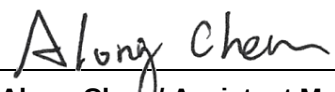


FCC Test Report

FCC ID : SQG-VELAIF820
Equipment : Bluetooth BT5.4 Dual Model Module
Model No. : Vela IF820
Brand Name : Laird Connectivity
Applicant : Laird Connectivity LLC
Address : W66N220 Commerce Court, Cedarburg, WI
53012 United States Of America
Standard : 47 CFR FCC Part 15.247
Received Date : Apr. 18, 2023
Tested Date : Jul. 26 ~ Aug. 09, 2023

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 shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:


Along Chen / Assistant Manager

Approved by:

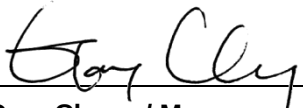

Gary Chang / Manager

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Appendix A. Unwanted Emissions into Restricted Frequency Bands

Appendix B. Unwanted Emissions into Non-Restricted Frequency Bands

Appendix C. Conducted Output Power

Appendix D. Number of Hopping Frequency

Appendix E. 20dB and Occupied Bandwidth

Appendix F. Channel Separation

Appendix G. Number of Dwell Time

Appendix H. AC Power Line Conducted Emissions

Release Record

Report No.	Version	Description	Issued Date
FR341801AD	Rev. 01	Initial issue	Sep. 19, 2023

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 2.334MHz 26.79 (Margin -19.21dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 173.56MHz 40.02 (Margin -3.48dB) - PK	Pass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(1)	Conducted Output Power	Power [dBm]: 7.75	Pass
15.247(a)(1)(iii)	Number of Hopping Channels	Meet the requirement of limit	Pass
15.247(a)(1)	Hopping Channel Separation	Meet the requirement of limit	Pass
15.247(a)(1)(iii)	Dwell Time	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Declaration of Conformity:

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

Comments and Explanations:

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

1 General Description

1.1 Information

1.1.1 Product Details

The EUT is available in SA module (integrated antenna) and SC module (IPEX MHF4 connector) variants.

Model Name	Part No.	Module
Vela IF820	453-00171	SA Module, Vela IF820, Integrated Antenna
	453-00172	SC Module, Vela IF820, MHF4

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	2402-2480	0-78 [79]	1 Mbps
2400-2483.5	EDR	2402-2480	0-78 [79]	2 Mbps
2400-2483.5	EDR	2402-2480	0-78 [79]	3 Mbps
Note 1: RF output power specifies that Maximum Peak Conducted Output Power.				
Note 2: Bluetooth BR uses a GFSK.				
Note 3: Bluetooth EDR uses a combination of $\pi/4$ -DQPSK and 8DPSK.				

1.1.3 Antenna Details

Ant. No.	Manufacturer	Model	Laird Part Number	Type	Connector	Gain	Cable loss (dB)
1	Laird	NanoBlue	EBL2400A1-10M H4L	PCB Dipole	IPEX MHF4	2dBi	N/A
2	Laird	FlexPIFA	001-0022	PCB Dipole	IPEX MHF4	2dBi	N/A
3	Mag.Layers	EDA-8709-2G4C1-B27-CY	0600-00057	Dipole	IPEX MHF4	2.32dBi	0.7
4	Laird	mFlexPIFA	EFA2400A3S-10 MH4L	PIFA	IPEX MHF4	2dBi	N/A
5	ACX	AD1608	AD1608-A2455A AT/LF	Chip Antenna	N/A	1dBi	N/A

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3Vdc 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	CyBluetool, V1.0 Bluetooth Simulator, Brand: R&S, Model: CMW270	
Modulation Mode	Duty Cycle Of Test Signal (%)	Duty Factor (dB)
DH5	79.95%	0.97
2DH5	79.72%	0.98
3DH5	79.72%	0.98

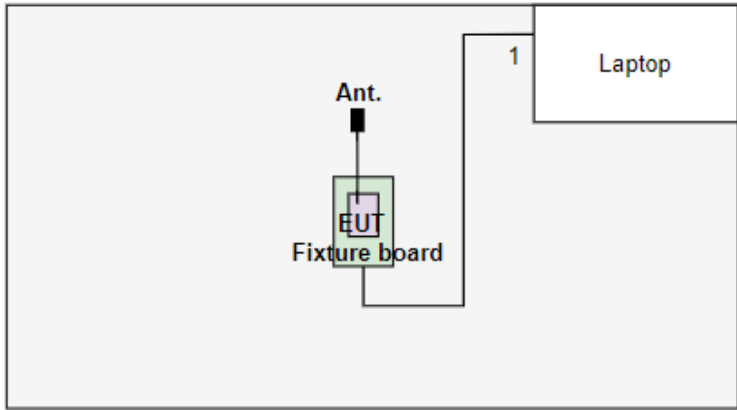
1.1.8 Power Index of Test Tool

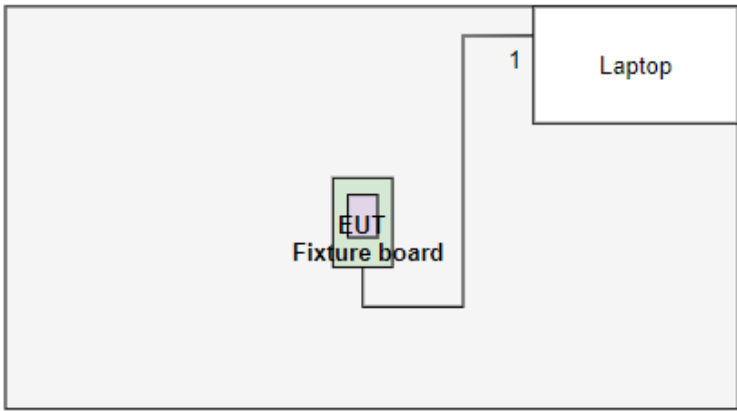
Modulation Mode	Test Frequency (MHz)		
	2402	2441	2480
GFSK/1Mbps	Default	Default	Default
$\pi/4$ -DQPSK /2Mbps	Default	Default	Default
8DPSK/3Mbps	Default	Default	Default

1.2 Local Support Equipment List

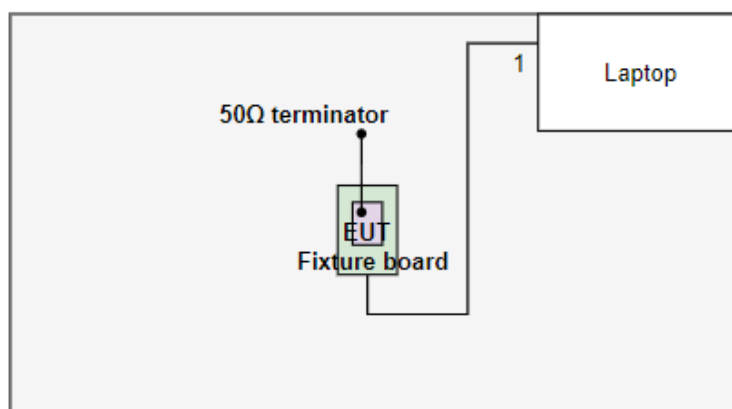
Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Laptop	DELL	Latitude 5400	DoC	---
2	Fixture	---	---	---	Provided by applicant.
3	50Ω terminator	Woken	WTER-18S2	---	---

1.3 Test Setup Chart

Test Setup Diagram (Conducted Emission – SC module)	
	
No.	Signal cable / Length (m)
1	USB, 1m shielded.

Test Setup Diagram (Conducted Emission – SA module)	
	
No.	Signal cable / Length (m)
1	USB, 1m shielded.

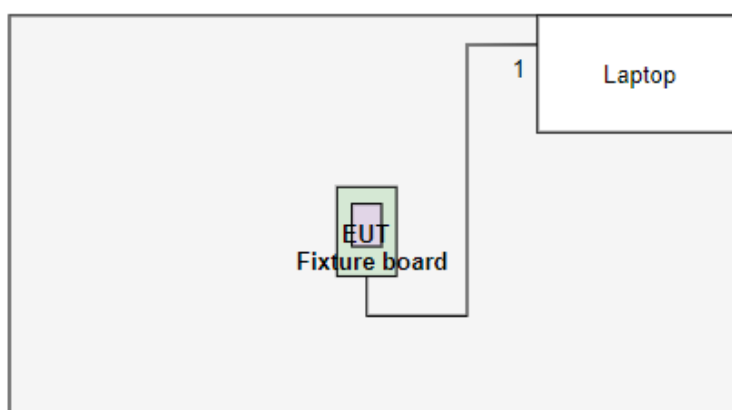
Test Setup Diagram (Radiated Emission – SC module)



No.	Signal cable / Length (m)
-----	---------------------------

1	USB, 1m shielded.
---	-------------------

Test Setup Diagram (Radiated Emission – SA module)



No.	Signal cable / Length (m)
-----	---------------------------

1	USB, 1m shielded.
---	-------------------

1.4 The Equipment List

Test Item	Radiated Emission below 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Aug. 04, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 03, 2023	Mar. 02, 2024
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 01, 2022	Oct. 31, 2023
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 31, 2023	Jul. 30, 2024
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2023	Jun. 27, 2024
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 04, 2022	Oct. 03, 2023
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 04, 2022	Oct. 03, 2023
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 04, 2022	Oct. 03, 2023
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 04, 2022	Oct. 03, 2023
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Jul. 26 ~ Aug. 01, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Wireless connectivity tester	R&S	CMW270	100856	Nov. 16, 2022	Nov. 15, 2023
Spectrum Analyzer	R&S	FSV40	101498	Nov. 21, 2022	Nov. 20, 2023
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 25, 2022	Nov. 24, 2023
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 27, 2022	Oct. 26, 2023
Preamplifier	EMC	EMC118A45SE	980898	Jul. 14, 2023	Jul. 13, 2024
Preamplifier	EMC	EMC184045SE	980903	Jul. 17, 2023	Jul. 16, 2024
RF Cable	EMC	EMC104-35M-35M-8000	210920	Oct. 04, 2022	Oct. 03, 2023
RF Cable	EMC	EMC104-35M-35M-3000	210922	Oct. 04, 2022	Oct. 03, 2023
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 06, 2022	Oct. 05, 2023
Attenuator	Pasternack	PE7005-10	10-2	Oct. 06, 2022	Oct. 05, 2023
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Aug. 09, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 17, 2023	Feb. 16, 2024
LISN	R&S	ENV216	101579	May 09, 2023	May 08, 2024
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127667	Jan. 03, 2023	Jan. 02, 2024
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 17, 2022	Oct. 16, 2023
50 ohm terminal (Support Unit)	NA	50	01	Jun. 14, 2023	Jun. 13, 2024
Measurement S/W	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Aug. 03 ~ Aug. 04, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Wireless connectivity tester	R&S	CMW270	100856	Nov. 16, 2022	Nov. 15, 2023
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
Power Meter	Anritsu	ML2495A	1241002	Nov. 23, 2022	Nov. 22, 2023
Power Sensor	Anritsu	MA2411B	1207366	Nov. 23, 2022	Nov. 22, 2023
Attenuator	Pasternack	PE7005-10	10-2	Oct. 06, 2022	Oct. 05, 2023
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 06, 2022	Oct. 05, 2023
LOWPASS FILTER	WI	WLKS1100-12SS	2	Oct. 06, 2022	Oct. 05, 2023
Measurement Software	Sporton	SENSE-15247_FS	V5.10.8	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
Unwanted Emission ≤ 1 GHz	± 3.41 dB
Unwanted 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	Modulation Mode	Test Frequency (MHz)	Test method	Mode	Test Configuration	Note
Conducted Emissions	GFSK(1Mbps)	2480	Conducted	TX	1, 2	-
Radiated Emissions $\leq$ 1GHz	GFSK(1Mbps)	2480	Radiated	TX	1, 2	Note 2
Radiated Emissions > 1GHz	GFSK(1Mbps) π/4 DQPSK(2Mbps)	2402, 2441, 2480 2402, 2441, 2480	Radiated	TX	1, 2	Note 2
Radiated Emissions $\leq$ 1GHz	GFSK(1Mbps)	2480	Conducted	TX	1	-
Radiated Emissions > 1GHz	GFSK(1Mbps) π/4 DQPSK(2Mbps)	2402, 2441, 2480 2402, 2441, 2480	Conducted	TX	1	-
Number of Hopping Channels	GFSK(1Mbps) π/4 DQPSK(2Mbps) 8DPSK(3Mbps)	2402~2480 2402~2480 2402~2480	Conducted	TX	1, 2	-
Conducted Output Power Hopping Channel Separation 20dB and Occupied bandwidth	GFSK(1Mbps) π/4 DQPSK(2Mbps) 8DPSK(3Mbps)	2402, 2441, 2480 2402, 2441, 2480 2402, 2441, 2480	Conducted	TX	1, 2	-
Dwell Time	GFSK(1Mbps) π/4 DQPSK(2Mbps) 8DPSK(3Mbps)	2402 2402 2402	Conducted	TX	1, 2	-

NOTE:

- The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** result was found as the worst case and was shown in this report.
- The 50Ω terminator is connected to antenna port of EUT for radiated emission measurement.
- Test configurations are listed as below:
Configuration 1: Laird part number: 453-00171 (SC module)
Configuration 2: Laird part number: 453-00172 (SA module)

3 Transmitter Test Results

3.1 Unwanted Emissions into Restricted Frequency Bands

3.1.1 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.

3.1.2 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:

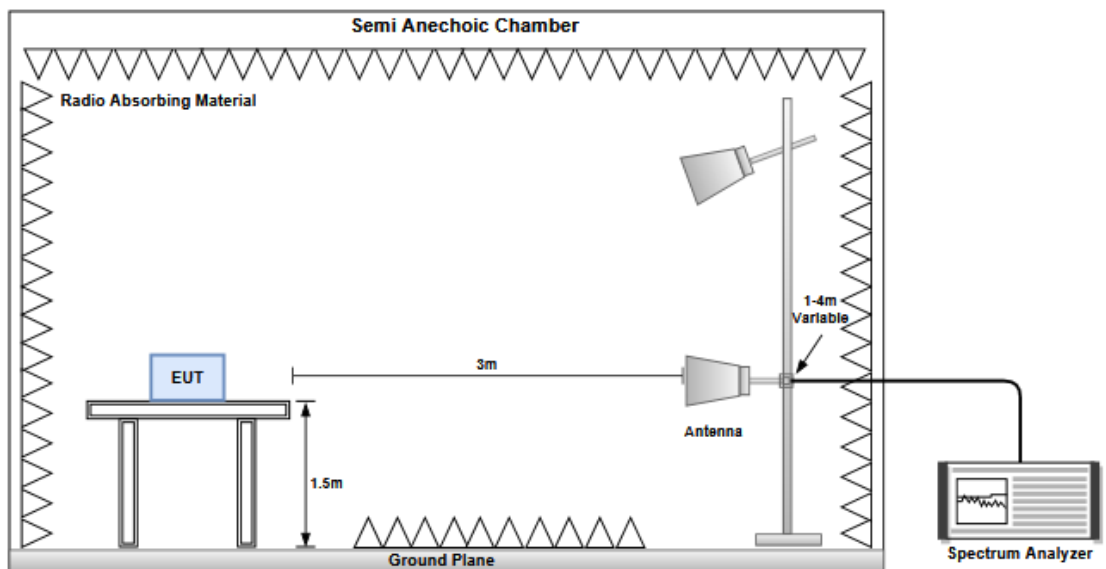
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. Radiated emission above 1GHz / Peak value
RBW=1MHz, VBW=3MHz and Peak detector
Radiated emission above 1GHz / Average value for harmonics
The average value is: Average = Peak value + 20log(Duty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

3.1.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.1.4 Test Results

Refer to Appendix A.

3.2 Unwanted Emissions into Non-Restricted Frequency Bands

3.2.1 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.

3.2.2 Test Procedures

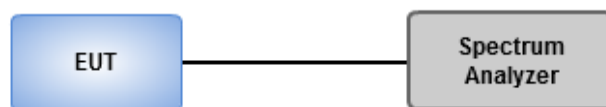
Reference level measurement

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

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	22-23°C / 63-64%	Tested By	Roger Lu
-------------------	------------------	-----------	----------

Refer to Appendix B.

3.3 Conducted Output Power

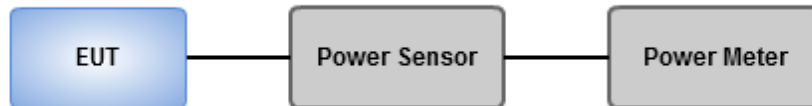
3.3.1 Limit of Conducted Output Power

- ☐ 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.

3.3.2 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

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	22-23°C / 63-64%	Tested By	Roger Lu
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Refer to Appendix C.

3.4 Number of Hopping Frequency

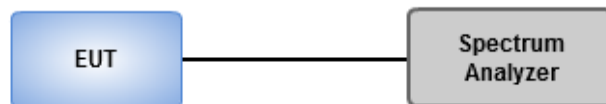
3.4.1 Limit of Number of Hopping Frequency

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

3.4.2 Test Procedures

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

3.4.3 Test Setup



3.4.4 Test Results

Ambient Condition	22-23°C / 63-64%	Tested By	Roger Lu
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Refer to Appendix D.

3.5 20dB and Occupied Bandwidth

3.5.1 Test Procedures

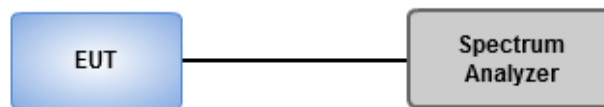
20dB Bandwidth

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

3.5.2 Test Setup



3.5.3 Test Results

Ambient Condition	22-23°C / 63-64%	Tested By	Roger Lu
-------------------	------------------	-----------	----------

Refer to Appendix E.

3.6 Channel Separation

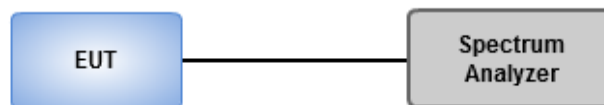
3.6.1 Limit of Channel Separation

- ☐ 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.

3.6.2 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

3.6.3 Test Setup



3.6.4 Test Results

Ambient Condition	22-23°C / 63-64%	Tested By	Roger Lu
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Refer to Appendix F.

3.7 Number of Dwell Time

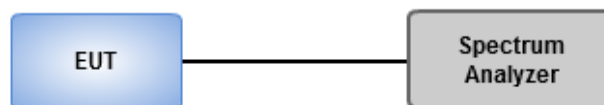
3.7.1 Limit of Dwell time

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.

3.7.2 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.

3.7.3 Test Setup



3.7.4 Test Results

Ambient Condition	22-23°C / 63-64%	Tested By	Roger Lu
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Refer to Appendix G.

3.8 AC Power Line Conducted Emissions

3.8.1 Limit of AC Power Line Conducted Emissions

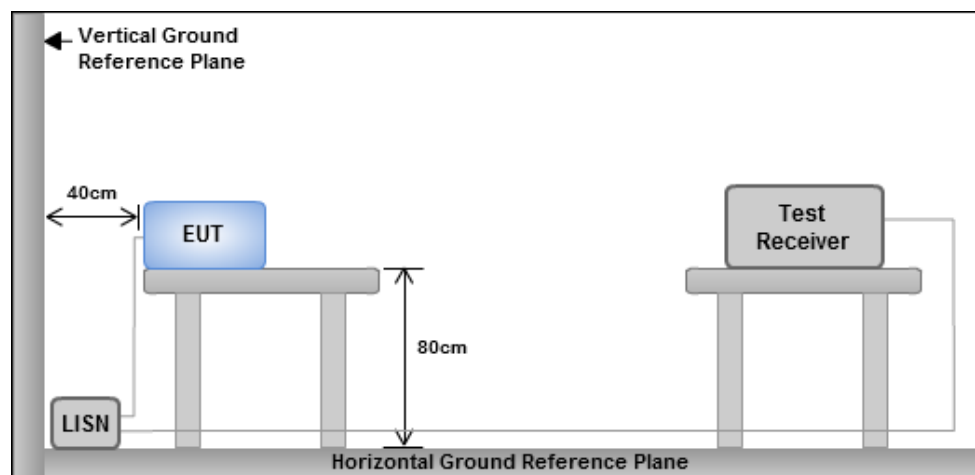
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

3.8.2 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

3.8.3 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

3.8.4 Test Results

Refer to Appendix H.

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 33381, 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

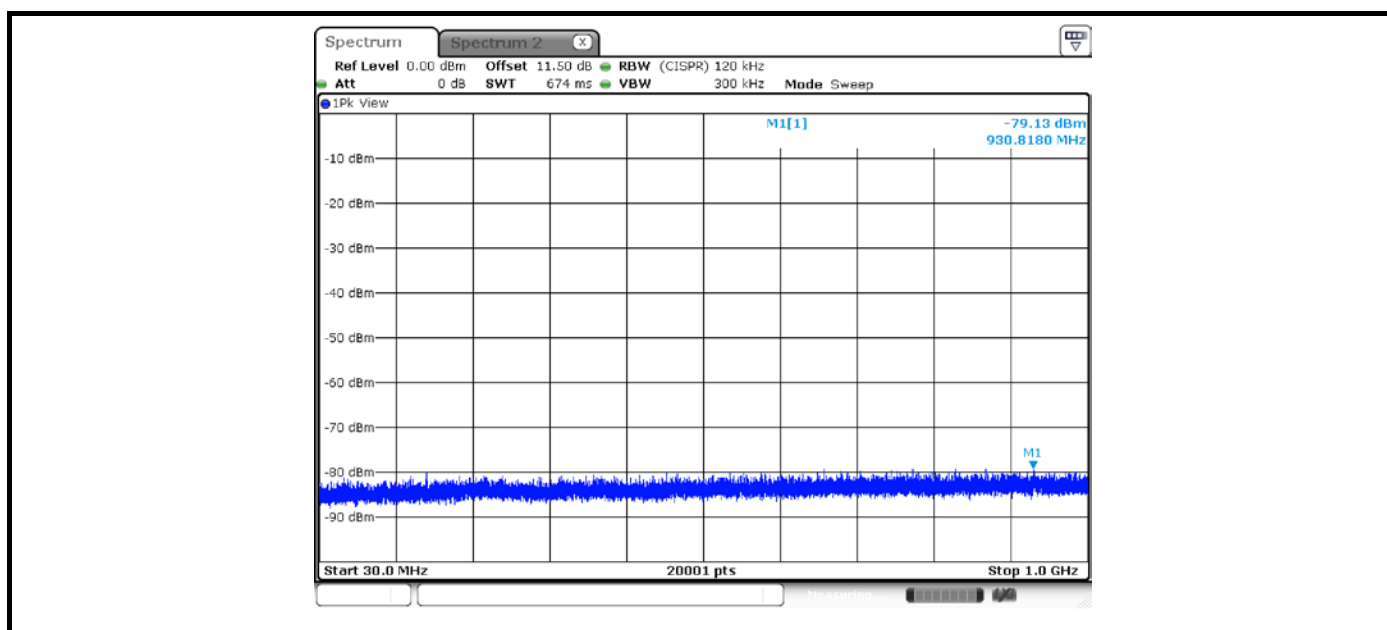
Email: ICC_Service@icertifi.com.tw

==END==

Restrict bands below 1G							
Transmitter Conducted Unwanted Emissions Results							
Modulation Mode	GFSK			Frequency	2480MHz		
Range (MHz)	Max Value (dBm)	DG (dBi)	GRF (dB)	EIRP (dBm)	E-Field (dBuV/m)	Min E-Field Limit (dBuV/m)	E-Field Margin (dB)
30~1000MHz	-79.13	2.00	4.70	-72.43	22.83	40.00	-17.17

DG=directional gain

GRF=ground reflection factor



Restrict bands above 1G							
Transmitter Conducted Unwanted Emissions Results in Restricted Frequency Band							
Modulation Mode	GFSK			Frequency	2402 MHz		
Freq (MHz)	Remark	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
4804.00	PK	-48.27	2.00	-46.27	48.99	74.00	-25.01
4804.00	AV note1	-	2.00	-	-	54.00	-

Restrict bands above 1G							
Transmitter Conducted Unwanted Emissions Results in Restricted Frequency Band							
Modulation Mode	GFSK			Frequency	2441 MHz		
Freq (MHz)	Remark	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
4882.00	PK	-49.50	2.00	-47.50	47.76	74.00	-26.24
4882.00	AV note1	-	2.00	-	-	54.00	-

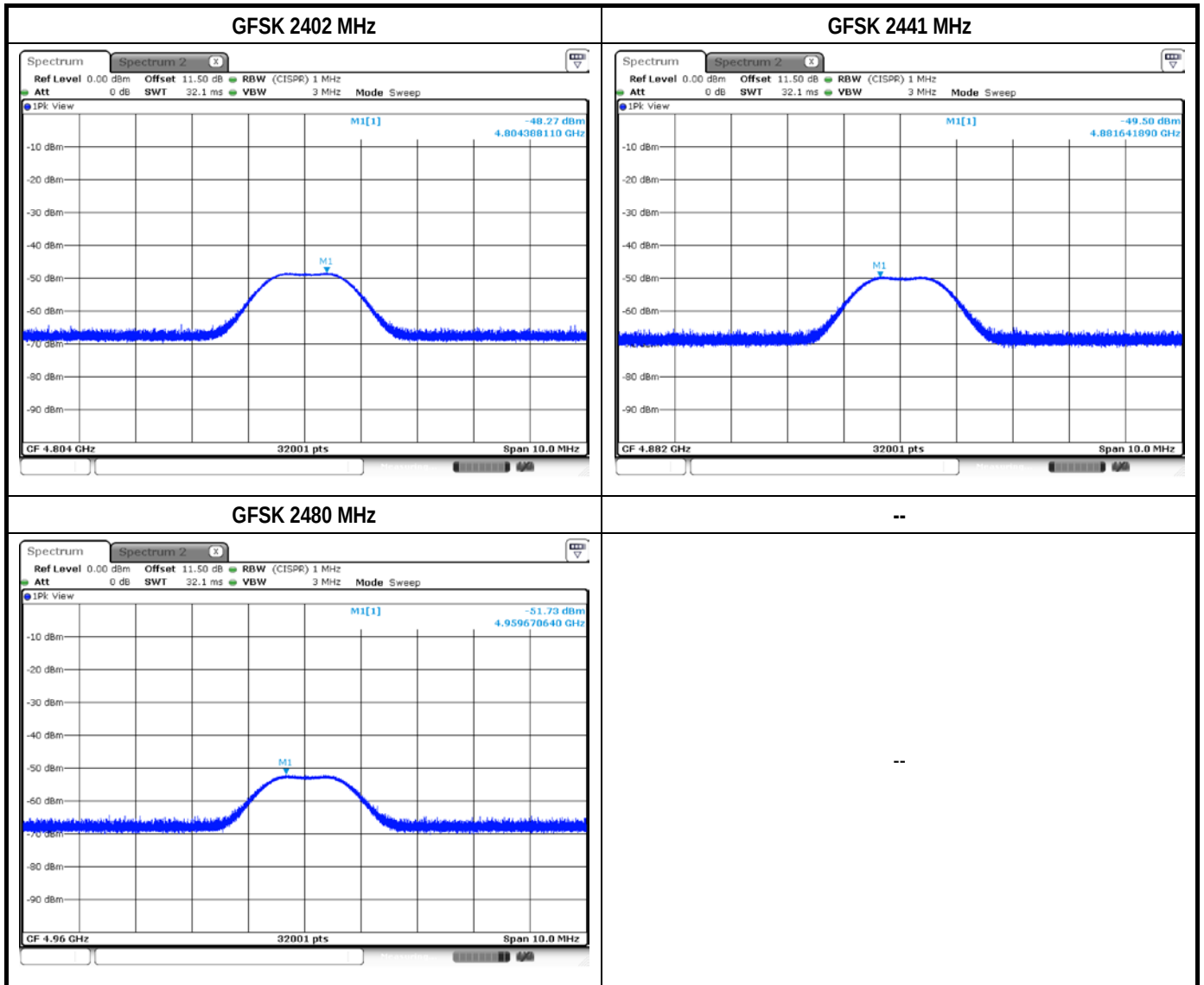
Restrict bands above 1G							
Transmitter Conducted Unwanted Emissions Results in Restricted Frequency Band							
Modulation Mode	GFSK			Frequency	2480 MHz		
Freq (MHz)	Remark	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
4960.00	PK	-51.73	2.00	-49.73	45.53	74.00	-28.47
4960.00	AV note1	-	2.00	-	-	54.00	-

Note: If the PK margin greater than 20 dB, there is no need to get AVG reading.



Unwanted Conducted Emissions into Restricted Frequency Bands – SC Module

Appendix A.1



Restrict bands above 1G							
Transmitter Conducted Unwanted Emissions Results in Restricted Frequency Band							
Modulation Mode	DQPSK			Frequency	2402 MHz		
Freq (MHz)	Remark	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
4804.00	PK	-53.30	2.00	-51.30	43.96	74.00	-30.04
4804.00	AV note1	-	2.00	-	-	54.00	-

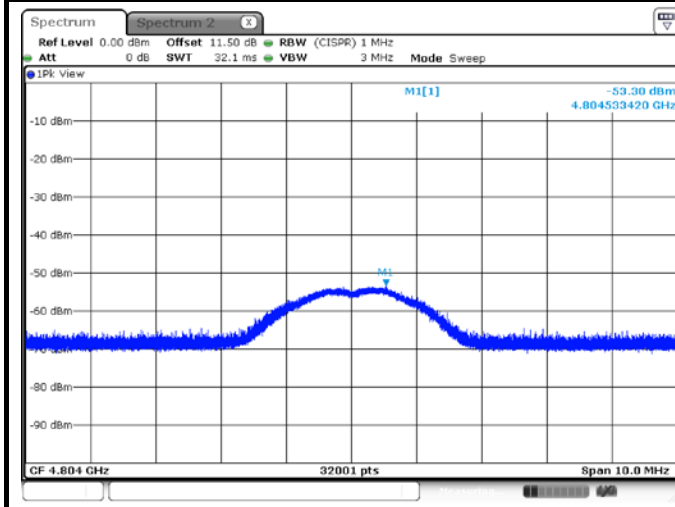
Restrict bands above 1G							
Transmitter Conducted Unwanted Emissions Results in Restricted Frequency Band							
Modulation Mode	DQPSK			Frequency	2441 MHz		
Freq (MHz)	Remark	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
4882.00	PK	-54.81	2.00	-52.81	42.45	74.00	-31.55
4882.00	AV note1	-	2.00	-	-	54.00	-

Restrict bands above 1G							
Transmitter Conducted Unwanted Emissions Results in Restricted Frequency Band							
Modulation Mode	DQPSK			Frequency	2480 MHz		
Freq (MHz)	Remark	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
4960.00	PK	-56.57	2.00	-54.57	40.69	74.00	-33.31
4960.00	AV note1	-	2.00	-	-	54.00	-

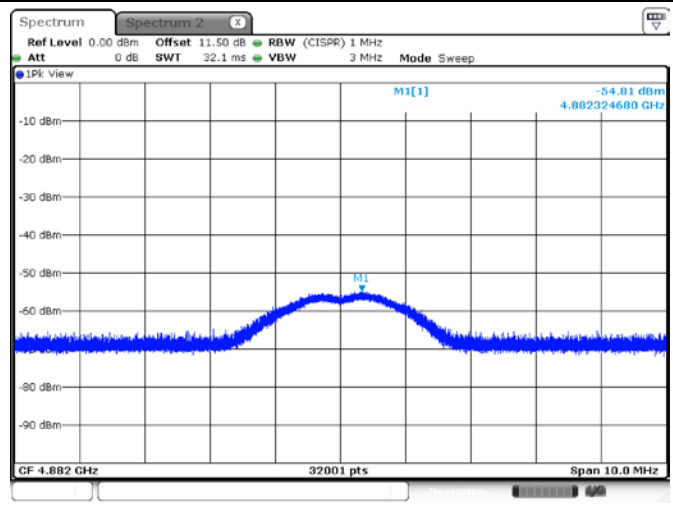
Note : If the PK margin greater than 20 dB, there is no need to get AVG reading.



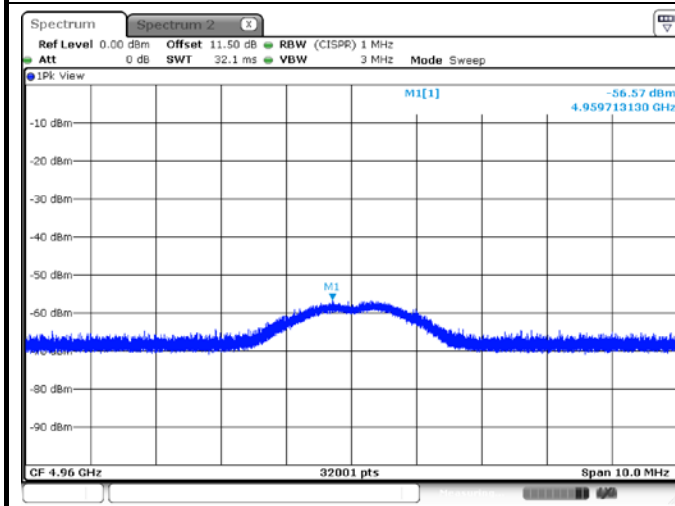
DQPSK 2402 MHz



DQPSK 2441 MHz



DQPSK 2480 MHz

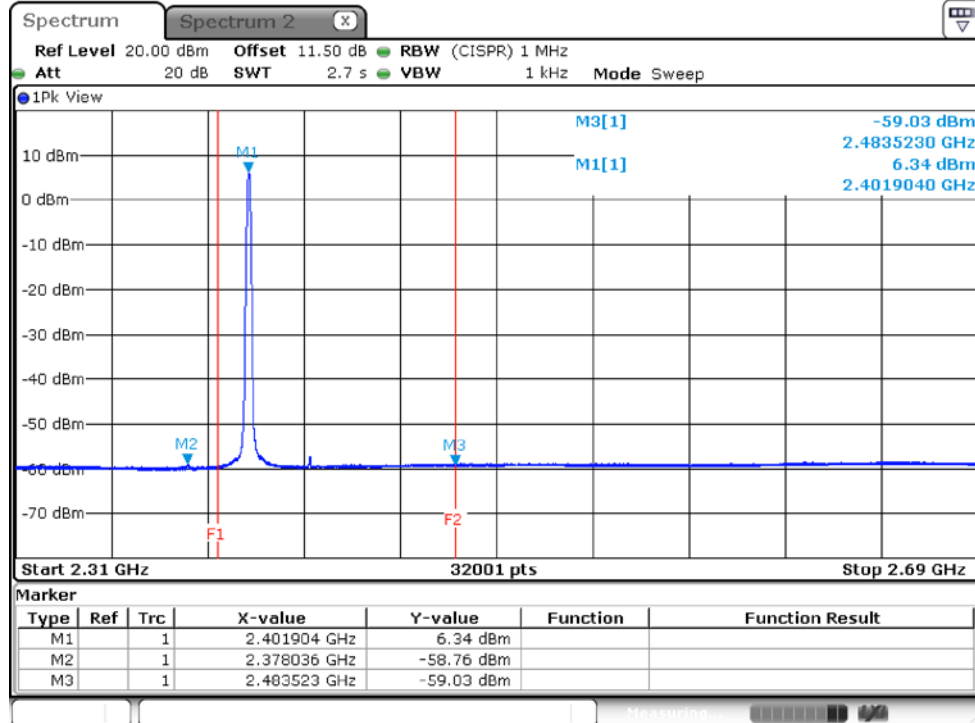
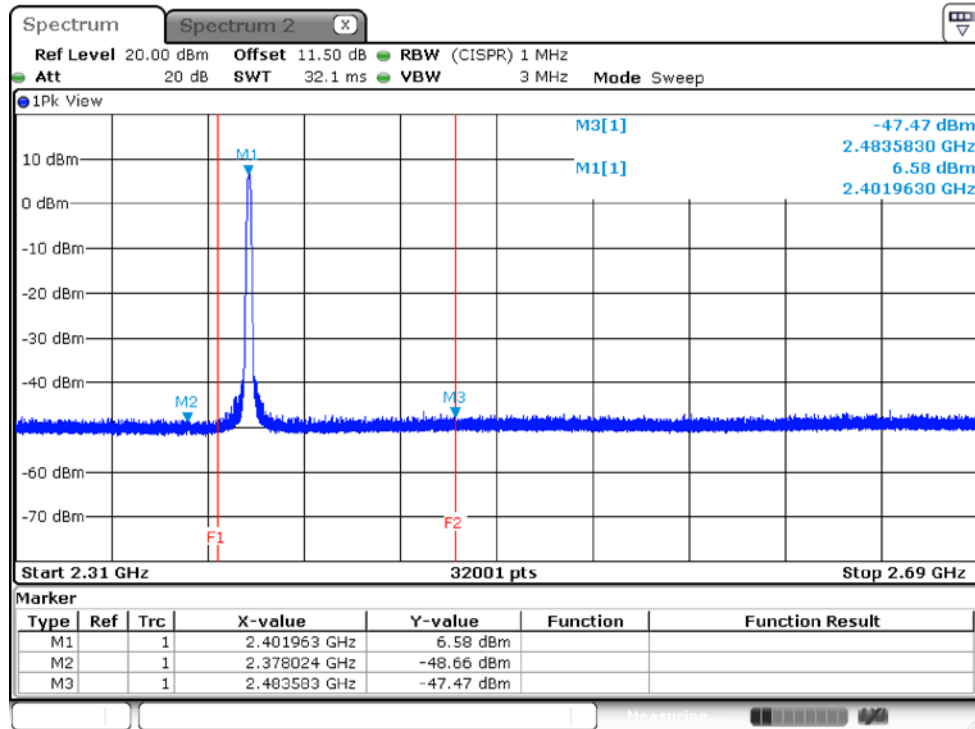


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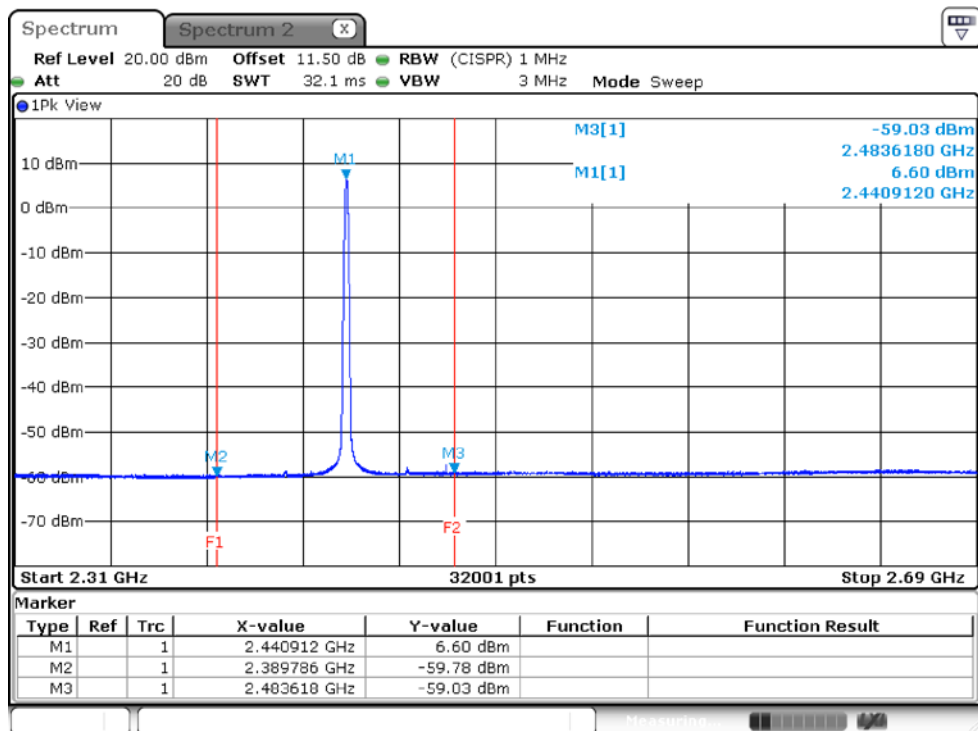
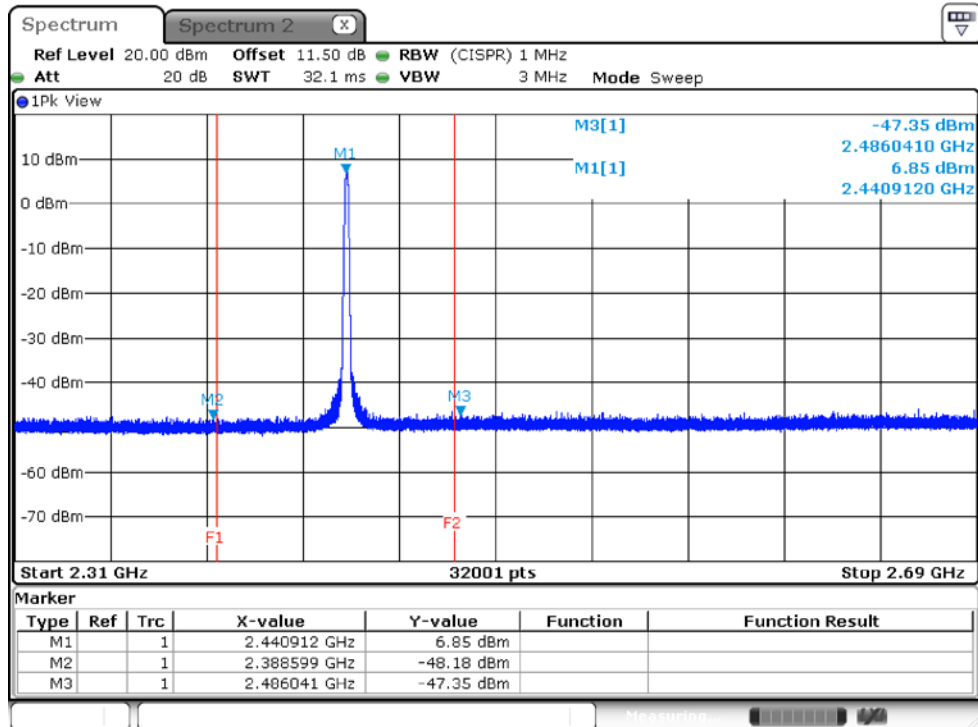
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Restrict bands above 1G								
Transmitter Conducted Unwanted Emissions Results in Band edge								
Modulation Mode	GFSK							
Test ch. Freq. (MHz)	Remark	Range (MHz)	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
2402	PK	2310~2390	-48.66	2.00	-46.66	48.60	74.00	-25.40
	AV	2310~2390	-58.76	2.00	-56.76	38.50	54.00	-15.50
	PK	2483.5~2500	-47.47	2.00	-45.47	49.79	74.00	-24.21
	AV	2483.5~2500	-59.03	2.00	-57.03	38.23	54.00	-15.77
2441	PK	2310~2390	-48.18	2.00	-46.18	49.08	74.00	-24.92
	AV	2310~2390	-59.78	2.00	-57.78	37.48	54.00	-16.52
	PK	2483.5~2500	-47.35	2.00	-45.35	49.91	74.00	-24.09
	AV	2483.5~2500	-59.03	2.00	-57.03	38.23	54.00	-15.77
2480	PK	2310~2390	-48.17	2.00	-46.17	49.09	74.00	-24.91
	AV	2310~2390	-60.01	2.00	-58.01	37.25	54.00	-16.75
	PK	2483.5~2500	-41.26	2.00	-39.26	56.00	74.00	-18.00
	AV	2483.5~2500	-56.20	2.00	-54.20	41.06	54.00	-12.94

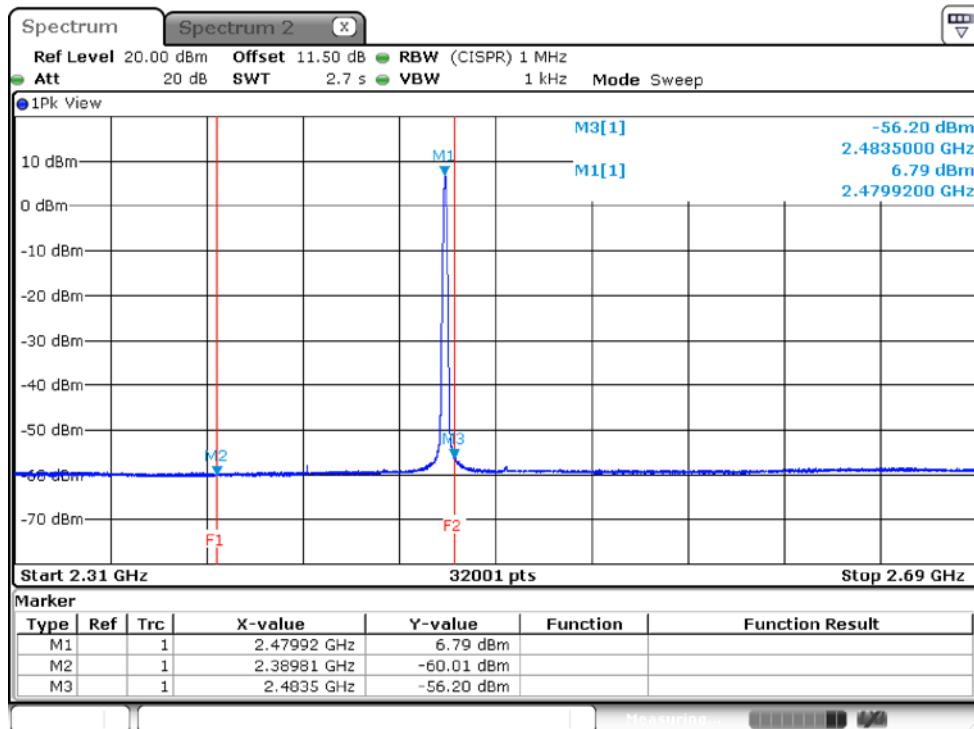
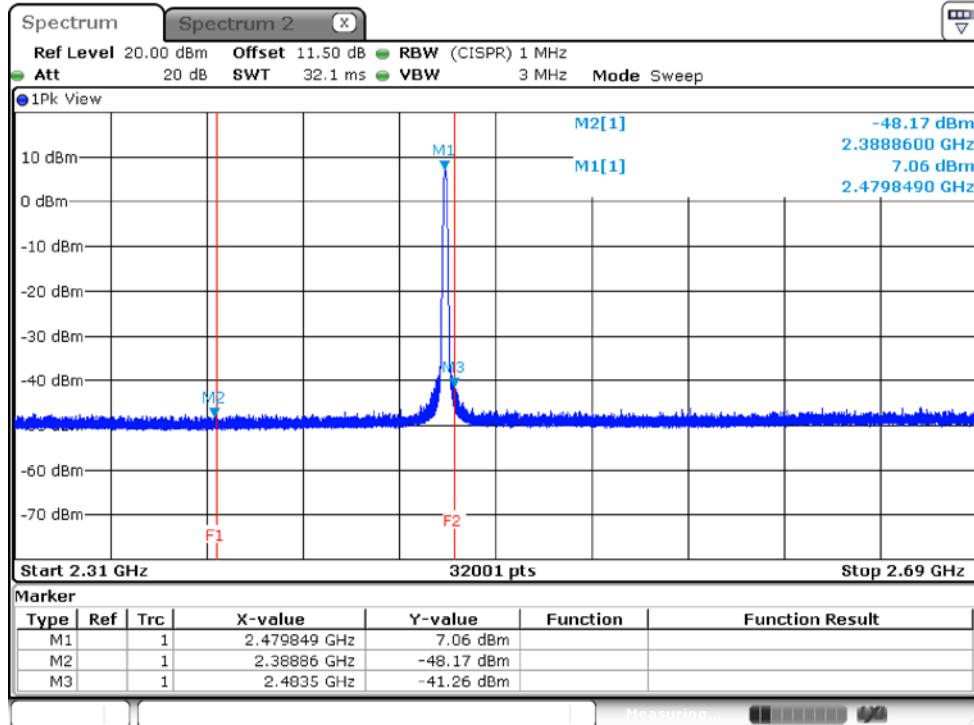
GFSK 2402 MHz



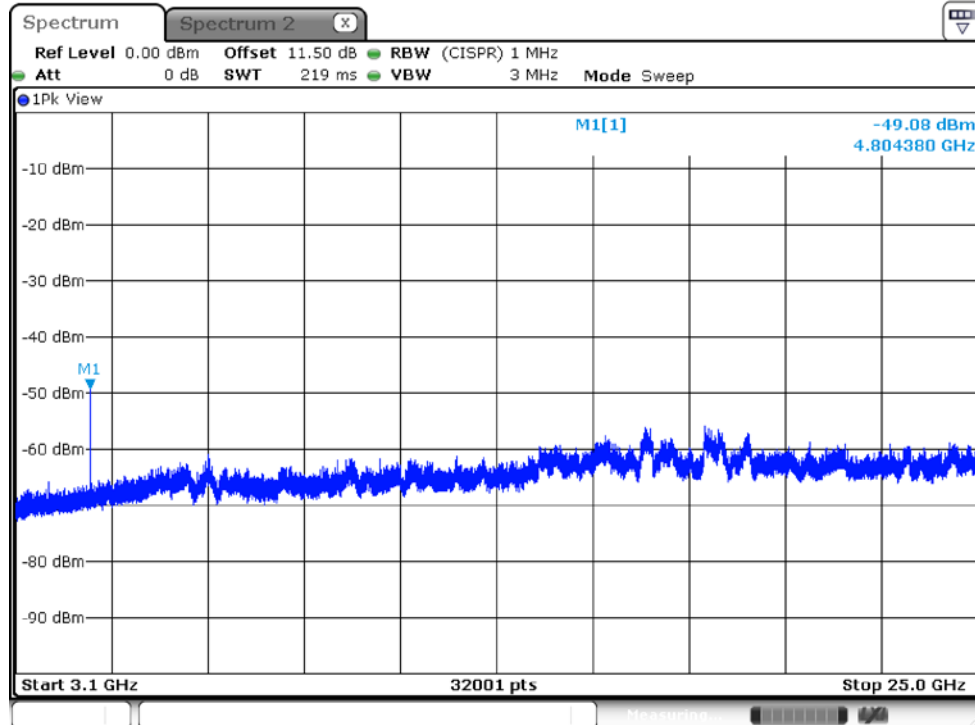
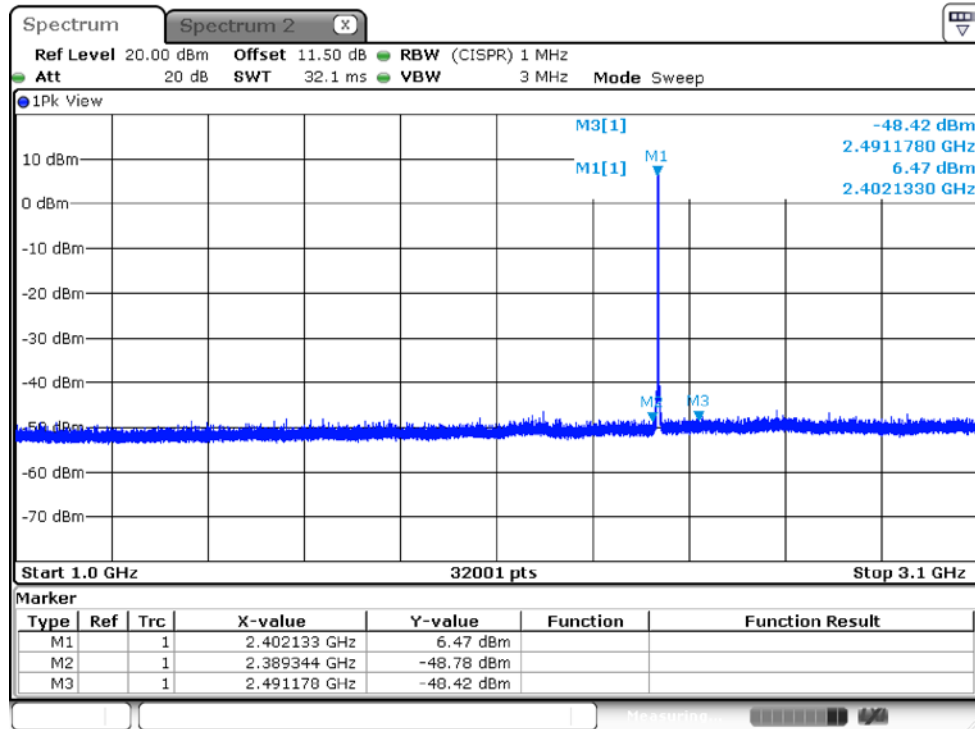
GFSK 2441 MHz



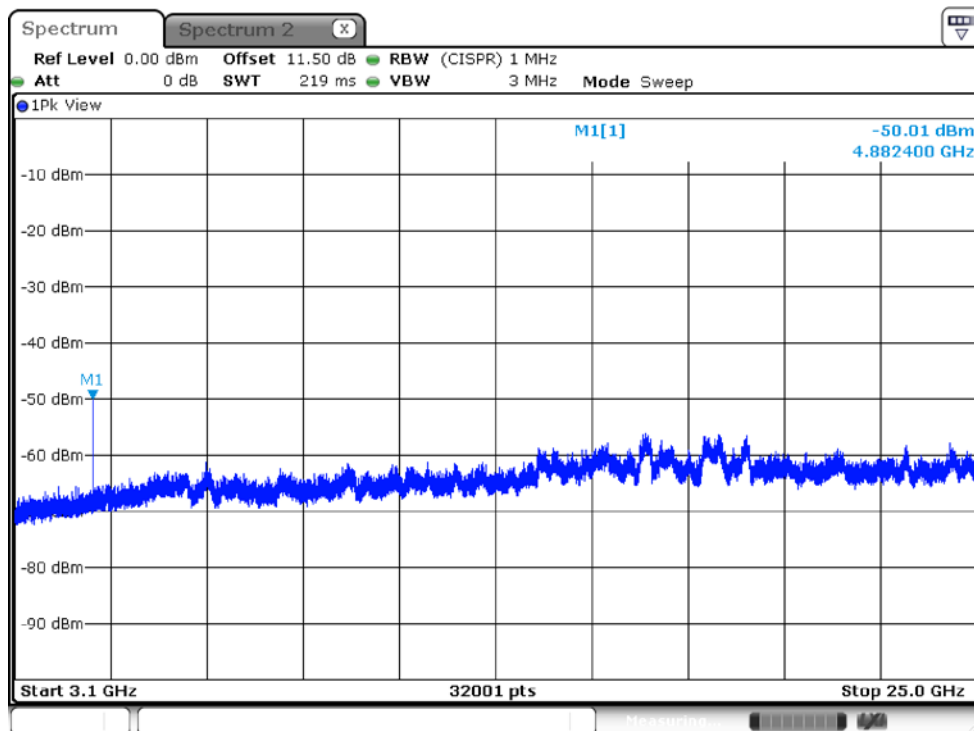
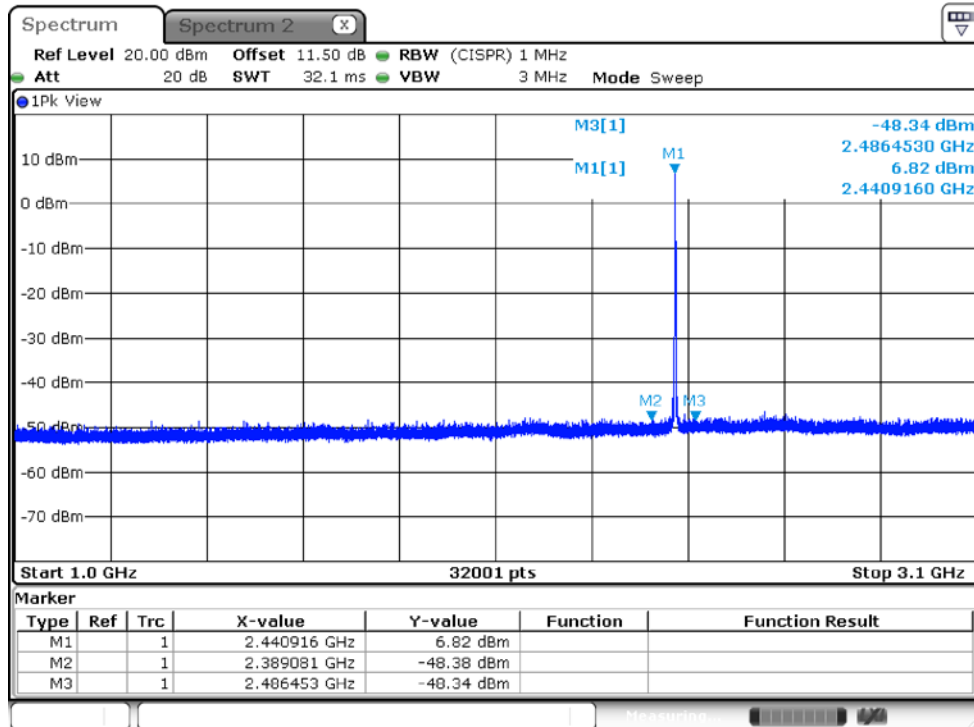
GFSK 2480 MHz



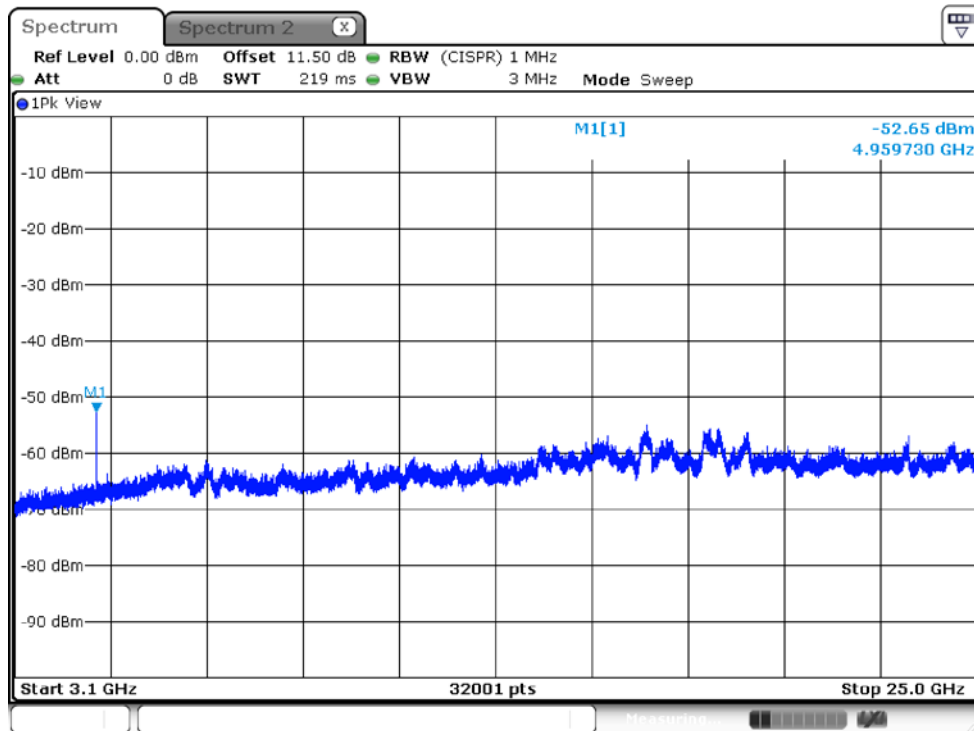
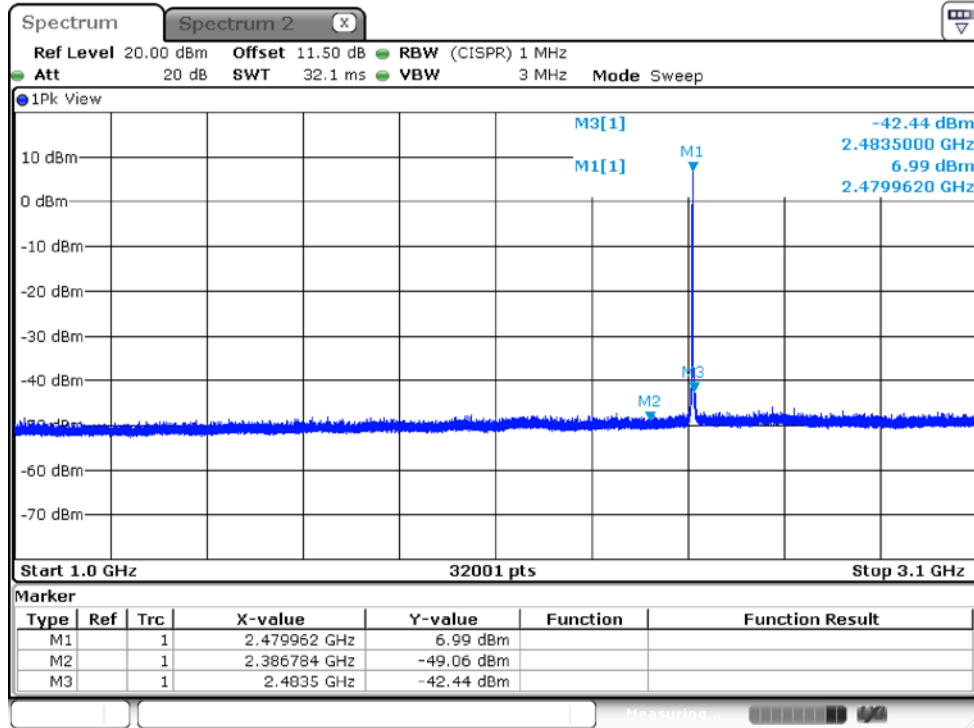
GFSK 2402 MHz



GFSK 2441 MHz

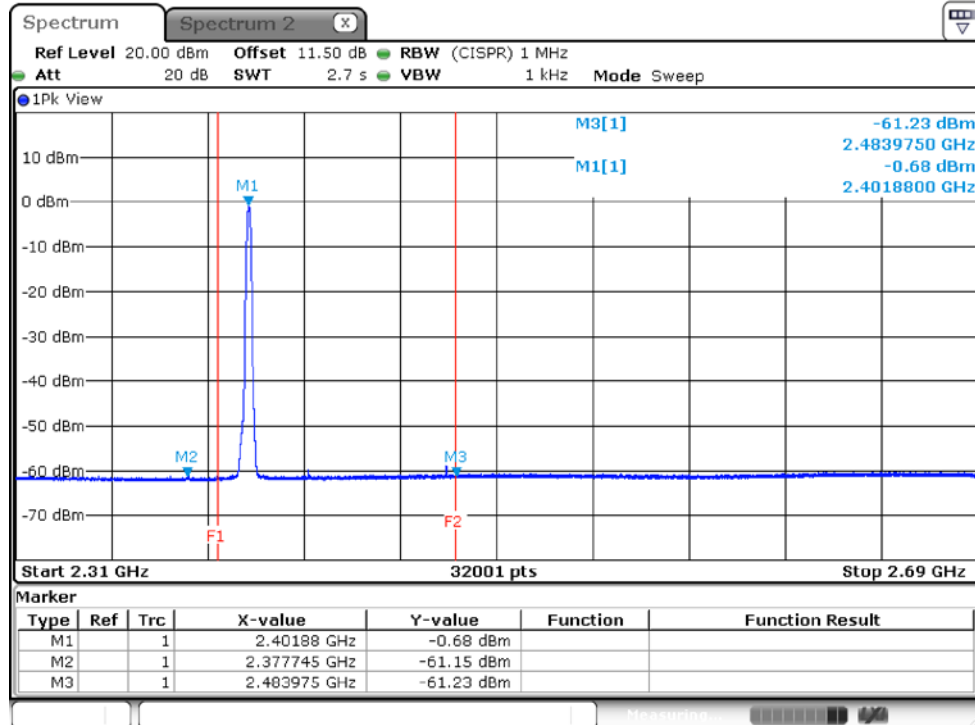
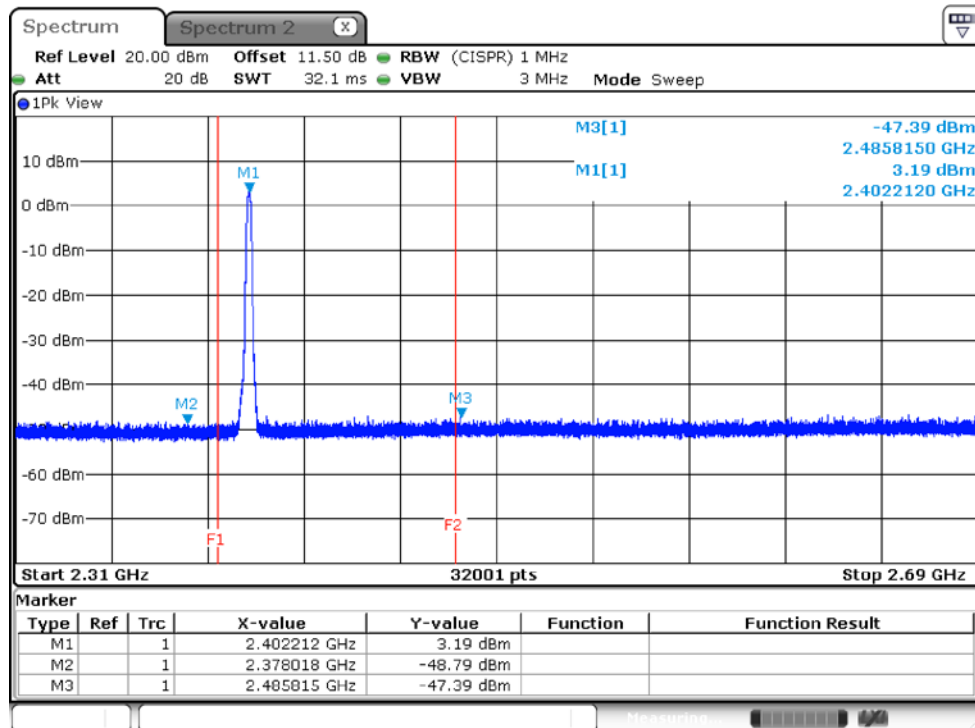


GFSK 2480 MHz

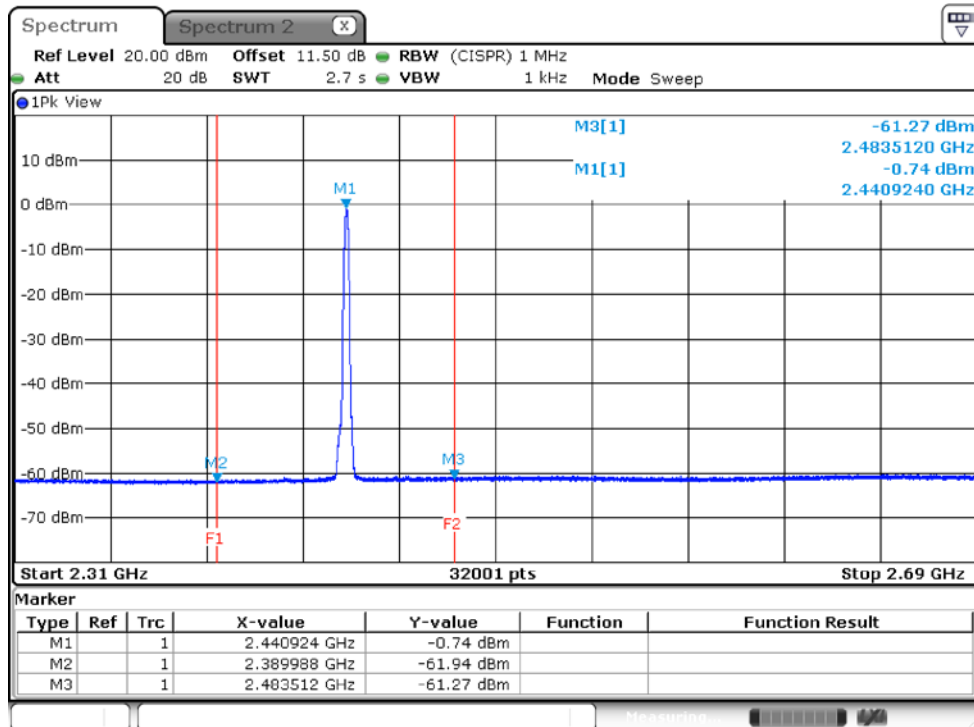
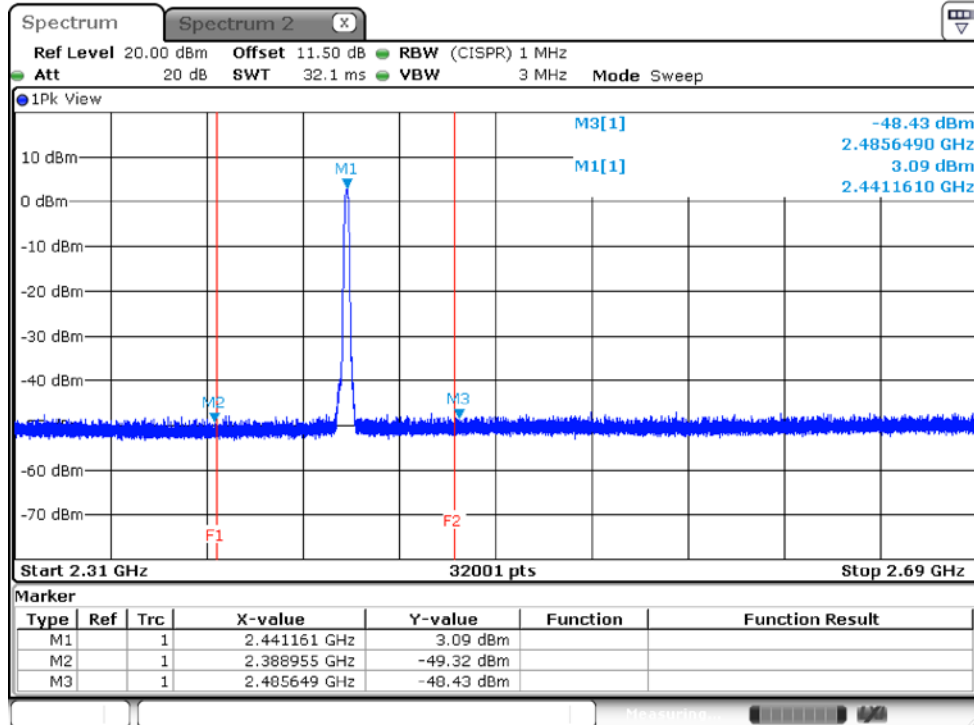


Restrict bands above 1G								
Transmitter Conducted Unwanted Emissions Results in Restricted Frequency Band - Bandedge								
Modulation Mode	DQPSK							
Test ch. Freq. (MHz)	Remark	Range (MHz)	Max Value (dBm)	DG (dBi)	EIRP (dBm)	E-Field (dBuV/m)	E-Field Limit (dBuV/m)	E-Field Margin (dB)
2402	PK	2310~2390	-48.79	2.00	-46.79	48.47	74.00	-25.53
	AV	2310~2390	-61.15	2.00	-59.15	36.11	54.00	-17.89
	PK	2483.5~2500	-47.39	2.00	-45.39	49.87	74.00	-24.13
	AV	2483.5~2500	-61.23	2.00	-59.23	36.03	54.00	-17.97
2441	PK	2310~2390	-49.32	2.00	-47.32	47.94	74.00	-26.06
	AV	2310~2390	-61.94	2.00	-59.94	35.32	54.00	-18.68
	PK	2483.5~2500	-48.43	2.00	-46.43	48.83	74.00	-25.17
	AV	2483.5~2500	-61.27	2.00	-59.27	35.99	54.00	-18.01
2480	PK	2310~2390	-47.94	2.00	-45.94	49.32	74.00	-24.68
	AV	2310~2390	-61.57	2.00	-59.57	35.69	54.00	-18.31
	PK	2483.5~2500	-47.74	2.00	-45.74	49.52	74.00	-24.48
	AV	2483.5~2500	-60.08	2.00	-58.08	37.18	54.00	-16.82

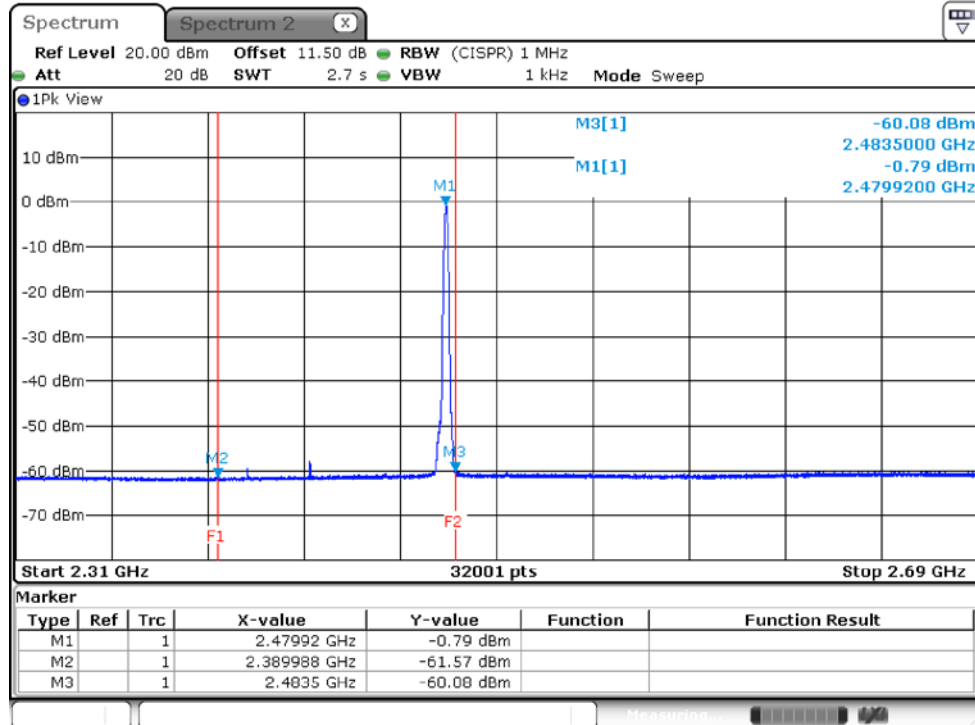
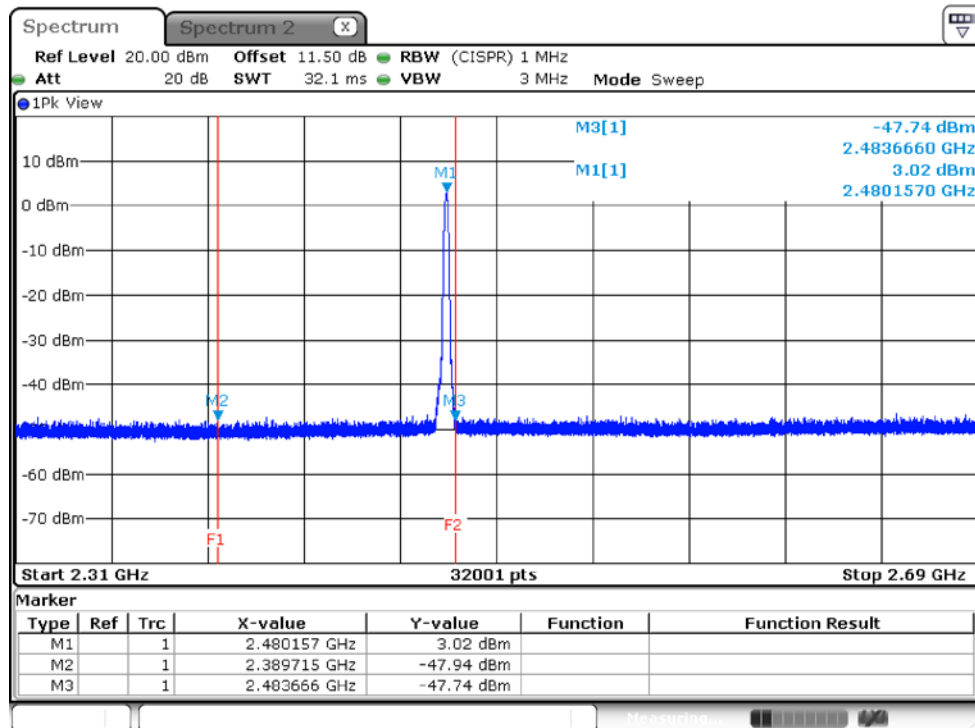
DQPSK 2402 MHz



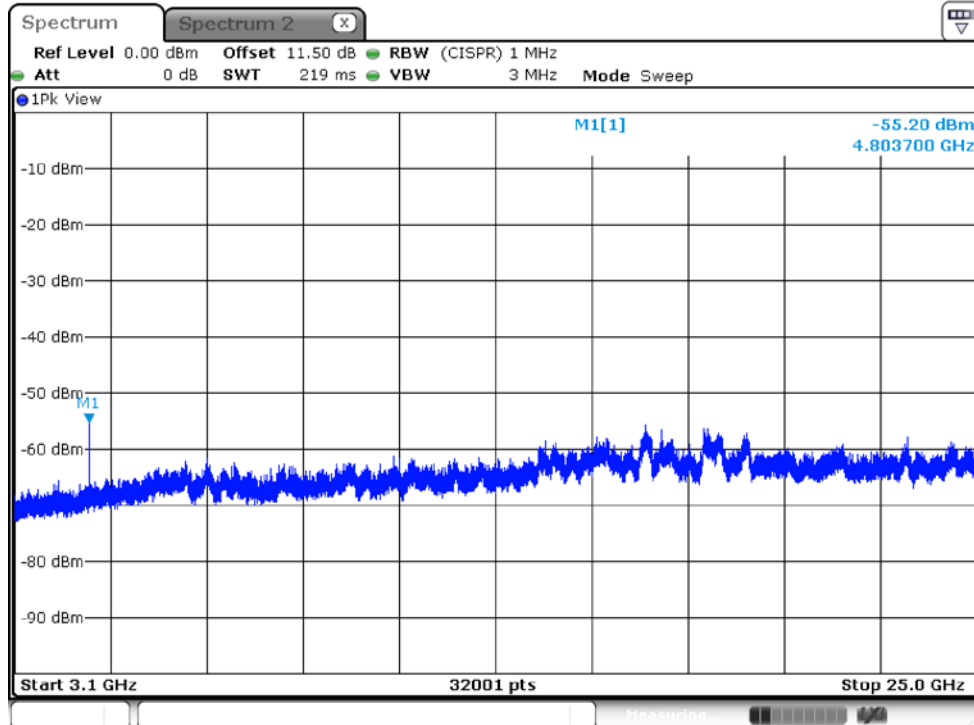
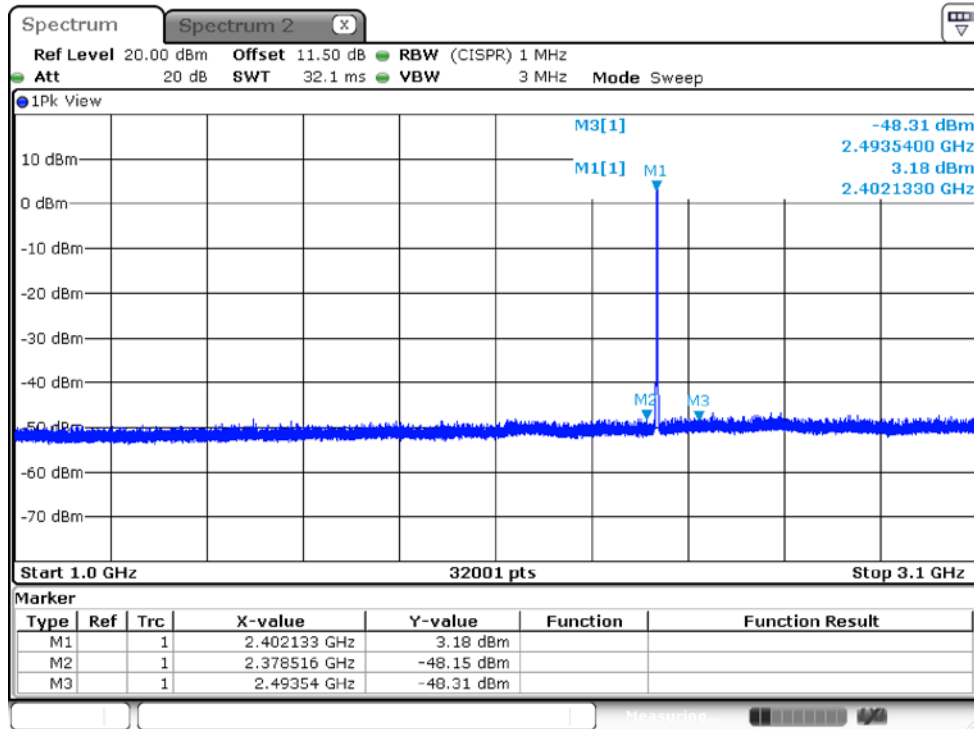
DQPSK 2441 MHz



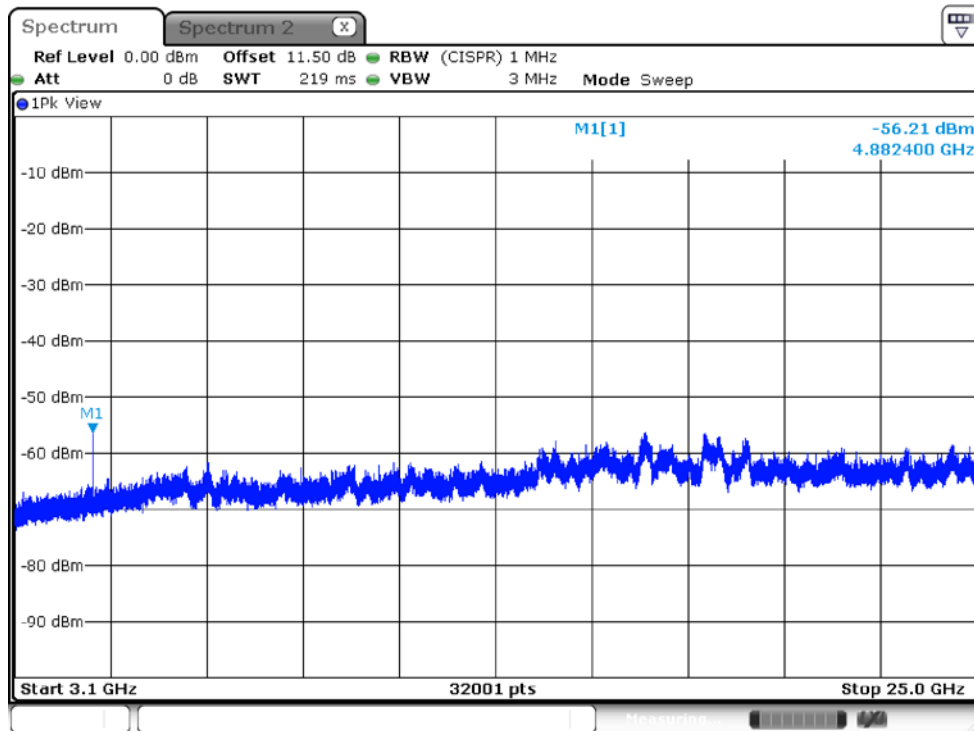
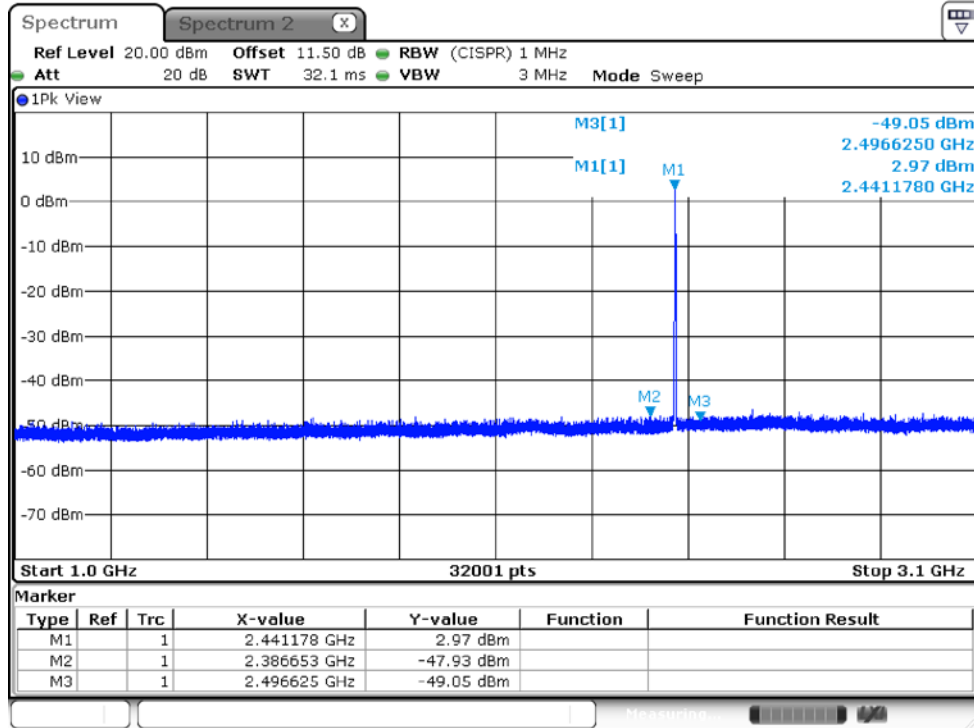
DQPSK 2480 MHz



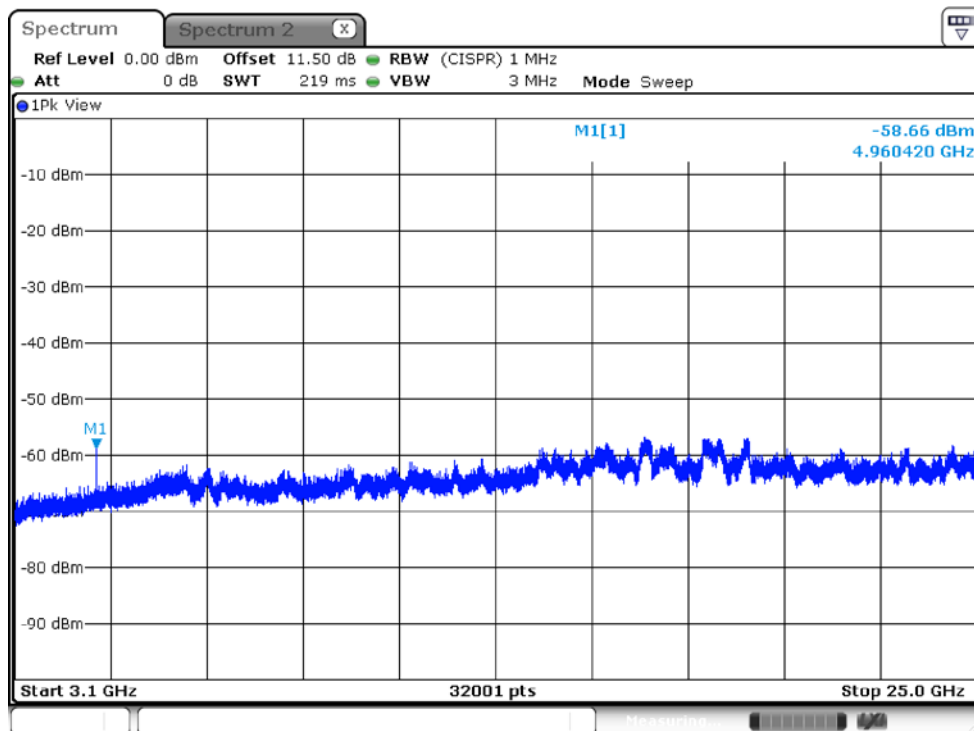
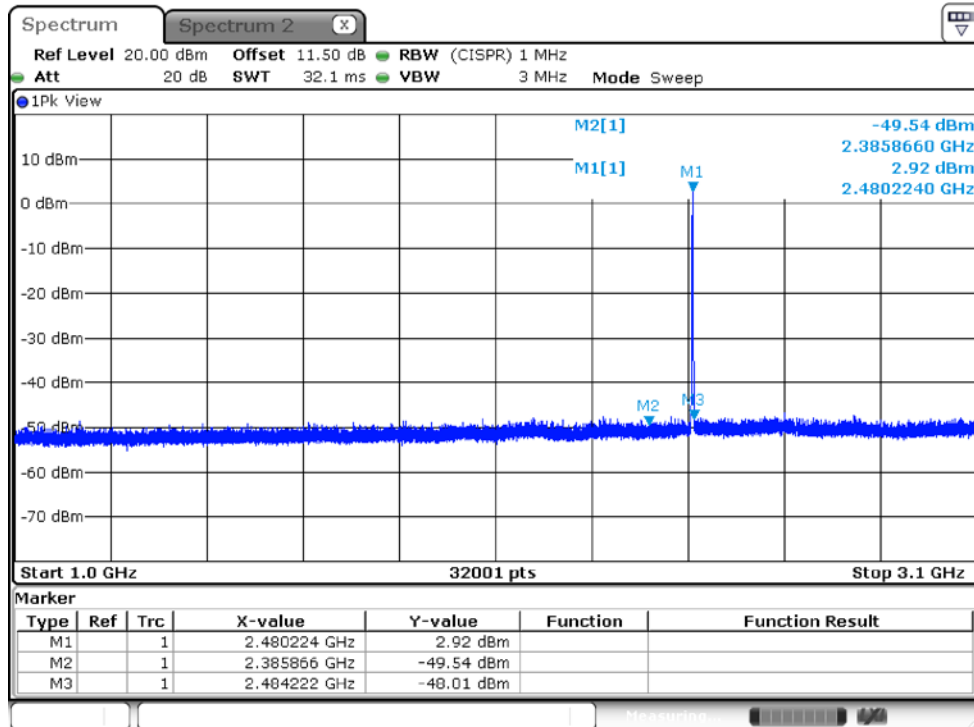
DQPSK 2402 MHz



DQPSK 2441 MHz



DQPSK 2480 MHz





Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):25 Humidity(%):61			
Level (dBUV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):25 Humidity(%):61			
Level (dBUV/m)			



Emissions (Above 1GHz) for GFSK

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBuV/m) <			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m) <			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m)			



Emissions (Above 1GHz) for DQPSK

Modulation	DQPSK	Test Freq. (MHz)	2402
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBuV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	DQPSK	Test Freq. (MHz)	2402
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	DQPSK	Test Freq. (MHz)	2441
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	DQPSK	Test Freq. (MHz)	2441
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	DQPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBuV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SC Module

Appendix A.2

Modulation	DQPSK	Test Freq. (MHz)	2480
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):24 Humidity(%):63			
Level (dBUV/m) <			



Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):25 Humidity(%):61			
Level (dBuV/m) <			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):25 Humidity(%):61			
Level (dBUV/m) <			



Emissions (Above 1GHz) for GFSK

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m) </			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m) <			



Emissions (Above 1GHz) for DQPSK

Modulation	DQPSK	Test Freq. (MHz)	2402
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	DQPSK	Test Freq. (MHz)	2402
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m) <			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	DQPSK	Test Freq. (MHz)	2441
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	DQPSK	Test Freq. (MHz)	2441
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	DQPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			



Unwanted Radiated Emissions into Restricted Frequency Bands – SA Module

Appendix A.3

Modulation	DQPSK	Test Freq. (MHz)	2480
Polarization	Vertical		
Test By :Sean Yu Temperature(°C):23 Humidity(%):65			
Level (dBuV/m) <			



2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-F5

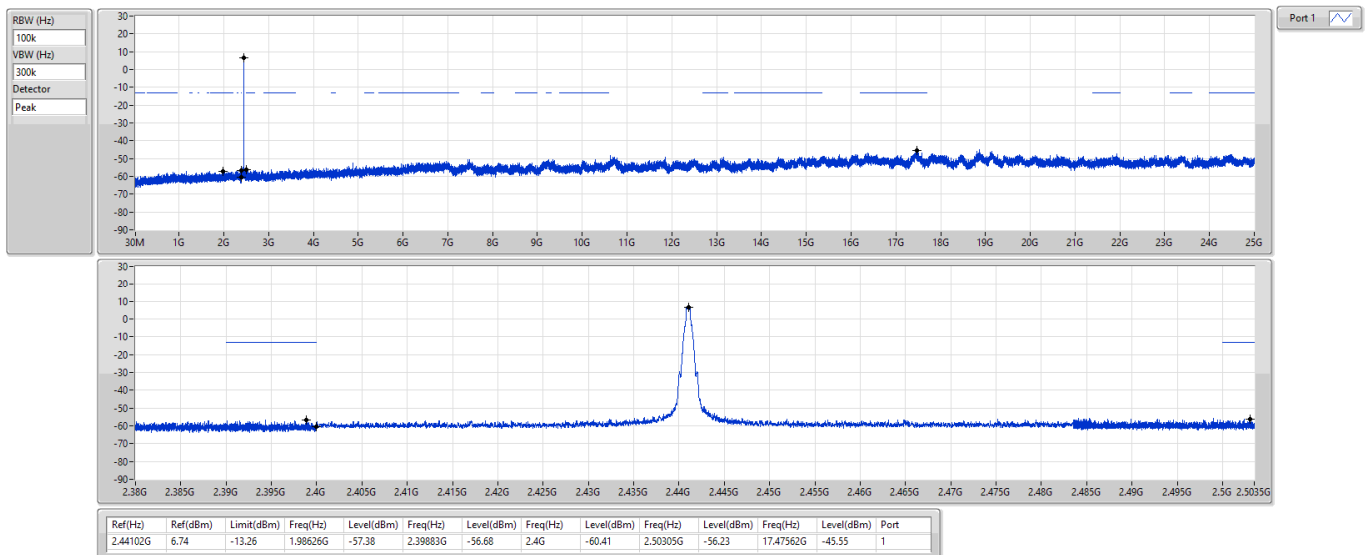
2402MHz



2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-F5

2441MHz



2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-FS

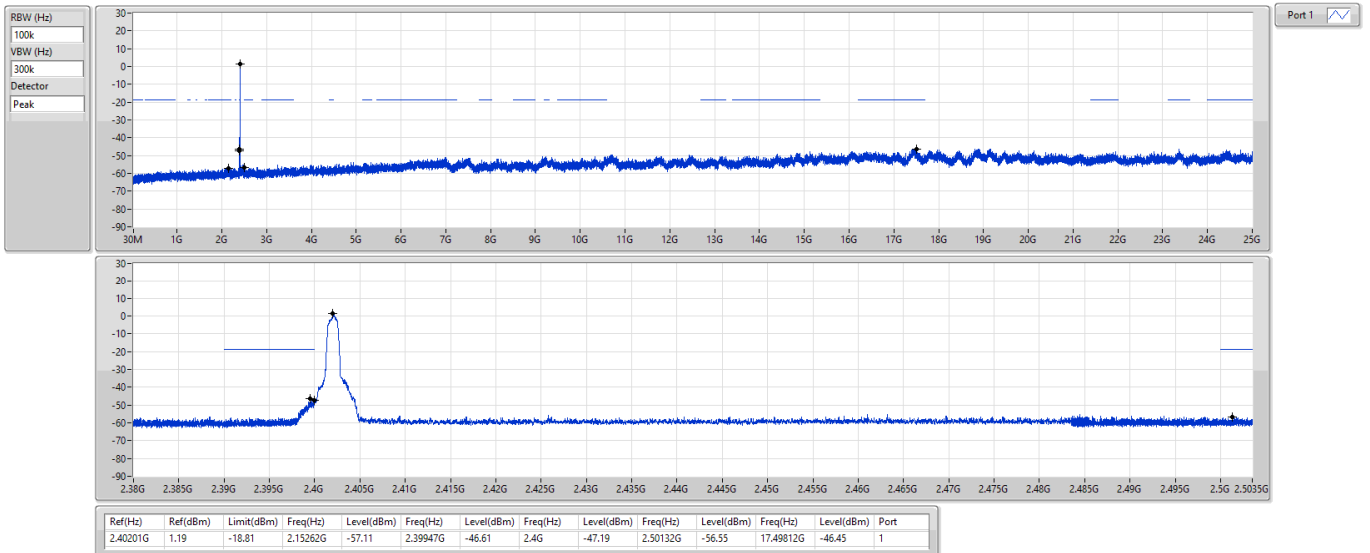
2480MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

2402MHz

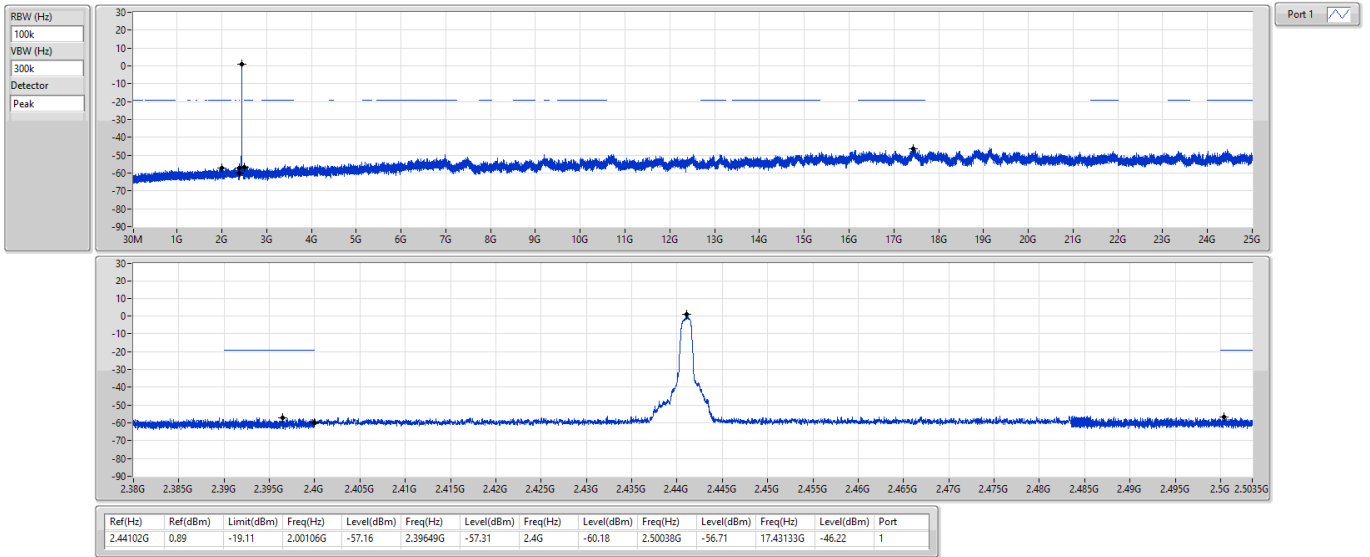




2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

2441MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

2480MHz

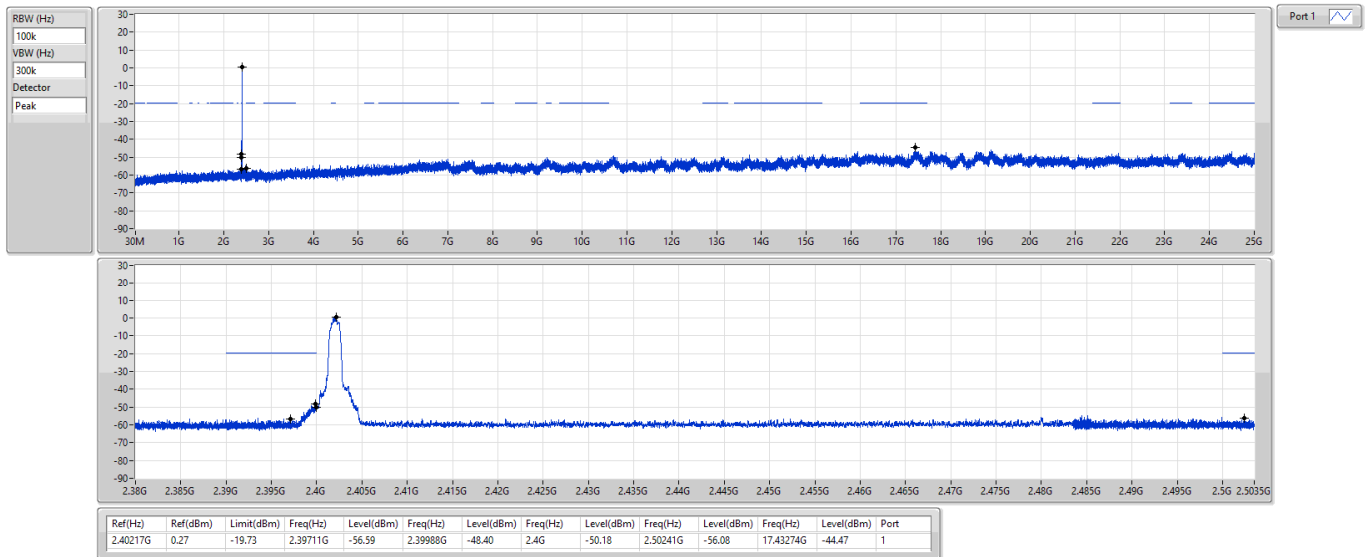




2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

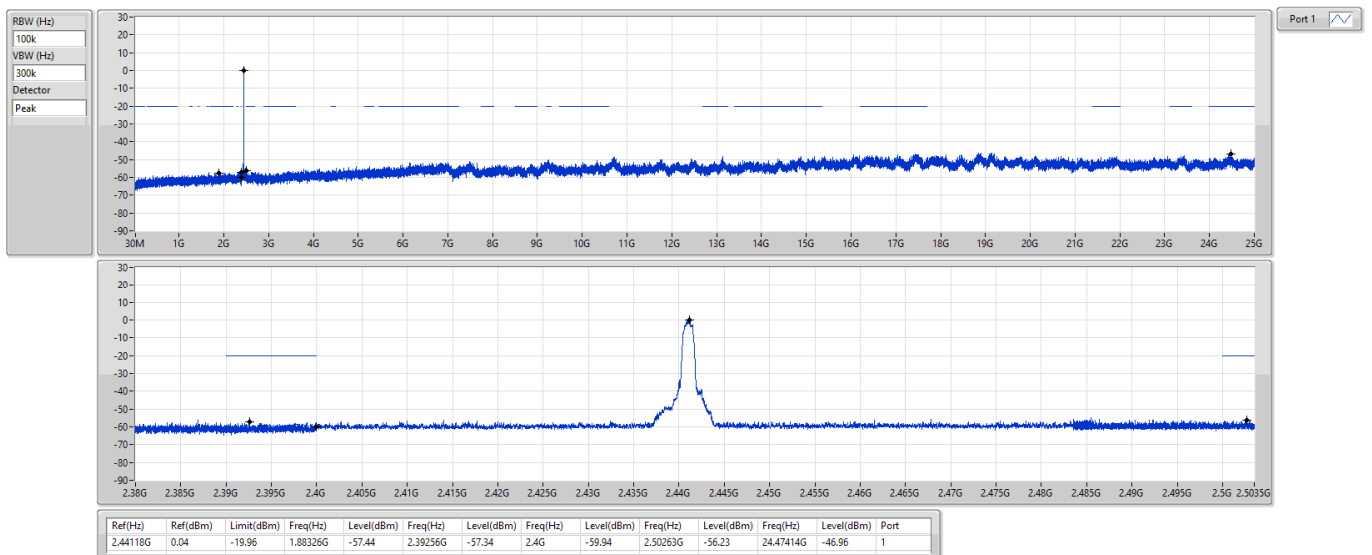
2402MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

2441MHz

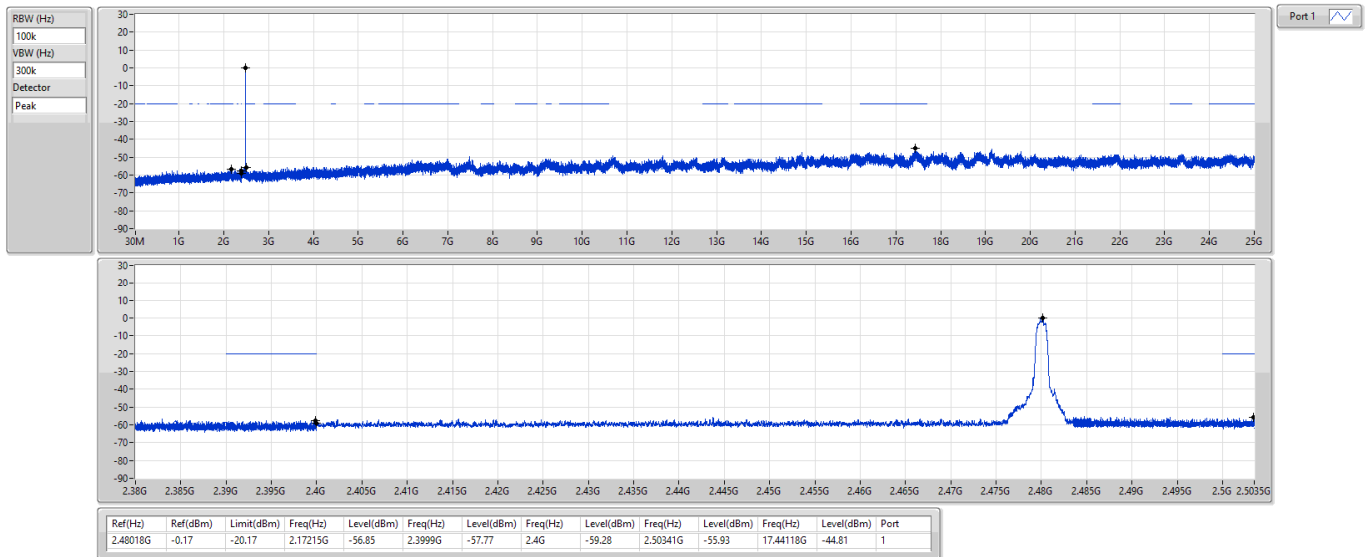




2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

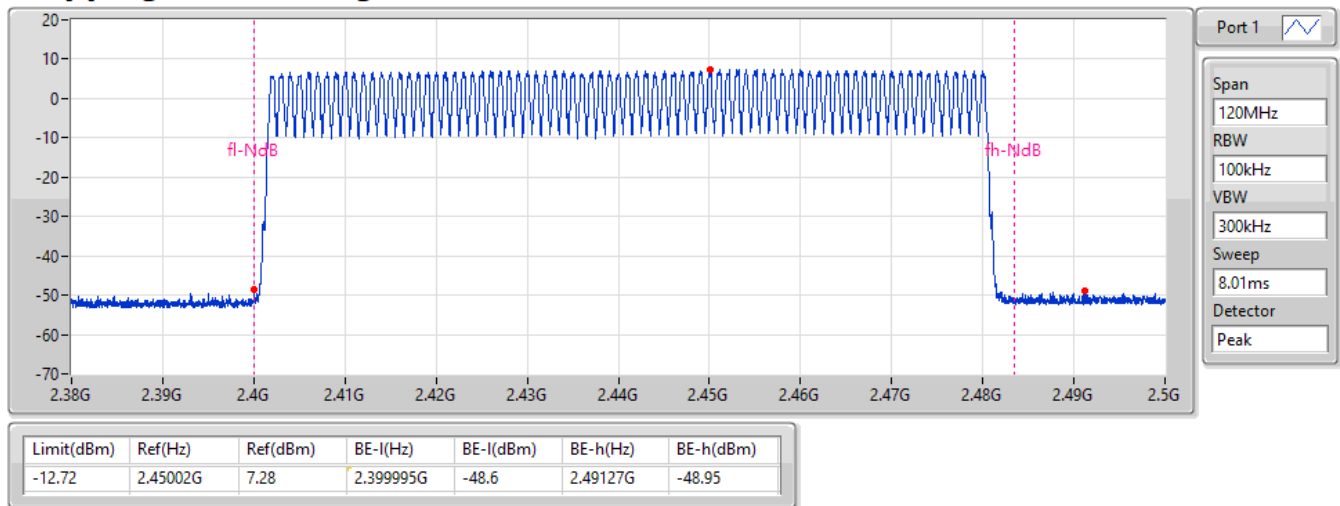
2480MHz



2.4-2.4835GHz_BT-BR(1Mbps)

2402MHz

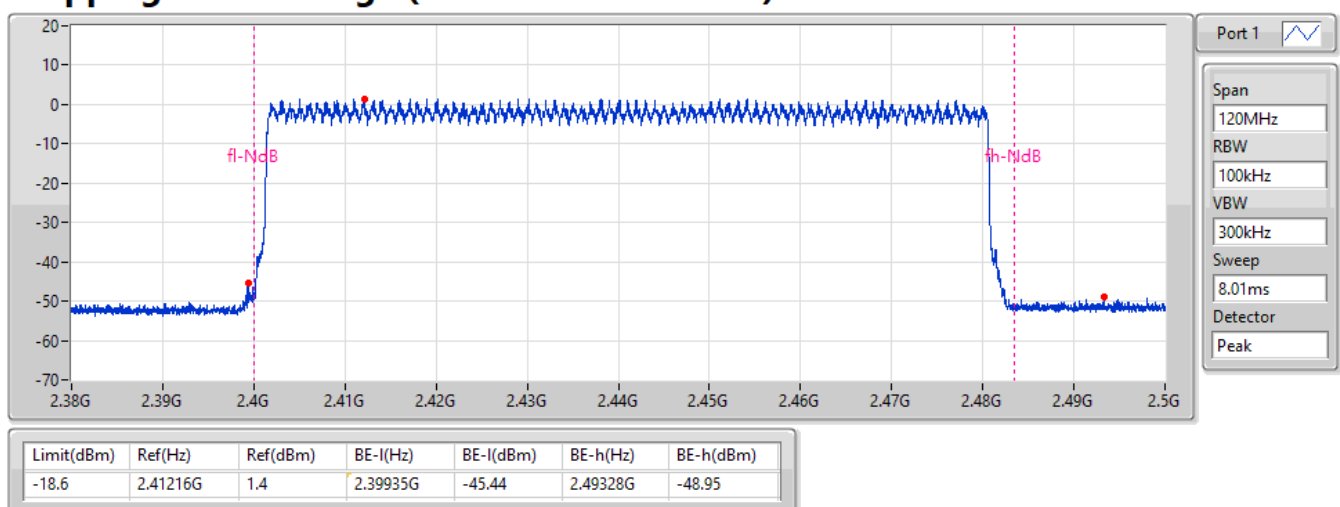
Hopping Ch Bandedge (Non-restricted Band)



2.4-2.4835GHz_BT-EDR(2Mbps)

2402MHz

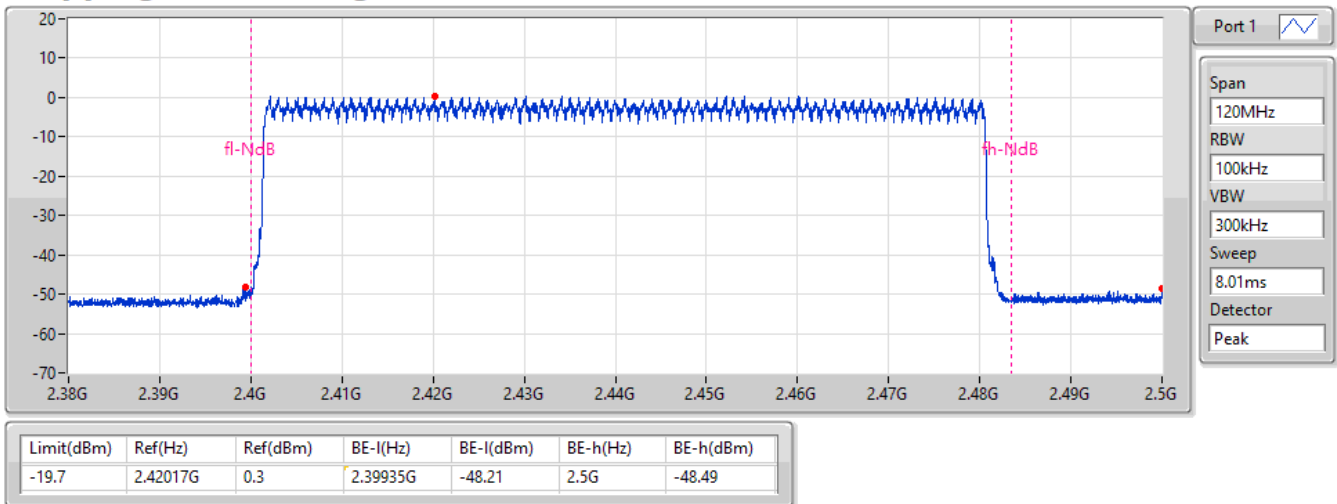
Hopping Ch Bandedge (Non-restricted Band)



2.4-2.4835GHz_BT-EDR(3Mbps)

2402MHz

Hopping Ch Bandedge (Non-restricted Band)

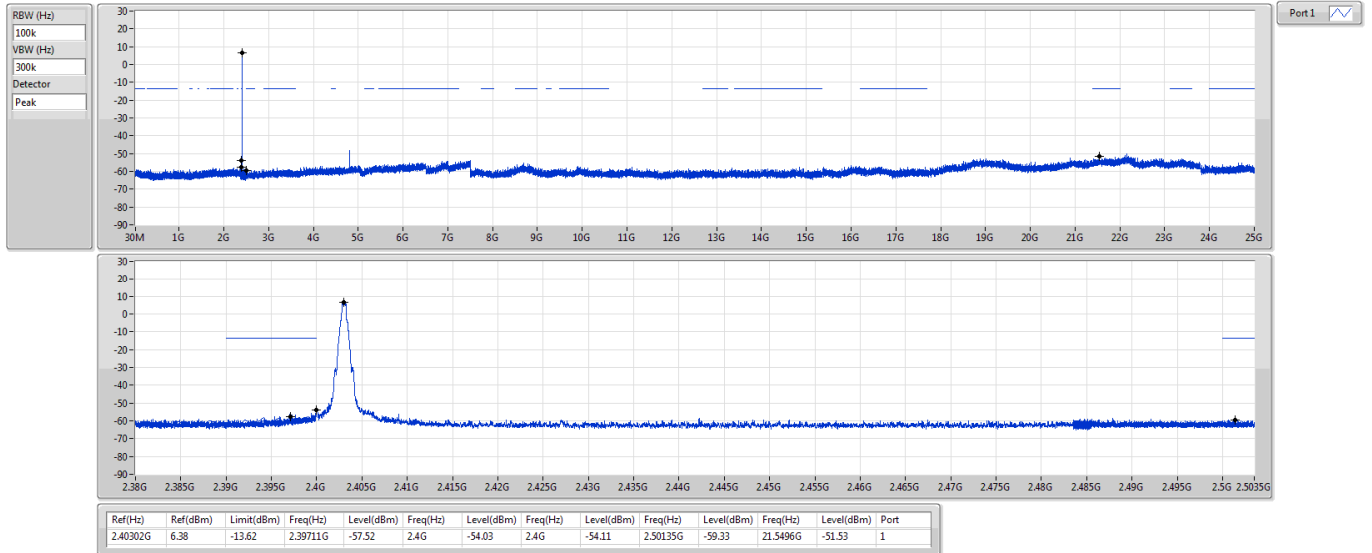




2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-F5

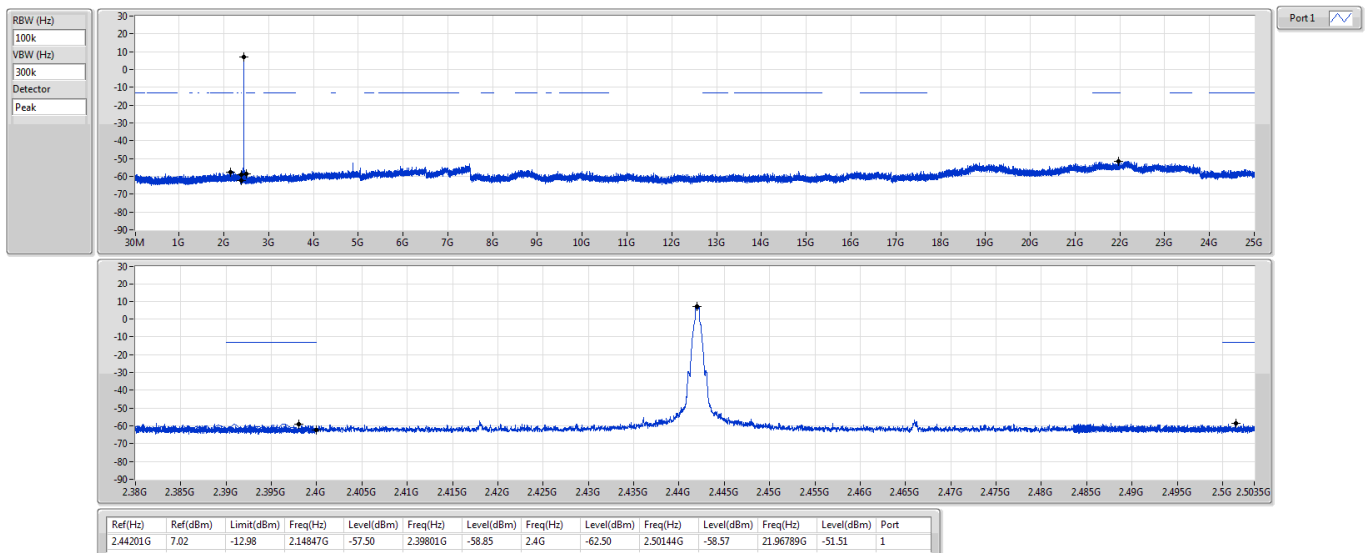
2402MHz



2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-F5

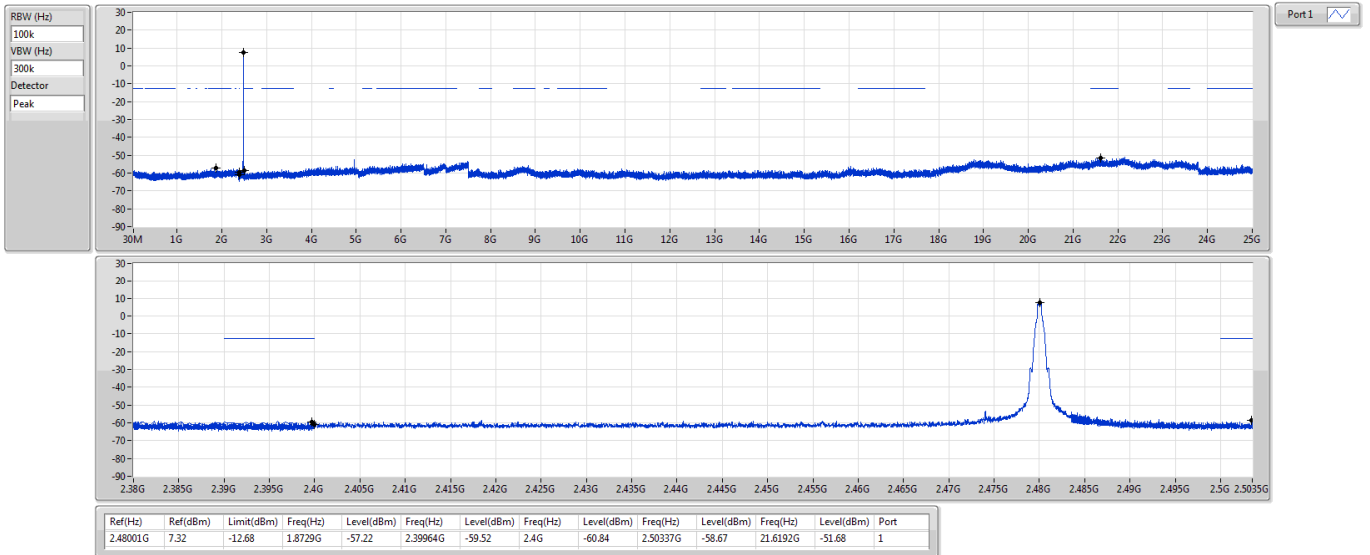
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2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-FS

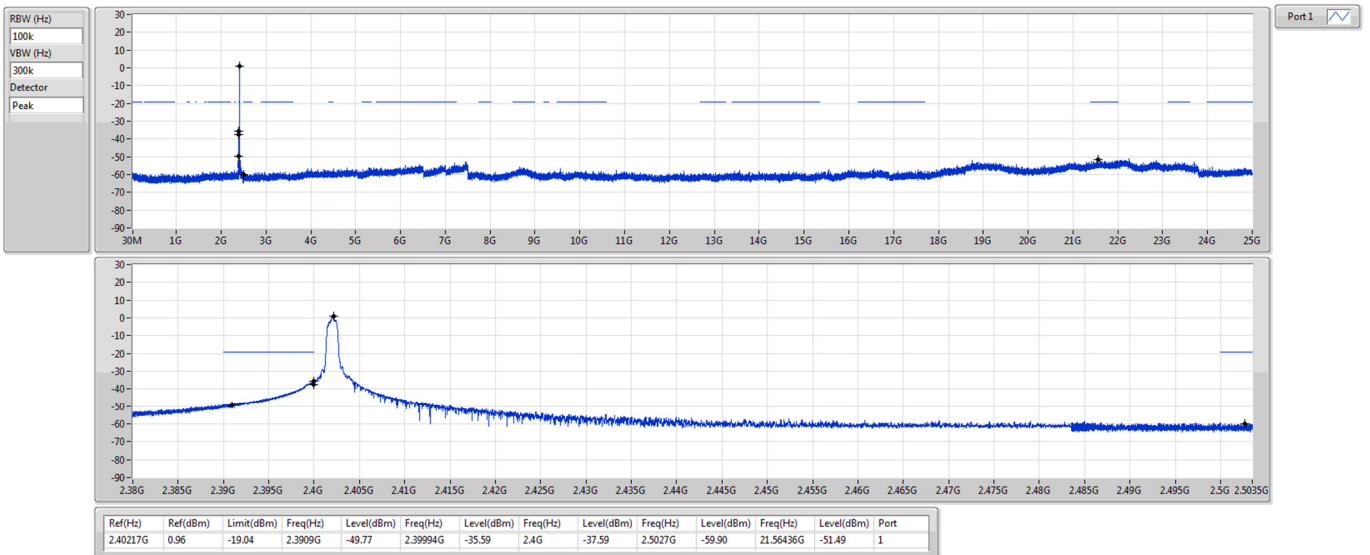
2480MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

2402MHz

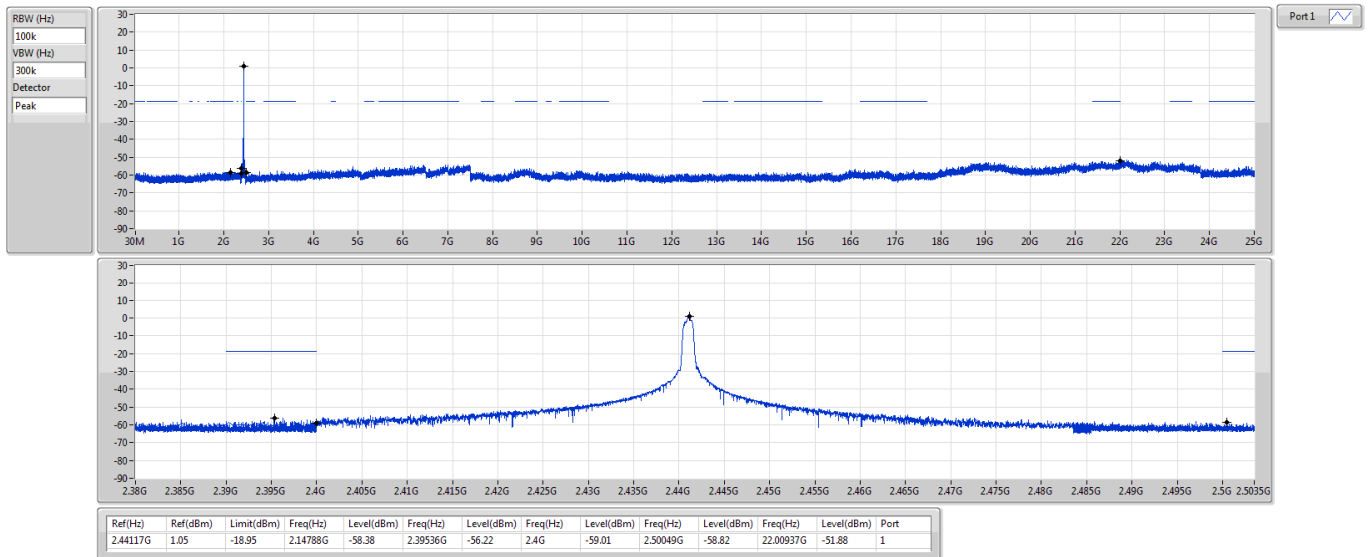




2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

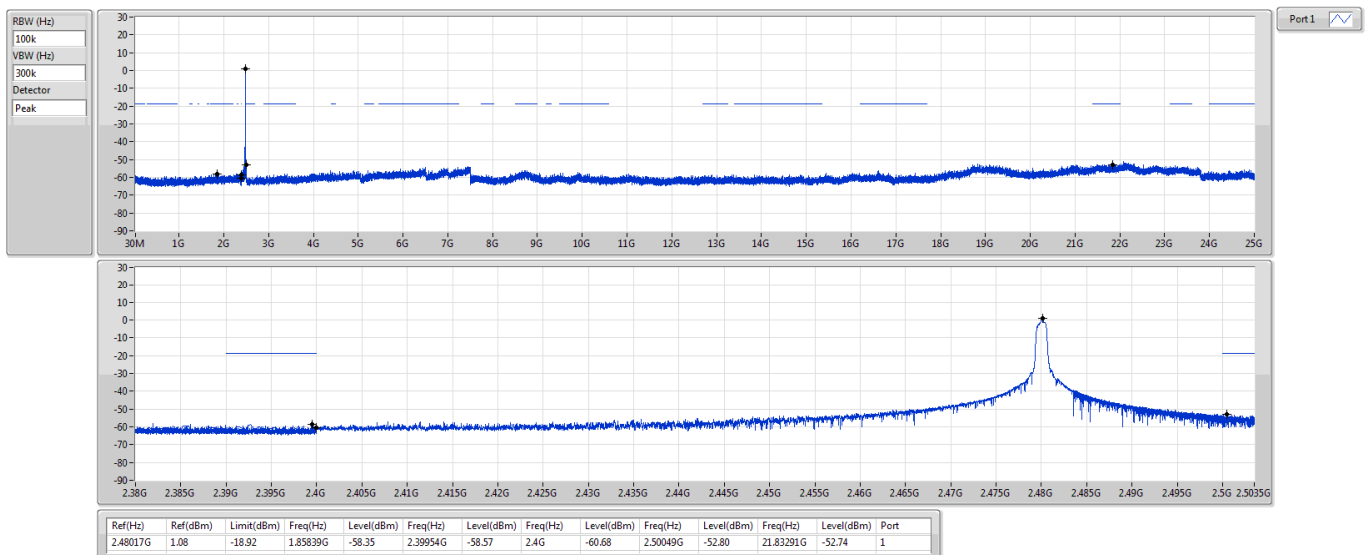
2441MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

2480MHz

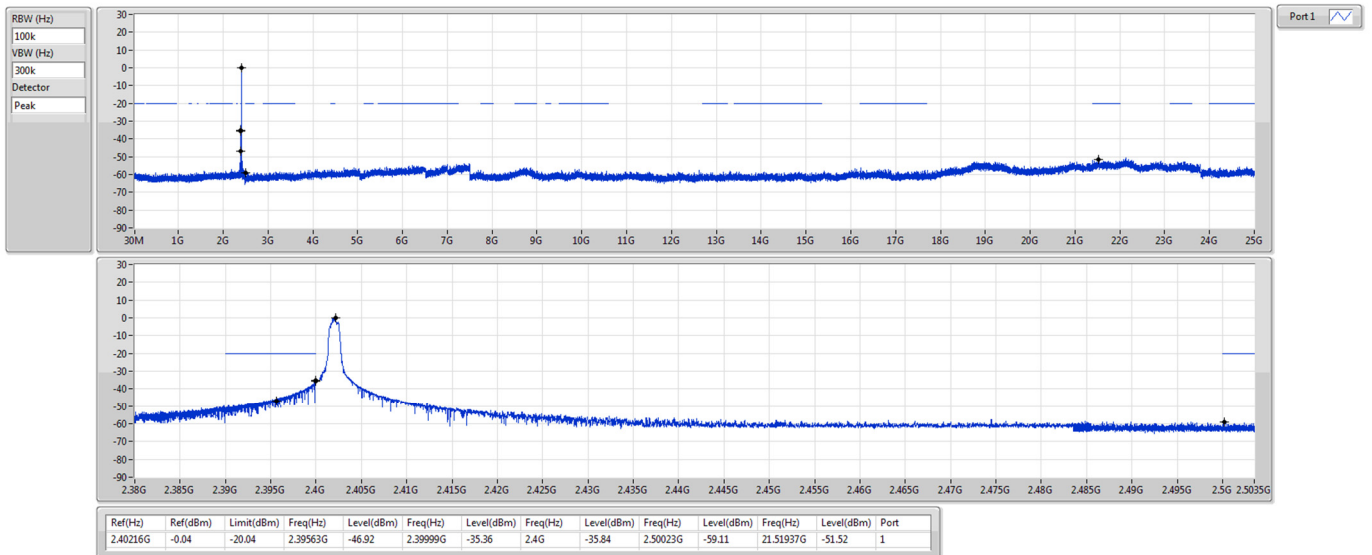




2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

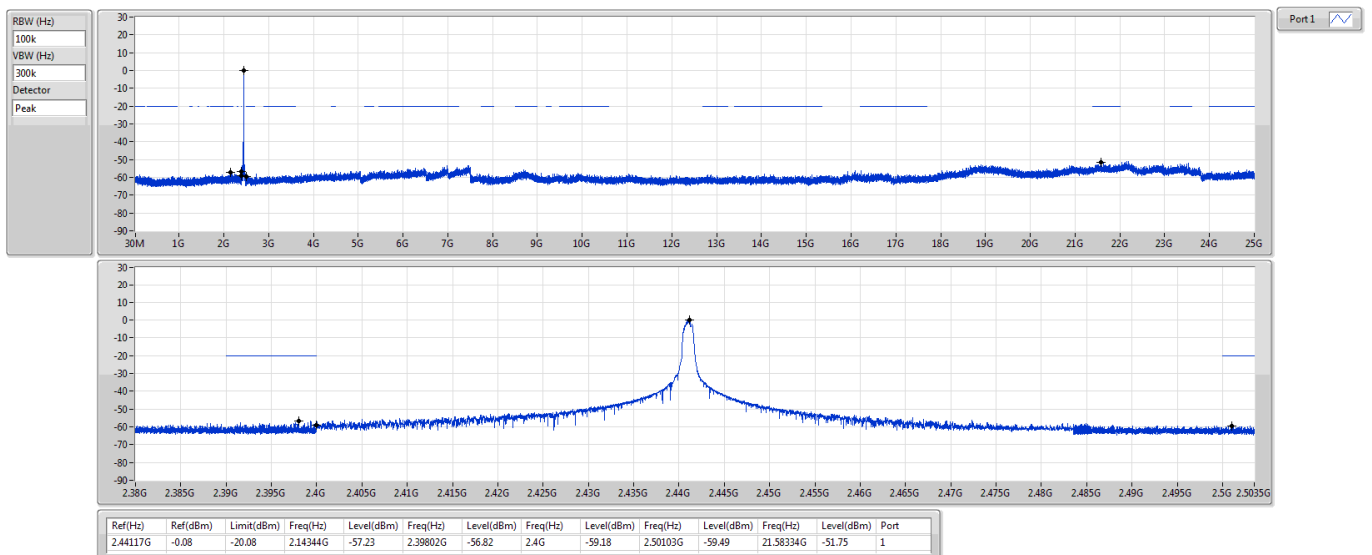
2402MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

2441MHz

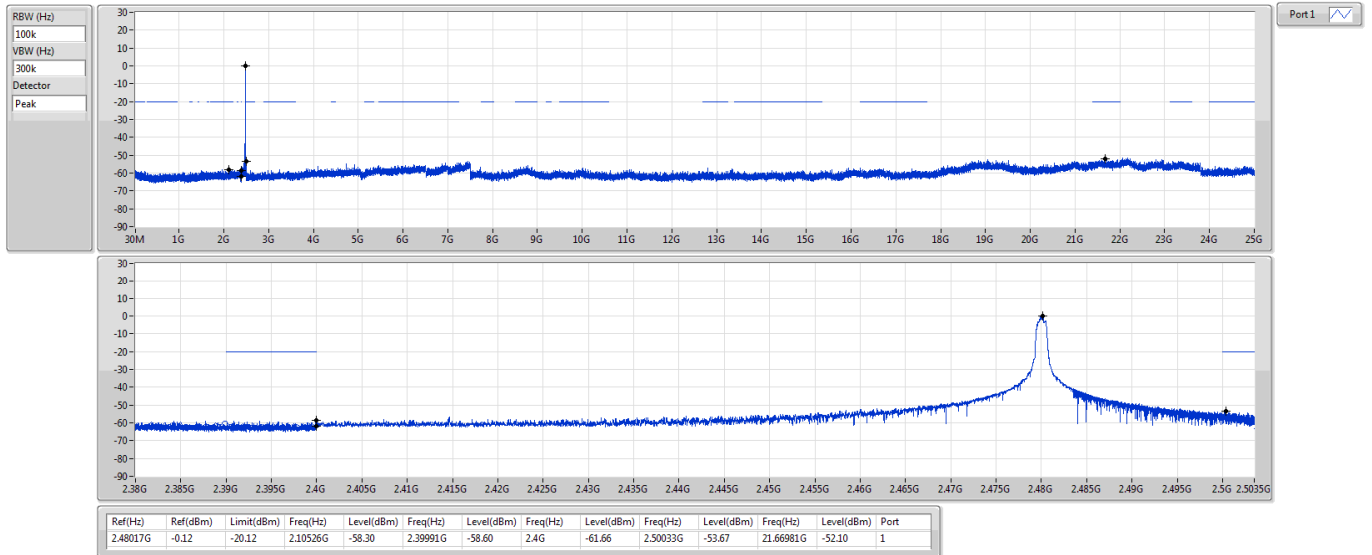




2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

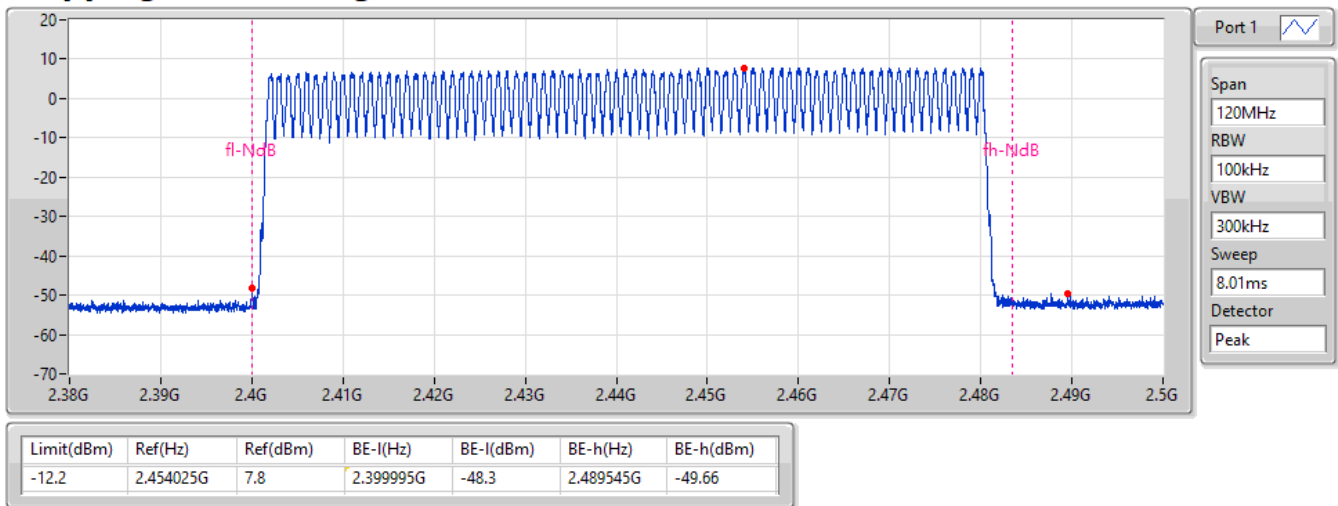
2480MHz



2.4-2.4835GHz_BT-BR(1Mbps)

2402MHz

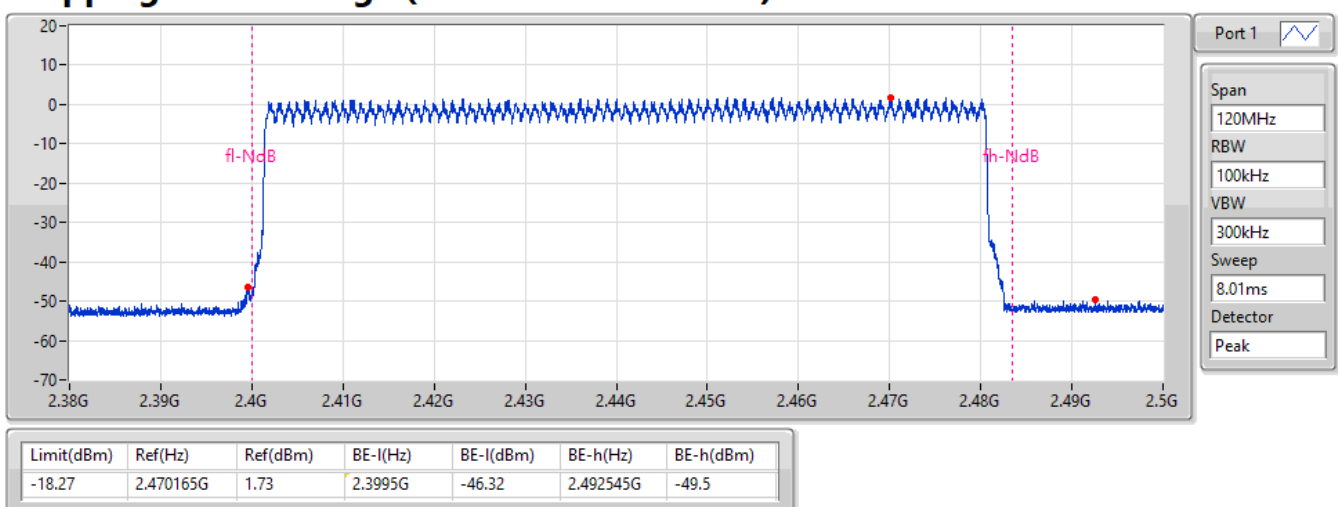
Hopping Ch Bandedge (Non-restricted Band)



2.4-2.4835GHz_BT-EDR(2Mbps)

2402MHz

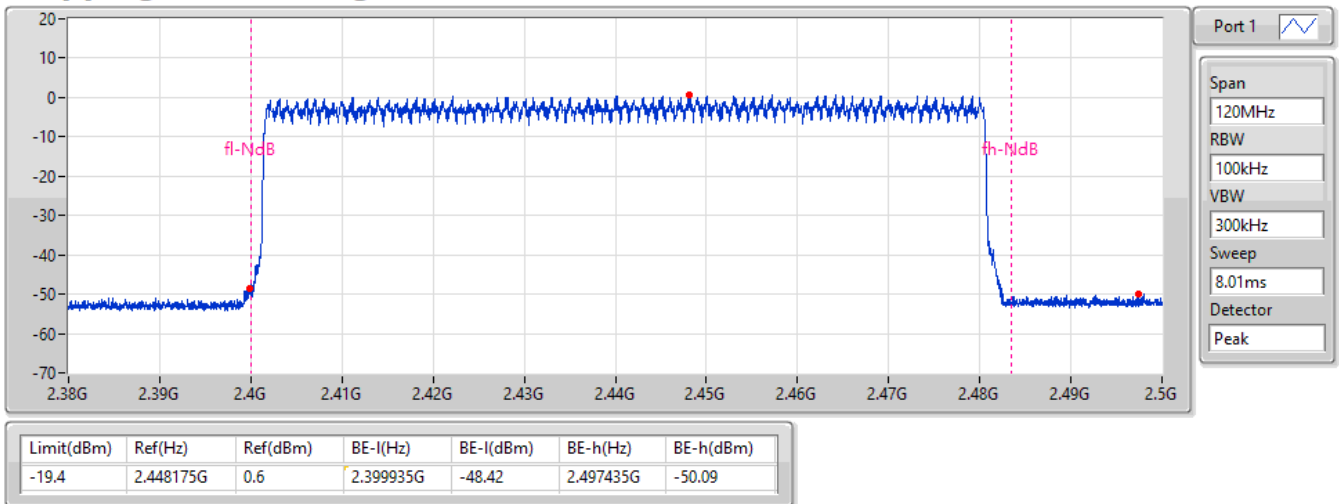
Hopping Ch Bandedge (Non-restricted Band)



2.4-2.4835GHz_BT-EDR(3Mbps)

2402MHz

Hopping Ch Bandedge (Non-restricted Band)



**Summary**

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	7.32	0.00540
BT-EDR(2Mbps)	4.56	0.00286
BT-EDR(3Mbps)	3.65	0.00232

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
BT-BR(1Mbps)	-	-	-	-	-	-
2402MHz	Pass	2.00	6.85	21.00	8.85	27.00
2441MHz	Pass	2.00	7.11	21.00	9.11	27.00
2480MHz	Pass	2.00	7.32	21.00	9.32	27.00
BT-EDR(2Mbps)	-	-	-	-	-	-
2402MHz	Pass	2.00	4.56	21.00	6.56	27.00
2441MHz	Pass	2.00	4.33	21.00	6.33	27.00
2480MHz	Pass	2.00	4.30	21.00	6.30	27.00
BT-EDR(3Mbps)	-	-	-	-	-	-
2402MHz	Pass	2.00	3.65	21.00	5.65	27.00
2441MHz	Pass	2.00	3.41	21.00	5.41	27.00
2480MHz	Pass	2.00	3.24	21.00	5.24	27.00

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

**Summary**

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	7.18	0.00522
BT-EDR(2Mbps)	1.95	0.00157
BT-EDR(3Mbps)	0.71	0.00118

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
BT-BR(1Mbps)	-	-	-	-	-	-
2402MHz	Pass	2.00	6.69	-	8.69	-
2441MHz	Pass	2.00	6.95	-	8.95	-
2480MHz	Pass	2.00	7.18	-	9.18	-
BT-EDR(2Mbps)	-	-	-	-	-	-
2402MHz	Pass	2.00	1.95	-	3.95	-
2441MHz	Pass	2.00	1.72	-	3.72	-
2480MHz	Pass	2.00	1.70	-	3.70	-
BT-EDR(3Mbps)	-	-	-	-	-	-
2402MHz	Pass	2.00	0.71	-	2.71	-
2441MHz	Pass	2.00	0.49	-	2.49	-
2480MHz	Pass	2.00	0.33	-	2.33	-

Note: Average power is for reference only

**Summary**

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	7.75	0.00596
BT-EDR(2Mbps)	4.45	0.00279
BT-EDR(3Mbps)	3.48	0.00223

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
BT-BR(1Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.00	6.50	21.00	7.50	27.00
2441MHz	Pass	1.00	7.21	21.00	8.21	27.00
2480MHz	Pass	1.00	7.75	21.00	8.75	27.00
BT-EDR(2Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.00	4.01	21.00	5.01	27.00
2441MHz	Pass	1.00	4.17	21.00	5.17	27.00
2480MHz	Pass	1.00	4.45	21.00	5.45	27.00
BT-EDR(3Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.00	3.17	21.00	4.17	27.00
2441MHz	Pass	1.00	3.37	21.00	4.37	27.00
2480MHz	Pass	1.00	3.48	21.00	4.48	27.00

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

**Summary**

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	7.64	0.00581
BT-EDR(2Mbps)	1.87	0.00154
BT-EDR(3Mbps)	0.55	0.00114

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
BT-BR(1Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.00	6.38	-	7.38	-
2441MHz	Pass	1.00	7.11	-	8.11	-
2480MHz	Pass	1.00	7.64	-	8.64	-
BT-EDR(2Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.00	1.46	-	2.46	-
2441MHz	Pass	1.00	1.61	-	2.61	-
2480MHz	Pass	1.00	1.87	-	2.87	-
BT-EDR(3Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.00	0.23	-	1.23	-
2441MHz	Pass	1.00	0.45	-	1.45	-
2480MHz	Pass	1.00	0.55	-	1.55	-

Note: Average power is for reference only

**Summary**

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

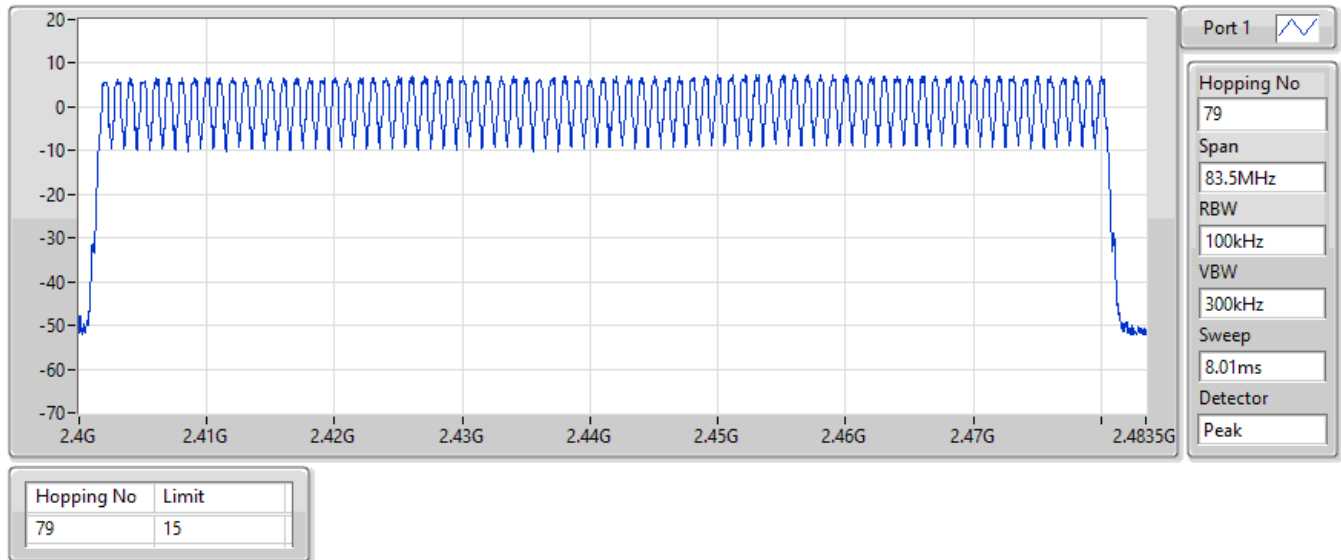
Result

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

2.4-2.4835GHz_BT-BR(1Mbps)

Hopping-FS

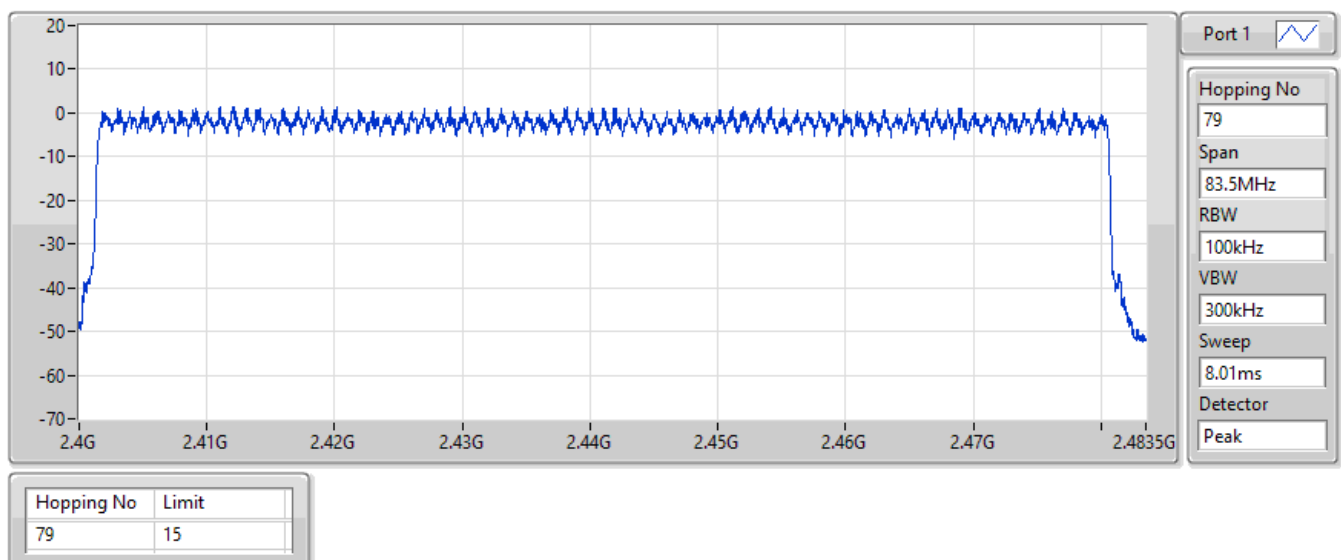
2402MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

Hopping-FS

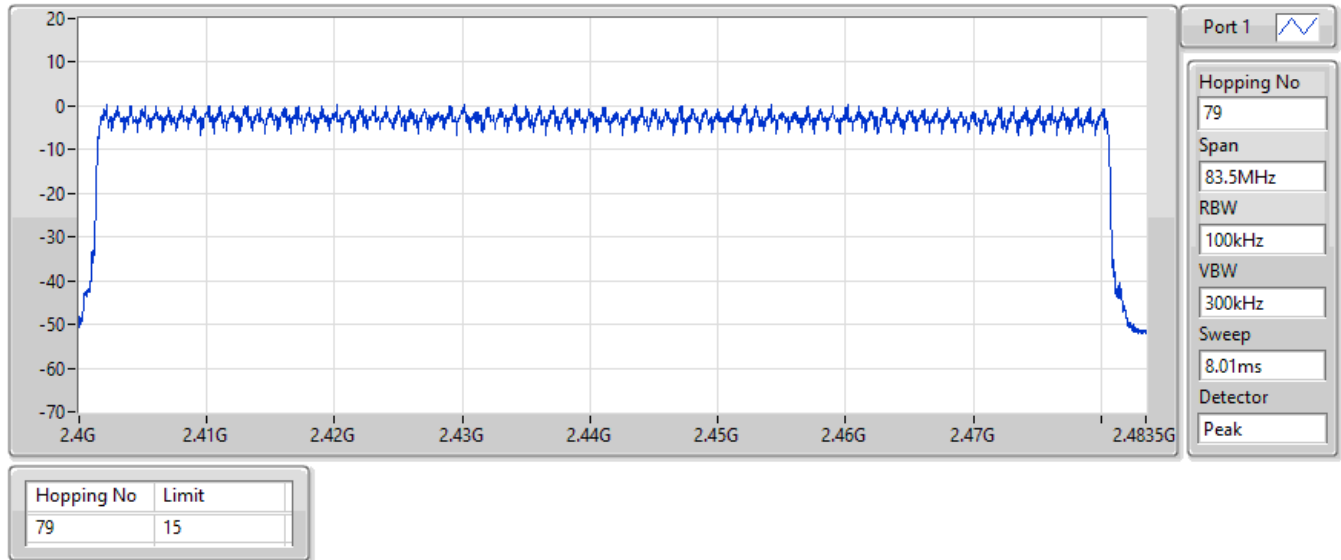
2402MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

Hopping-FS

2402MHz



**Summary**

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

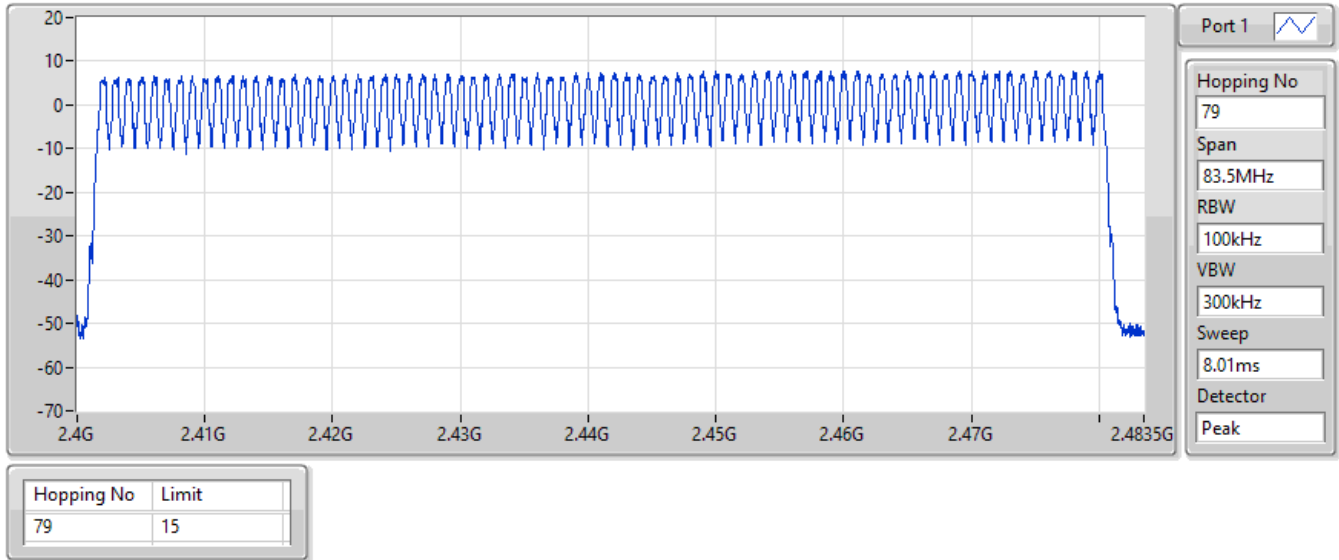
Result

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

2.4-2.4835GHz_BT-BR(1Mbps)

Hopping-FS

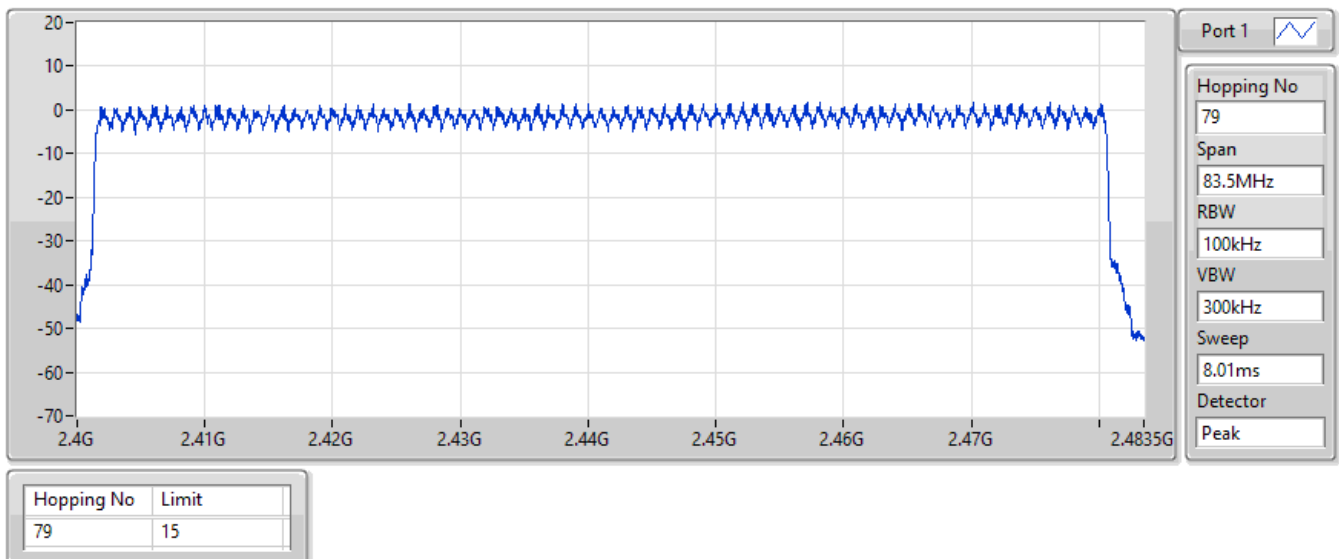
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2.4-2.4835GHz_BT-EDR(2Mbps)

Hopping-FS

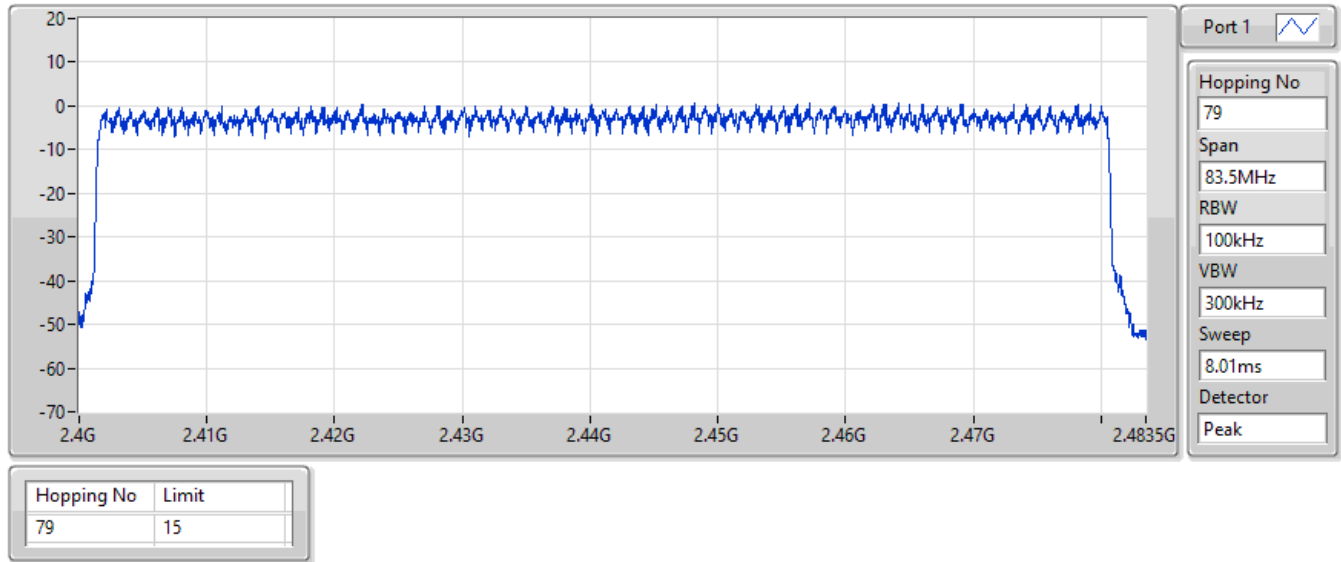
2402MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

Hopping-FS

2402MHz



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)	1.012M	912.044k	912KF1D	987.25k	904.548k
BT-EDR(2Mbps)	1.353M	1.214M	1M21G1D	1.348M	1.211M
BT-EDR(3Mbps)	1.328M	1.204M	1M20G1D	1.304M	1.202M

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	1.009M	912.044k
2441MHz	Pass	Inf	987.25k	904.548k
2480MHz	Pass	Inf	1.012M	907.046k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.348M	1.214M
2441MHz	Pass	Inf	1.35M	1.211M
2480MHz	Pass	Inf	1.353M	1.212M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.304M	1.204M
2441MHz	Pass	Inf	1.328M	1.202M
2480MHz	Pass	Inf	1.306M	1.202M

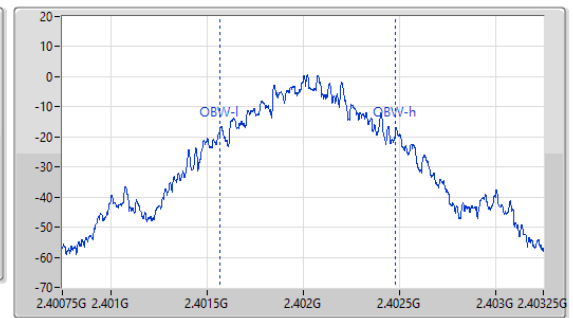
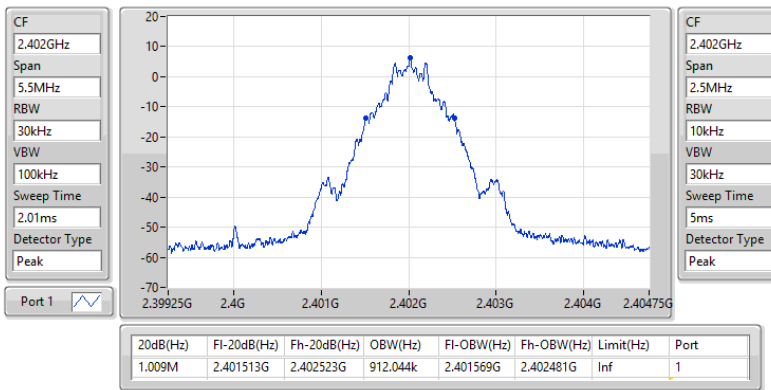
Port X-N dB = Port X 20dB down bandwidth;

Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_BT-BR(1Mbps)

EBW-FS

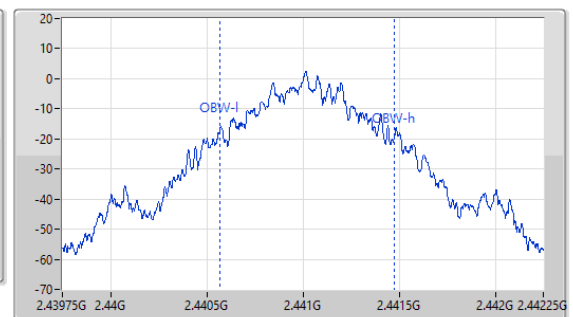
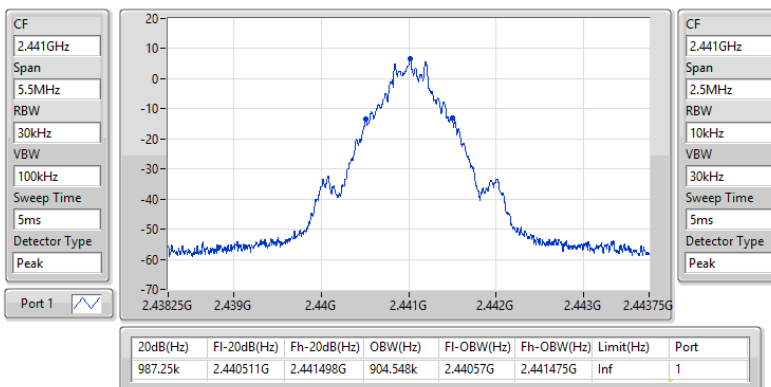
2402MHz



2.4-2.4835GHz_BT-BR(1Mbps)

EBW-FS

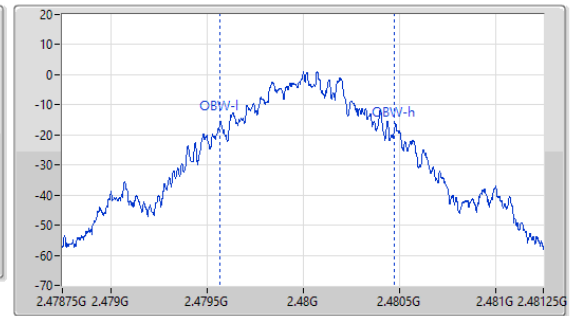
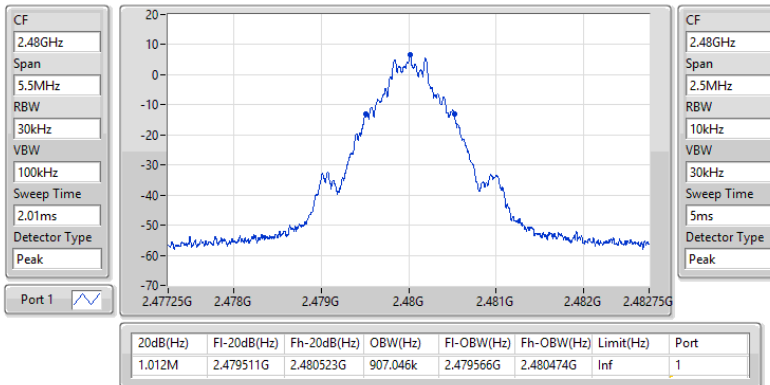
2441MHz



2.4-2.4835GHz_BT-BR(1Mbps)

EBW-FS

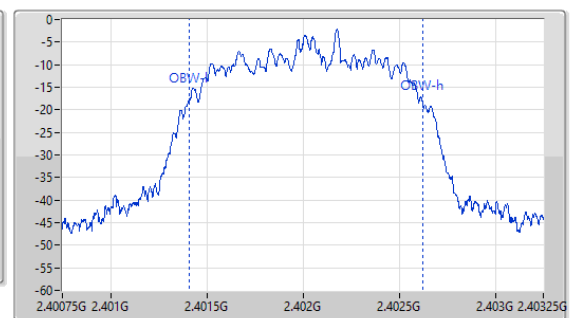
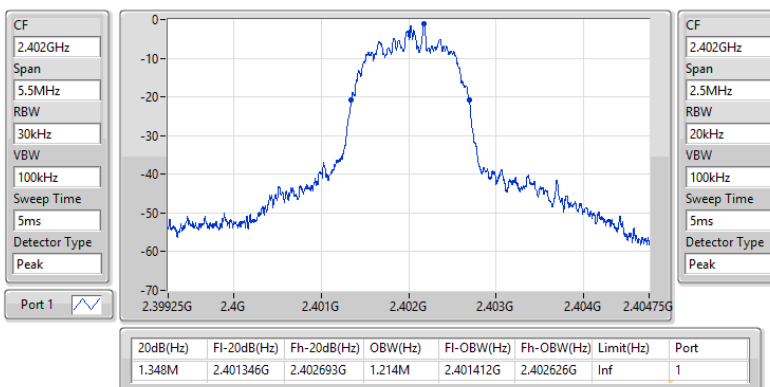
2480MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

EBW-FS

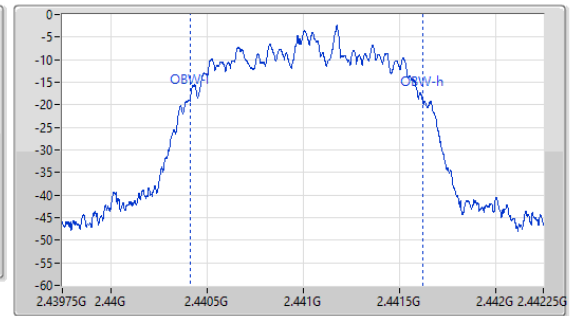
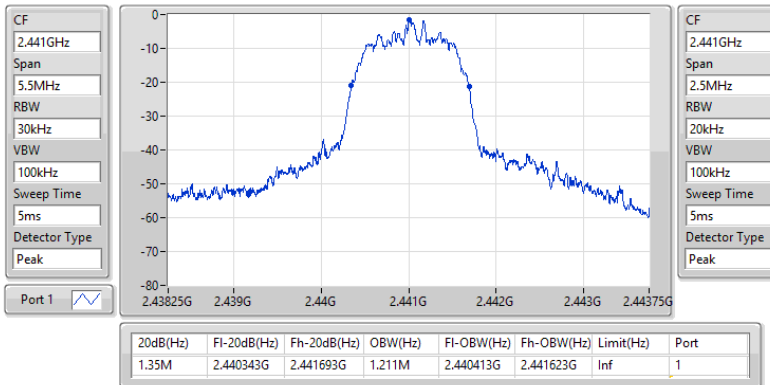
2402MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

EBW-FS

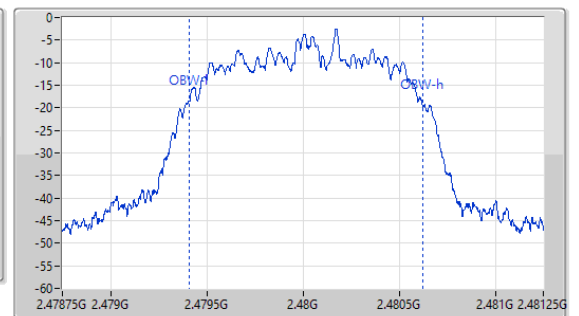
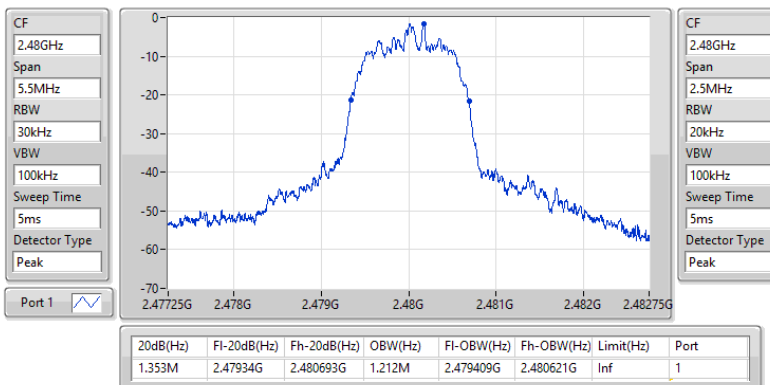
2441MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

EBW-FS

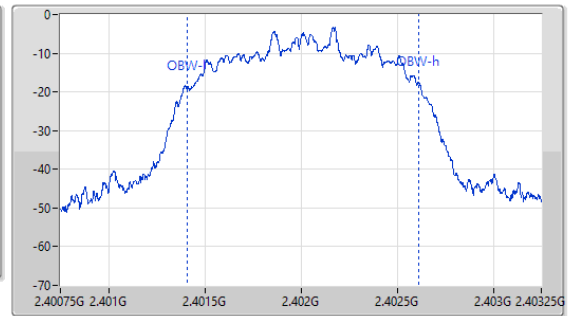
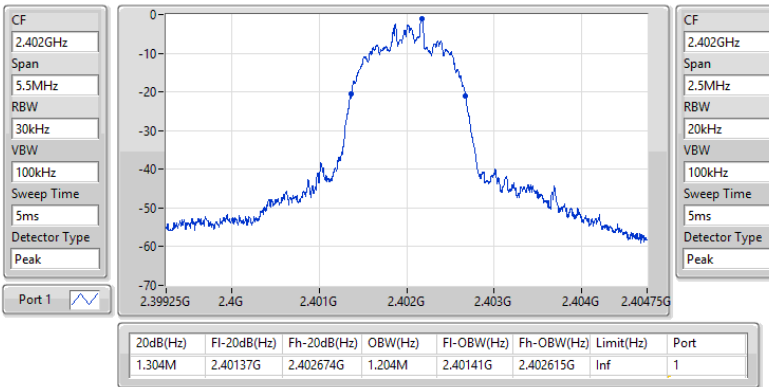
2480MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

EBW-FS

2402MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

EBW-FS

2441MHz

