



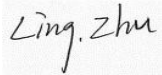
Appendix A

RF Test Data for BT LE (Conducted Measurement)

Product Name: Bluetooth Module

Test Model: MK3431BLE

Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	 Ling Zhu
Supervised by:	 Li Huan



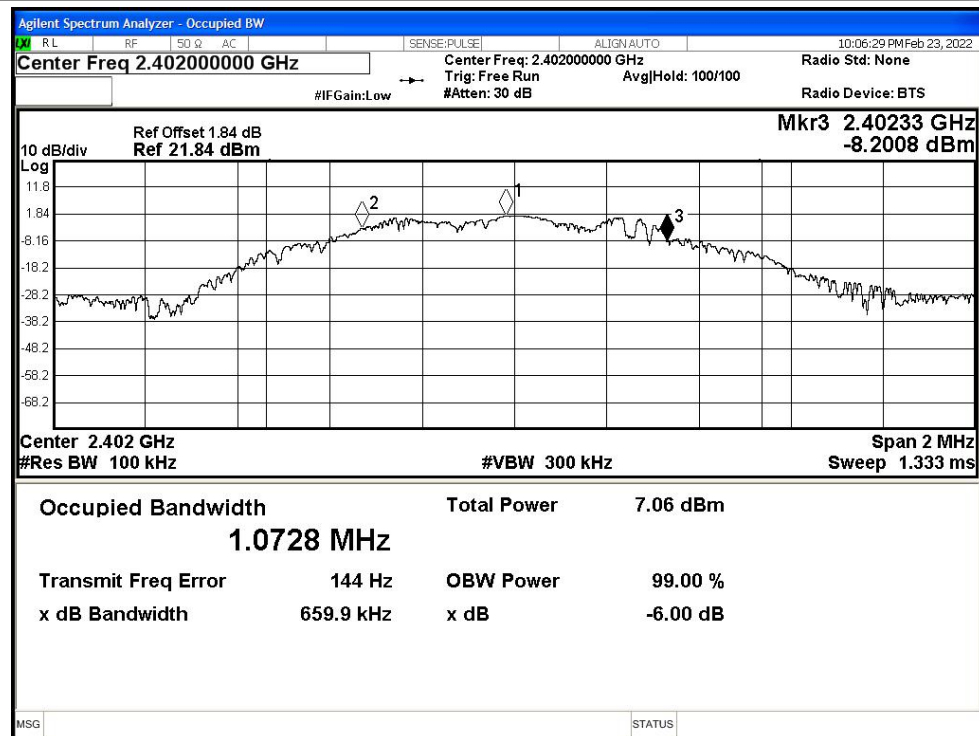
A.1 -6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6dB Bandwidth (MHz)	Limit(MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.660	≥0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.632	≥0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.664	≥0.5	Pass

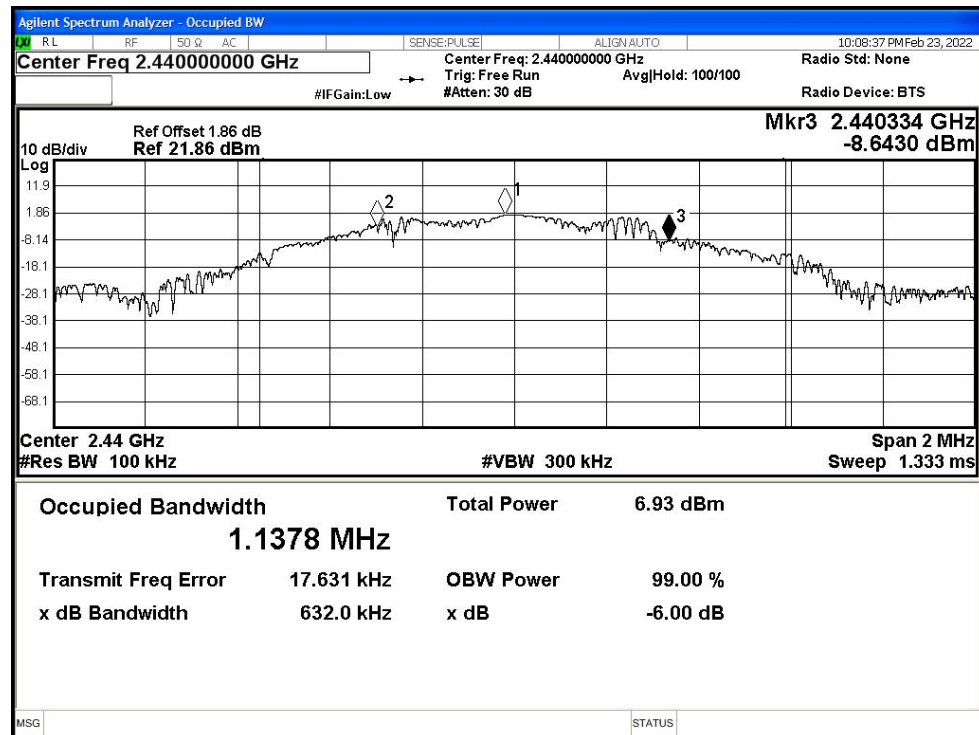


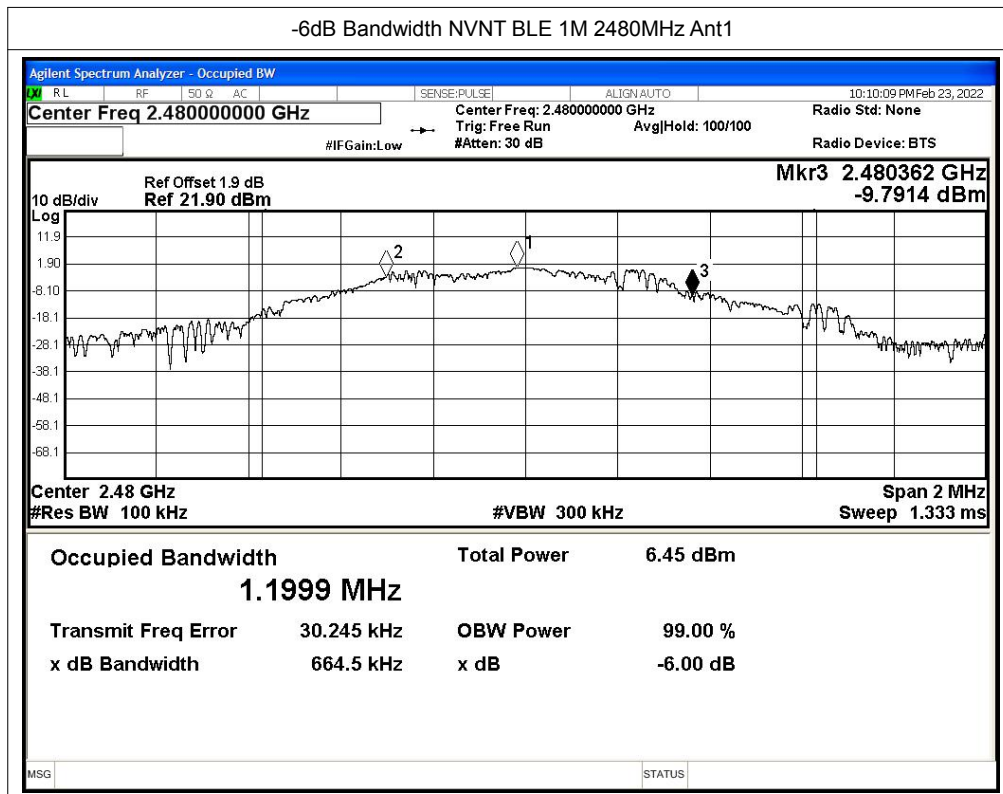
Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1







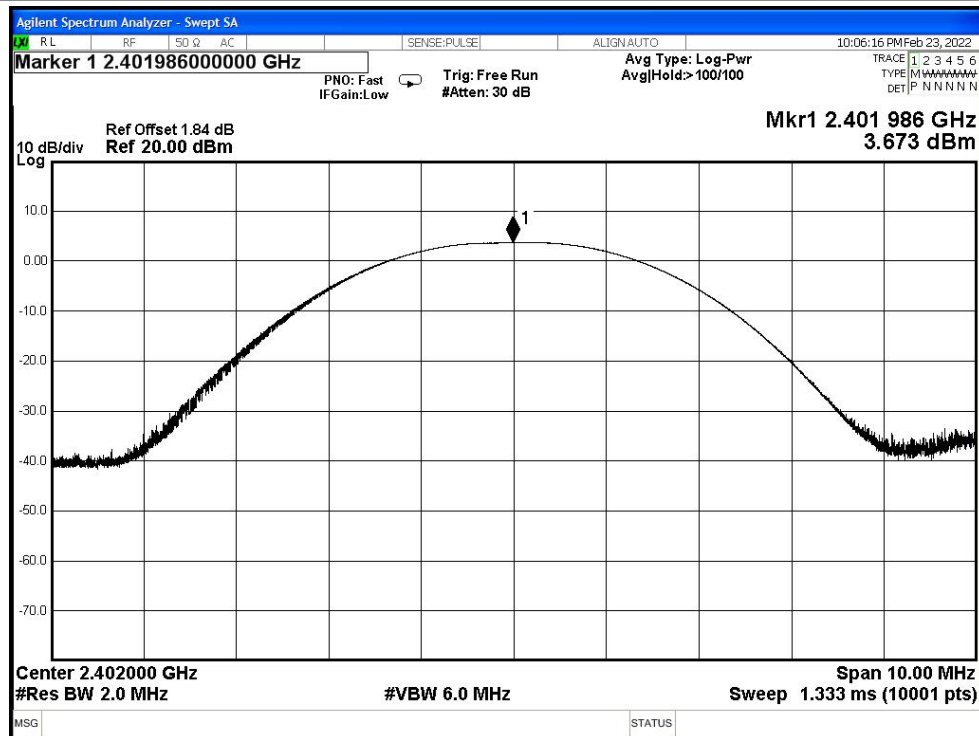
A.2 Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Result(dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	3.673	≤30	Pass
NVNT	BLE 1M	2440	Ant1	3.876	≤30	Pass
NVNT	BLE 1M	2480	Ant1	3.836	≤30	Pass

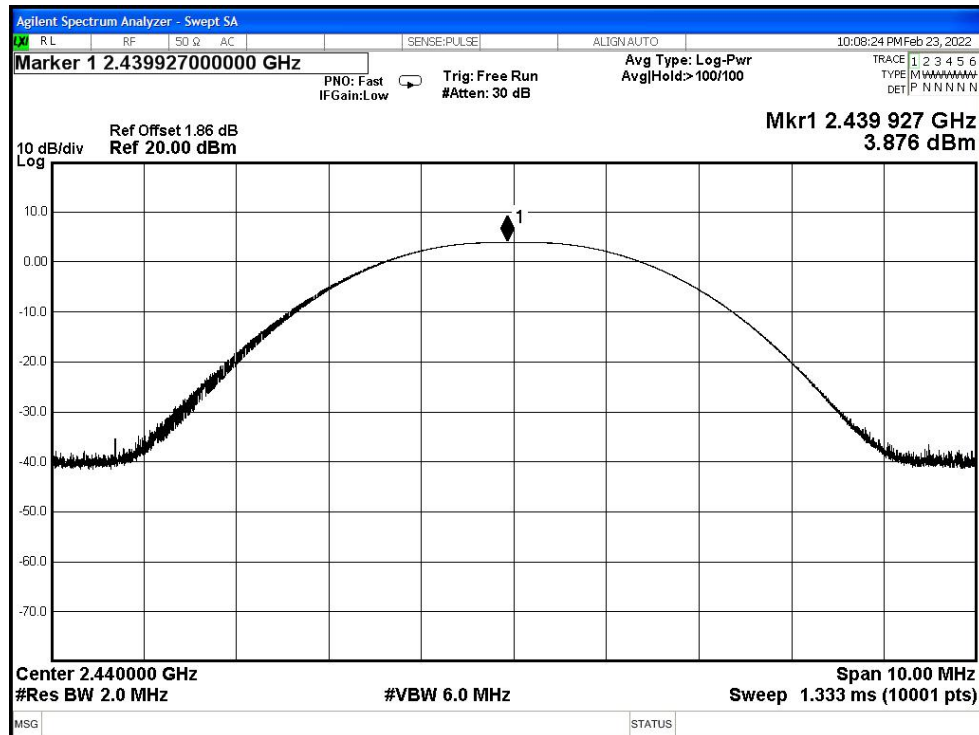


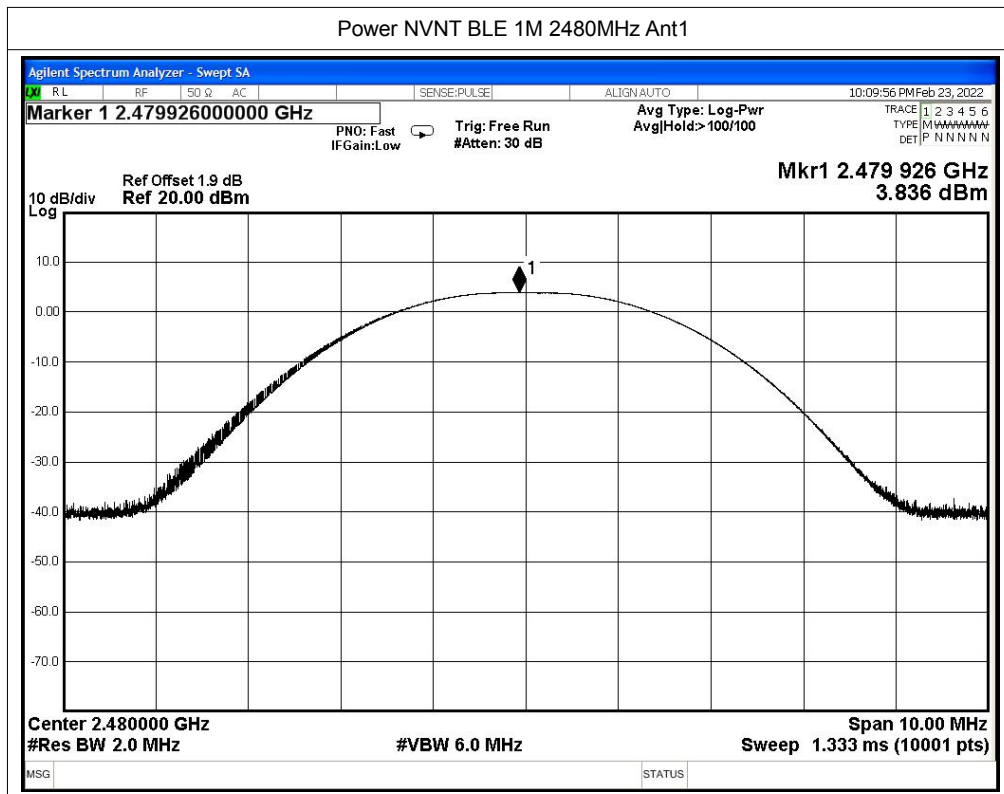
Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1







A.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Result (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-11.38	≤ 8	Pass
NVNT	BLE 1M	2440	Ant1	-12.1	≤ 8	Pass
NVNT	BLE 1M	2480	Ant1	-12.39	≤ 8	Pass

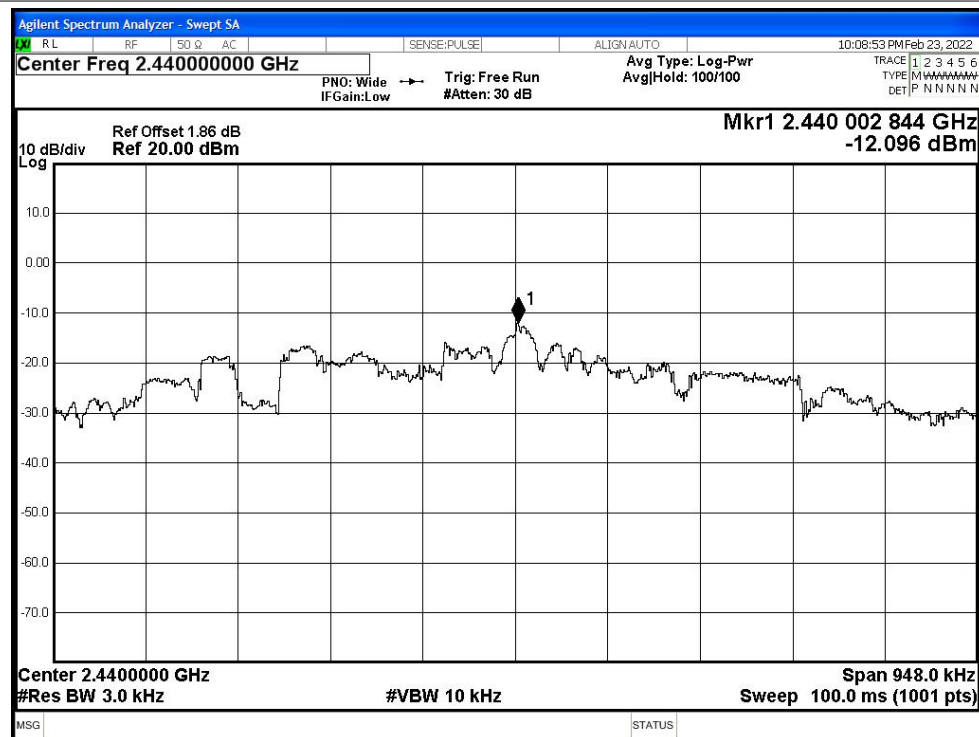


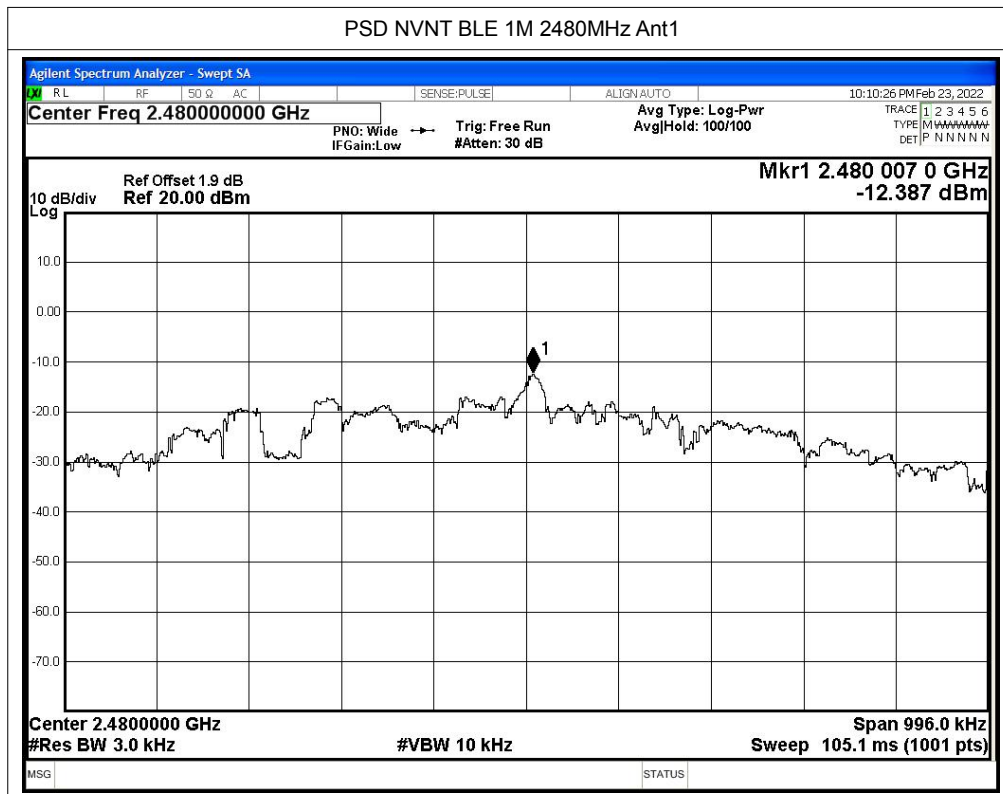
Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1

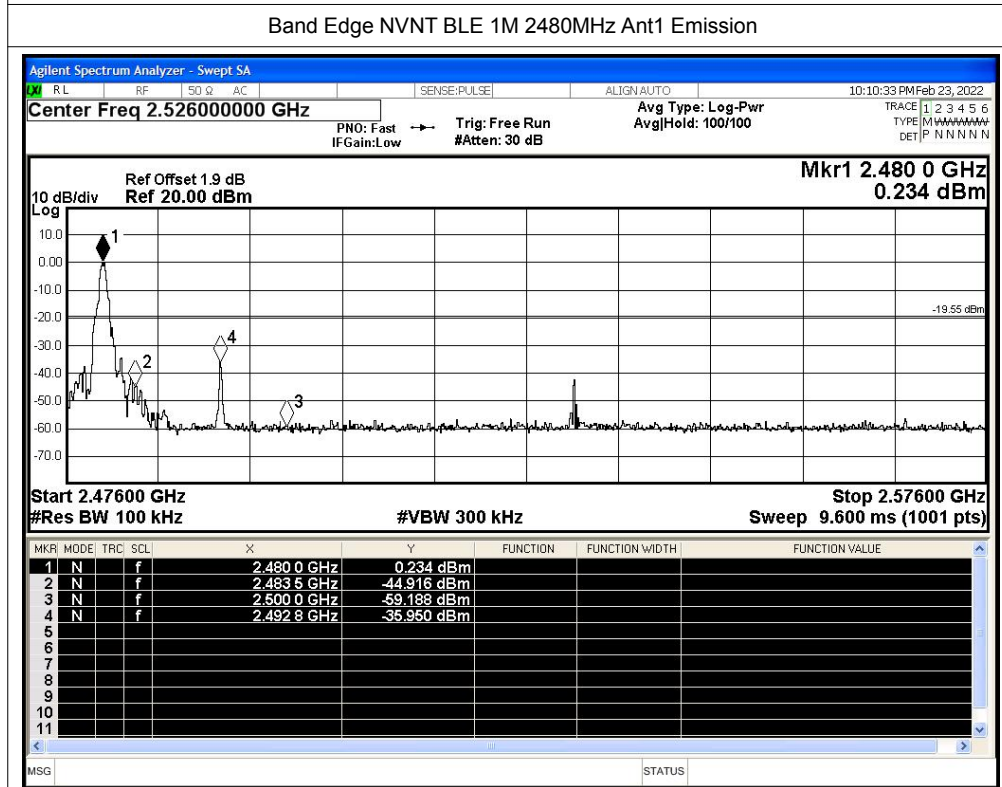
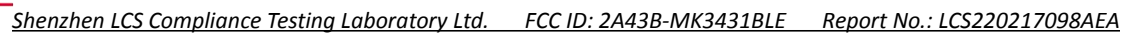






A.4 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max. Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-41.35	≤ -20	Pass
NVNT	BLE 1M	2480	Ant1	-36.4	≤ -20	Pass



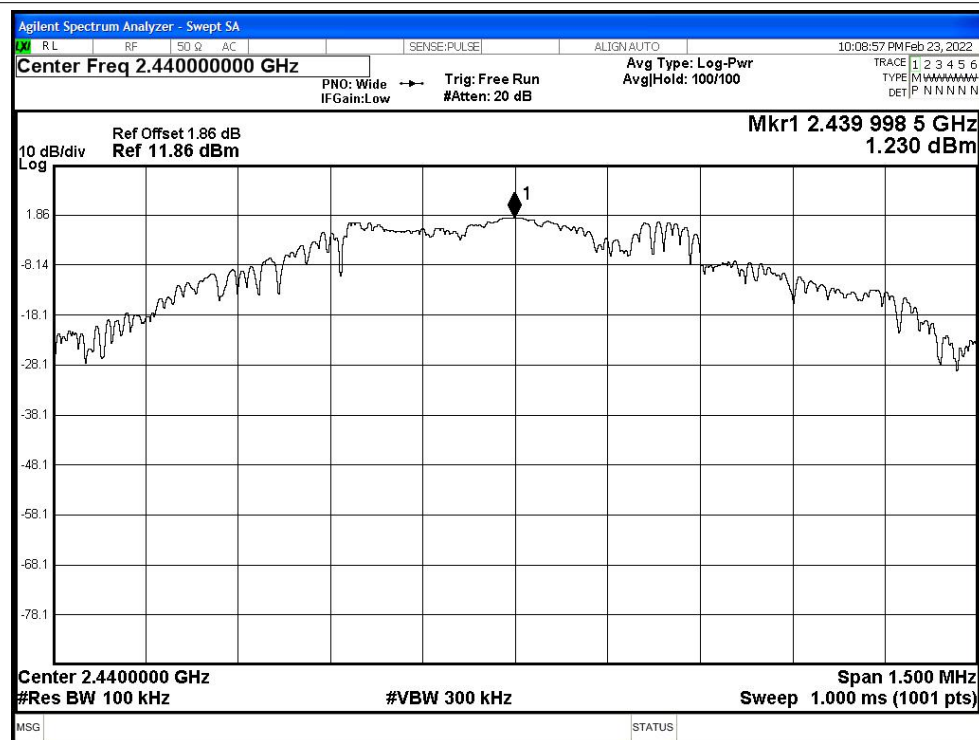


A.5 Conducted RF Spurious Emission

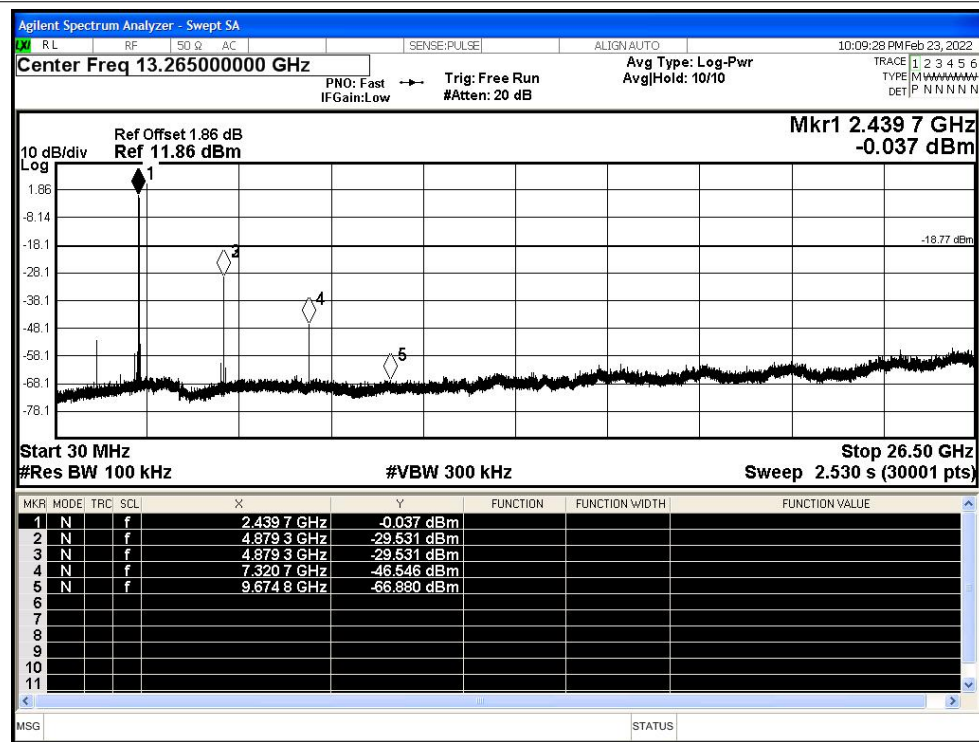
Condition	Mode	Frequency (MHz)	Antenna	Max. Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-31.17	≤ -20	Pass
NVNT	BLE 1M	2440	Ant1	-30.76	≤ -20	Pass
NVNT	BLE 1M	2480	Ant1	-25.84	≤ -20	Pass



Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref

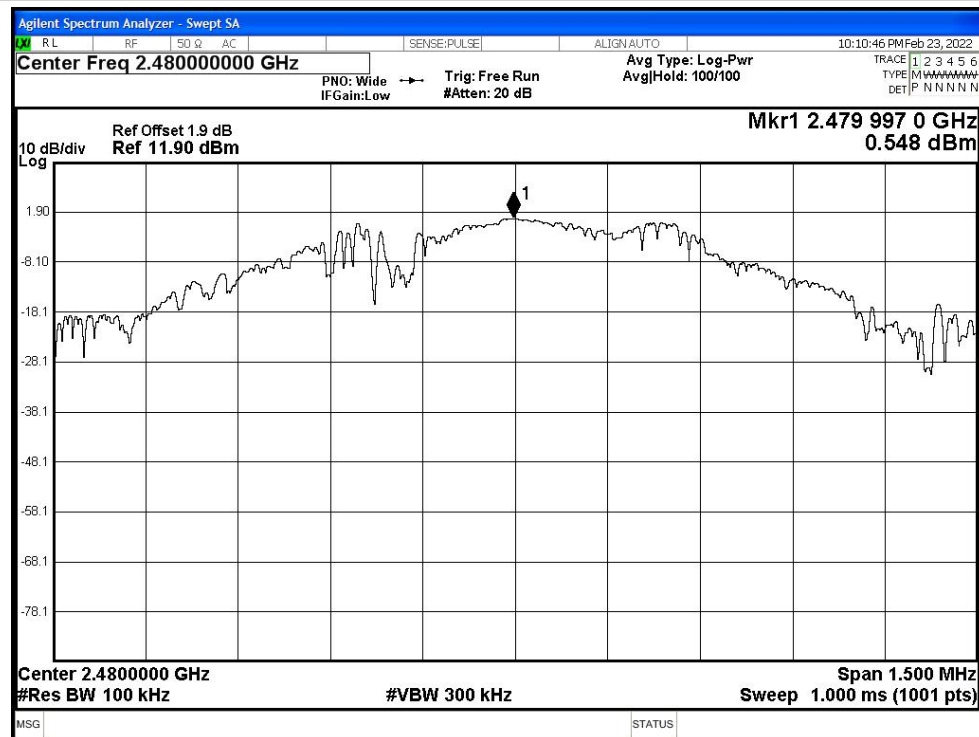


Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission

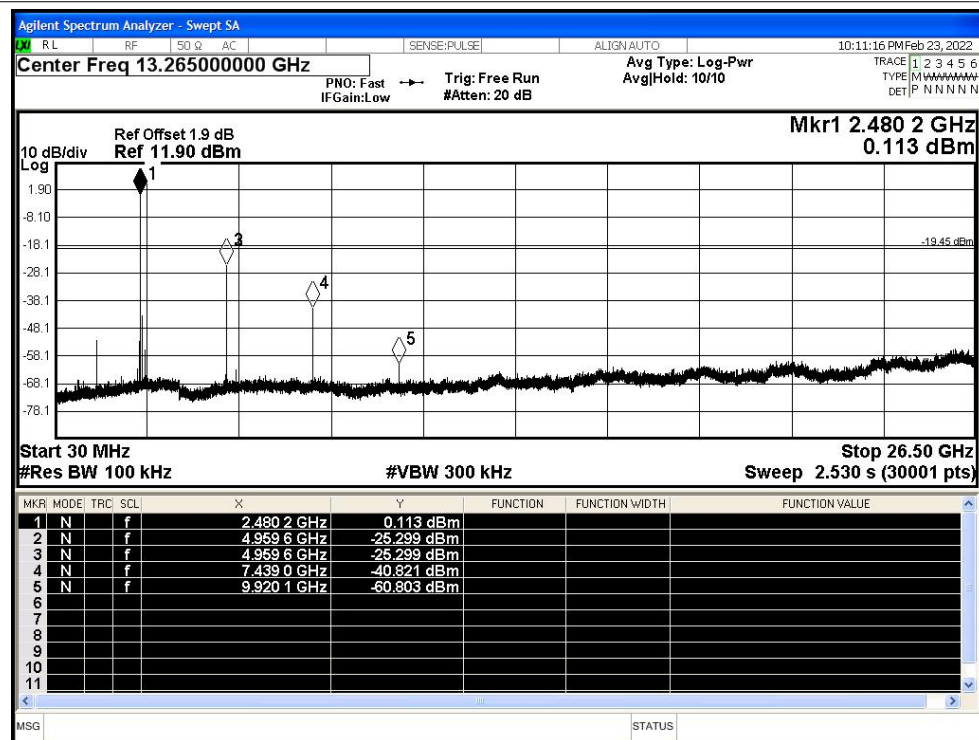




Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



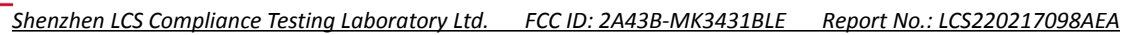
Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



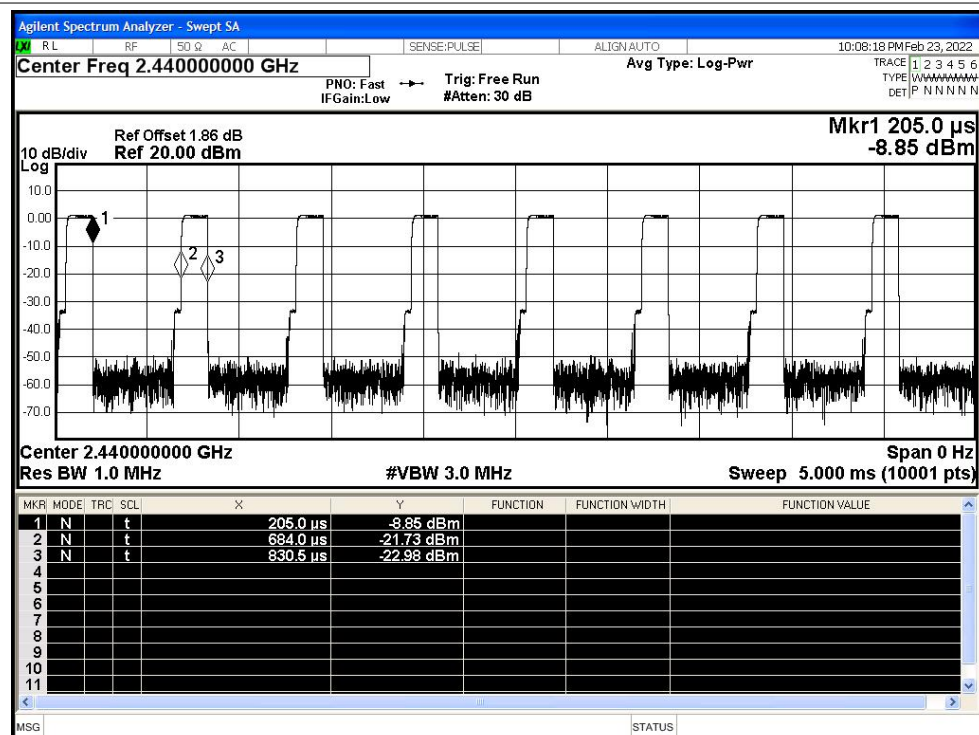


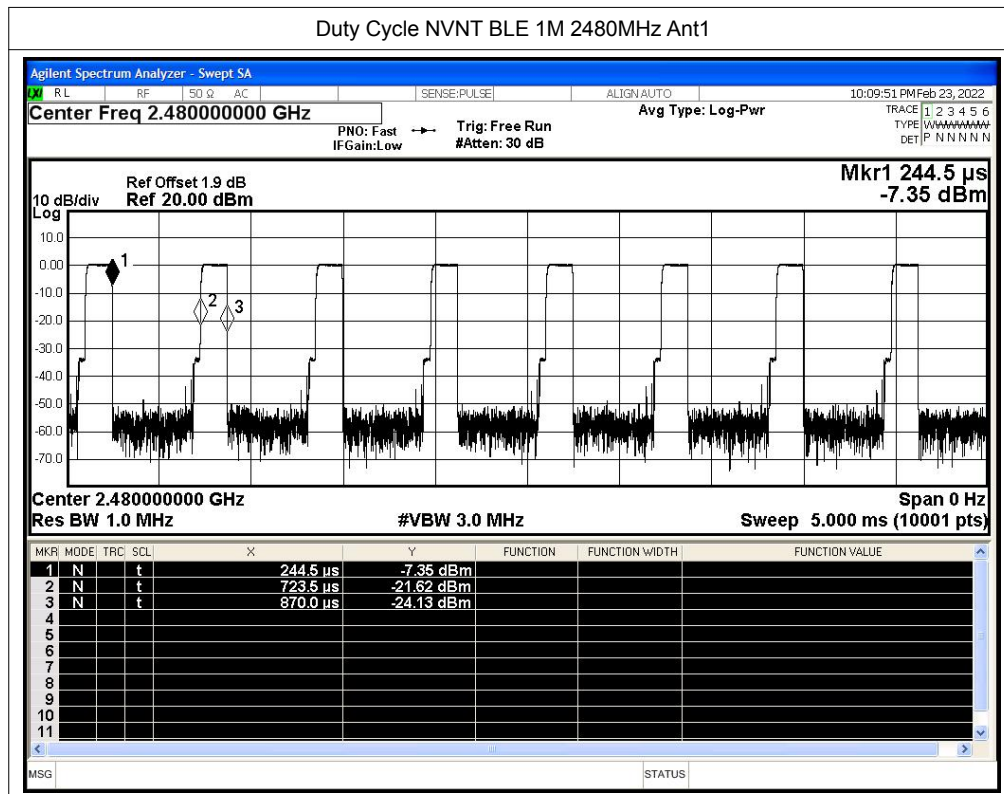
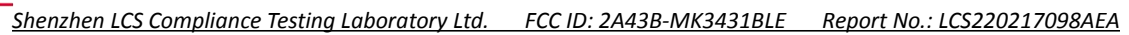
A.6 Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	23.44	6.3	6.83
NVNT	BLE 1M	2440	Ant1	23.42	6.3	6.83
NVNT	BLE 1M	2480	Ant1	23.42	6.3	6.83



Duty Cycle NVNT BLE 1M 2402MHz Ant1

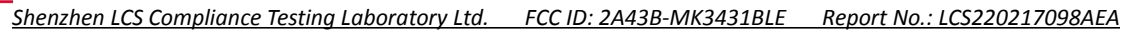




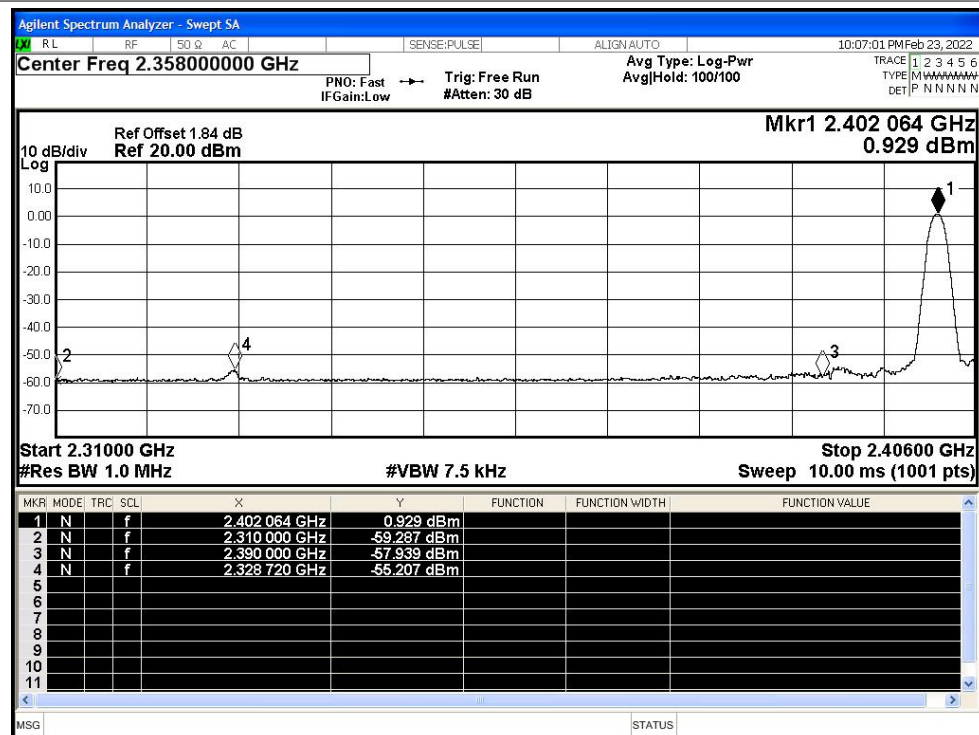
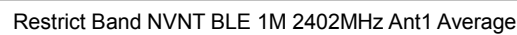


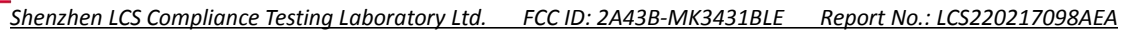
A.7 Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1M	2402	Ant1	2310	-50.82	2	46.44	Peak	≤74	Pass
NVNT	BLE 1M	2402	Ant1	2310	-59.28	2	37.98	Average	≤54	Pass
NVNT	BLE 1M	2402	Ant1	2328.912	-34.29	2	62.97	Peak	≤74	Pass
NVNT	BLE 1M	2402	Ant1	2328.72	-55.2	2	42.06	Average	≤54	Pass
NVNT	BLE 1M	2402	Ant1	2390	-39.78	2	57.48	Peak	≤74	Pass
NVNT	BLE 1M	2402	Ant1	2390	-57.11	2	40.15	Average	≤54	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-33.6	2	63.66	Peak	≤74	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-53.37	2	43.89	Average	≤54	Pass
NVNT	BLE 1M	2480	Ant1	2483.584	-31.25	2	66.01	Peak	≤74	Pass
NVNT	BLE 1M	2480	Ant1	2492.584	-50.75	2	46.51	Average	≤54	Pass
NVNT	BLE 1M	2480	Ant1	2500	-51.09	2	46.17	Peak	≤74	Pass
NVNT	BLE 1M	2480	Ant1	2500	-58.48	2	38.78	Average	≤54	Pass



Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 10:10:38 PM Feb 23, 2022

Center Freq 2.488000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 100/100

Ref Offset 1.9 dB Ref 20.00 dBm Mkr1 2.479 744 GHz 0.596 dBm

10 dB/div Log

Start 2.47600 GHz #Res BW 1.0 MHz Stop 2.50000 GHz Sweep 1.000 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.479 744 GHz	0.596 dBm			
2	N		f	2.483 500 GHz	-33.607 dBm			
3	N		f	2.500 000 GHz	-51.091 dBm			
4	N		f	2.483 584 GHz	-31.255 dBm			

[illegible]