



Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Device_UI_Protech_651G

Test Model: 42-18000-0

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Nick Peng
Supervised by:	Ling Zhu



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B.1 DTS Bandwidth

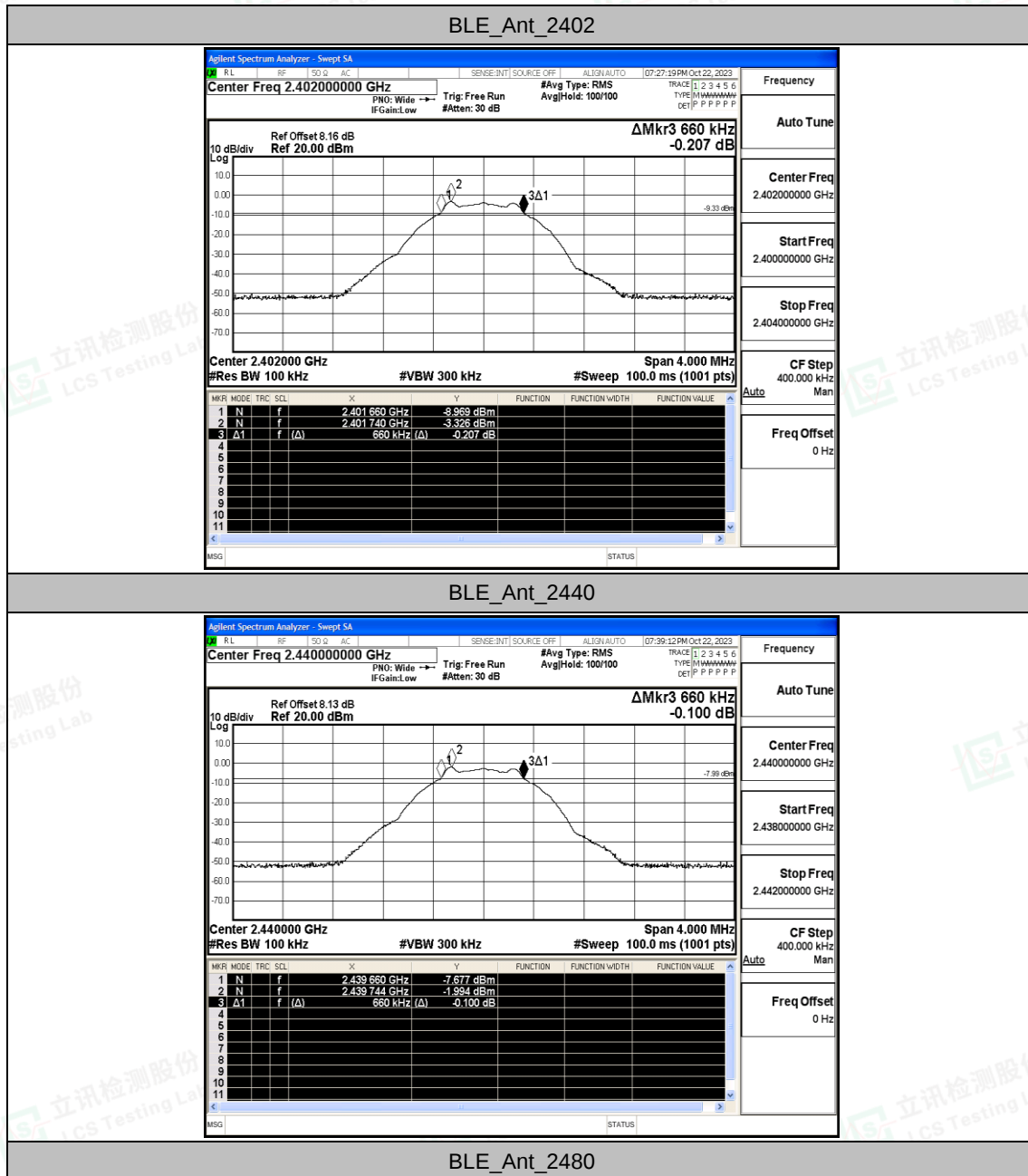
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE	Ant	2402	0.660	2401.660	2402.320	0.5	PASS
		2440	0.660	2439.660	2440.320	0.5	PASS
		2480	0.660	2479.656	2480.316	0.5	PASS





Test Graphs

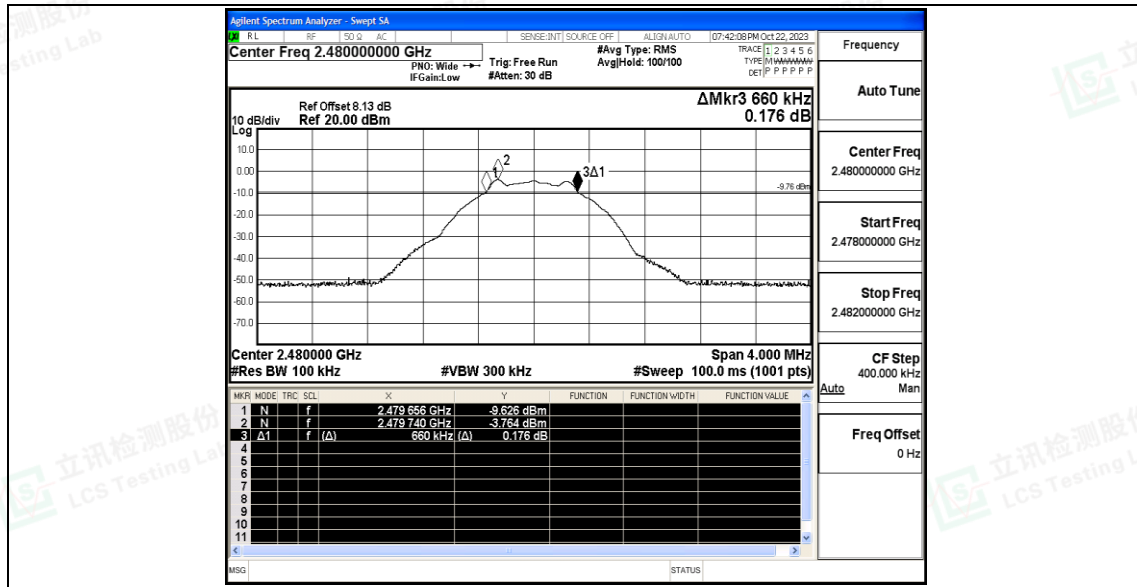


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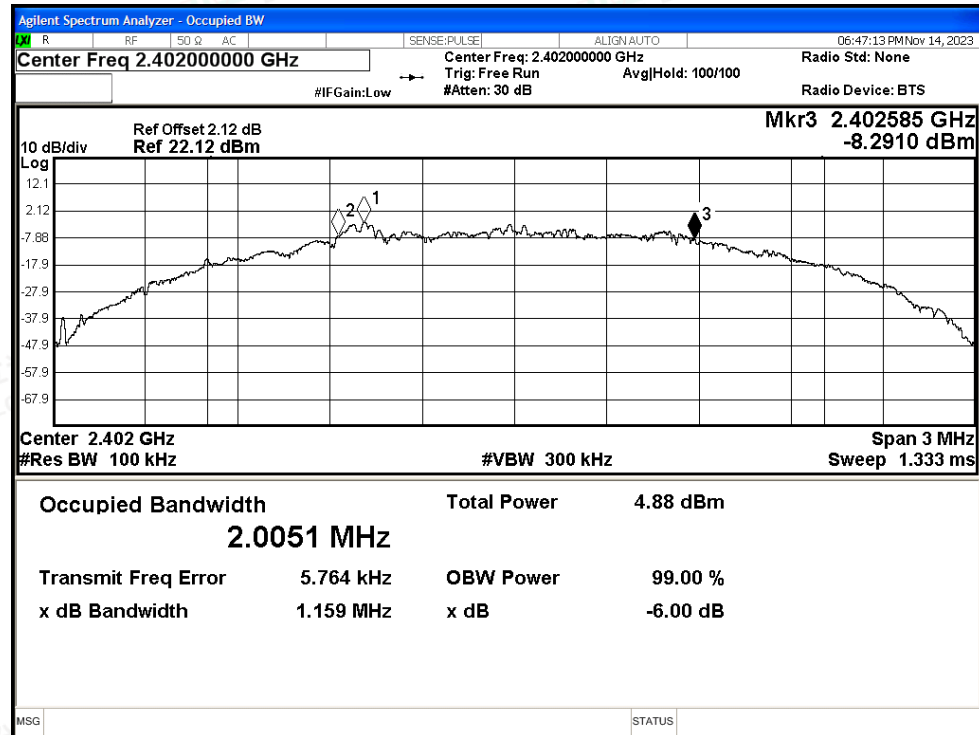
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 2M	2402	Ant	1.159	>=0.5	Pass
NVNT	BLE 2M	2440	Ant	1.156	>=0.5	Pass
NVNT	BLE 2M	2480	Ant	1.122	>=0.5	Pass



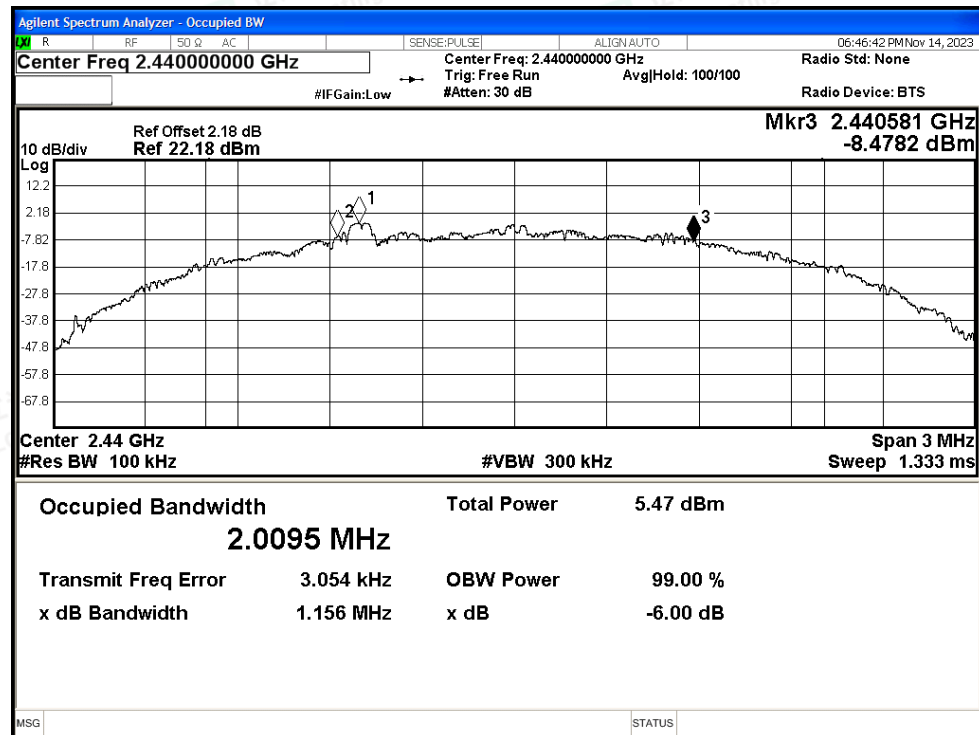


Test Graphs

-6dB Bandwidth NVNT BLE 2M 2402MHz Ant



-6dB Bandwidth NVNT BLE 2M 2440MHz Ant

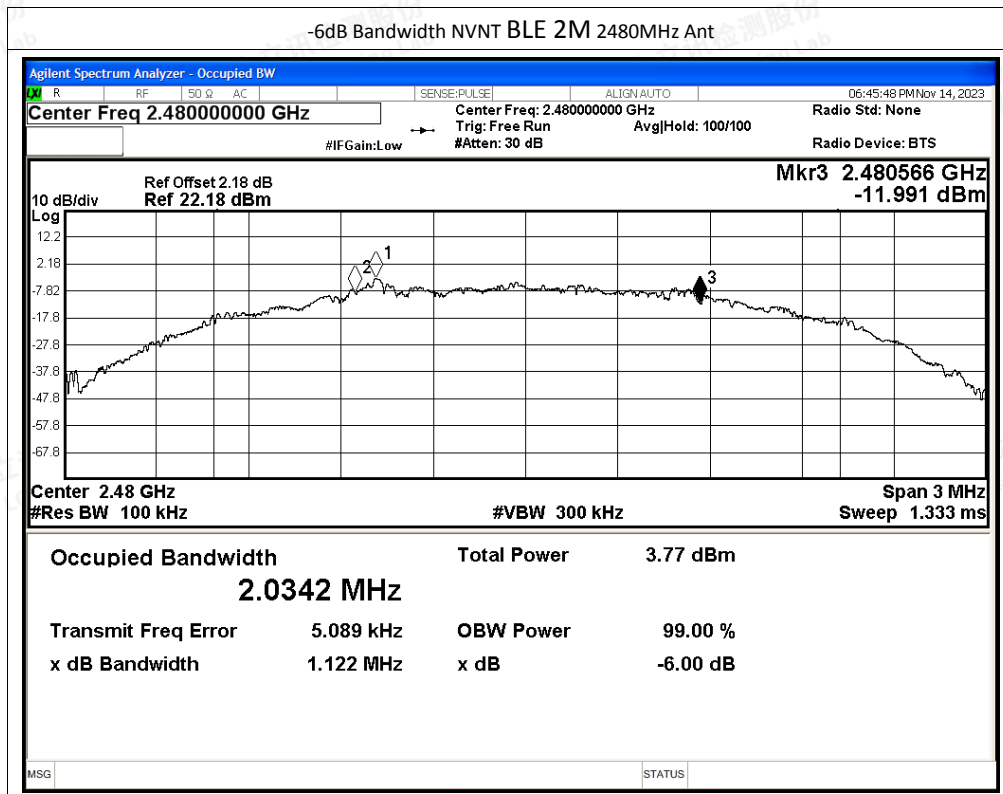


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B.2 Occupied Channel Bandwidth

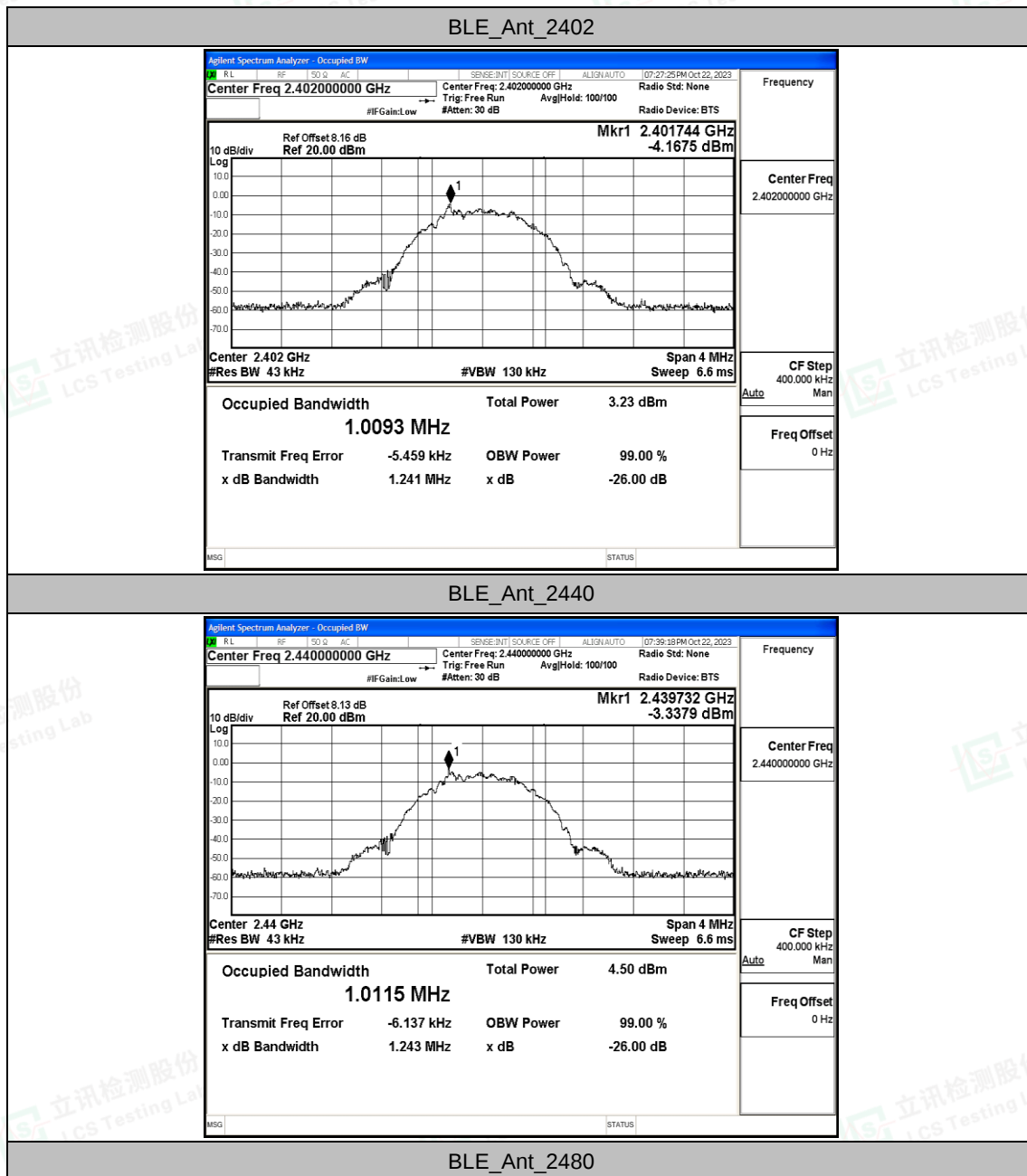
Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE	Ant	2402	1.0093	2401.4899	2402.4992	---	---
		2440	1.0115	2439.4881	2440.4996	---	---
		2480	1.0103	2479.4877	2480.4980	---	---





Test Graphs

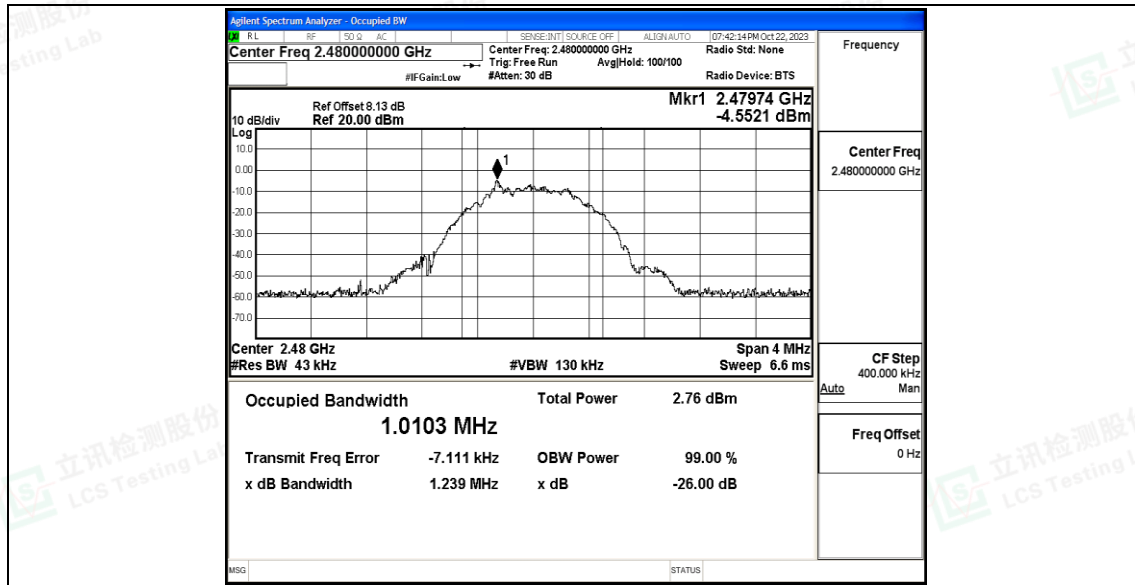


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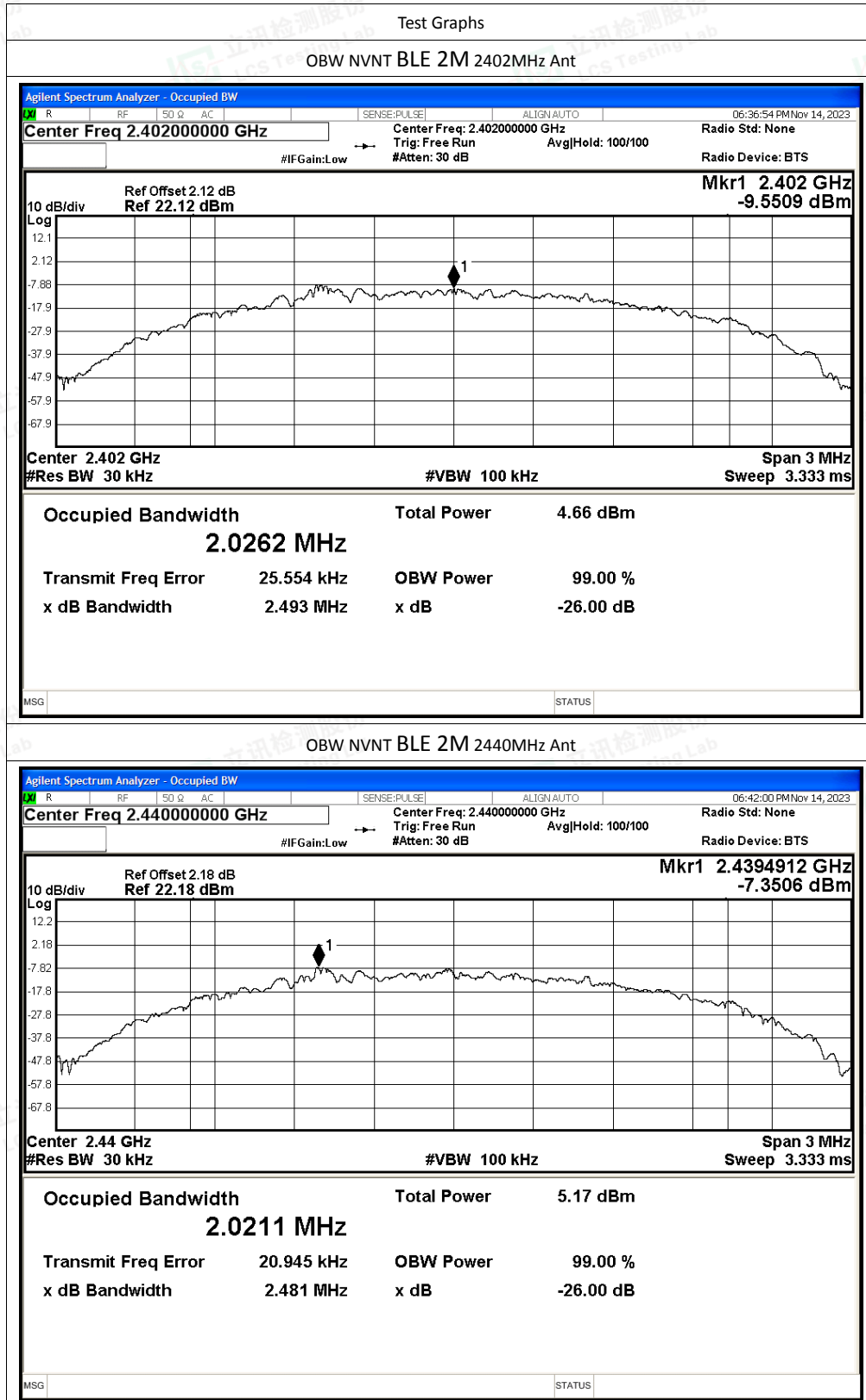
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Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 2M	2402	Ant	2.026
NVNT	BLE 2M	2440	Ant	2.021
NVNT	BLE 2M	2480	Ant	2.022



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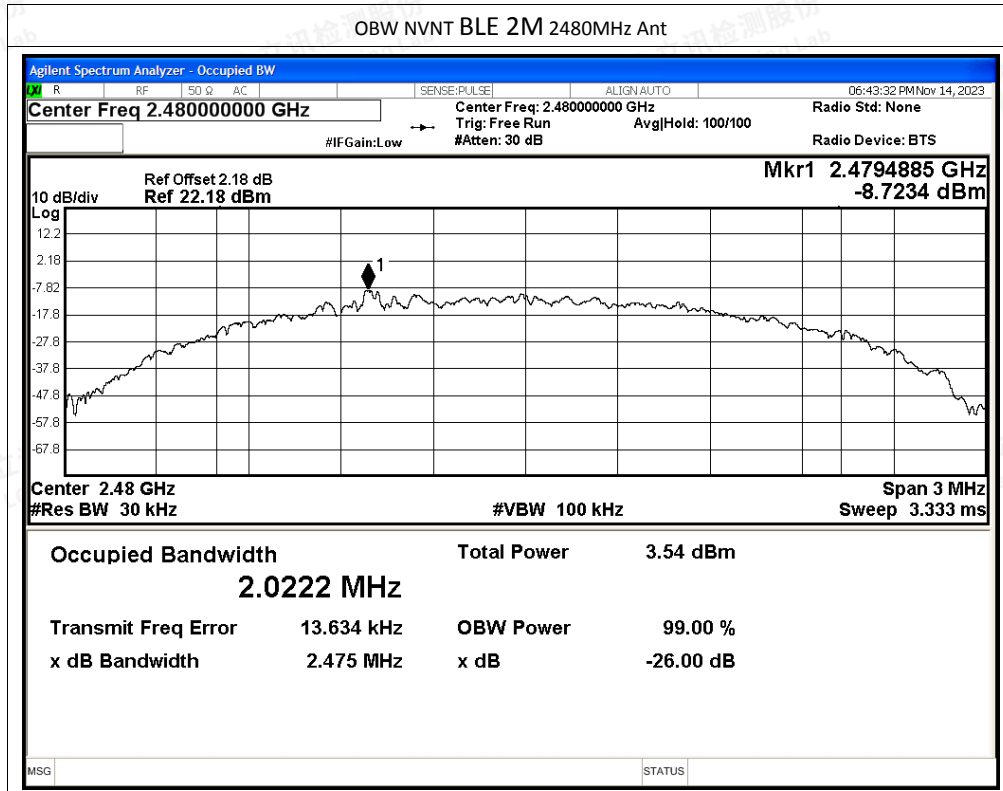


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B.3 Maximum Peak conducted output power

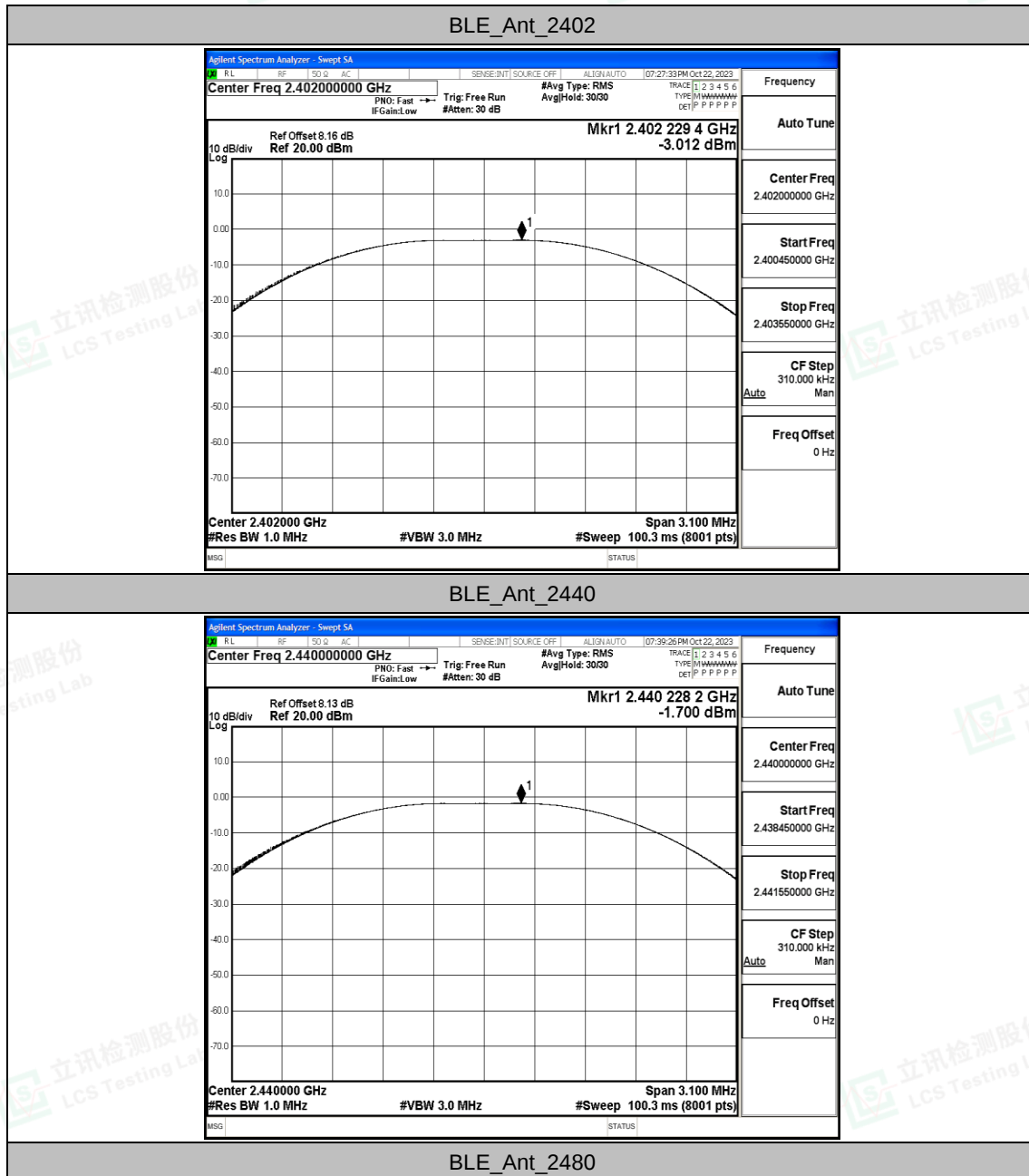
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit[dBm]	Verdict
BLE	Ant	2402	-3.01	≤30	0.77	-2.24	≤36.00	PASS
		2440	-1.7	≤30	0.77	-0.93	≤36.00	PASS
		2480	-3.49	≤30	0.77	-2.72	≤36.00	PASS





Test Graphs

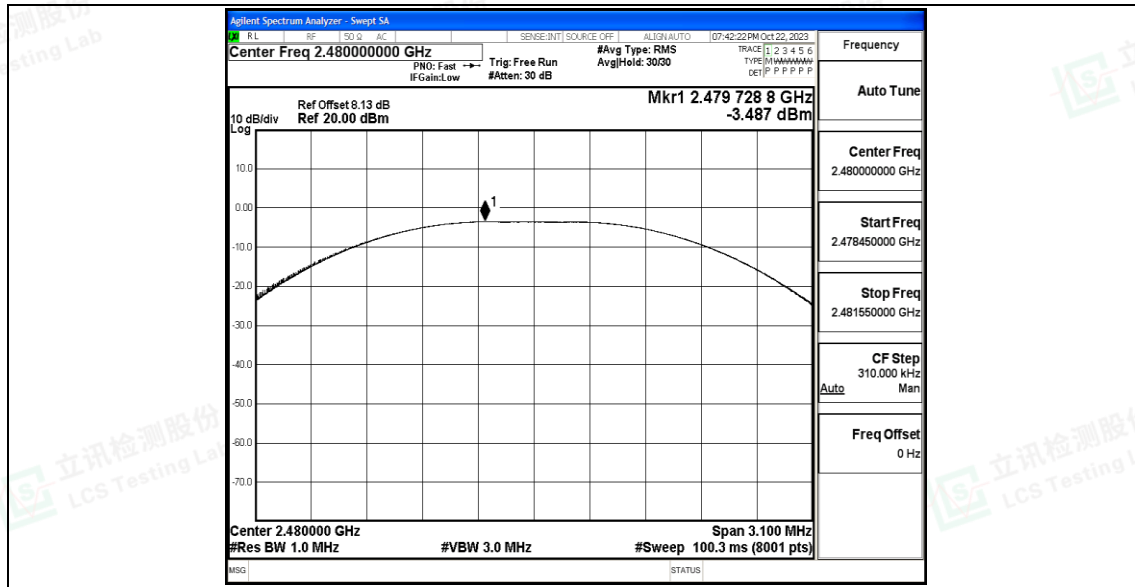


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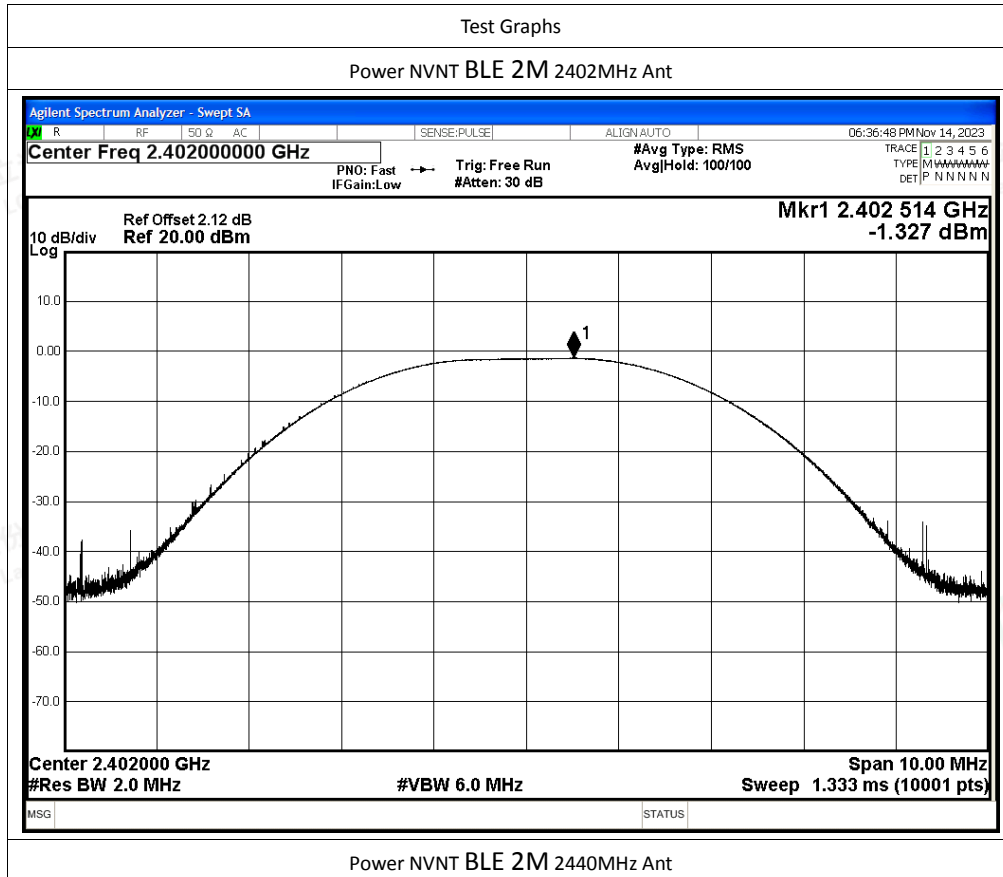
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Gain [dBi]	EIRP [dBm]	EIRP Limit[dBm]	Verdict
NVNT	BLE 2M	2402	Ant	-1.33	30	0.77	-0.56	36	Pass
NVNT	BLE 2M	2440	Ant	-0.89	30	0.77	-0.12	36	Pass
NVNT	BLE 2M	2480	Ant	-2.39	30	0.77	-1.62	36	Pass

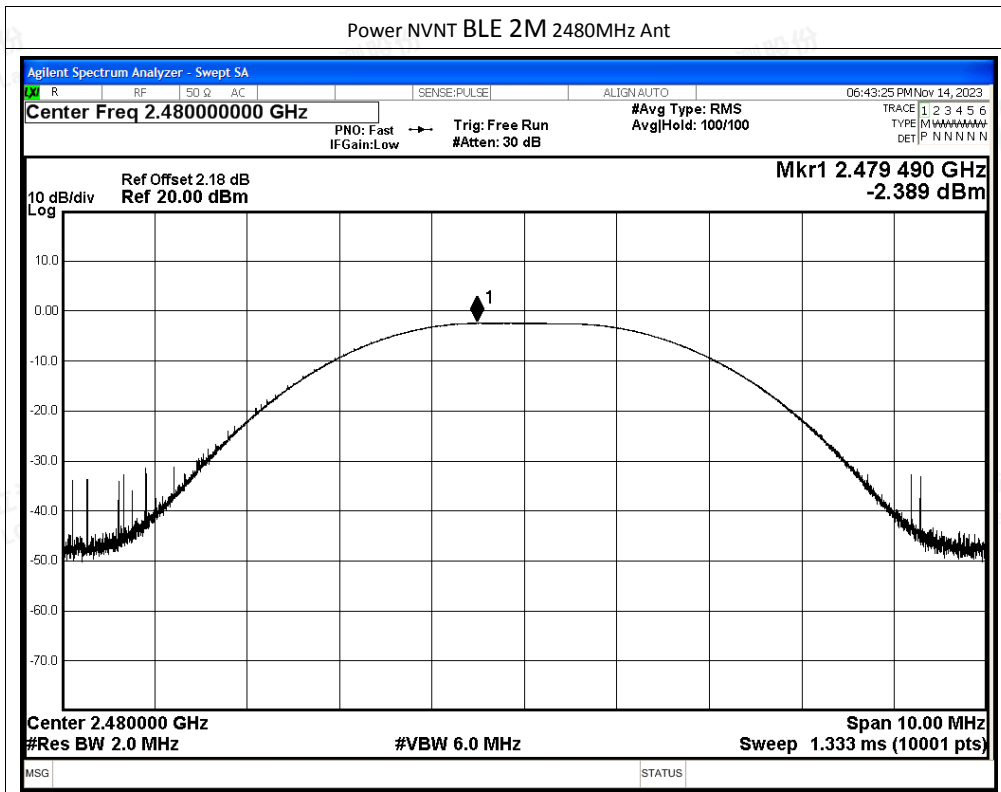
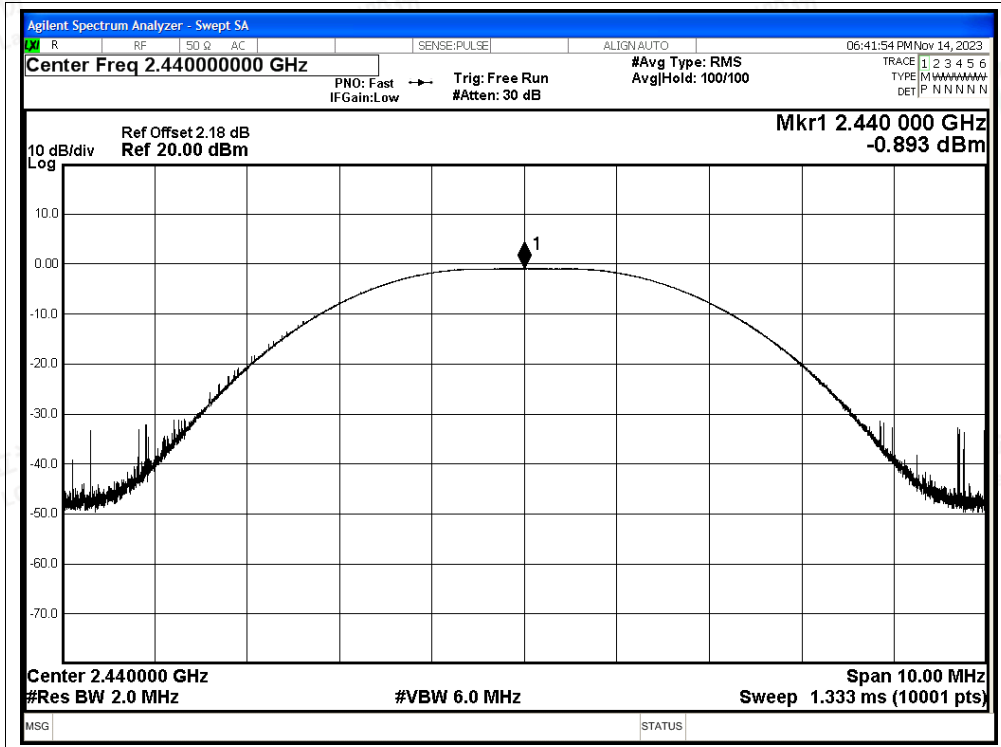


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B.4 Maximum power spectral density

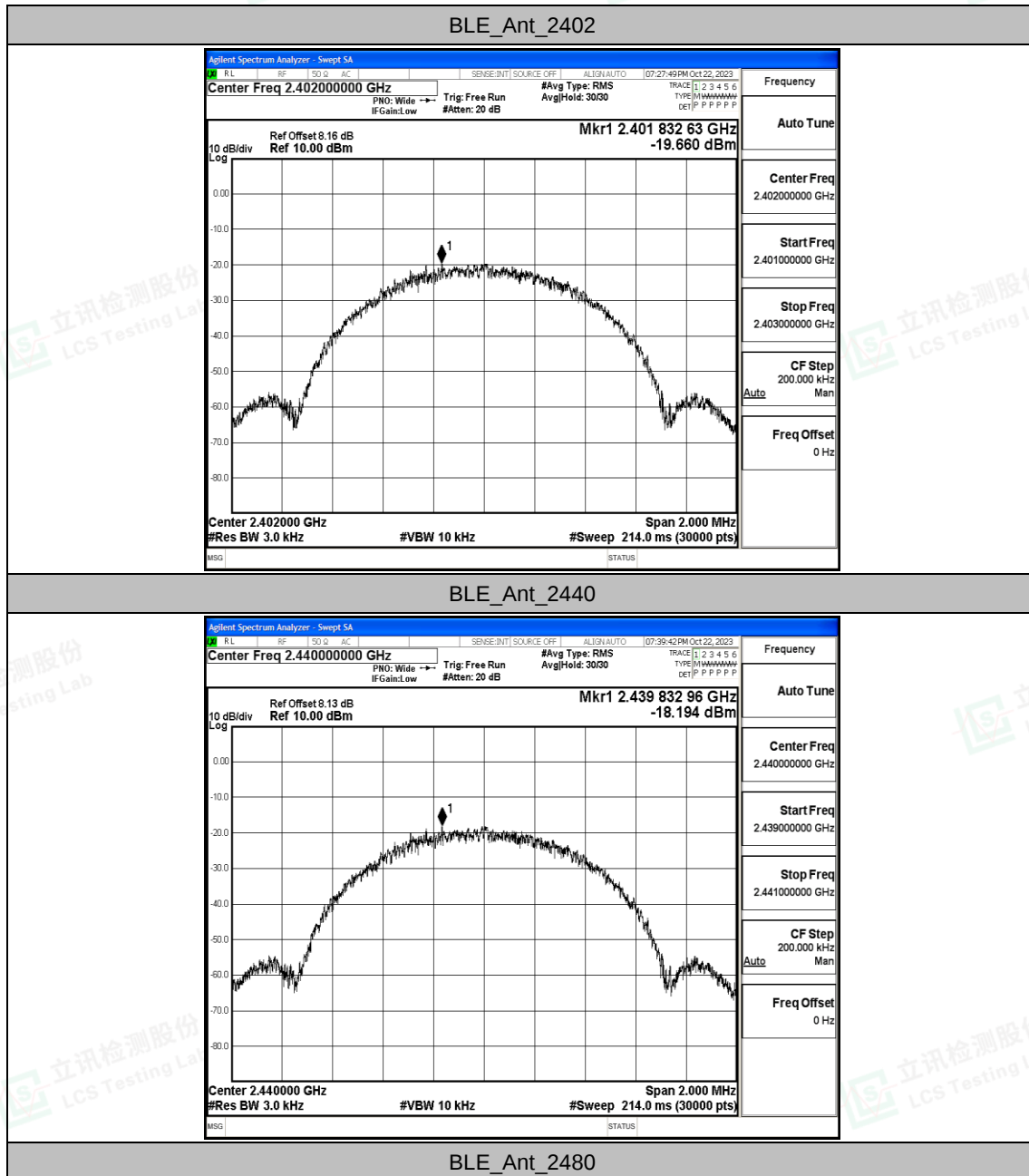
Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE	Ant	2402	-19.66	≤8.00	PASS
		2440	-18.19	≤8.00	PASS
		2480	-19.96	≤8.00	PASS





Test Graphs

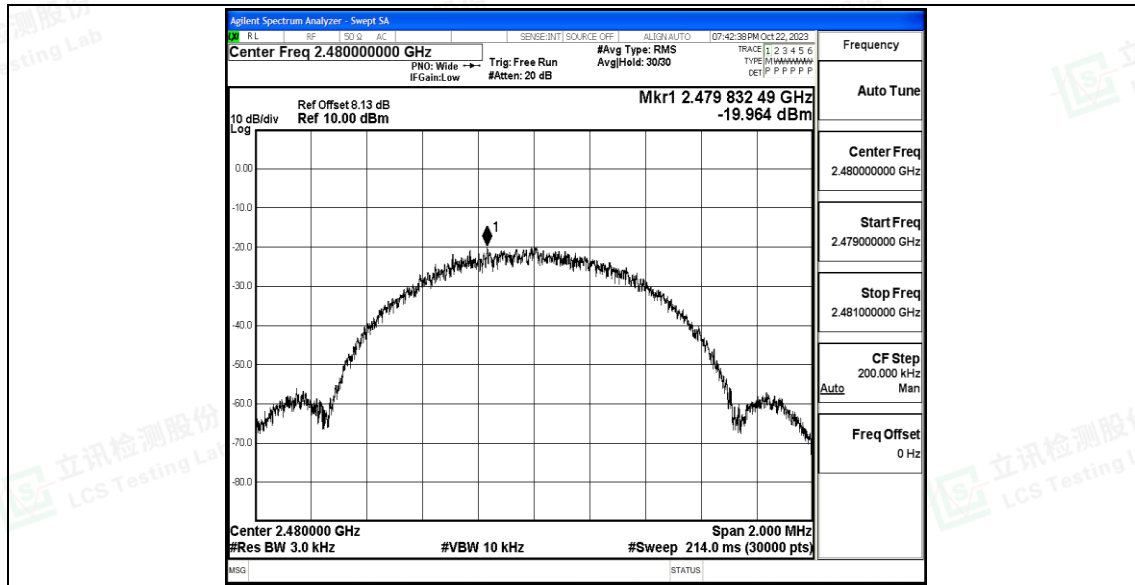


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Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 2M	2402	Ant	-21.32	8	Pass
NVNT	BLE 2M	2440	Ant	-21.1	8	Pass
NVNT	BLE 2M	2480	Ant	-22.72	8	Pass



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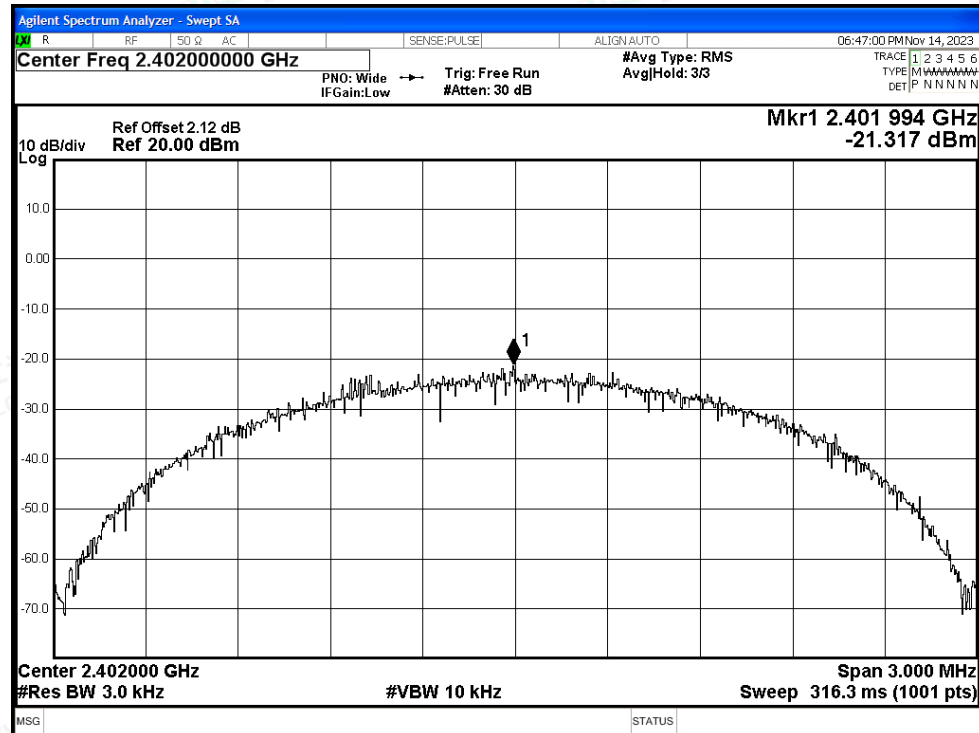
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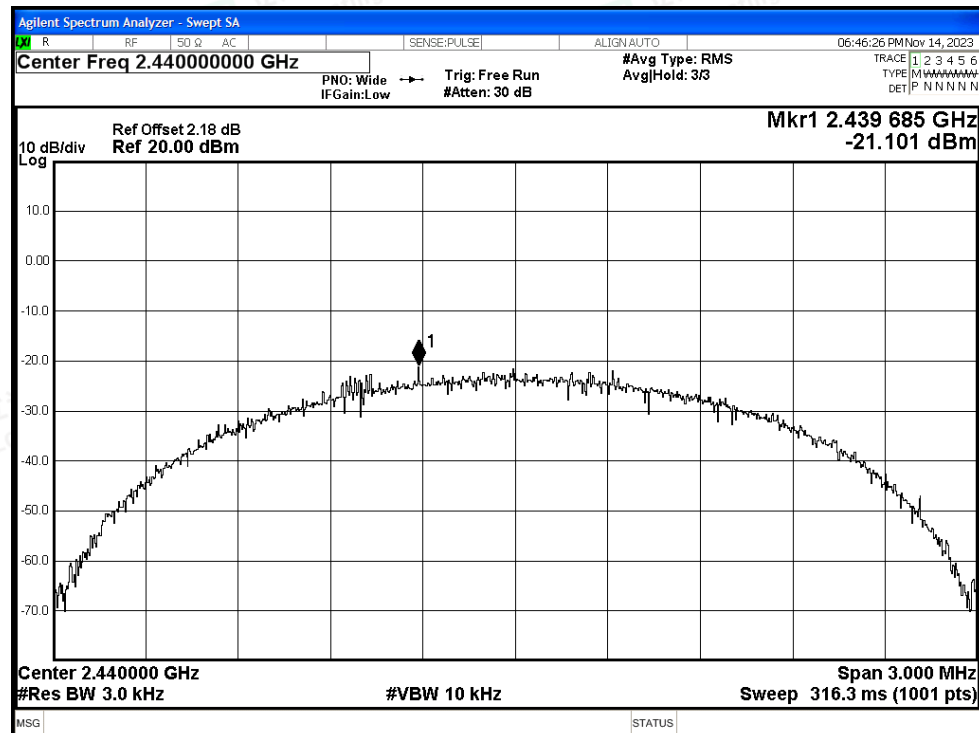


Test Graphs

PSD NVNT BLE 2M 2402MHz Ant



PSD NVNT BLE 2M 2440MHz Ant

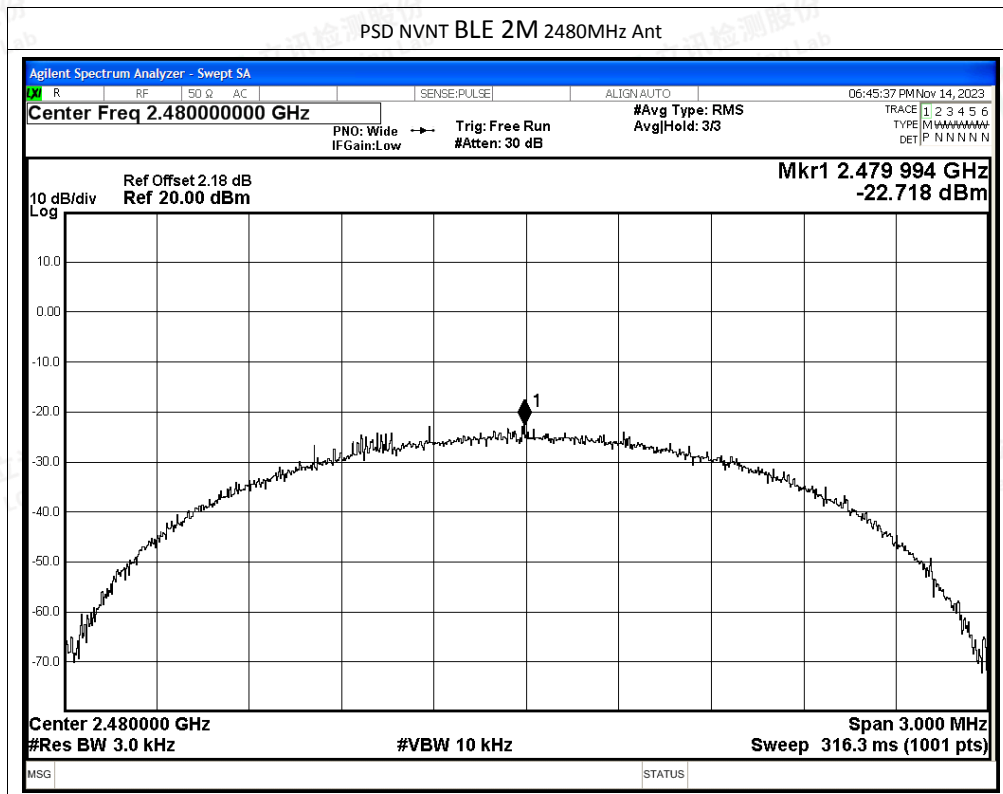


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B.5 Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE	Ant	Low	2402	-3.33	-60.11	≤ -23.33	PASS
		High	2480	-4.51	-59.65	≤ -24.51	PASS





Test Graphs



Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 2M	2402	Ant	-45.38	-20	Pass
NVNT	BLE 2M	2480	Ant	-51.82	-20	Pass



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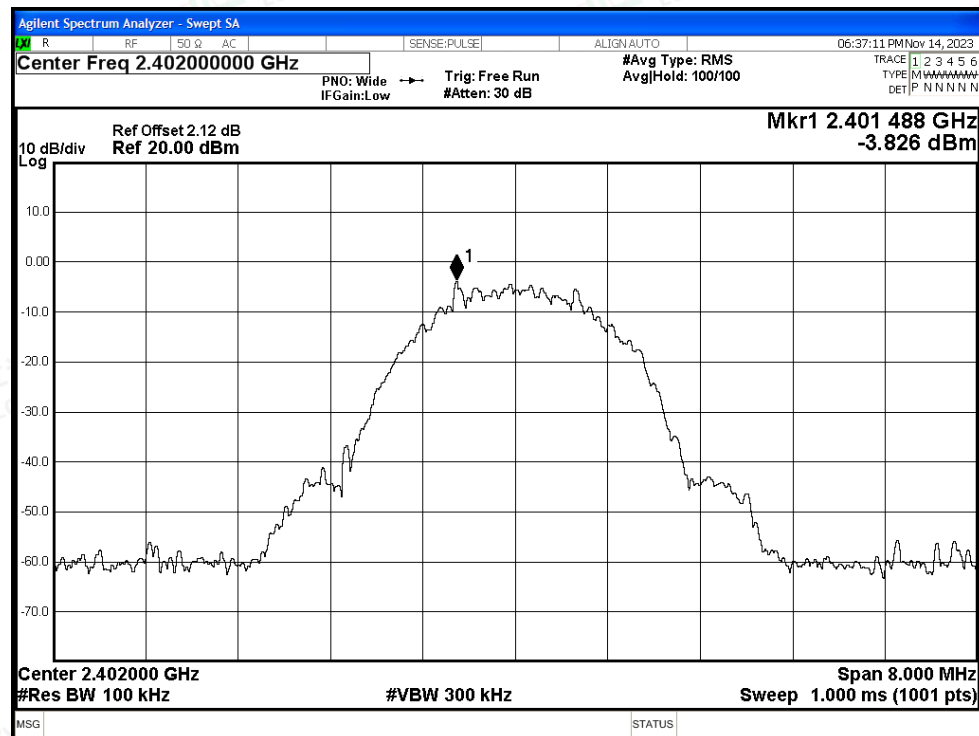
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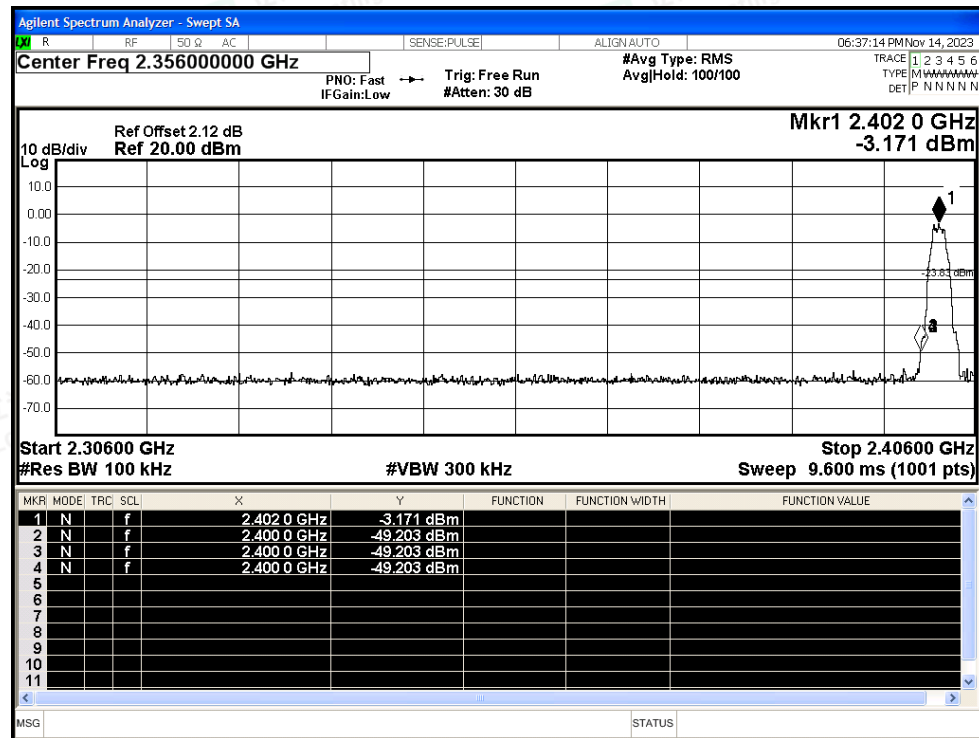


Test Graphs

Band Edge NVNT BLE 2M 2402MHz Ant Ref



Band Edge NVNT BLE 2M 2402MHz Ant Emission



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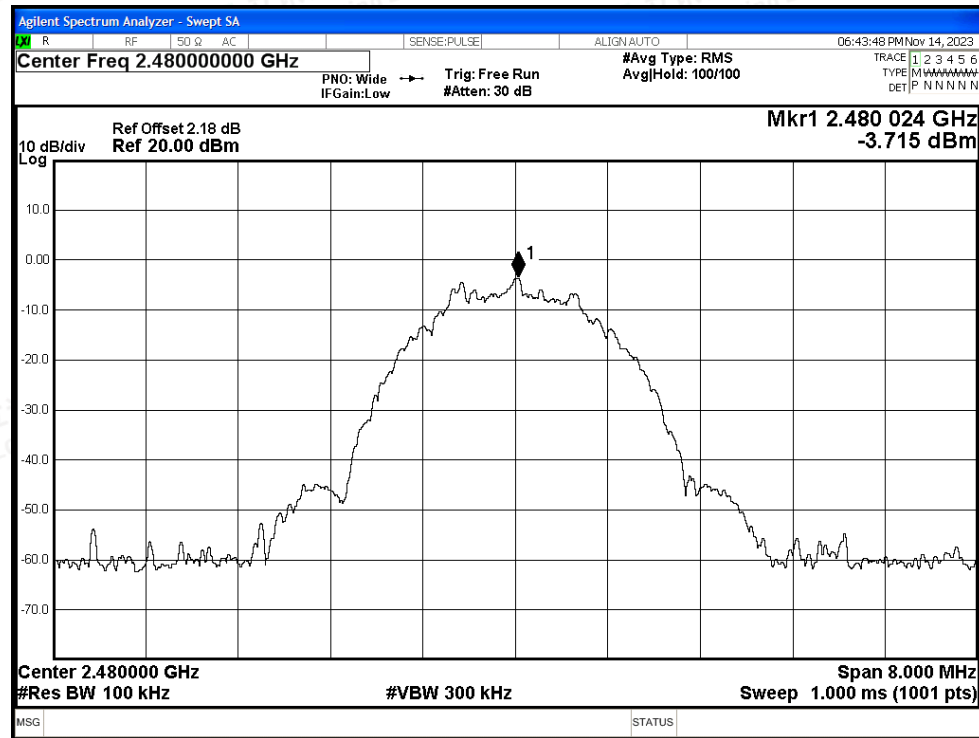
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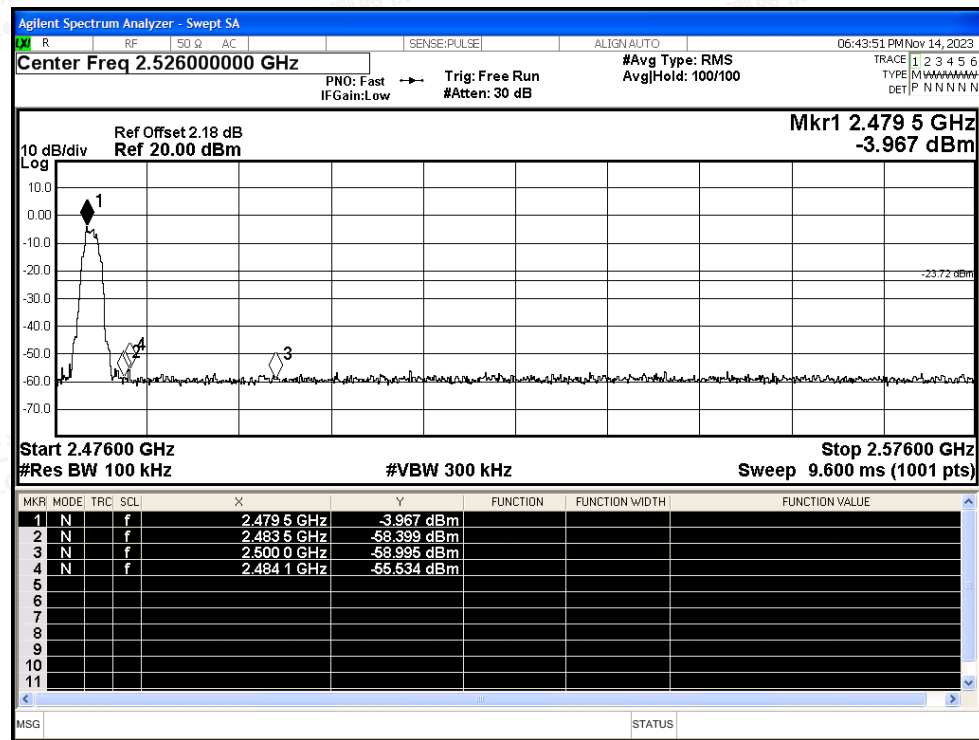
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Band Edge NVNT BLE 2M 2480MHz Ant Ref



Band Edge NVNT BLE 2M 2480MHz Ant Emission



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B.6 Conducted Spurious Emission

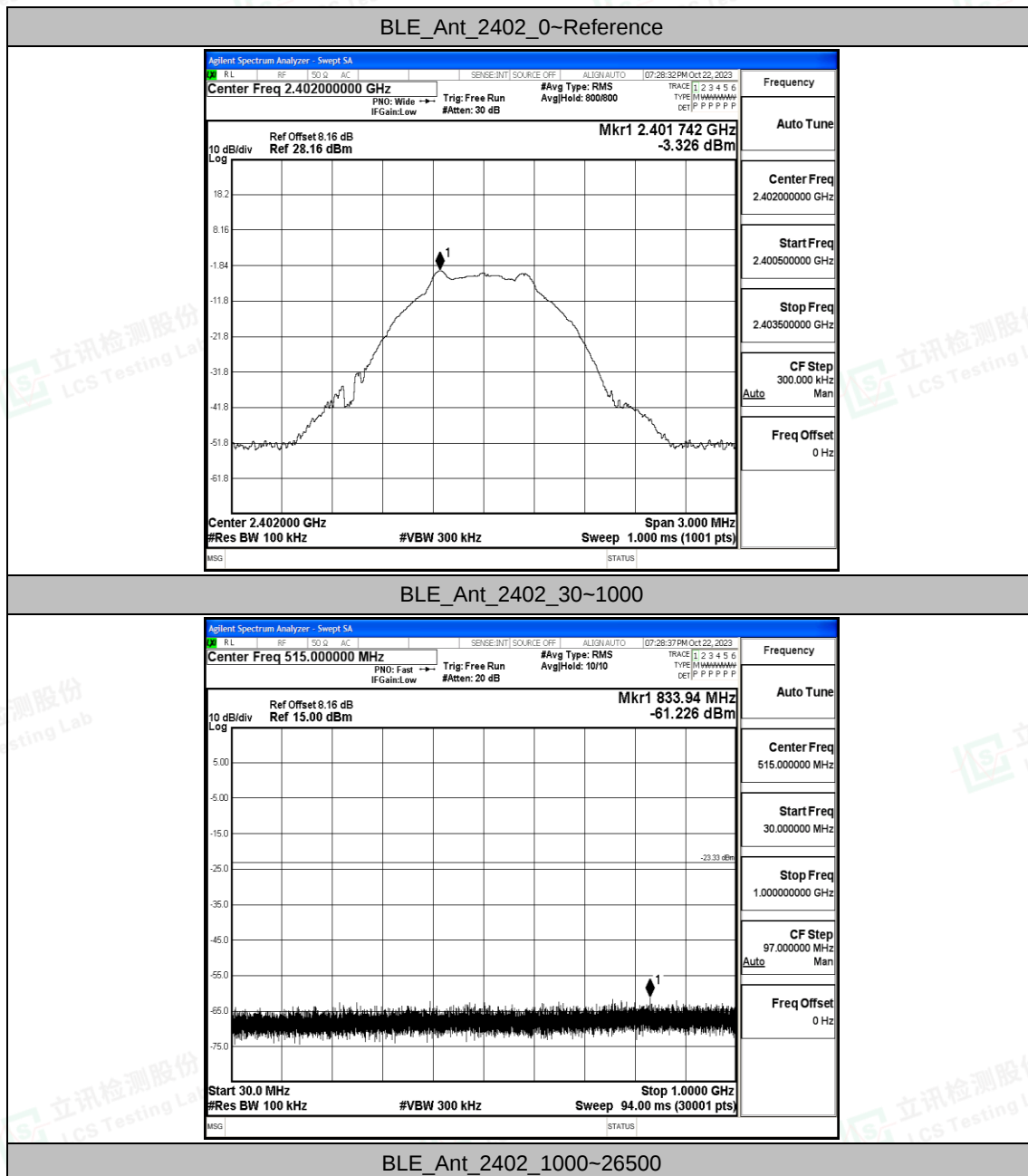
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE	Ant	2402	Reference	-3.33	-3.33	---	PASS
			30~1000	-3.33	-61.23	≤-23.33	PASS
			1000~26500	-3.33	-49	≤-23.33	PASS
		2440	Reference	-2.05	-2.05	---	PASS
			30~1000	-2.05	-61.82	≤-22.05	PASS
			1000~26500	-2.05	-49.52	≤-22.05	PASS
		2480	Reference	-3.88	-3.88	---	PASS
			30~1000	-3.88	-60.91	≤-23.88	PASS
			1000~26500	-3.88	-49.03	≤-23.88	PASS





Test Graphs

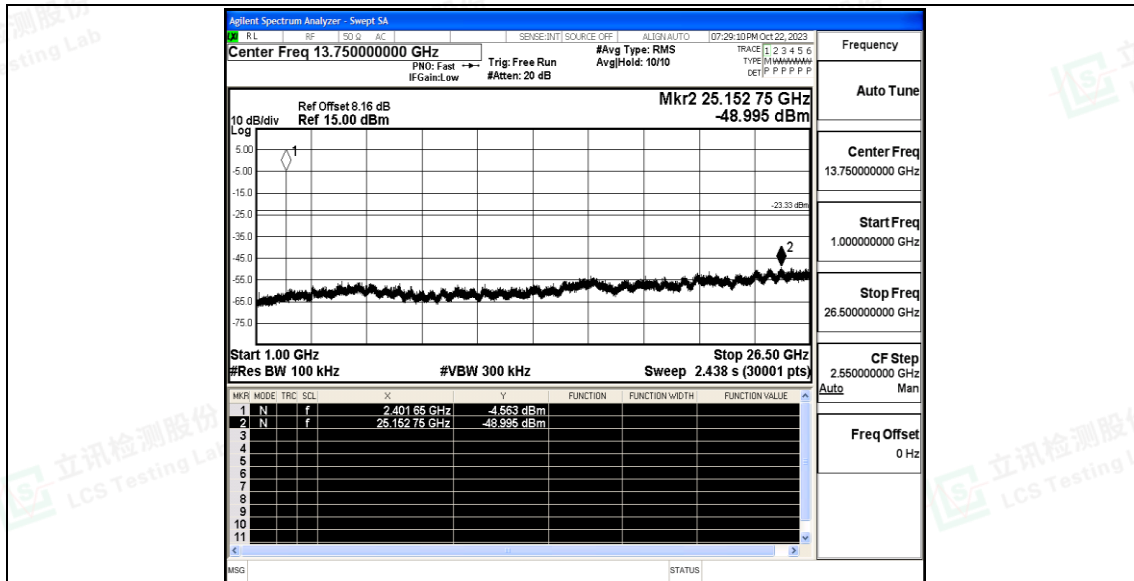


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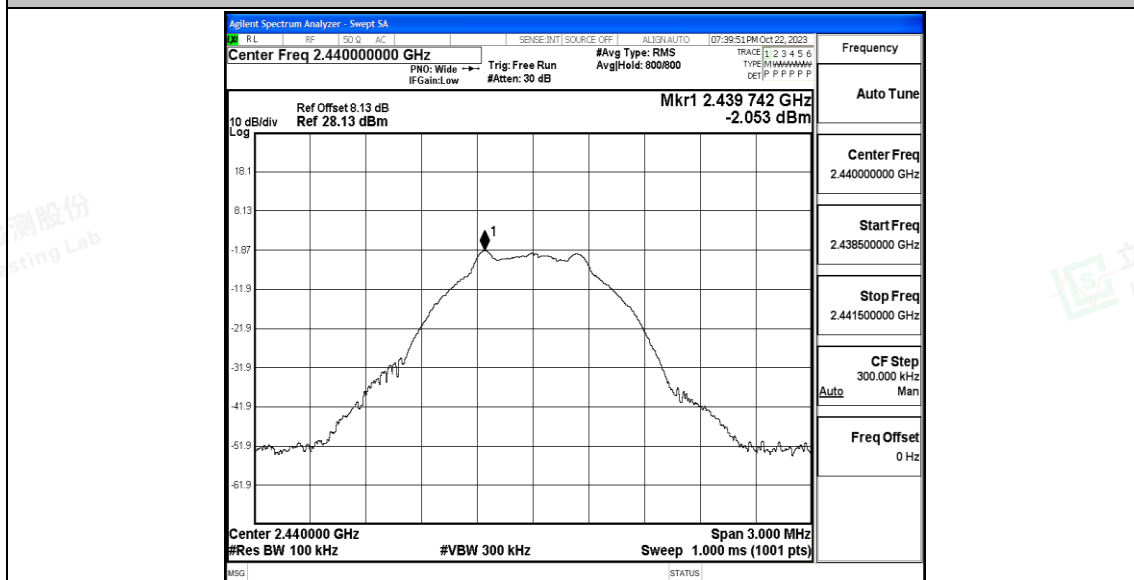
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BLE_Ant_2440_0~Reference



BLE_Ant_2440_30~1000

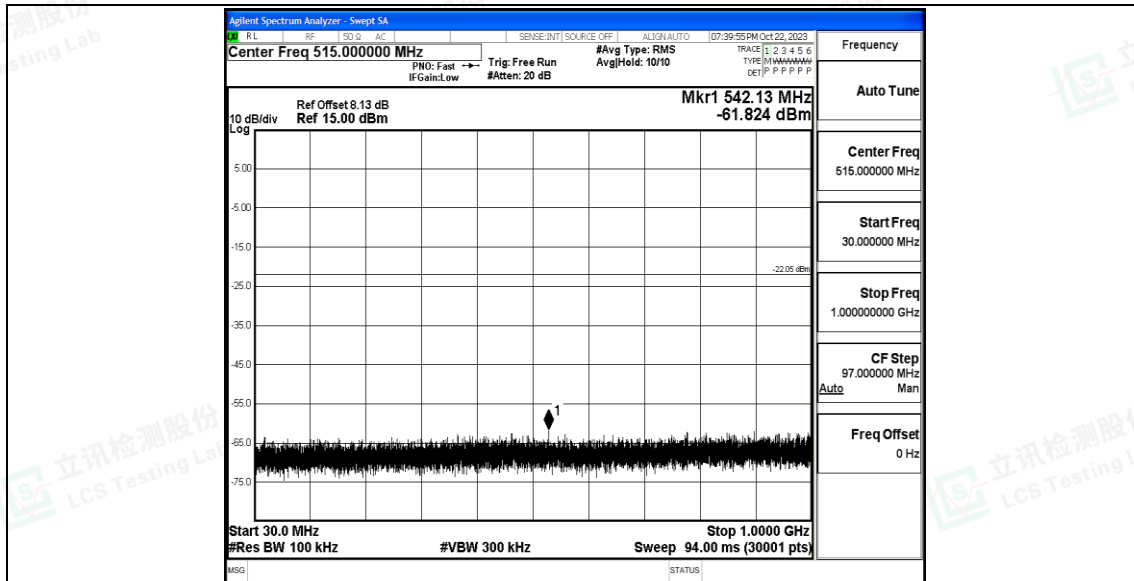


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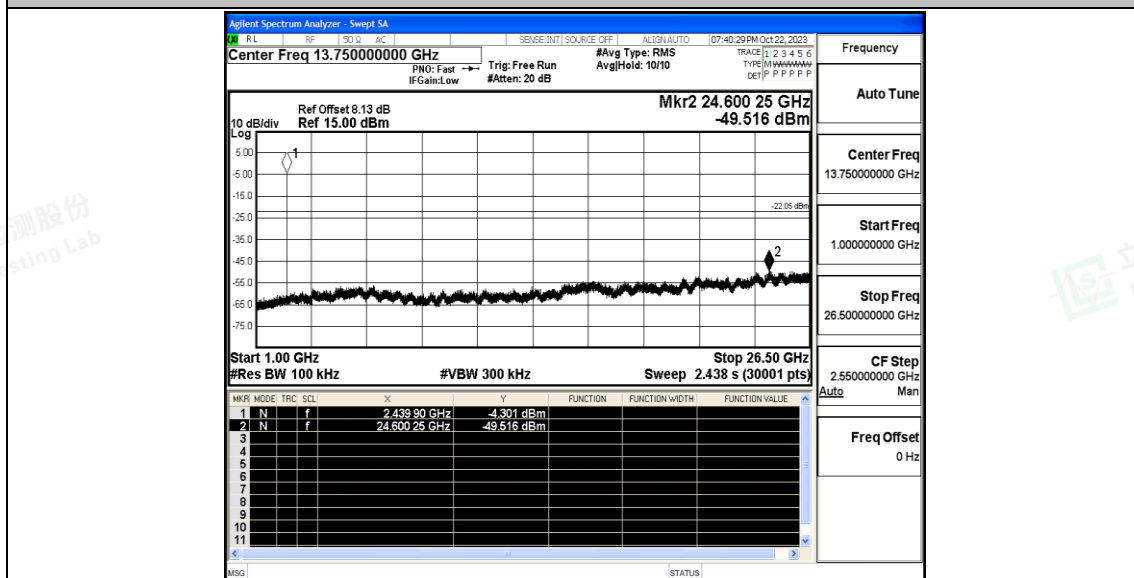
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BLE_Ant_2440_1000~26500



BLE_Ant_2480_0~Reference

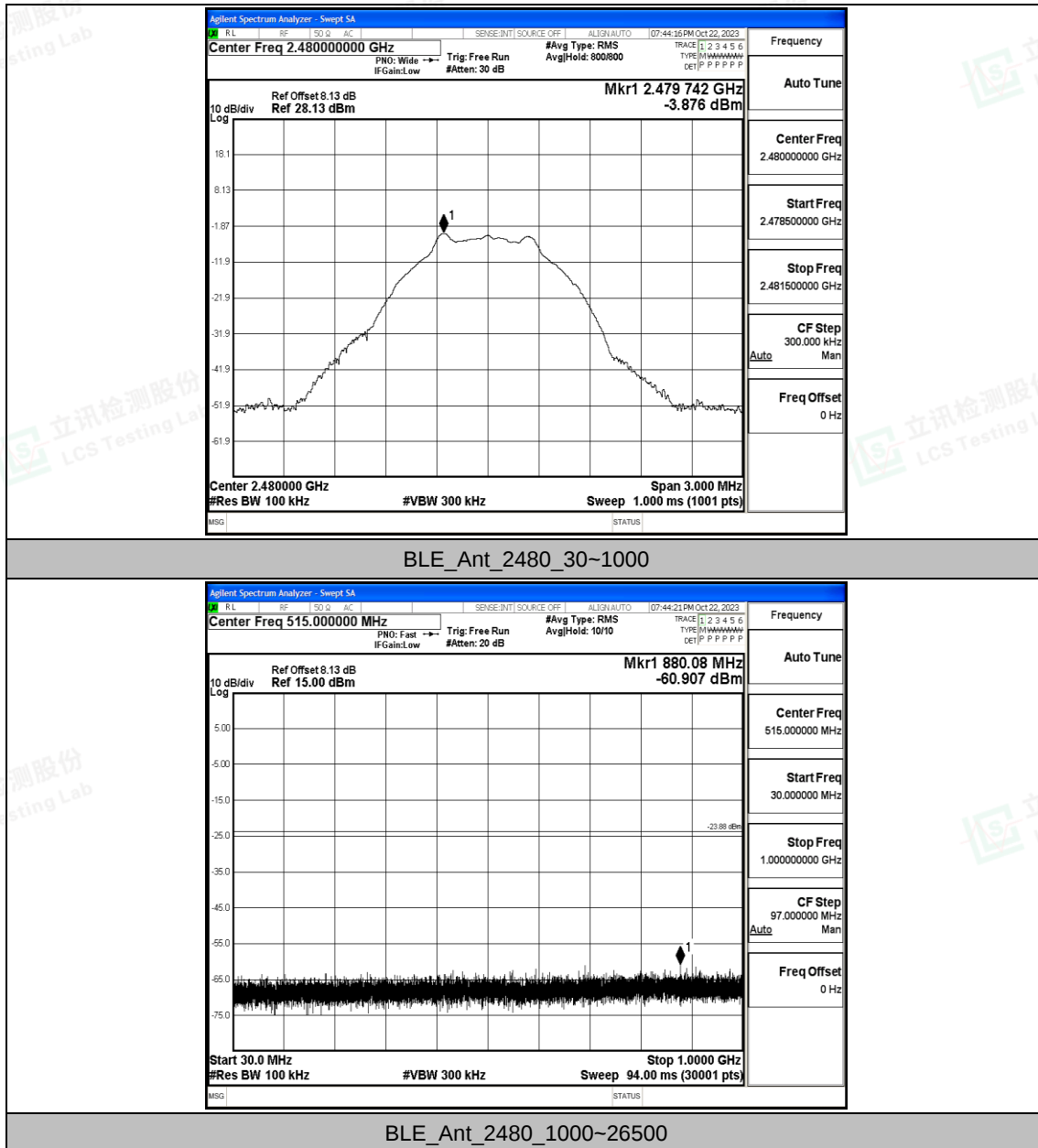


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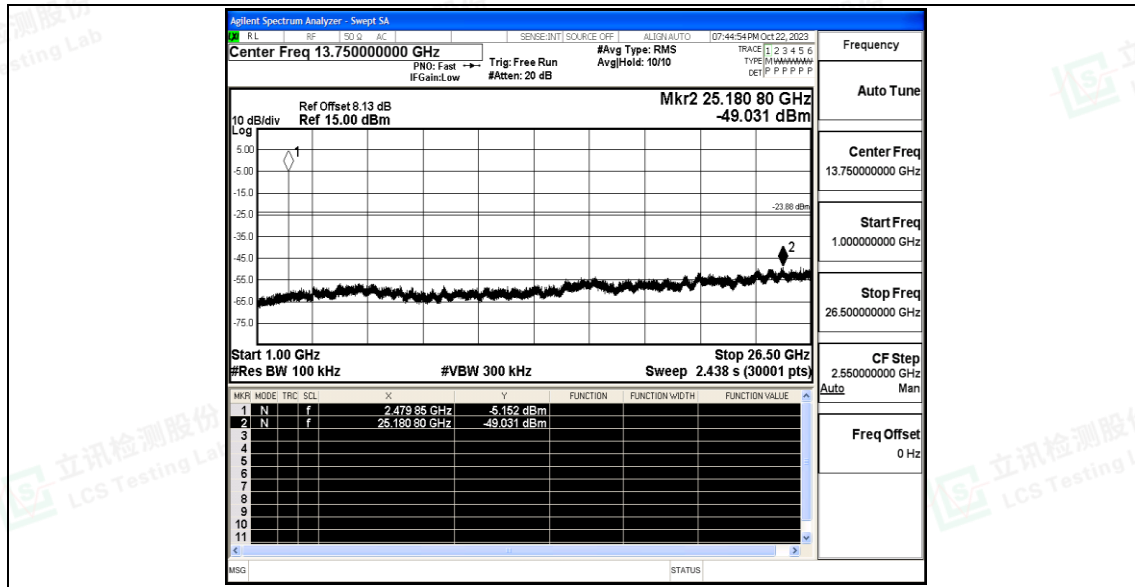


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Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 2M	2402	Ant	-52.42	-20	Pass
NVNT	BLE 2M	2440	Ant	-54.4	-20	Pass
NVNT	BLE 2M	2480	Ant	-51.34	-20	Pass



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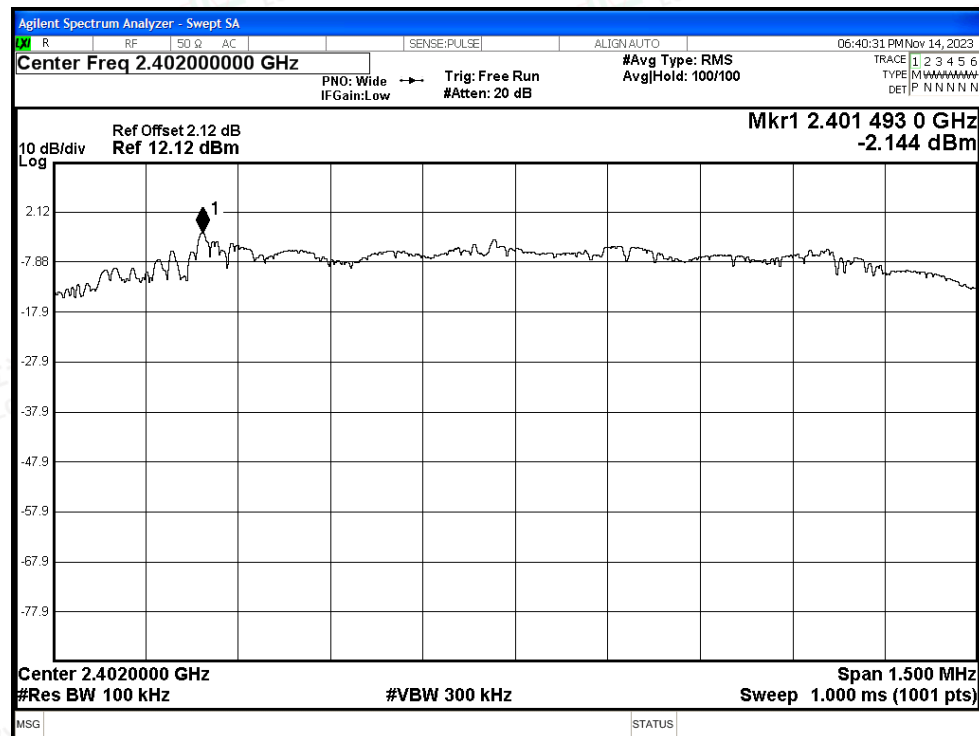
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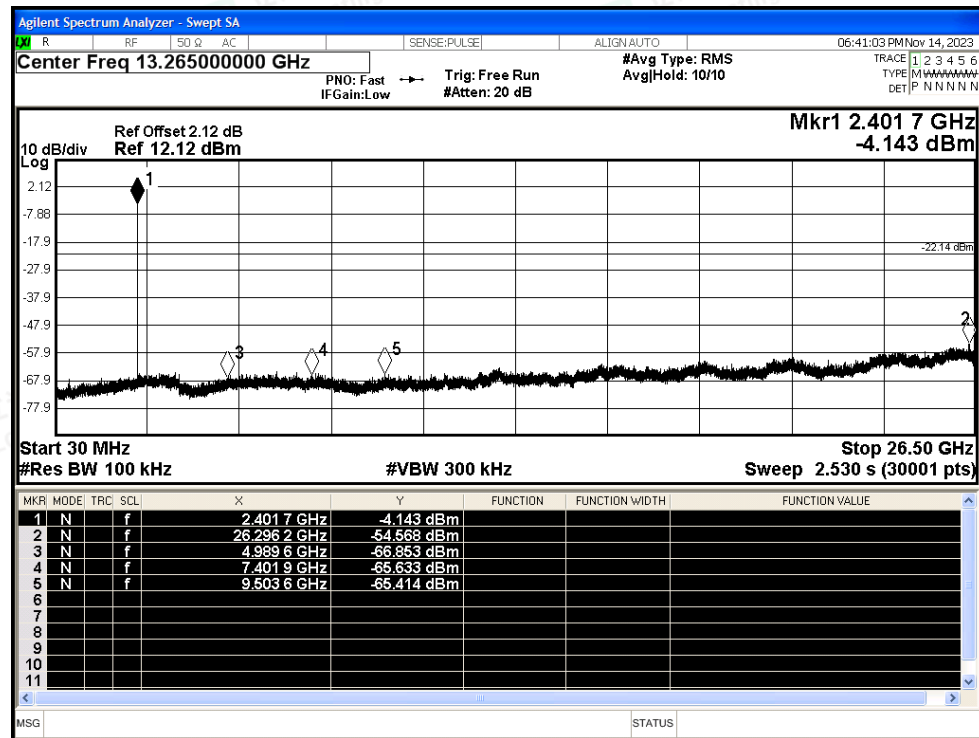


Test Graphs

Tx. Spurious NVNT BLE 2M 2402MHz Ant Ref



Tx. Spurious NVNT BLE 2M 2402MHz Ant Emission



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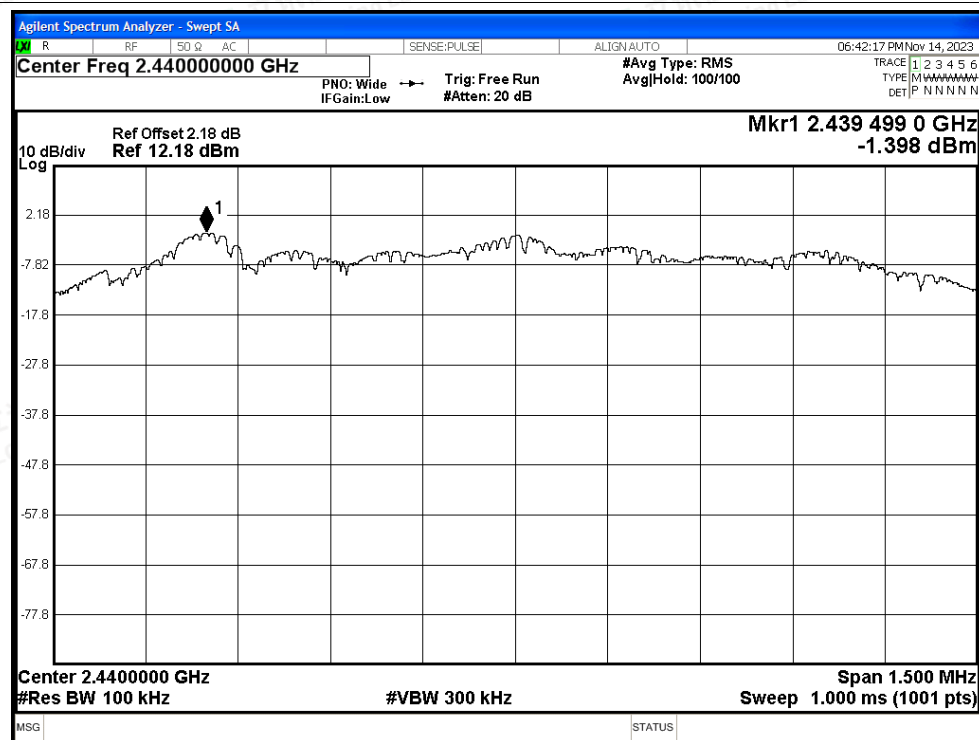
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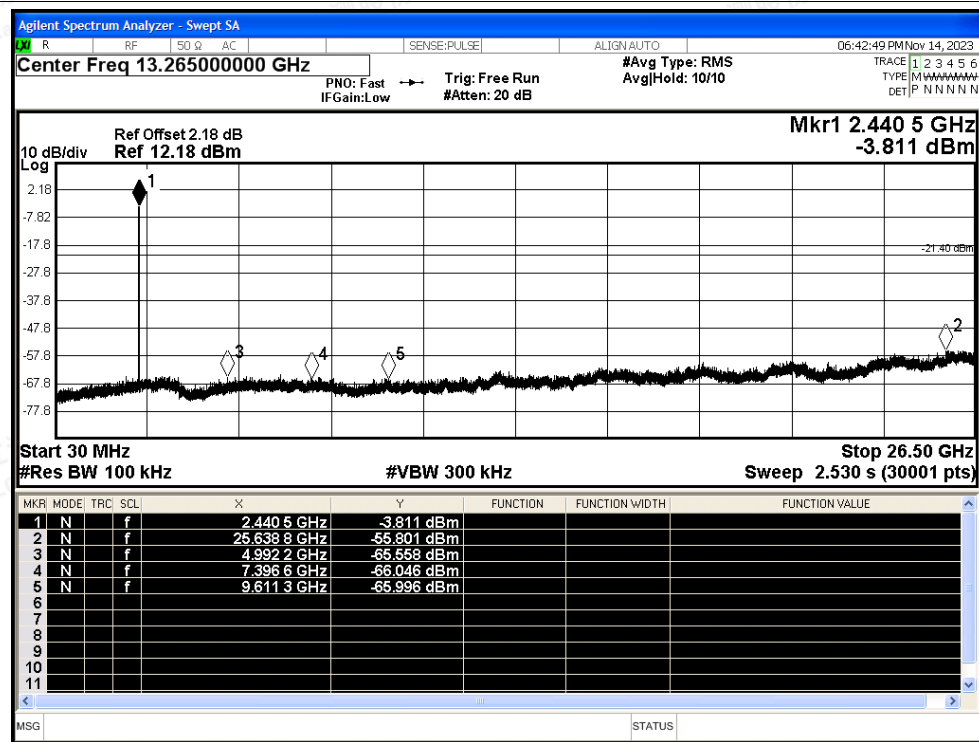
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Tx. Spurious NVNT BLE 2M 2440MHz Ant Ref



Tx. Spurious NVNT BLE 2M 2440MHz Ant Emission



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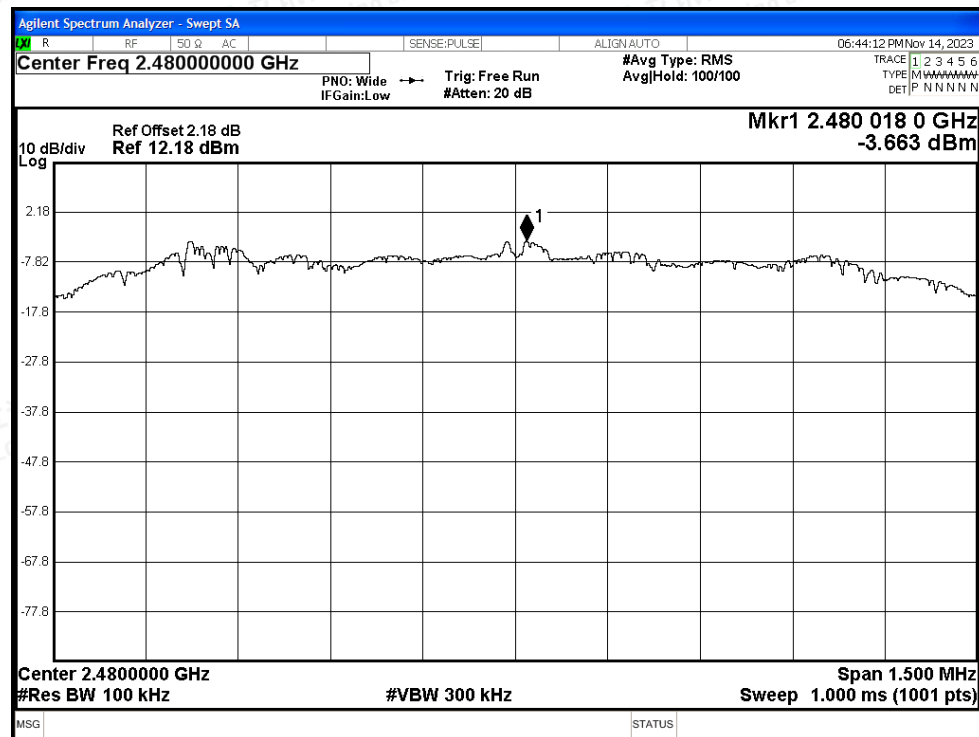
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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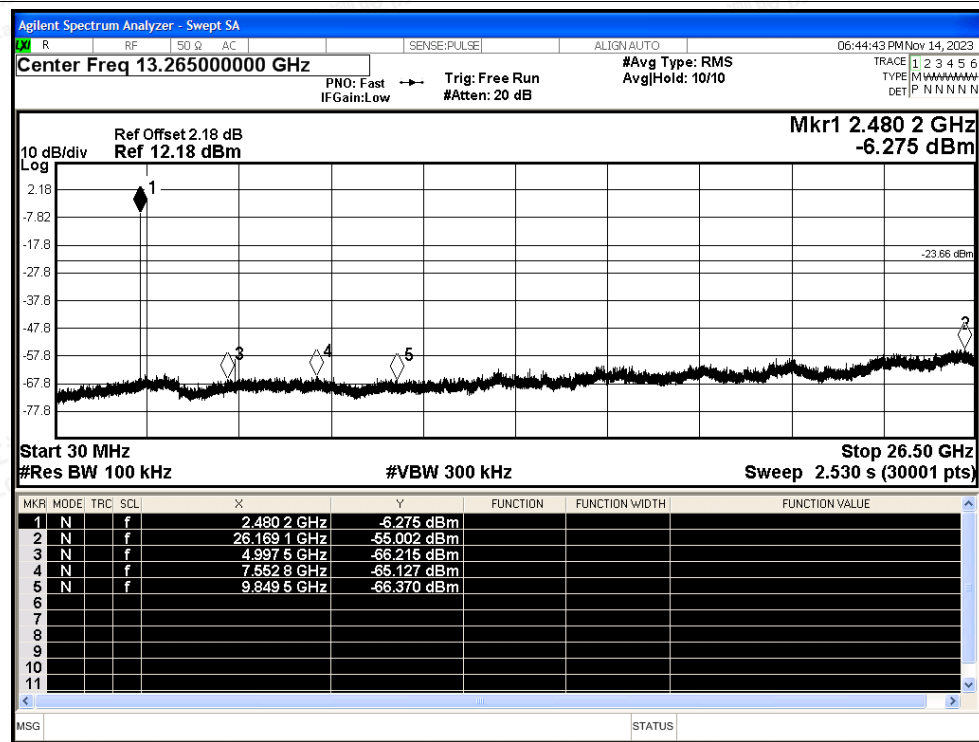
Scan code to check authenticity



Tx. Spurious NVNT BLE 2M 2480MHz Ant Ref



Tx. Spurious NVNT BLE 2M 2480MHz Ant Emission



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B.7 Duty Cycle

Test Result

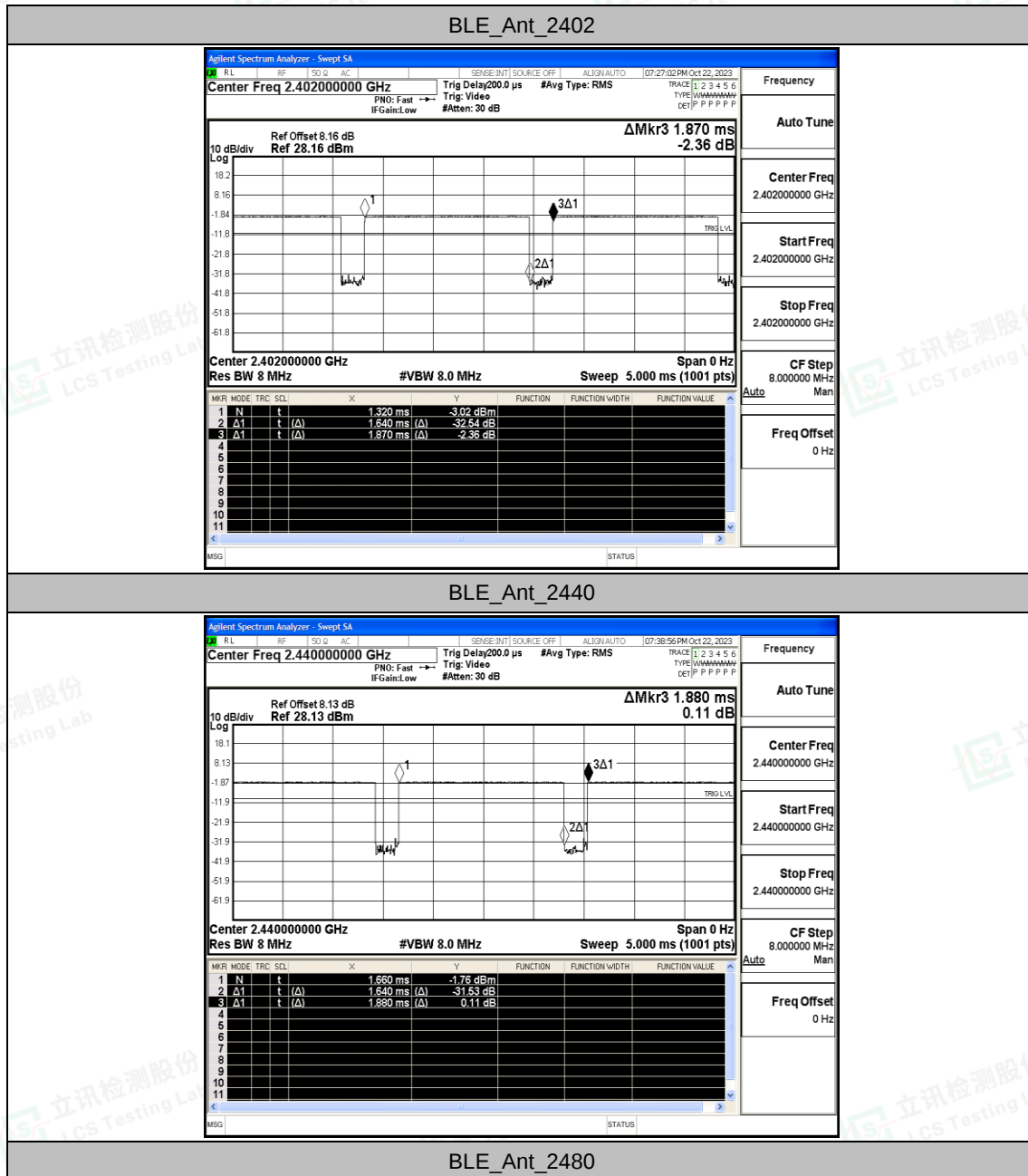
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant	85.08	0.7	0.47
NVNT	BLE 1M	2440	Ant	85.08	0.7	0.47
NVNT	BLE 1M	2480	Ant	85.08	0.7	0.47



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Test Graphs

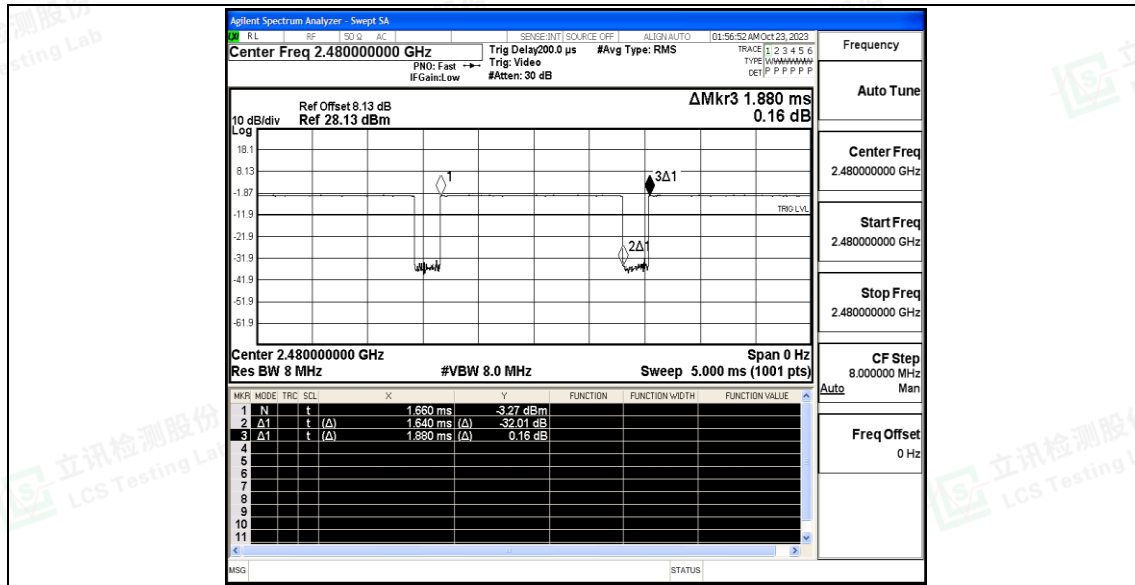


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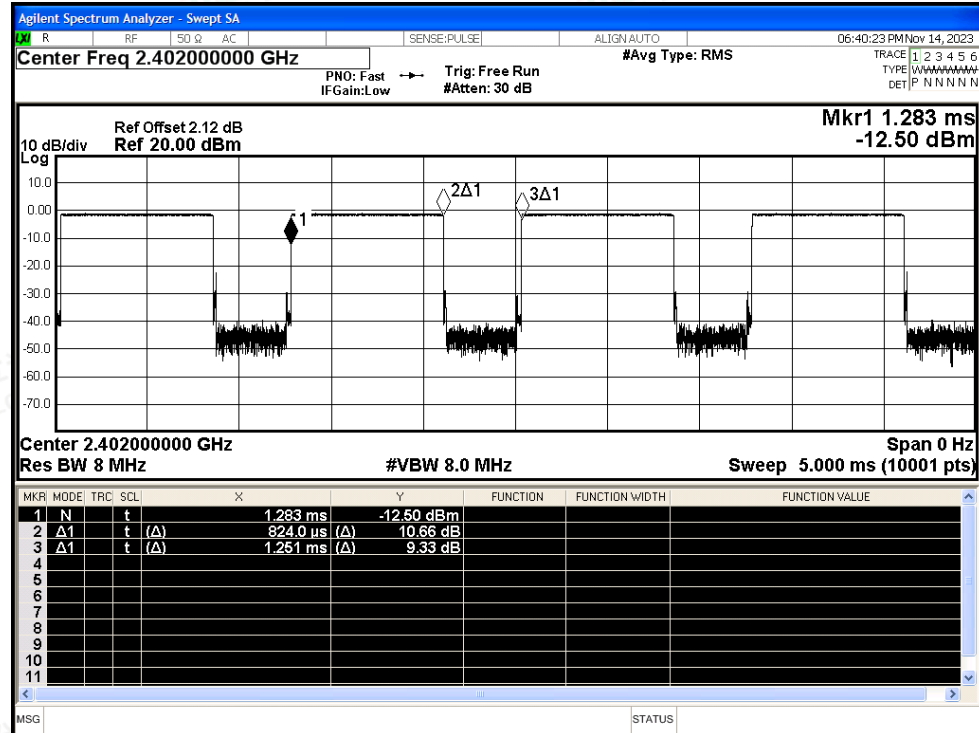
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 2M	2402	Ant	65.89	1.81	1.21
NVNT	BLE 2M	2440	Ant	65.92	1.81	1.21
NVNT	BLE 2M	2480	Ant	65.92	1.81	1.21



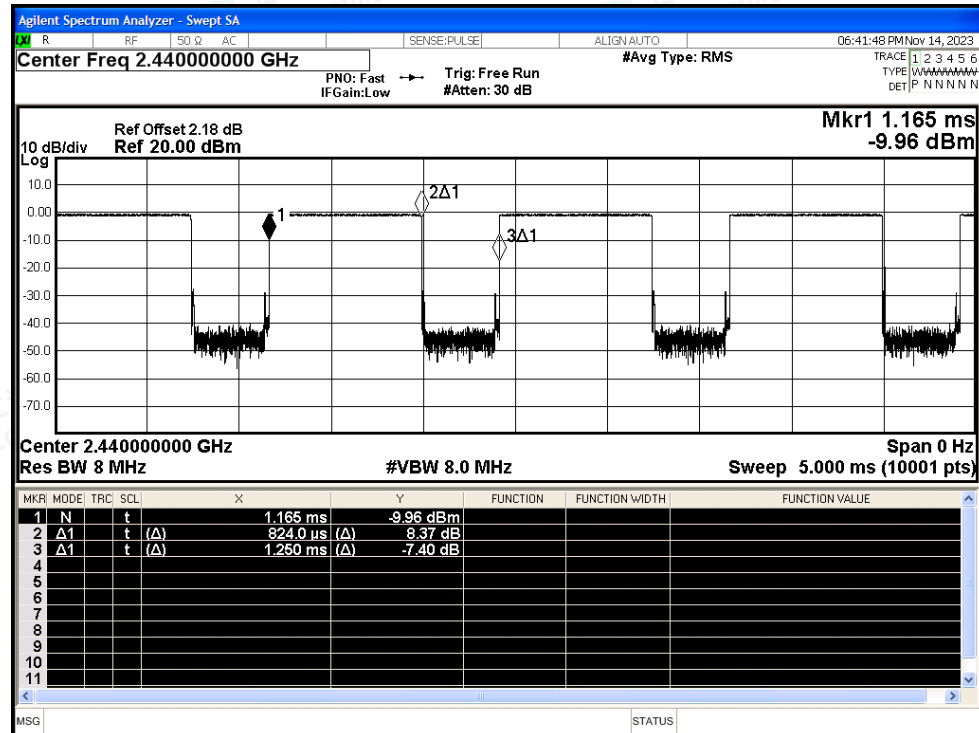


Test Graphs

Duty Cycle NVNT BLE 2M 2402MHz Ant



Duty Cycle NVNT BLE 2M 2440MHz Ant

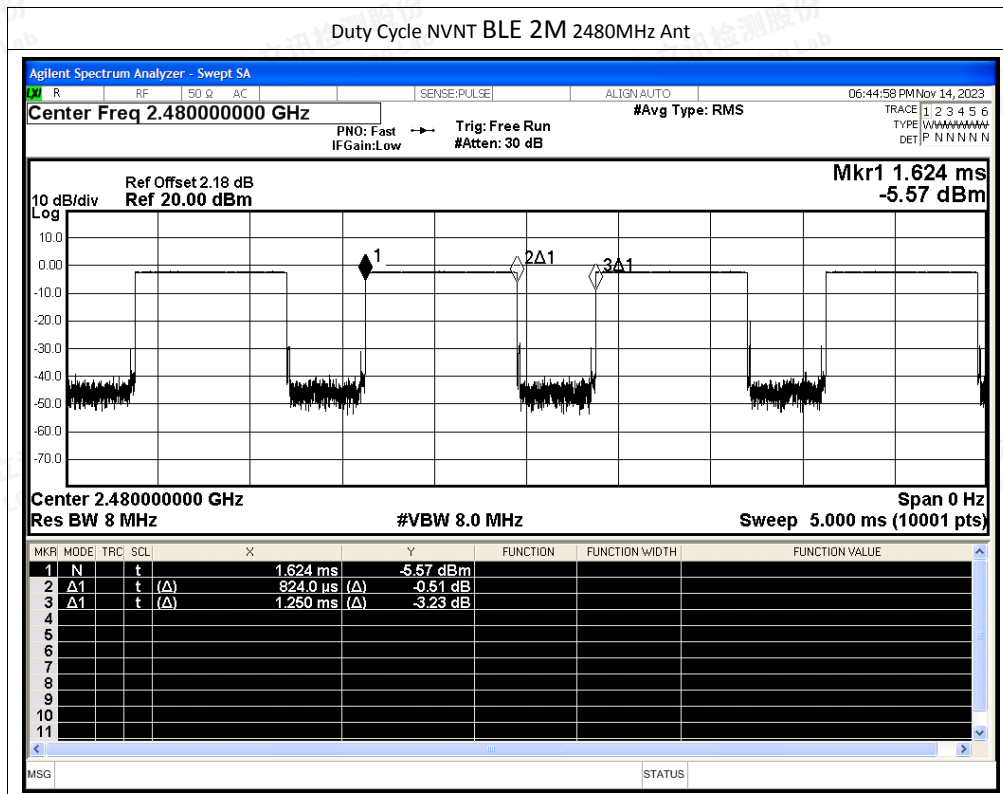


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B.8 Emissions in Restricted Bands

Test Result

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1M	2402	Ant1	2310	-51.24	2	-	46.02	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2310	-58.57	2	0.7	39.39	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2369.712	-47.42	2	-	49.84	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2384.592	-57.63	2	0.7	40.33	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2390	-51.52	2	-	45.74	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2390	-58.39	2	0.7	39.57	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-50.14	2	-	47.12	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-57.97	2	0.7	39.99	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2486.656	-47.43	2	-	49.83	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2496.688	-57.22	2	0.7	40.74	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2500	-49.51	2	-	47.75	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2500	-58.35	2	0.7	39.61	Average	54	Pass

Note: 1M and 2M were tested, the report only recorded the worst result of 1M

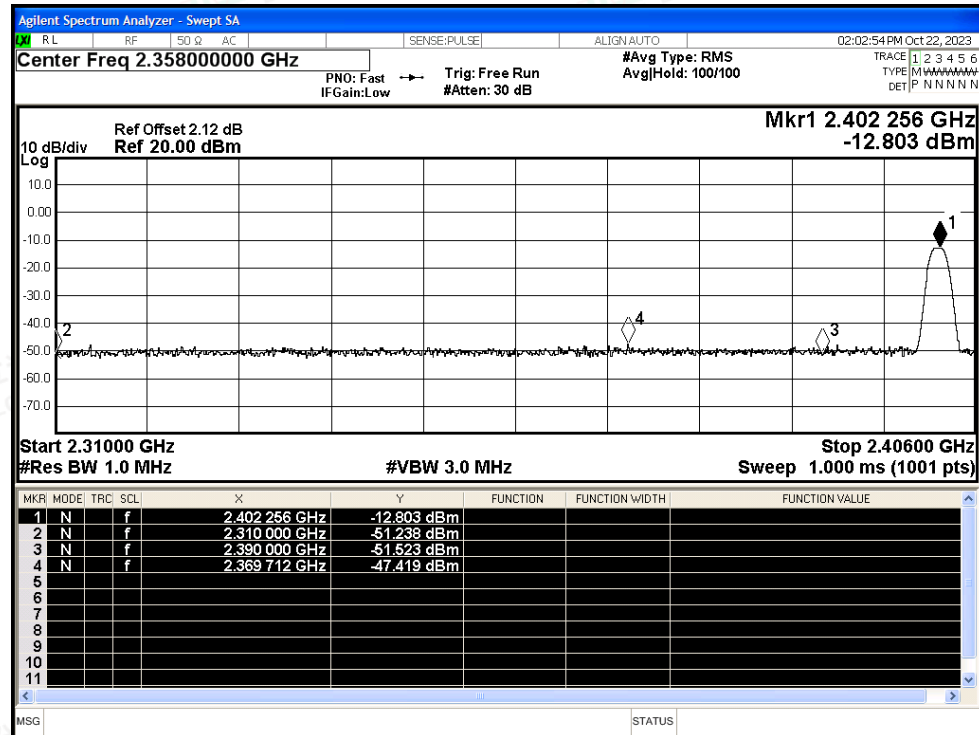


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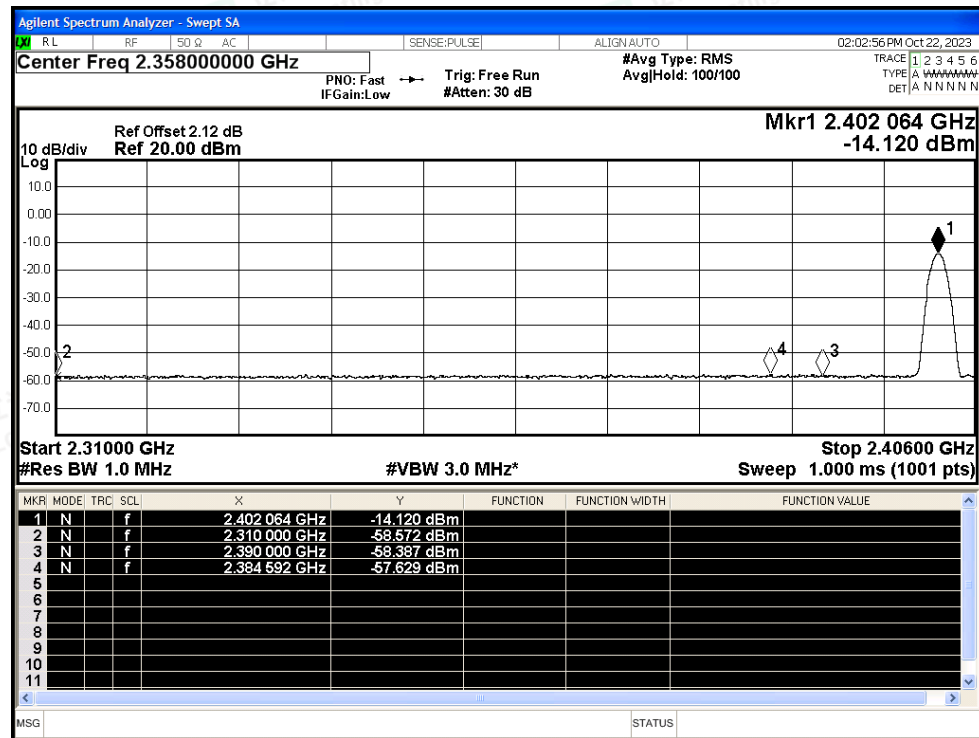


Test Graphs

Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak



Restrict Band NVNT BLE 1M 2402MHz Ant1 Average



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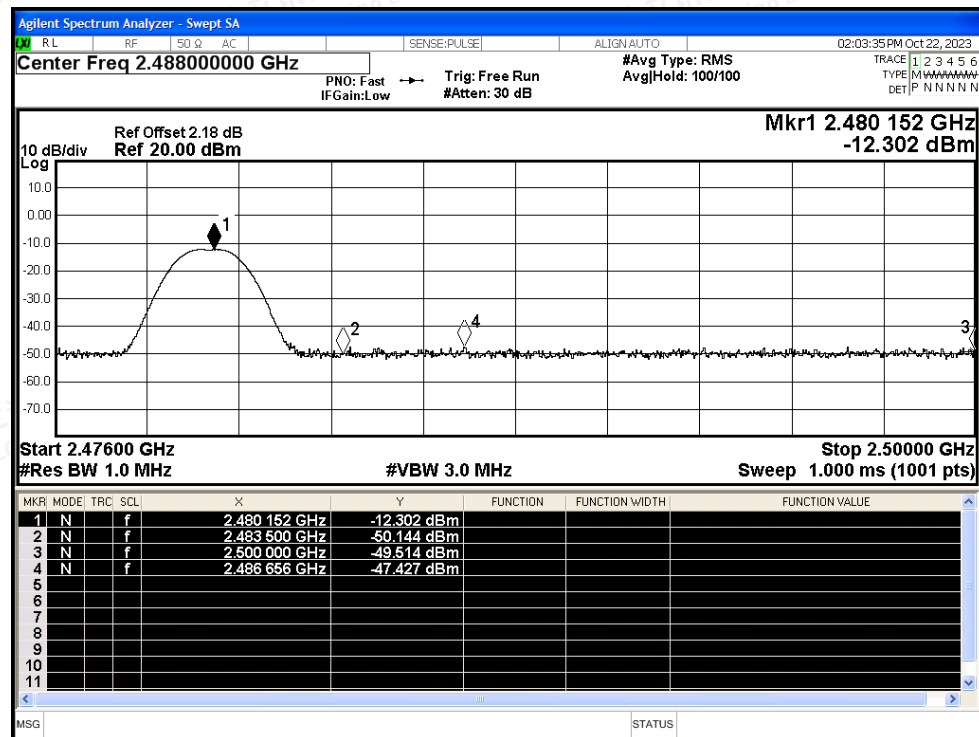
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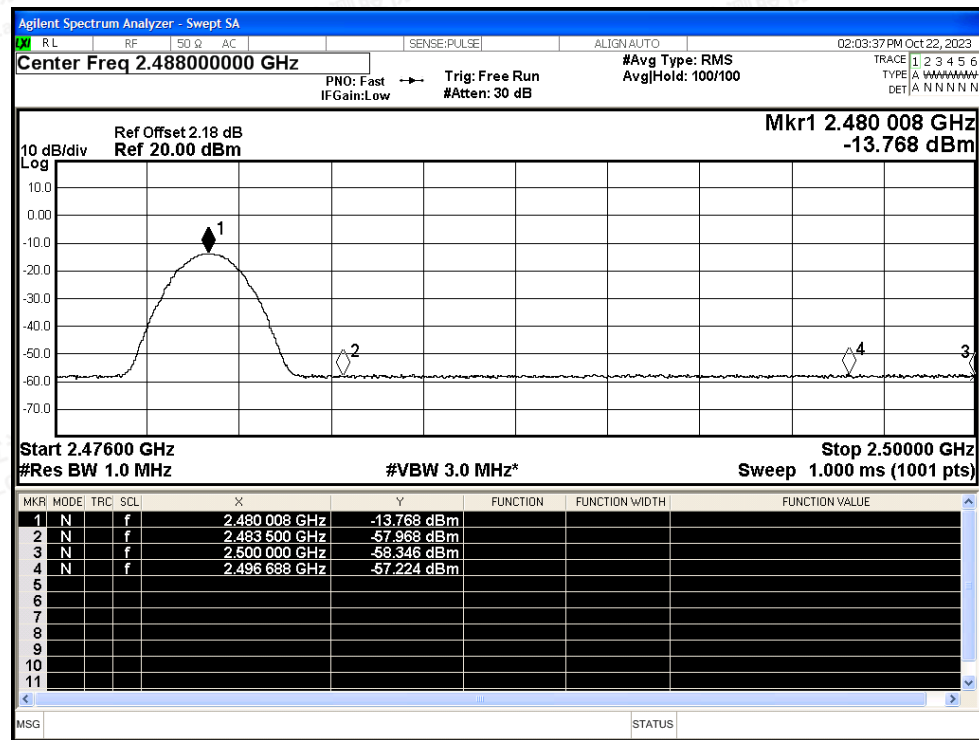
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Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



Restrict Band NVNT BLE 1M 2480MHz Ant1 Average



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