



Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: Catron AI

Test Model: WIA4BR

Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Bill Zhu
Supervised by:	Li Huan





A.1 6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	6 dB Bandwidth (MHz)	Limit 6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.632	0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.663	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.661	0.5	Pass
NVNT	BLE 2M	2402	Ant1	1.111	0.5	Pass
NVNT	BLE 2M	2440	Ant1	1.124	0.5	Pass
NVNT	BLE 2M	2480	Ant1	1.102	0.5	Pass



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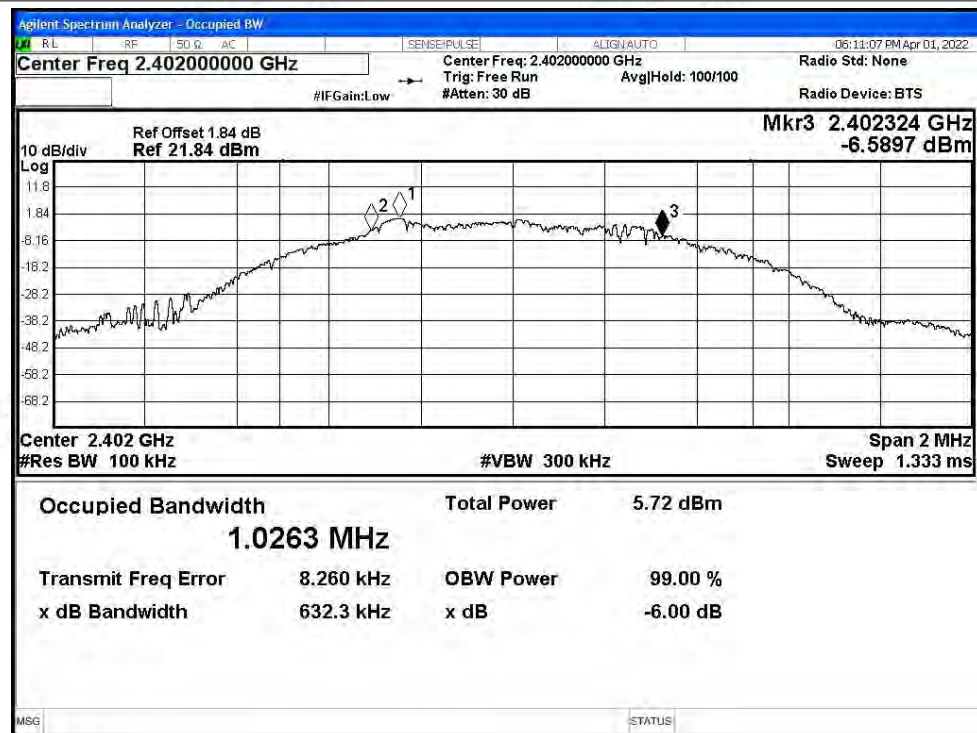
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

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Test Graphs

6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



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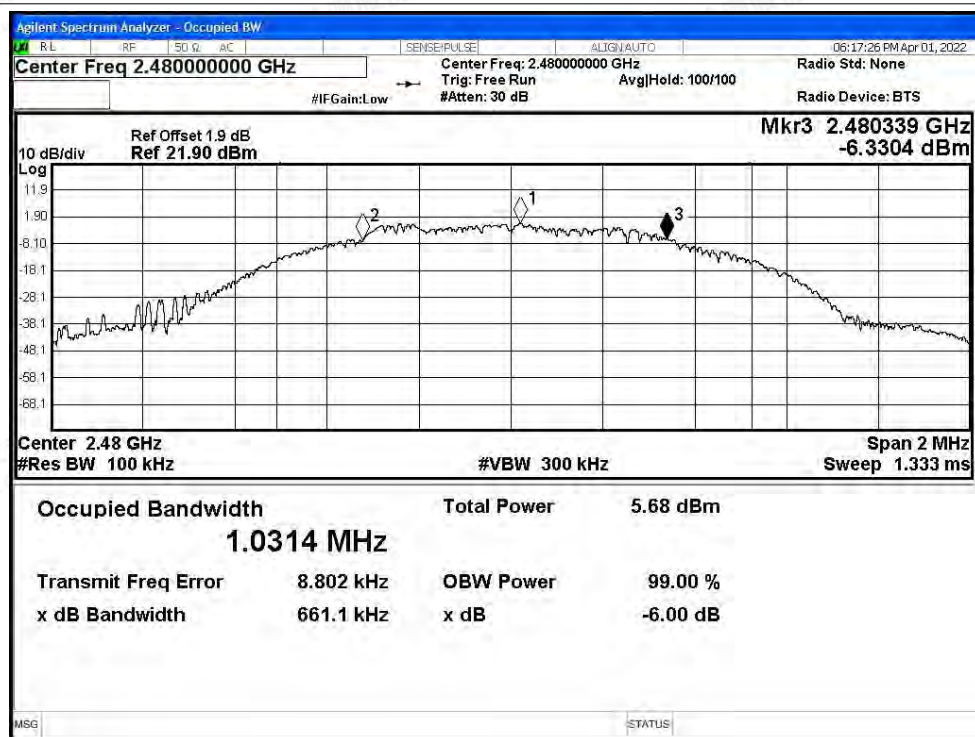
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



6dB Bandwidth NVNT BLE 2M 2402MHz Ant1



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6dB Bandwidth NVNT BLE 2M 2440MHz Ant1



6dB Bandwidth NVNT BLE 2M 2480MHz Ant1



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A.2 Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	0.49	30	Pass
NVNT	BLE 1M	2440	Ant1	0.02	30	Pass
NVNT	BLE 1M	2480	Ant1	0.63	30	Pass
NVNT	BLE 2M	2402	Ant1	0.45	30	Pass
NVNT	BLE 2M	2440	Ant1	1.84	30	Pass
NVNT	BLE 2M	2480	Ant1	0.59	30	Pass



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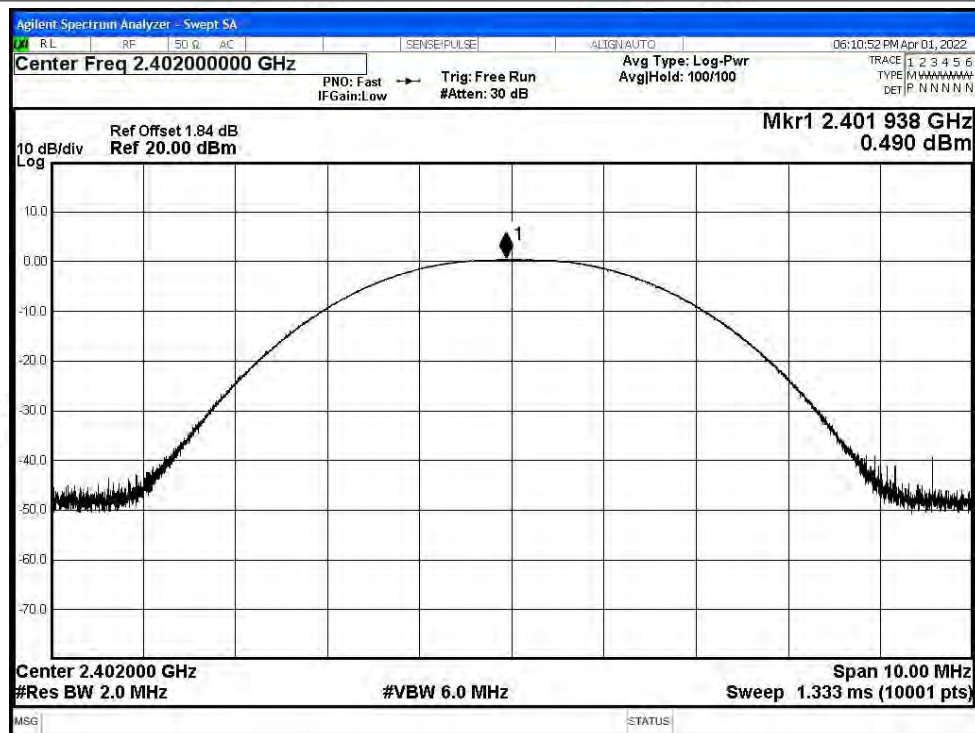
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

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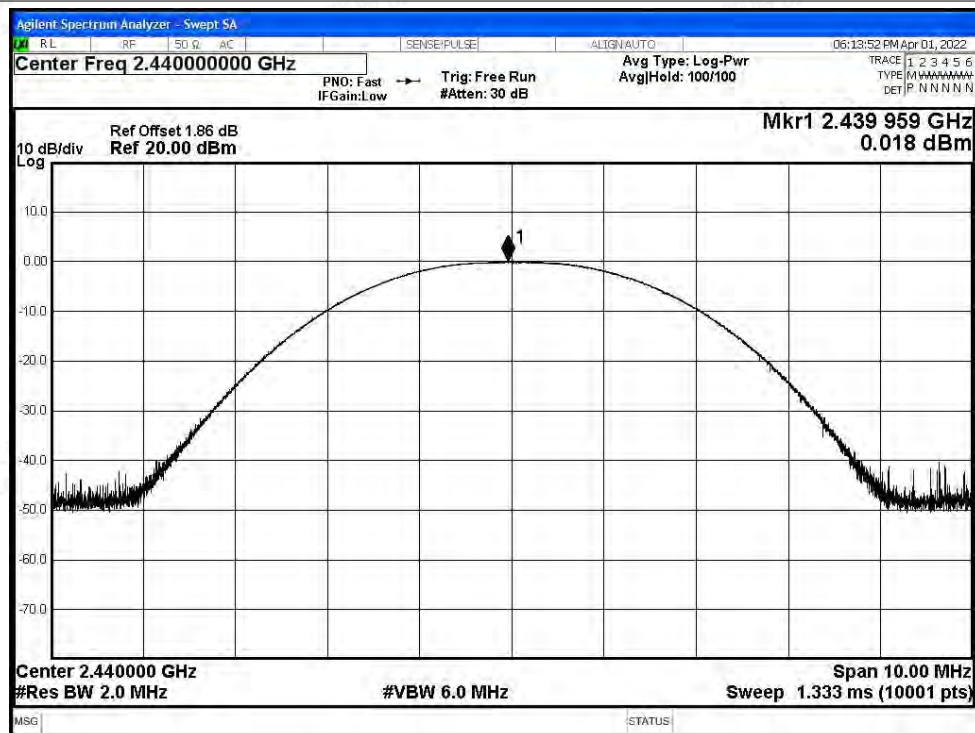


Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1



Shenzhen LCS Compliance Testing Laboratory Ltd.

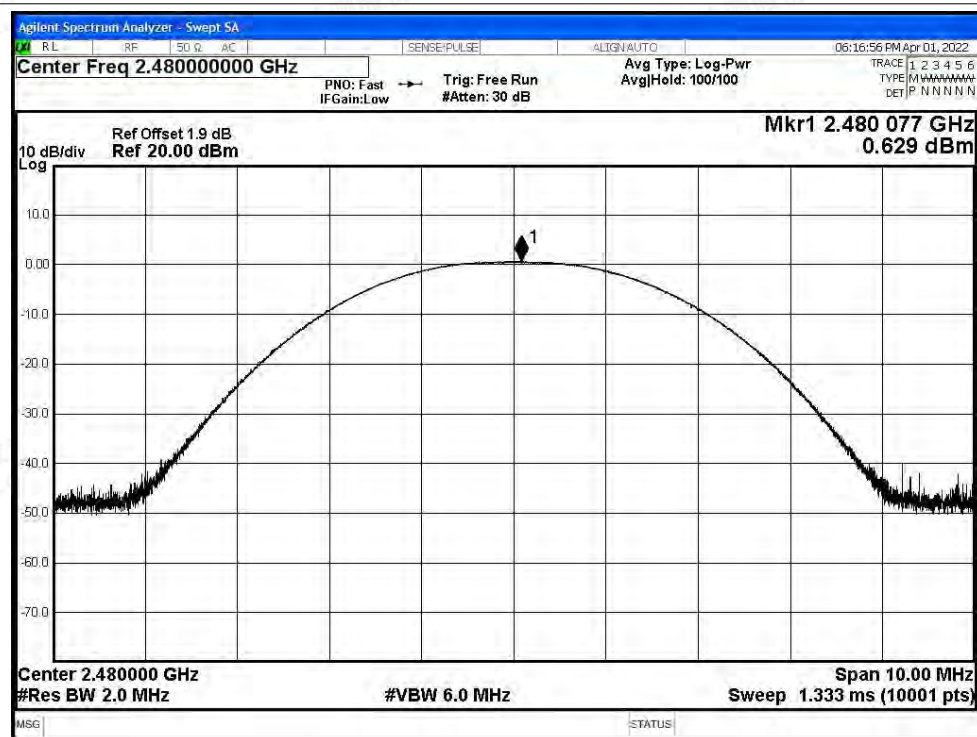
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

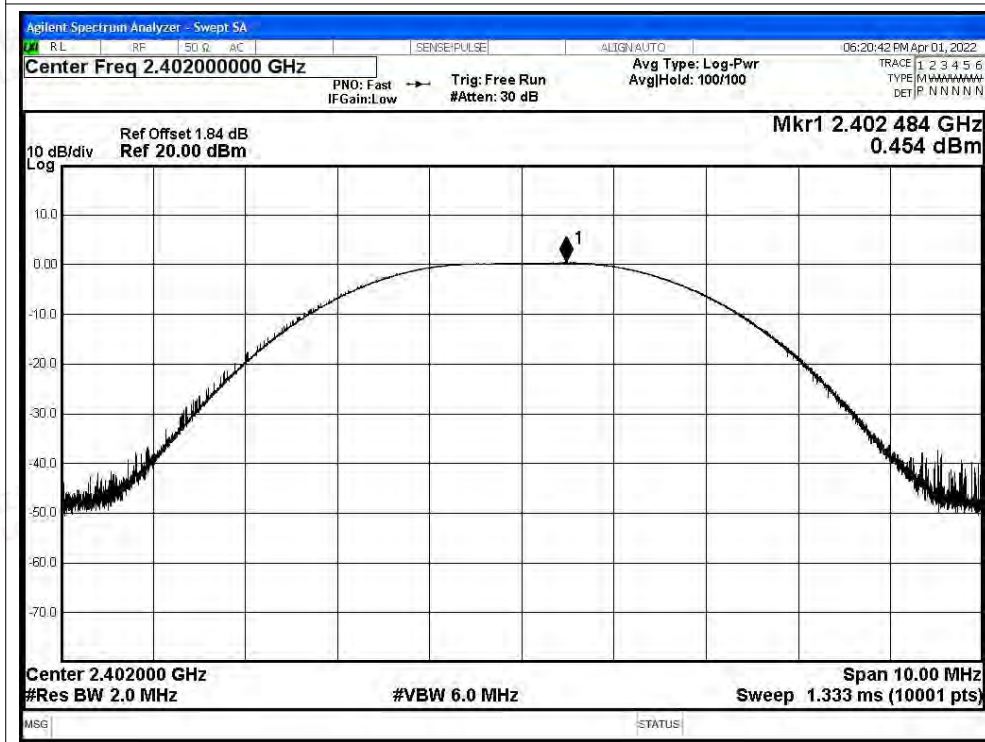
Scan code to check authenticity



Power NVNT BLE 1M 2480MHz Ant1



Power NVNT BLE 2M 2402MHz Ant1



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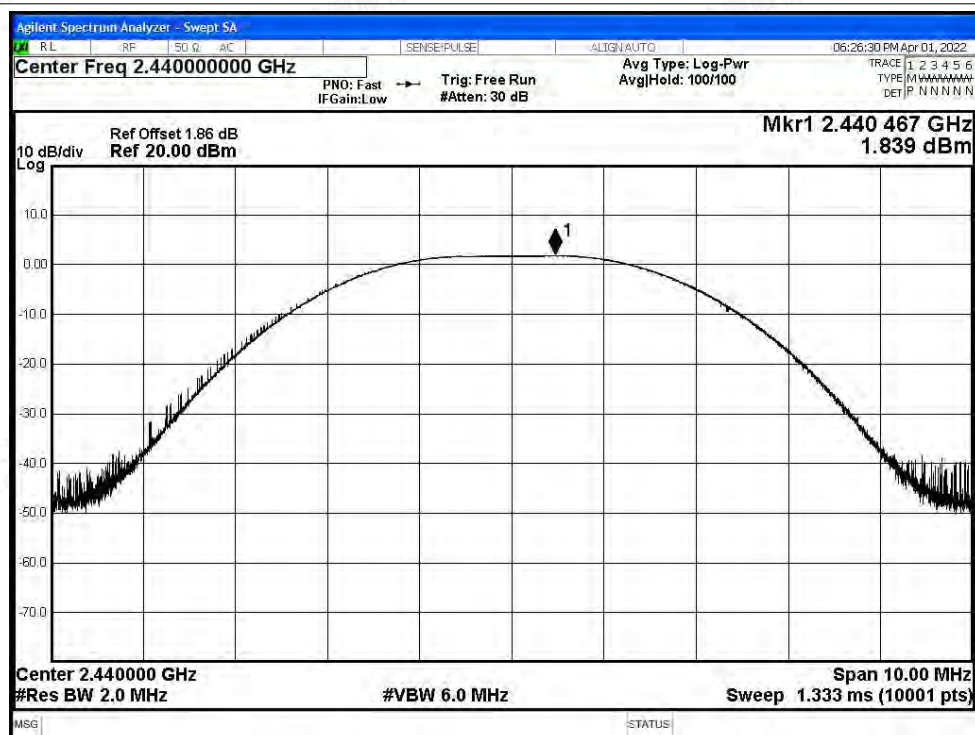
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

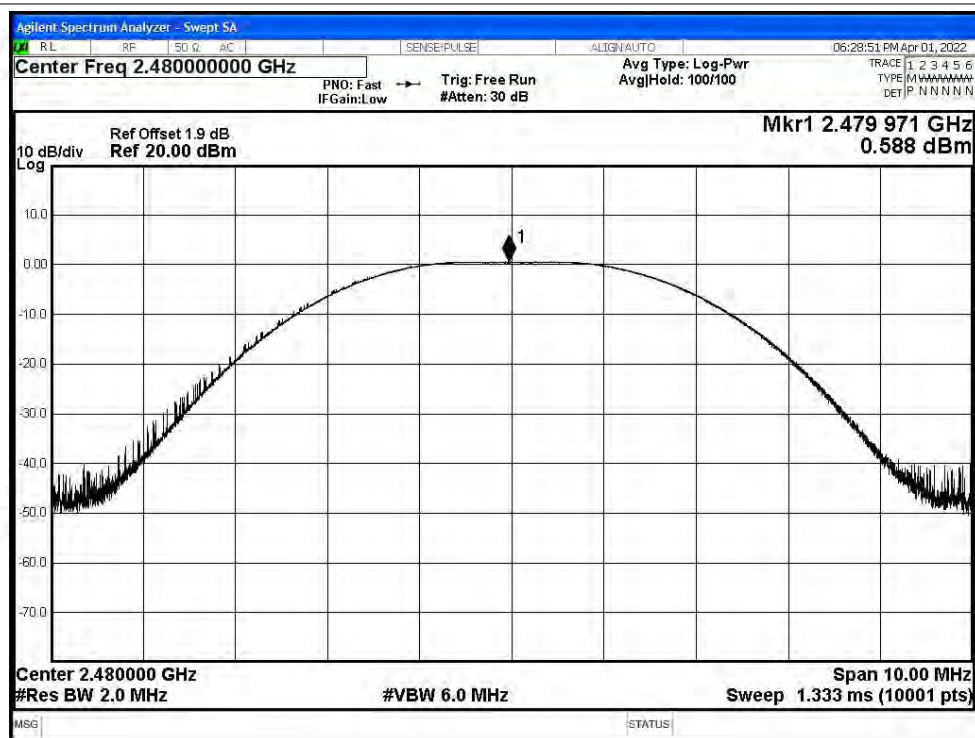
Scan code to check authenticity



Power NVNT BLE 2M 2440MHz Ant1



Power NVNT BLE 2M 2480MHz Ant1



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A.3 Maximum Power Spectral Density

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	-15.07	0	-15.07	8	Pass
NVNT	BLE 1M	2440	Ant1	-15.3	0	-15.3	8	Pass
NVNT	BLE 1M	2480	Ant1	-14.65	0	-14.65	8	Pass
NVNT	BLE 2M	2402	Ant1	-17.17	0	-17.17	8	Pass
NVNT	BLE 2M	2440	Ant1	-15.57	0	-15.57	8	Pass
NVNT	BLE 2M	2480	Ant1	-16.79	0	-16.79	8	Pass



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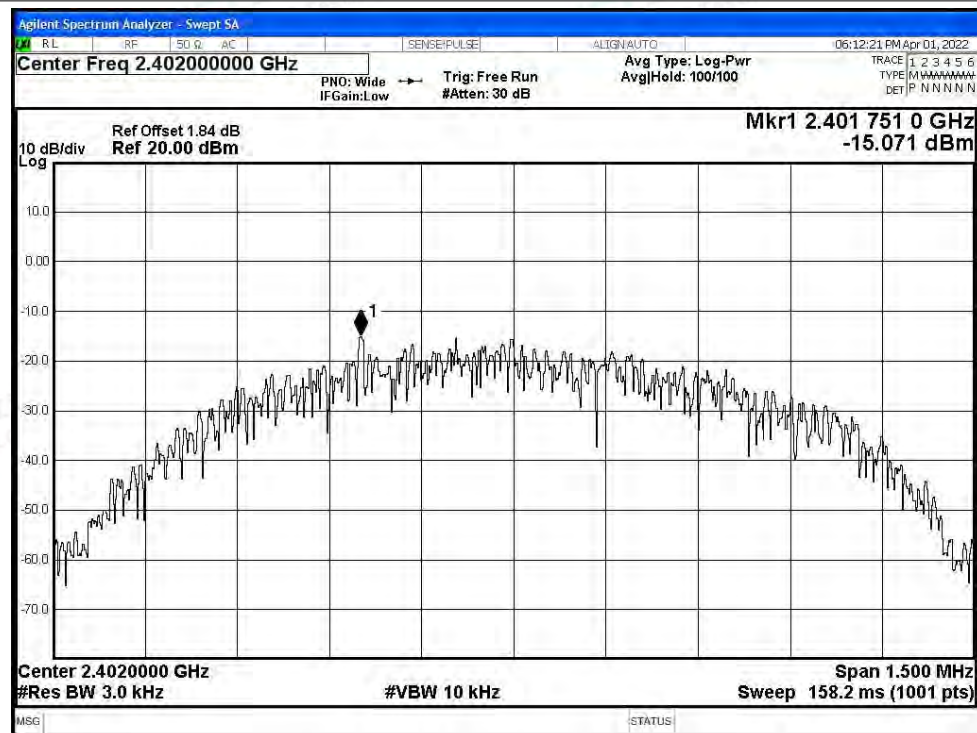
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

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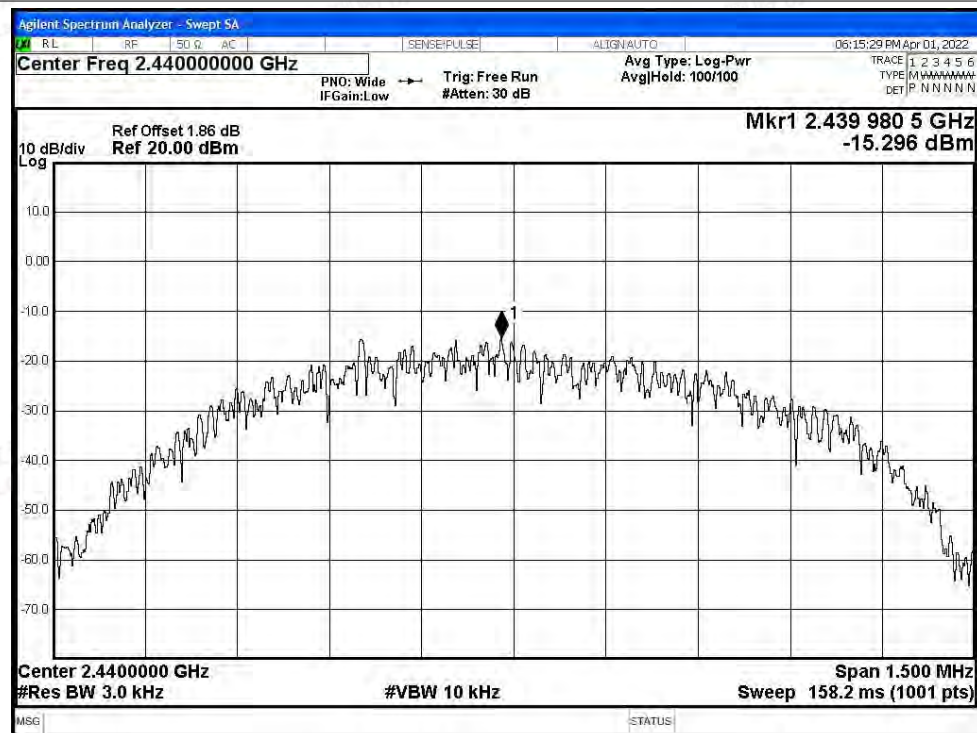


Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1



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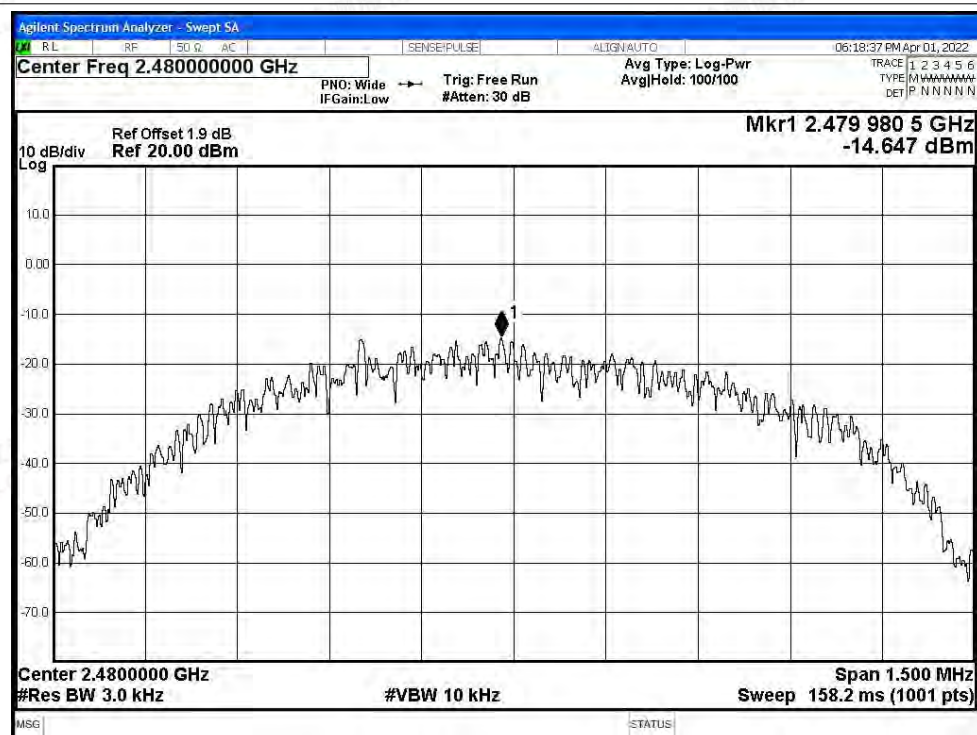
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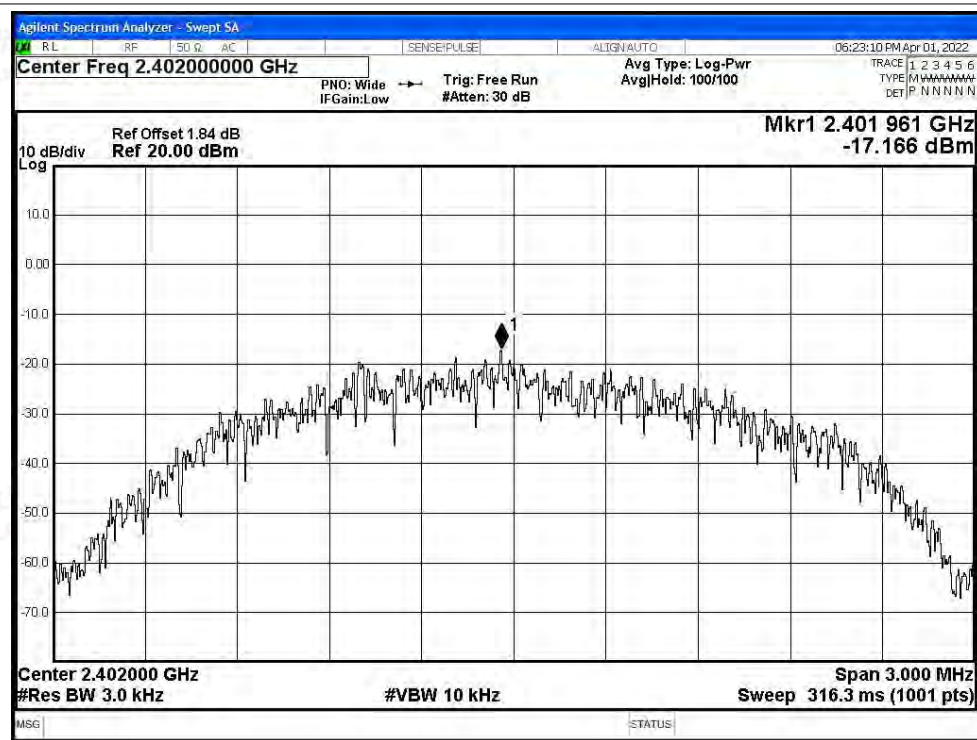
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PSD NVNT BLE 1M 2480MHz Ant1



PSD NVNT BLE 2M 2402MHz Ant1



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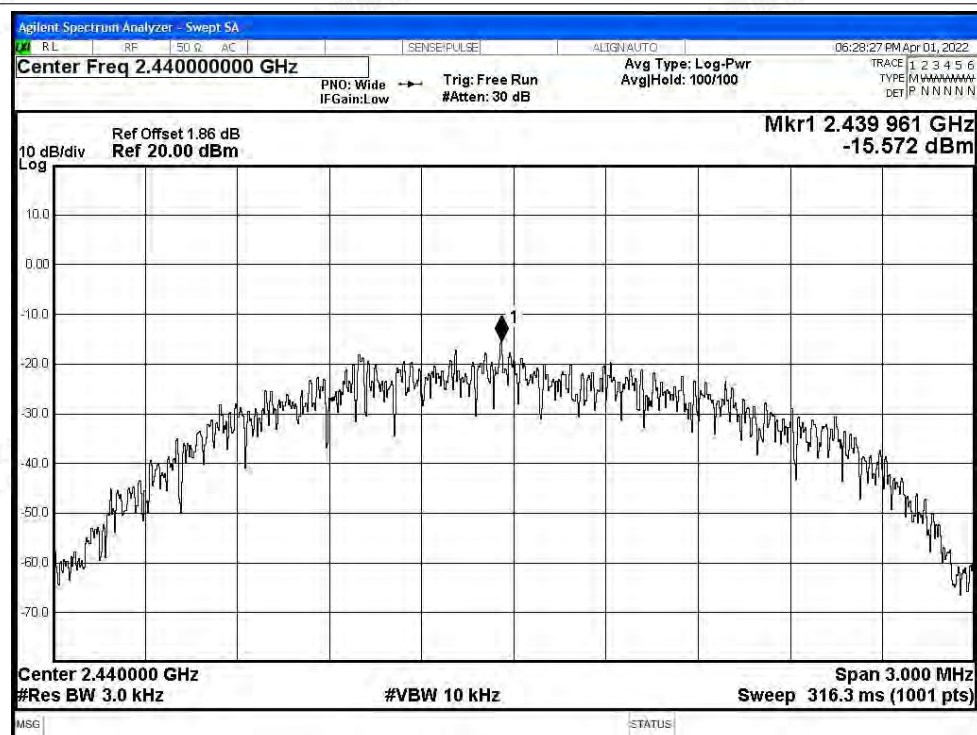
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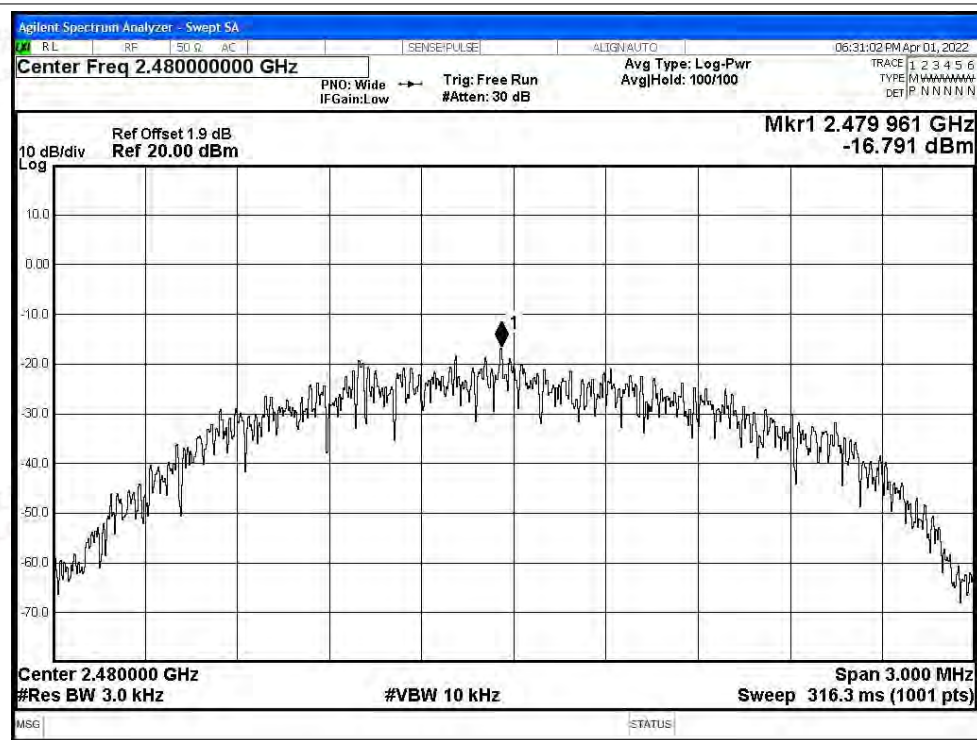
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PSD NVNT BLE 2M 2440MHz Ant1



PSD NVNT BLE 2M 2480MHz Ant1



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A.4 Band edge measurements

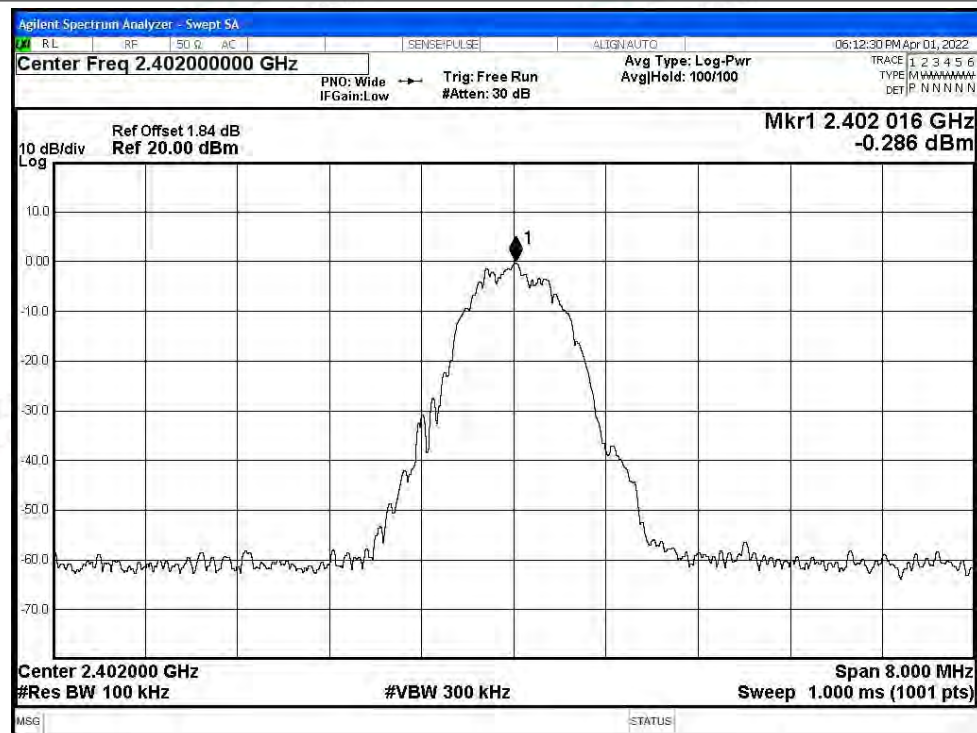
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-56.4	-20	Pass
NVNT	BLE 1M	2480	Ant1	-57.09	-20	Pass
NVNT	BLE 2M	2402	Ant1	-46.84	-20	Pass
NVNT	BLE 2M	2480	Ant1	-56.16	-20	Pass



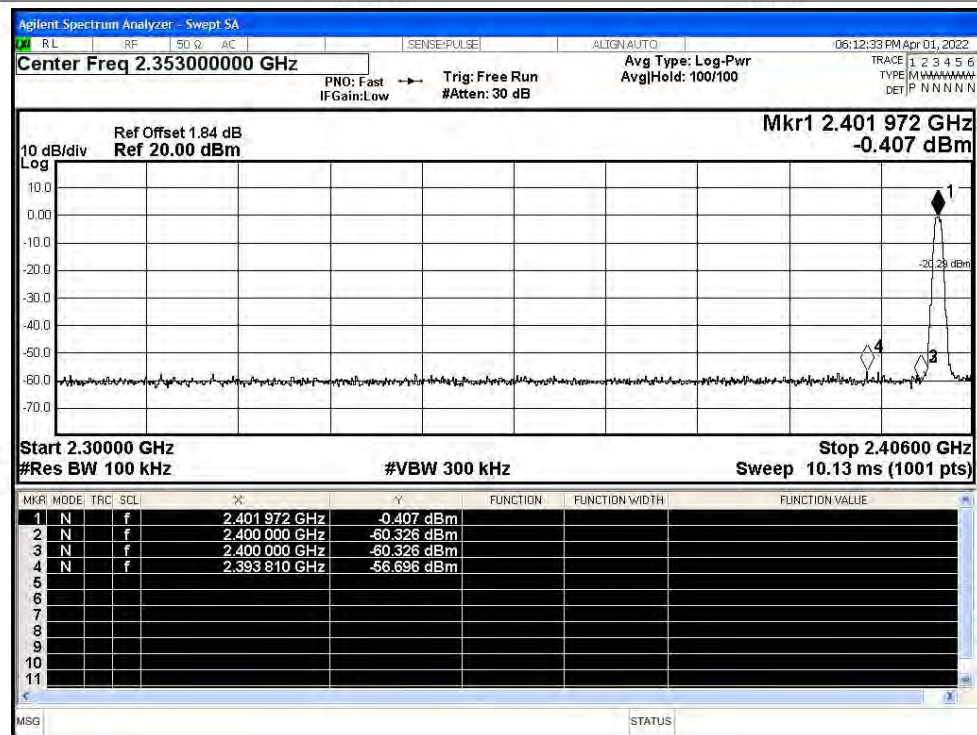


Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



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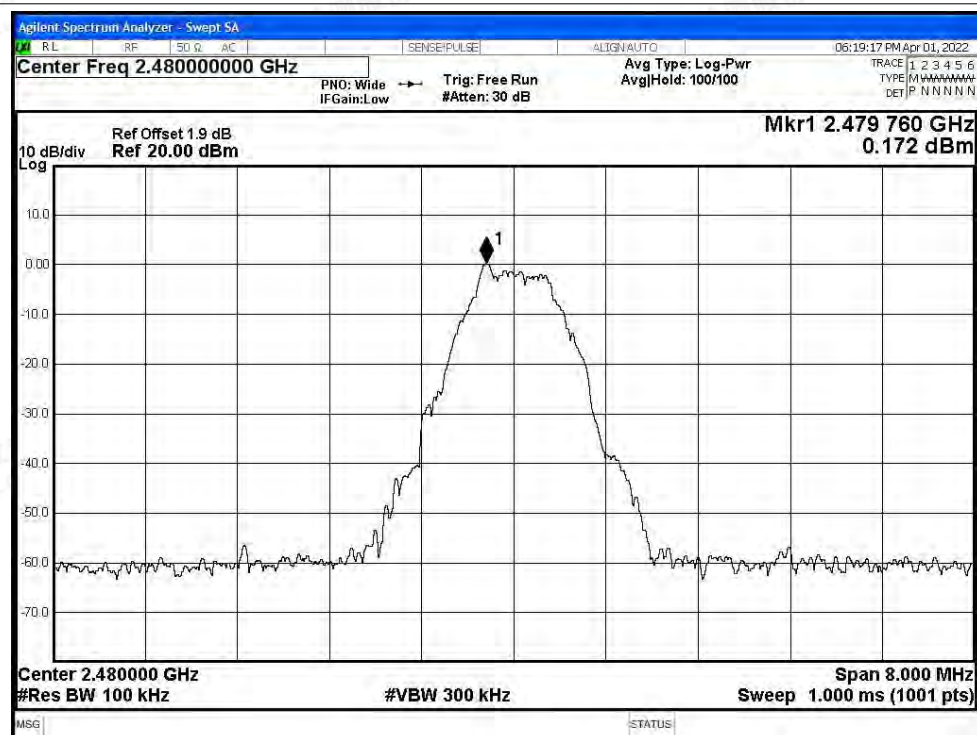
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

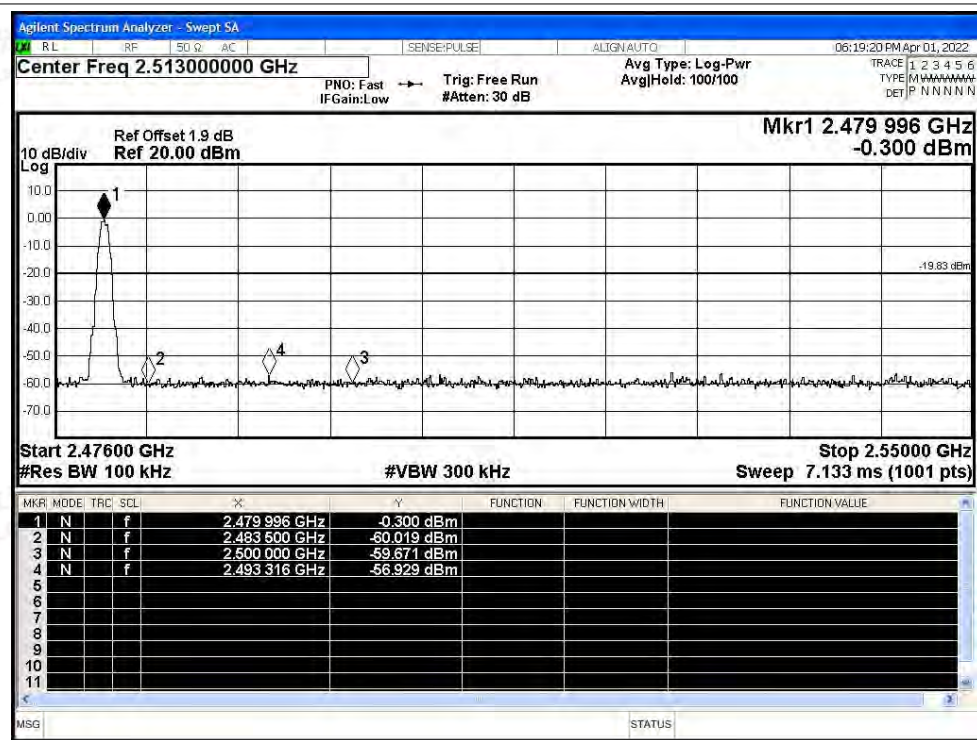
Scan code to check authenticity



Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



Shenzhen LCS Compliance Testing Laboratory Ltd.

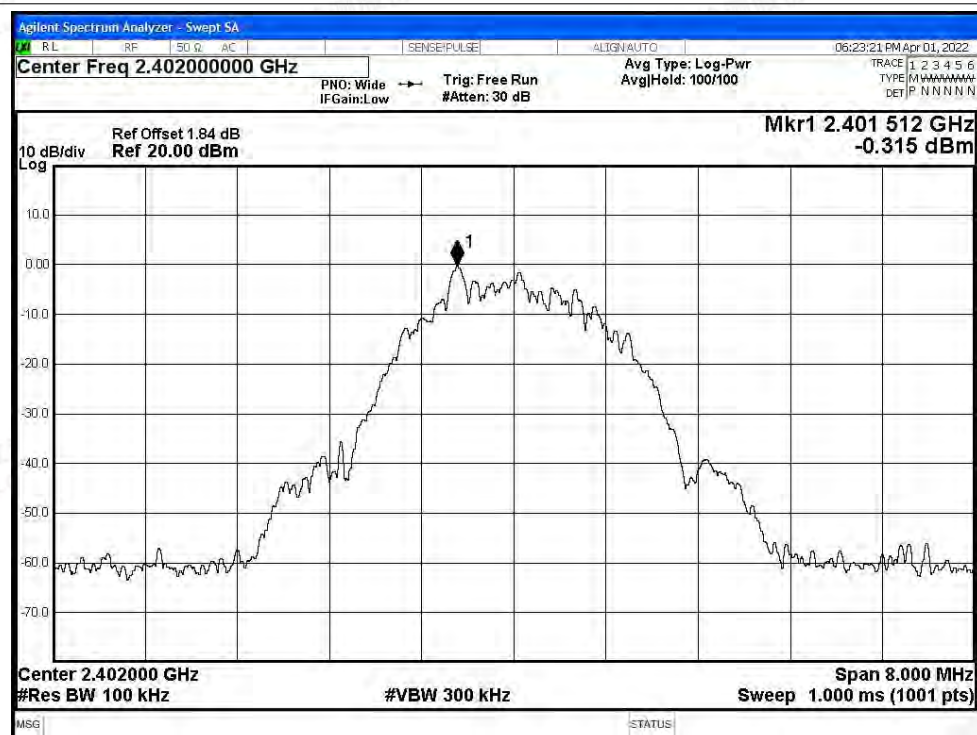
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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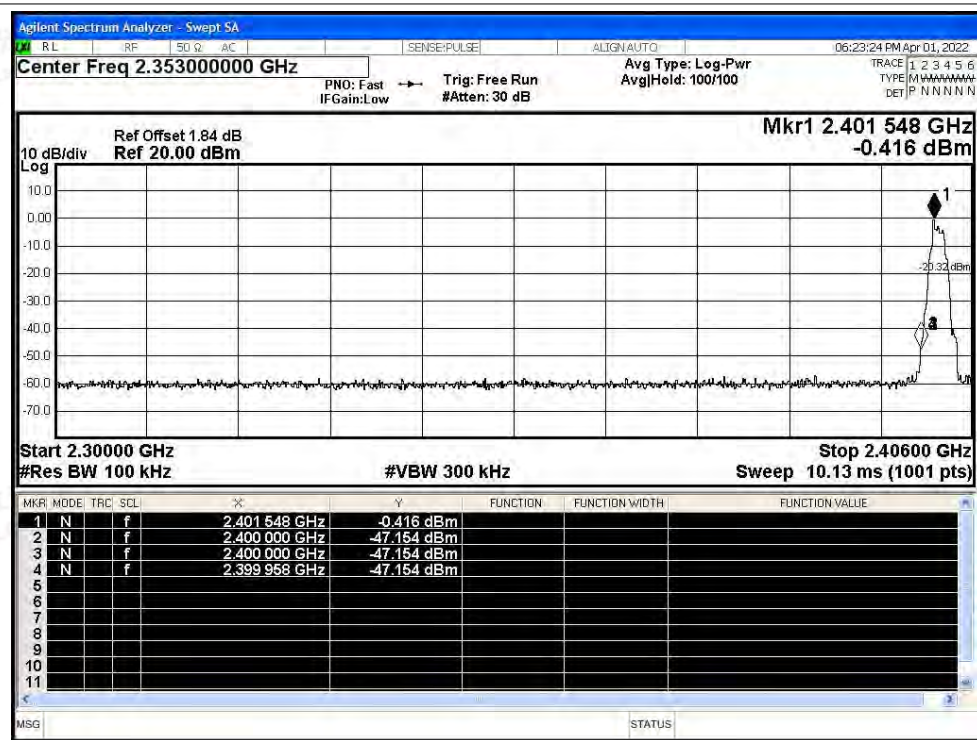
Scan code to check authenticity



Band Edge NVNT BLE 2M 2402MHz Ant1 Ref



Band Edge NVNT BLE 2M 2402MHz Ant1 Emission



Shenzhen LCS Compliance Testing Laboratory Ltd.

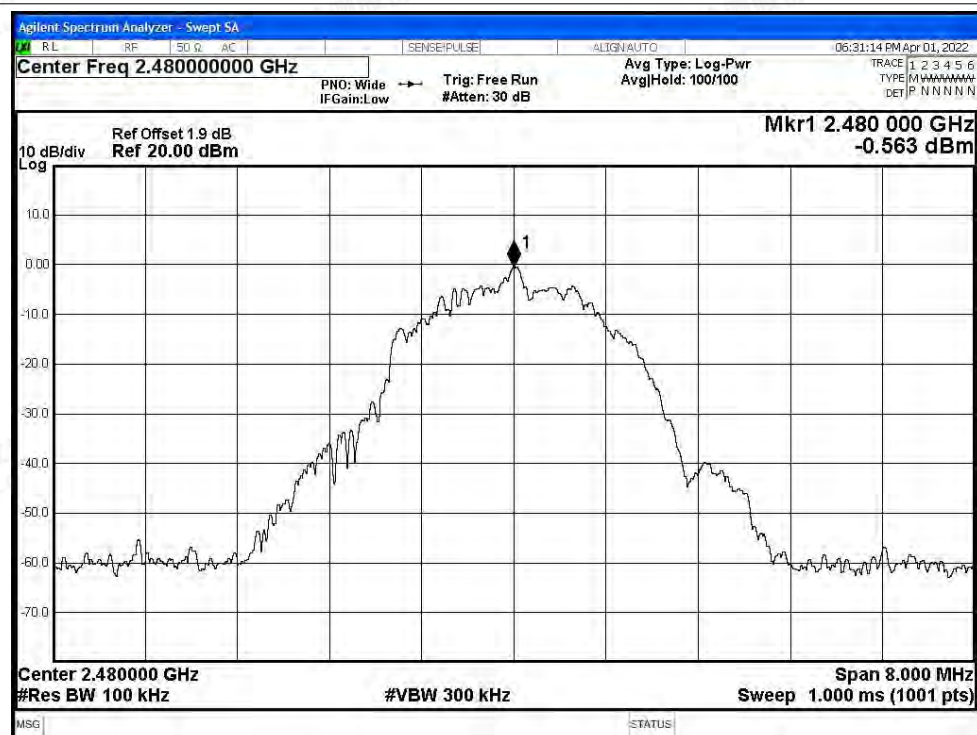
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

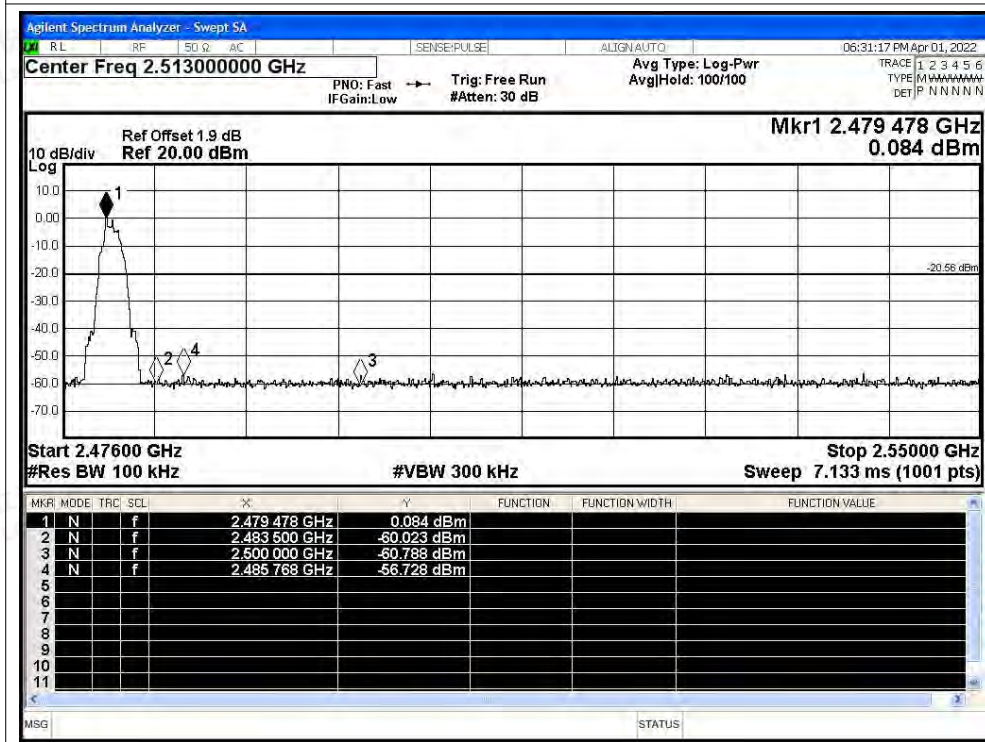
Scan code to check authenticity



Band Edge NVNT BLE 2M 2480MHz Ant1 Ref



Band Edge NVNT BLE 2M 2480MHz Ant1 Emission



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.479 478 GHz	0.084 dBm			
2	N	f		2.483 500 GHz	-60.023 dBm			
3	N	f		2.500 000 GHz	-60.788 dBm			
4	N	f		2.485 768 GHz	-56.728 dBm			
5								
6								
7								
8								
9								
10								
11								



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A.5 Conducted Spurious Emission

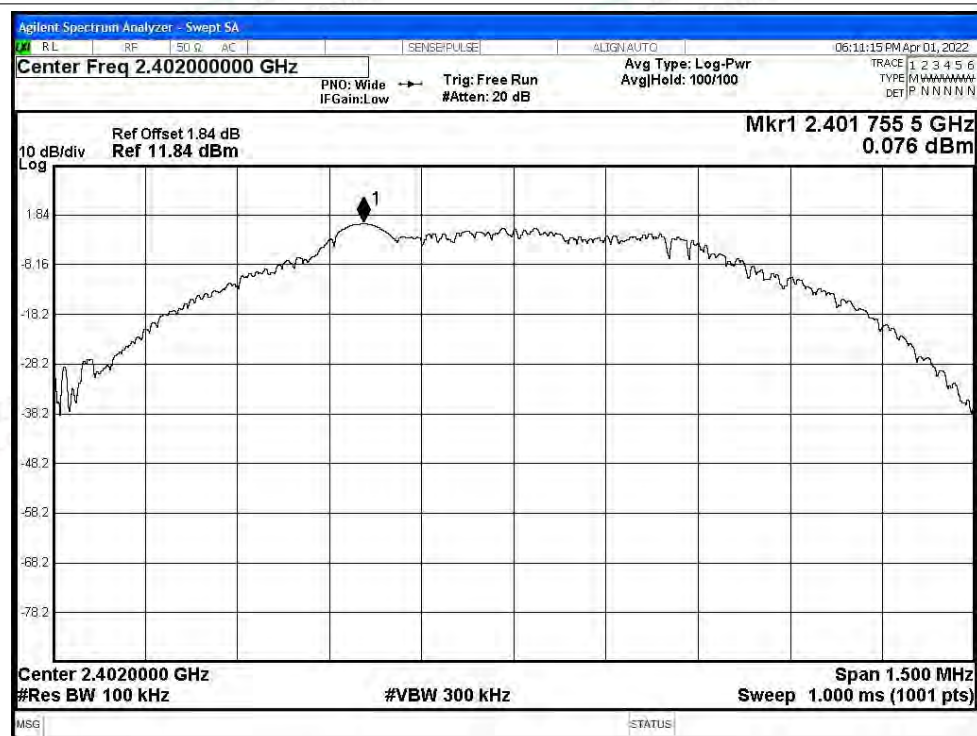
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-56.12	-20	Pass
NVNT	BLE 1M	2440	Ant1	-55.86	-20	Pass
NVNT	BLE 1M	2480	Ant1	-56.3	-20	Pass
NVNT	BLE 2M	2402	Ant1	-55.25	-20	Pass
NVNT	BLE 2M	2440	Ant1	-56.17	-20	Pass
NVNT	BLE 2M	2480	Ant1	-55.49	-20	Pass



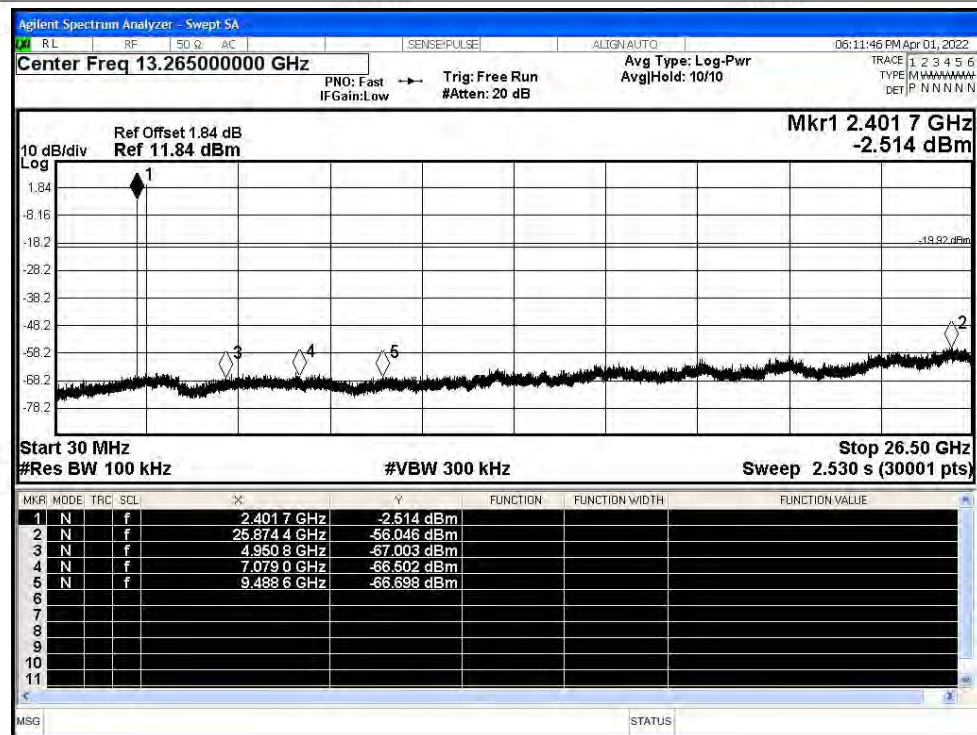


Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



Shenzhen LCS Compliance Testing Laboratory Ltd.

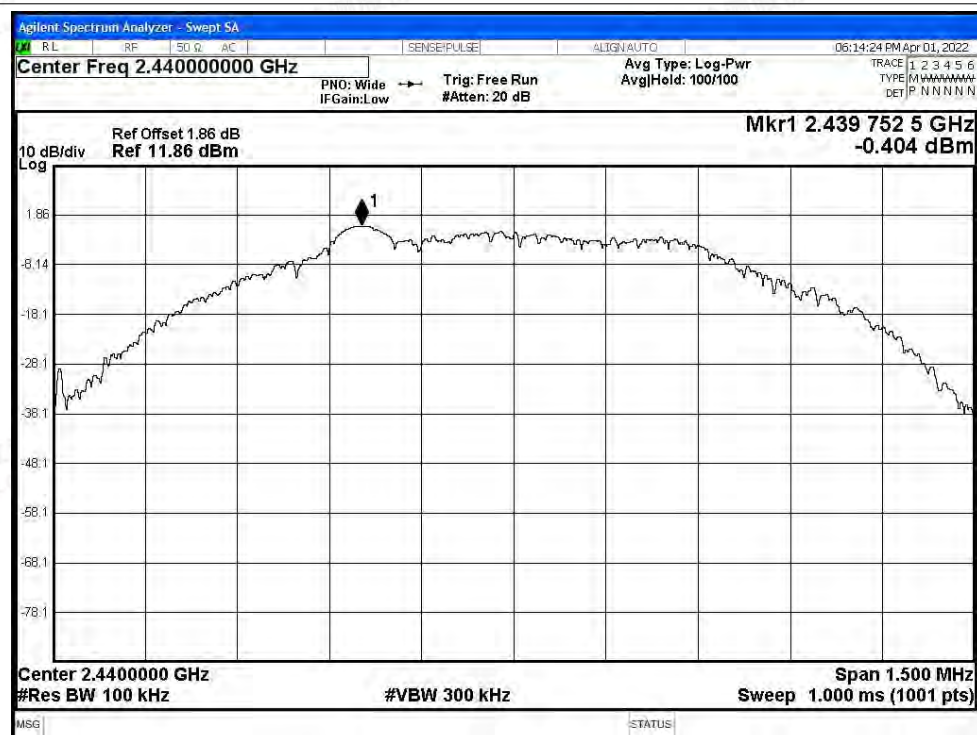
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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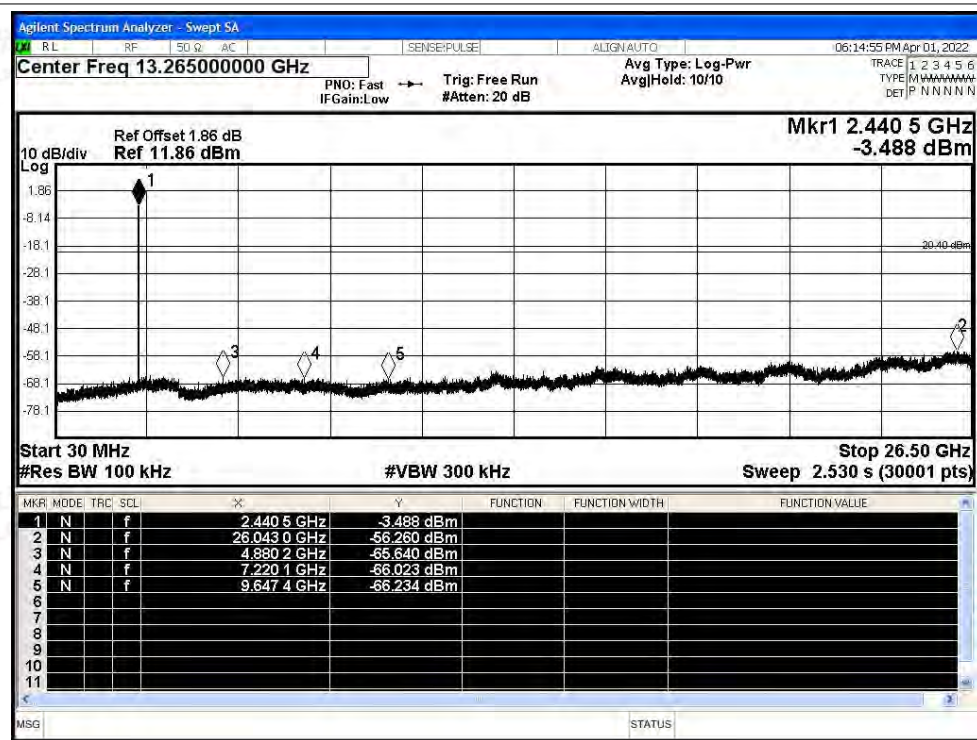
Scan code to check authenticity



Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



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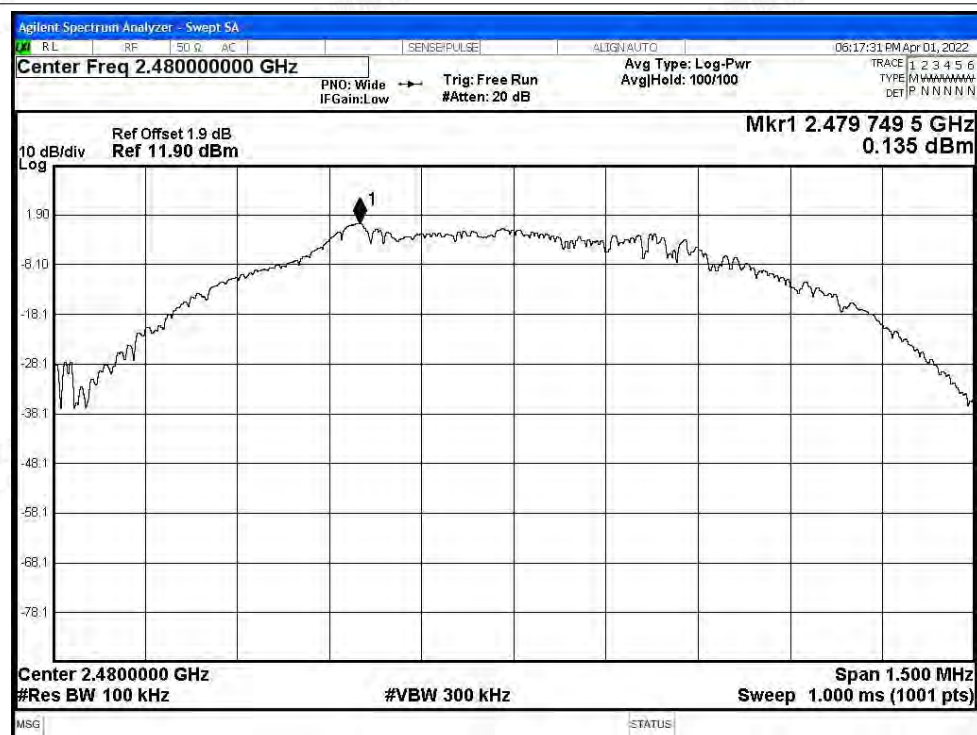
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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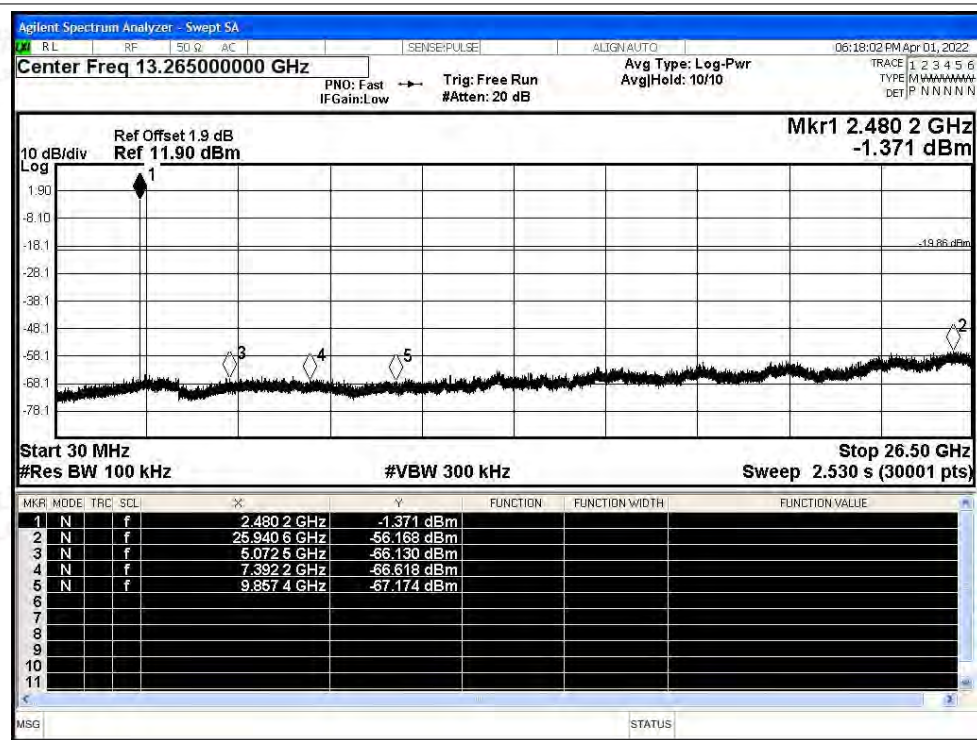
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Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



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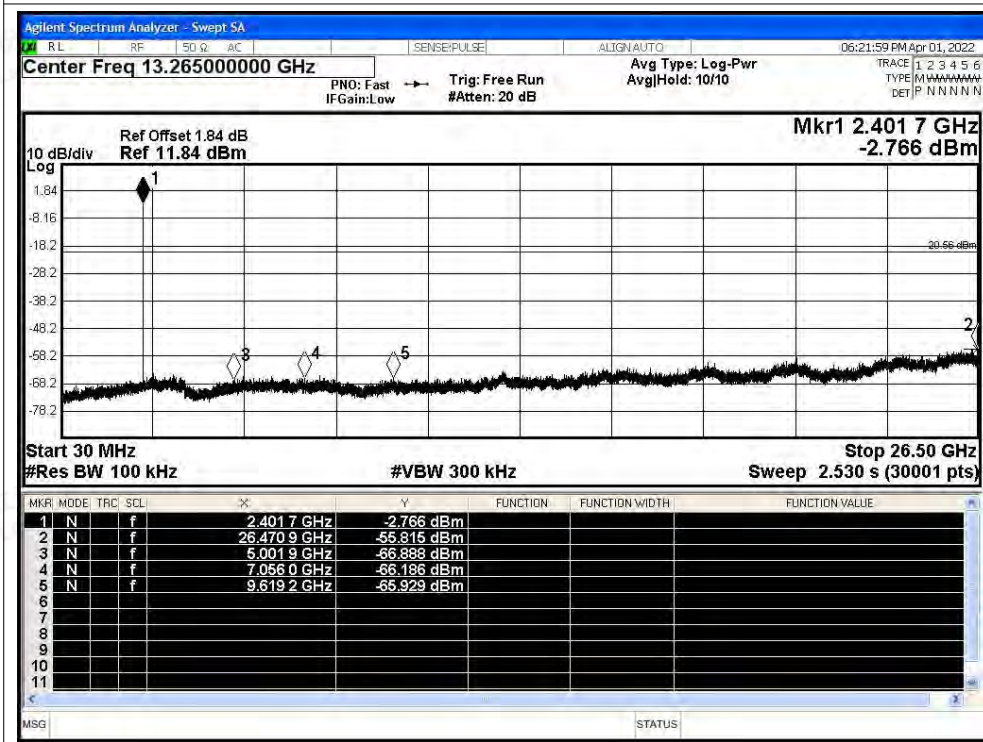
Scan code to check authenticity



Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission



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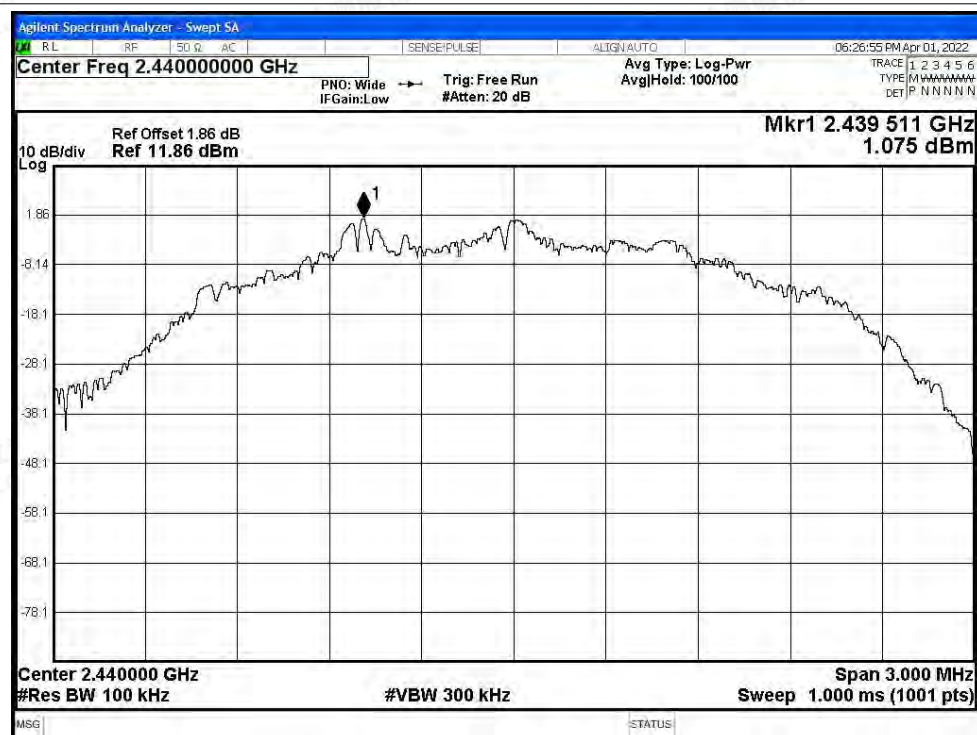
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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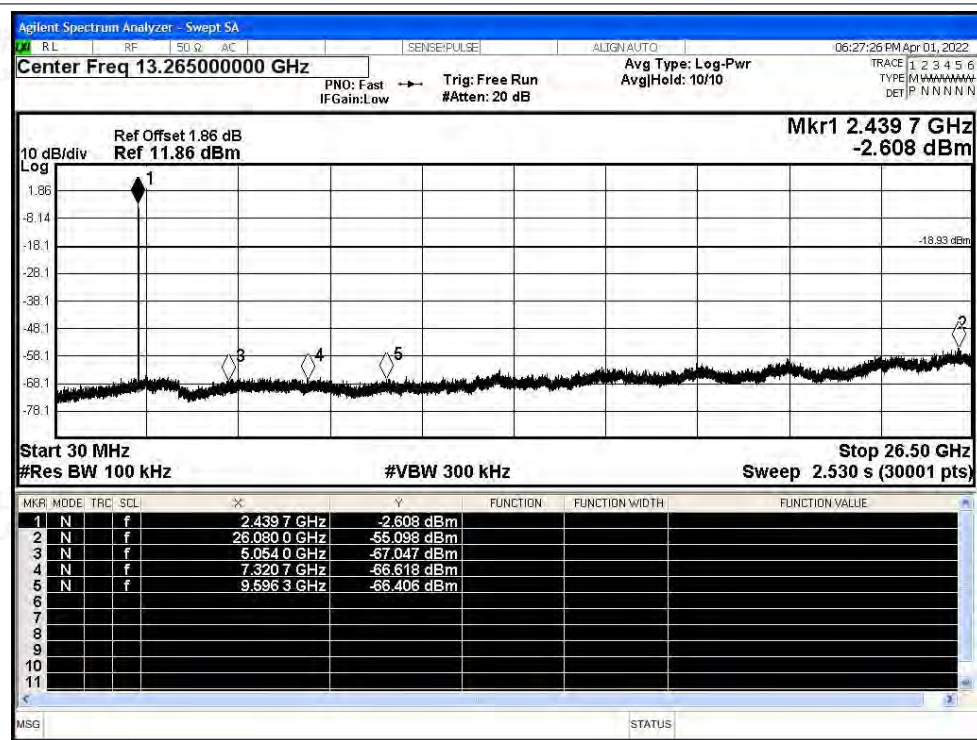
Scan code to check authenticity



Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission



Shenzhen LCS Compliance Testing Laboratory Ltd.

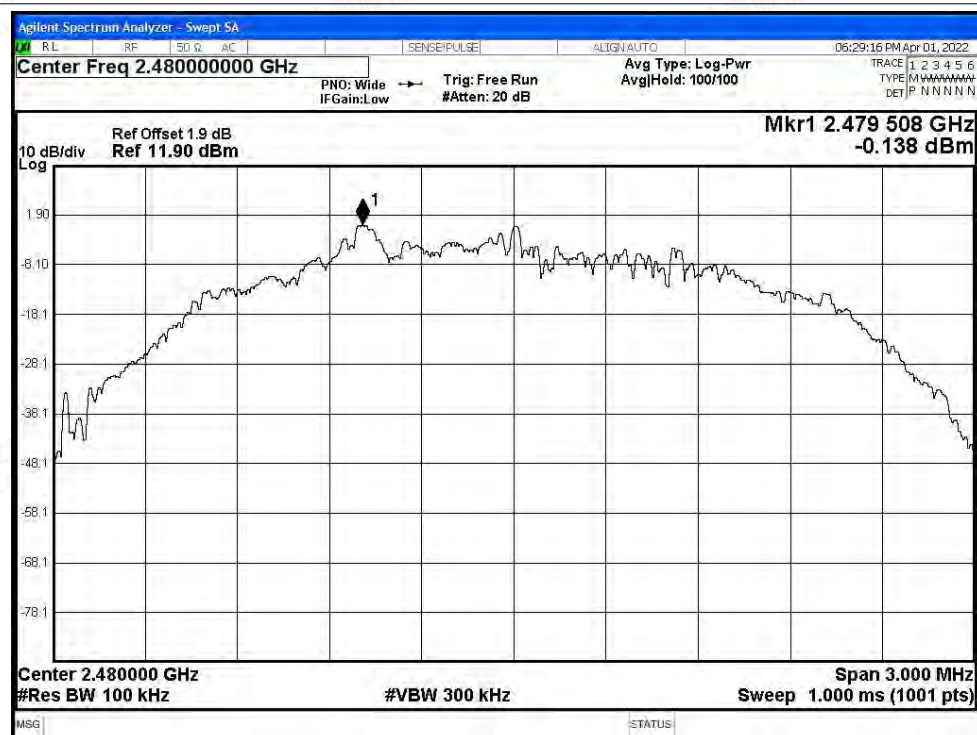
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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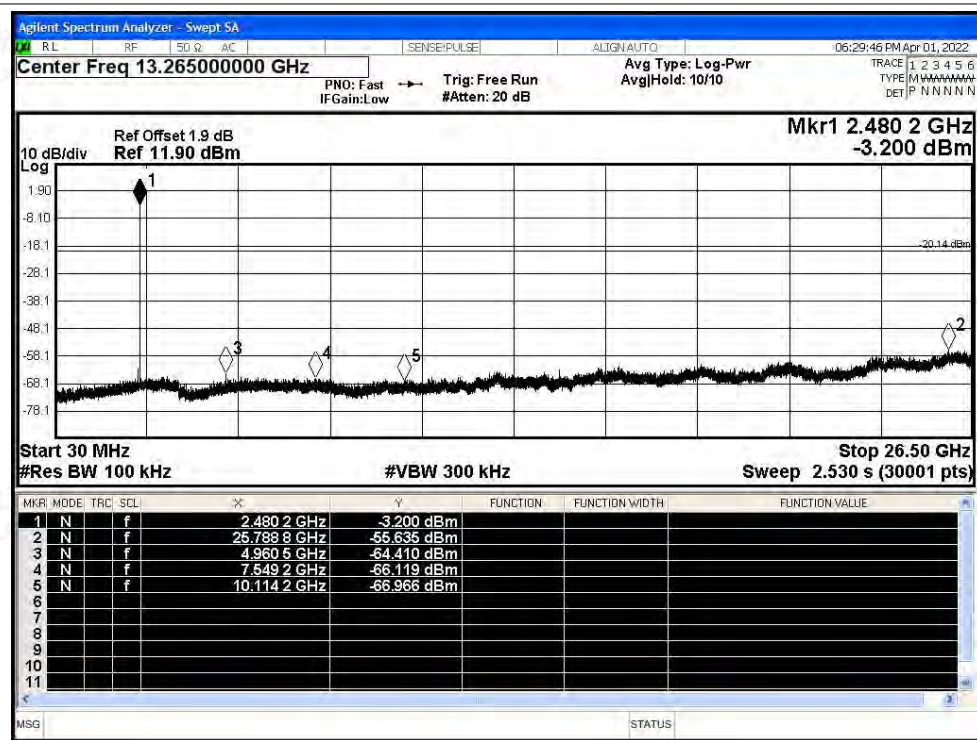
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Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Emission



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A.6 Duty Cycle

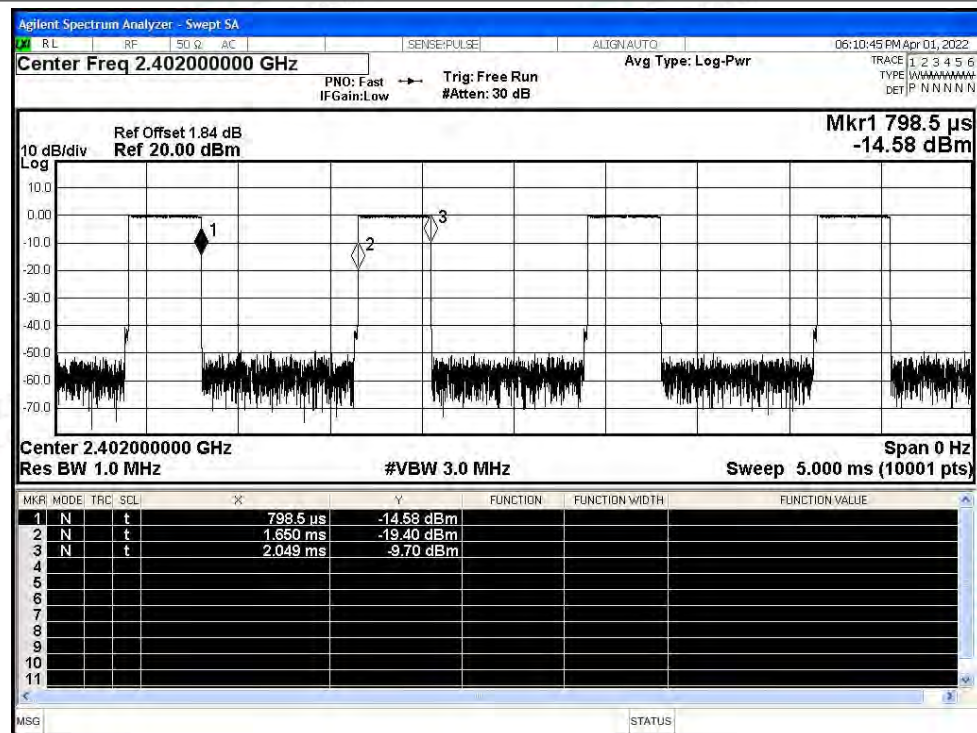
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	31.88	4.96	2.51
NVNT	BLE 1M	2440	Ant1	31.88	4.96	2.51
NVNT	BLE 1M	2480	Ant1	31.84	4.97	2.51
NVNT	BLE 2M	2402	Ant1	32.64	4.86	4.9
NVNT	BLE 2M	2440	Ant1	32.64	4.86	4.9
NVNT	BLE 2M	2480	Ant1	32.64	4.86	4.9



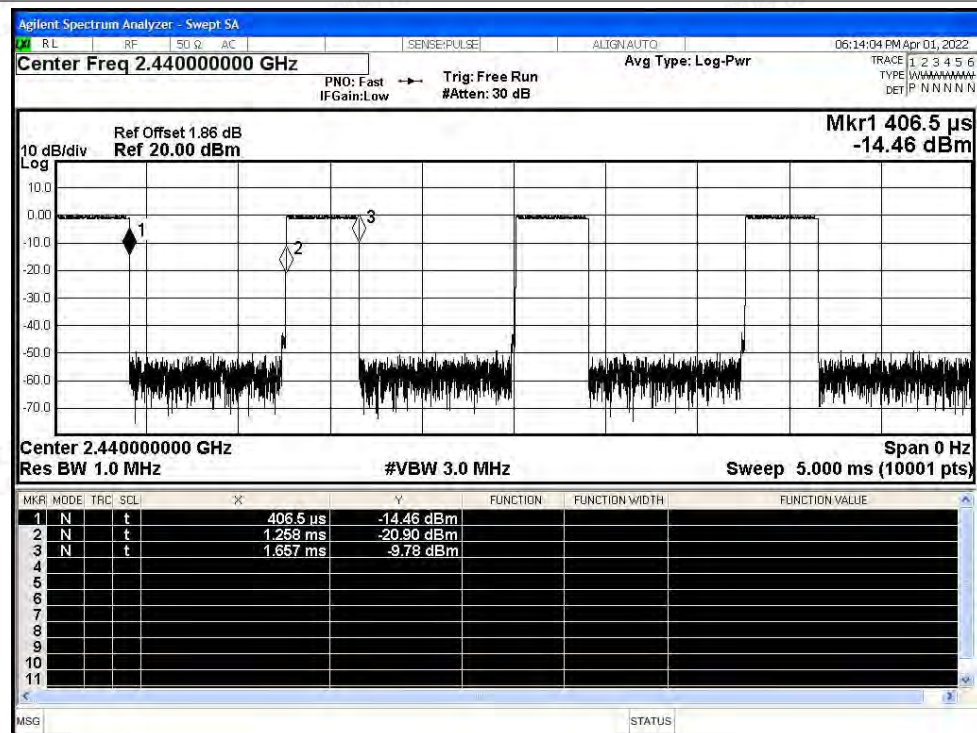


Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant1



Duty Cycle NVNT BLE 1M 2440MHz Ant1



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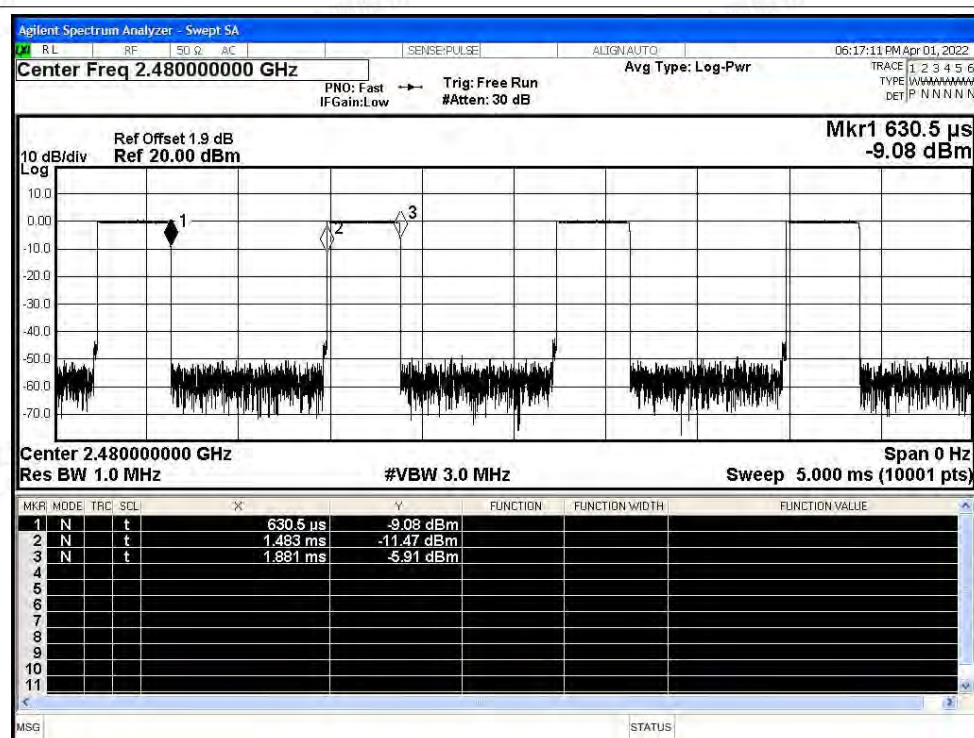
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

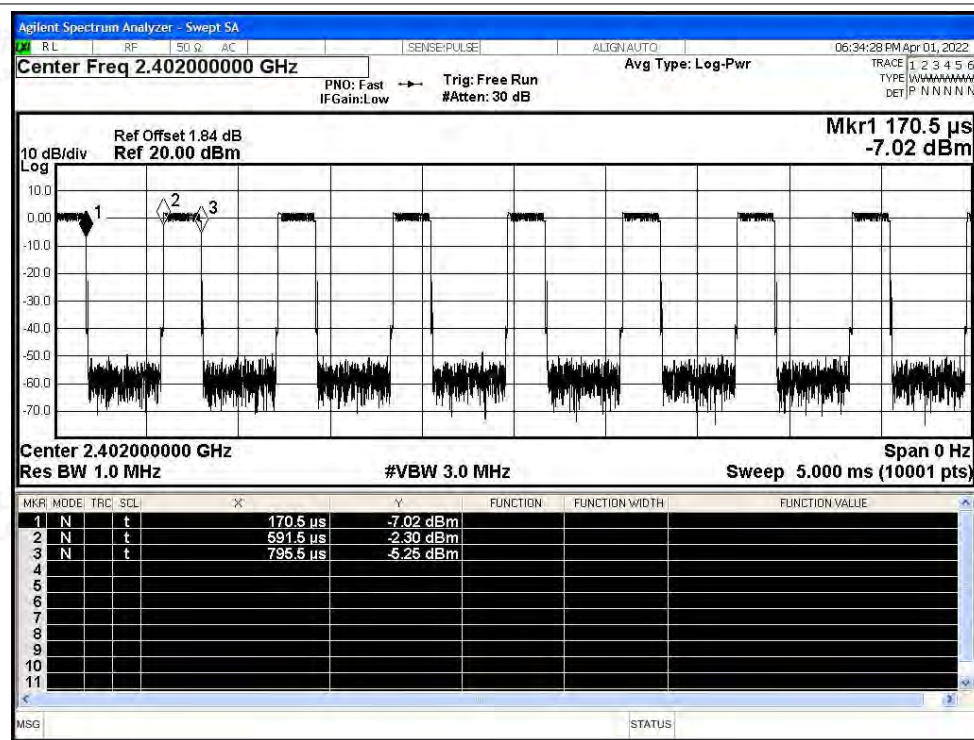
Scan code to check authenticity



Duty Cycle NVNT BLE 1M 2480MHz Ant1



Duty Cycle NVNT BLE 2M 2402MHz Ant1



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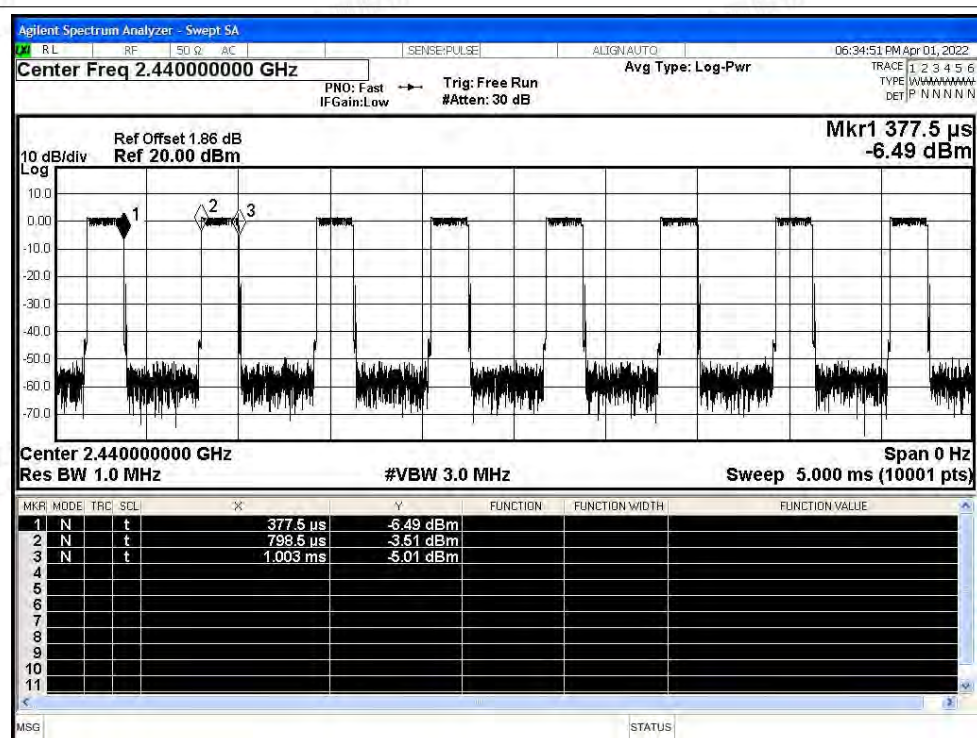
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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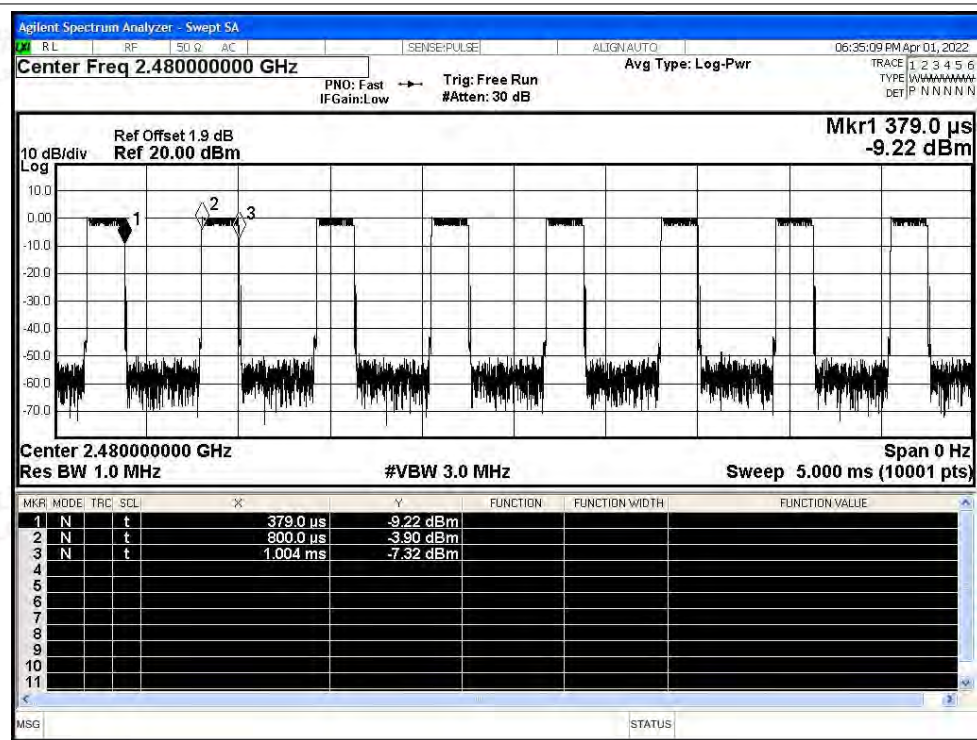
Scan code to check authenticity



Duty Cycle NVNT BLE 2M 2440MHz Ant1



Duty Cycle NVNT BLE 2M 2480MHz Ant1



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A.7 Emissions in Restricted Bands

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	-50.77	2	46.49	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2310	-59.91	2	37.35	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2371.656	-47.53	2	49.73	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2384.8	-59.18	2	38.08	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2390	-49.25	2	48.01	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2390	-59.53	2	37.73	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-49.15	2	48.11	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-59.04	2	38.22	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2485.398	-46.98	2	50.28	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2486.434	-58.77	2	38.49	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2500	-50.8	2	46.46	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2500	-58.95	2	38.31	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2310	-50.97	2	46.29	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2310	-59.65	2	37.61	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2329.362	-48.22	2	49.04	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2386.284	-58.32	2	38.94	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2390	-51.25	2	46.01	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2390	-59.09	2	38.17	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2483.5	-51.82	2	45.44	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2483.5	-58.18	2	39.08	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2485.102	-44.4	2	52.86	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2483.77	-57.9	2	39.36	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2500	-50.18	2	47.08	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2500	-59.06	2	38.2	Average	54	Pass



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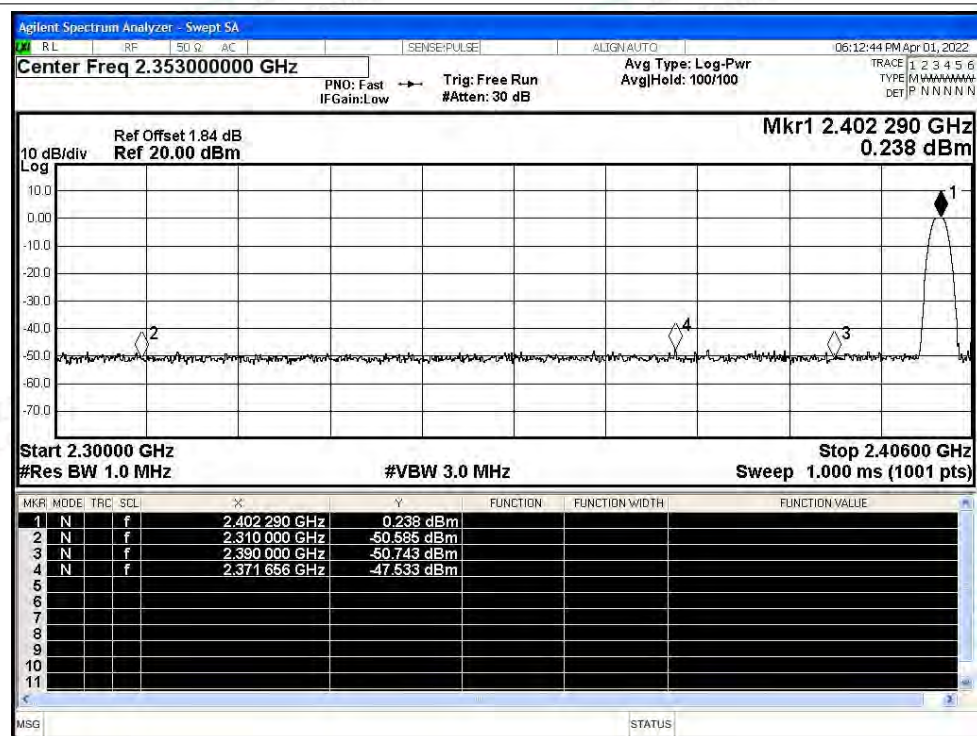
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

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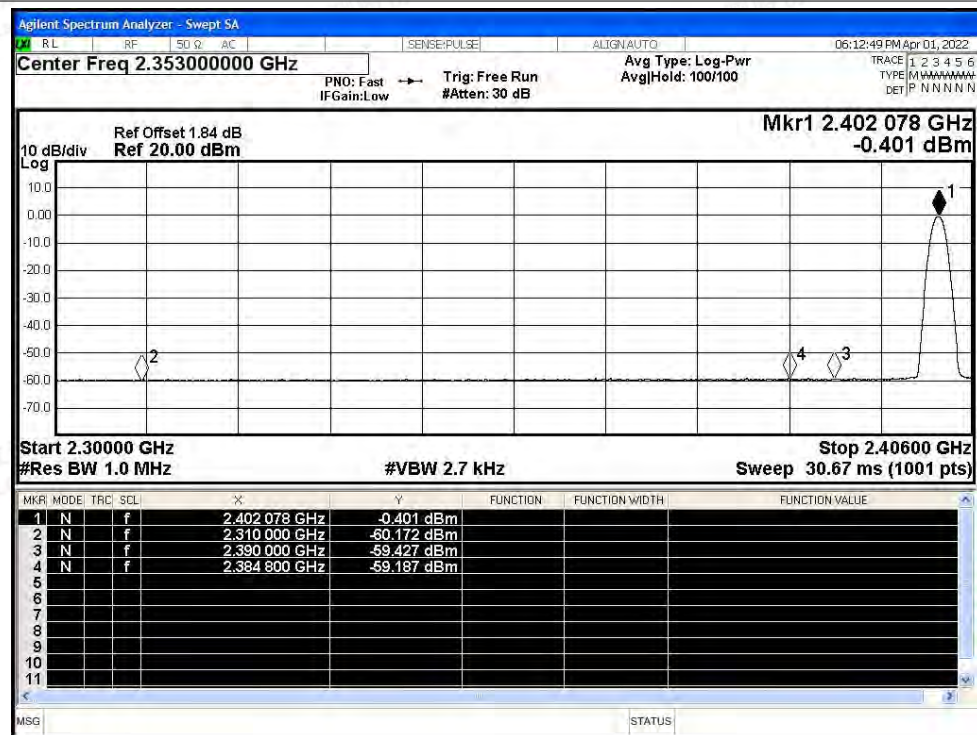


Test Graphs

Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak



Restrict Band NVNT BLE 1M 2402MHz Ant1 Average



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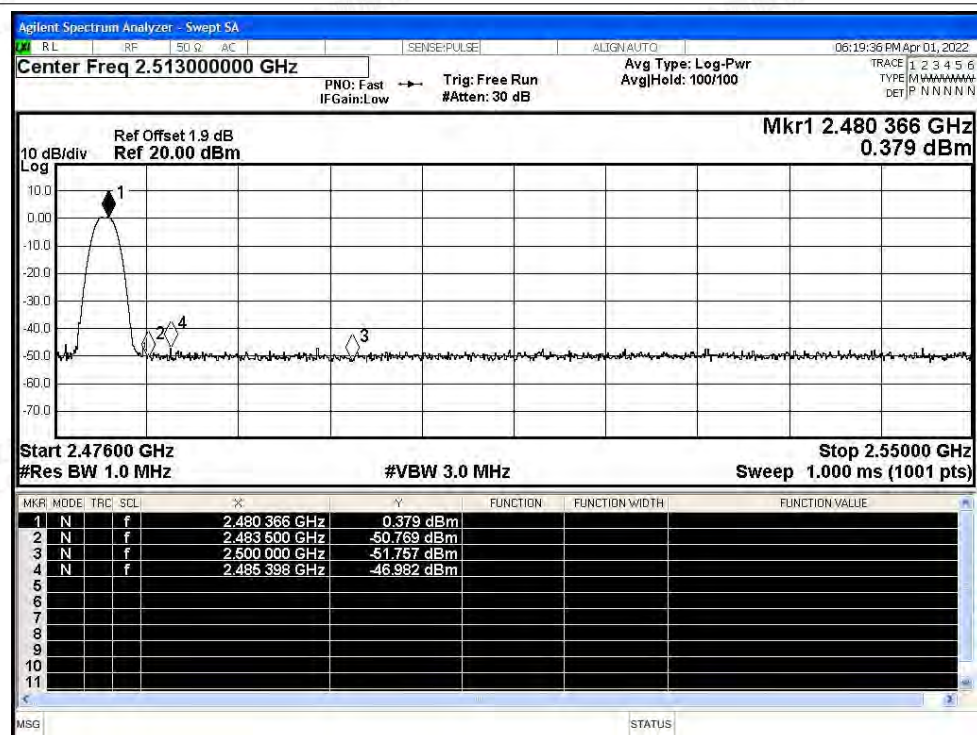
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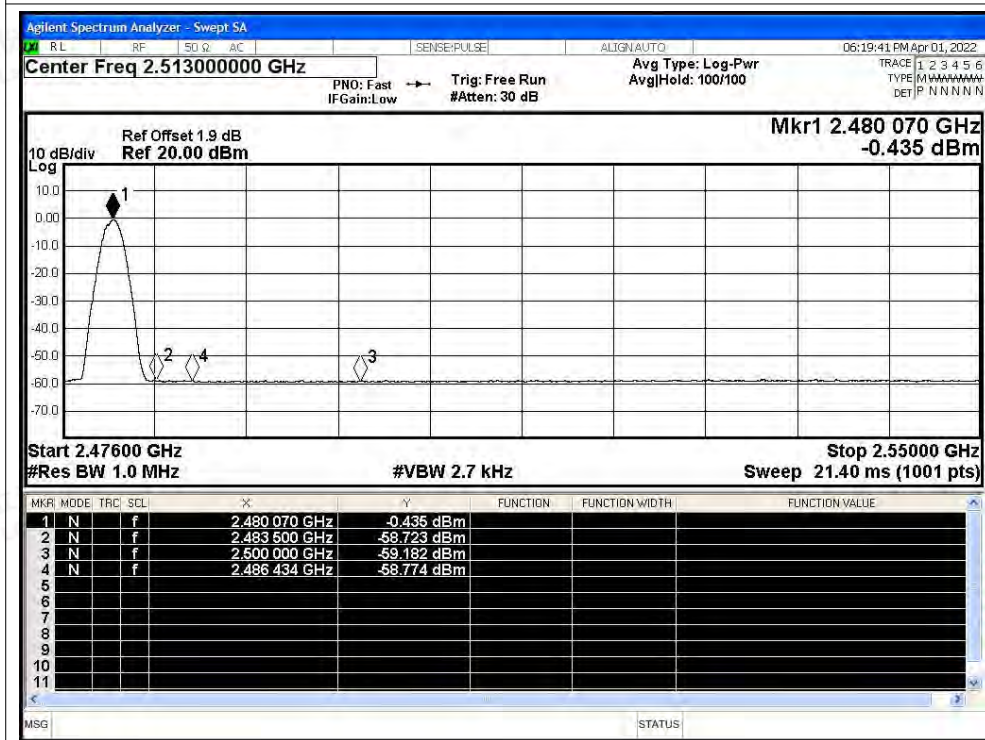
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Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



Restrict Band NVNT BLE 1M 2480MHz Ant1 Average



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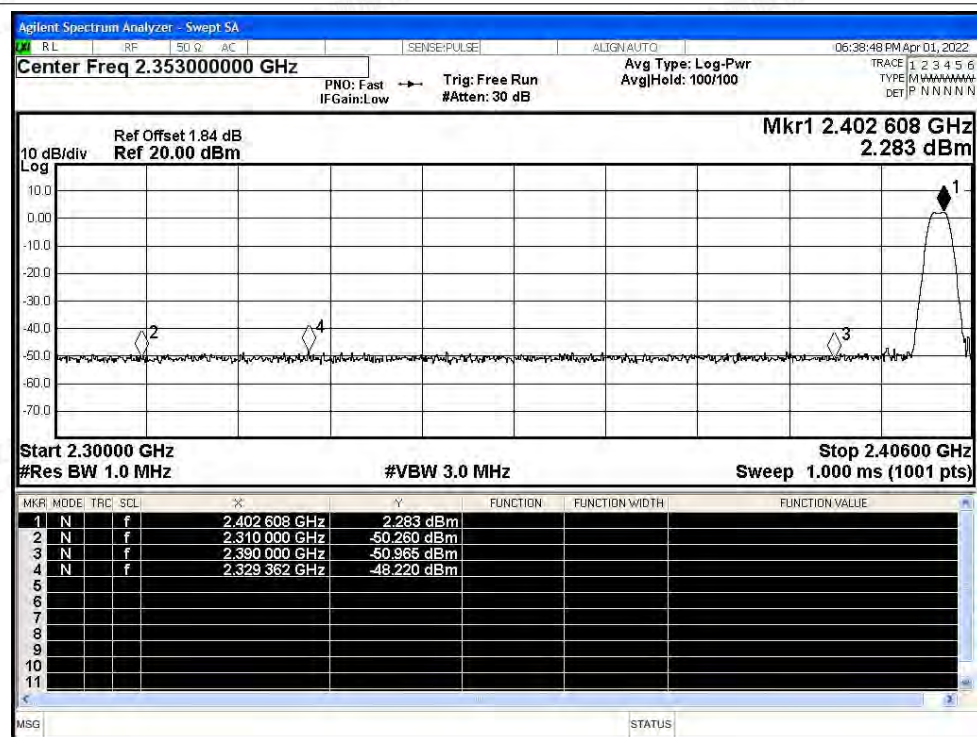
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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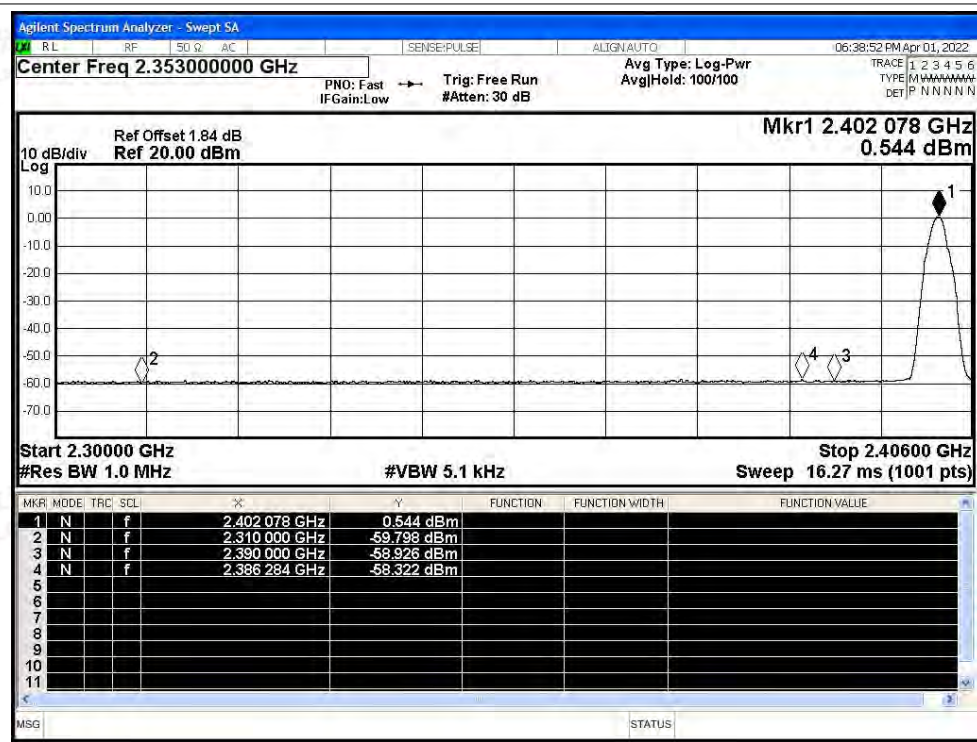
Scan code to check authenticity



Restrict Band NVNT BLE 2M 2402MHz Ant1 Peak



Restrict Band NVNT BLE 2M 2402MHz Ant1 Average



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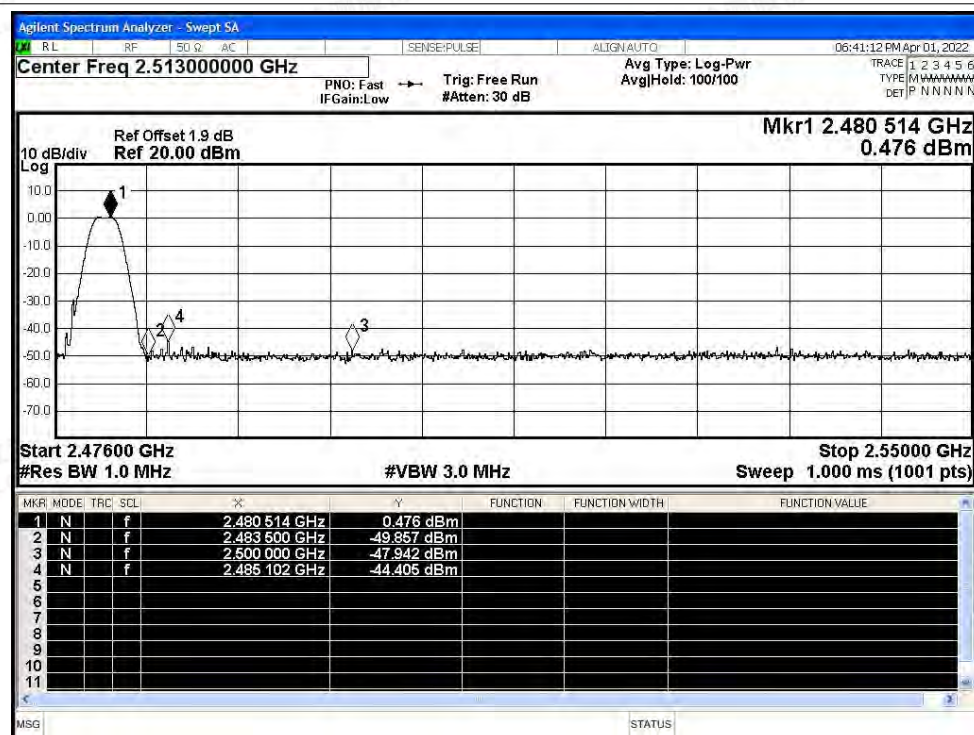
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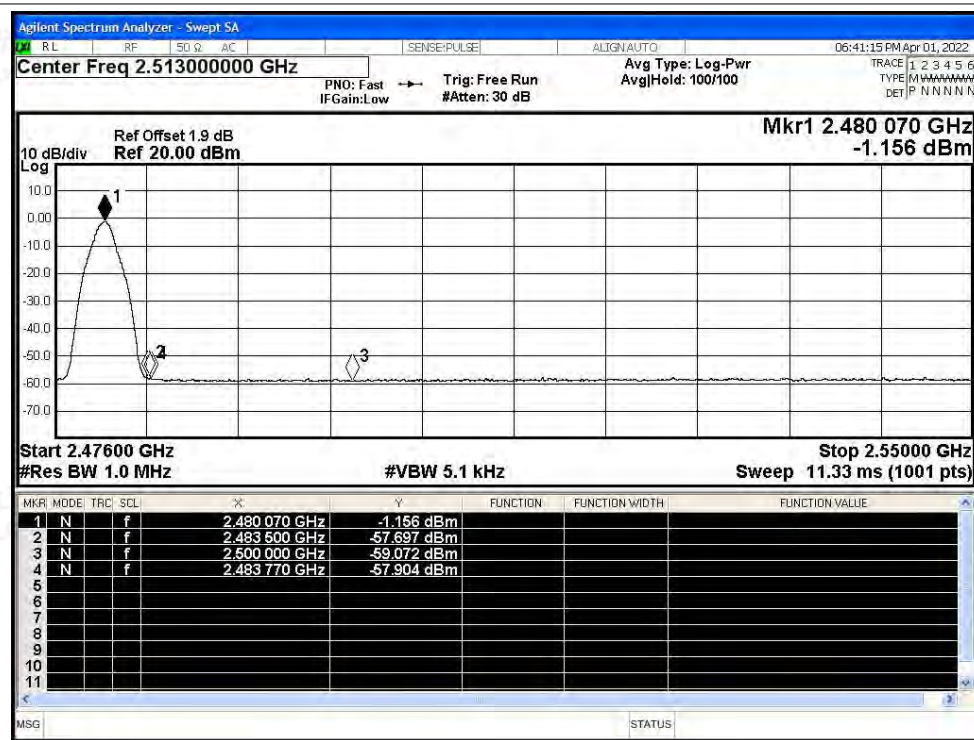
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Restrict Band NVNT BLE 2M 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2M 2480MHz Ant1 Average



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