Appendix:Bluetooth LE

Contents

Contents..... 2
1. Duty Cycle..... 3
Test data：..... 3
Test graphs：..... 4
2. Maximum Peak Conducted Output Power..... 7
Test data：..... 7
Test graphs：..... 8
3. -6dB Bandwidth..... 11
Test data：..... 11
Test graphs：..... 12
4. Occupied Channel Bandwidth..... 15
Test data：..... 15
Test graphs：..... 16
5. Maximum Power Spectral Density Level..... 19
Test data：..... 19
Test graphs：..... 20
6. Band Edge..... 23
Test data：..... 23
Test graphs：..... 24
7. Conducted RF Spurious Emission..... 28
Test data：..... 28
Test graphs：..... 29

1.Duty Cycle

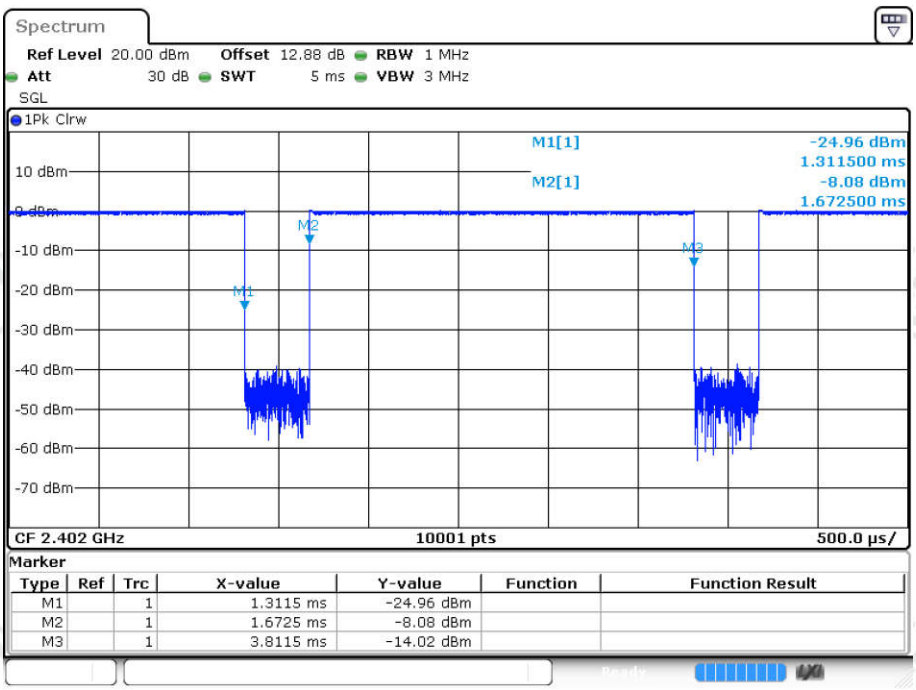
Test data：

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	85.56	0.68	0.47
NVNT	BLE 1M	2440	Ant1	85.56	0.68	0.47
NVNT	BLE 1M	2480	Ant1	85.54	0.68	0.47
NVNT	BLE 2M	2402	Ant1	57.63	2.39	0.93
NVNT	BLE 2M	2440	Ant1	57.64	2.39	0.93
NVNT	BLE 2M	2480	Ant1	57.63	2.39	0.93

Test graphs：

Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant1

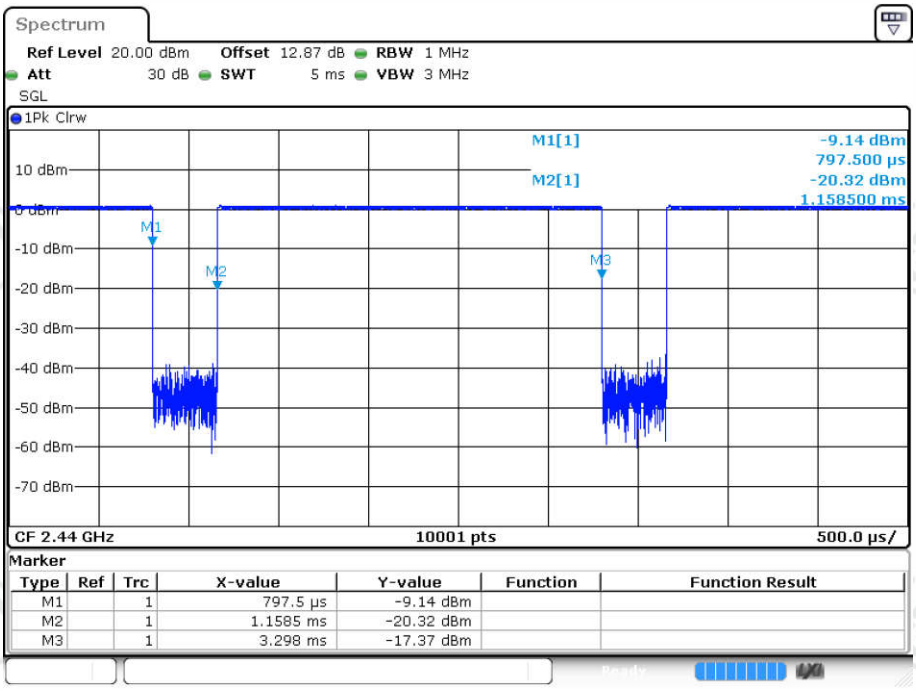


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.3115 ms	-24.96 dBm		
M2		1	1.6725 ms	-8.08 dBm		
M3		1	3.8115 ms	-14.02 dBm		

Date: 22.JUL.2022 10:50:18

Duty Cycle NVNT BLE 1M 2440MHz Ant1

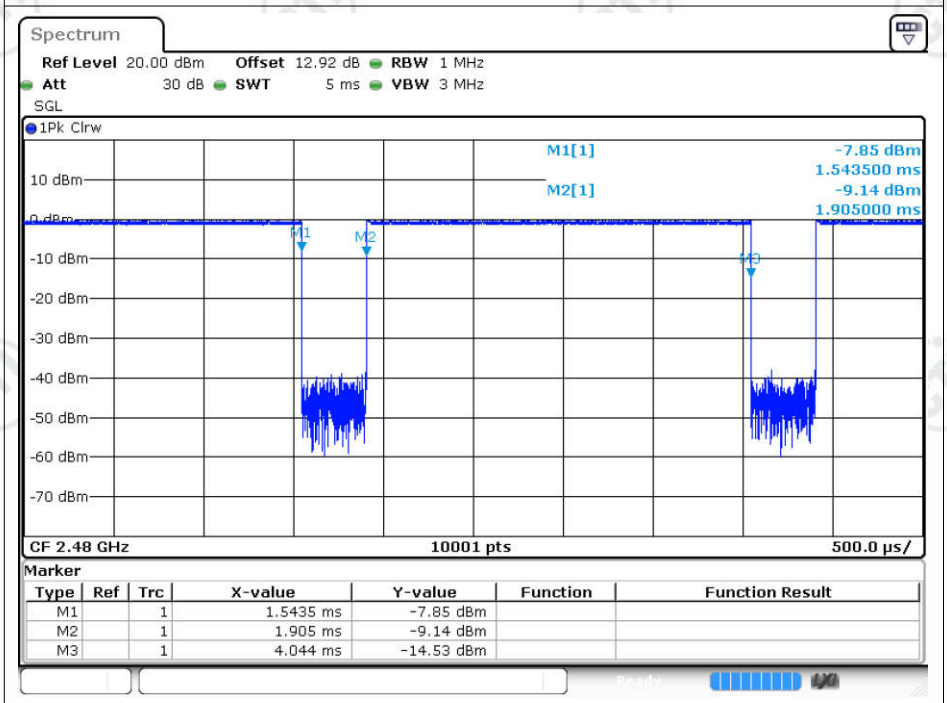


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	797.5 µs	-9.14 dBm		
M2		1	1.1585 ms	-20.32 dBm		
M3		1	3.298 ms	-17.37 dBm		

Date: 22.JUL.2022 10:52:14

Duty Cycle NVNT BLE 1M 2480MHz Ant1

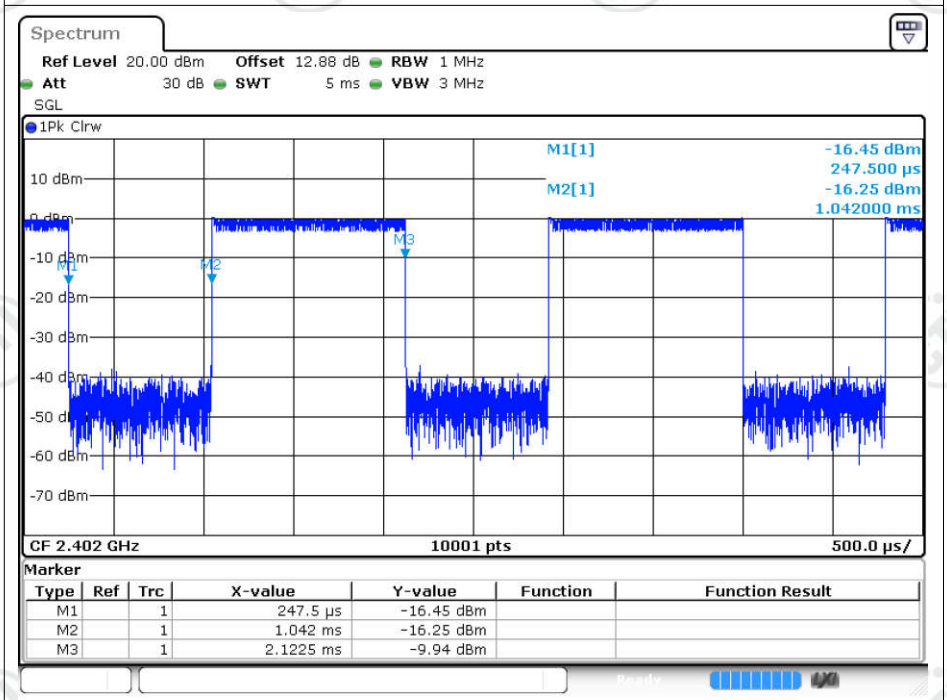


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.5435 ms	-7.85 dBm		
M2		1	1.905 ms	-9.14 dBm		
M3		1	4.044 ms	-14.53 dBm		

Date: 22.JUL.2022 11:03:17

Duty Cycle NVNT BLE 2M 2402MHz Ant1

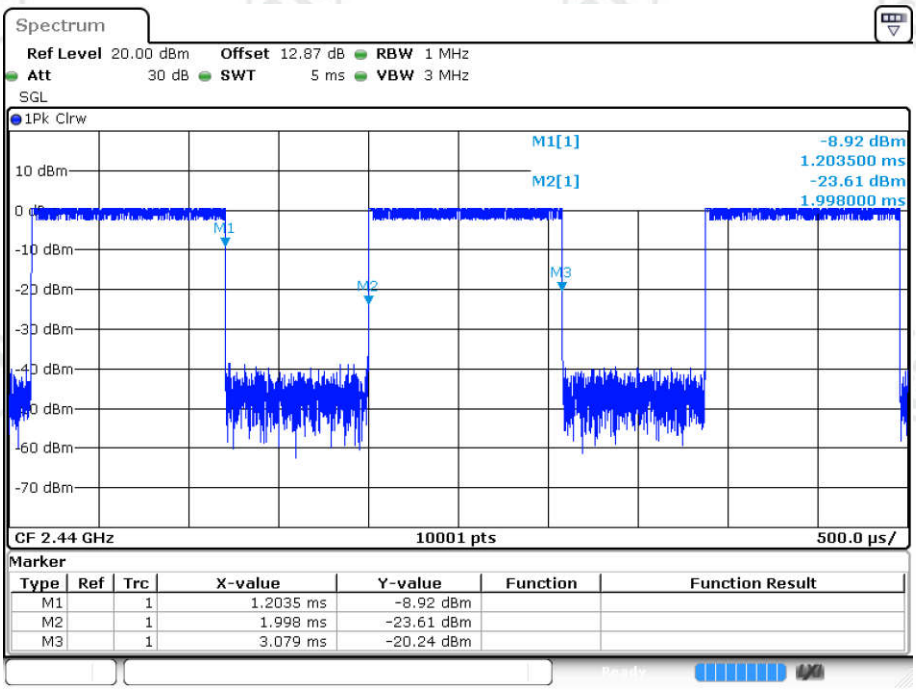


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	247.5 µs	-16.45 dBm		
M2		1	1.042 ms	-16.25 dBm		
M3		1	2.1225 ms	-9.94 dBm		

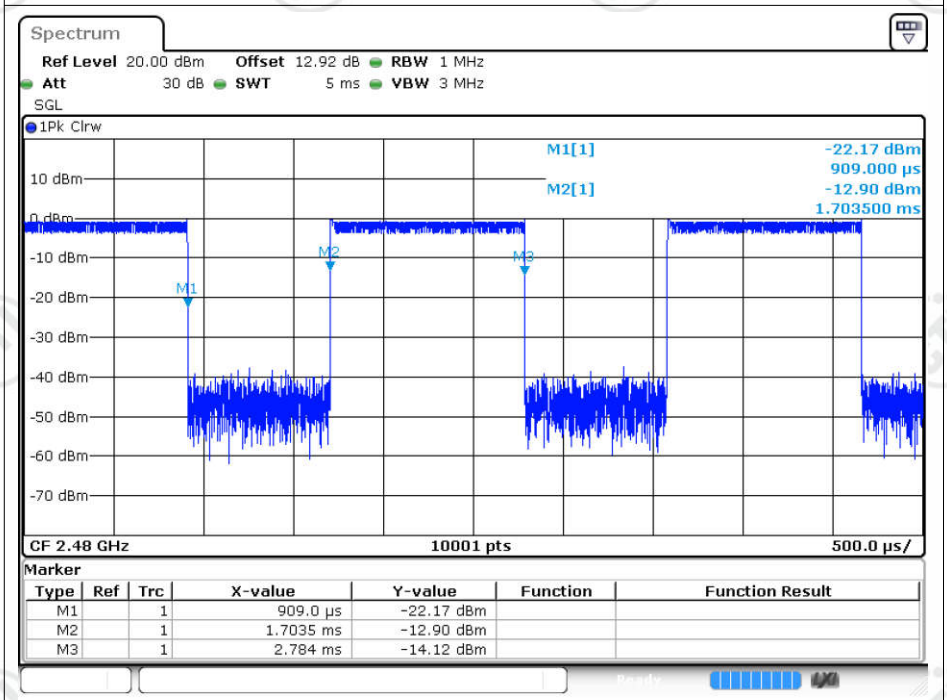
Date: 22.JUL.2022 10:55:49

Duty Cycle NVNT BLE 2M 2440MHz Ant1



Date: 22.JUL.2022 10:57:42

Duty Cycle NVNT BLE 2M 2480MHz Ant1



Date: 22.JUL.2022 10:59:43

2.Maximum Peak Conducted Output Power

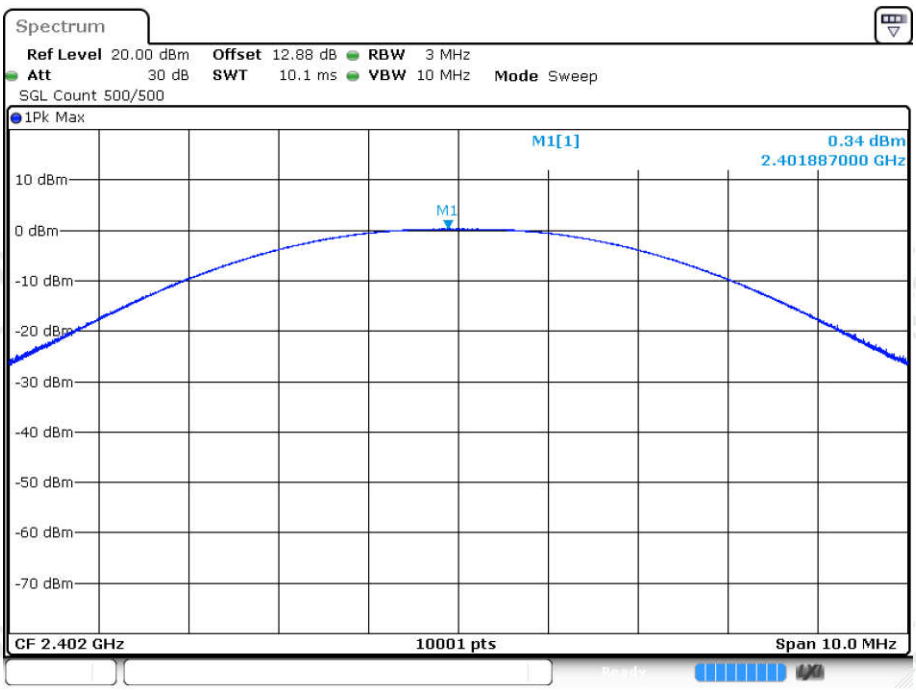
Test data：

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	0.34	0	0.34	30	Pass
NVNT	BLE 1M	2440	Ant1	2.02	0	2.02	30	Pass
NVNT	BLE 1M	2480	Ant1	-0.25	0	-0.25	30	Pass
NVNT	BLE 2M	2402	Ant1	0.29	0	0.29	30	Pass
NVNT	BLE 2M	2440	Ant1	**2.09**	0	**2.09**	30	Pass
NVNT	BLE 2M	2480	Ant1	-0.26	0	-0.26	30	Pass

Test graphs：

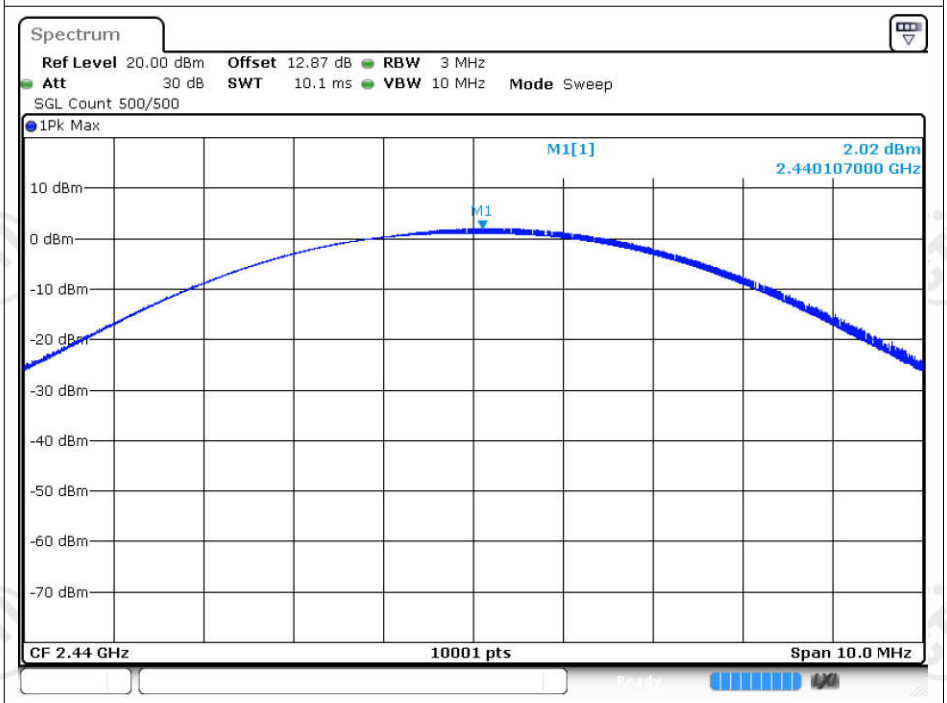
Test Graphs

Peak Power NVNT BLE 1M 2402MHz Ant1



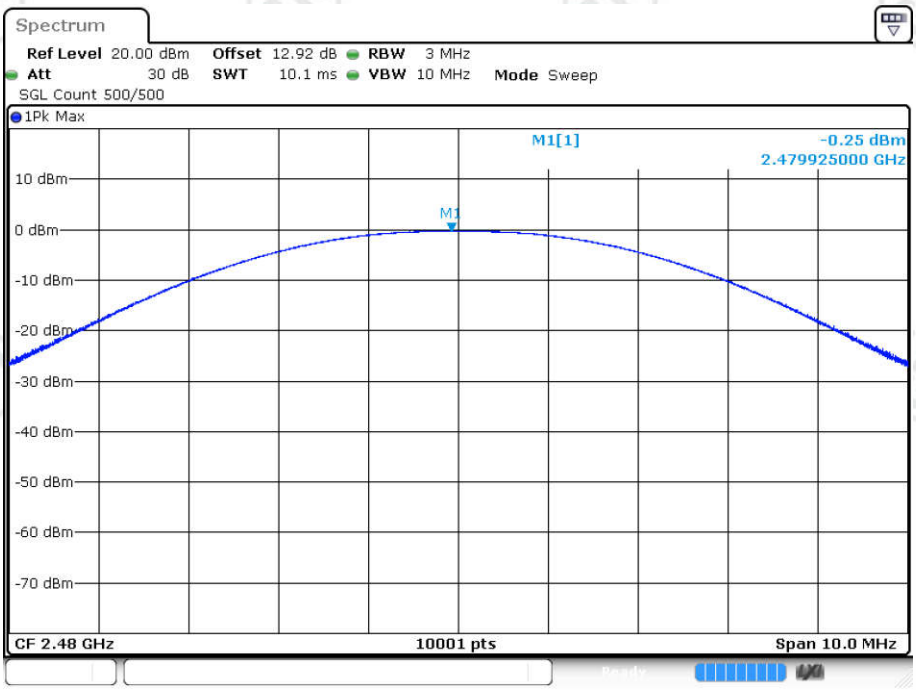
Date: 22.JUL.2022 10:50:38

Peak Power NVNT BLE 1M 2440MHz Ant1



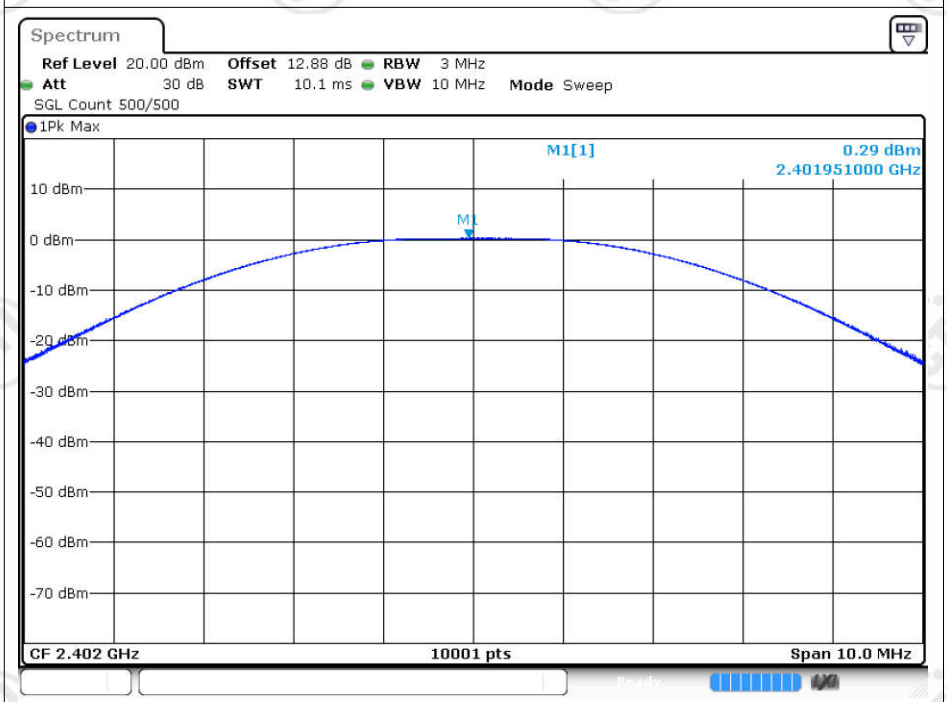
Date: 22.JUL.2022 10:52:34

Peak Power NVNT BLE 1M 2480MHz Ant1



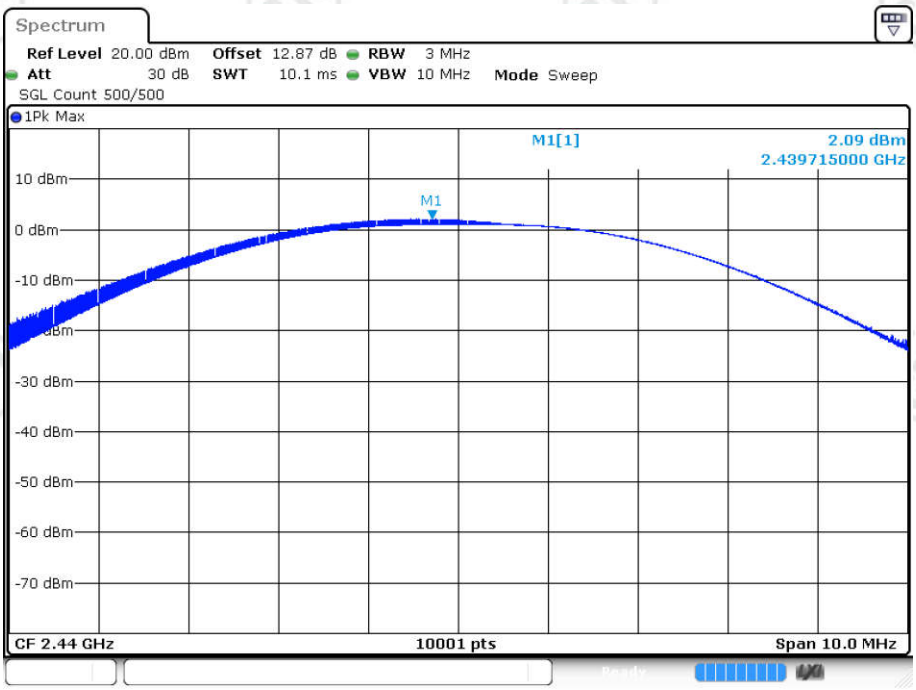
Date: 22.JUL.2022 10:54:19

Peak Power NVNT BLE 2M 2402MHz Ant1



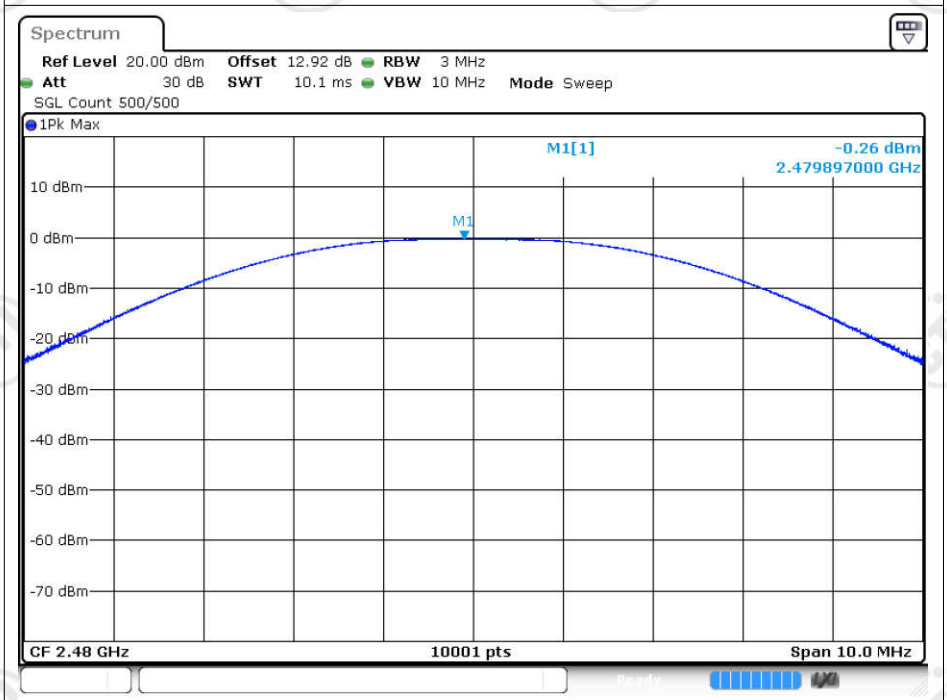
Date: 22.JUL.2022 10:56:10

Peak Power NVNT BLE 2M 2440MHz Ant1



Date: 22.JUL.2022 10:58:03

Peak Power NVNT BLE 2M 2480MHz Ant1



Date: 22.JUL.2022 11:00:03

3.-6dB Bandwidth

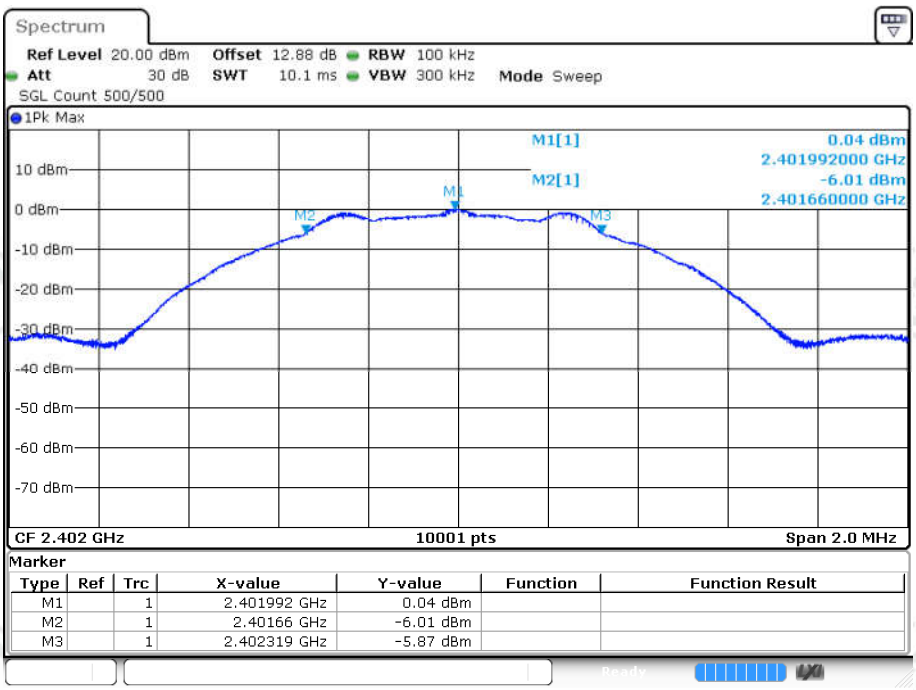
Test data：

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.659	0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.669	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.659	0.5	Pass
NVNT	BLE 2M	2402	Ant1	1.124	0.5	Pass
NVNT	BLE 2M	2440	Ant1	1.142	0.5	Pass
NVNT	BLE 2M	2480	Ant1	1.136	0.5	Pass

Test graphs：

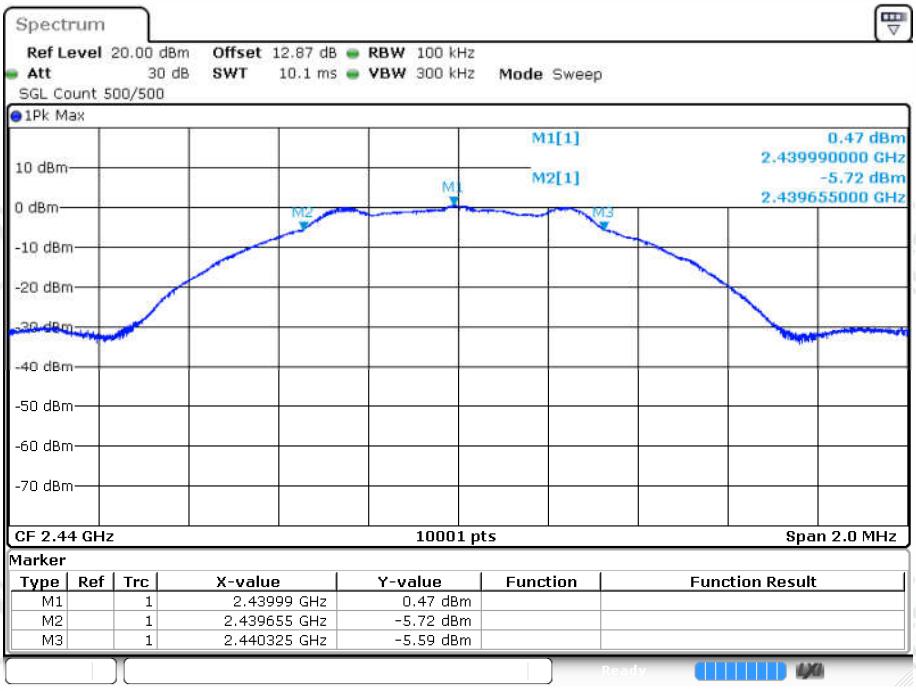
Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



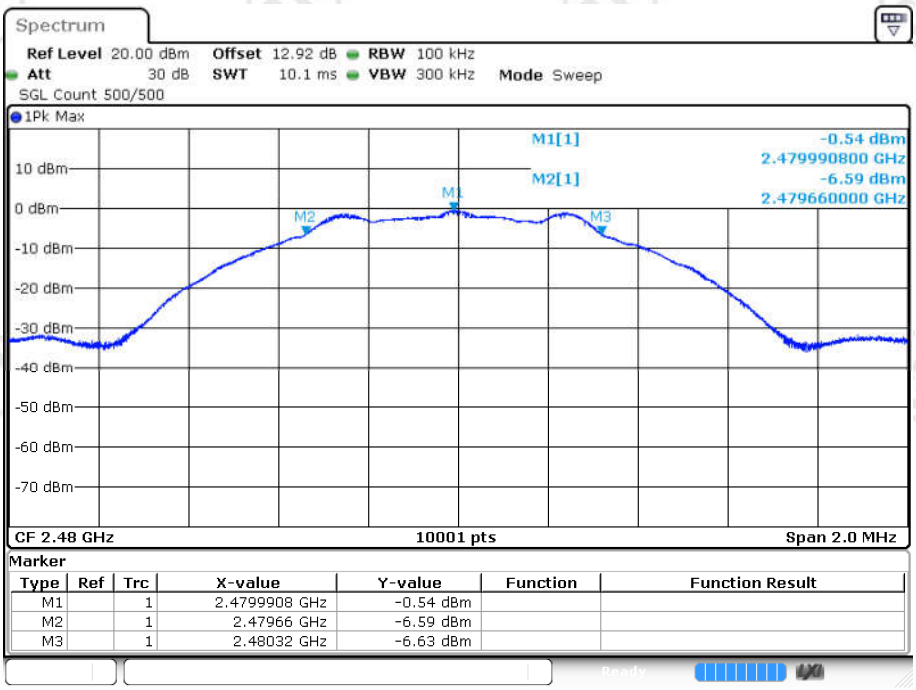
Date: 22.JUL.2022 10:51:00

-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



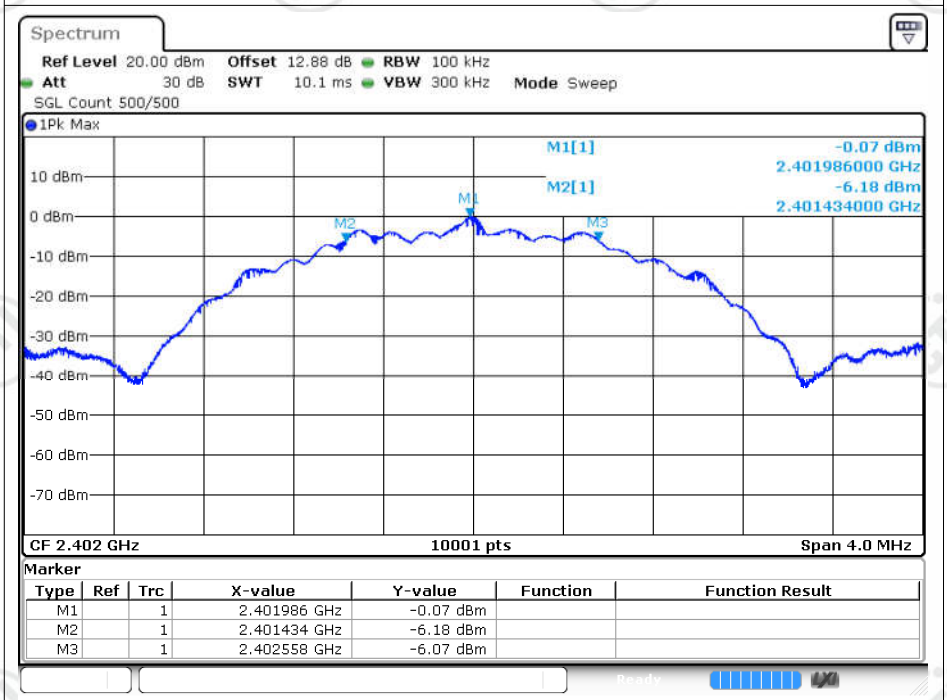
Date: 22.JUL.2022 10:52:56

-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



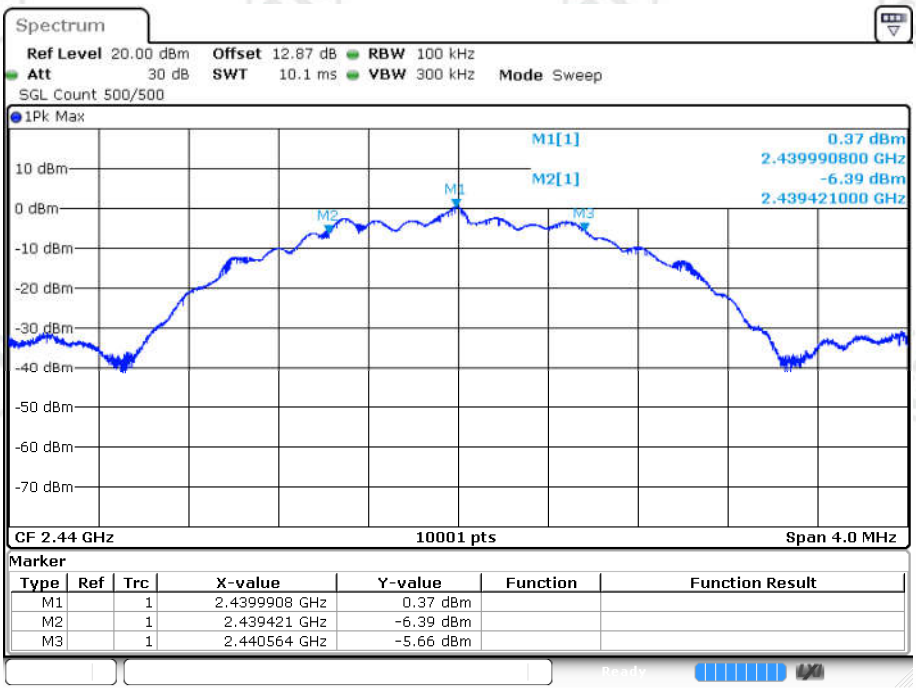
Date: 22.JUL.2022 10:54:40

-6dB Bandwidth NVNT BLE 2M 2402MHz Ant1



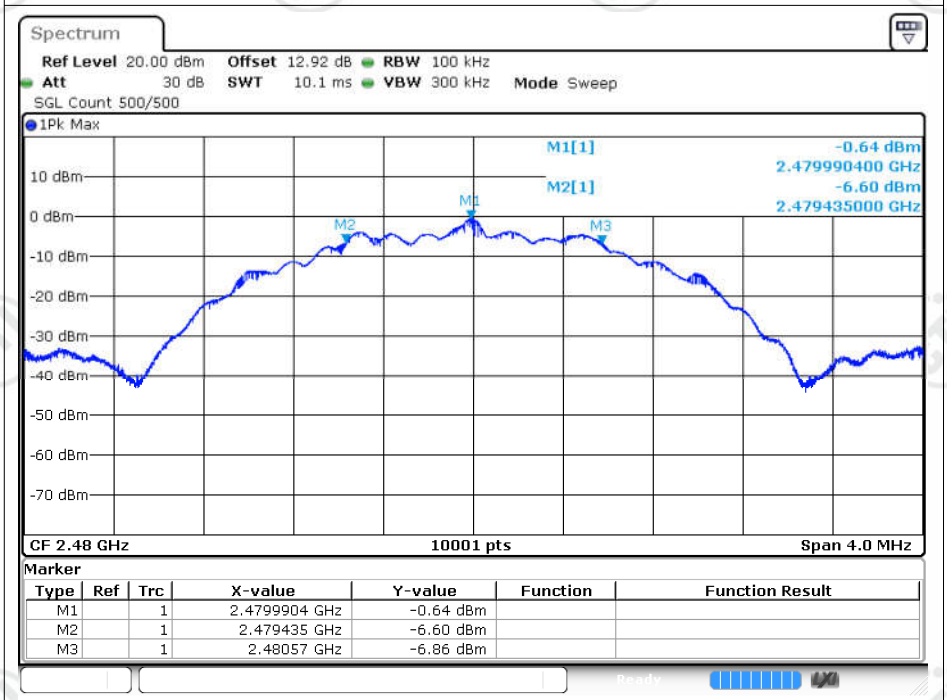
Date: 22.JUL.2022 10:56:31

-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1



Date: 22.JUL.2022 10:58:25

-6dB Bandwidth NVNT BLE 2M 2480MHz Ant1



Date: 22.JUL.2022 11:00:25

4.Occupied Channel Bandwidth

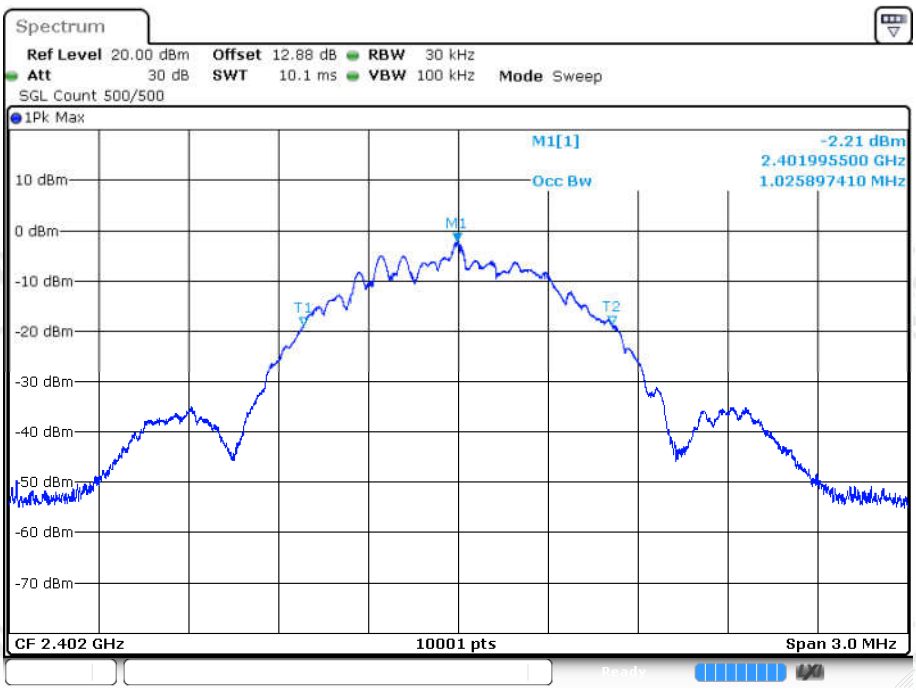
Test data：

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 1M	2402	Ant1	1.026
NVNT	BLE 1M	2440	Ant1	1.027
NVNT	BLE 1M	2480	Ant1	1.025
NVNT	BLE 2M	2402	Ant1	2.036
NVNT	BLE 2M	2440	Ant1	2.036
NVNT	BLE 2M	2480	Ant1	2.037

Test graphs：

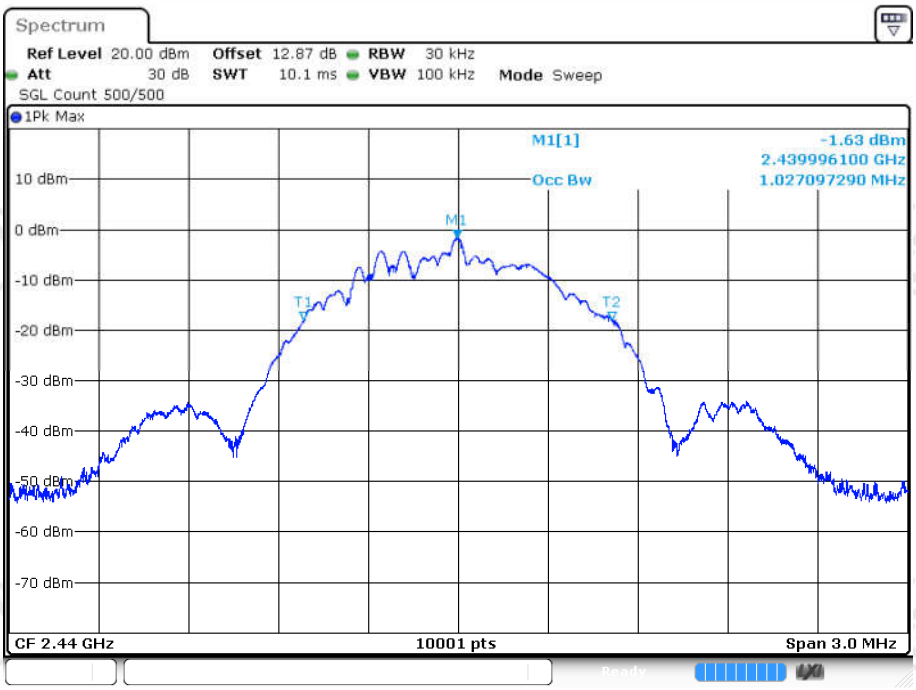
Test Graphs

OBW NVNT BLE 1M 2402MHz Ant1



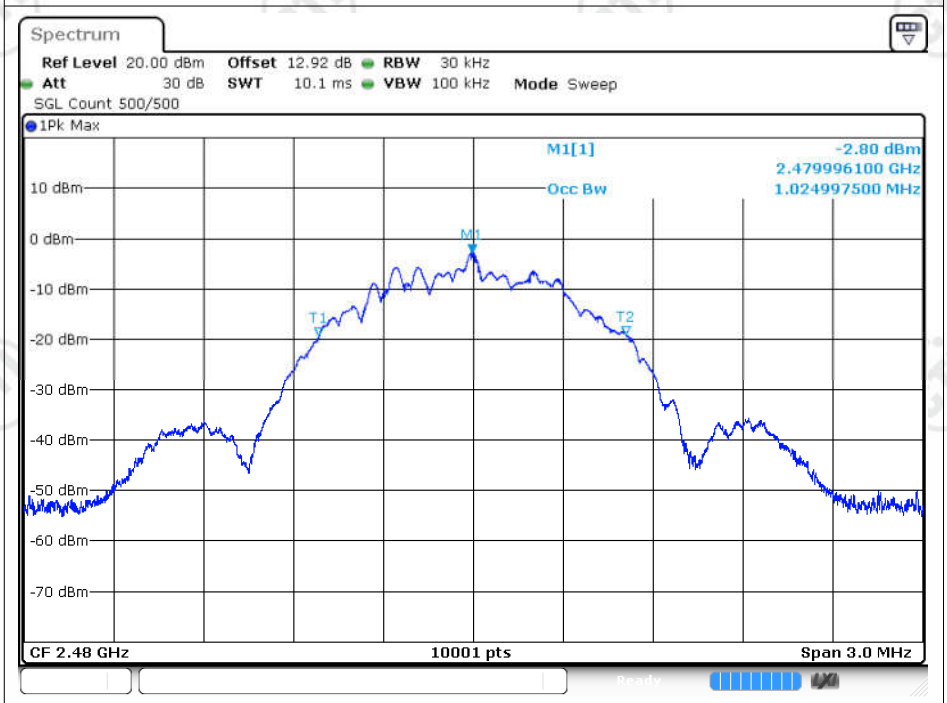
Date: 22.JUL.2022 10:50:50

OBW NVNT BLE 1M 2440MHz Ant1



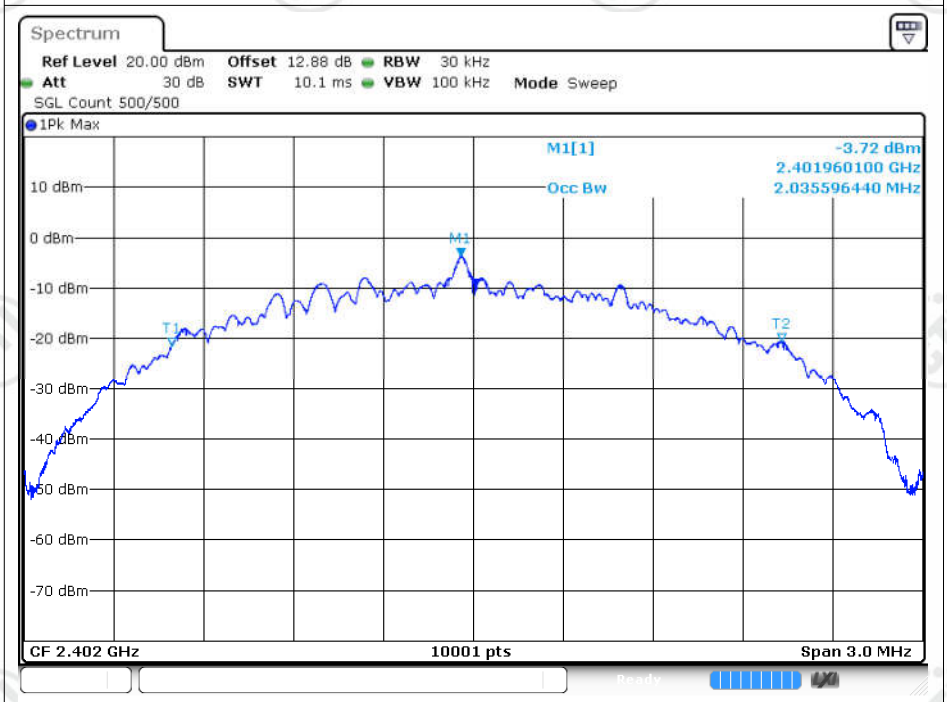
Date: 22.JUL.2022 10:52:45

OBW NVNT BLE 1M 2480MHz Ant1



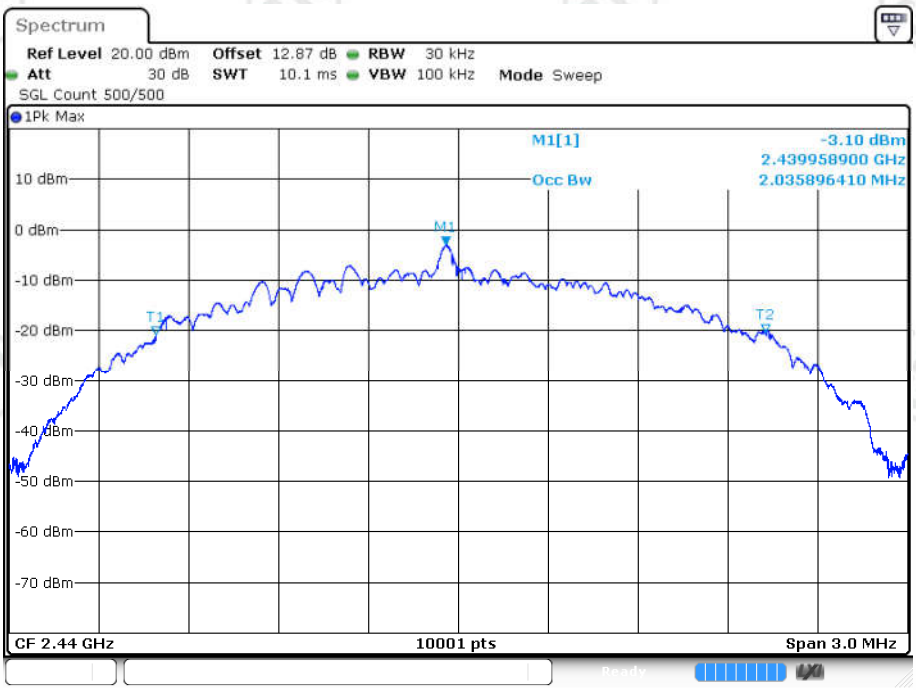
Date: 22.JUL.2022 10:54:30

OBW NVNT BLE 2M 2402MHz Ant1



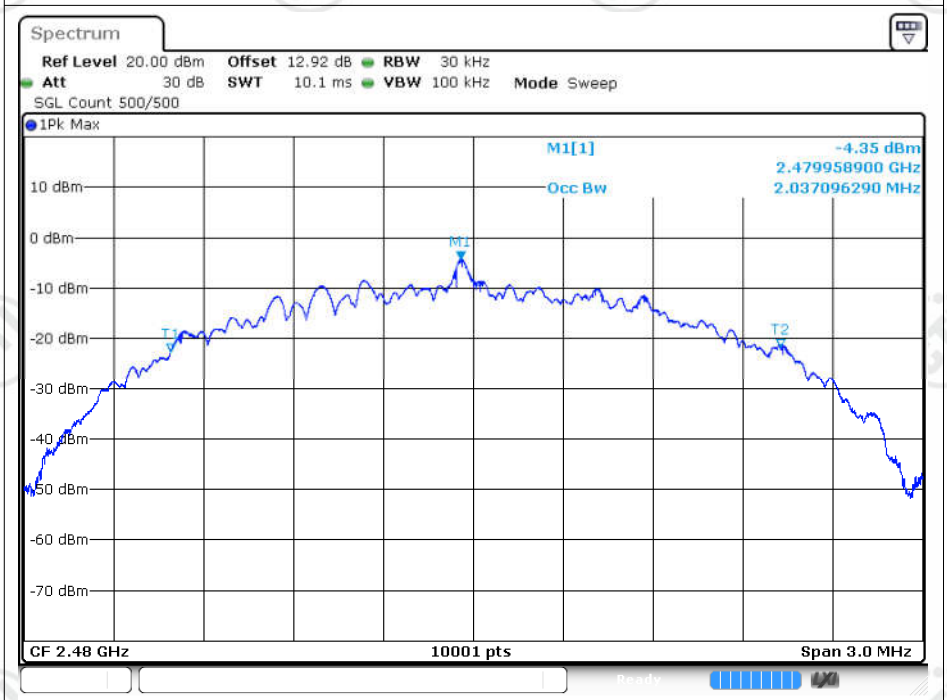
Date: 22.JUL.2022 10:56:21

OBW NVNT BLE 2M 2440MHz Ant1



Date: 22.JUL.2022 10:58:14

OBW NVNT BLE 2M 2480MHz Ant1



Date: 22.JUL.2022 11:00:14

5.Maximum Power Spectral Density Level

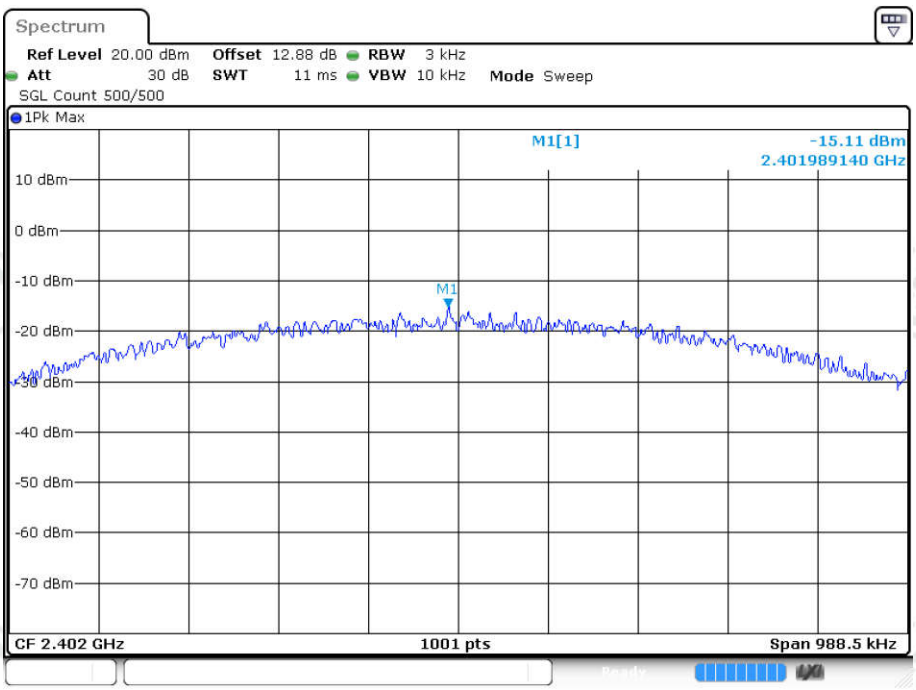
Test data：

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Duty Factor (dB)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-15.11	0	-15.11	8	Pass
NVNT	BLE 1M	2440	Ant1	-15.34	0	-15.34	8	Pass
NVNT	BLE 1M	2480	Ant1	-15.59	0	-15.59	8	Pass
NVNT	BLE 2M	2402	Ant1	-17.07	0	-17.07	8	Pass
NVNT	BLE 2M	2440	Ant1	-17.41	0	-17.41	8	Pass
NVNT	BLE 2M	2480	Ant1	-18.37	0	-18.37	8	Pass

Test graphs：

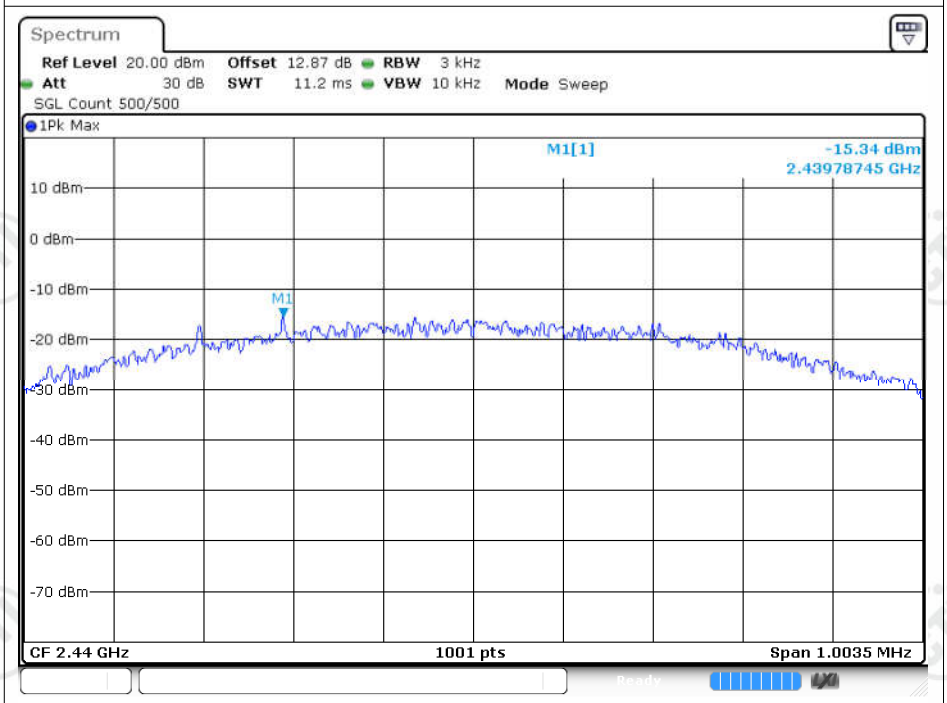
Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



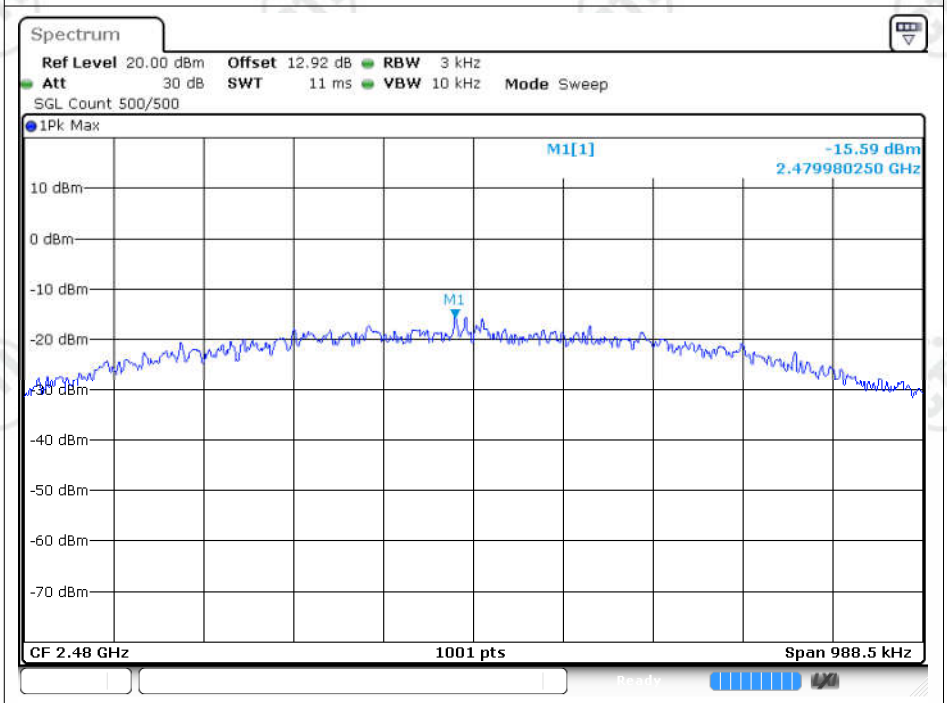
Date: 22.JUL.2022 10:51:14

PSD NVNT BLE 1M 2440MHz Ant1



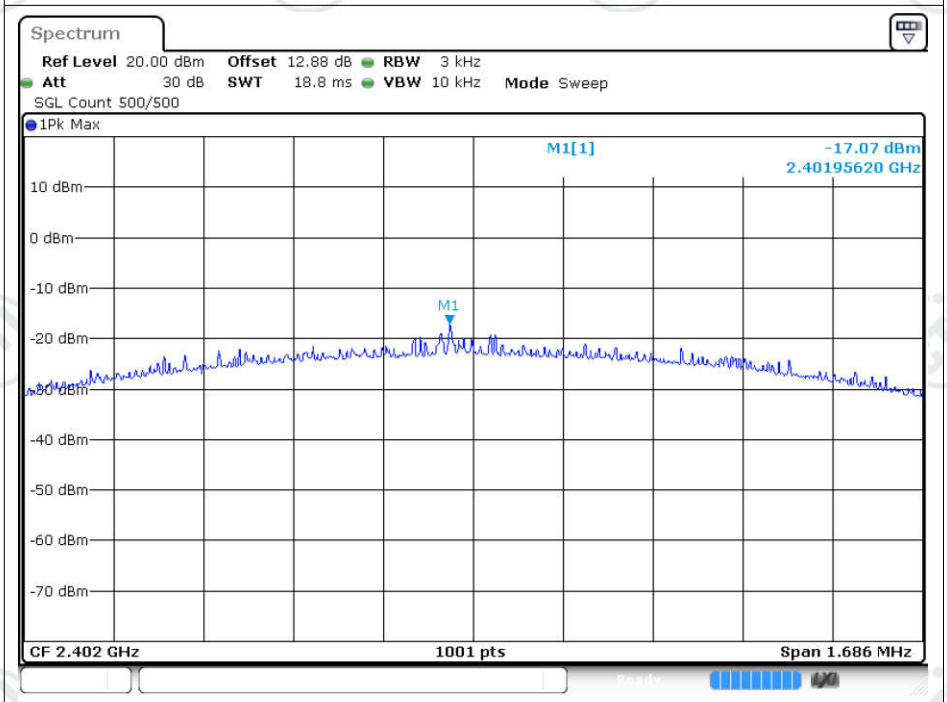
Date: 22.JUL.2022 10:53:14

PSD NVNT BLE 1M 2480MHz Ant1



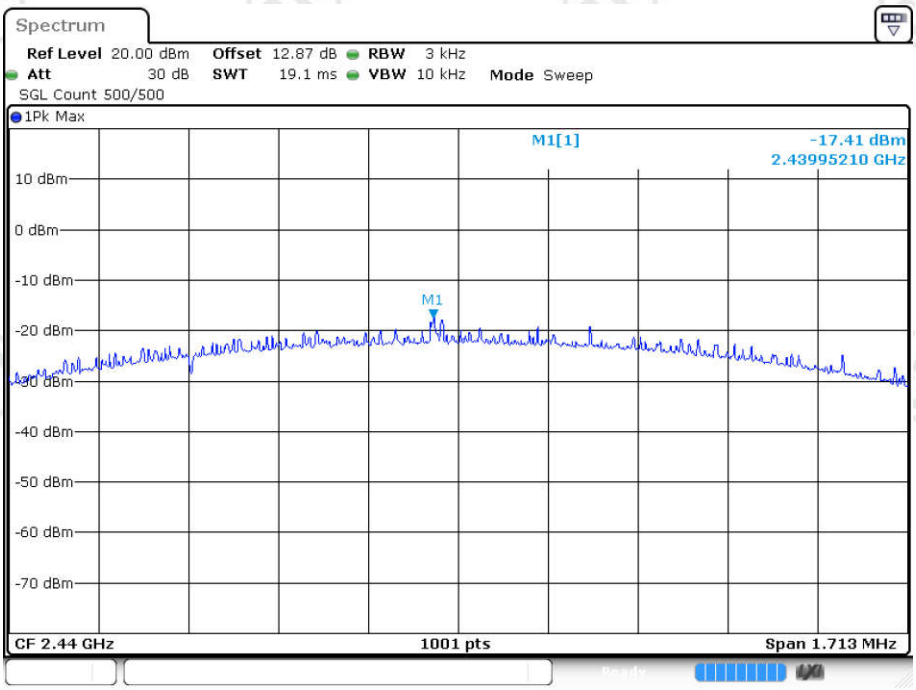
Date: 22.JUL.2022 10:54:54

PSD NVNT BLE 2M 2402MHz Ant1



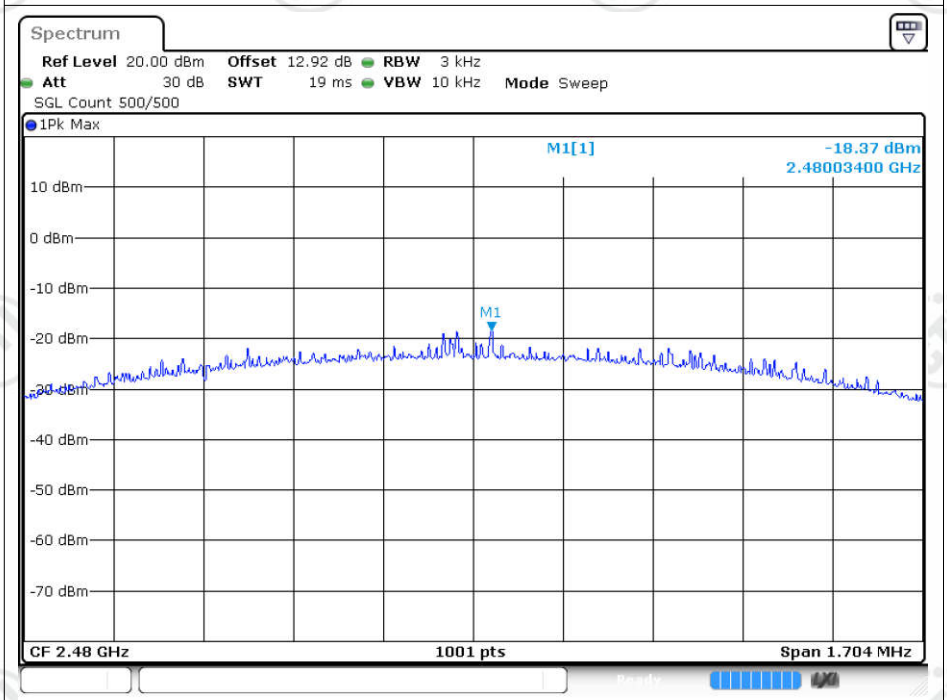
Date: 22.JUL.2022 10:56:53

PSD NVNT BLE 2M 2440MHz Ant1



Date: 22.JUL.2022 10:58:46

PSD NVNT BLE 2M 2480MHz Ant1



Date: 22.JUL.2022 11:00:47

6.Band Edge

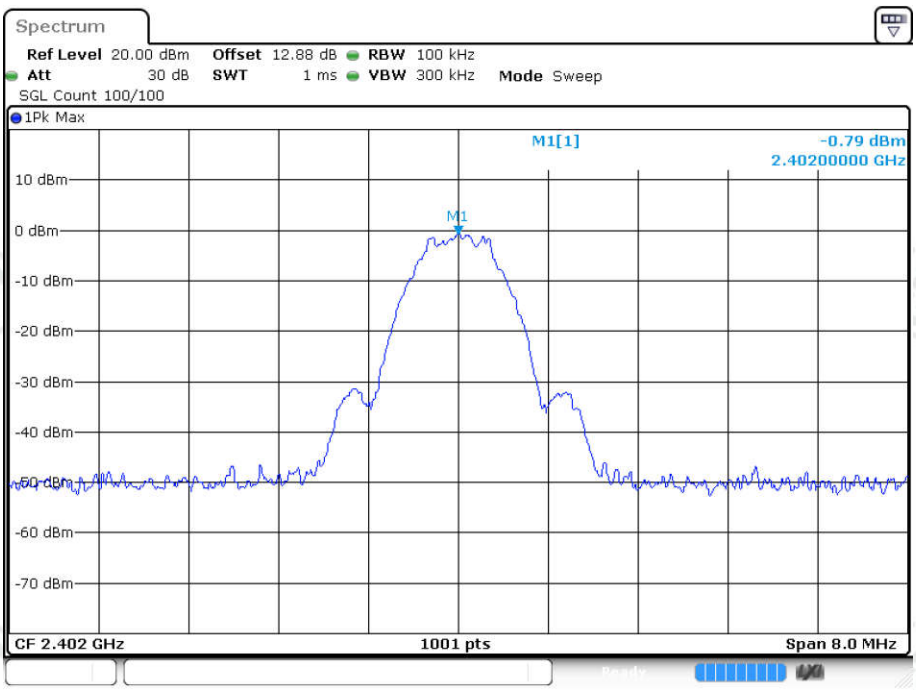
Test data：

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-45.09	-20	Pass
NVNT	BLE 1M	2480	Ant1	-44.85	-20	Pass
NVNT	BLE 2M	2402	Ant1	-33.59	-20	Pass
NVNT	BLE 2M	2480	Ant1	-43.28	-20	Pass

Test graphs：

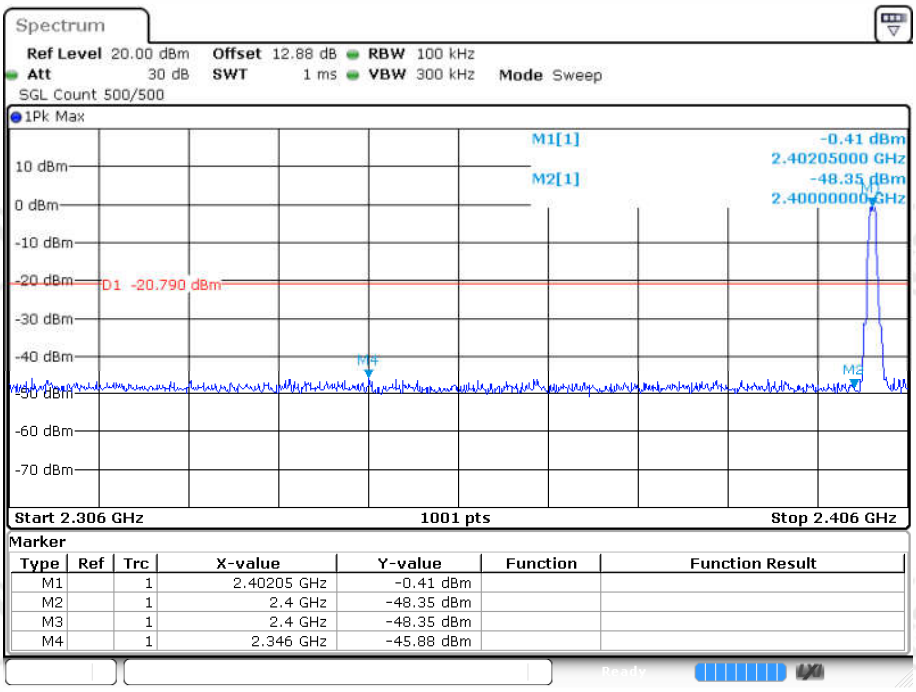
Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



Date: 22.JUL.2022 10:51:17

Band Edge NVNT BLE 1M 2402MHz Ant1 Emission

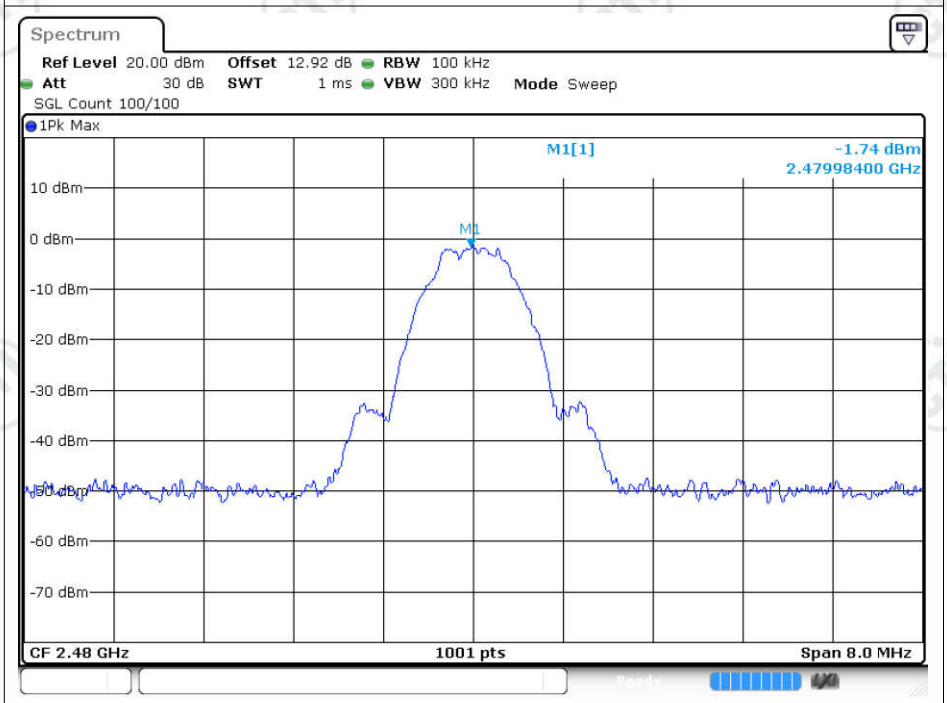


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40205 GHz	-0.41 dBm		
M2		1	2.4 GHz	-48.35 dBm		
M3		1	2.4 GHz	-48.35 dBm		
M4		1	2.346 GHz	-45.88 dBm		

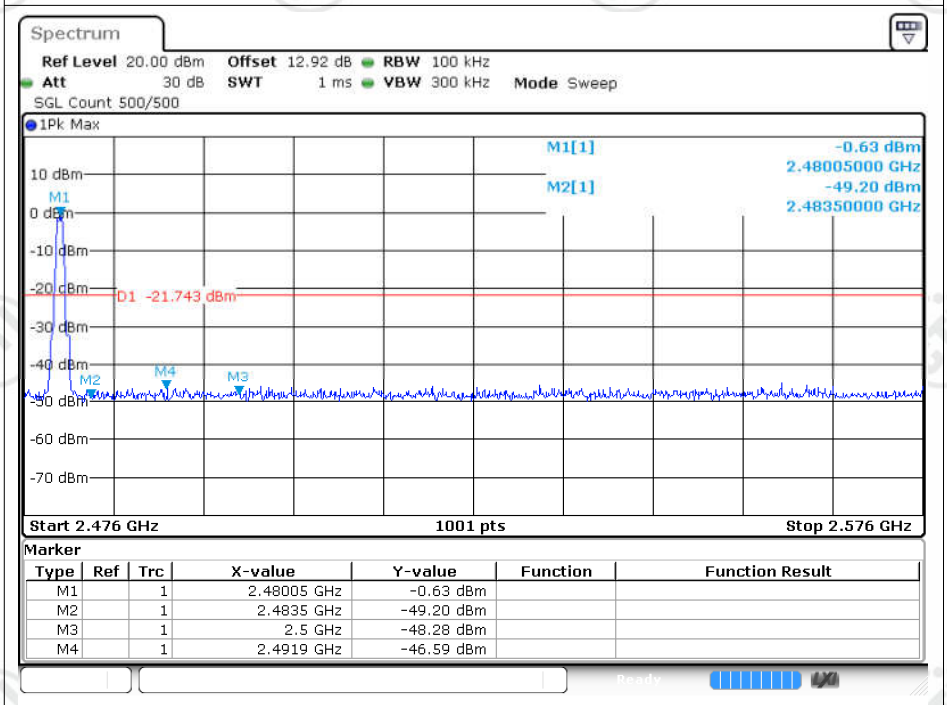
Date: 22.JUL.2022 10:51:21

Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



Date: 22.JUL.2022 10:54:57

Band Edge NVNT BLE 1M 2480MHz Ant1 Emission

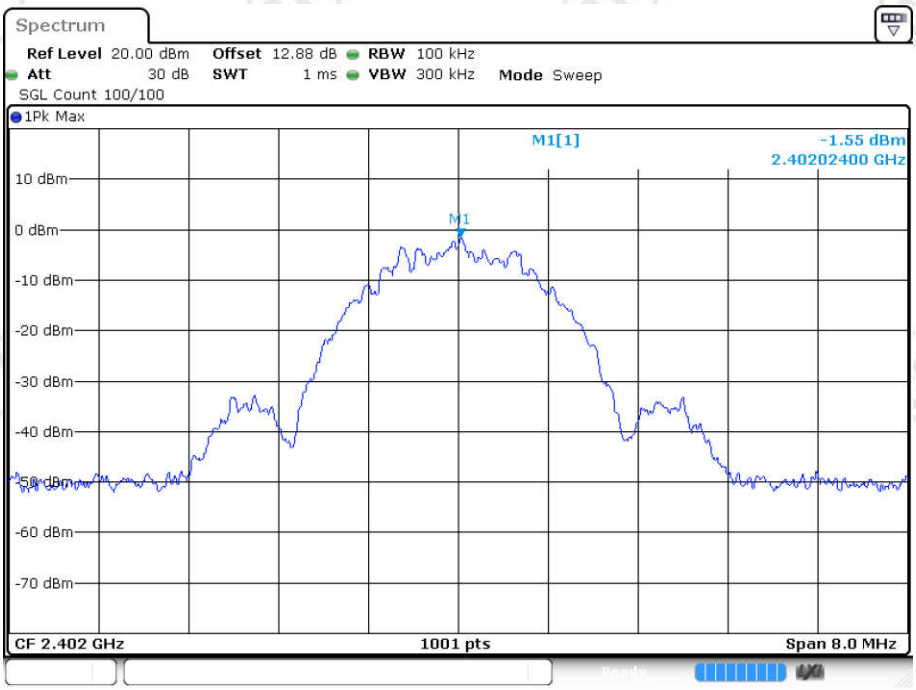


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48005 GHz	-0.63 dBm		
M2		1	2.4835 GHz	-49.20 dBm		
M3		1	2.5 GHz	-48.28 dBm		
M4		1	2.4919 GHz	-46.59 dBm		

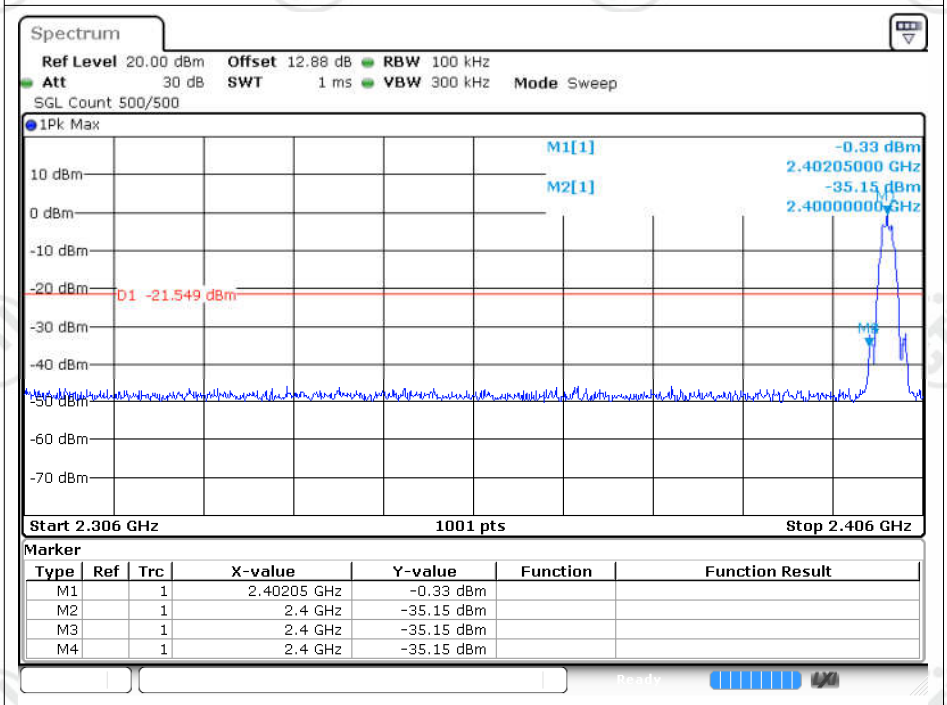
Date: 22.JUL.2022 10:54:59

Band Edge NVNT BLE 2M 2402MHz Ant1 Ref



Date: 22.JUL.2022 10:56:56

Band Edge NVNT BLE 2M 2402MHz Ant1 Emission

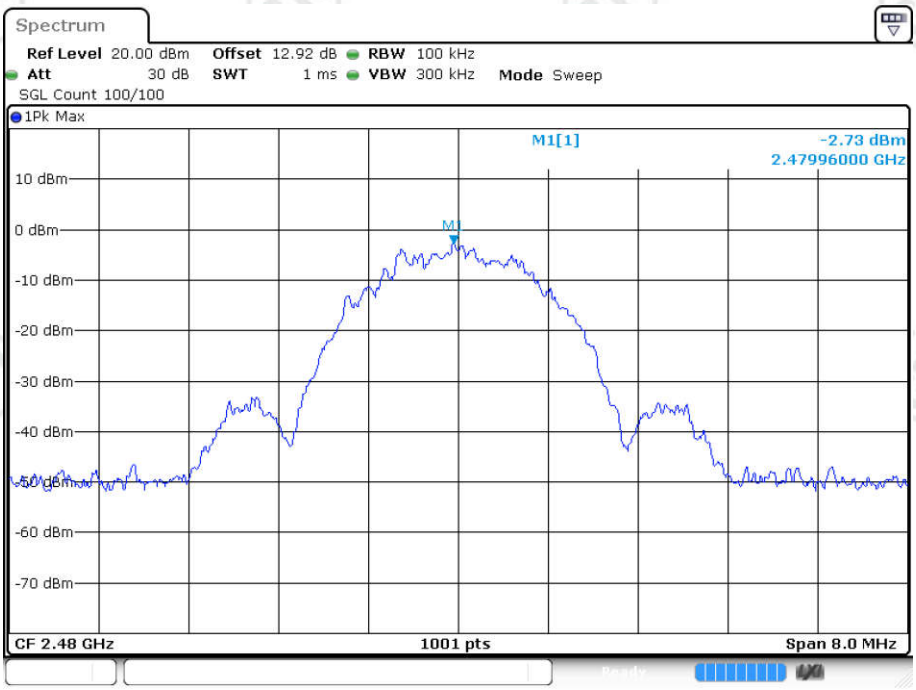


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40205 GHz	-0.33 dBm		
M2		1	2.4 GHz	-35.15 dBm		
M3		1	2.4 GHz	-35.15 dBm		
M4		1	2.4 GHz	-35.15 dBm		

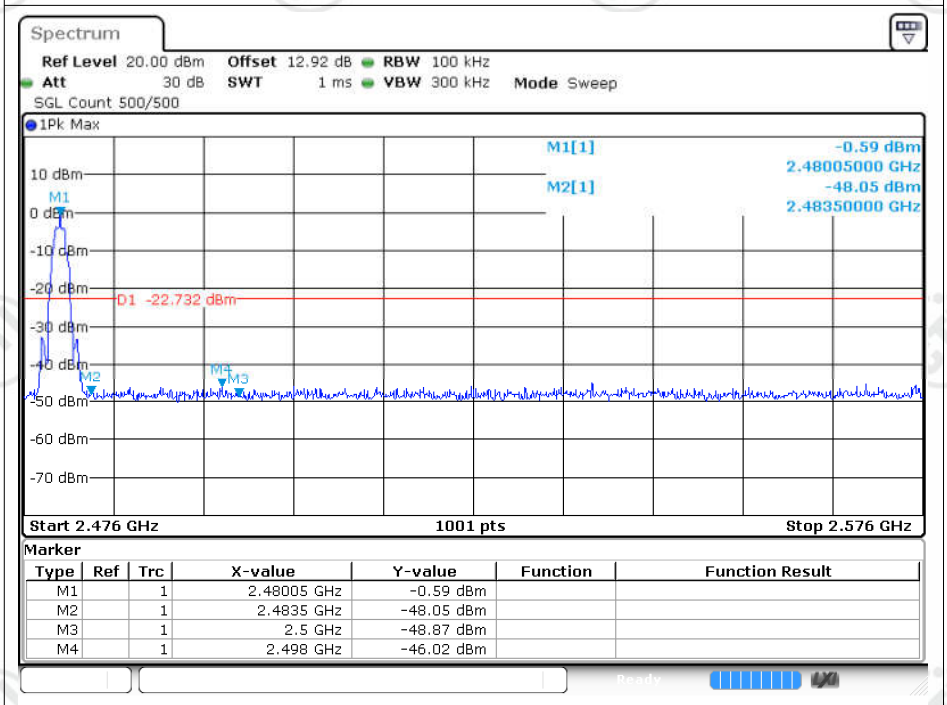
Date: 22.JUL.2022 10:56:59

Band Edge NVNT BLE 2M 2480MHz Ant1 Ref



Date: 22.JUL.2022 11:00:49

Band Edge NVNT BLE 2M 2480MHz Ant1 Emission



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48005 GHz	-0.59 dBm		
M2		1	2.4835 GHz	-48.05 dBm		
M3		1	2.5 GHz	-48.87 dBm		
M4		1	2.498 GHz	-46.02 dBm		

Date: 22.JUL.2022 11:00:52

7.Conducted RF Spurious Emission

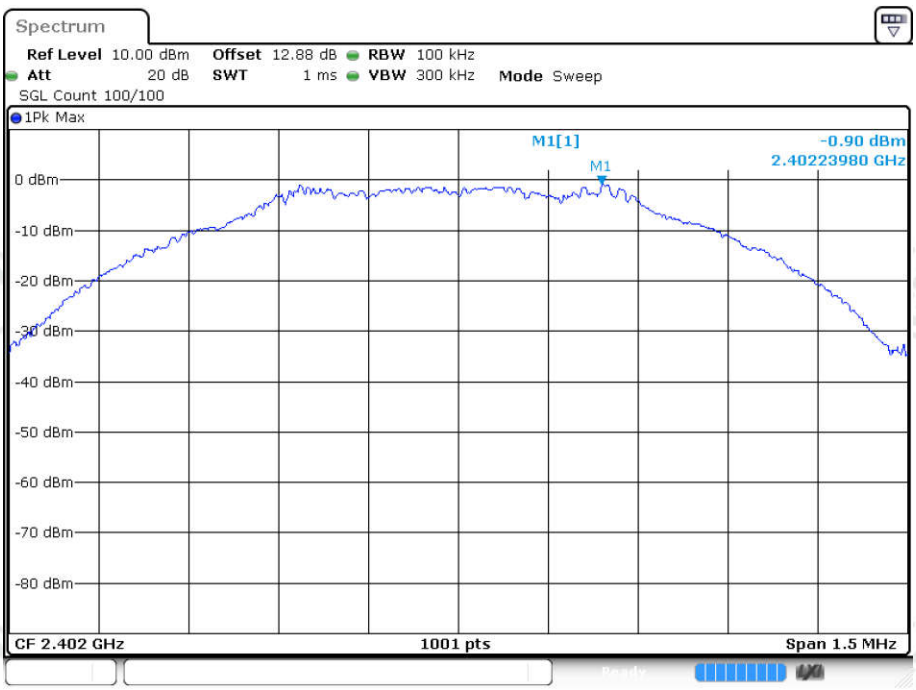
Test data：

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-48.41	-20	Pass
NVNT	BLE 1M	2440	Ant1	-49.4	-20	Pass
NVNT	BLE 1M	2480	Ant1	-46.42	-20	Pass
NVNT	BLE 2M	2402	Ant1	-49.03	-20	Pass
NVNT	BLE 2M	2440	Ant1	-49.15	-20	Pass
NVNT	BLE 2M	2480	Ant1	-47.99	-20	Pass

Test graphs：

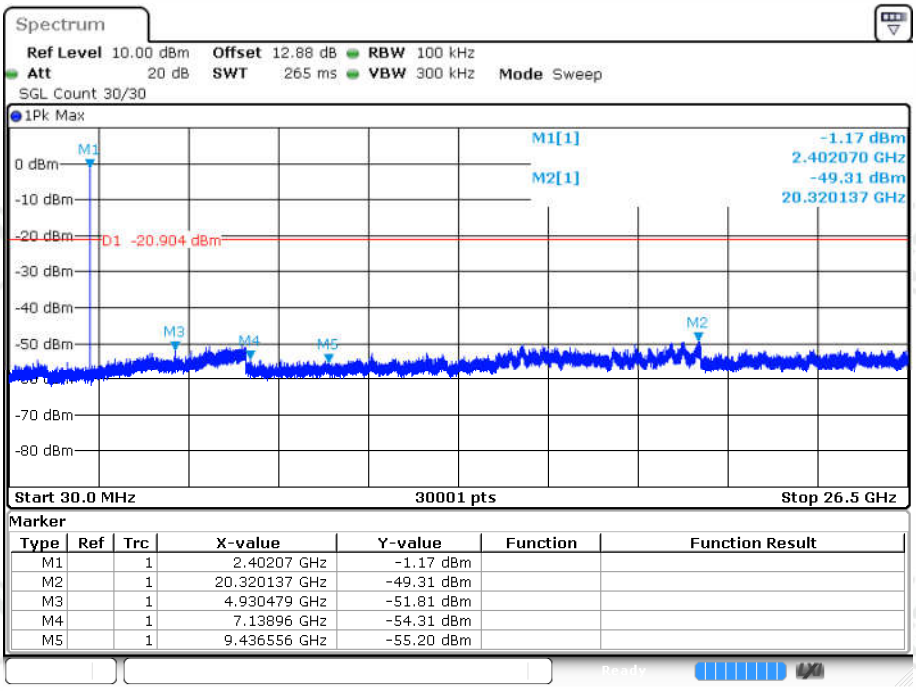
Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



Date: 22.JUL.2022 10:51:24

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission

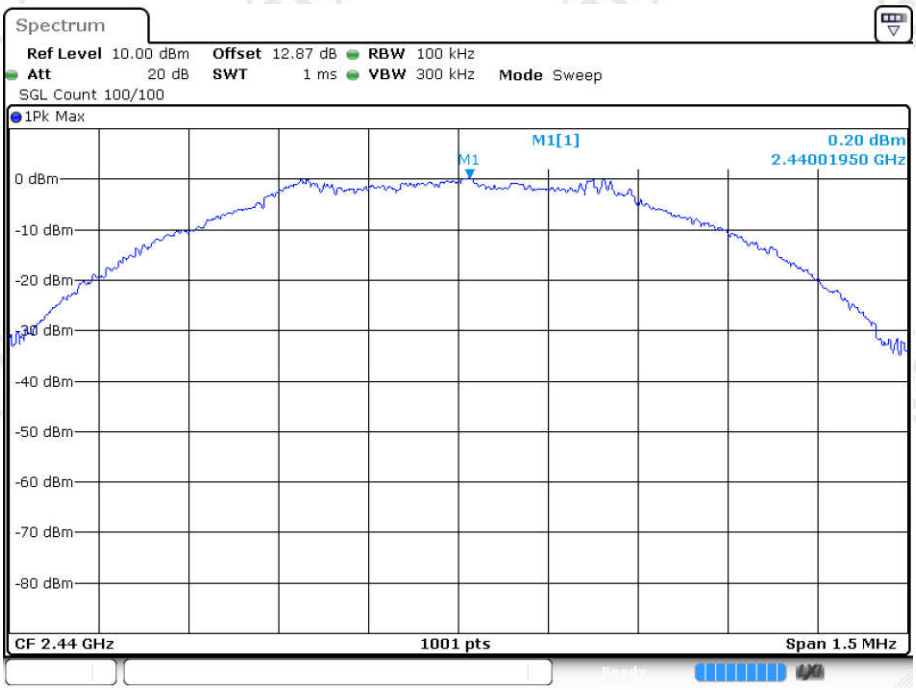


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40207 GHz	-1.17 dBm		
M2		1	20.320137 GHz	-49.31 dBm		
M3		1	4.930479 GHz	-51.81 dBm		
M4		1	7.13896 GHz	-54.31 dBm		
M5		1	9.436556 GHz	-55.20 dBm		

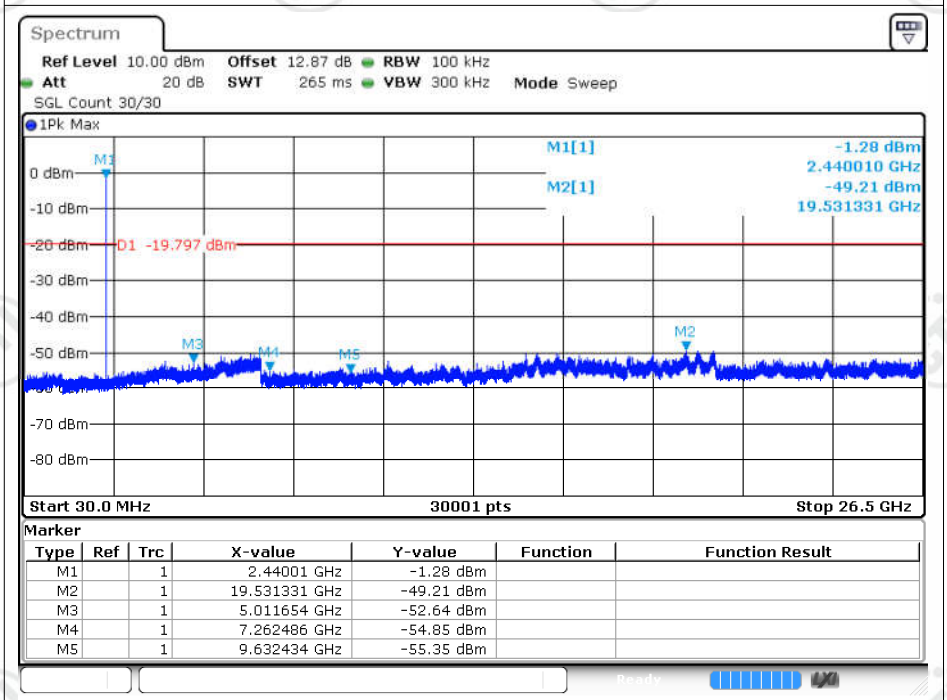
Date: 22.JUL.2022 10:51:52

Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



Date: 22.JUL.2022 10:53:17

Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission

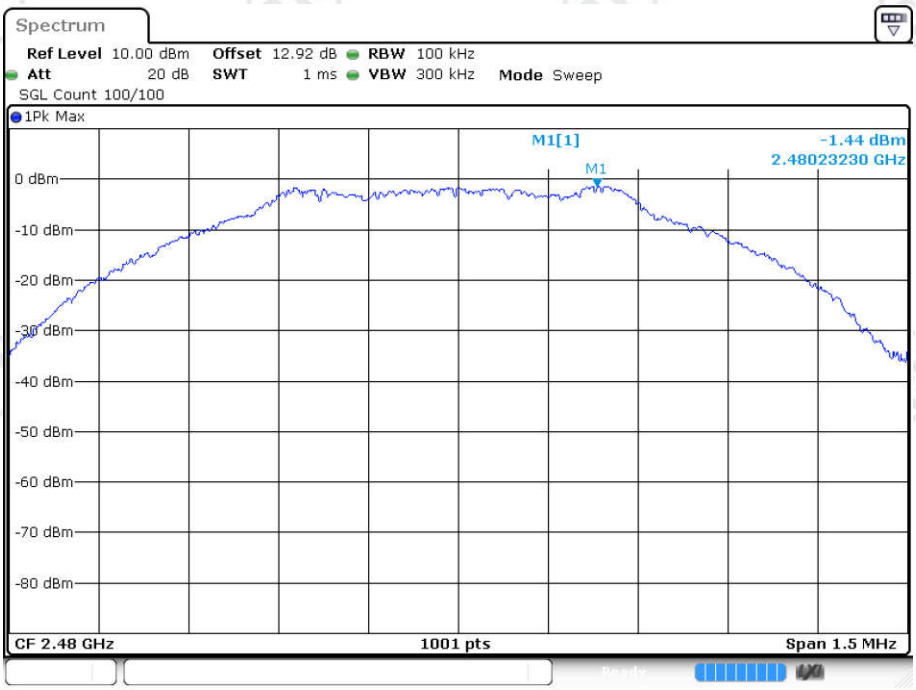


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44001 GHz	-1.28 dBm		
M2		1	19.531331 GHz	-49.21 dBm		
M3		1	5.011654 GHz	-52.64 dBm		
M4		1	7.262486 GHz	-54.85 dBm		
M5		1	9.632434 GHz	-55.35 dBm		

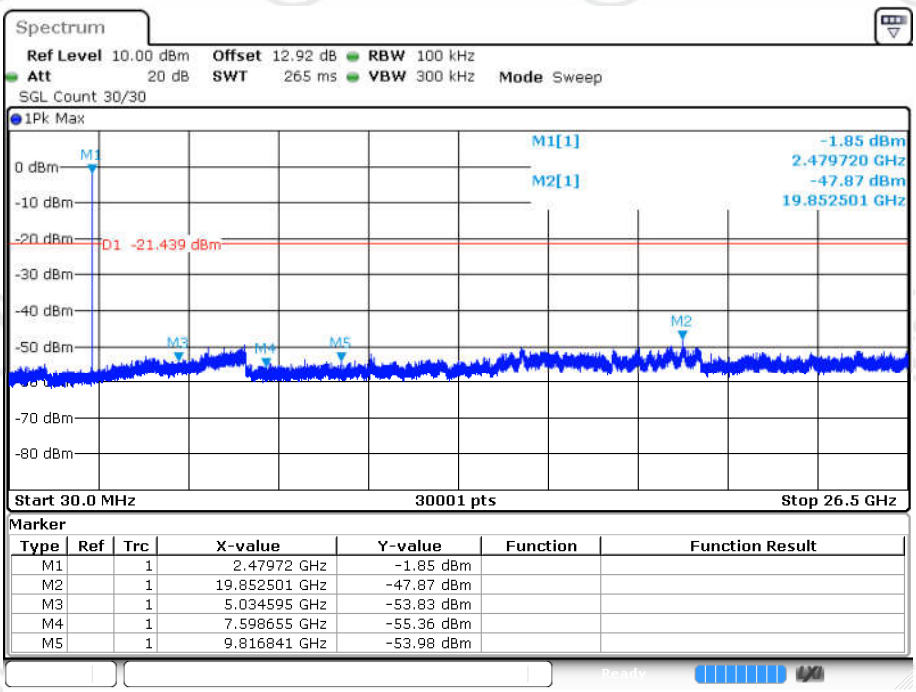
Date: 22.JUL.2022 10:53:46

Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Date: 22.JUL.2022 10:55:02

Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission

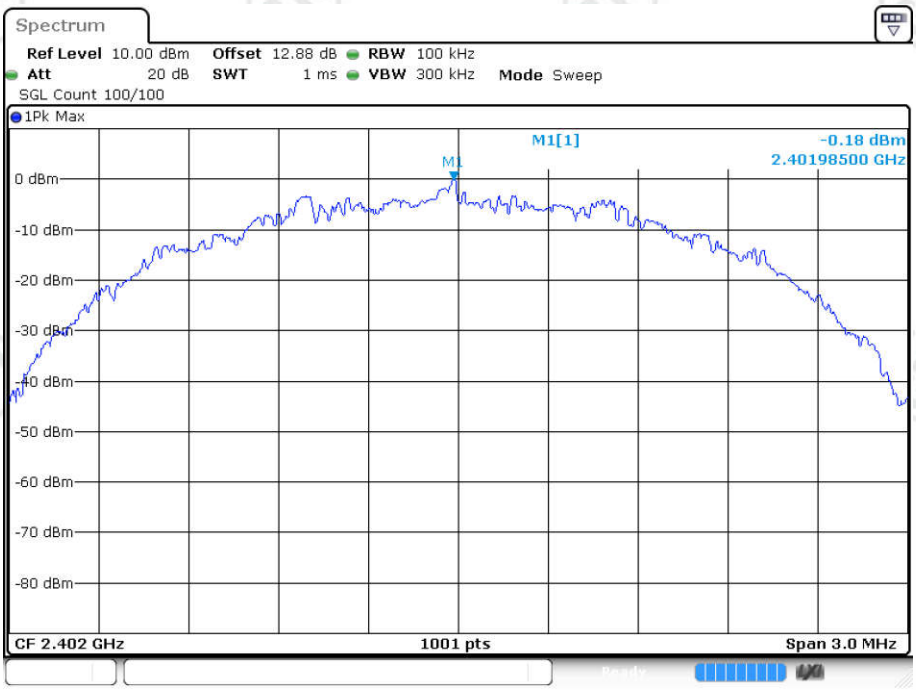


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47972 GHz	-1.85 dBm		
M2		1	19.852501 GHz	-47.87 dBm		
M3		1	5.034595 GHz	-53.83 dBm		
M4		1	7.598655 GHz	-55.36 dBm		
M5		1	9.816841 GHz	-53.98 dBm		

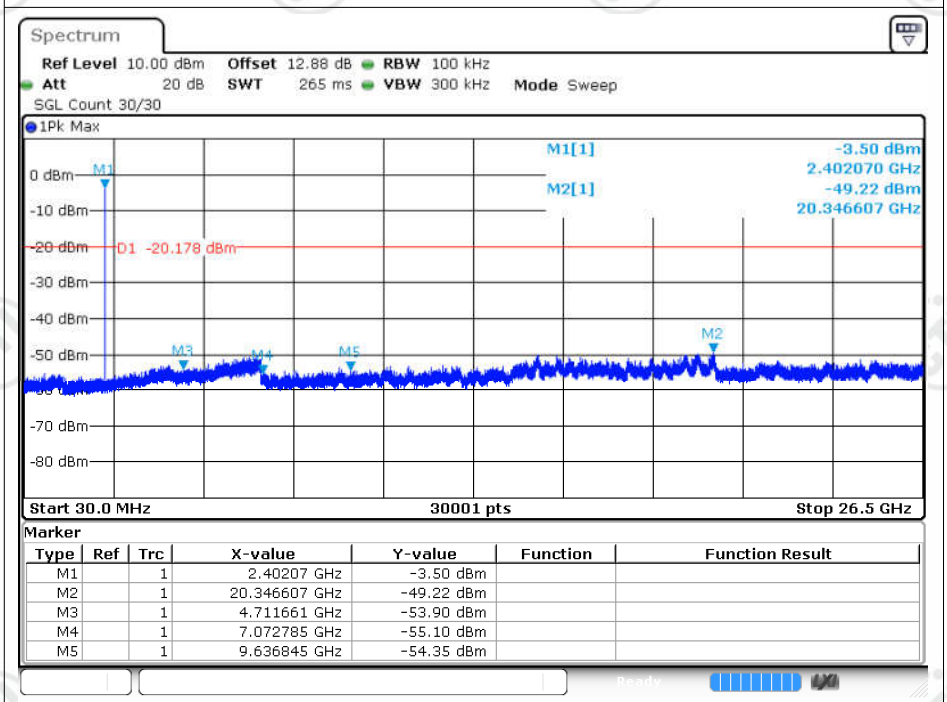
Date: 22.JUL.2022 10:55:30

Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Ref



Date: 22.JUL.2022 10:57:02

Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission

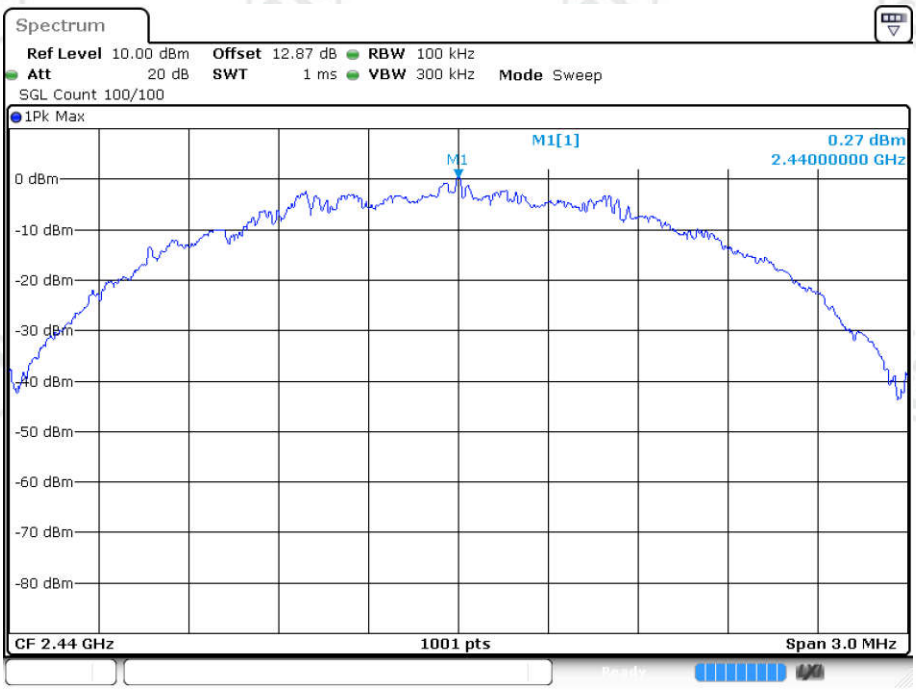


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40207 GHz	-3.50 dBm		
M2		1	20.346607 GHz	-49.22 dBm		
M3		1	4.711661 GHz	-53.90 dBm		
M4		1	7.072785 GHz	-55.10 dBm		
M5		1	9.636845 GHz	-54.35 dBm		

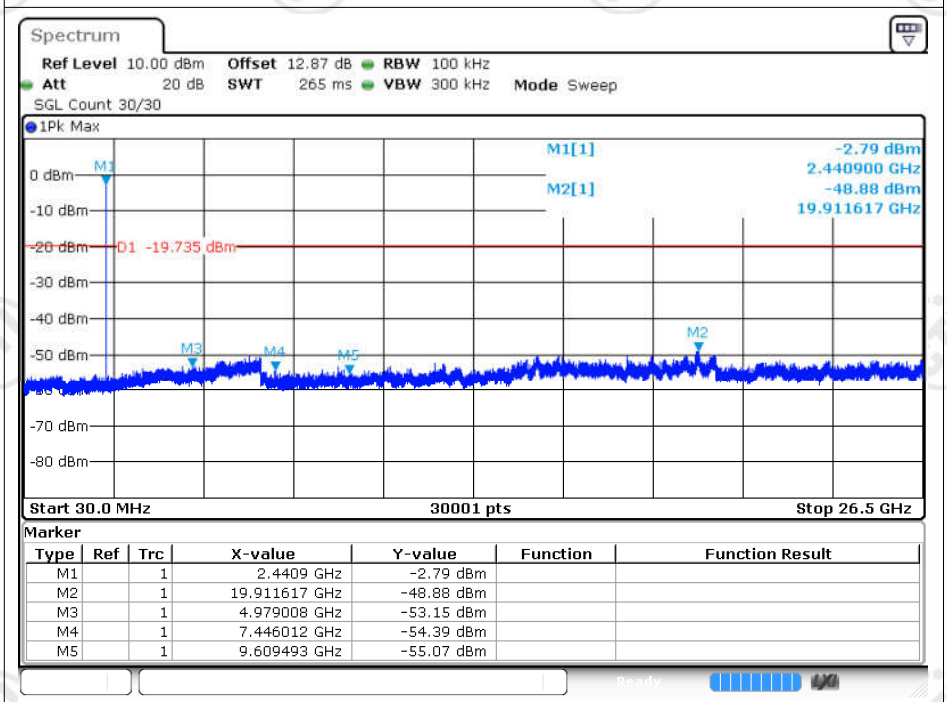
Date: 22.JUL.2022 10:57:31

Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref



Date: 22.JUL.2022 10:58:50

Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission

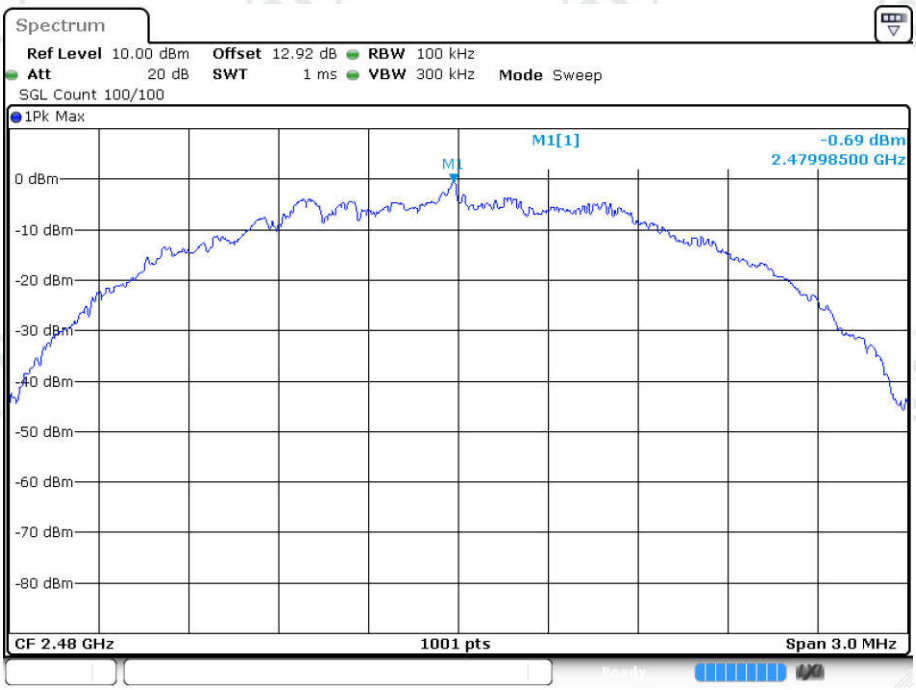


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4409 GHz	-2.79 dBm		
M2		1	19.911617 GHz	-48.88 dBm		
M3		1	4.979008 GHz	-53.15 dBm		
M4		1	7.446012 GHz	-54.39 dBm		
M5		1	9.609493 GHz	-55.07 dBm		

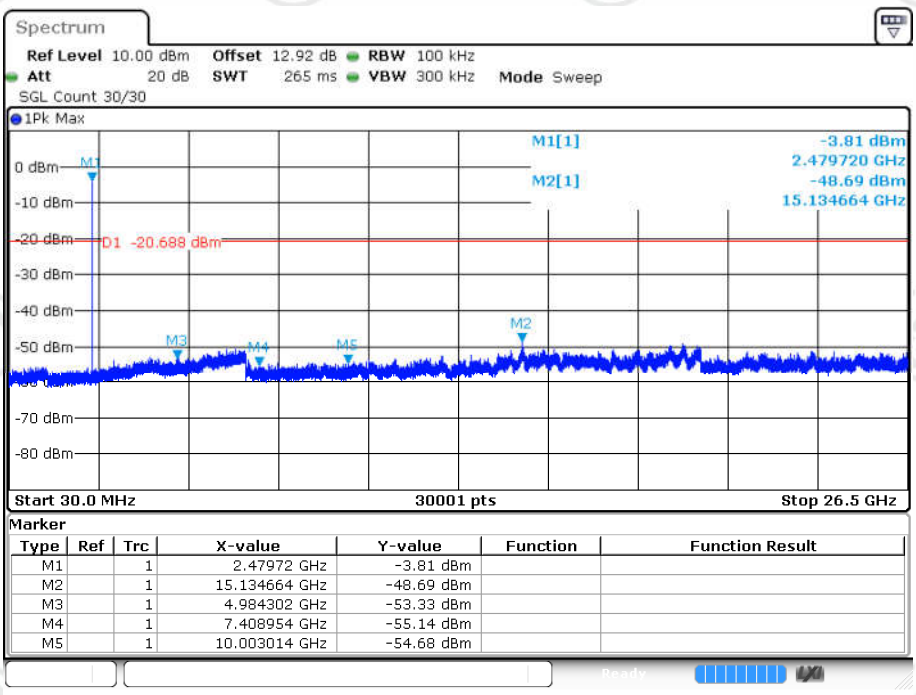
Date: 22.JUL.2022 10:59:18

Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Ref



Date: 22.JUL.2022 11:00:55

Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Emission



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47972 GHz	-3.81 dBm		
M2		1	15.134664 GHz	-48.69 dBm		
M3		1	4.984302 GHz	-53.33 dBm		
M4		1	7.408954 GHz	-55.14 dBm		
M5		1	10.003014 GHz	-54.68 dBm		

Date: 22.JUL.2022 11:01:23

END OF REPORT