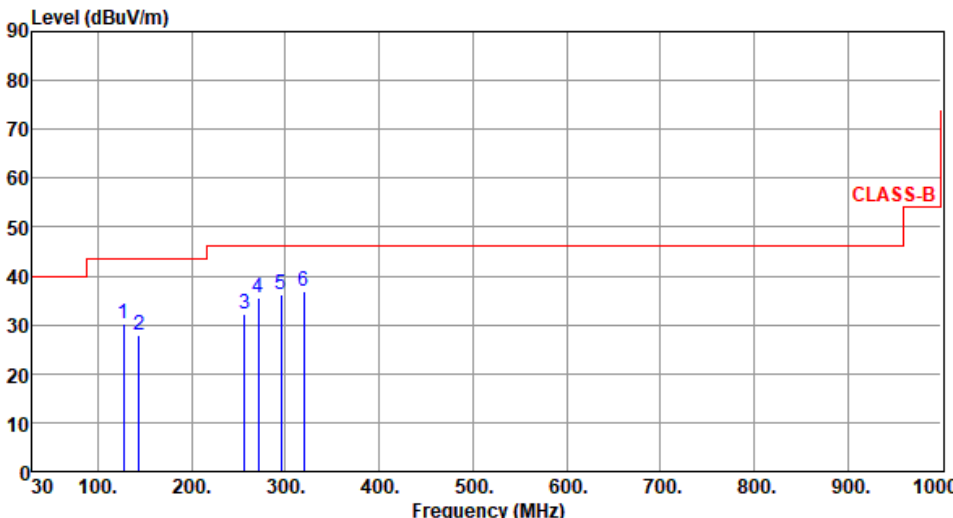
*Factor includes antenna factor , cable loss and amplifier gain

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

Configuration 4: Model BT740-SC, Dipole antenna, Y-plane

3.2.13 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal		
Test By :Brad Wu		Temperature(°C):25	Humidity(%):66



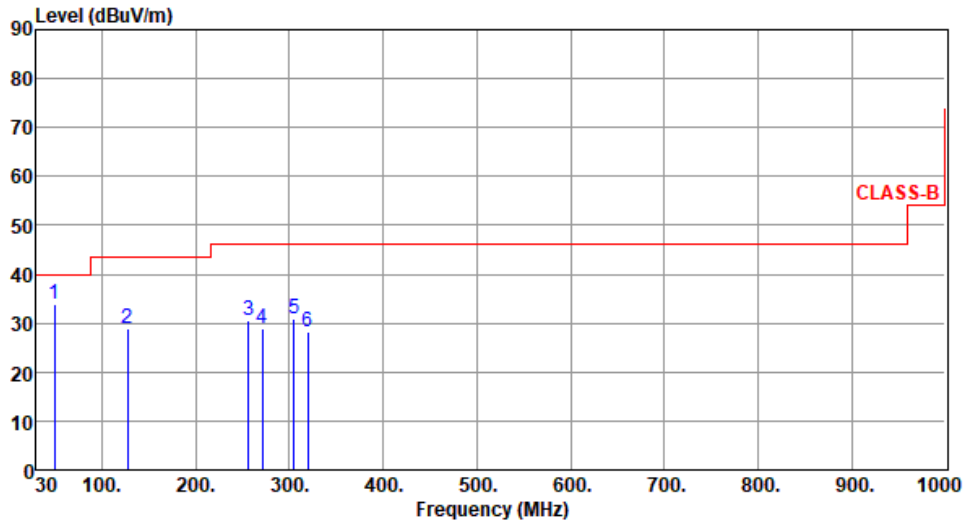
The graph displays the radiated unwanted emissions. The y-axis represents the level in dBuV/m, ranging from 0 to 90. The x-axis represents the frequency in MHz, ranging from 30 to 1000. A red line indicates the CLASS-B emission limit, which is constant at 40 dBuV/m from 30 MHz to 100 MHz, then steps up to 45 dBuV/m from 100 MHz to 1000 MHz. Six blue vertical lines represent measured emission peaks, labeled 1 through 6, with their respective frequencies and levels.

	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	127.00	30.34	43.50	-13.16	40.38	-10.04	Peak	---	---
2	143.49	27.94	43.50	-15.56	37.02	-9.08	Peak	---	---
3	256.01	32.07	46.00	-13.93	41.98	-9.91	Peak	---	---
4	271.53	35.40	46.00	-10.60	44.53	-9.13	Peak	---	---
5	295.78	36.11	46.00	-9.89	44.41	-8.30	Peak	---	---
6	320.03	36.84	46.00	-9.16	44.41	-7.57	Peak	---	---

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):25 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	49.40	34.04	40.00	-5.96	42.62	-8.58	Peak	---	---
2	127.00	28.74	43.50	-14.76	38.78	-10.04	Peak	---	---
3	256.01	30.72	46.00	-15.28	40.63	-9.91	Peak	---	---
4	271.53	28.87	46.00	-17.13	38.00	-9.13	Peak	---	---
5	304.51	30.89	46.00	-15.11	39.00	-8.11	Peak	---	---
6	320.03	28.16	46.00	-17.84	35.73	-7.57	Peak	---	---

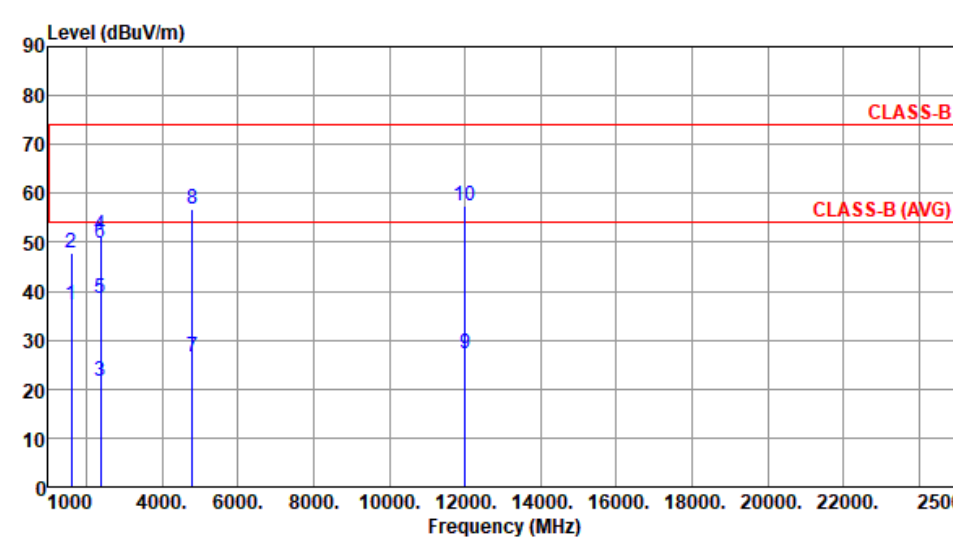
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*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.

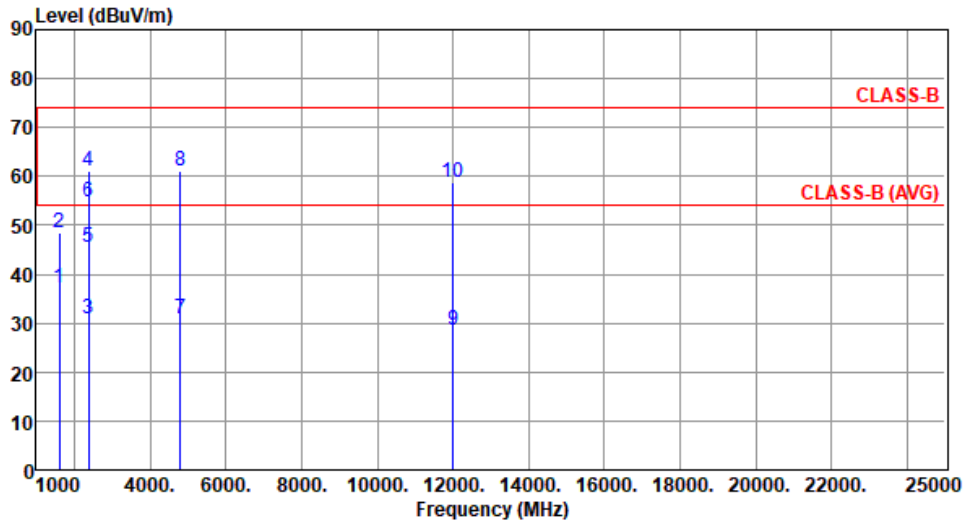
3.2.14 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

Modulation	GFSK	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):24 Humidity(%):64									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	37.26	54.00	-16.74	44.05	-6.79	Average	212	230
2	1601.00	47.93	74.00	-26.07	54.72	-6.79	Peak	212	230
3	2386.00	21.43	54.00	-32.57	24.21	-2.78	Average	186	308
4	2386.00	51.53	74.00	-22.47	54.31	-2.78	Peak	186	308
5	2390.00	38.56	54.00	-15.44	41.35	-2.79	Average	216	306
6	2390.00	49.71	74.00	-24.29	52.50	-2.79	Peak	216	306
7	4804.00	26.59	54.00	-27.41	23.09	3.50	Average	100	125
8	4804.00	56.69	74.00	-17.31	53.19	3.50	Peak	100	125
9	12010.00	27.38	54.00	-26.62	13.11	14.27	Average	100	89
10	12010.00	57.48	74.00	-16.52	43.21	14.27	Peak	100	89

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

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	37.29	54.00	-16.71	44.08	-6.79	Average	100	314
2	1601.00	48.40	74.00	-25.60	55.19	-6.79	Peak	100	314
3	2386.00	31.03	54.00	-22.97	33.81	-2.78	Average	105	219
4	2386.00	61.13	74.00	-12.87	63.91	-2.78	Peak	105	219
5	2390.00	45.52	54.00	-8.48	48.31	-2.79	Average	100	213
6	2390.00	54.82	74.00	-19.18	57.61	-2.79	Peak	100	213
7	4804.00	30.87	54.00	-23.13	27.37	3.50	Average	101	131
8	4804.00	60.97	74.00	-13.03	57.47	3.50	Peak	101	131
9	12010.00	28.55	54.00	-25.45	14.28	14.27	Average	100	102
10	12010.00	58.65	74.00	-15.35	44.38	14.27	Peak	100	102

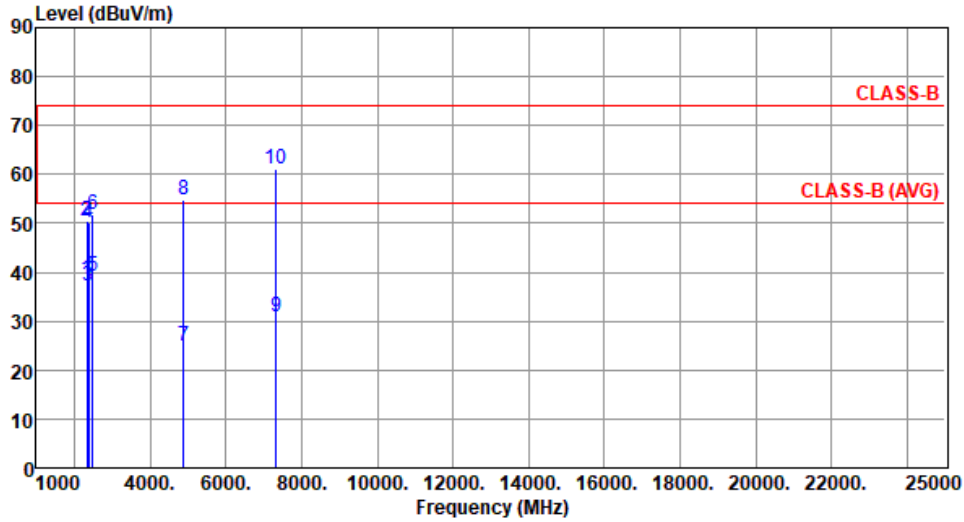
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	38.51	54.00	-15.49	41.26	-2.75	Average	203	296
2	2345.00	50.61	74.00	-23.39	53.36	-2.75	Peak	203	296
3	2390.00	37.29	54.00	-16.71	40.08	-2.79	Average	203	296
4	2390.00	50.19	74.00	-23.81	52.98	-2.79	Peak	203	296
5	2483.50	39.19	54.00	-14.81	41.93	-2.74	Average	203	296
6	2483.50	51.68	74.00	-22.32	54.42	-2.74	Peak	203	296
7	4882.00	24.86	54.00	-29.14	21.39	3.47	Average	100	115
8	4882.00	54.96	74.00	-19.04	51.49	3.47	Peak	100	115
9	7323.00	30.88	54.00	-23.12	21.85	9.03	Average	100	111
10	7323.00	60.98	74.00	-13.02	51.95	9.03	Peak	100	111

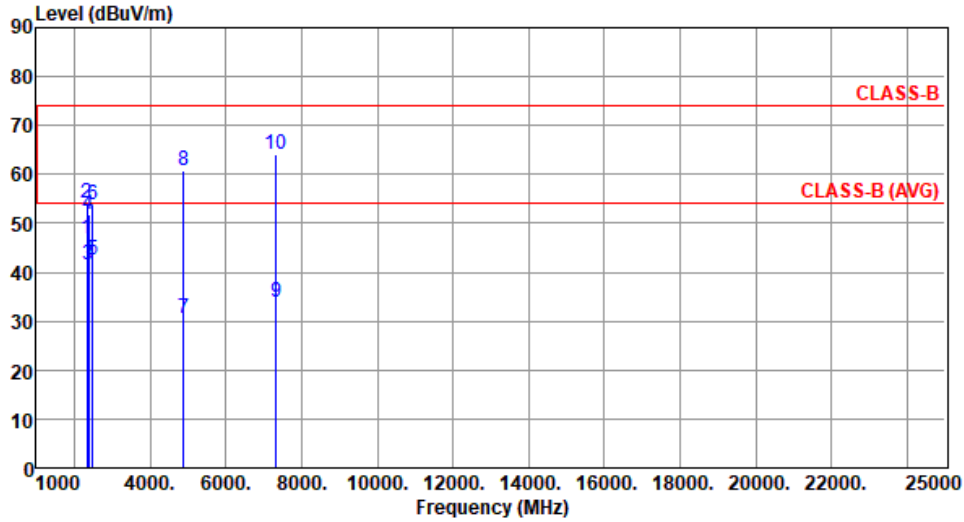
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	46.96	54.00	-7.04	49.71	-2.75	Average	117	218
2	2345.00	54.27	74.00	-19.73	57.02	-2.75	Peak	117	218
3	2390.00	41.47	54.00	-12.53	44.26	-2.79	Average	100	221
4	2390.00	51.75	74.00	-22.25	54.54	-2.79	Peak	100	221
5	2483.50	42.51	54.00	-11.49	45.25	-2.74	Average	100	221
6	2483.50	53.74	74.00	-20.26	56.48	-2.74	Peak	100	221
7	4882.00	30.52	54.00	-23.48	27.05	3.47	Average	100	130
8	4882.00	60.62	74.00	-13.38	57.15	3.47	Peak	100	130
9	7323.00	33.85	54.00	-20.15	24.82	9.03	Average	100	99
10	7323.00	63.95	74.00	-10.05	54.92	9.03	Peak	100	99

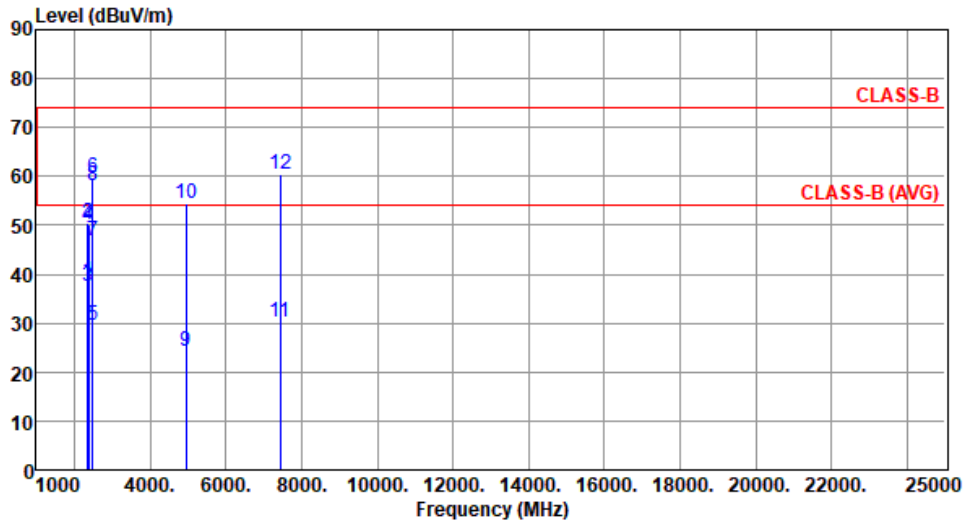
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64

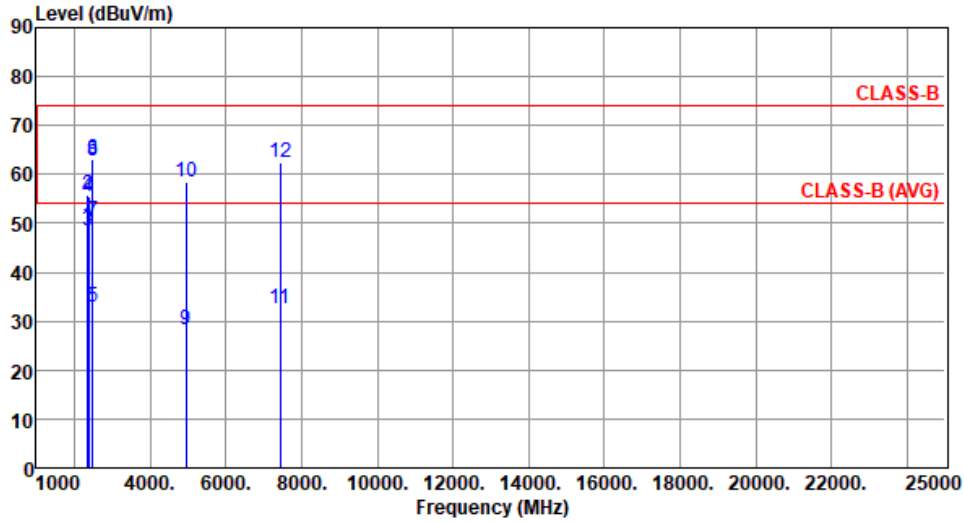


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	38.66	54.00	-15.34	41.41	-2.75	Average	202	298
2	2352.00	50.45	74.00	-23.55	53.20	-2.75	Peak	202	298
3	2384.00	37.40	54.00	-16.60	40.18	-2.78	Average	202	298
4	2384.00	50.05	74.00	-23.95	52.83	-2.78	Peak	202	298
5	2483.50	29.65	54.00	-24.35	32.39	-2.74	Average	203	298
6	2483.50	59.75	74.00	-14.25	62.49	-2.74	Peak	203	298
7	2485.50	46.72	54.00	-7.28	49.46	-2.74	Average	203	298
8	2485.50	57.98	74.00	-16.02	60.72	-2.74	Peak	203	298
9	4960.00	24.39	54.00	-29.61	20.71	3.68	Average	100	116
10	4960.00	54.49	74.00	-19.51	50.81	3.68	Peak	100	116
11	7440.00	30.32	54.00	-23.68	21.34	8.98	Average	100	108
12	7440.00	60.42	74.00	-13.58	51.44	8.98	Peak	100	108

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

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		

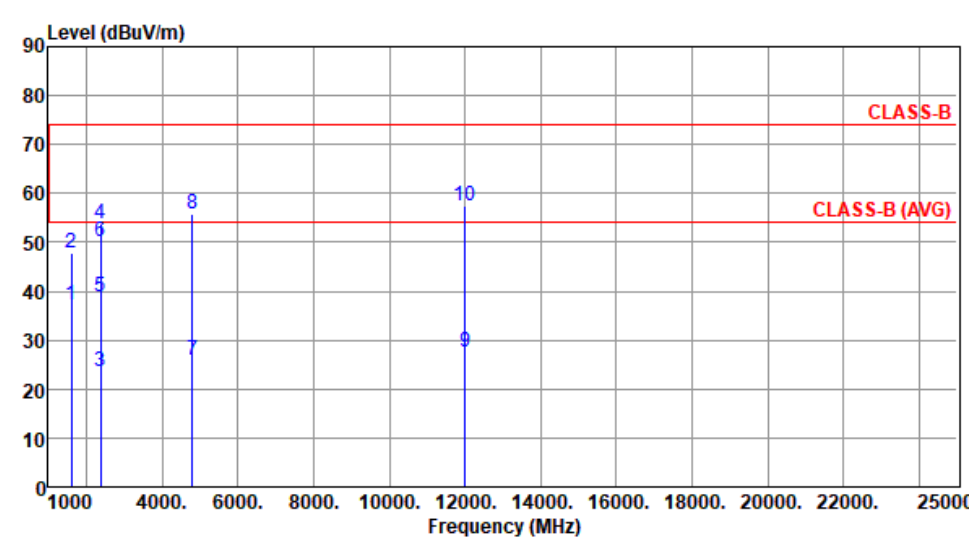
Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	49.58	54.00	-4.42	52.33	-2.75	Average	108	216
2	2352.00	55.71	74.00	-18.29	58.46	-2.75	Peak	108	216
3	2384.00	48.60	54.00	-5.40	51.38	-2.78	Average	104	218
4	2384.00	55.47	74.00	-18.53	58.25	-2.78	Peak	104	218
5	2483.50	33.04	54.00	-20.96	35.78	-2.74	Average	108	222
6	2483.50	63.14	74.00	-10.86	65.88	-2.74	Peak	108	222
7	2485.50	50.54	54.00	-3.46	53.28	-2.74	Average	108	222
8	2485.50	62.81	74.00	-11.19	65.55	-2.74	Peak	108	222
9	4960.00	28.30	54.00	-25.70	24.62	3.68	Average	100	124
10	4960.00	58.40	74.00	-15.60	54.72	3.68	Peak	100	124
11	7440.00	32.48	54.00	-21.52	23.50	8.98	Average	101	98
12	7440.00	62.58	74.00	-11.42	53.60	8.98	Peak	101	98

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

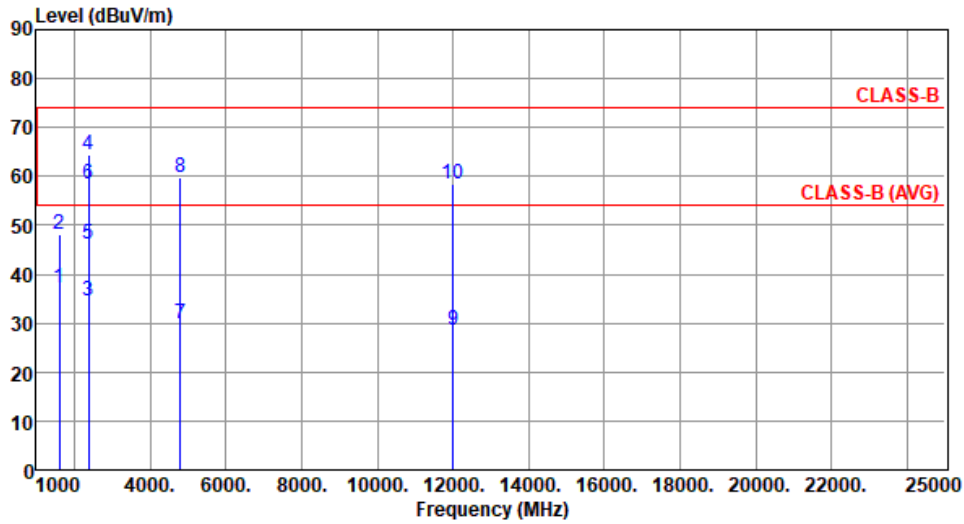
3.2.15 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

Modulation	8DPSK	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):24 Humidity(%):64									
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	1601.00	37.11	54.00	-16.89	43.90	-6.79	Average	214	232
2	1601.00	47.85	74.00	-26.15	54.64	-6.79	Peak	214	232
3	2386.00	23.59	54.00	-30.41	26.37	-2.78	Average	215	305
4	2386.00	53.69	74.00	-20.31	56.47	-2.78	Peak	215	305
5	2390.00	38.74	54.00	-15.26	41.53	-2.79	Average	215	305
6	2390.00	50.02	74.00	-23.98	52.81	-2.79	Peak	215	305
7	4804.00	25.79	54.00	-28.21	22.29	3.50	Average	100	126
8	4804.00	55.89	74.00	-18.11	52.39	3.50	Peak	100	126
9	12010.00	27.51	54.00	-26.49	13.24	14.27	Average	100	96
10	12010.00	57.61	74.00	-16.39	43.34	14.27	Peak	100	96

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

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1601.00	37.14	54.00	-16.86	43.93	-6.79	Average	100	316
2	1601.00	48.29	74.00	-25.71	55.08	-6.79	Peak	100	316
3	2386.00	34.41	54.00	-19.59	37.19	-2.78	Average	100	212
4	2386.00	64.51	74.00	-9.49	67.29	-2.78	Peak	100	212
5	2390.00	46.27	54.00	-7.73	49.06	-2.79	Average	100	212
6	2390.00	58.29	74.00	-15.71	61.08	-2.79	Peak	100	212
7	4804.00	29.76	54.00	-24.24	26.26	3.50	Average	102	132
8	4804.00	59.86	74.00	-14.14	56.36	3.50	Peak	102	132
9	12010.00	28.46	54.00	-25.54	14.19	14.27	Average	100	105
10	12010.00	58.56	74.00	-15.44	44.29	14.27	Peak	100	105

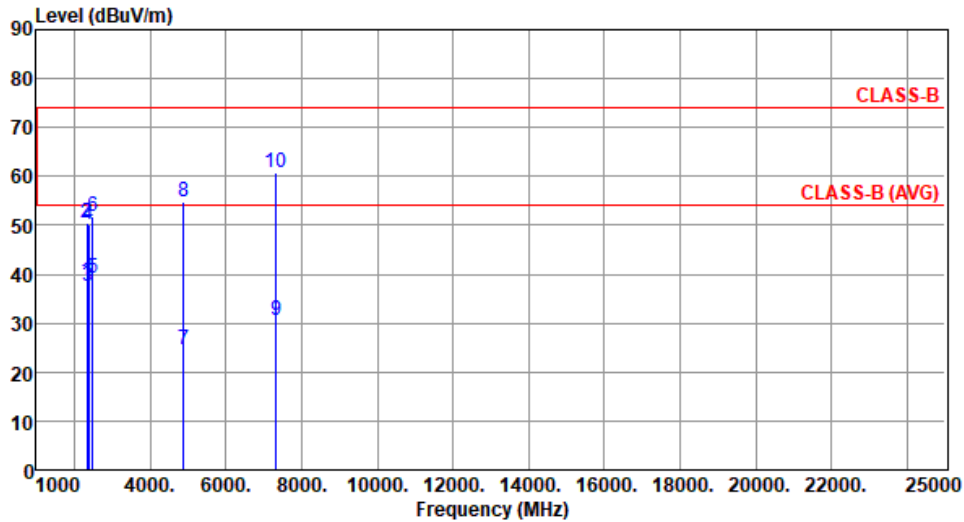
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	38.45	54.00	-15.55	41.20	-2.75	Average	202	298
2	2345.00	50.56	74.00	-23.44	53.31	-2.75	Peak	202	298
3	2390.00	37.41	54.00	-16.59	40.20	-2.79	Average	202	298
4	2390.00	50.24	74.00	-23.76	53.03	-2.79	Peak	202	298
5	2483.50	39.25	54.00	-14.75	41.99	-2.74	Average	202	298
6	2483.50	51.66	74.00	-22.34	54.40	-2.74	Peak	202	298
7	4882.00	24.66	54.00	-29.34	21.19	3.47	Average	100	118
8	4882.00	54.76	74.00	-19.24	51.29	3.47	Peak	100	118
9	7323.00	30.71	54.00	-23.29	21.68	9.03	Average	100	115
10	7323.00	60.81	74.00	-13.19	51.78	9.03	Peak	100	115

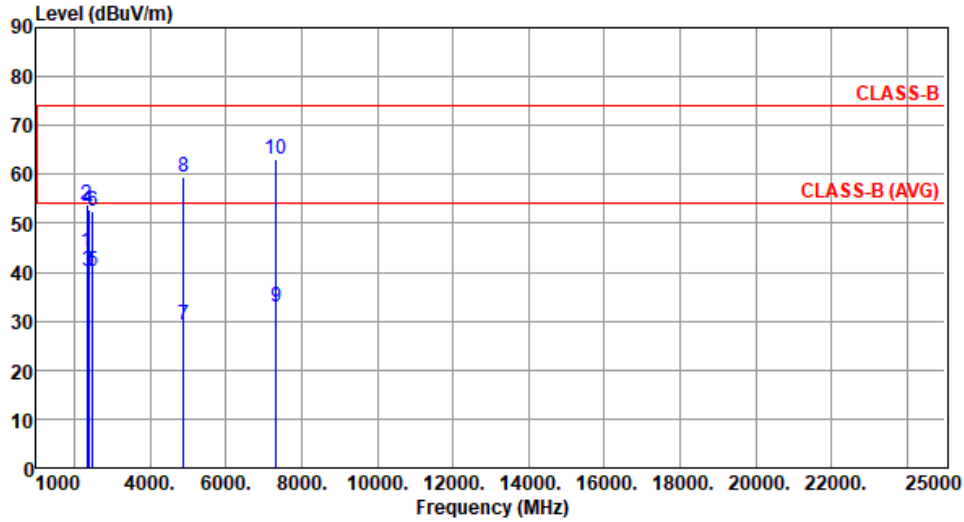
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2345.00	44.03	54.00	-9.97	46.78	-2.75	Average	114	216
2	2345.00	53.67	74.00	-20.33	56.42	-2.75	Peak	114	216
3	2390.00	40.15	54.00	-13.85	42.94	-2.79	Average	114	216
4	2390.00	52.77	74.00	-21.23	55.56	-2.79	Peak	114	216
5	2483.50	40.30	54.00	-13.70	43.04	-2.74	Average	114	216
6	2483.50	52.39	74.00	-21.61	55.13	-2.74	Peak	114	216
7	4882.00	29.36	54.00	-24.64	25.89	3.47	Average	100	131
8	4882.00	59.46	74.00	-14.54	55.99	3.47	Peak	100	131
9	7323.00	33.04	54.00	-20.96	24.01	9.03	Average	100	102
10	7323.00	63.14	74.00	-10.86	54.11	9.03	Peak	100	102

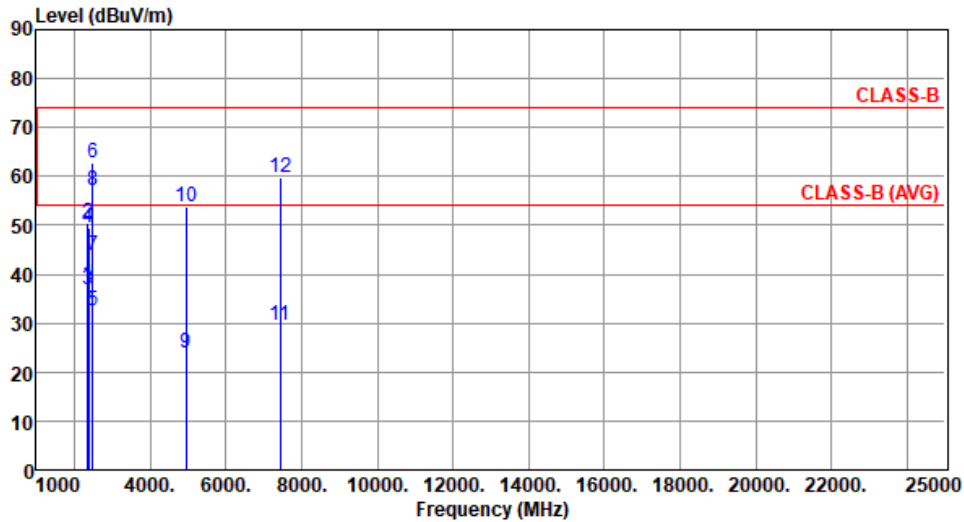
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	37.87	54.00	-16.13	40.62	-2.75	Average	202	309
2	2352.00	50.40	74.00	-23.60	53.15	-2.75	Peak	202	309
3	2384.00	37.02	54.00	-16.98	39.80	-2.78	Average	202	296
4	2384.00	49.51	74.00	-24.49	52.29	-2.78	Peak	202	296
5	2483.50	32.62	54.00	-21.38	35.36	-2.74	Average	202	296
6	2483.50	62.72	74.00	-11.28	65.46	-2.74	Peak	202	296
7	2485.50	43.88	54.00	-10.12	46.62	-2.74	Average	202	296
8	2485.50	57.00	74.00	-17.00	59.74	-2.74	Peak	202	296
9	4960.00	23.84	54.00	-30.16	20.16	3.68	Average	100	126
10	4960.00	53.94	74.00	-20.06	50.26	3.68	Peak	100	126
11	7440.00	29.72	54.00	-24.28	20.74	8.98	Average	100	108
12	7440.00	59.82	74.00	-14.18	50.84	8.98	Peak	100	108

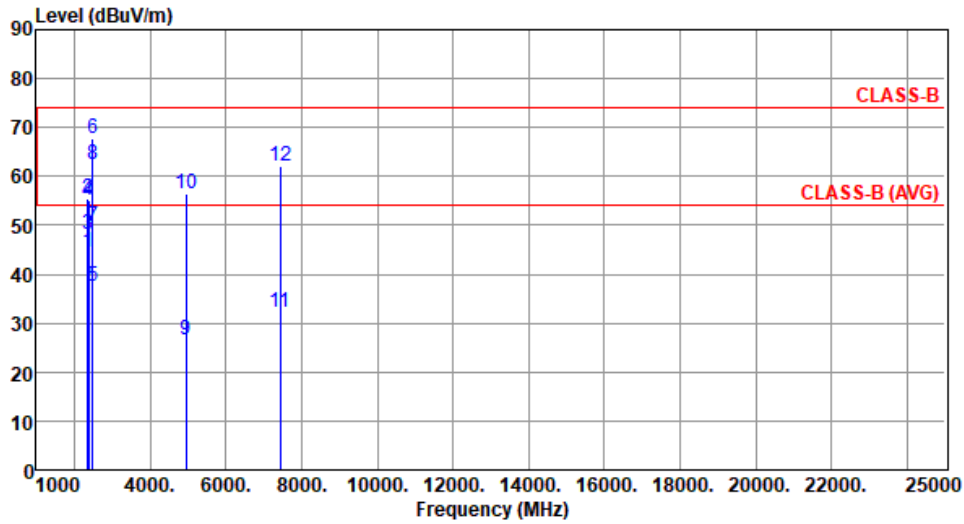
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%) :64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2352.00	44.52	54.00	-9.48	47.27	-2.75	Average	106	211
2	2352.00	55.32	74.00	-18.68	58.07	-2.75	Peak	106	211
3	2384.00	48.25	54.00	-5.75	51.03	-2.78	Average	108	221
4	2384.00	55.16	74.00	-18.84	57.94	-2.78	Peak	108	221
5	2483.50	37.60	54.00	-16.40	40.34	-2.74	Average	108	221
6	2483.50	67.70	74.00	-6.30	70.44	-2.74	Peak	108	221
7	2485.50	49.80	54.00	-4.20	52.54	-2.74	Average	108	221
8	2485.50	62.34	74.00	-11.66	65.08	-2.74	Peak	108	221
9	4960.00	26.43	54.00	-27.57	22.75	3.68	Average	100	126
10	4960.00	56.53	74.00	-17.47	52.85	3.68	Peak	100	126
11	7440.00	32.14	54.00	-21.86	23.16	8.98	Average	104	108
12	7440.00	62.24	74.00	-11.76	53.26	8.98	Peak	104	108

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

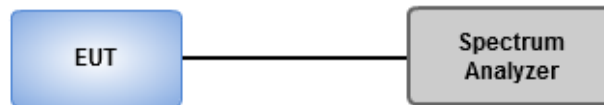
Reference level measurement

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

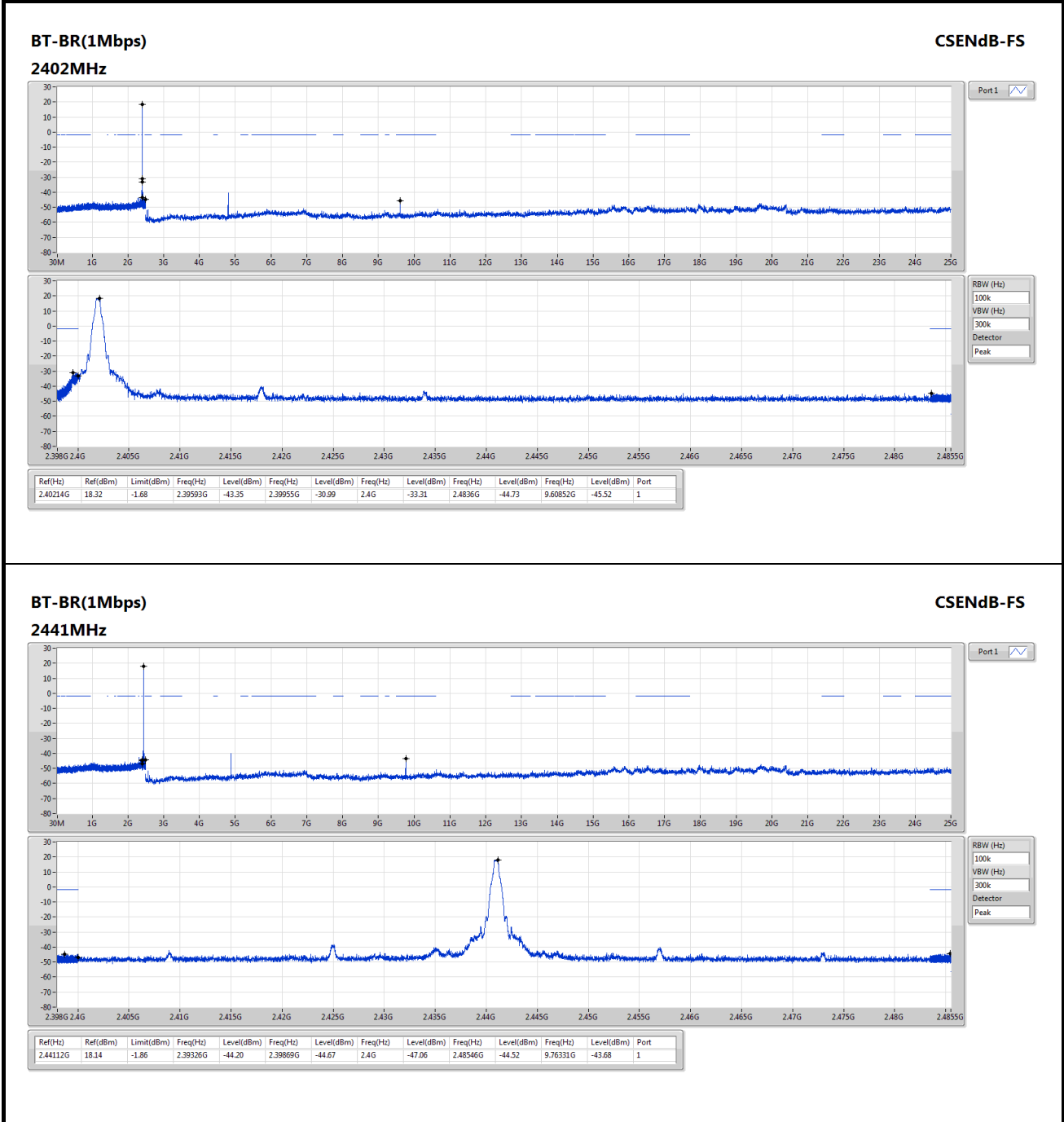
3.3.3 Test Setup



3.3.4 Unwanted Emissions into Non-Restricted Frequency Bands

Ambient Condition	25°C / 67%	Tested By	Aska Huang
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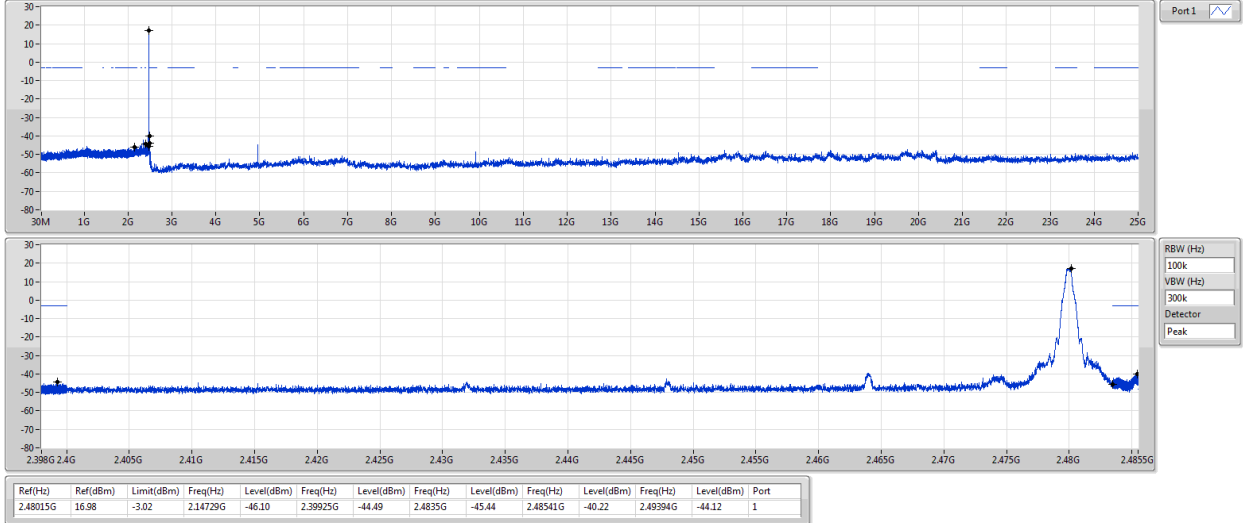
Model BT740-SA



BT-BR(1Mbps)

CSENdB-FS

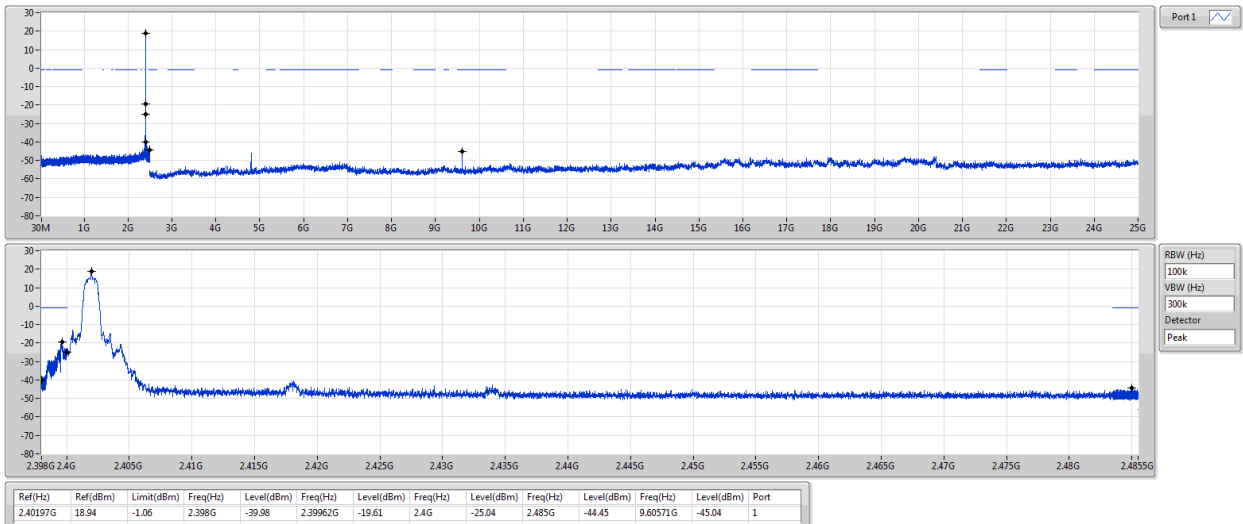
2480MHz



BT-EDR(2Mbps)

CSENdB-FS

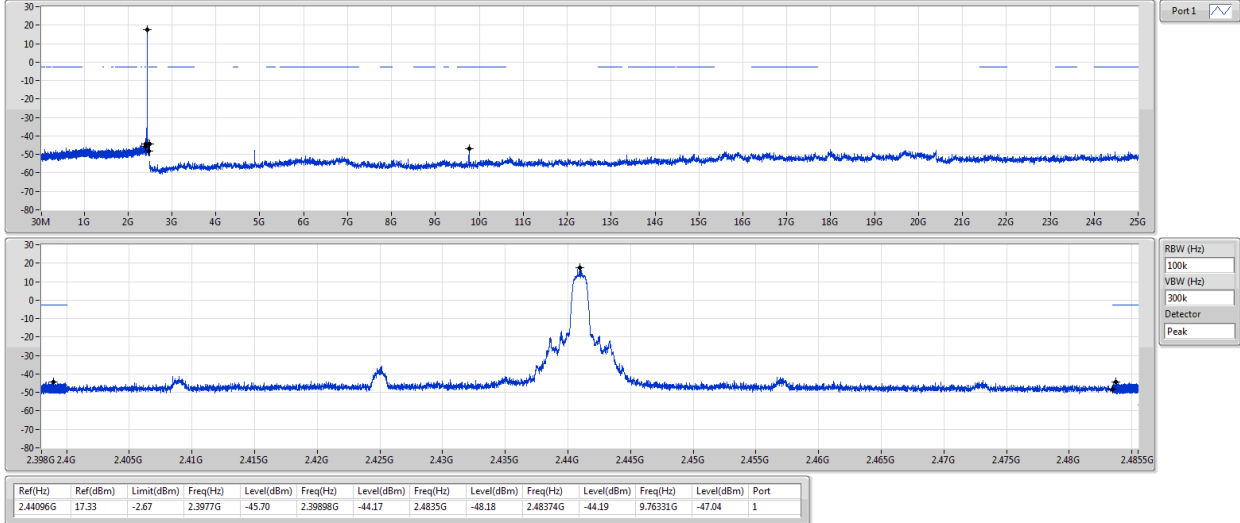
2402MHz



BT-EDR(2Mbps)

CSENdB-FS

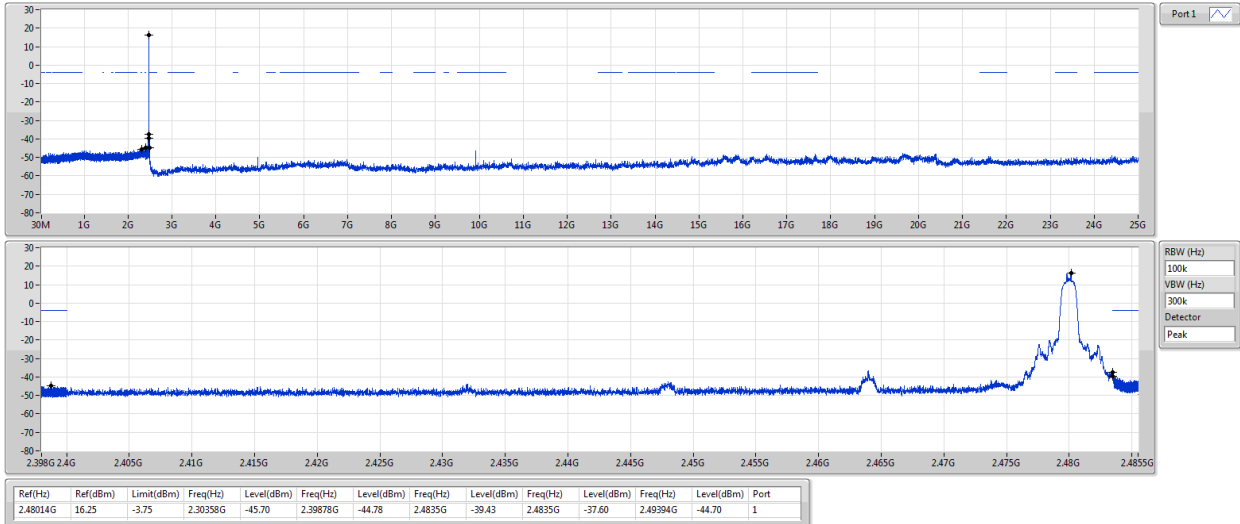
2441MHz



BT-EDR(2Mbps)

CSENdB-FS

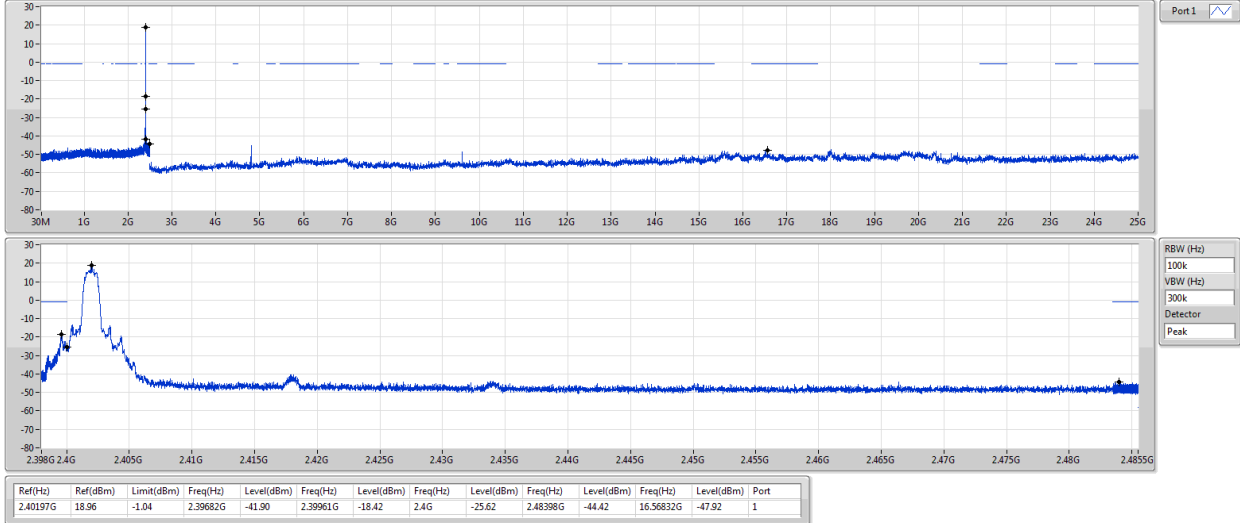
2480MHz



BT-EDR(3Mbps)

CSENdB-FS

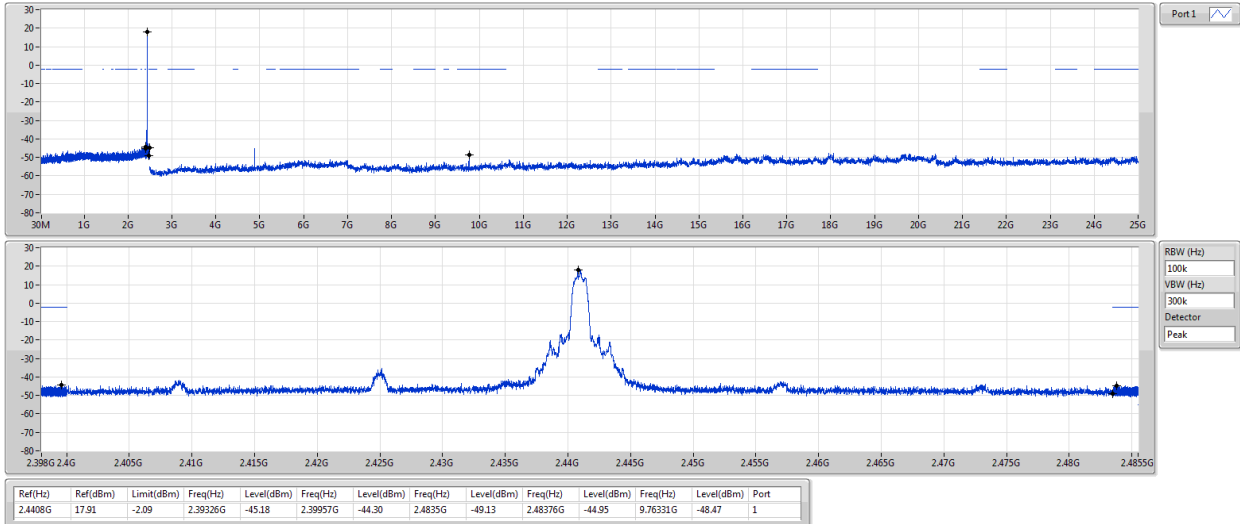
2402MHz

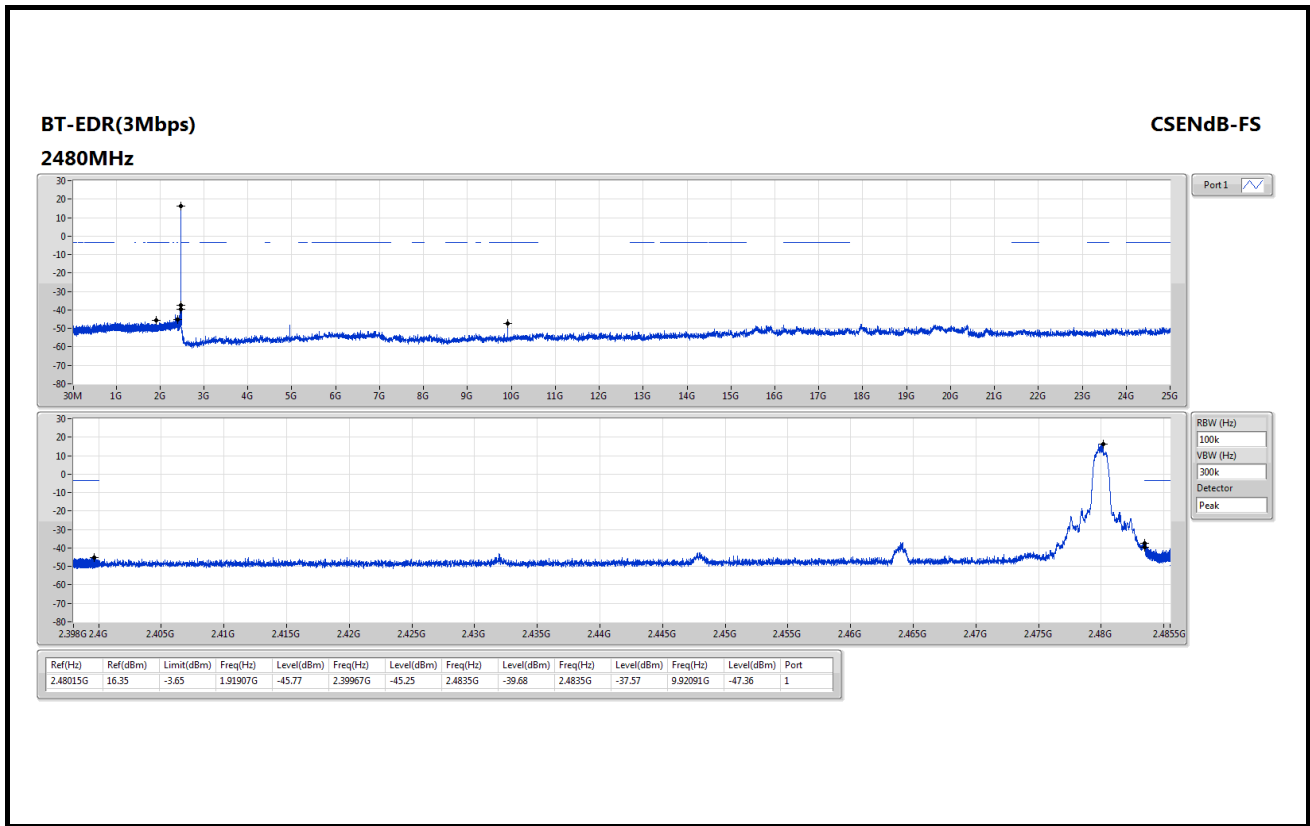


BT-EDR(3Mbps)

CSENdB-FS

2441MHz

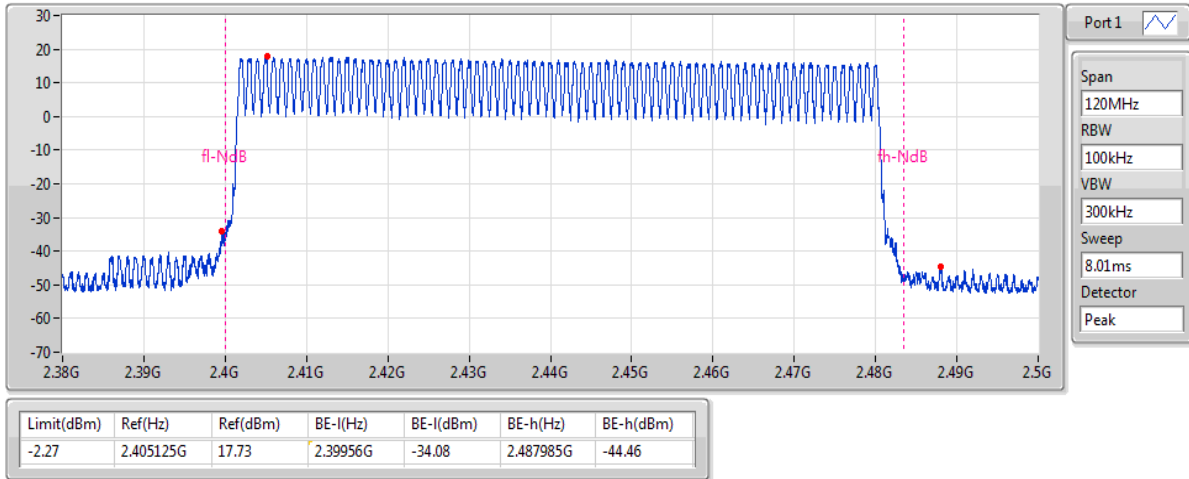




BT-BR(1Mbps)

2402MHz

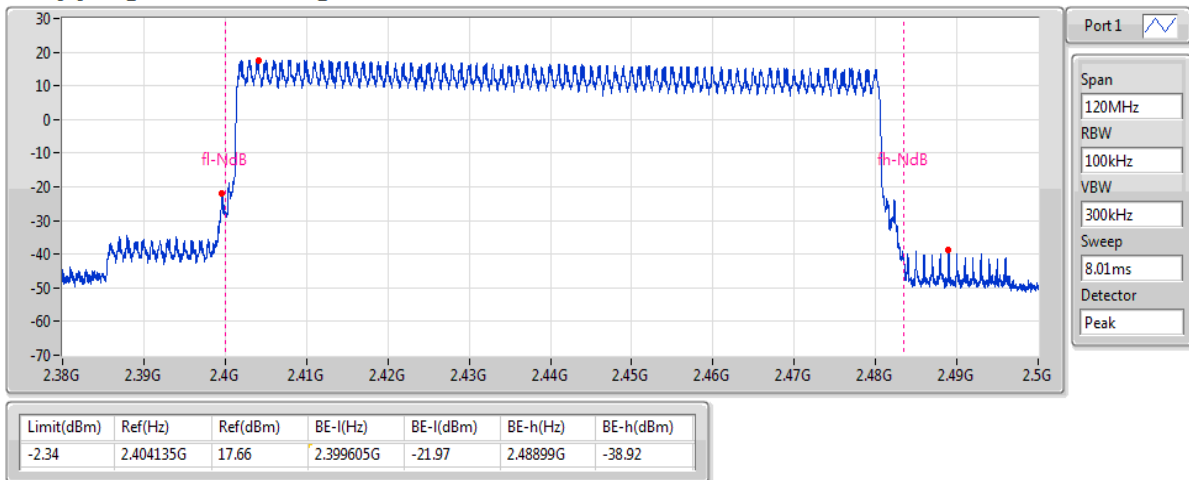
Hopping Ch Bandedge (Non-restricted Band)



BT-EDR(2Mbps)

2402MHz

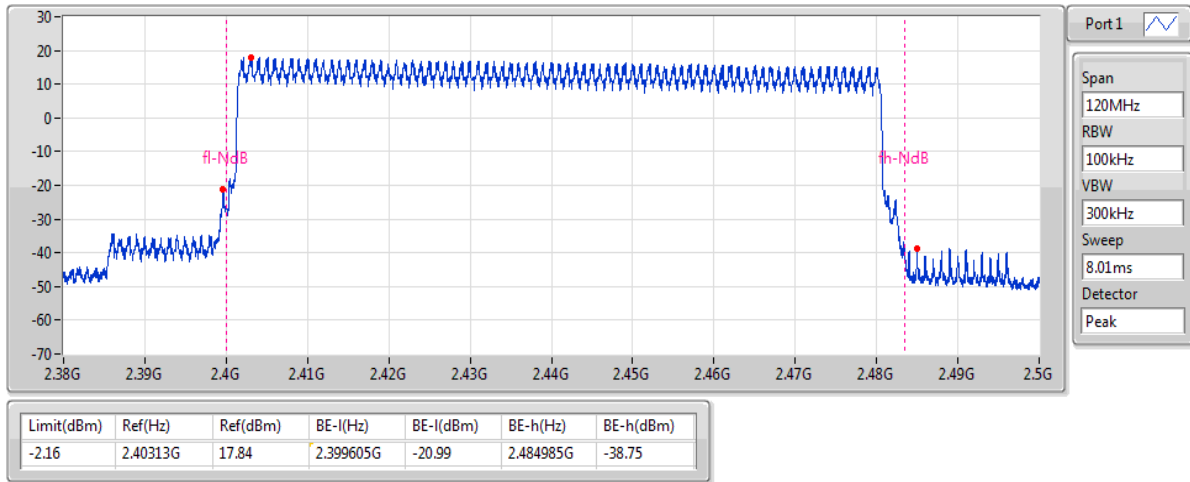
Hopping Ch Bandedge (Non-restricted Band)



BT-EDR(3Mbps)

2402MHz

Hopping Ch Bandedge (Non-restricted Band)

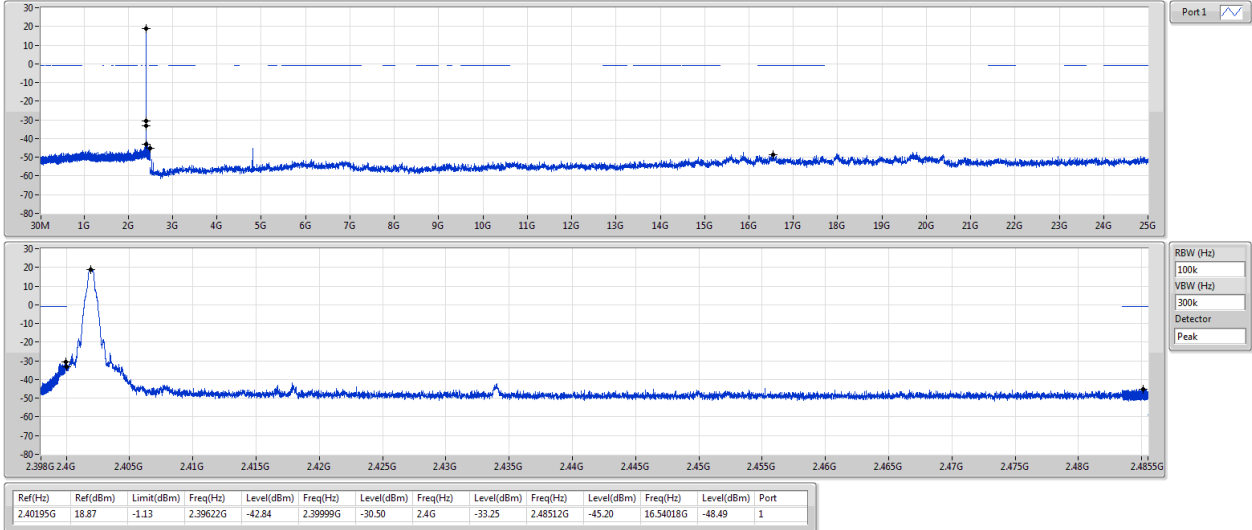


Model BT740-SC

BT-BR(1Mbps)

CSENdB-FS

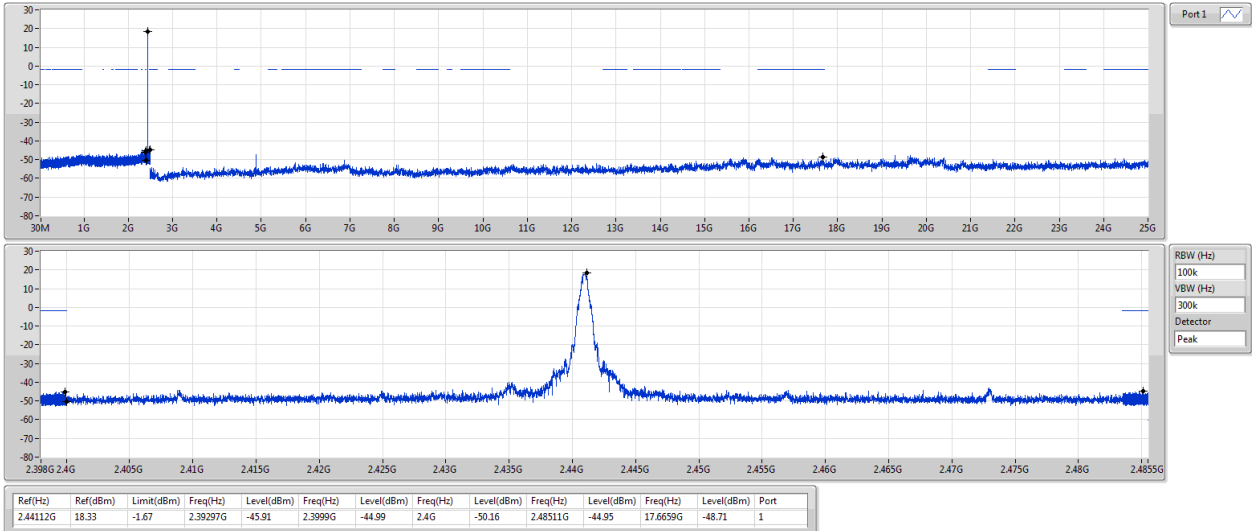
2402MHz



BT-BR(1Mbps)

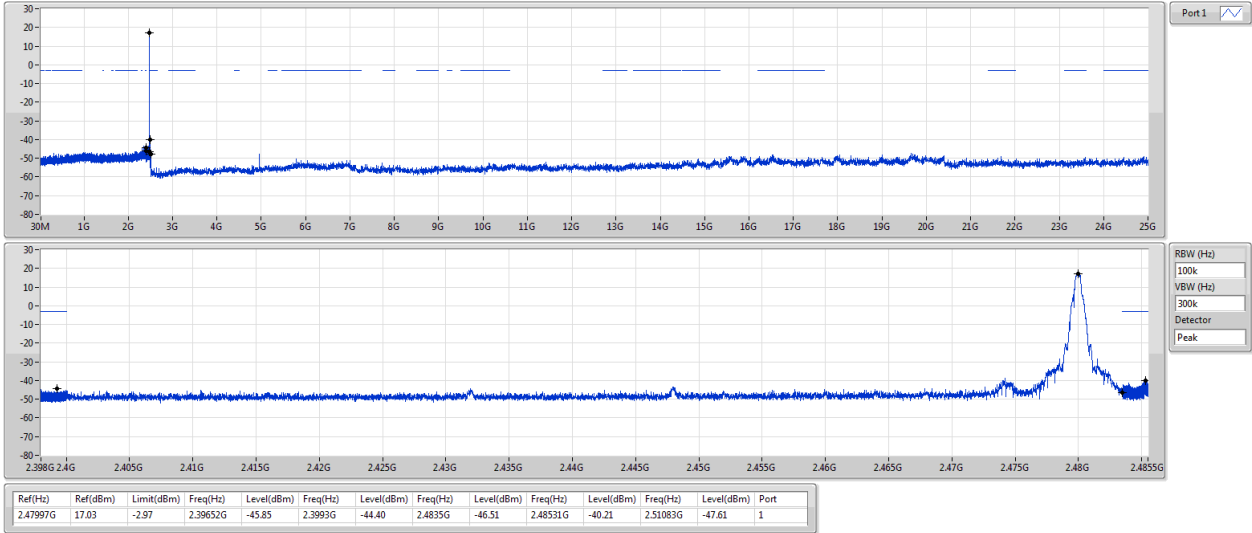
CSENdB-FS

2441MHz



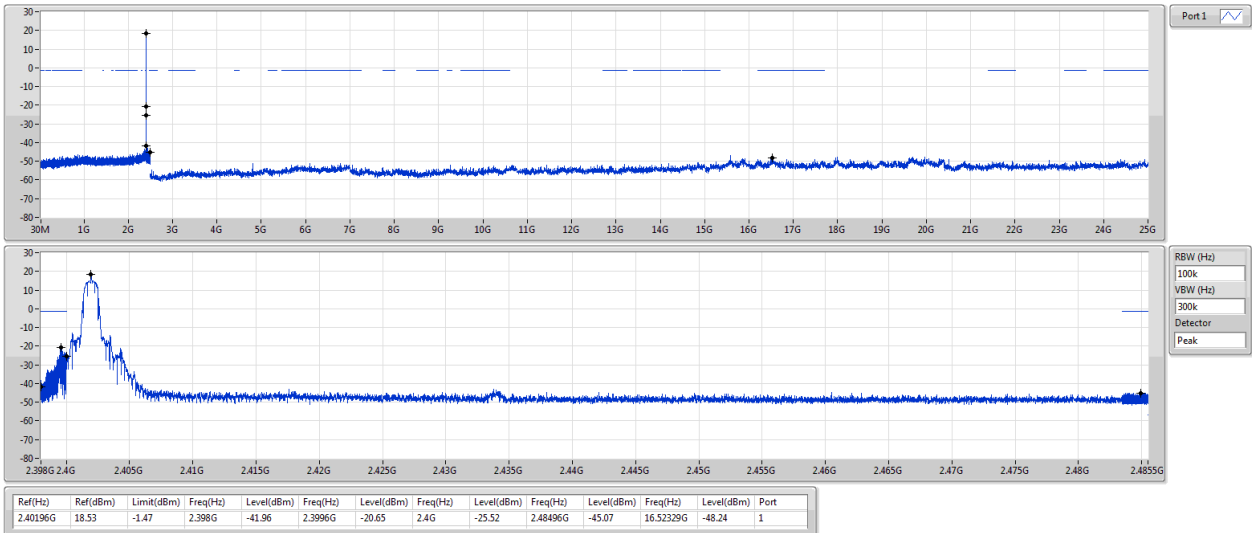
BT-BR(1Mbps)
2480MHz

CSENdB-FS



BT-EDR(2Mbps)
2402MHz

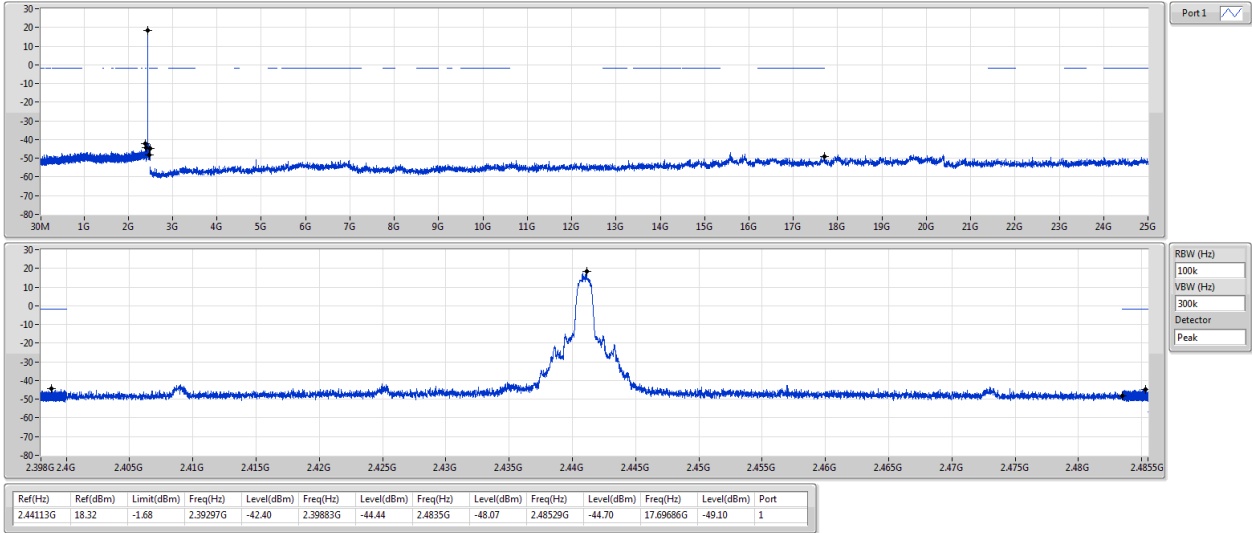
CSENdB-FS



BT-EDR(2Mbps)

CSENdB-FS

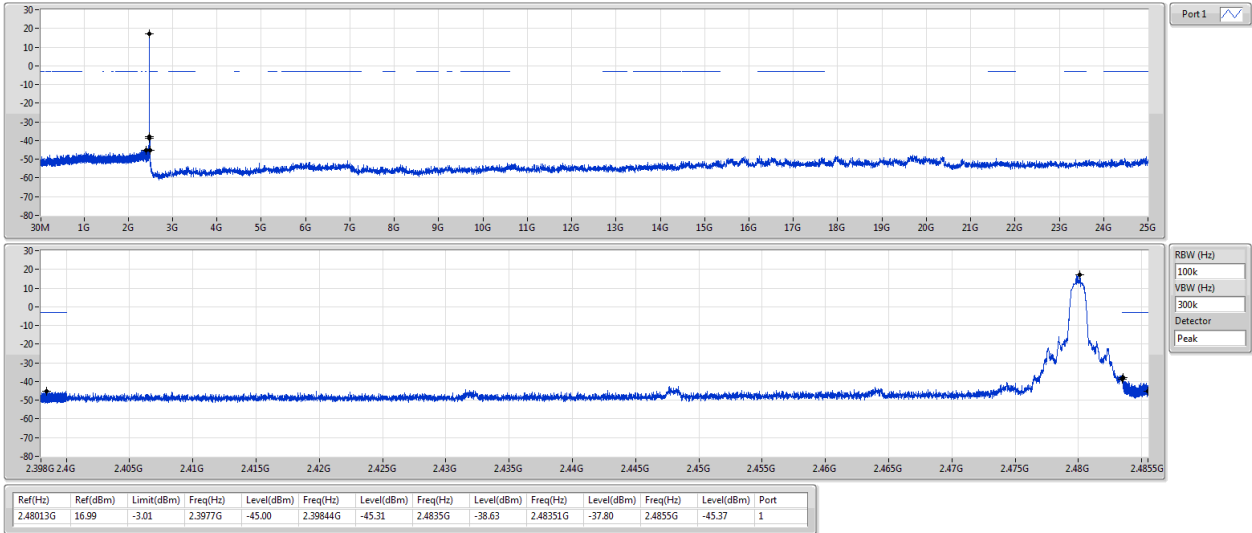
2441MHz



BT-EDR(2Mbps)

CSENdB-FS

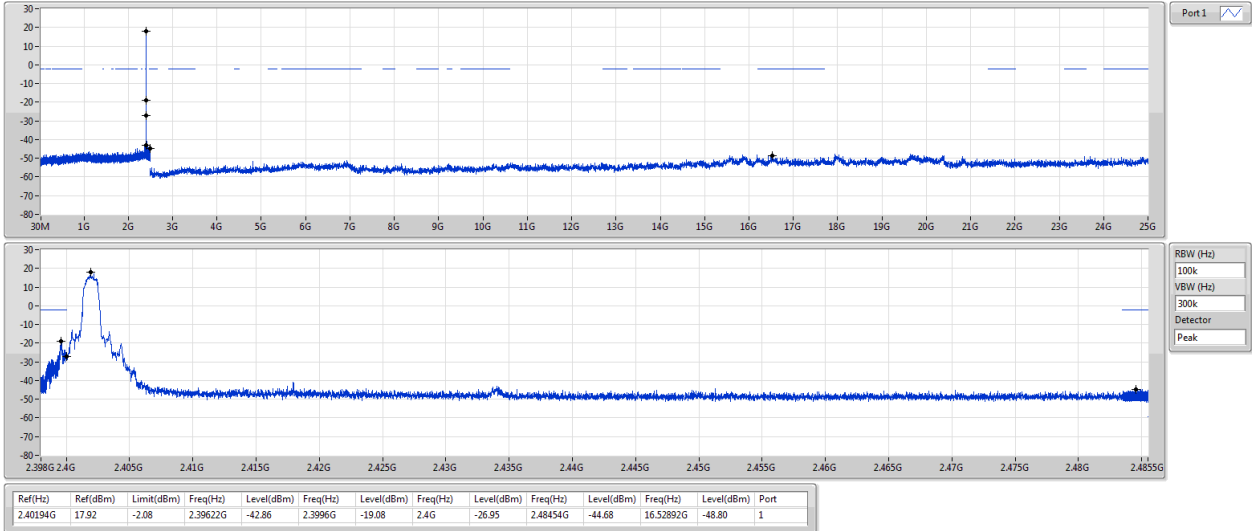
2480MHz



BT-EDR(3Mbps)

CSENdB-FS

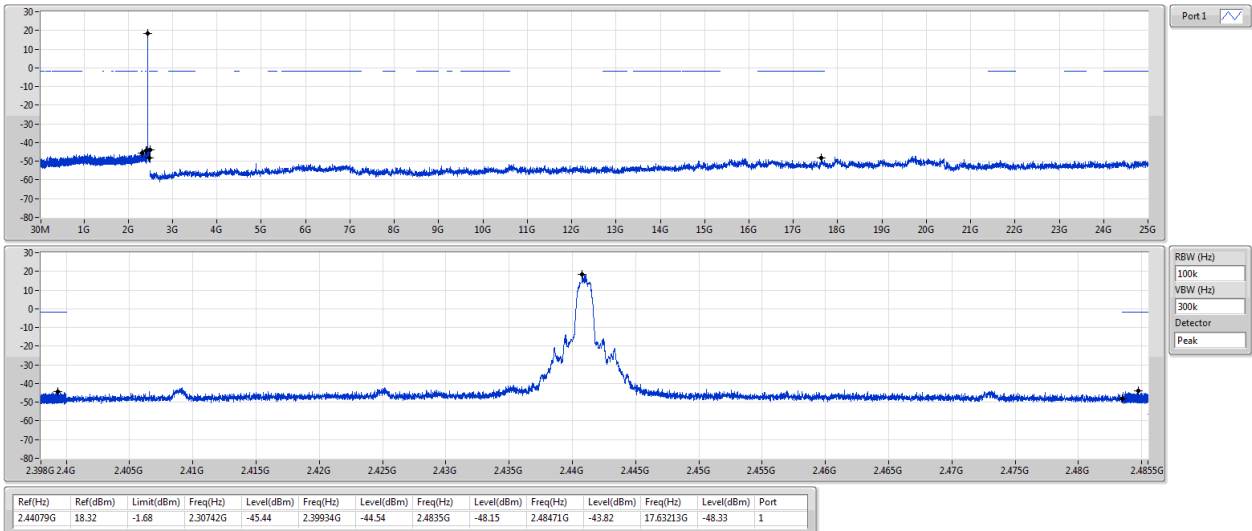
2402MHz

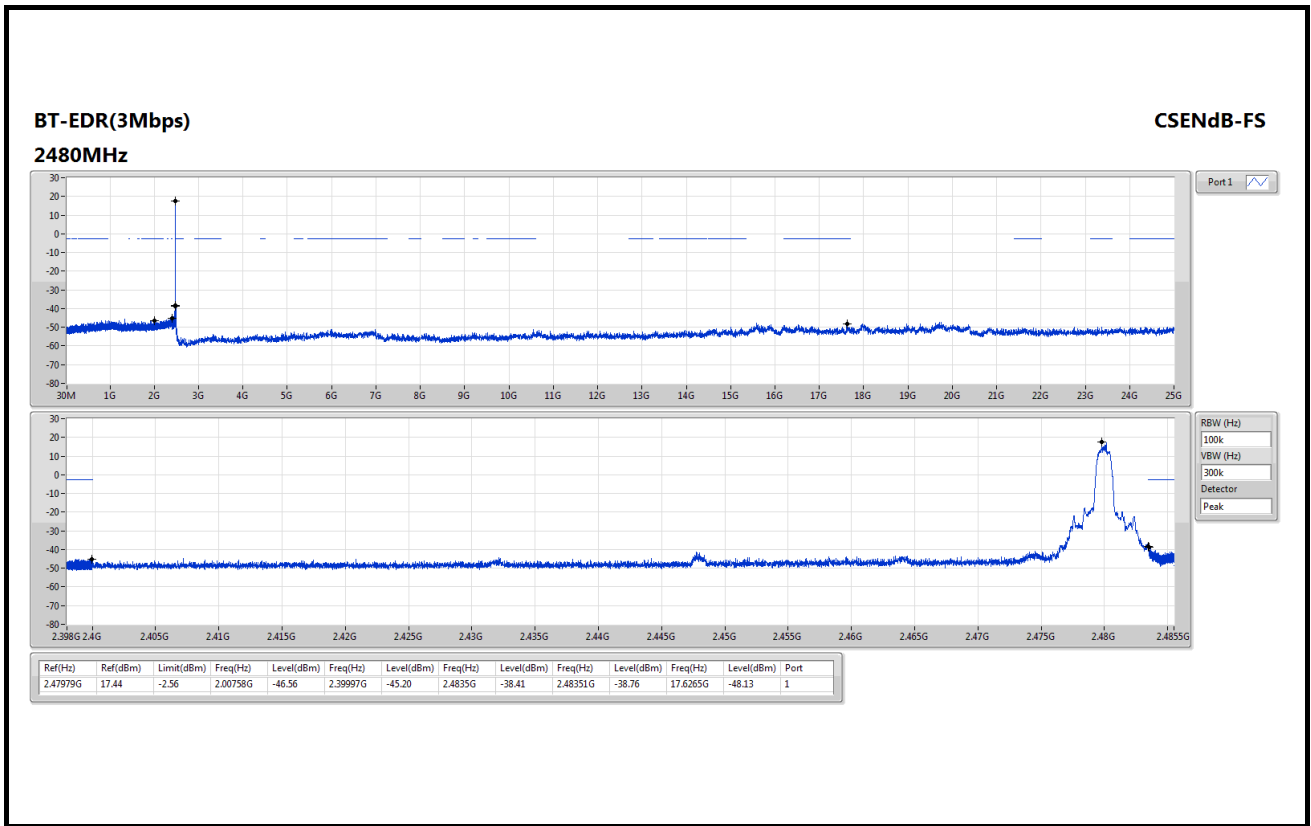


BT-EDR(3Mbps)

CSENdB-FS

2441MHz

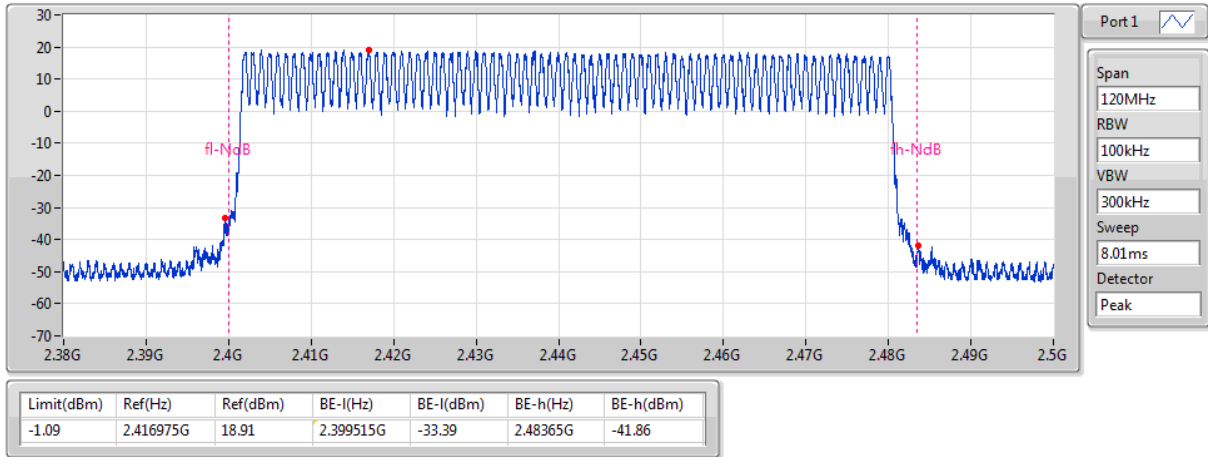




BT-BR(1Mbps)

2402MHz

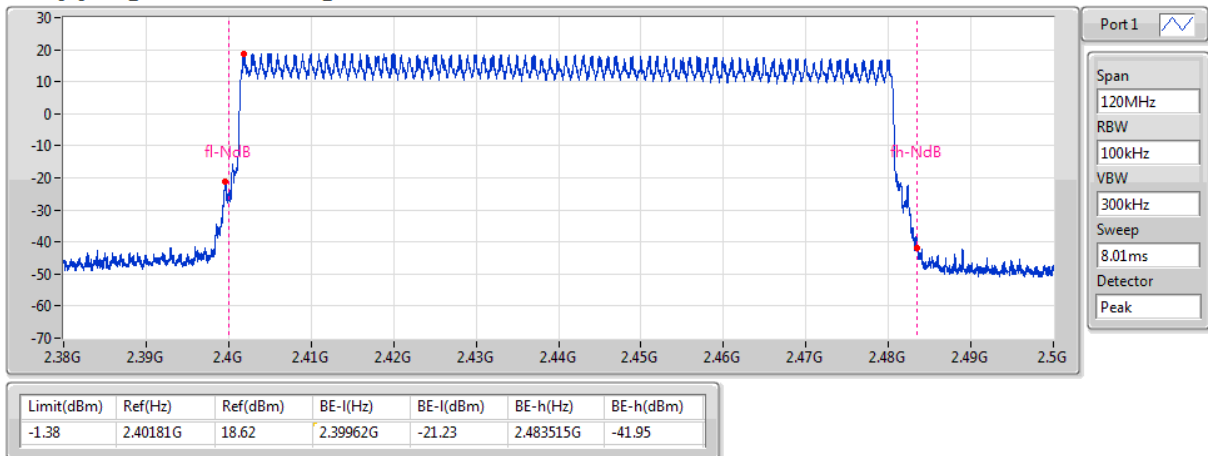
Hopping Ch Bandedge (Non-restricted Band)



BT-EDR(2Mbps)

2402MHz

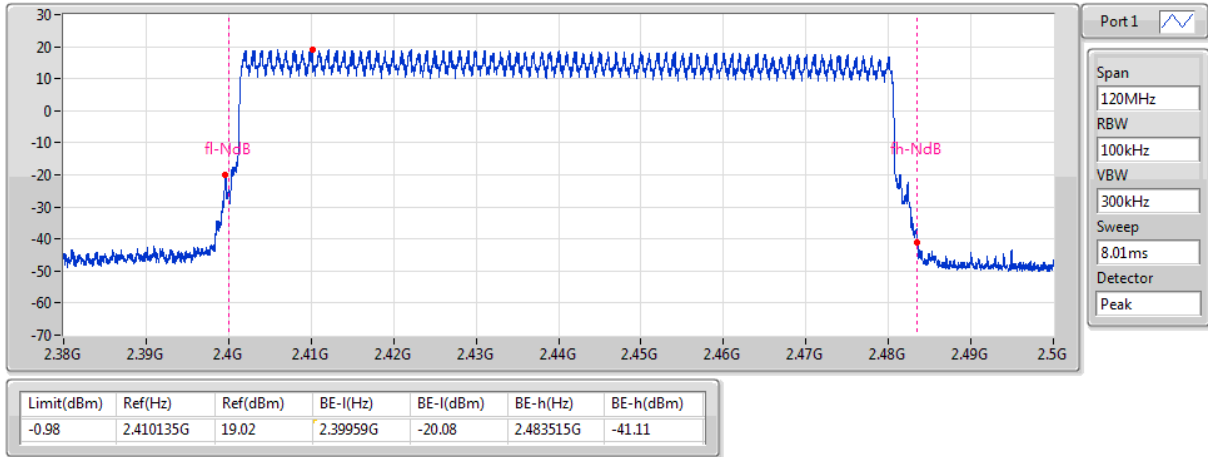
Hopping Ch Bandedge (Non-restricted Band)



BT-EDR(3Mbps)

2402MHz

Hopping Ch Bandedge (Non-restricted Band)



3.4 Conducted Output Power

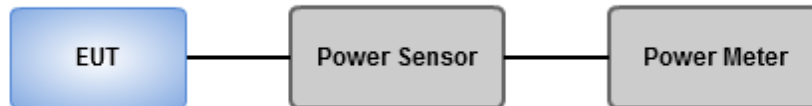
3.4.1 Limit of Conducted Output Power

- 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

Ambient Condition	25°C / 67%	Tested By	Aska Huang
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Model BT740-SA

Summary of Peak Conducted Output Power

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	18.56	0.07178
BT-EDR(2Mbps)	19.16	0.08241
BT-EDR(3Mbps)	19.31	0.08531

Result

Mode	Result	Antenna Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	0.50	18.56	21.00
2441MHz	Pass	0.50	18.42	21.00
2480MHz	Pass	0.50	17.67	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	0.50	19.16	21.00
2441MHz	Pass	0.50	18.09	21.00
2480MHz	Pass	0.50	17.46	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	0.50	19.31	21.00
2441MHz	Pass	0.50	18.19	21.00
2480MHz	Pass	0.50	17.53	21.00

Summary of Conducted (Average) Output Power

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	18.44	0.06982
BT-EDR(2Mbps)	17.62	0.05781
BT-EDR(3Mbps)	17.67	0.05848

Result

Mode	Result	Antenna Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	0.50	18.44	-
2441MHz	Pass	0.50	18.30	-
2480MHz	Pass	0.50	17.52	-
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	0.50	17.62	-
2441MHz	Pass	0.50	16.41	-
2480MHz	Pass	0.50	15.08	-
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	0.50	17.67	-
2441MHz	Pass	0.50	16.44	-
2480MHz	Pass	0.50	15.09	-

Note: Average power is for reference only.

Model BT740-SC

Summary of Peak Conducted Output Power

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	19.08	0.08091
BT-EDR(2Mbps)	19.56	0.09036
BT-EDR(3Mbps)	19.80	0.09550

Result

Mode	Result	Antenna Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.00	19.08	21.00
2441MHz	Pass	2.00	18.57	21.00
2480MHz	Pass	2.00	16.80	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.00	19.56	21.00
2441MHz	Pass	2.00	19.15	21.00
2480MHz	Pass	2.00	17.67	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.00	19.80	21.00
2441MHz	Pass	2.00	19.30	21.00
2480MHz	Pass	2.00	18.21	21.00

Summary of Conducted (Average) Output Power

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	18.96	0.07870
BT-EDR(2Mbps)	17.53	0.05662
BT-EDR(3Mbps)	17.62	0.05781

Result

Mode	Result	Antenna Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.00	18.96	-
2441MHz	Pass	2.00	18.43	-
2480MHz	Pass	2.00	16.64	-
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.00	17.53	-
2441MHz	Pass	2.00	16.92	-
2480MHz	Pass	2.00	15.50	-
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.00	17.62	-
2441MHz	Pass	2.00	16.96	-
2480MHz	Pass	2.00	15.74	-

Note: Average power is for reference only.

3.5 Number of Hopping Frequency

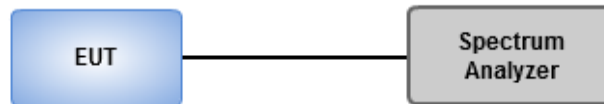
3.5.1 Limit of Number of Hopping Frequency

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

Ambient Condition	25°C / 67%	Tested By	Aska Huang
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Model BT740-SA

Summary

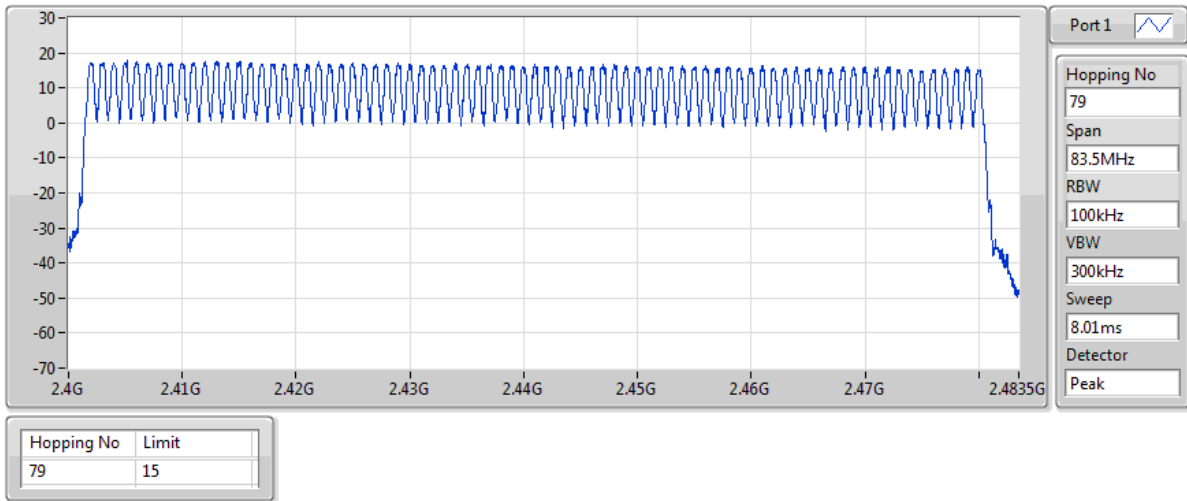
Mode	Max-Hop No
2.4-2.4835GHz	-
BT-BR(1Mbps)	79
BT-EDR(2Mbps)	79
BT-EDR(3Mbps)	79

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

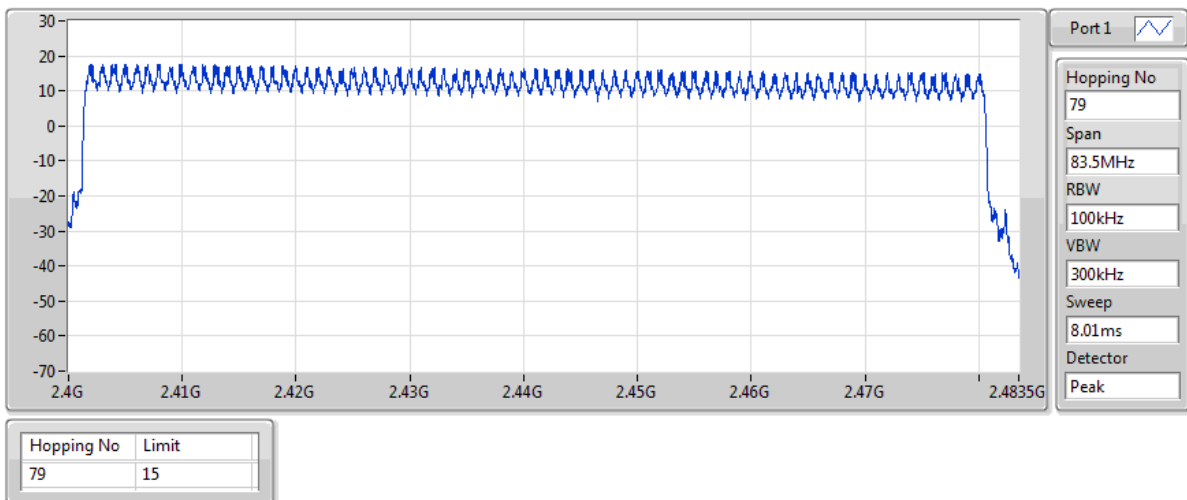
BT-BR(1Mbps)
2402MHz

Hopping-FS



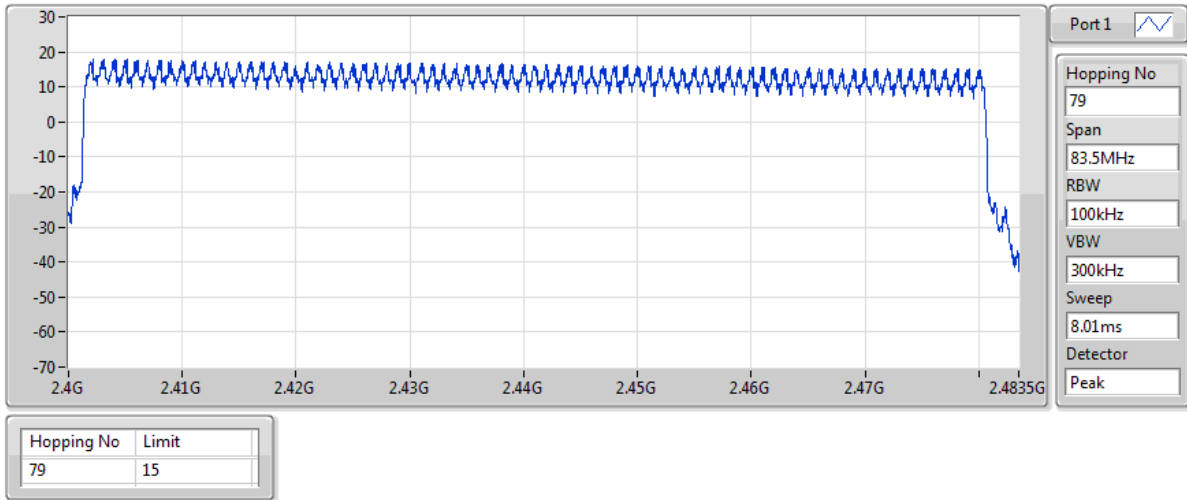
BT-EDR(2Mbps)
2402MHz

Hopping-FS



BT-EDR(3Mbps)
2402MHz

Hopping-FS



Model BT740-SC

Summary

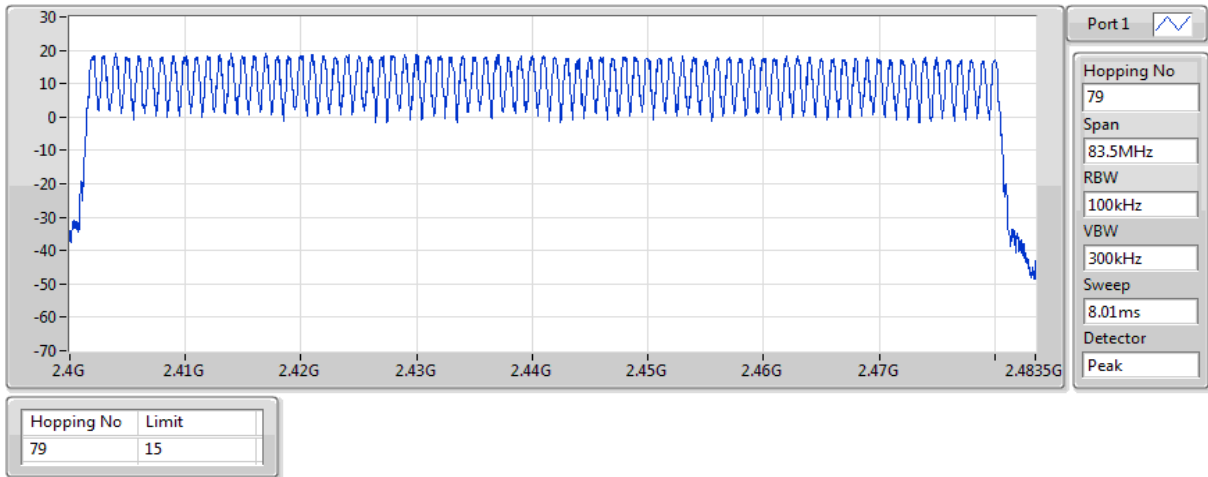
Mode	Max-Hop No
2.4-2.4835GHz	-
BT-BR(1Mbps)	79
BT-EDR(2Mbps)	79
BT-EDR(3Mbps)	79

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

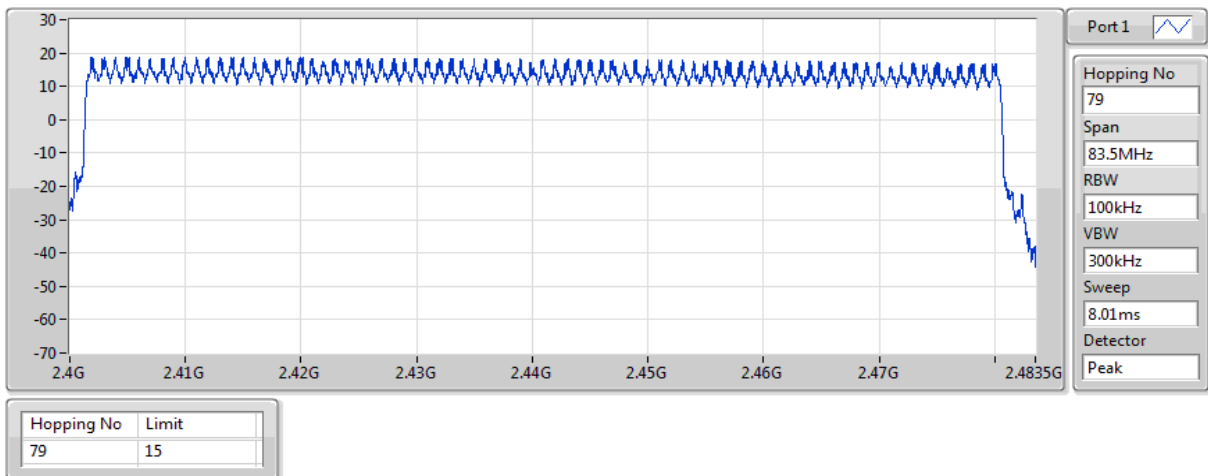
BT-BR(1Mbps)
2402MHz

Hopping-FS



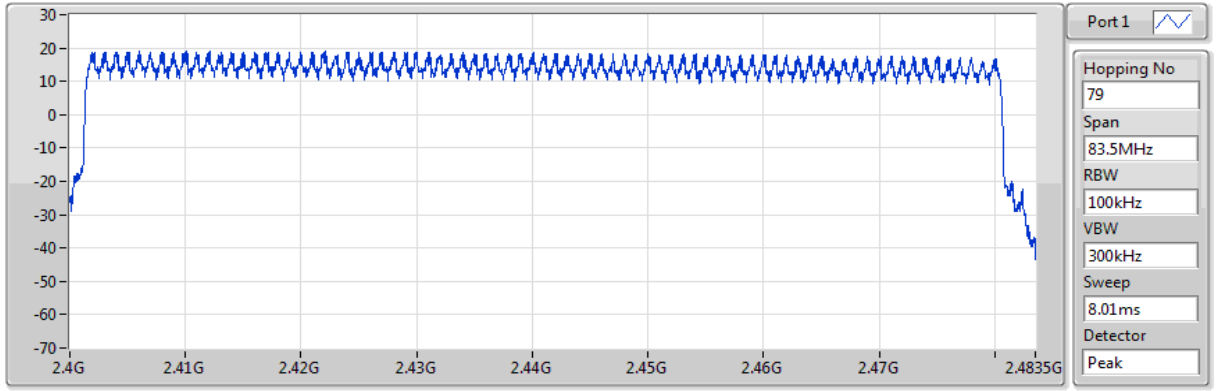
BT-EDR(2Mbps)
2402MHz

Hopping-FS



BT-EDR(3Mbps)
2402MHz

Hopping-FS



Hopping No	Limit
79	15

3.6 20dB and Occupied Bandwidth

3.6.1 Test Procedures

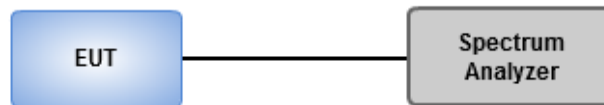
20dB Bandwidth

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, 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

Ambient Condition	25°C / 67%	Tested By	Aska Huang
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Model BT740-SA

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)	942.029k	890.014k	890KF1D	884.058k	871.925k
BT-EDR(2Mbps)	1.297M	1.194M	1M19G1D	1.228M	1.19M
BT-EDR(3Mbps)	1.272M	1.198M	1M20G1D	1.239M	1.183M

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

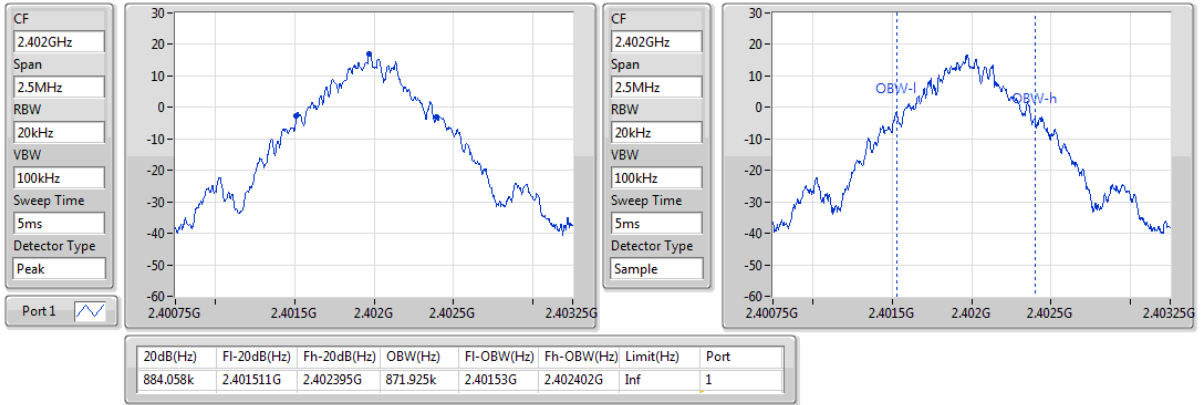
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	884.058k	871.925k
2441MHz	Pass	Inf	942.029k	890.014k
2480MHz	Pass	Inf	909.42k	886.397k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.228M	1.194M
2441MHz	Pass	Inf	1.228M	1.19M
2480MHz	Pass	Inf	1.297M	1.19M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.239M	1.183M
2441MHz	Pass	Inf	1.272M	1.198M
2480MHz	Pass	Inf	1.25M	1.183M

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

BT-BR(1Mbps)

EBW-FS

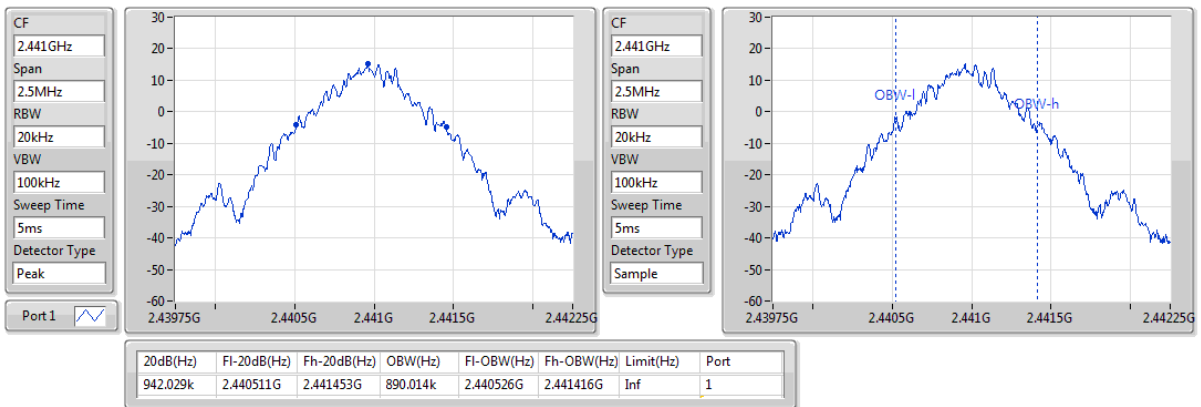
2402MHz



BT-BR(1Mbps)

EBW-FS

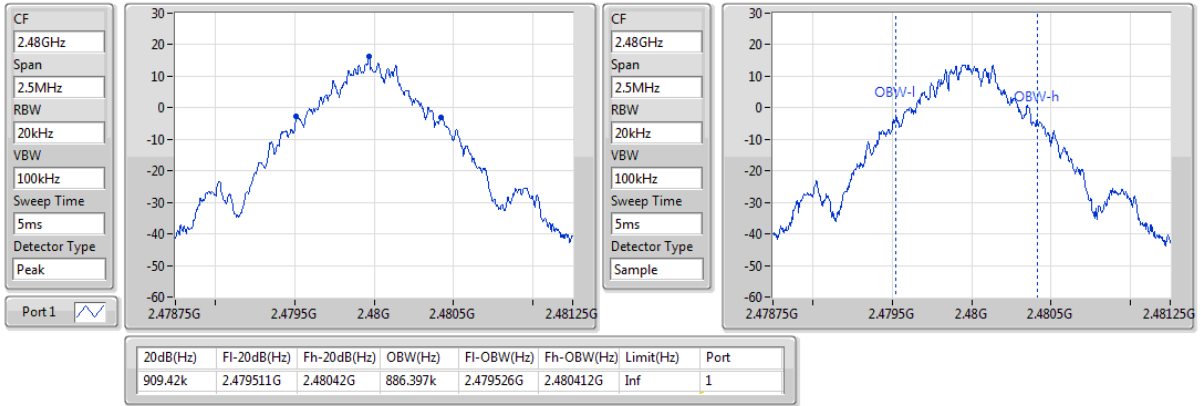
2441MHz



BT-BR(1Mbps)

EBW-FS

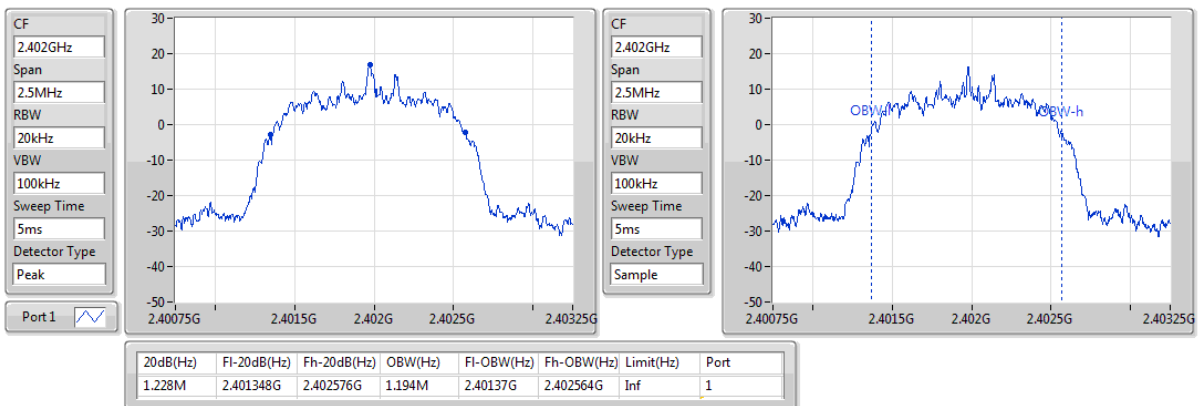
2480MHz



BT-EDR(2Mbps)

EBW-FS

2402MHz



BT-EDR(2Mbps)

EBW-FS

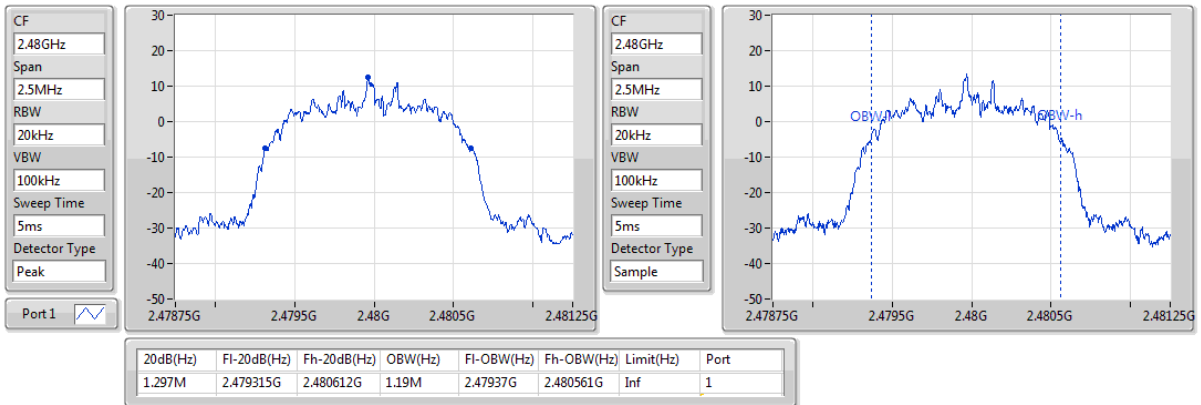
2441MHz



BT-EDR(2Mbps)

EBW-FS

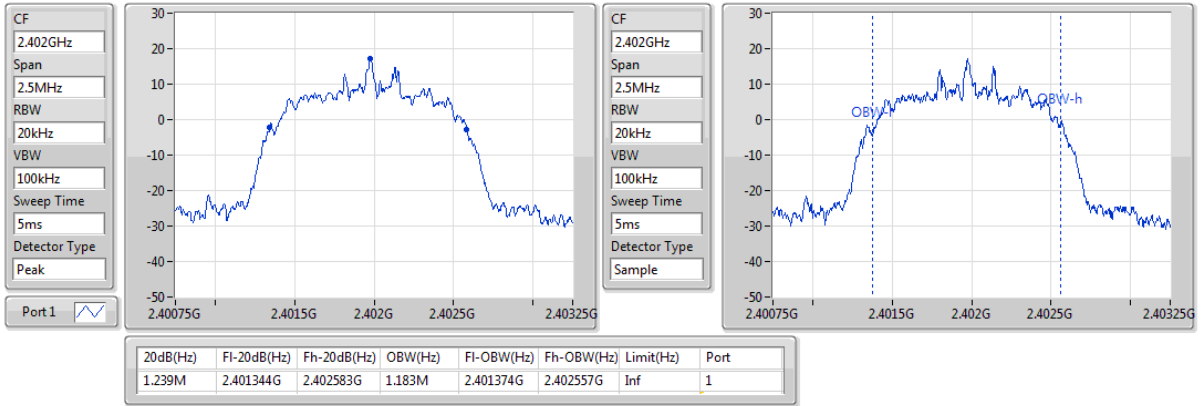
2480MHz



BT-EDR(3Mbps)

EBW-FS

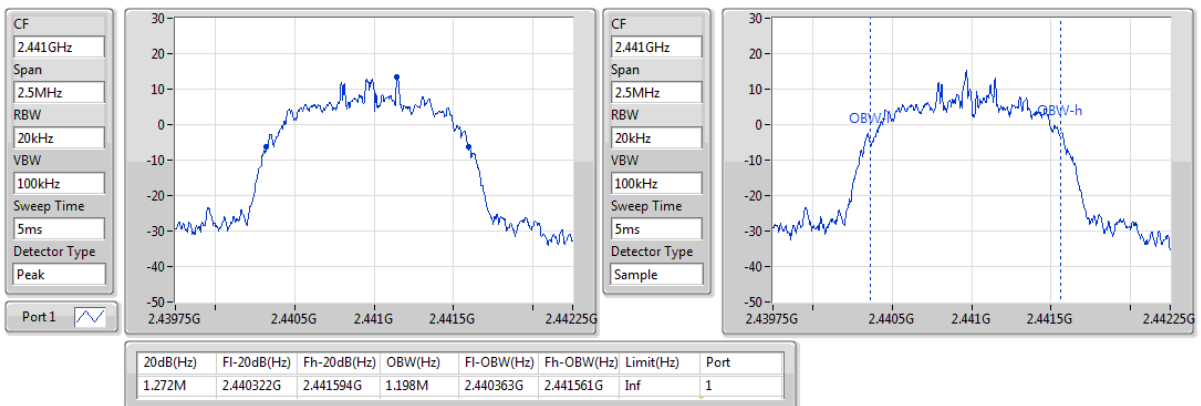
2402MHz



BT-EDR(3Mbps)

EBW-FS

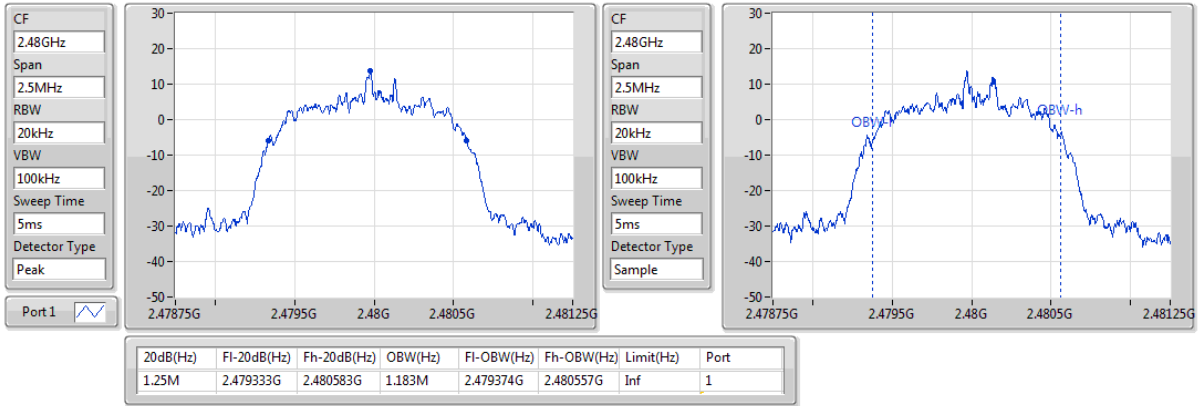
2441MHz



BT-EDR(3Mbps)

EBW-FS

2480MHz



Model BT740-SC

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	882.779k	883KF1D	923.913k	882.779k
BT-EDR(2Mbps)	1.315M	1.201M	1M20G1D	1.232M	1.194M
BT-EDR(3Mbps)	1.275M	1.201M	1M20G1D	1.25M	1.194M

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

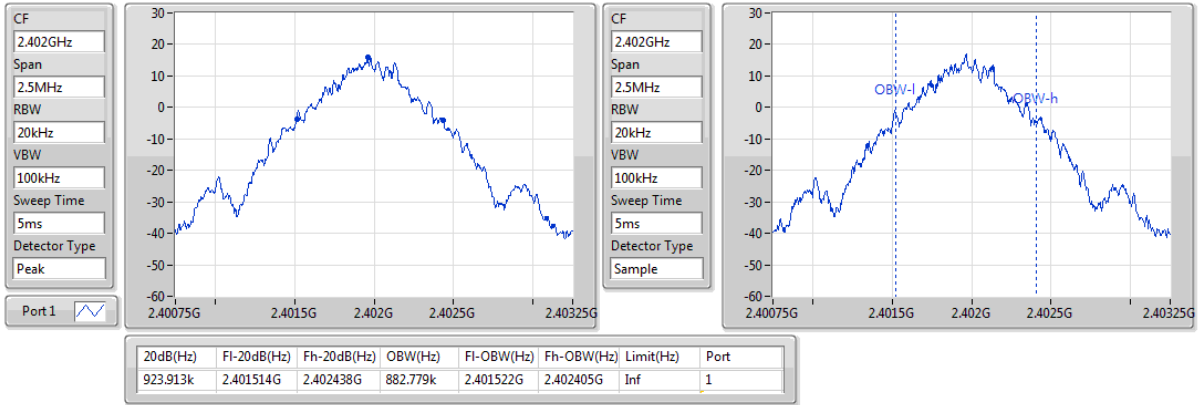
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	923.913k	882.779k
2441MHz	Pass	Inf	938.406k	882.779k
2480MHz	Pass	Inf	934.783k	882.779k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.308M	1.194M
2441MHz	Pass	Inf	1.315M	1.198M
2480MHz	Pass	Inf	1.232M	1.201M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.268M	1.194M
2441MHz	Pass	Inf	1.275M	1.198M
2480MHz	Pass	Inf	1.25M	1.201M

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

BT-BR(1Mbps)

EBW-FS

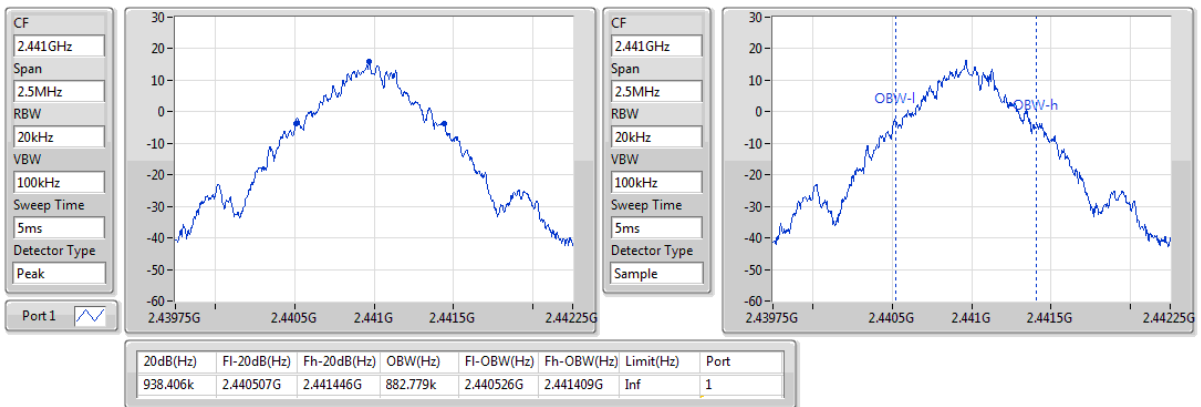
2402MHz



BT-BR(1Mbps)

EBW-FS

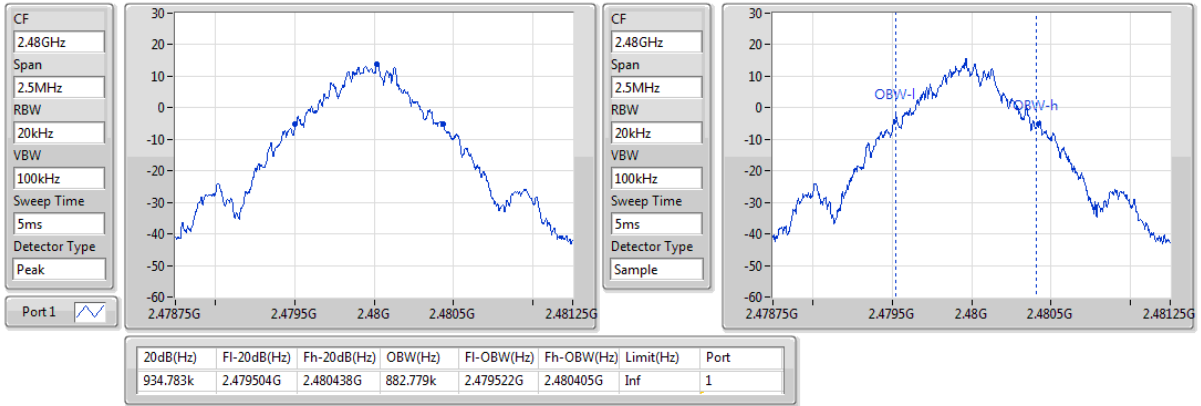
2441MHz



BT-BR(1Mbps)

EBW-FS

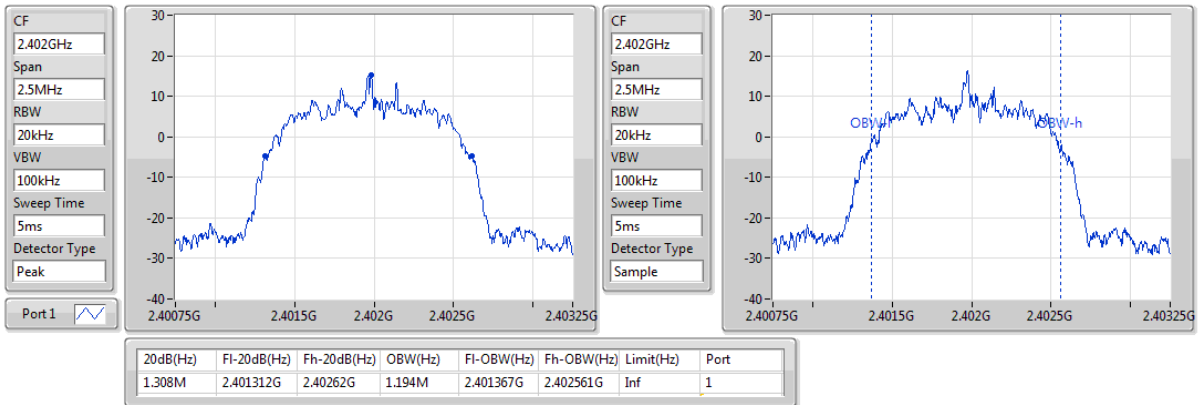
2480MHz



BT-EDR(2Mbps)

EBW-FS

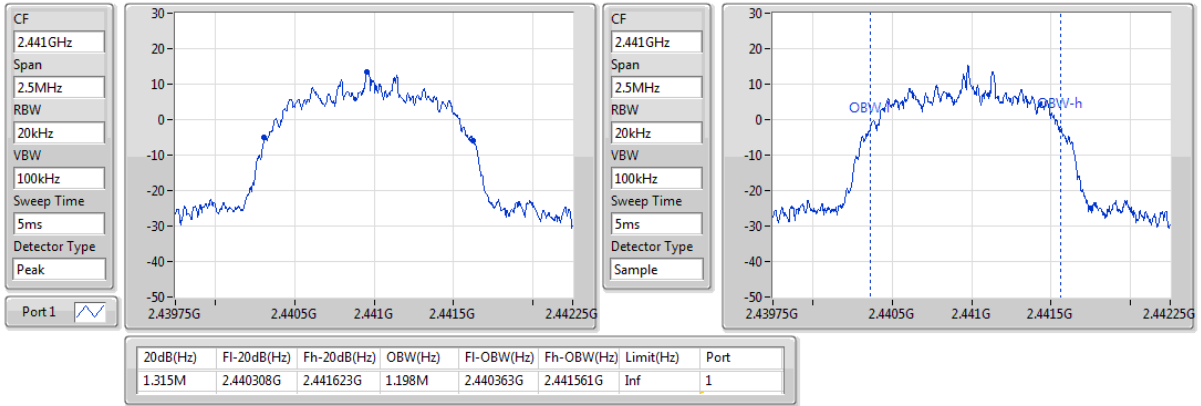
2402MHz



BT-EDR(2Mbps)

EBW-FS

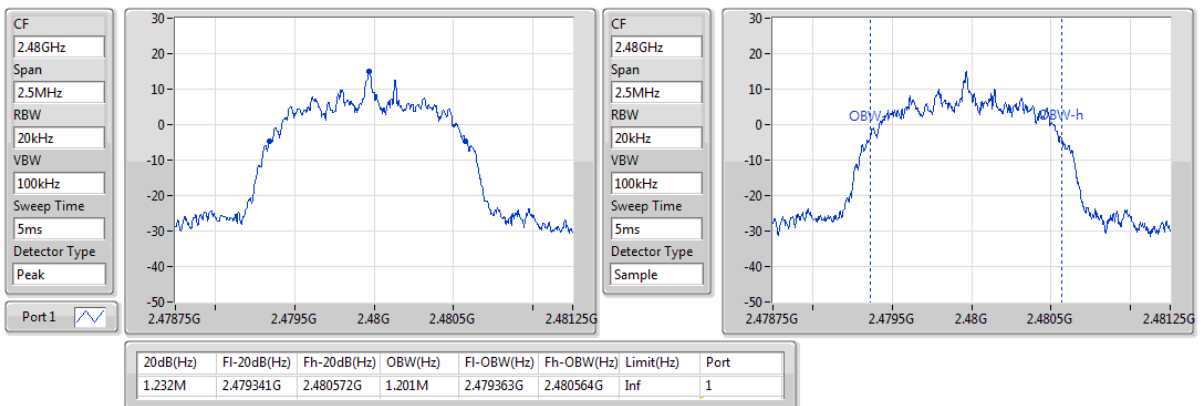
2441MHz



BT-EDR(2Mbps)

EBW-FS

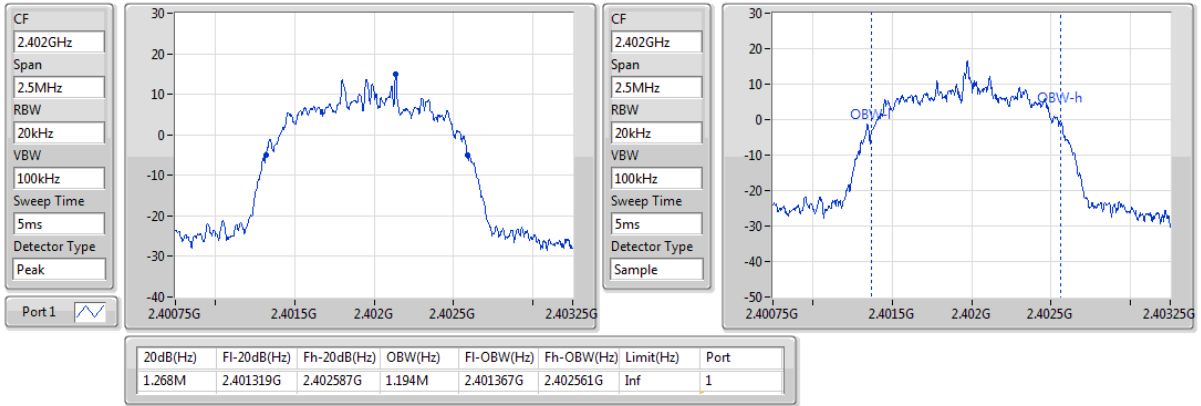
2480MHz



BT-EDR(3Mbps)

EBW-FS

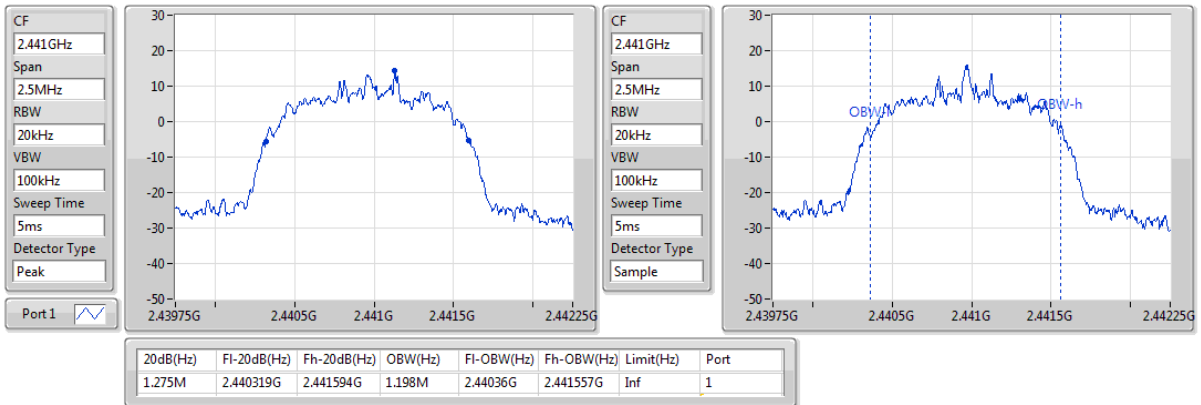
2402MHz



BT-EDR(3Mbps)

EBW-FS

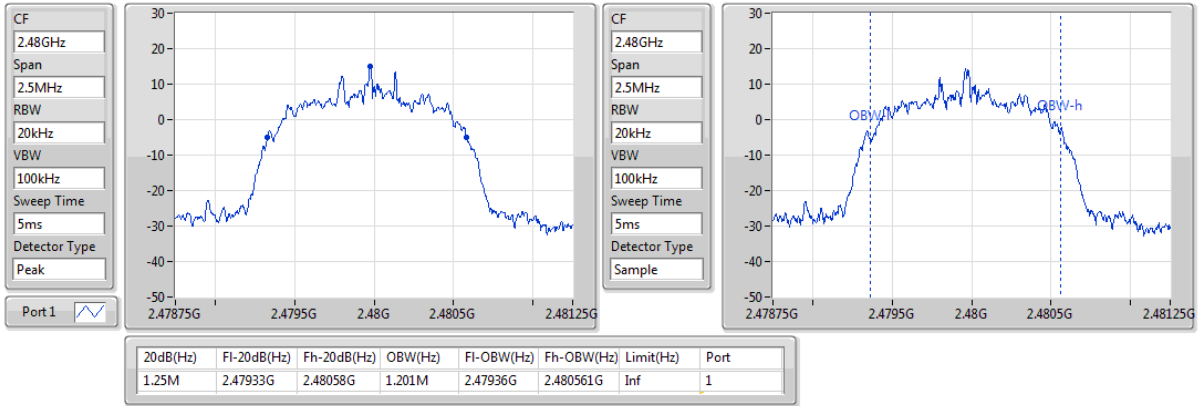
2441MHz



BT-EDR(3Mbps)

EBW-FS

2480MHz



3.7 Channel Separation

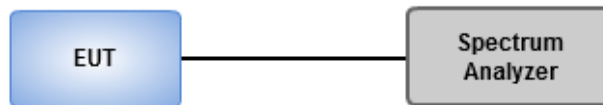
3.7.1 Limit of Channel Separation

- 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

Ambient Condition	25°C / 67%	Tested By	Aska Huang
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Model BT740-SA

Summary

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

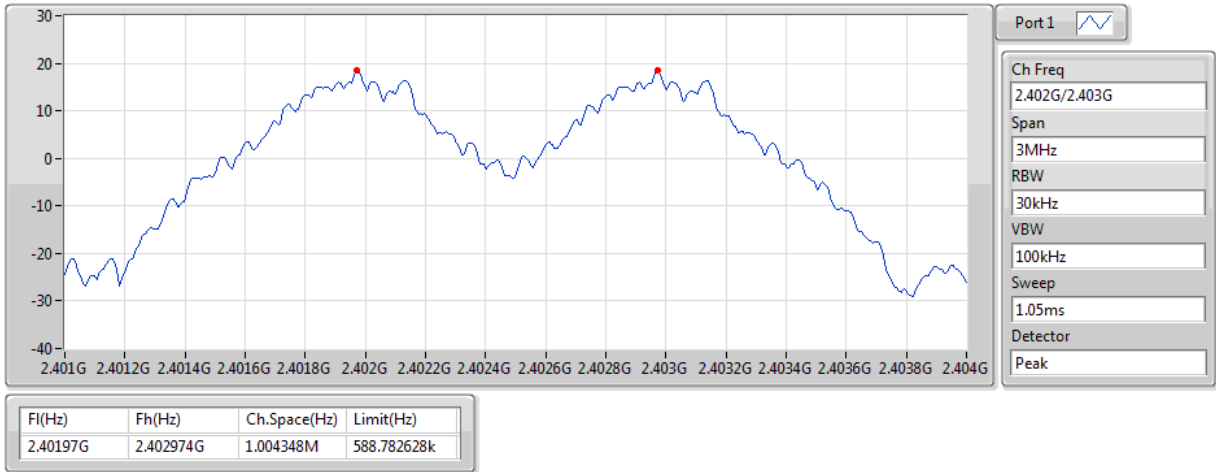
Result

Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.40197G	2.402974G	1.004348M	588.782628k
2441MHz	Pass	2.44097G	2.44197G	1M	627.391314k
2480MHz	Pass	2.47897G	2.479974G	1.004348M	605.67372k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.401974G	2.402978G	1.004348M	817.848k
2441MHz	Pass	2.440974G	2.441978G	1.004348M	817.848k
2480MHz	Pass	2.478978G	2.479978G	1M	863.802k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.401974G	2.402978G	1.004348M	825.174k
2441MHz	Pass	2.440974G	2.441974G	1M	847.152k
2480MHz	Pass	2.478978G	2.479978G	1M	832.5k

BT-BR(1Mbps)

Channel Separation-FS

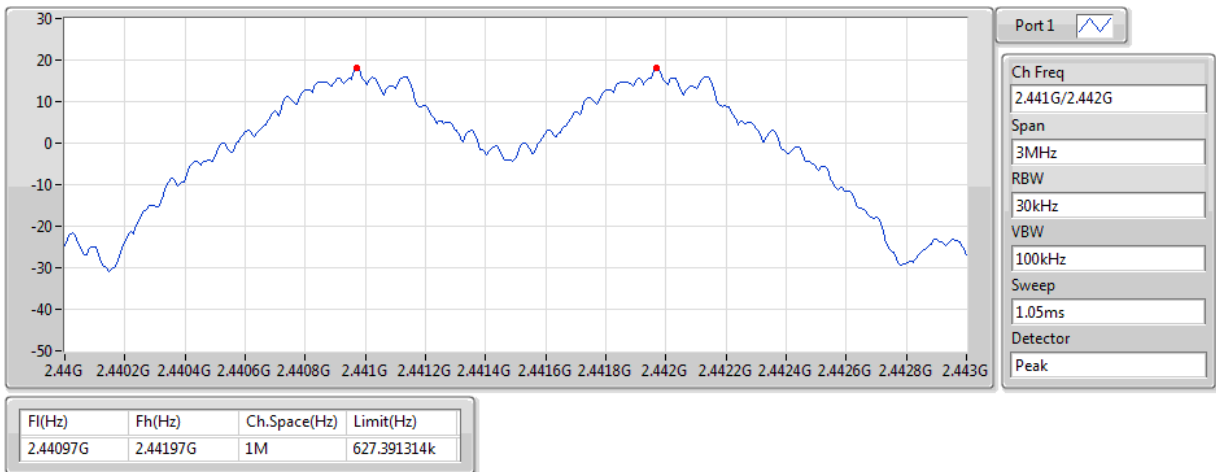
2.402G/2.403GHz



BT-BR(1Mbps)

Channel Separation-FS

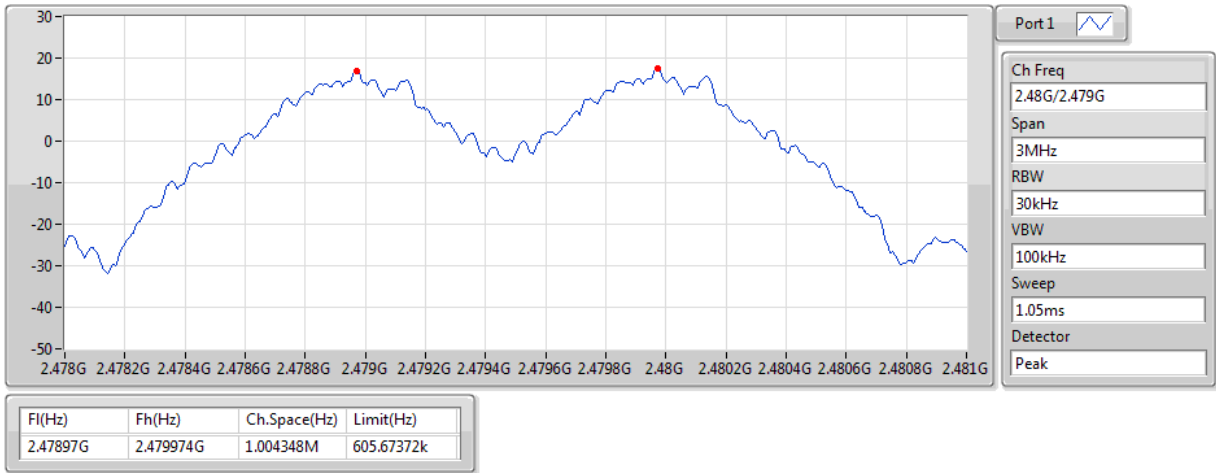
2.441G/2.442GHz



BT-BR(1Mbps)

Channel Separation-FS

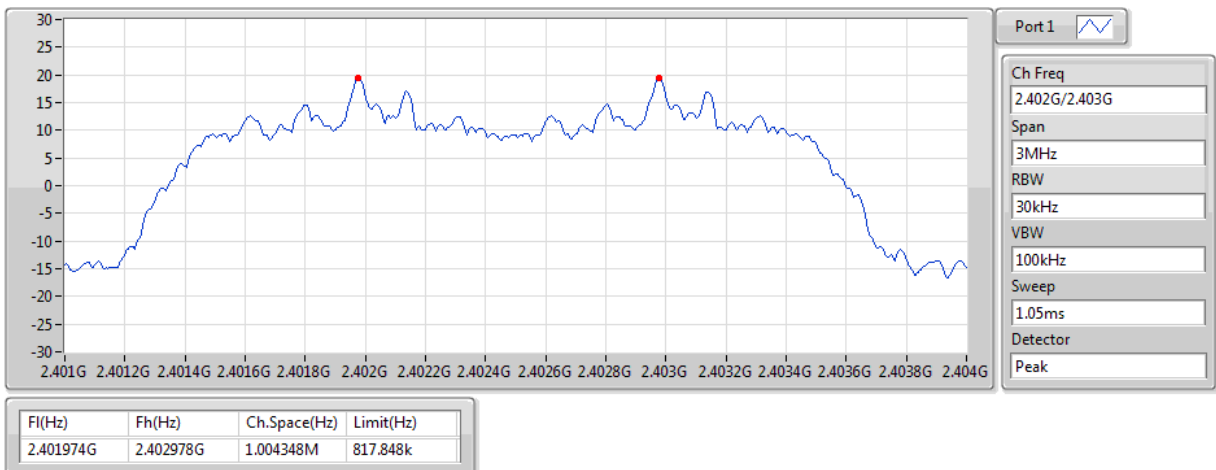
2.48G/2.479GHz



BT-EDR(2Mbps)

Channel Separation-FS

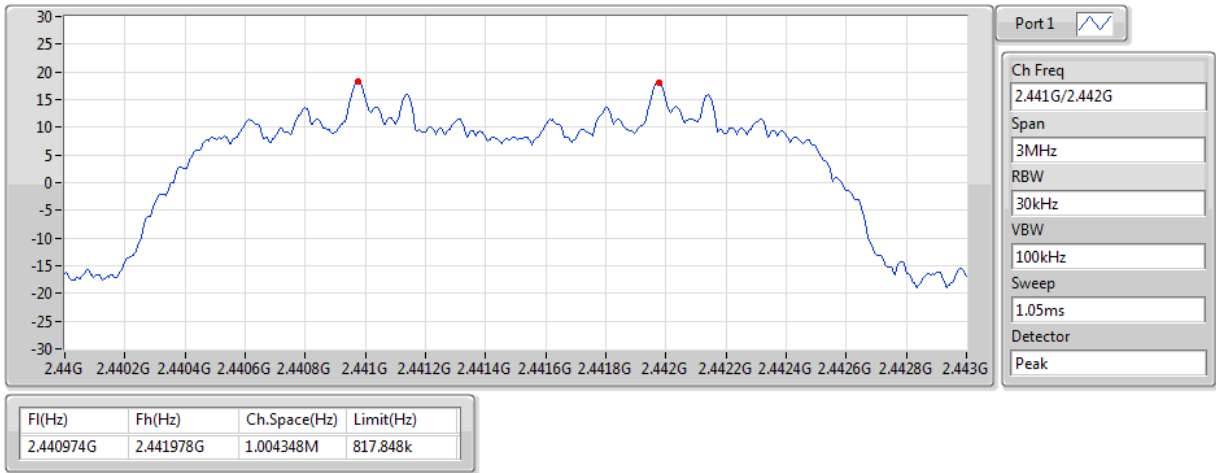
2.402G/2.403GHz



BT-EDR(2Mbps)

Channel Separation-FS

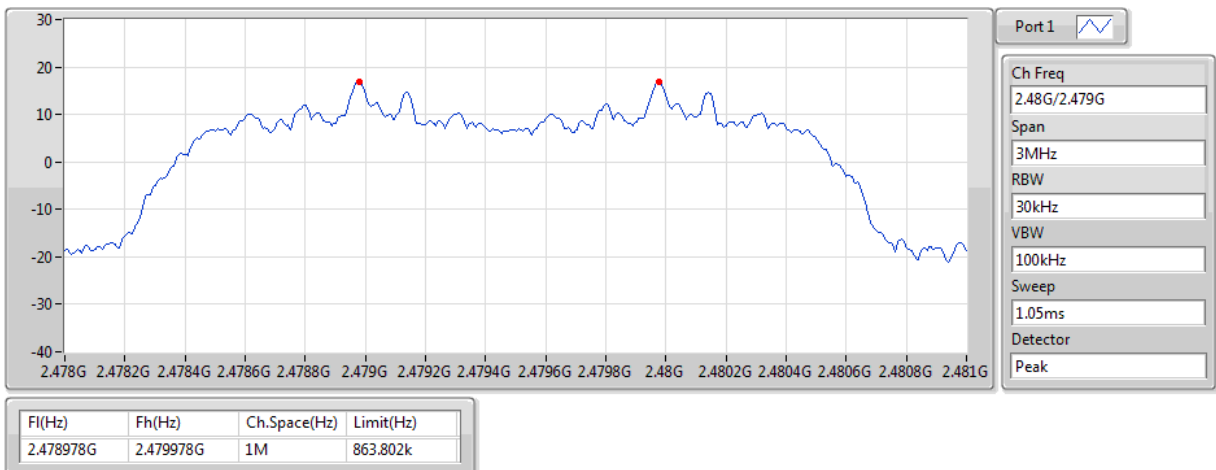
2.441G/2.442GHz



BT-EDR(2Mbps)

Channel Separation-FS

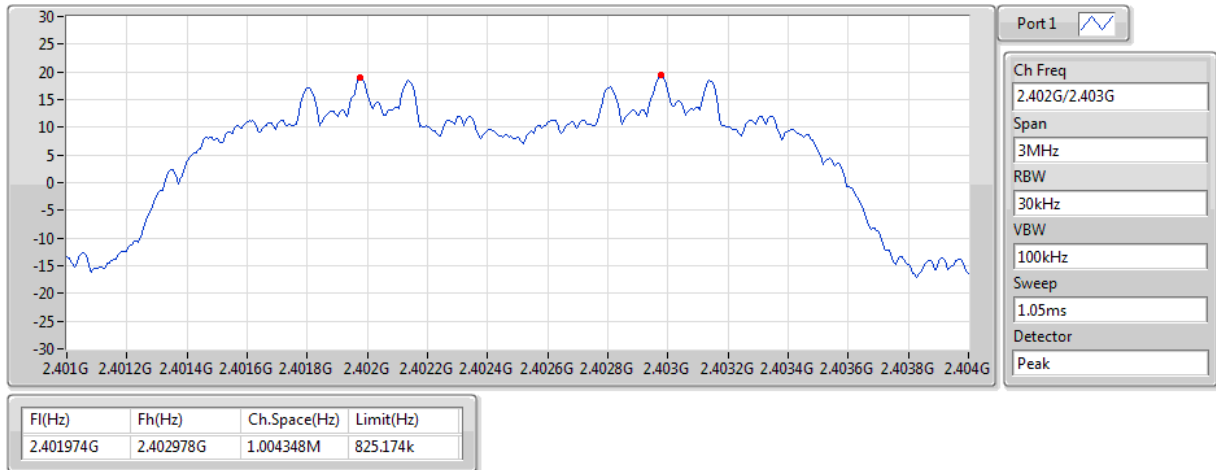
2.48G/2.479GHz



BT-EDR(3Mbps)

Channel Separation-FS

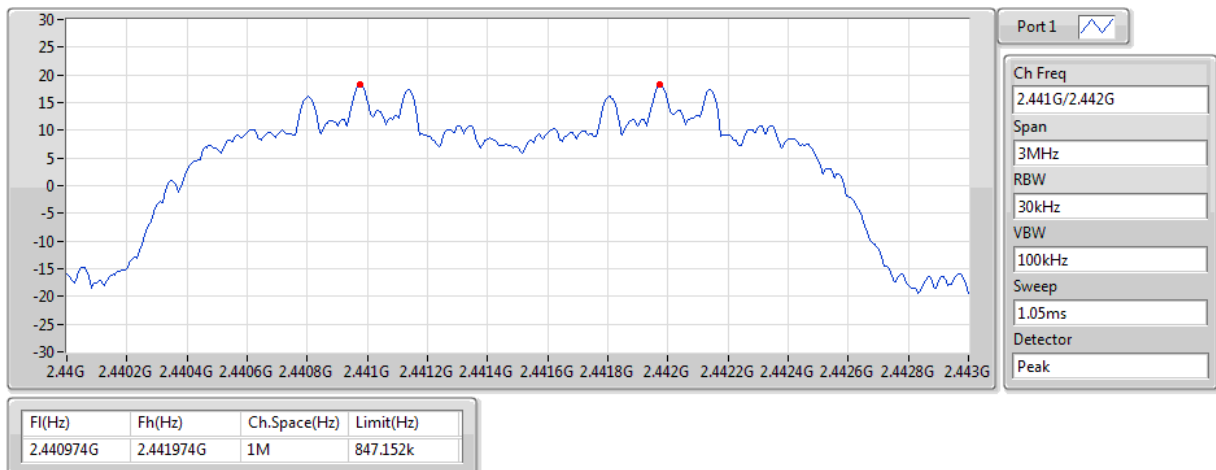
2.402G/2.403GHz



BT-EDR(3Mbps)

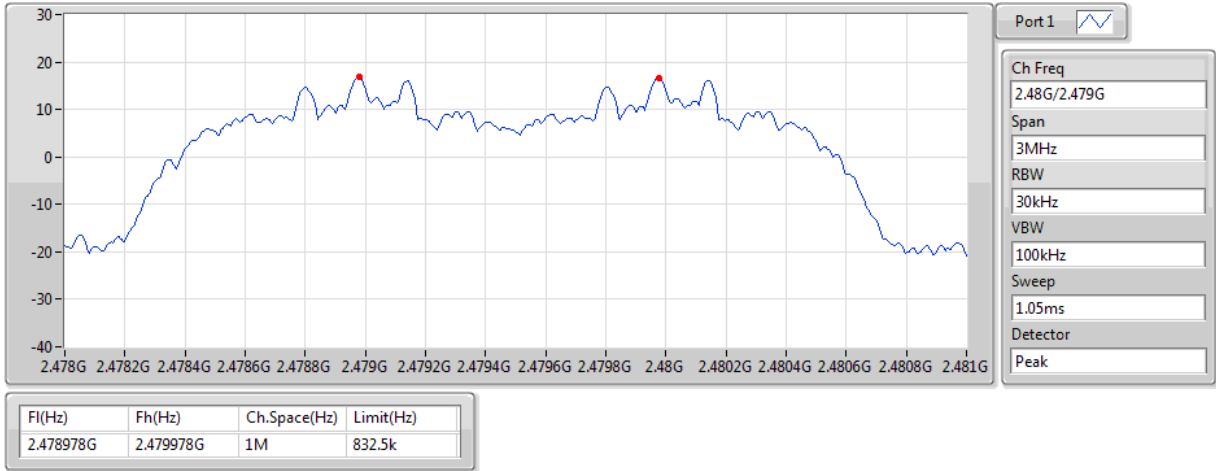
Channel Separation-FS

2.441G/2.442GHz



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

Channel Separation-FS



Model BT740-SC

Summary

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

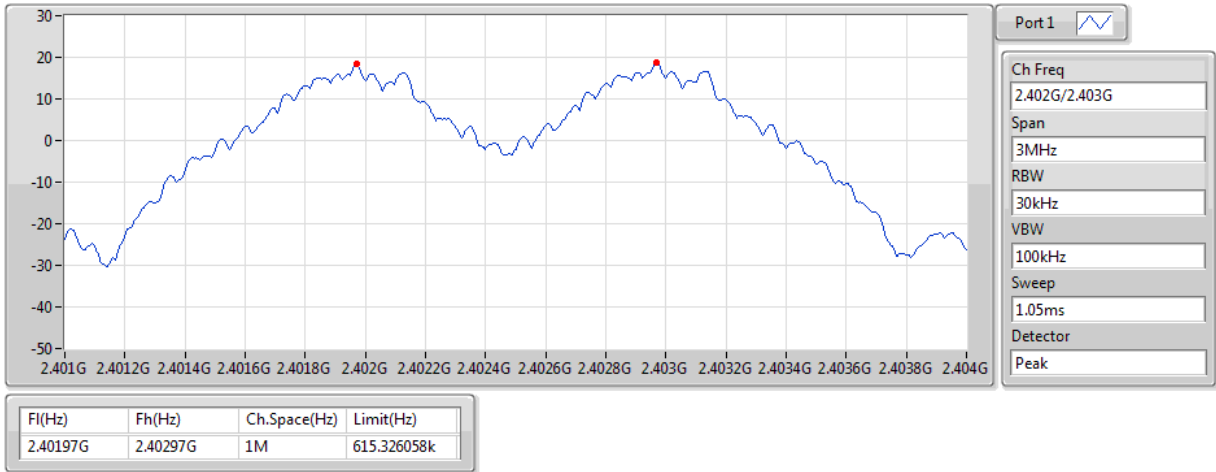
Result

Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.40197G	2.40297G	1M	615.326058k
2441MHz	Pass	2.440965G	2.44197G	1.004348M	624.978396k
2480MHz	Pass	2.478965G	2.479965G	1M	622.565478k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.401974G	2.402974G	1M	871.128k
2441MHz	Pass	2.44097G	2.441974G	1.004348M	875.79k
2480MHz	Pass	2.47897G	2.479974G	1.004348M	820.512k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.40197G	2.402974G	1.004348M	844.488k
2441MHz	Pass	2.44097G	2.441974G	1.004348M	849.15k
2480MHz	Pass	2.478974G	2.479974G	1M	832.5k

BT-BR(1Mbps)

Channel Separation-FS

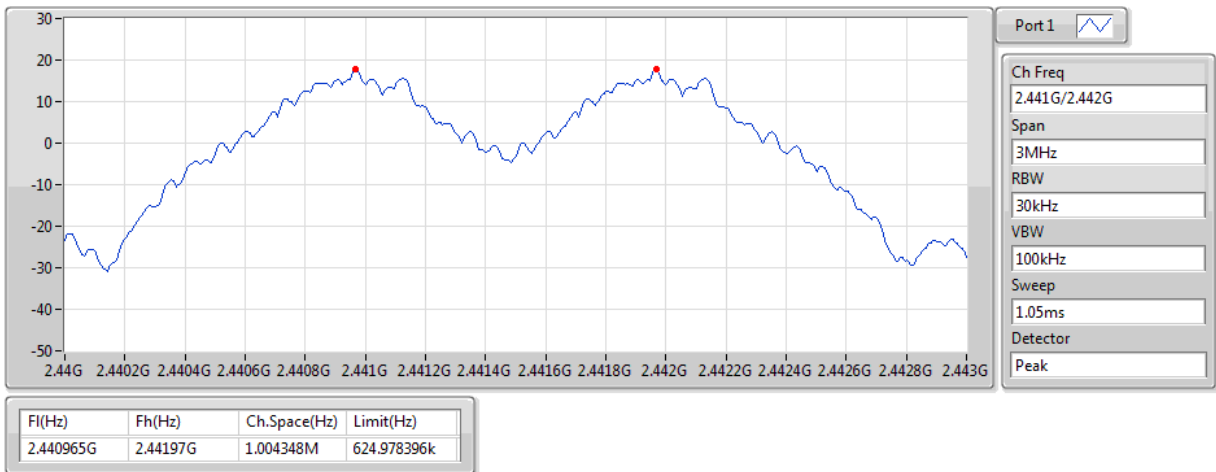
2.402G/2.403GHz



BT-BR(1Mbps)

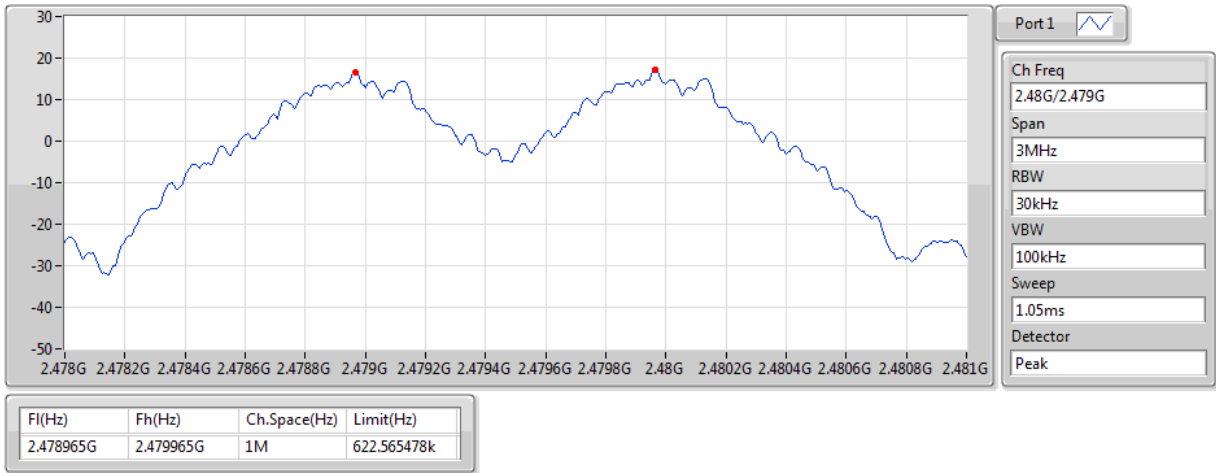
Channel Separation-FS

2.441G/2.442GHz



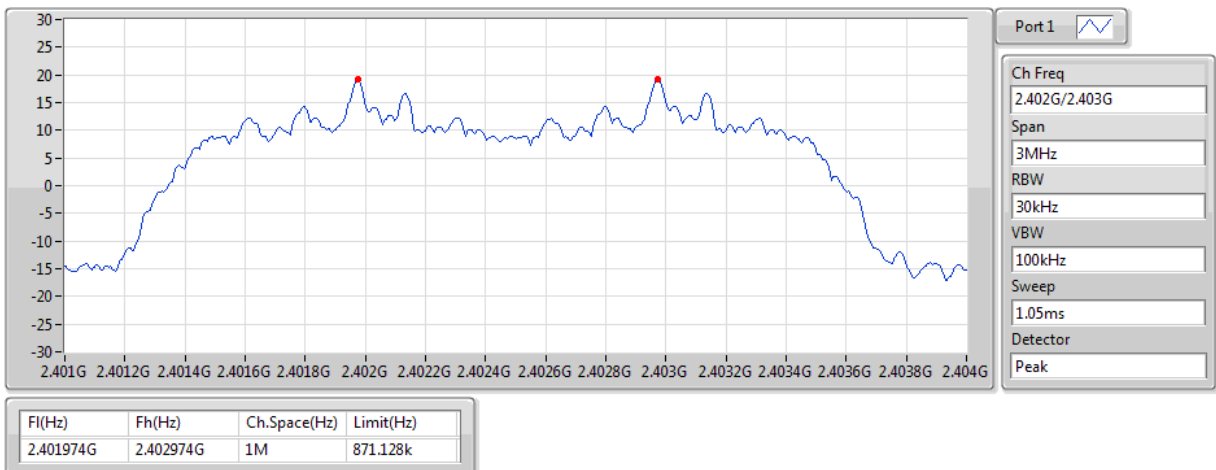
BT-BR(1Mbps)
2.48G/2.479GHz

Channel Separation-FS



BT-EDR(2Mbps)
2.402G/2.403GHz

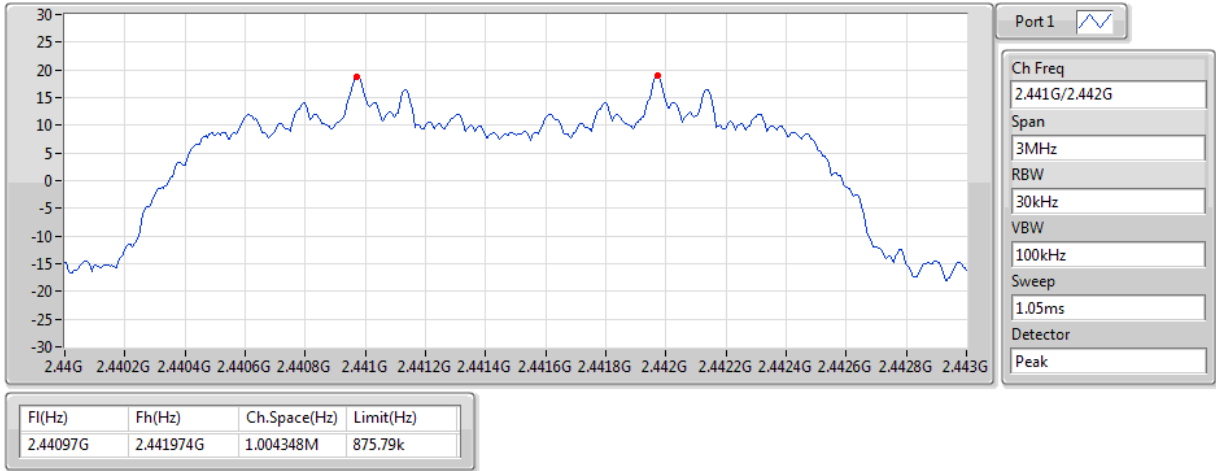
Channel Separation-FS



BT-EDR(2Mbps)

Channel Separation-FS

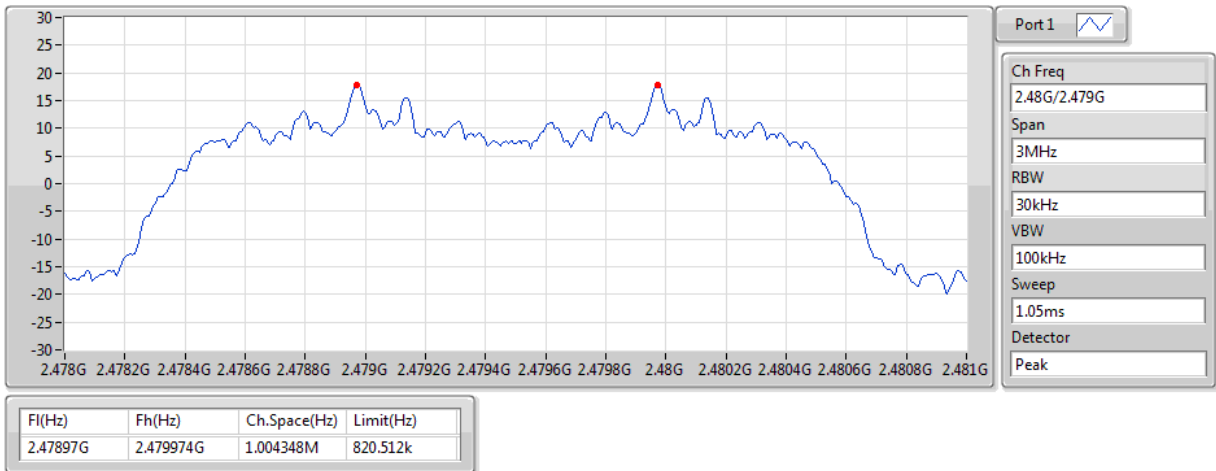
2.441G/2.442GHz



BT-EDR(2Mbps)

Channel Separation-FS

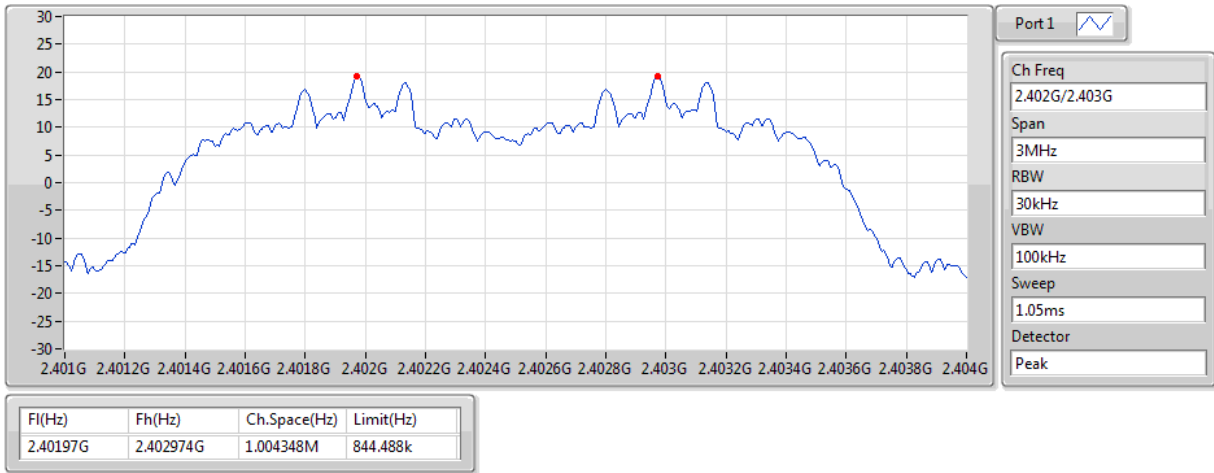
2.48G/2.479GHz



BT-EDR(3Mbps)

Channel Separation-FS

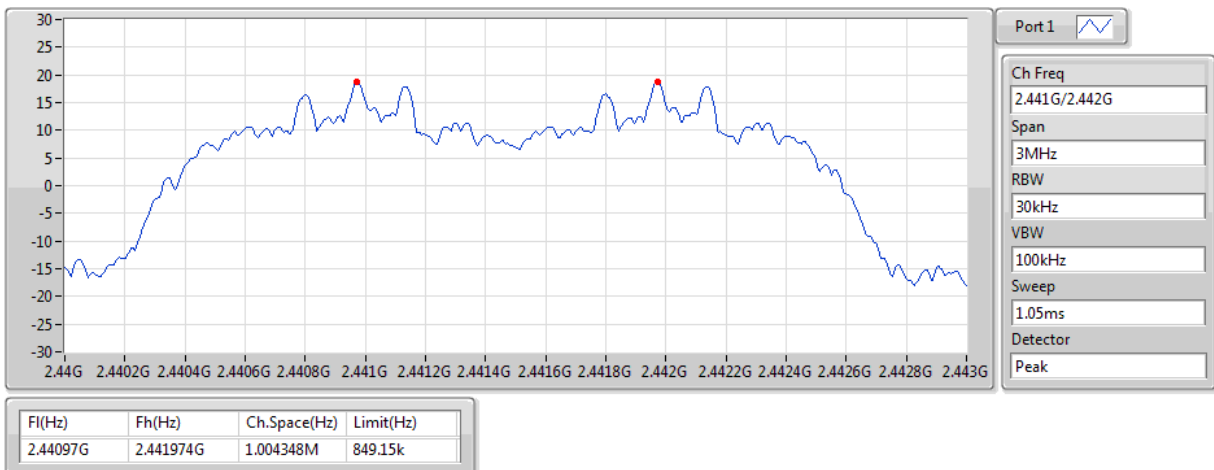
2.402G/2.403GHz



BT-EDR(3Mbps)

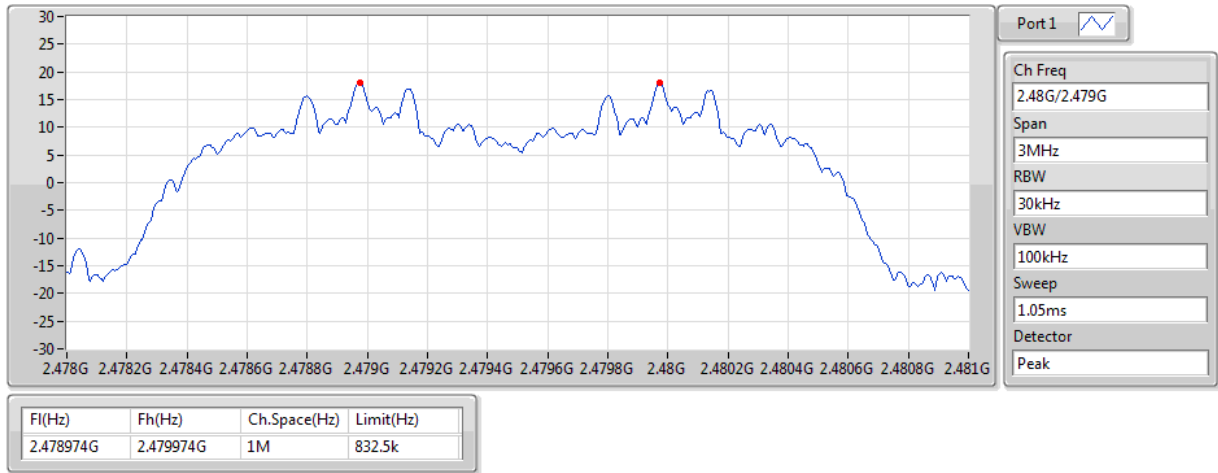
Channel Separation-FS

2.441G/2.442GHz



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

Channel Separation-FS



3.8 Number of Dwell Time

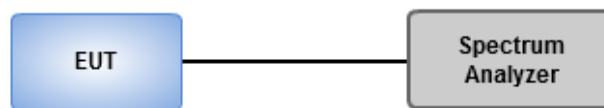
3.8.1 Limit of Dwell time

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

Ambient Condition	25°C / 67%	Tested By	Aska Huang
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Model BT740-SA

Summary

Mode	Max-Dwell (s)
2.4-2.4835GHz	-
BT-BR(1Mbps)	351.17396m_DH5
BT-EDR(2Mbps)	315.8736m_DH5
BT-EDR(3Mbps)	334.56816m_DH5
BT-BR-AFH(1Mbps)	304.252m_DH5-AFH
BT-EDR-AFH(2Mbps)	294m_DH5-AFH
BT-EDR-AFH(3Mbps)	317.547m_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	0.35117	0.4	2.92450	19
BT-EDR(2Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	31.6	0.31587	0.4	2.94000	17
BT-EDR(3Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	31.6	0.33457	0.4	2.94100	18

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

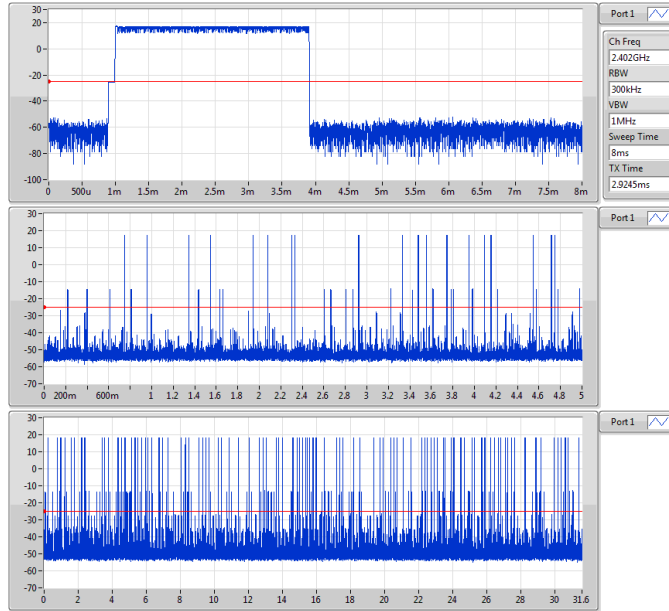
Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (ms)	Number of transmission in a 2 s
BT-BR-AFH(1Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.30425	0.4	2.92550	26
BT-EDR-AFH(2Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.29400	0.4	2.94000	25
BT-EDR-AFH(3Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.31755	0.4	2.94025	27

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

Note 2: DH5 was the worst mode.

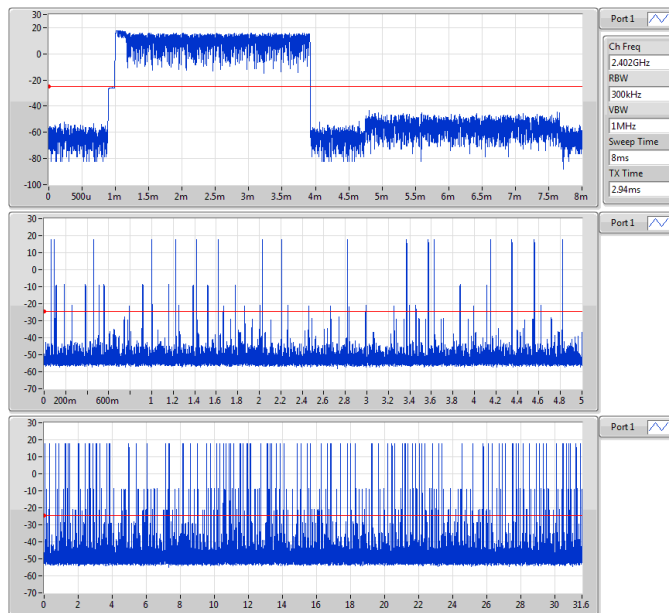
BT-BR(1Mbps)
2402MHz

Dwell-FS



BT-EDR(2Mbps)
2402MHz

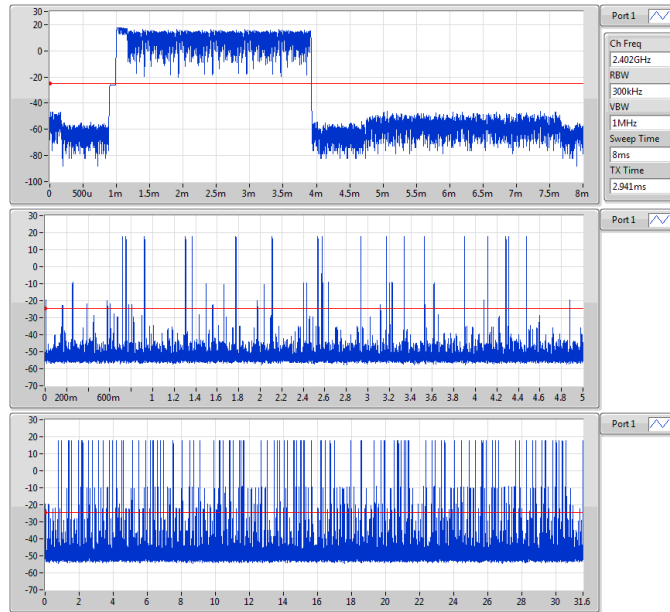
Dwell-FS



BT-EDR(3Mbps)

Dwell-FS

2402MHz



BT-BR-AFH(1Mbps)

Dwell-FS

2402MHz



BT-EDR-AFH(2Mbps)

Dwell-FS

2402MHz



BT-EDR-AFH(3Mbps)

Dwell-FS

2402MHz



Model BT740-SC**Summary**

Mode	Max-Dwell (s)
2.4-2.4835GHz	-
BT-BR(1Mbps)	334.53972m_DH5
BT-EDR(2Mbps)	353.15528m_DH5
BT-EDR(3Mbps)	315.95418m_DH5
BT-BR-AFH(1Mbps)	315.927m_DH5-AFH
BT-EDR-AFH(2Mbps)	317.493m_DH5-AFH
BT-EDR-AFH(3Mbps)	294.075m_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	0.33454	0.4	2.94075	18
BT-EDR(2Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	31.6	0.35316	0.4	2.94100	19
BT-EDR(3Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	31.6	0.31595	0.4	2.94075	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	0.31593	0.4	2.92525	27
BT-EDR-AFH(2Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.31749	0.4	2.93975	27
BT-EDR-AFH(3Mbps)	-	-	-	-	-	-
2402MHz_DH5	PASS	8	0.29408	0.4	2.94075	25

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



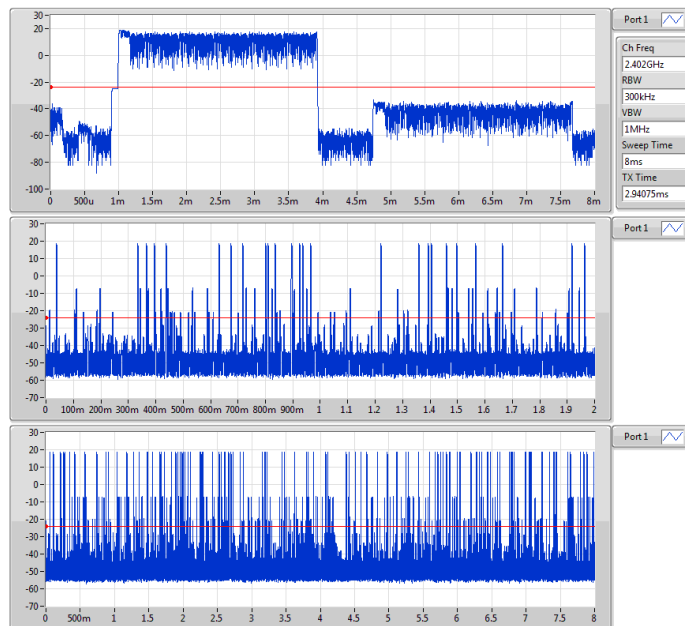
BT-EDR-AFH(2Mbps)
2402MHz

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.)
No.2-1, 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: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

==END==