



Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: SecuroSmart Fingerprint door unlock controller

Test Model: SecuroSmart

Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Joker Hu
Supervised by:	Ling Zhu





A.1 -6dB Bandwidth

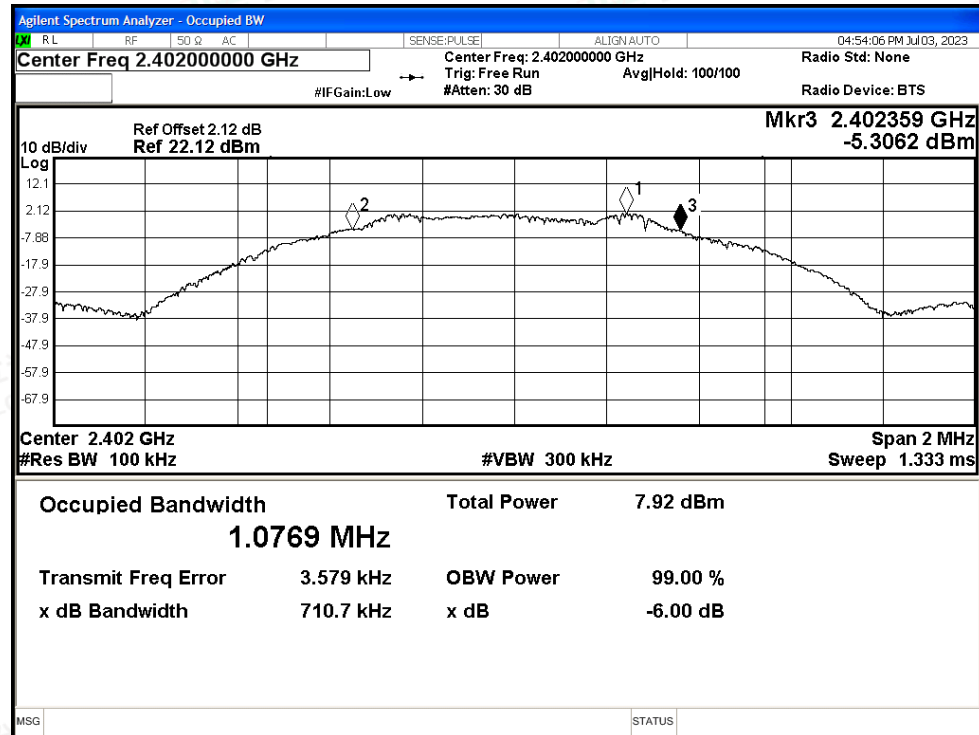
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE	2402	Ant	0.711	≥ 0.5	Pass
NVNT	BLE	2440	Ant	0.699	≥ 0.5	Pass
NVNT	BLE	2480	Ant	0.707	≥ 0.5	Pass



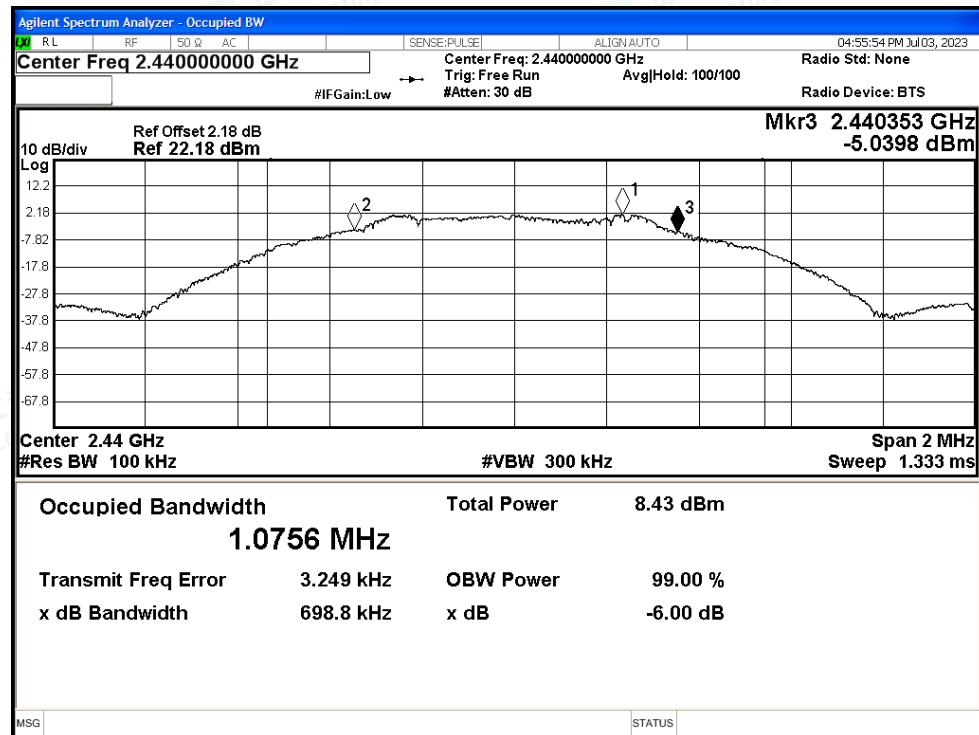


Test Graphs

-6dB Bandwidth NVNT BLE 2402MHz Ant



-6dB Bandwidth NVNT BLE 2440MHz Ant

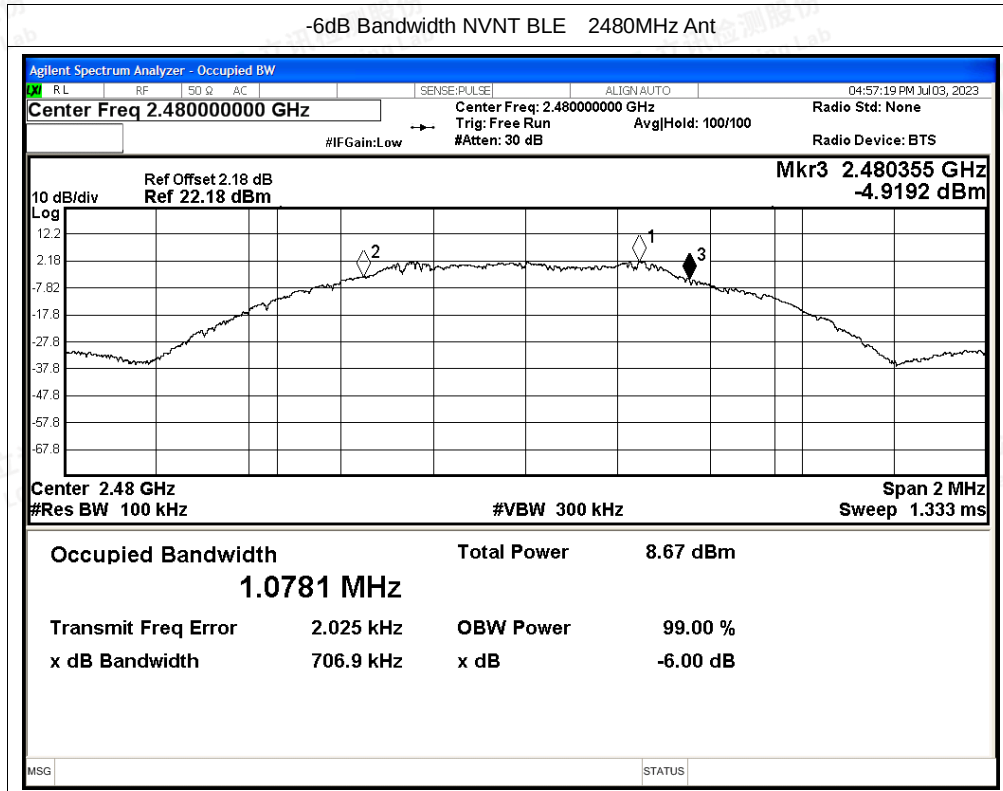


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A.2 Occupied Channel Bandwidth

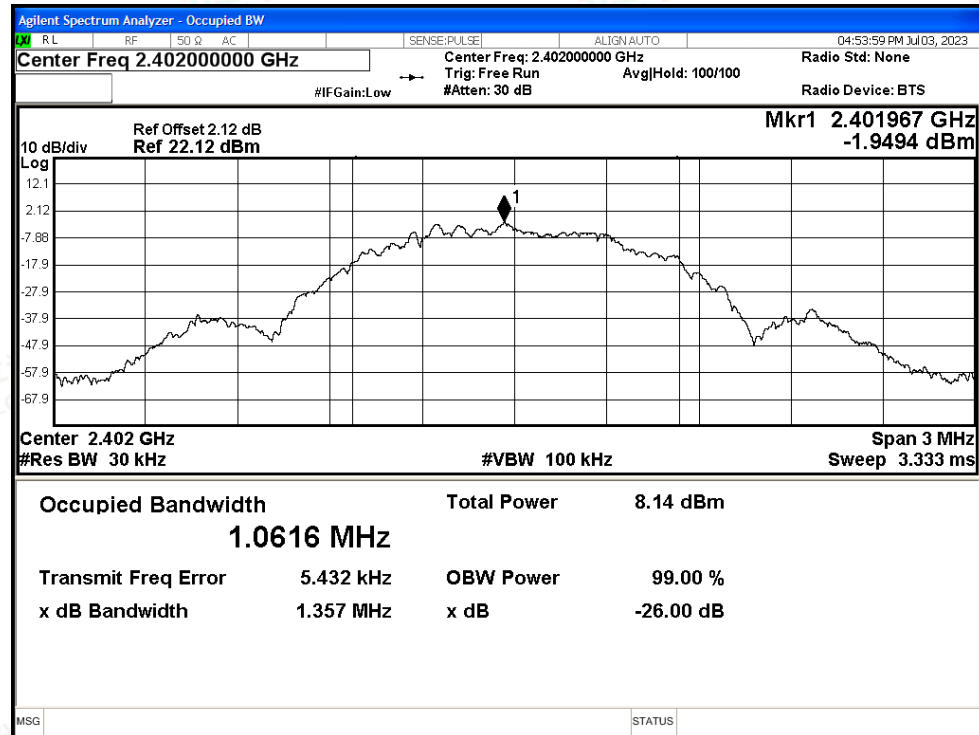
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE	2402	Ant	1.062
NVNT	BLE	2440	Ant	1.067
NVNT	BLE	2480	Ant	1.064



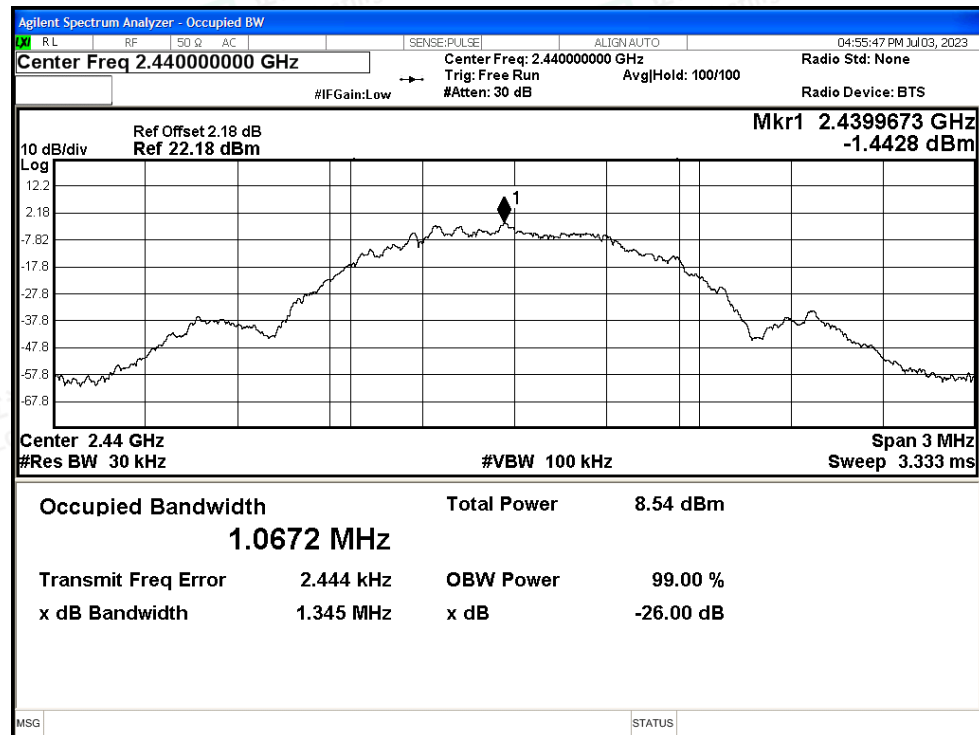


Test Graphs

OBW NVNT BLE 2402MHz Ant



OBW NVNT BLE 2440MHz Ant

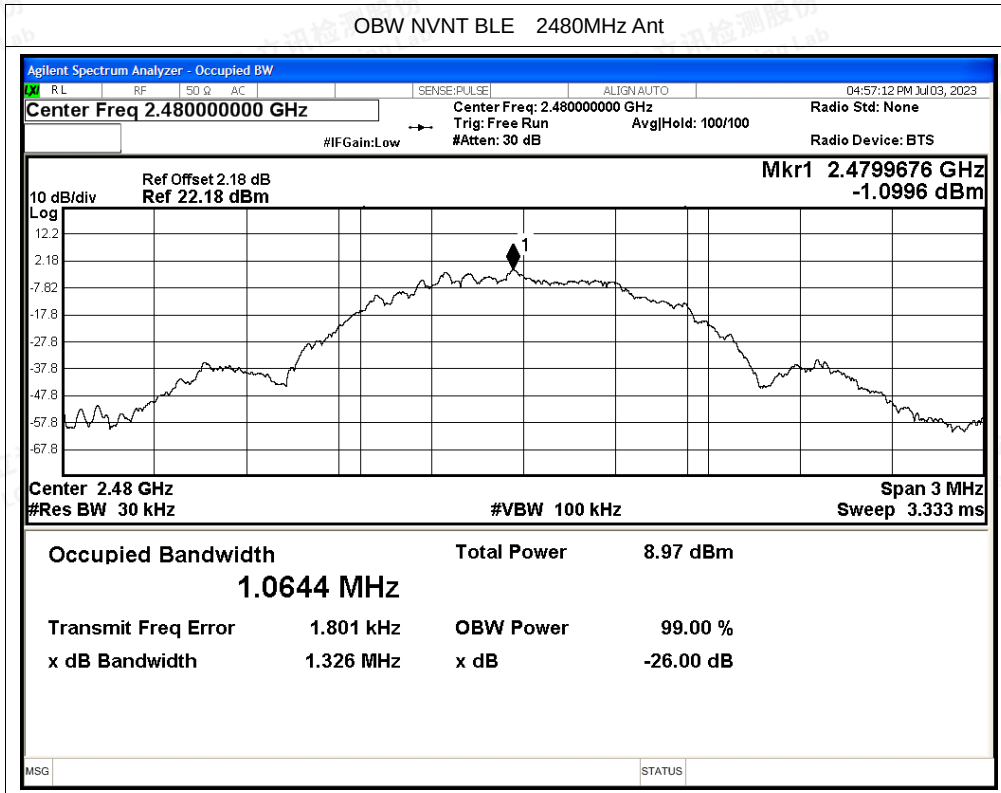


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A.3 Maximum Conducted Output Power

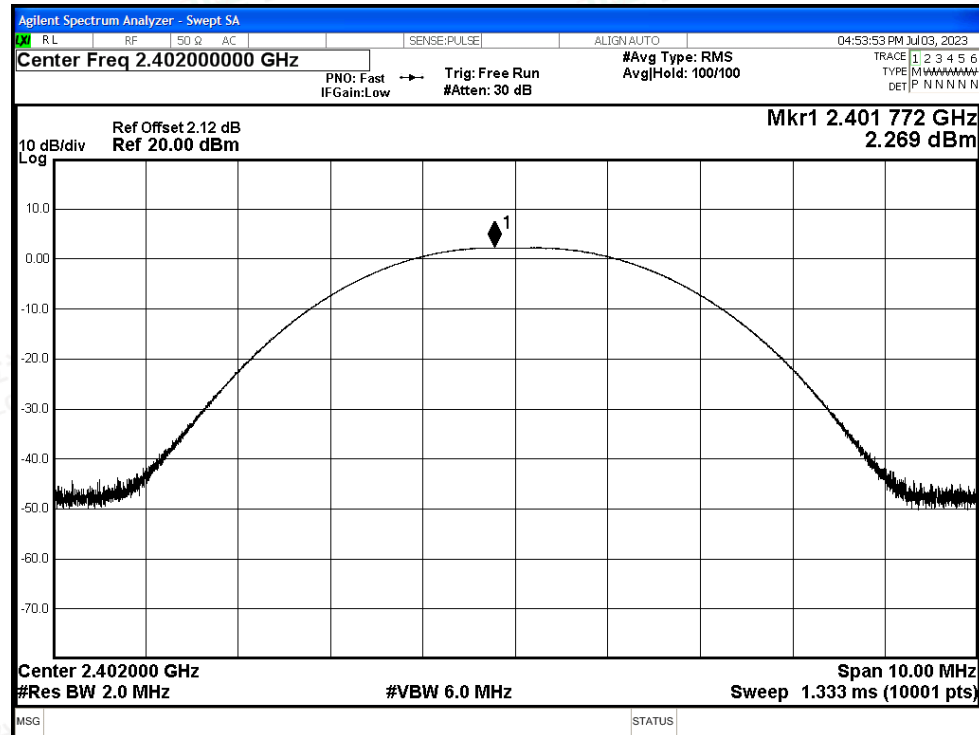
Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Antenna Gain	Report EIRP Power(dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant	2.27	30	0	2.27	36	Pass
NVNT	BLE	2440	Ant	2.73	30	0	2.73	36	Pass
NVNT	BLE	2480	Ant	3.03	30	0	3.03	36	Pass



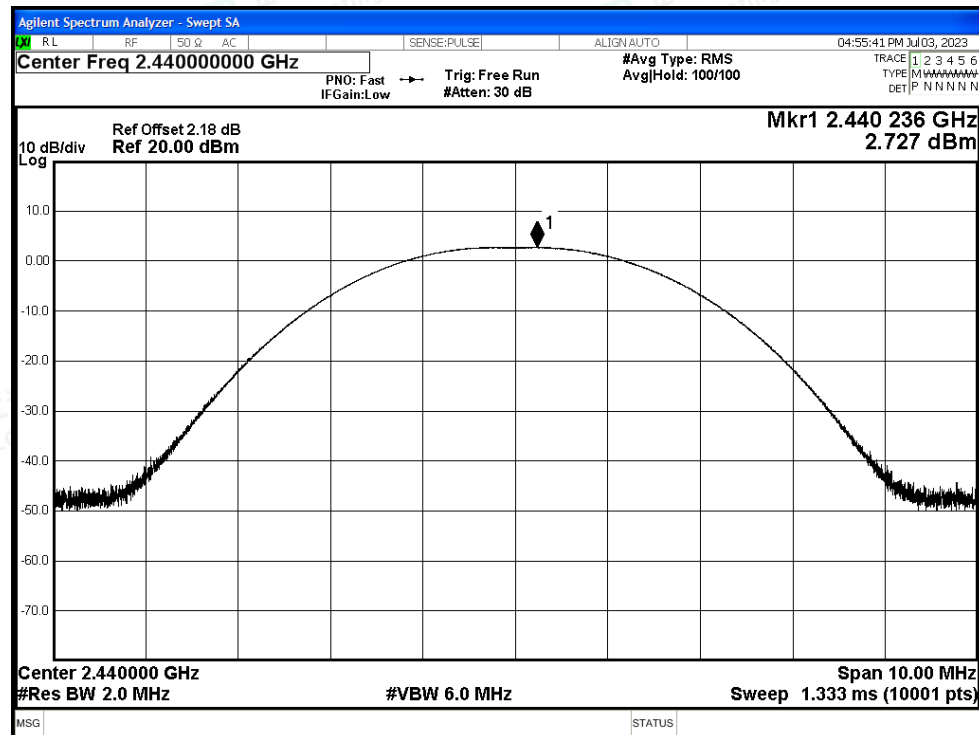


Test Graphs

Power NVNT BLE 2402MHz Ant



Power NVNT BLE 2440MHz Ant

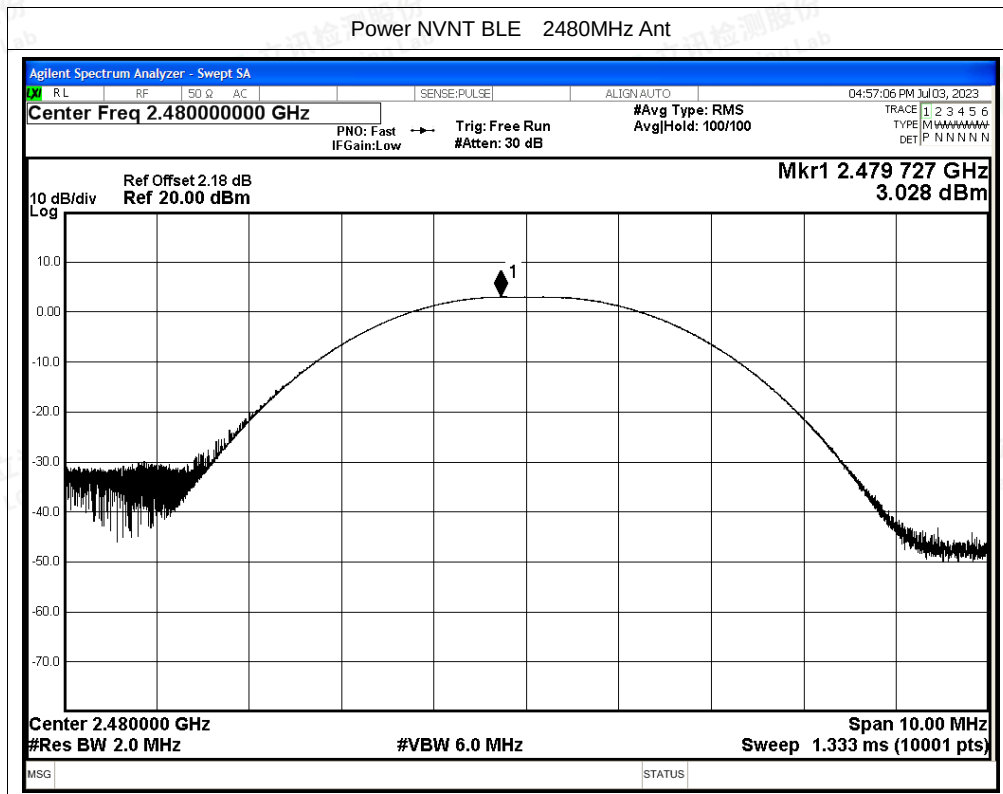


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A.4 Maximum Power Spectral Density Level

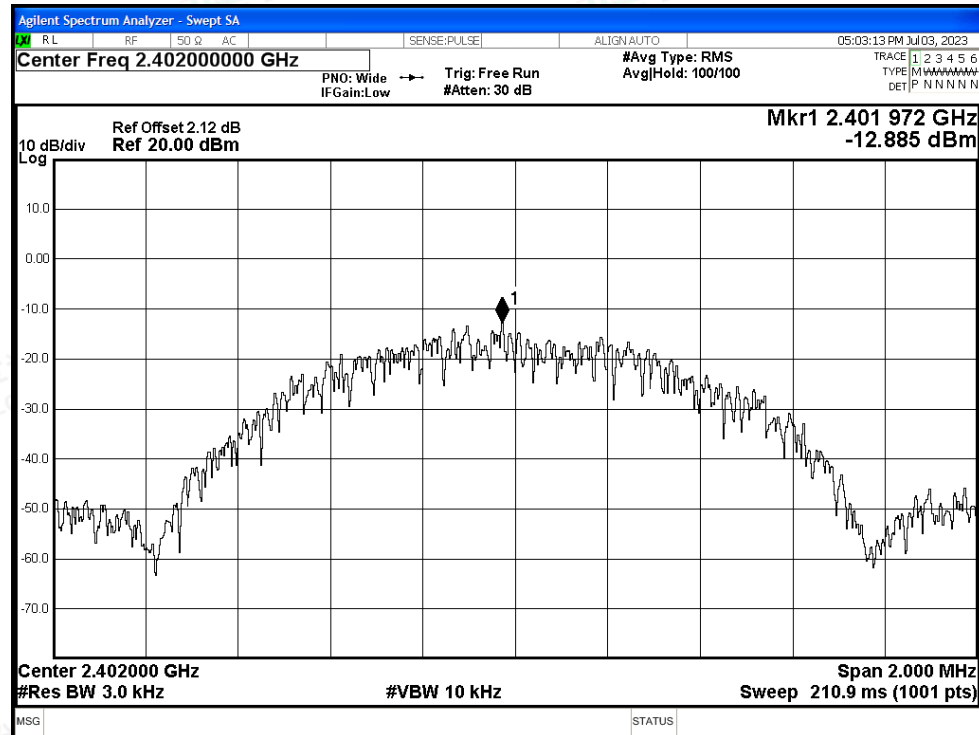
Condition	Mode	Frequency (MHz)	Antenna	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE	2402	Ant	-12.89	8	Pass
NVNT	BLE	2440	Ant	-12.48	8	Pass
NVNT	BLE	2480	Ant	-12.13	8	Pass



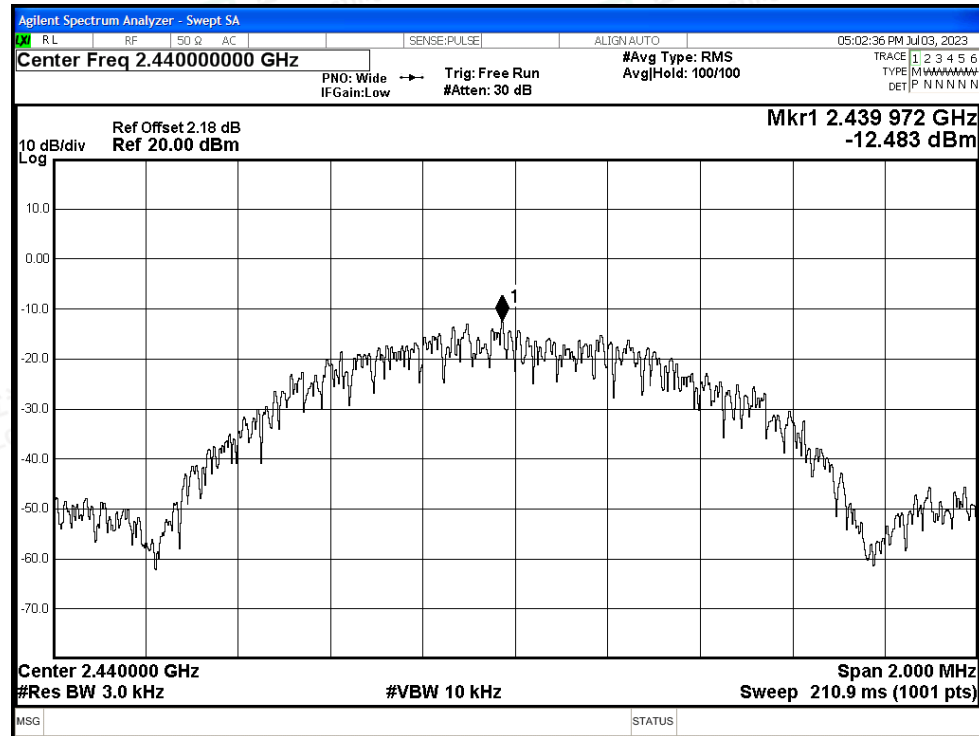


Test Graphs

PSD NVNT BLE 2402MHz Ant



PSD NVNT BLE 2440MHz Ant

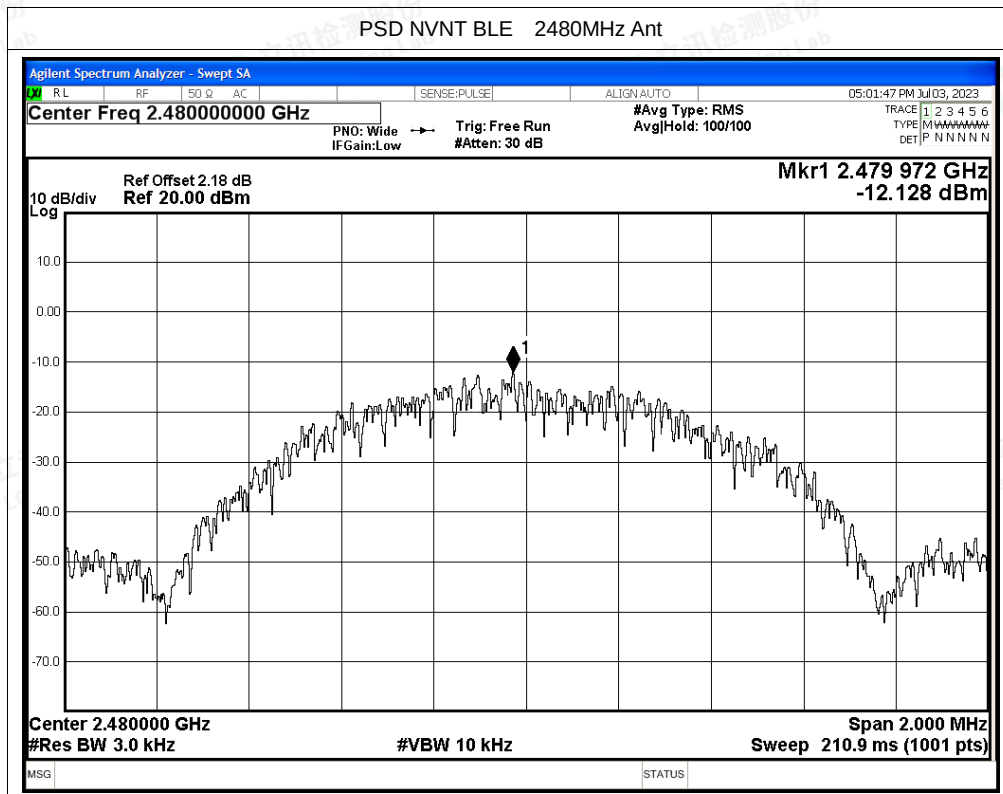


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A.5 Band Edge

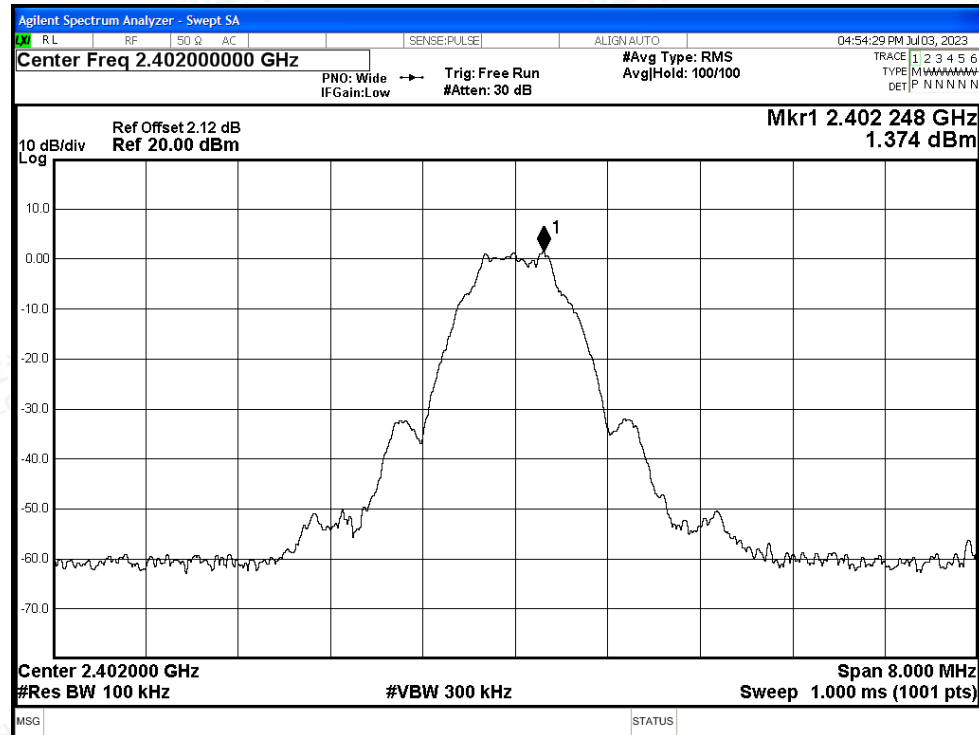
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant	-57.52	-20	Pass
NVNT	BLE	2480	Ant	-59.22	-20	Pass



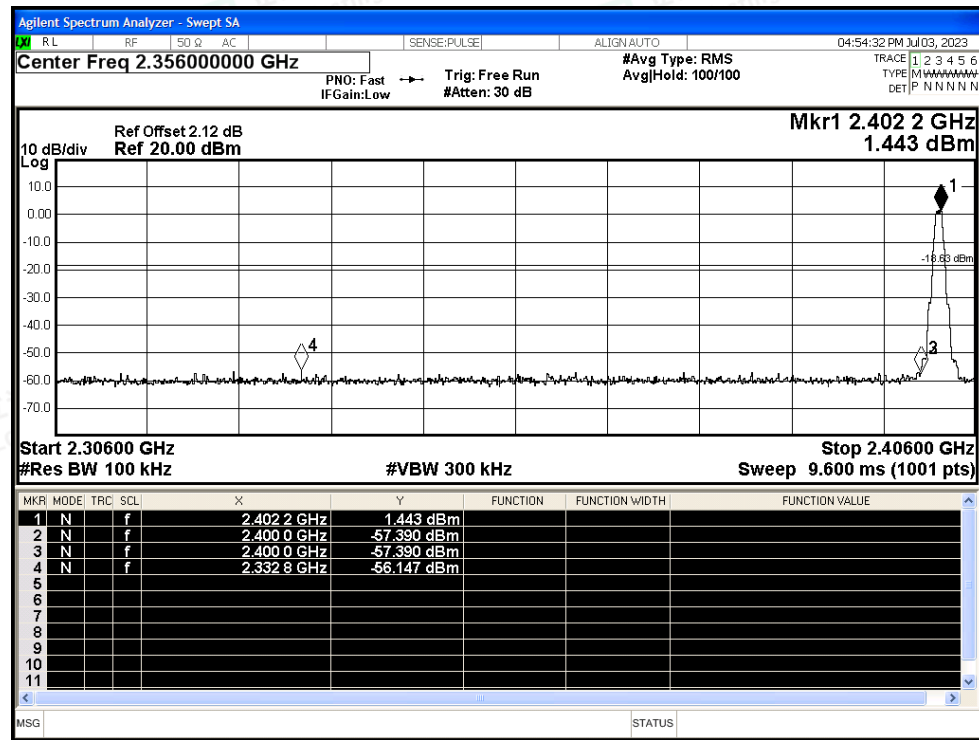


Test Graphs

Band Edge NVNT BLE 2402MHz Ant Ref



Band Edge NVNT BLE 2402MHz Ant Emission

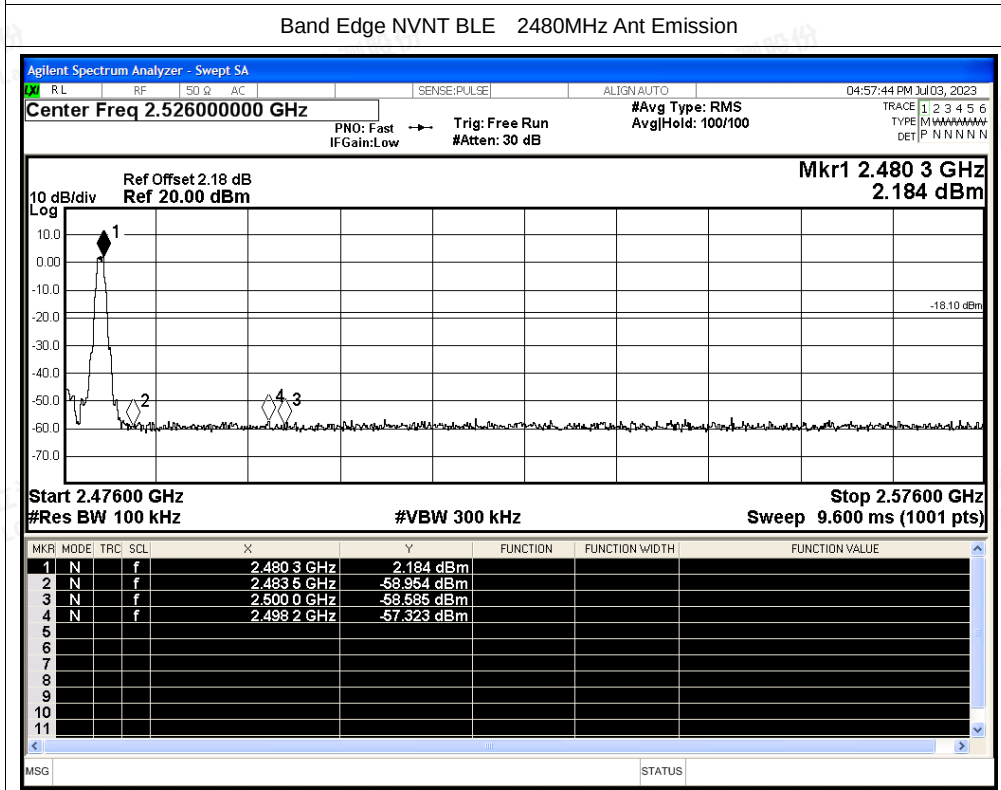
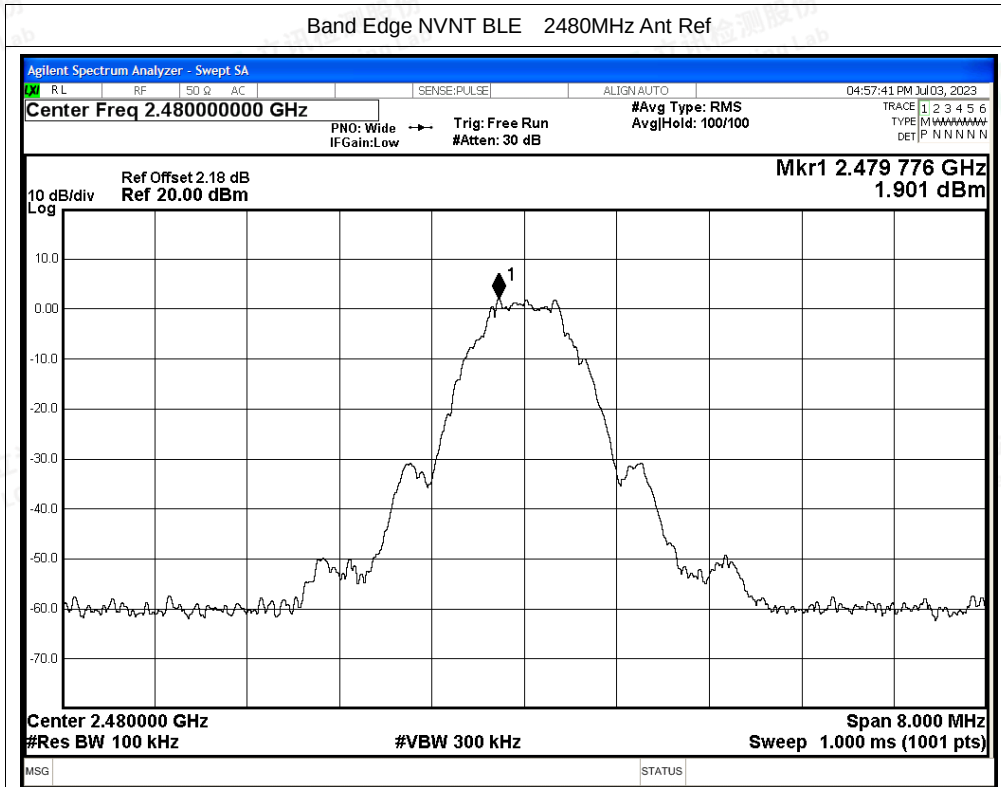


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A.6 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant	-56.71	-20	Pass
NVNT	BLE	2440	Ant	-56.75	-20	Pass
NVNT	BLE	2480	Ant	-53.93	-20	Pass

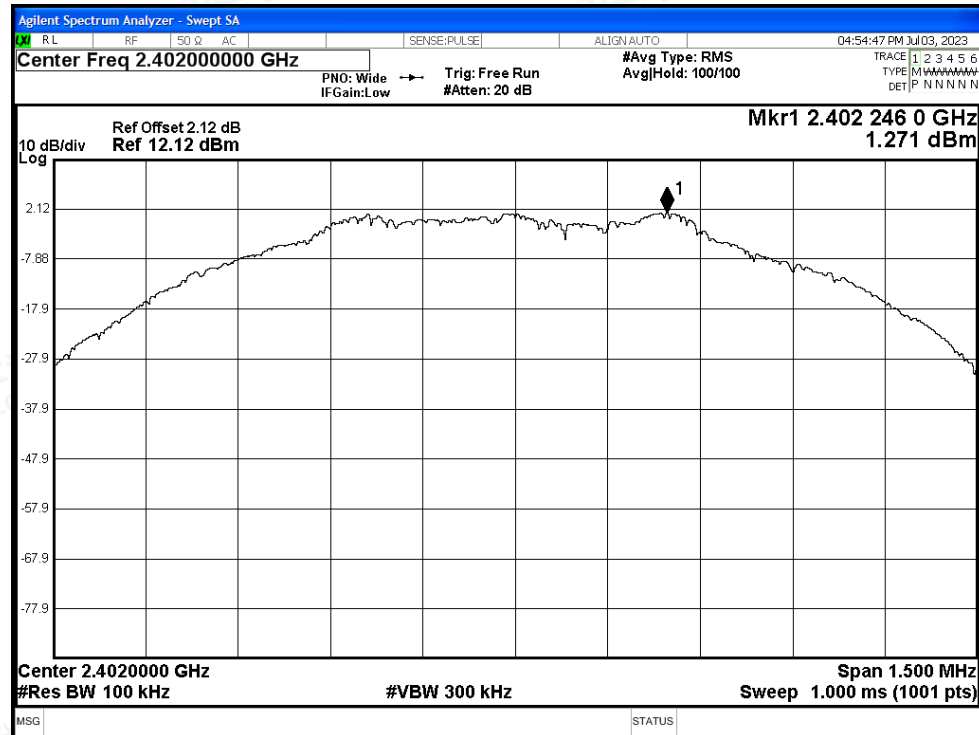


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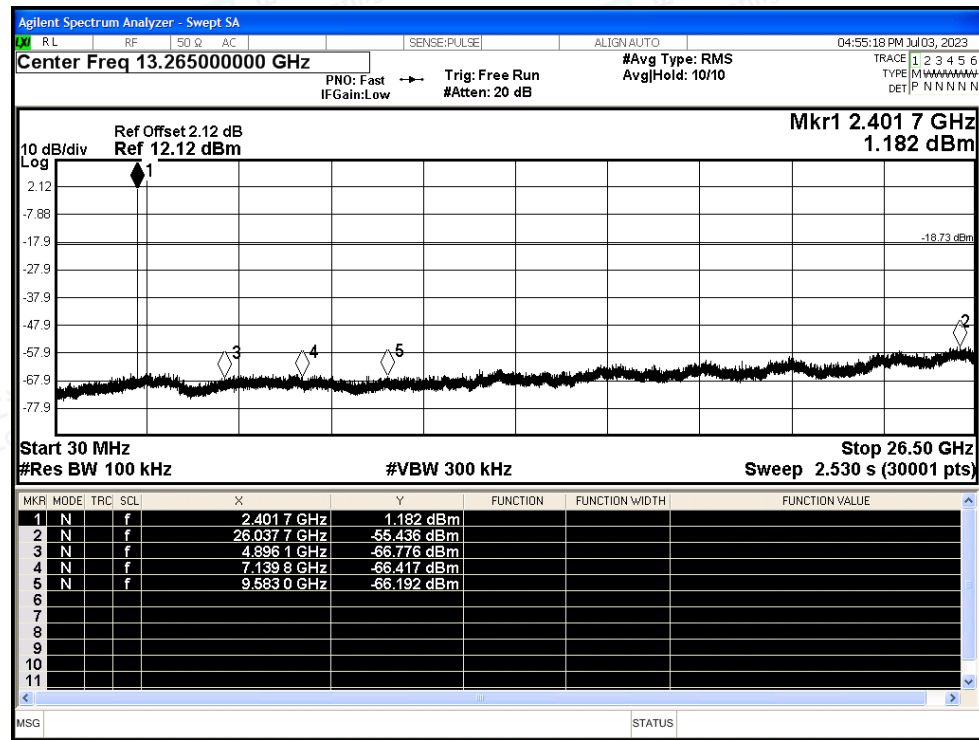


Test Graphs

Tx. Spurious NVNT BLE 2402MHz Ant Ref



Tx. Spurious NVNT BLE 2402MHz Ant Emission



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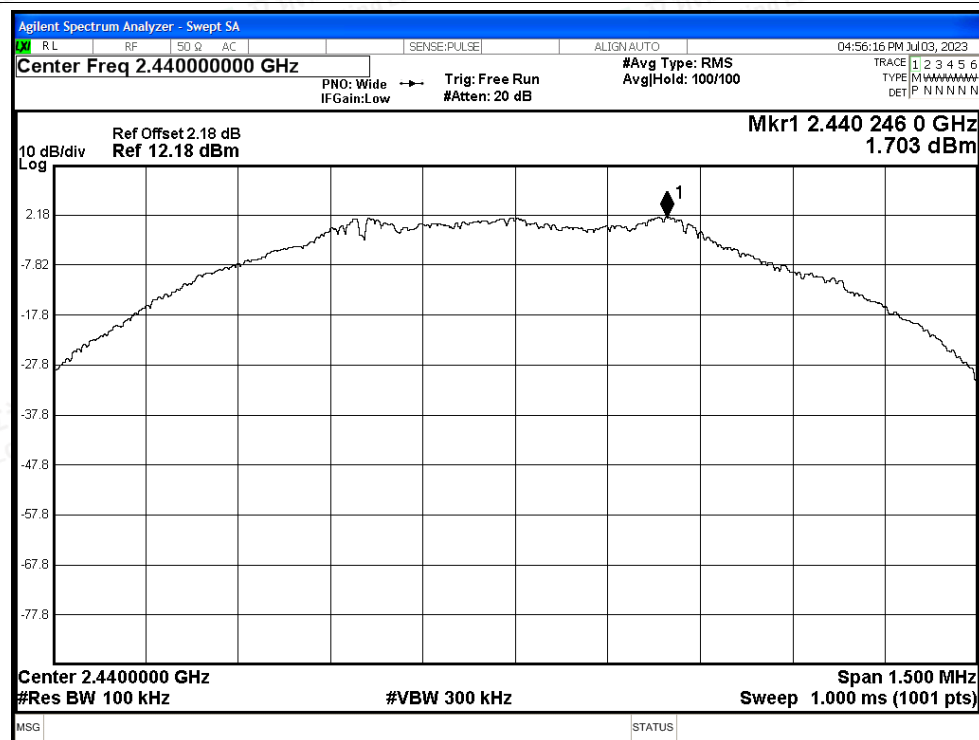
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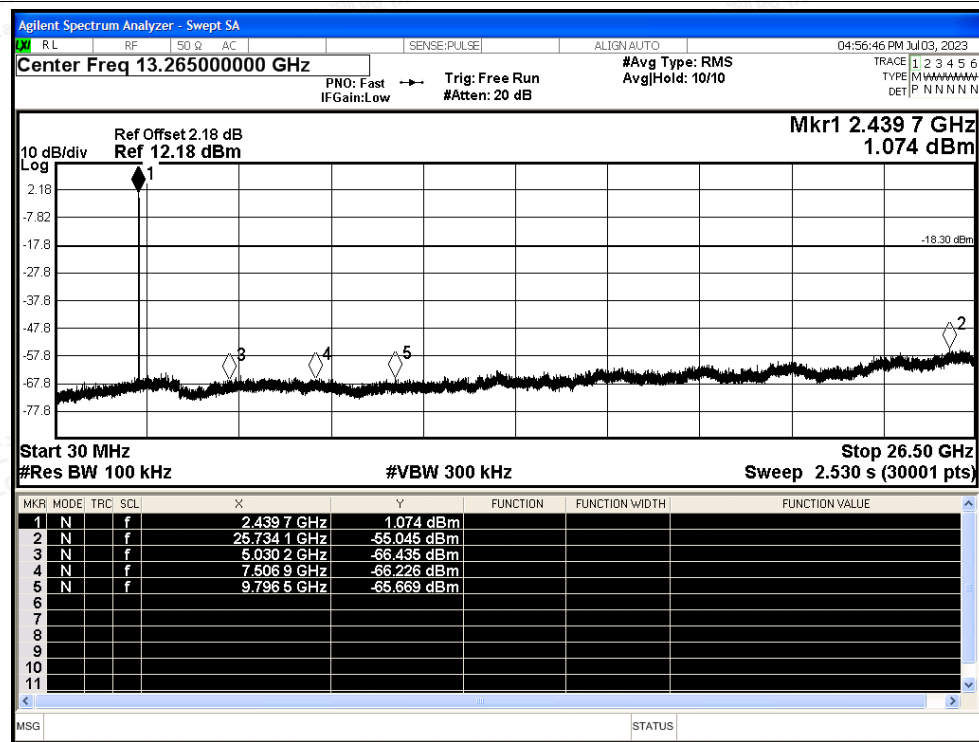
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Tx. Spurious NVNT BLE 2440MHz Ant Ref



Tx. Spurious NVNT BLE 2440MHz Ant Emission



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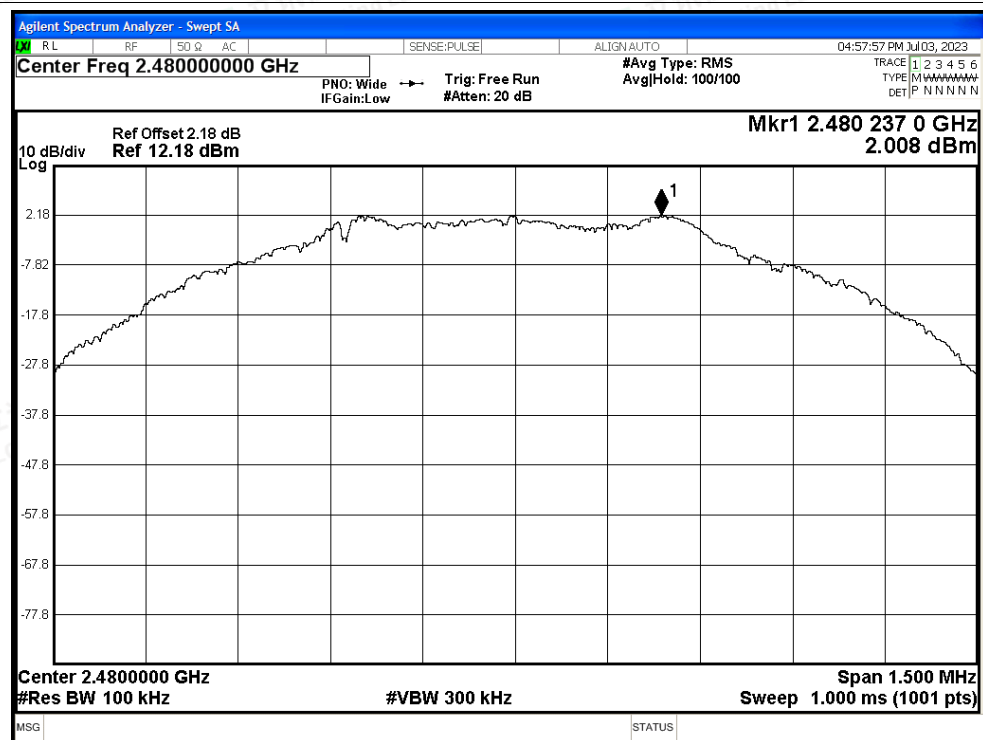
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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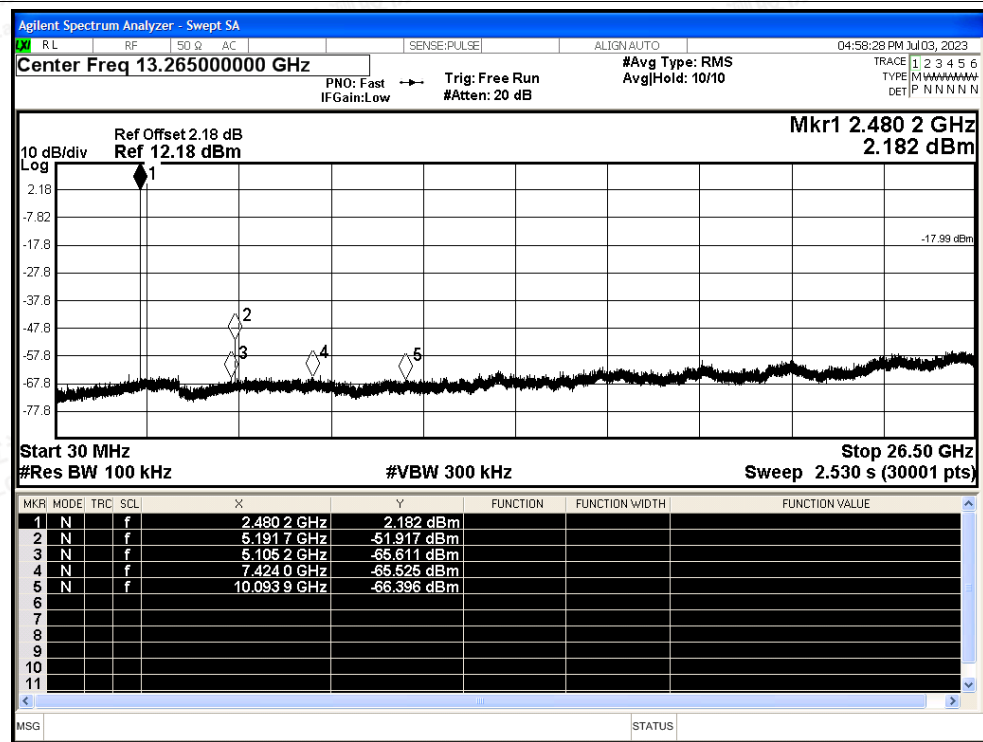
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Tx. Spurious NVNT BLE 2480MHz Ant Ref



Tx. Spurious NVNT BLE 2480MHz Ant Emission



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A.7 Duty Cycle

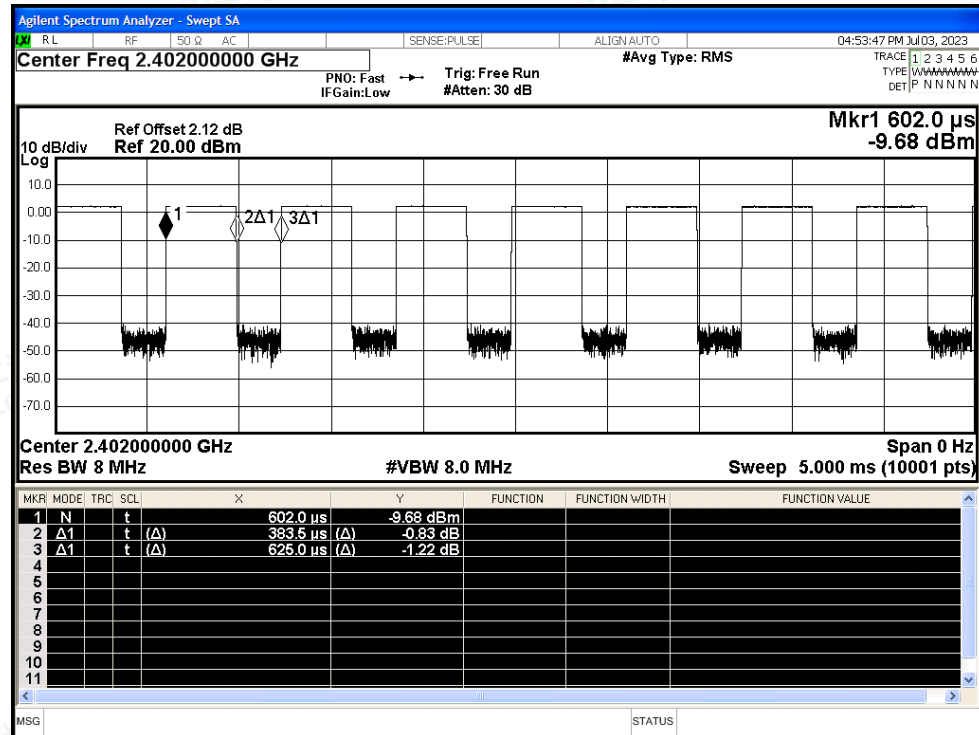
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE	2402	Ant	61.36	2.12	2.61
NVNT	BLE	2440	Ant	61.36	2.12	2.61
NVNT	BLE	2480	Ant	61.36	2.12	2.61



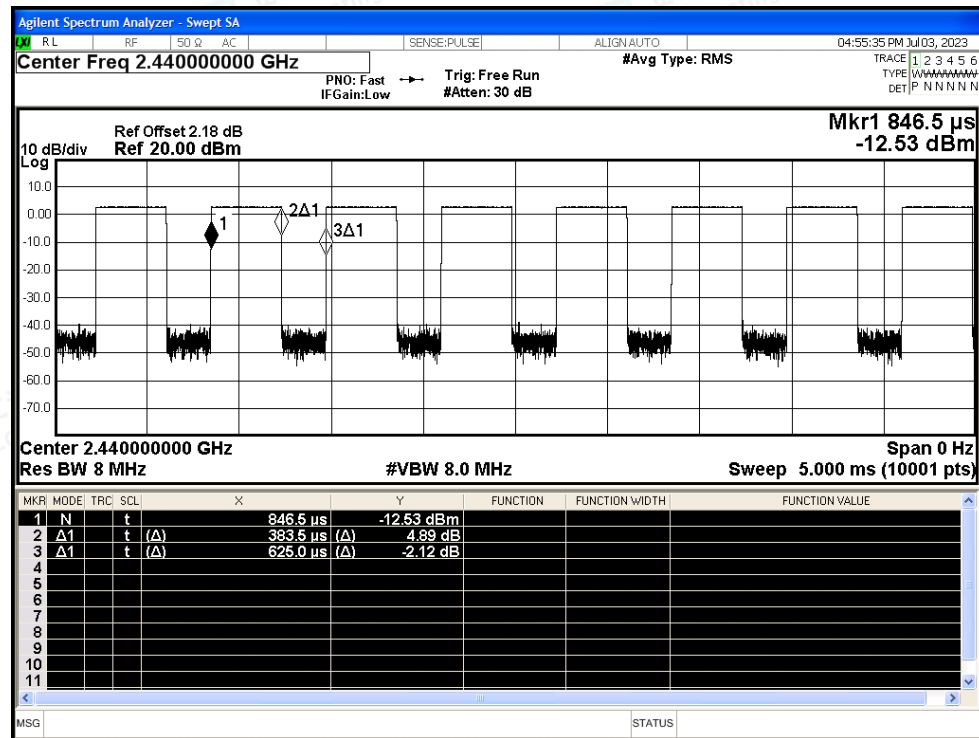


Test Graphs

Duty Cycle NVNT BLE 2402MHz Ant



Duty Cycle NVNT BLE 2440MHz Ant

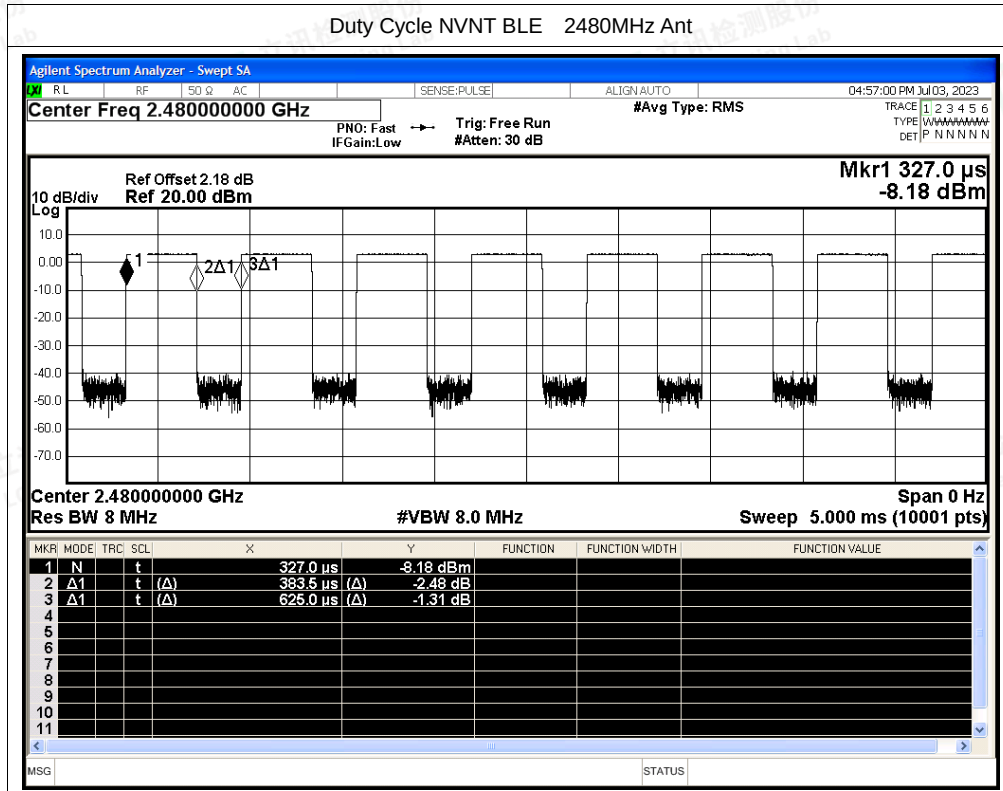


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A.8 Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE	2402	Ant	2310	-50.29	2	46.97	Peak	74	Pass
NVNT	BLE	2402	Ant	2310	-57.22	2	40.04	Average	54	Pass
NVNT	BLE	2402	Ant	2352.912	-47.39	2	49.87	Peak	74	Pass
NVNT	BLE	2402	Ant	2377.2	-56.18	2	41.08	Average	54	Pass
NVNT	BLE	2402	Ant	2390	-49.97	2	47.29	Peak	74	Pass
NVNT	BLE	2402	Ant	2390	-57.07	2	40.19	Average	54	Pass
NVNT	BLE	2480	Ant	2483.5	-48	2	49.26	Peak	74	Pass
NVNT	BLE	2480	Ant	2483.5	-53.15	2	44.11	Average	54	Pass
NVNT	BLE	2480	Ant	2484.064	-46.95	2	50.31	Peak	74	Pass
NVNT	BLE	2480	Ant	2483.512	-53.15	2	44.11	Average	54	Pass
NVNT	BLE	2480	Ant	2500	-50.54	2	46.72	Peak	74	Pass
NVNT	BLE	2480	Ant	2500	-56.48	2	40.78	Average	54	Pass



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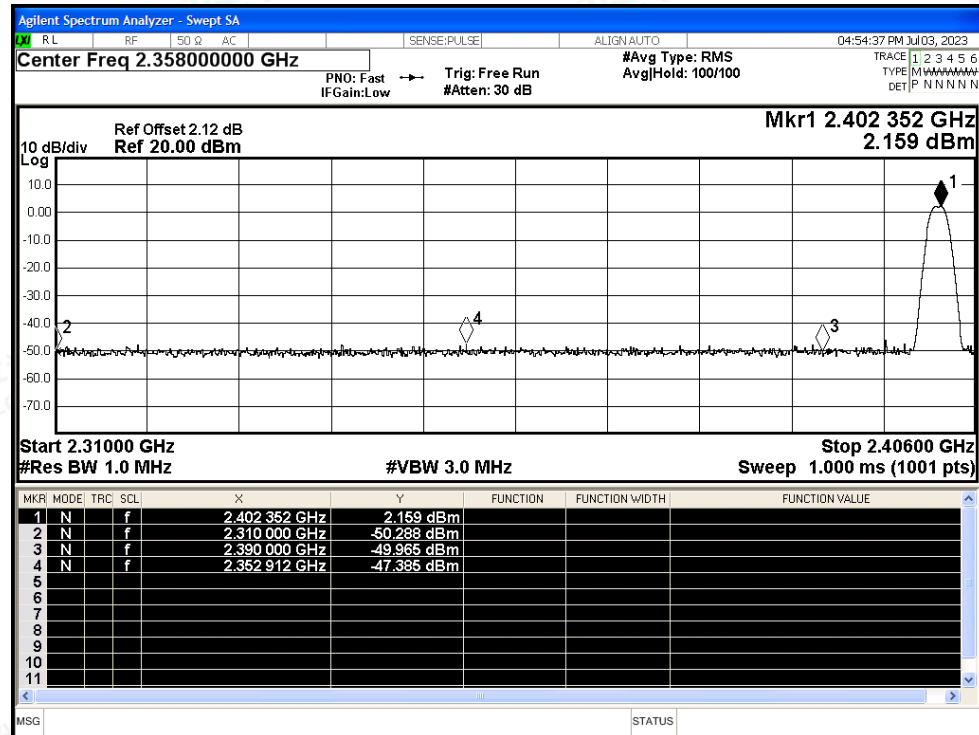
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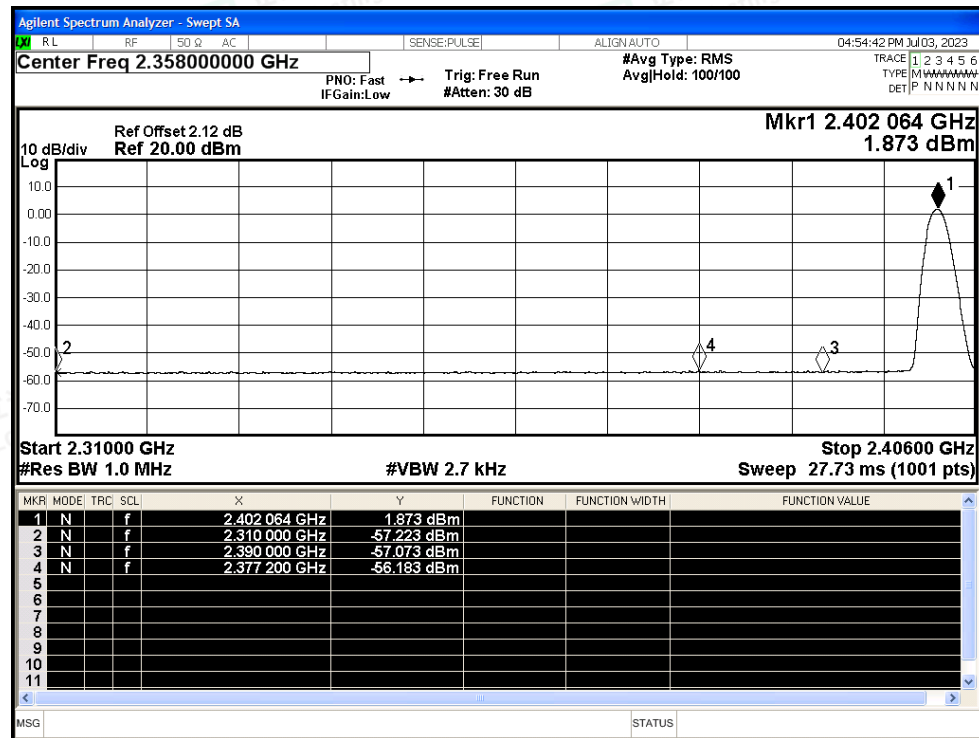


Test Graphs

Restrict Band NVNT BLE 2402MHz Ant Peak



Restrict Band NVNT BLE 2402MHz Ant Average



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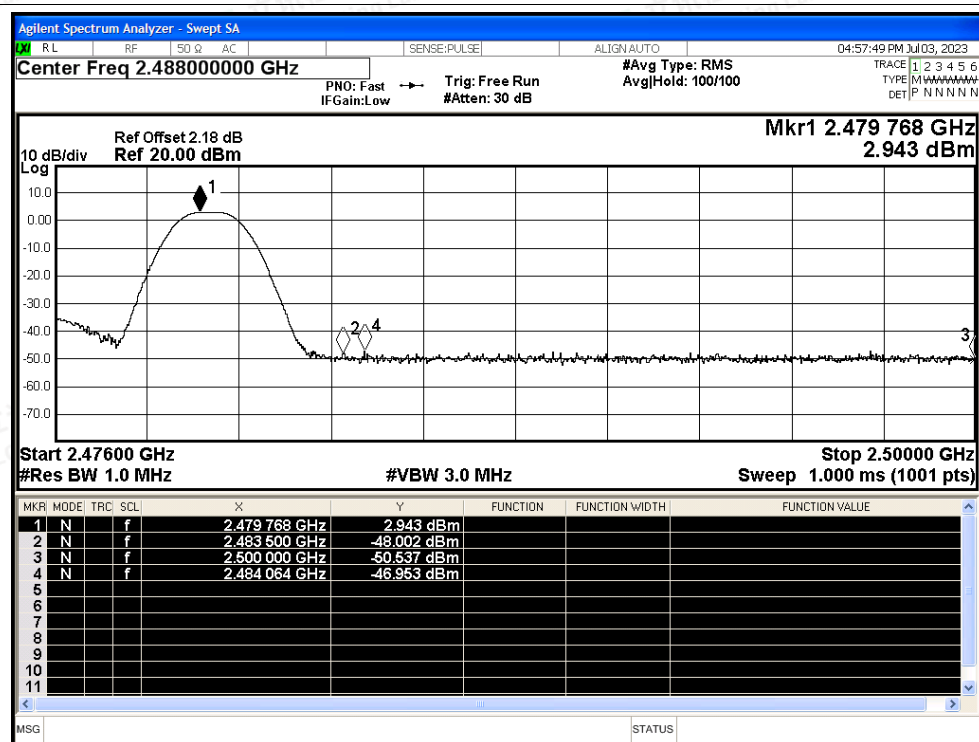
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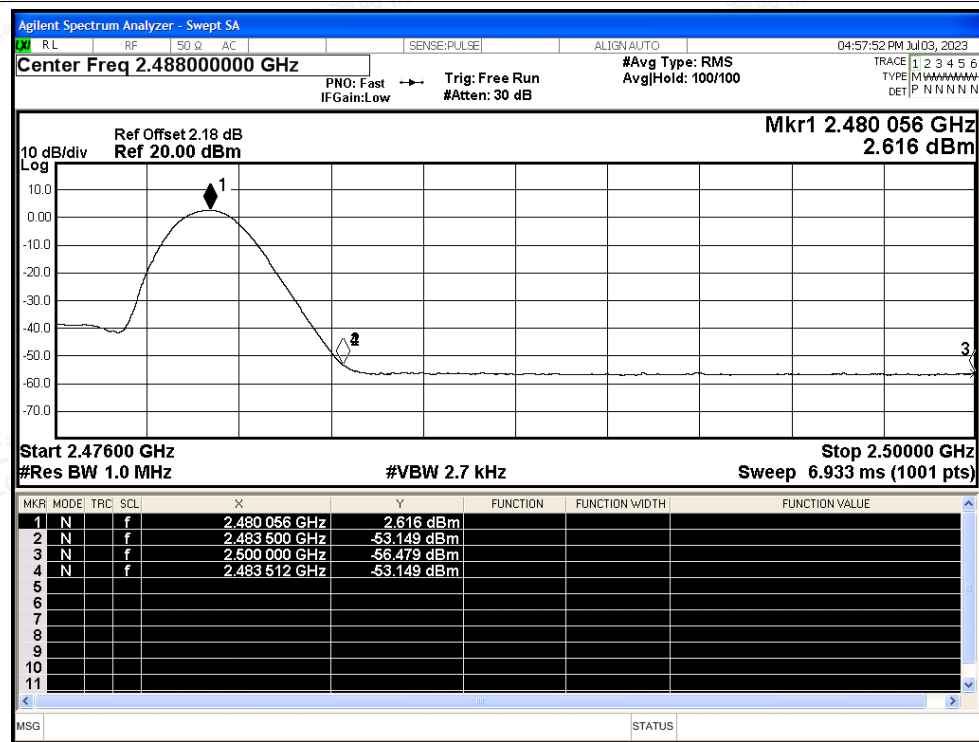
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Restrict Band NVNT BLE 2480MHz Ant Peak



Restrict Band NVNT BLE 2480MHz Ant Average



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