



Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: Motion and brightness Sensor

Test Model: SBLM04

Environmental Conditions

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





A.1 6dB Bandwidth

Test Result

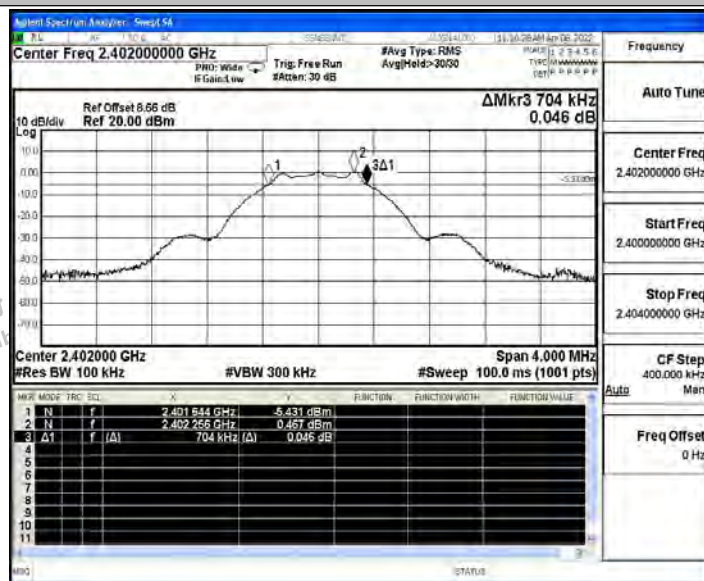
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.704	2401.644	2402.348	0.5	PASS
		2440	0.712	2439.640	2440.352	0.5	PASS
		2480	0.712	2479.640	2480.352	0.5	PASS
BLE_2M	Ant1	2402	1.148	2401.432	2402.580	0.5	PASS
		2440	1.152	2439.428	2440.580	0.5	PASS
		2480	1.132	2479.444	2480.576	0.5	PASS



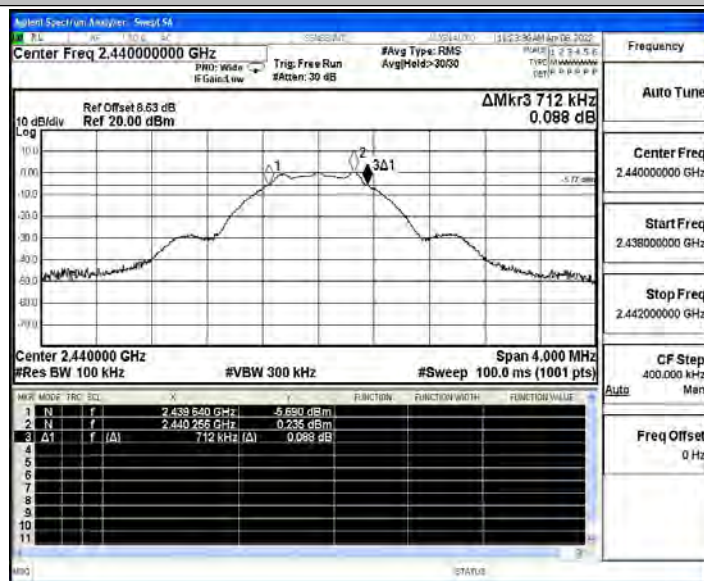


Test Graphs

BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

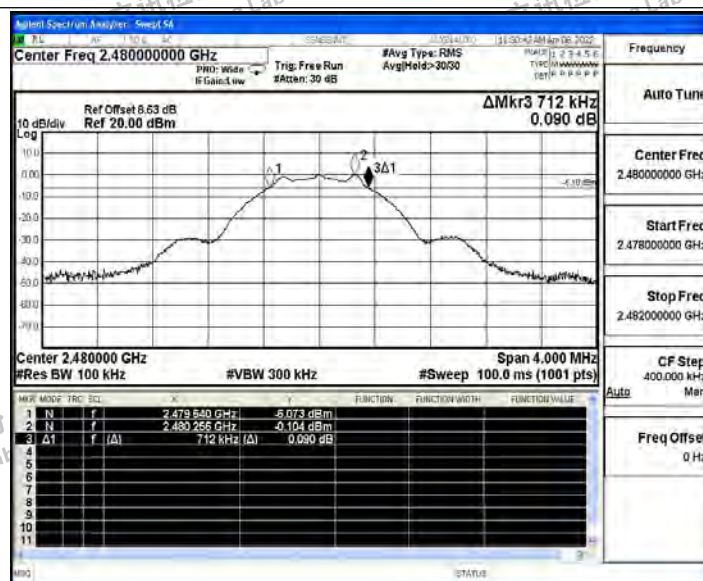


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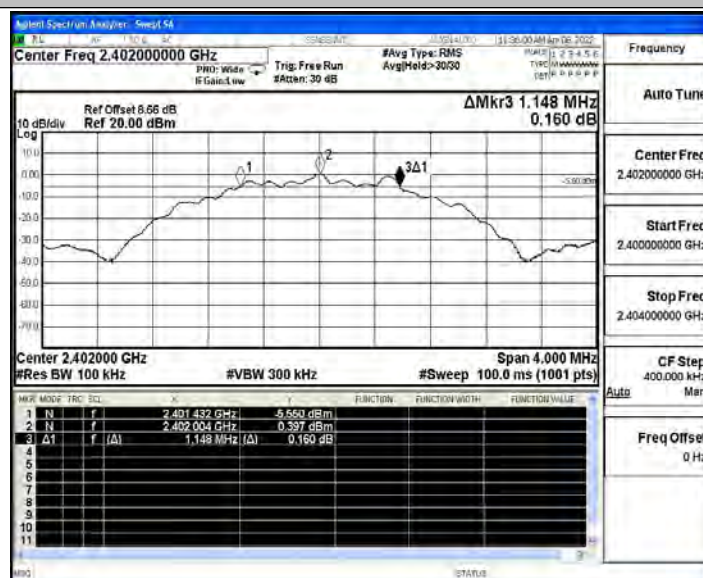
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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

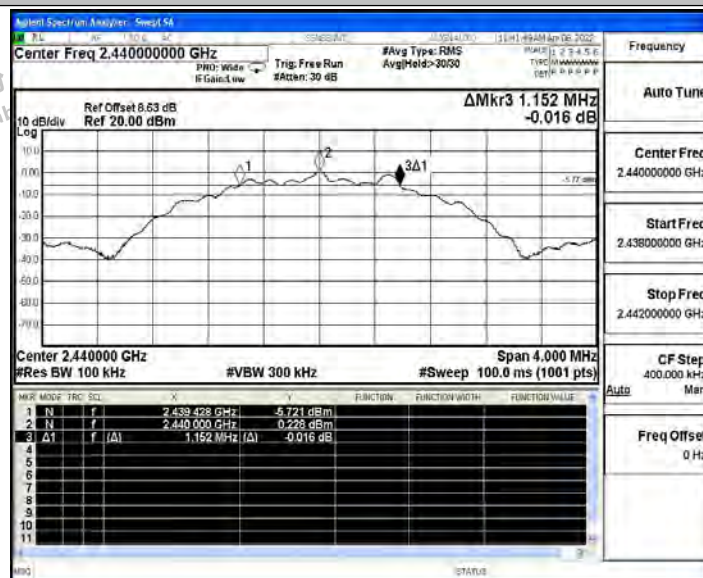
Scan code to check authenticity



BLE_2M_Ant1_2402

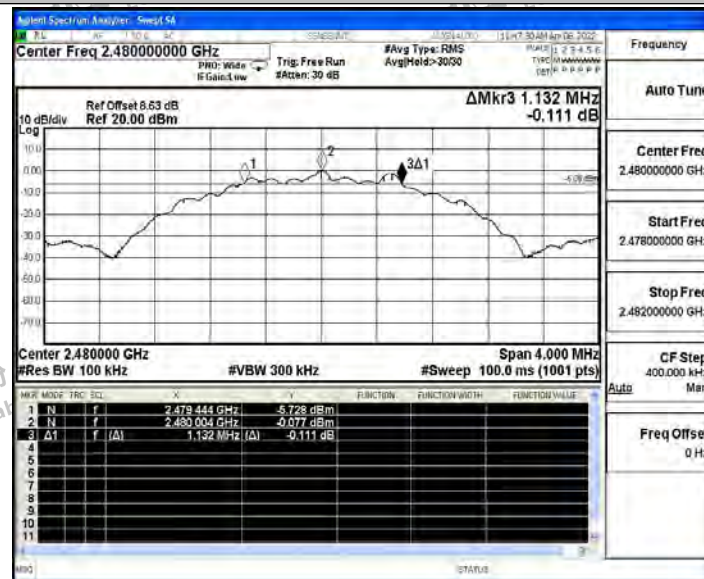


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





A.2 Maximum conducted output power

Test Result

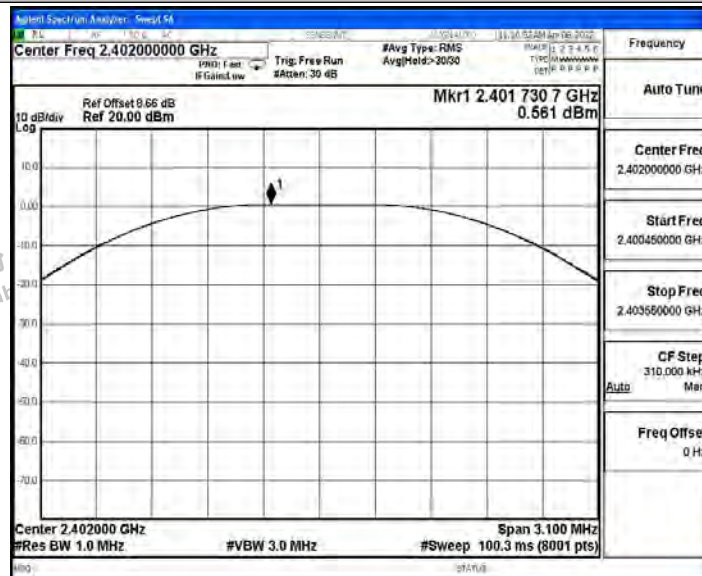
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.56	≤30	PASS
		2440	0.33	≤30	PASS
		2480	-0.01	≤30	PASS
BLE_2M	Ant1	2402	0.58	≤30	PASS
		2440	0.47	≤30	PASS
		2480	0.15	≤30	PASS



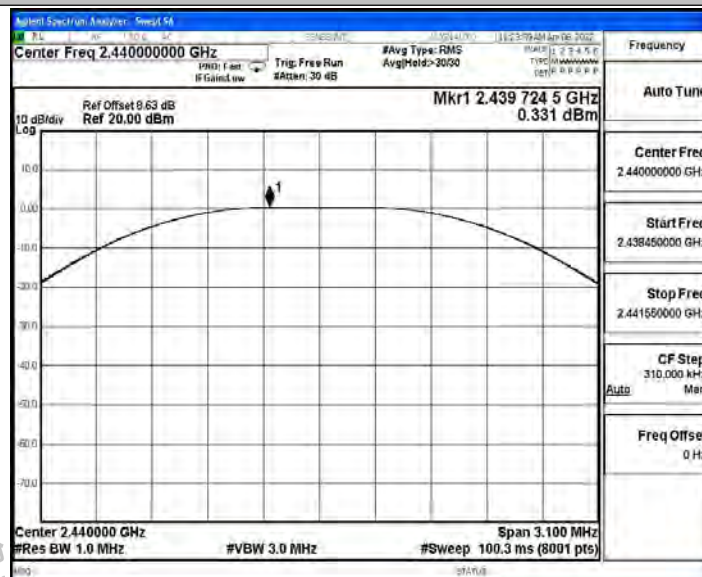


Test Graphs

BLE_1M_Ant1_2402

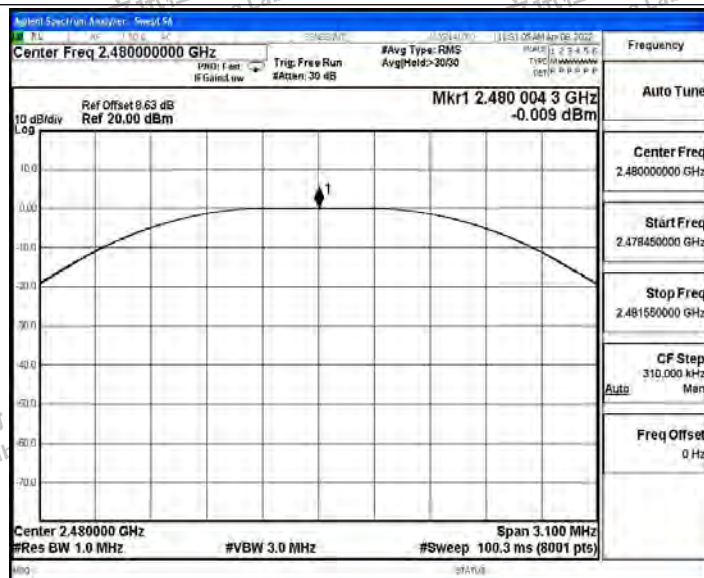


BLE_1M_Ant1_2440

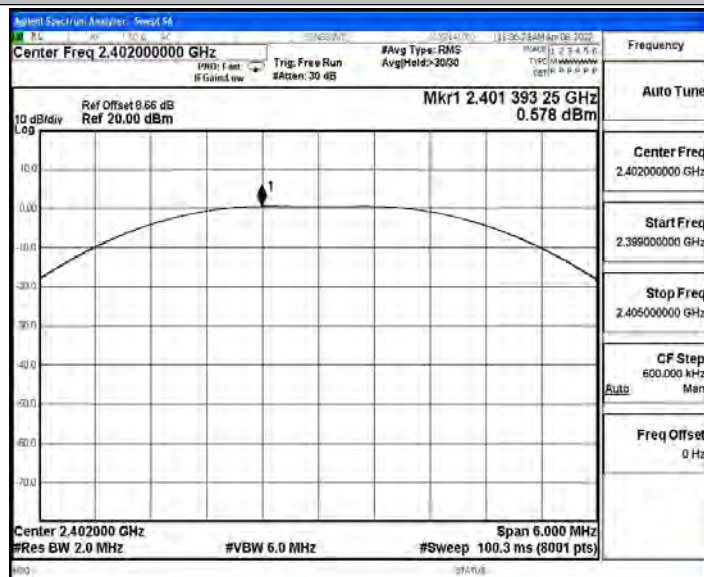


BLE_1M_Ant1_2480

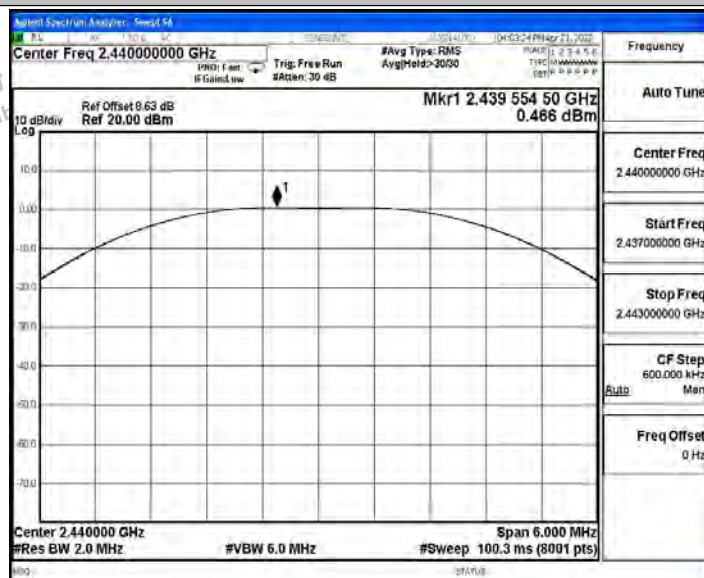




BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



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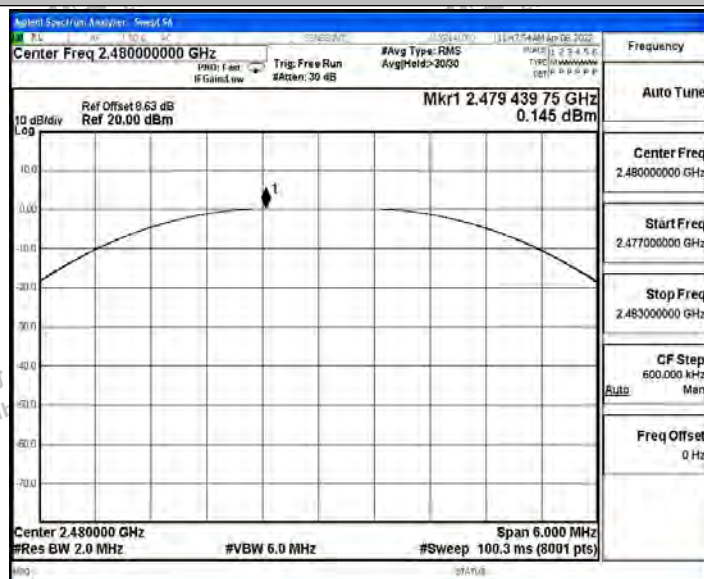
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BLE_2M_Ant1_2480





A.3 Maximum power spectral density

Test Result

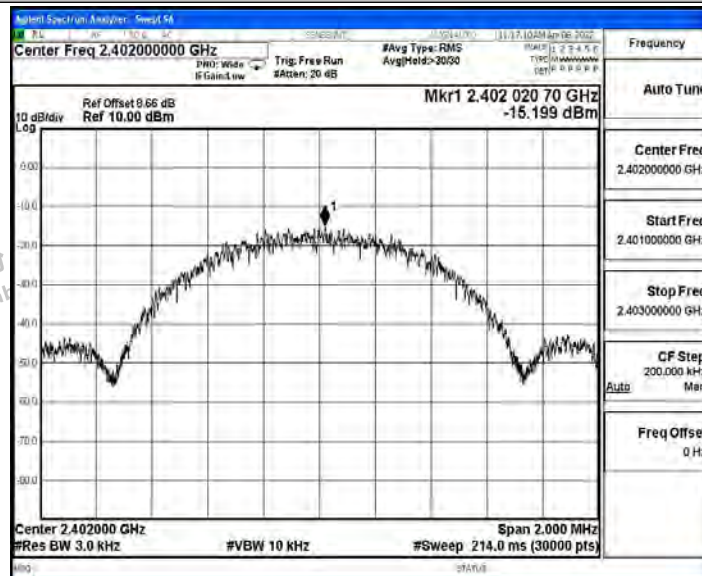
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.2	≤8.00	PASS
		2440	-15.48	≤8.00	PASS
		2480	-15.9	≤8.00	PASS
BLE_2M	Ant1	2402	-15.69	≤8.00	PASS
		2440	-16.18	≤8.00	PASS
		2480	-16	≤8.00	PASS



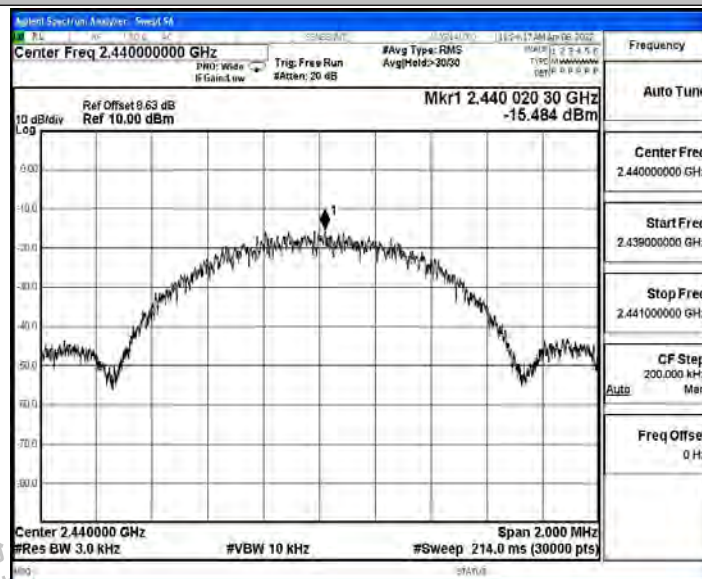


Test Graphs

BLE_1M_Ant1_2402

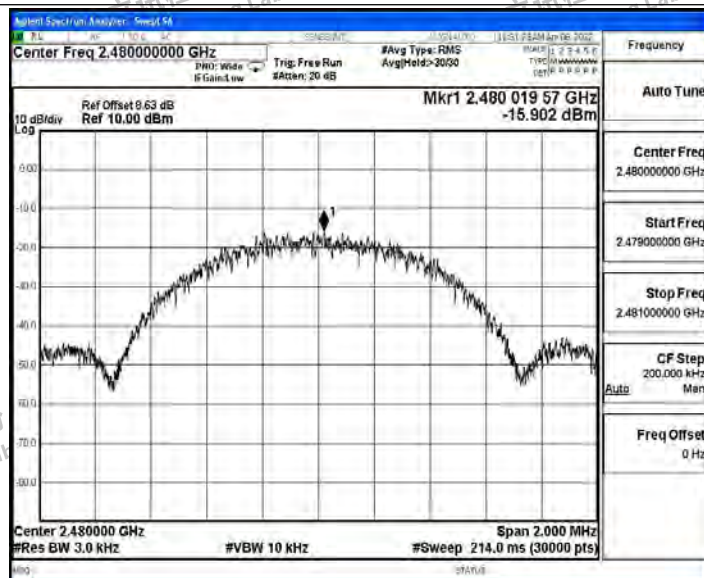


BLE_1M_Ant1_2440

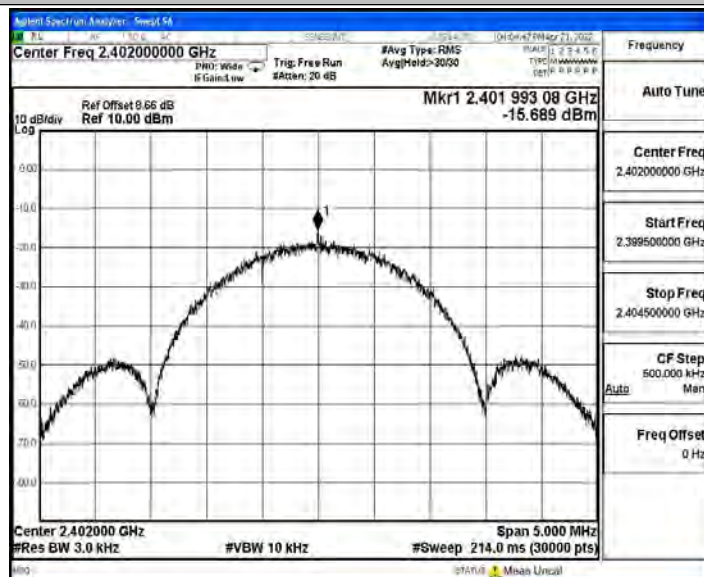


BLE_1M_Ant1_2480

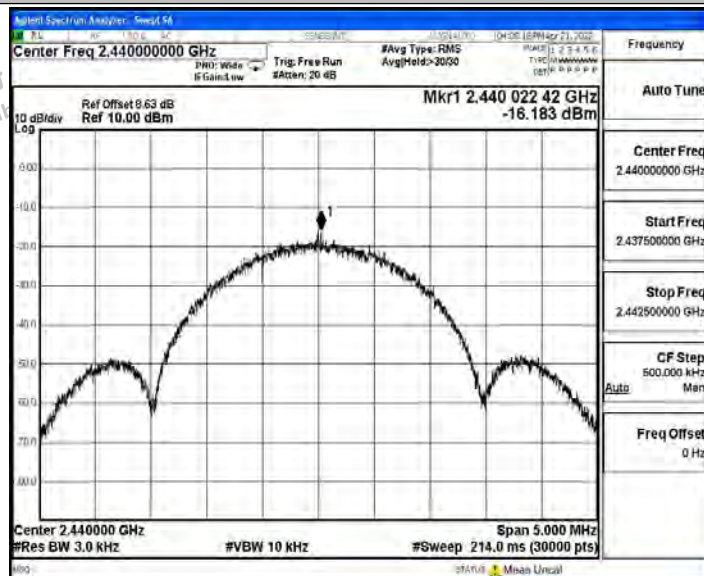




BLE_2M_Ant1_2402



BLE_2M_Ant1_2440

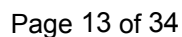


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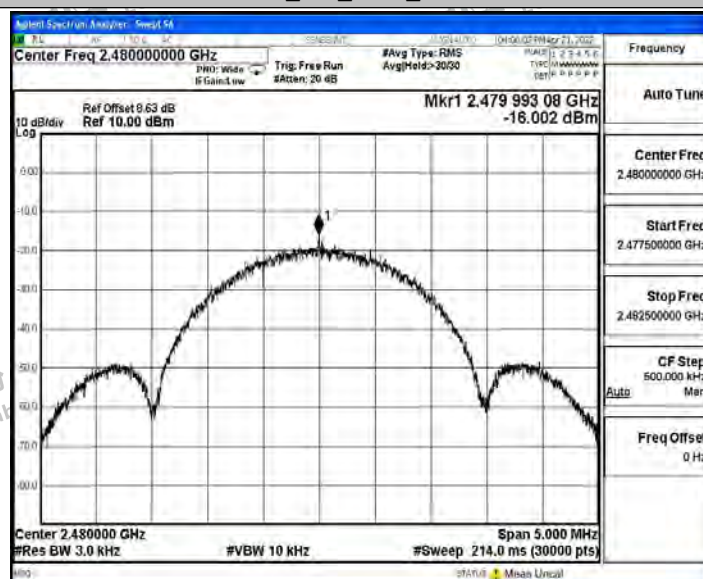
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BLE_2M_Ant1_2480



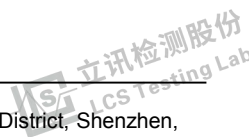
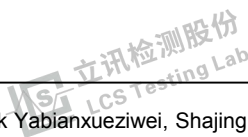
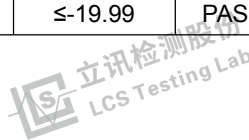
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A.4 Band edge measurements

Test Result

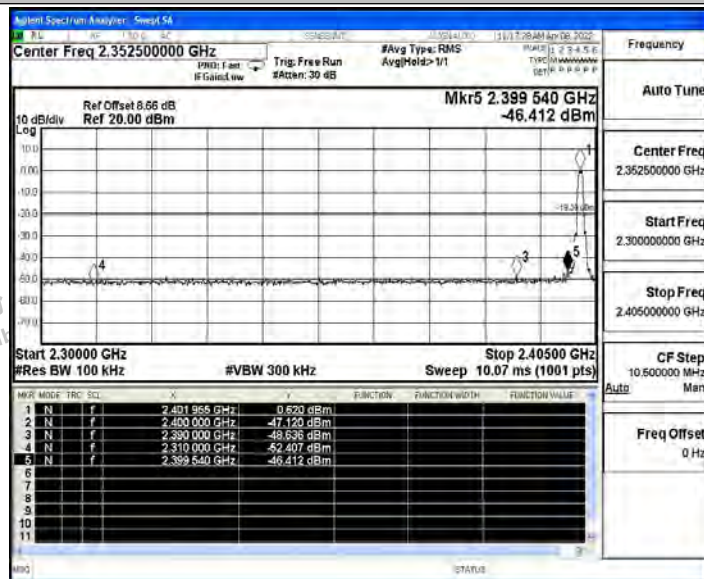
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.61	-46.41	≤-19.39	PASS
		High	2480	-0.05	-47.81	≤-20.05	PASS
BLE_2M	Ant1	Low	2402	-1.80	-32.13	≤-21.8	PASS
		High	2480	0.01	-47.61	≤-19.99	PASS



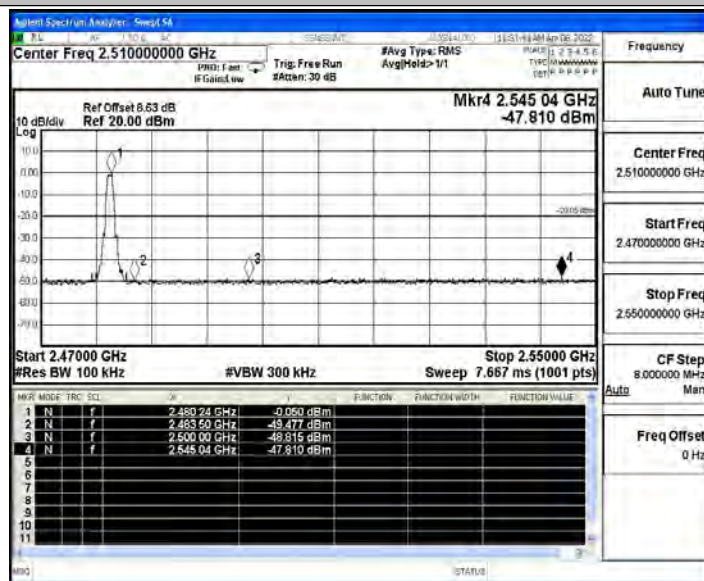


Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402

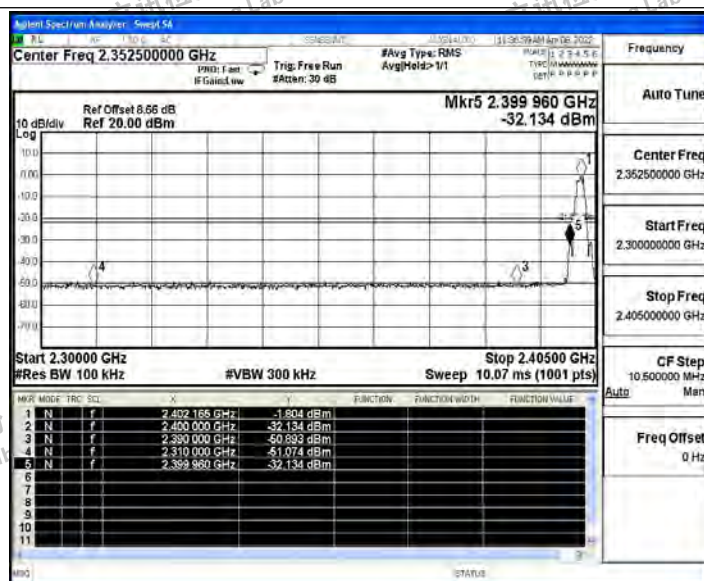


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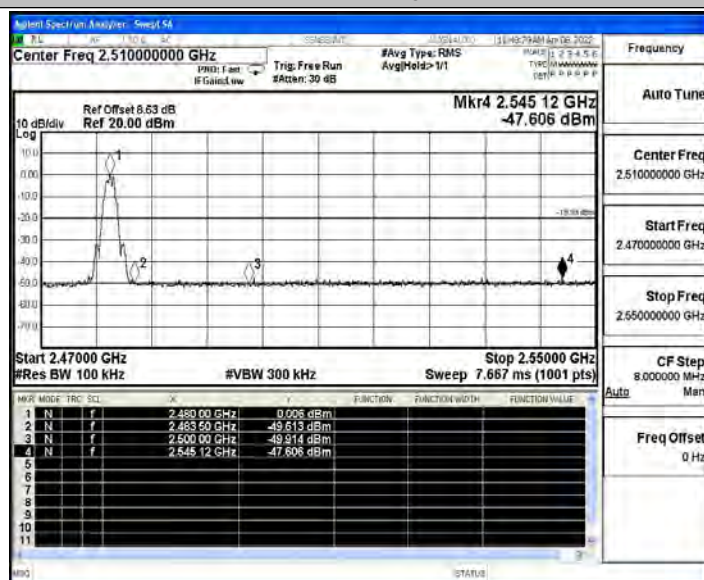
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BLE_2M_Ant1_High_2480





A.5 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	0.40	0.40	---	PASS
			30~1000	0.40	-60.41	≤-19.6	PASS
			1000~26500	0.40	-45.56	≤-19.6	PASS
		2440	Reference	0.23	0.23	---	PASS
			30~1000	0.23	-60.64	≤-19.77	PASS
			1000~26500	0.23	-46.03	≤-19.77	PASS
		2480	Reference	-0.10	-0.10	---	PASS
			30~1000	-0.10	-60.67	≤-20.1	PASS
			1000~26500	-0.10	-46.08	≤-20.1	PASS
BLE_2M	Ant1	2402	Reference	-0.37	-0.37	---	PASS
			30~1000	-0.37	-60.83	≤-20.37	PASS
			1000~26500	-0.37	-45.85	≤-20.37	PASS
		2440	Reference	0.13	0.13	---	PASS
			30~1000	0.13	-60.3	≤-19.87	PASS
			1000~26500	0.13	-43.87	≤-19.87	PASS
		2480	Reference	0.00	0.00	---	PASS
			30~1000	0.00	-60.65	≤-20	PASS
			1000~26500	0.00	-46.43	≤-20	PASS



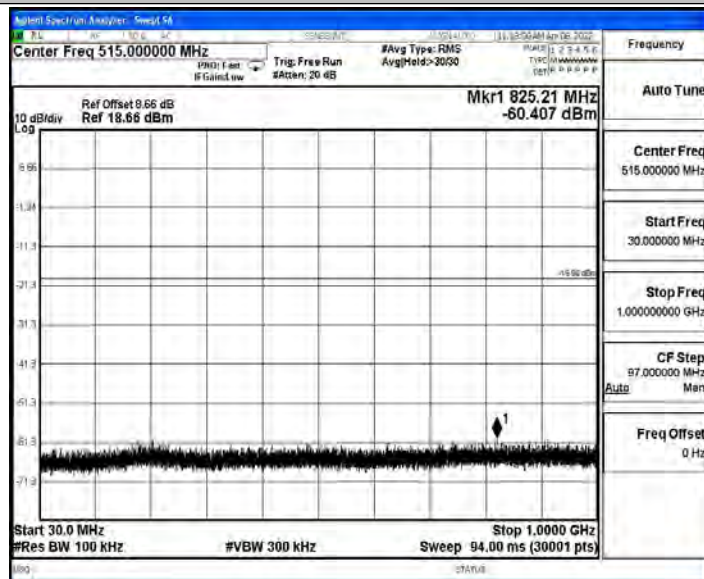


Test Graphs

BLE_1M_Ant1_2402_0~Reference



BLE_1M_Ant1_2402_30~1000



BLE_1M_Ant1_2402_1000~26500

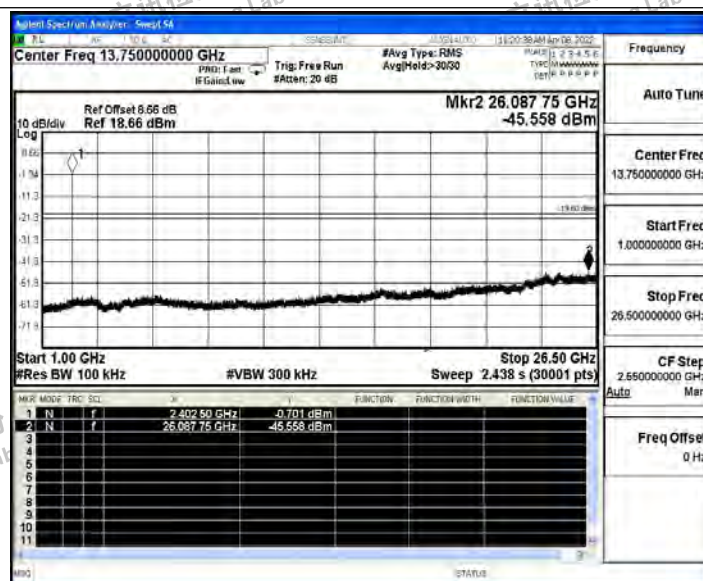


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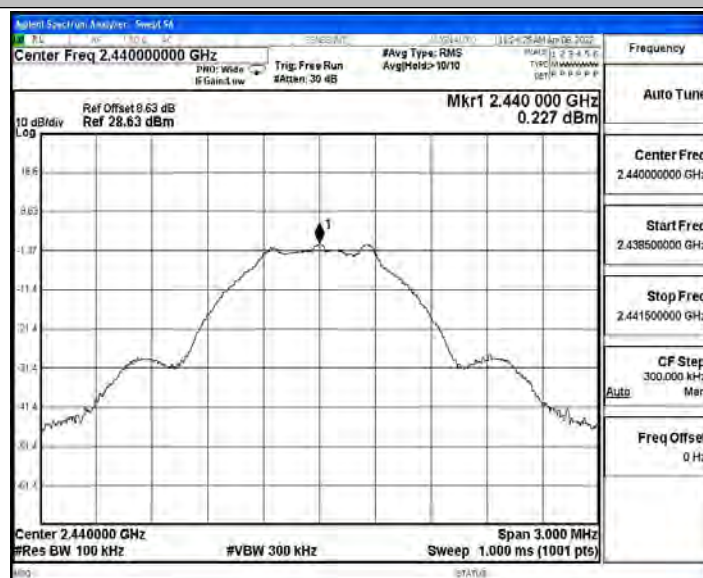
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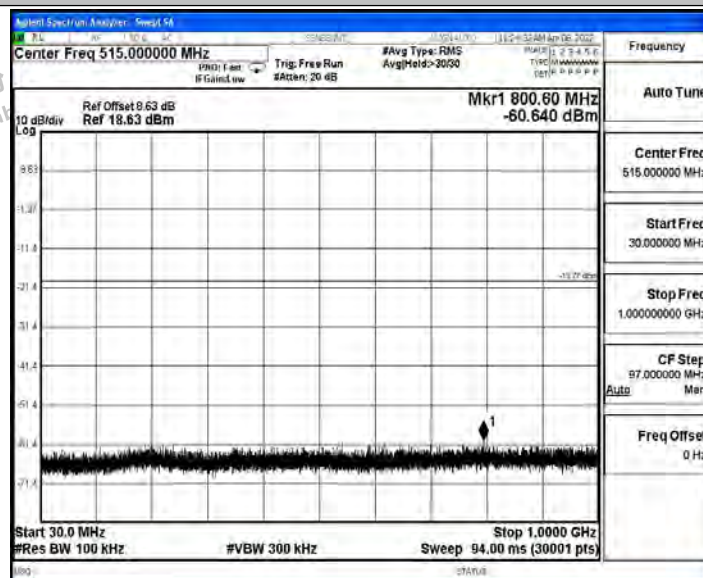
Scan code to check authenticity



BLE_1M_Ant1_2440_0~Reference



BLE_1M_Ant1_2440_30~1000



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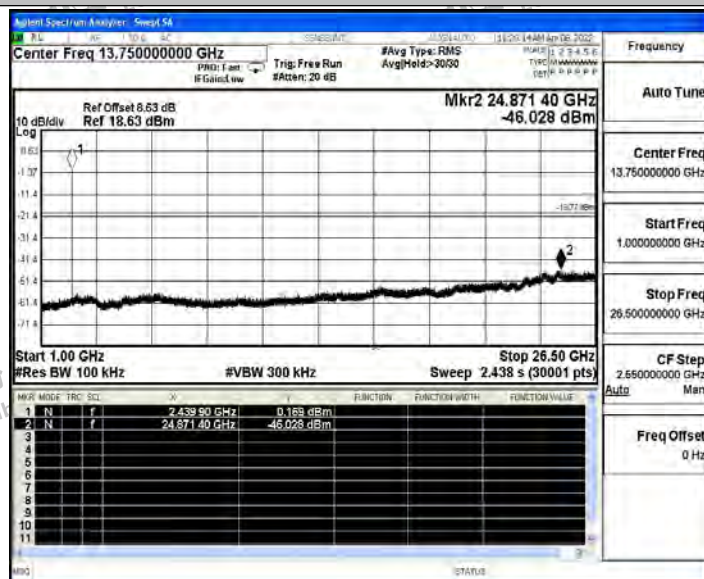
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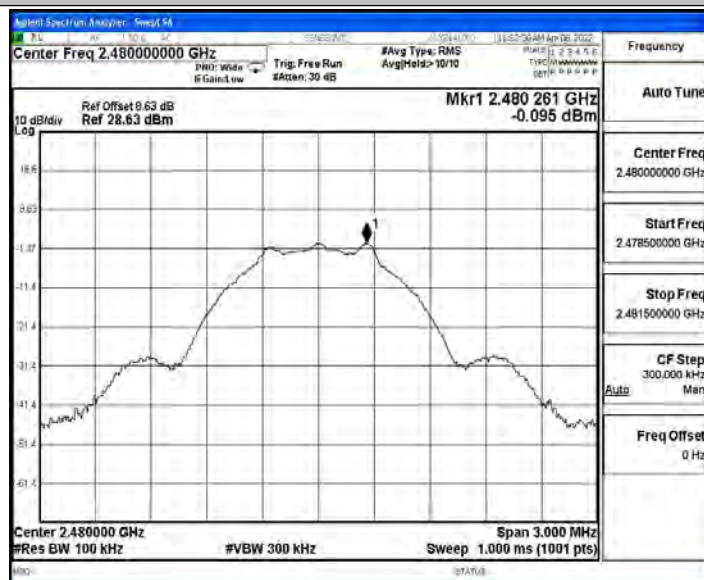
Scan code to check authenticity



BLE_1M_Ant1_2440_1000~26500



BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000

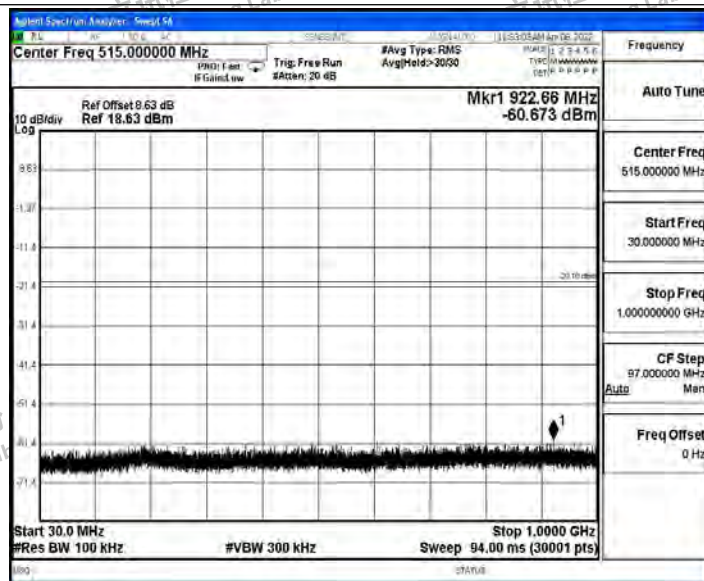


Shenzhen LCS Compliance Testing Laboratory Ltd.

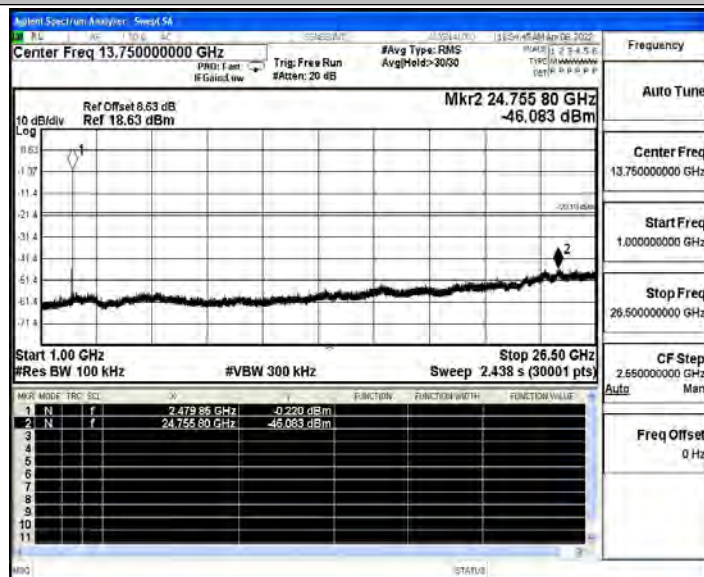
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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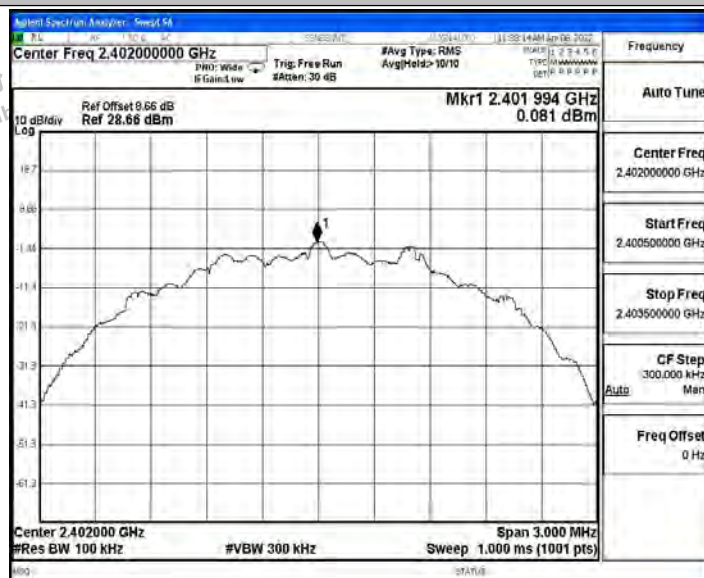
Scan code to check authenticity



BLE_1M_Ant1_2480_1000~26500



BLE_2M_Ant1_2402_0~Reference



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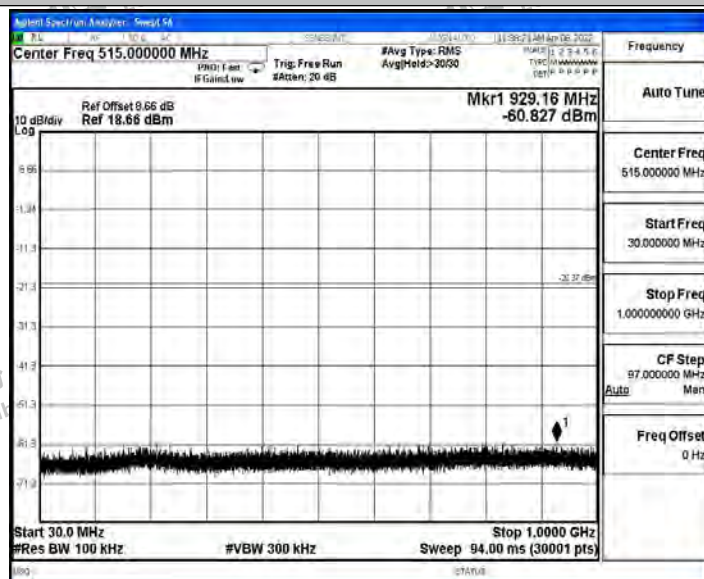
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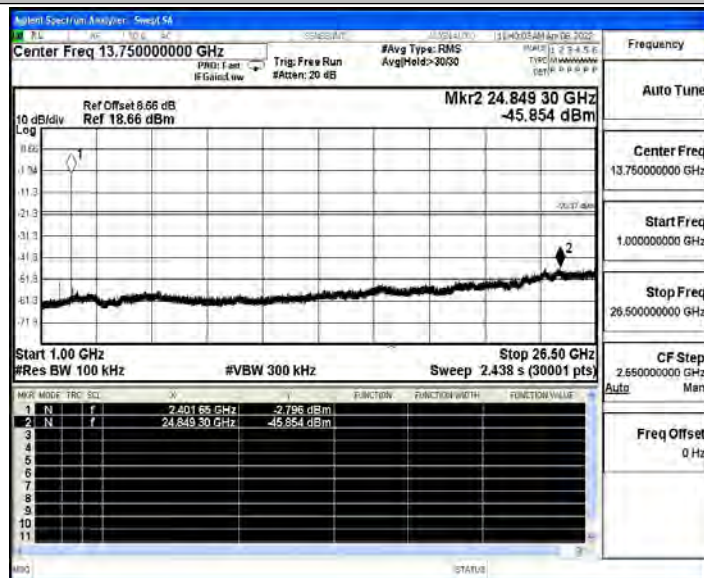
Scan code to check authenticity



BLE_2M_Ant1_2402_30~1000



BLE_2M_Ant1_2402_1000~26500



BLE_2M_Ant1_2440_0~Reference

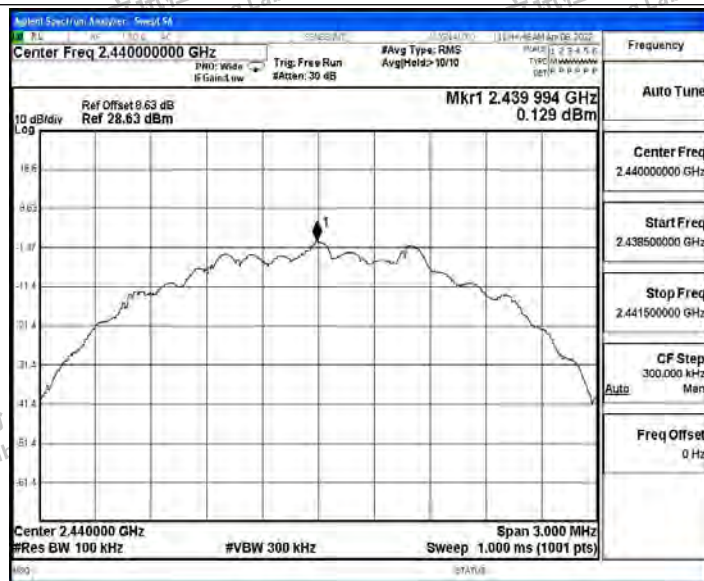


Shenzhen LCS Compliance Testing Laboratory Ltd.

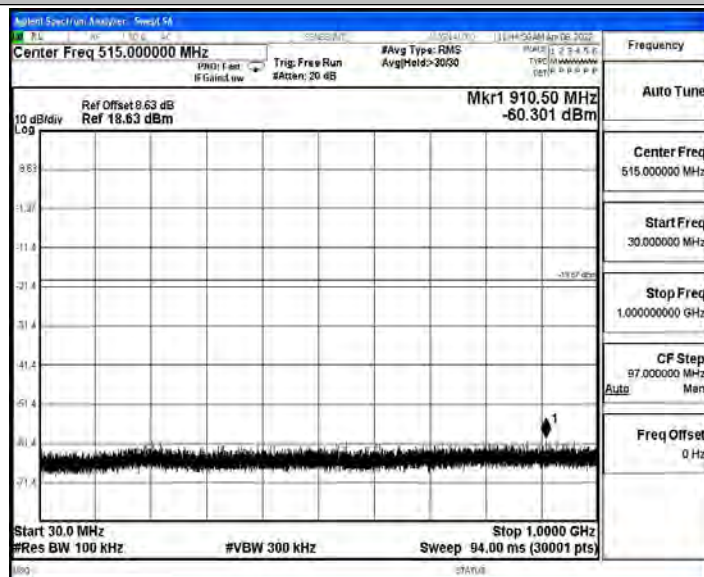
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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

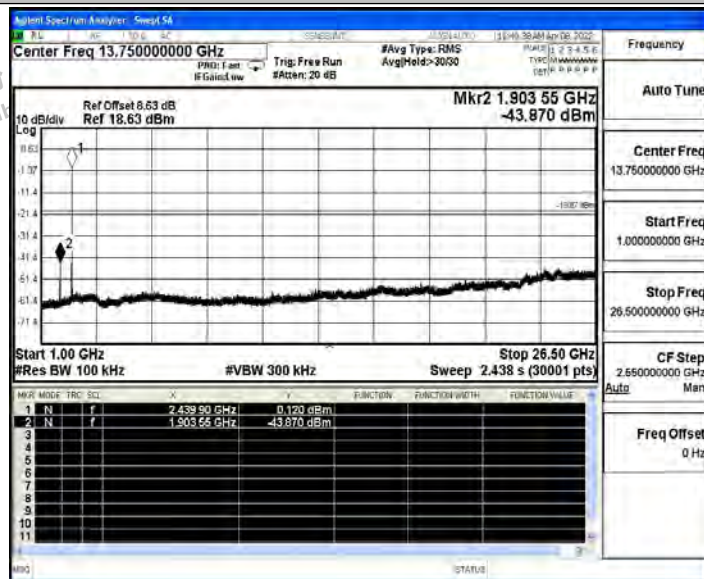
Scan code to check authenticity



BLE_2M_Ant1_2440_30~1000

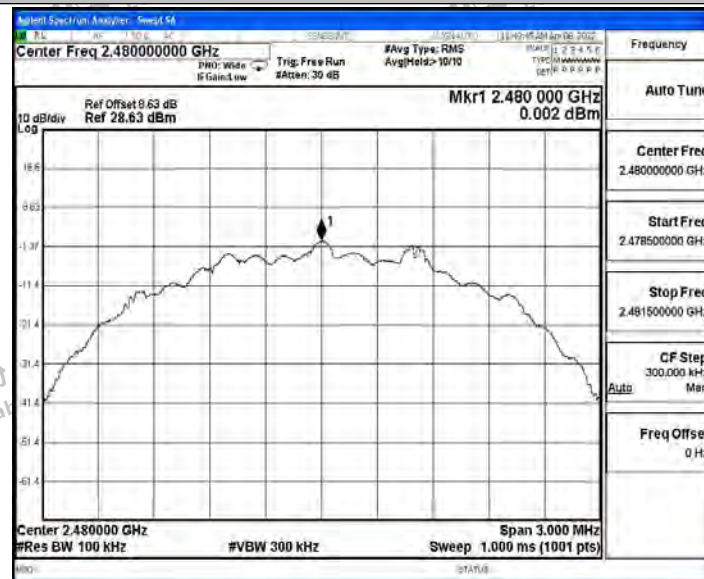


BLE_2M_Ant1_2440_1000~26500

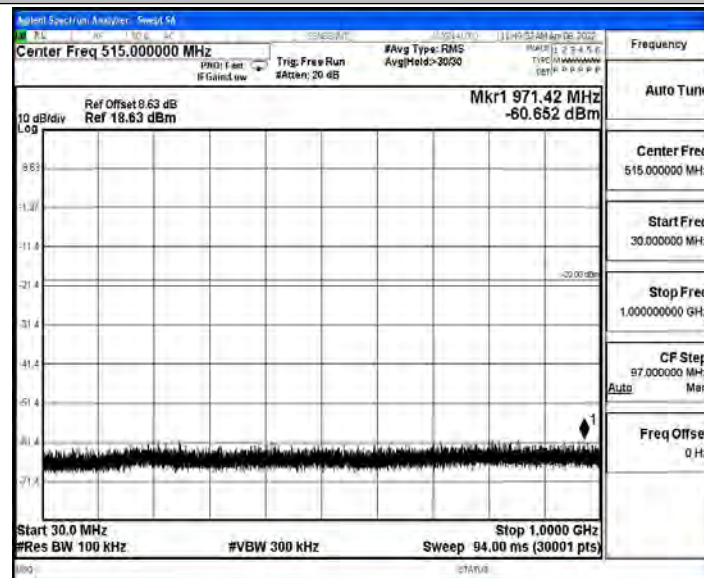




BLE_2M_Ant1_2480_0~Reference

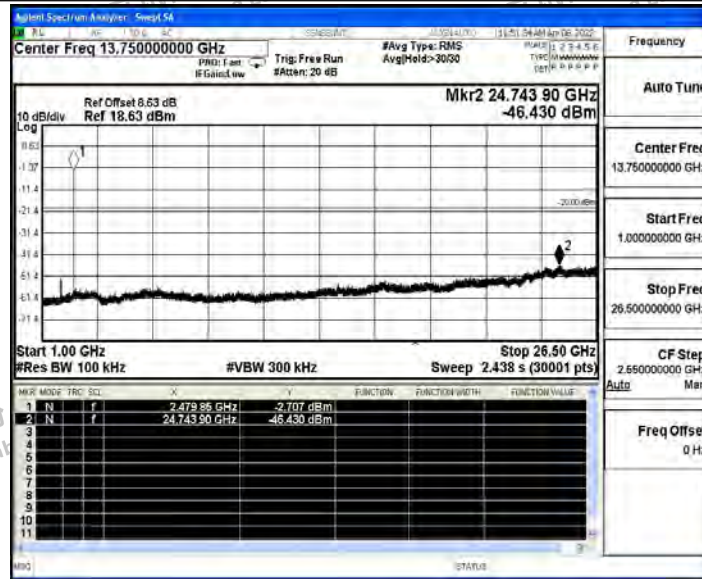


BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500







A.6 Duty Cycle

Test Result

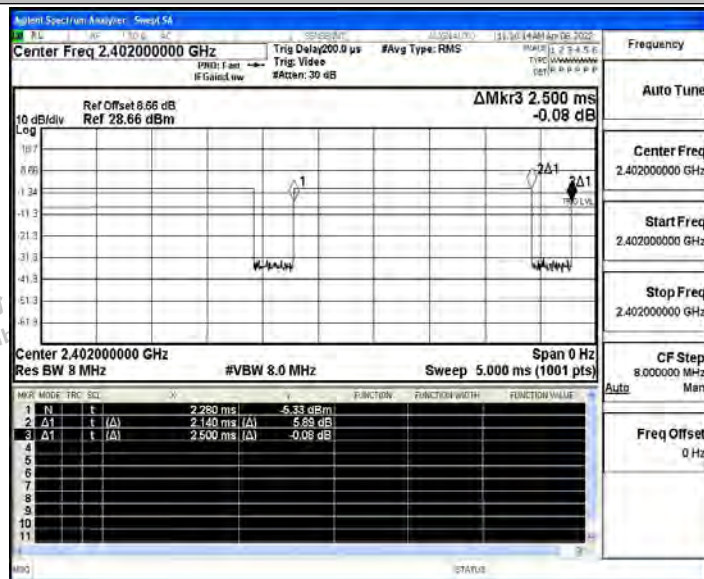
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	2.14	2.50	0.8560	85.60	0.68	---	---
		2440	2.14	2.50	0.8560	85.60	0.68	---	---
		2480	2.14	2.50	0.8560	85.60	0.68	---	---
BLE_2M	Ant1	2402	1.08	1.87	0.5775	57.75	2.38	---	---
		2440	1.08	1.87	0.5775	57.75	2.38	---	---
		2480	1.08	1.87	0.5775	57.75	2.38	---	---



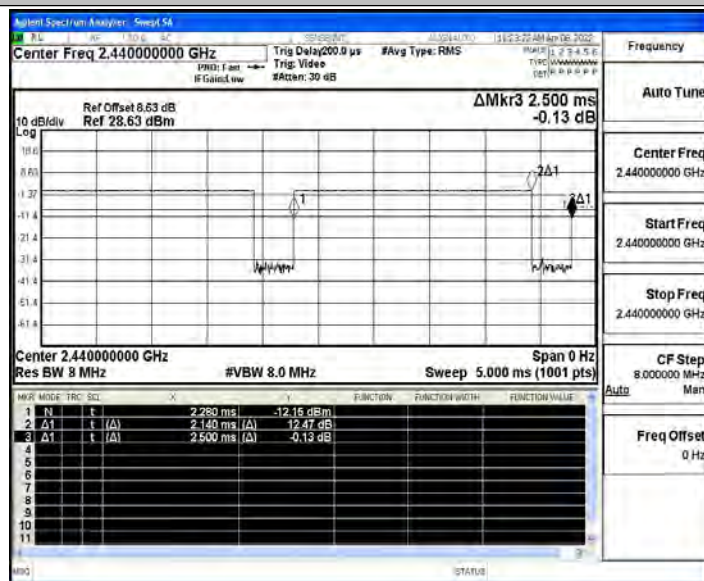


Test Graphs

BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

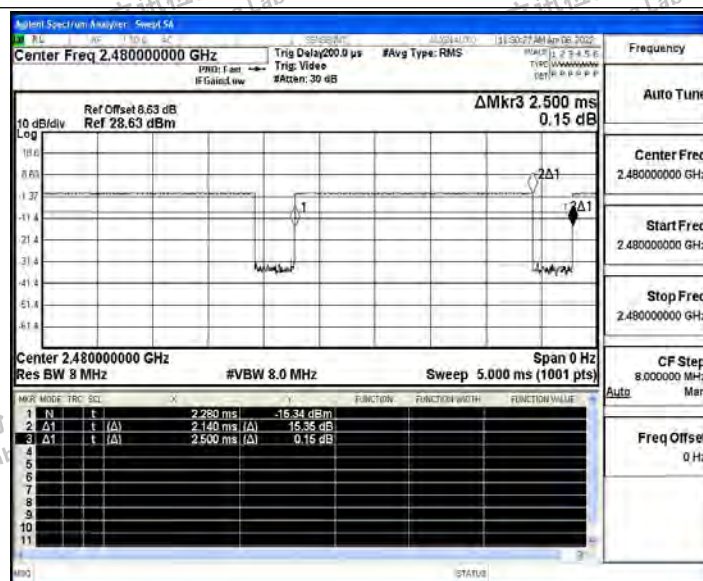


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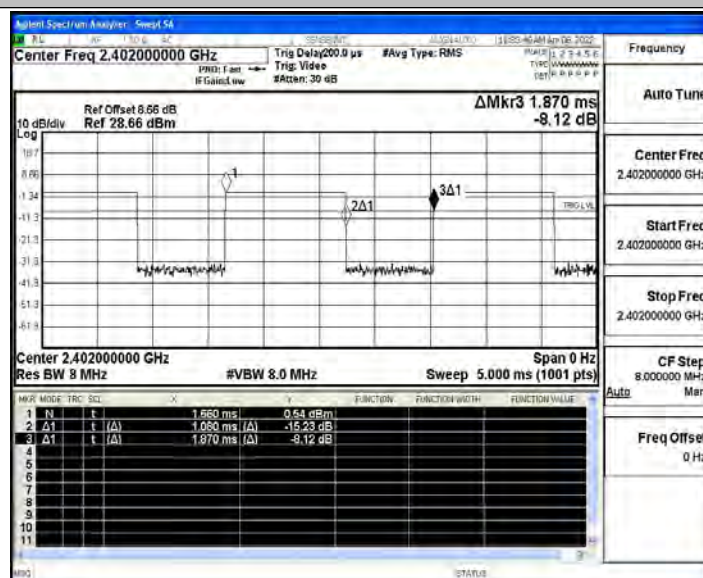
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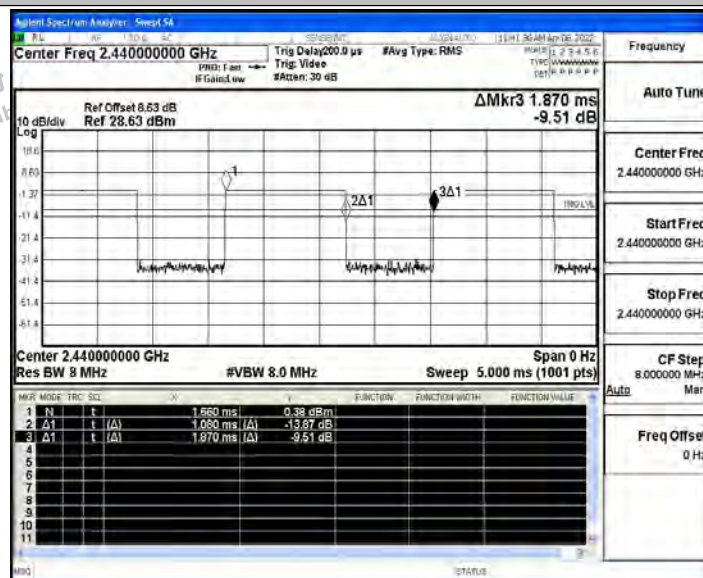
Scan code to check authenticity



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



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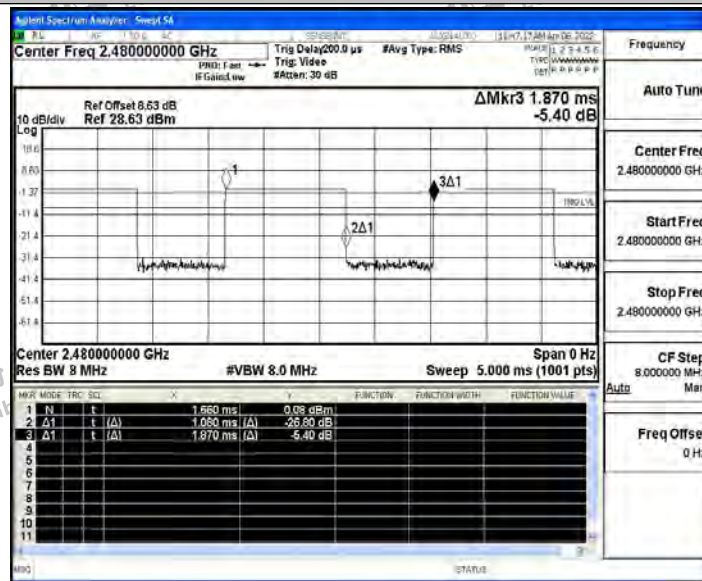
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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BLE_2M_Ant1_2480





A.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1 M	Ant1	Low	2402	AV	2310.000	-48.23	≤-41.20	46.97	≤54	PASS
				AV	2389.355	-47.67	≤-41.20	47.53	≤54	PASS
				AV	2390.000	-47.82	≤-41.20	47.38	≤54	PASS
				Peak	2310.000	-39.51	≤-21.20	55.69	≤74	PASS
				Peak	2365.520	-36.62	≤-21.20	58.58	≤74	PASS
				Peak	2390.000	-38.22	≤-21.20	56.98	≤74	PASS
		High	2480	AV	2483.500	-46.87	≤-41.20	48.33	≤54	PASS
				AV	2483.520	-46.87	≤-41.20	48.33	≤54	PASS
				AV	2500.000	-47.36	≤-41.20	47.84	≤54	PASS
				Peak	2483.500	-36.03	≤-21.20	59.17	≤74	PASS
				Peak	2492.560	-35.18	≤-21.20	60.02	≤74	PASS
				Peak	2500.000	-37.91	≤-21.20	57.29	≤74	PASS
BLE_2 M	Ant1	Low	2402	AV	2310.000	-48.09	≤-41.20	47.11	≤54	PASS
				AV	2389.880	-47.42	≤-41.20	47.78	≤54	PASS
				AV	2390.000	-47.46	≤-41.20	47.74	≤54	PASS
				Peak	2310.000	-37.94	≤-21.20	57.26	≤74	PASS
				Peak	2374.865	-36.84	≤-21.20	58.36	≤74	PASS
				Peak	2390.000	-38.11	≤-21.20	57.09	≤74	PASS
		High	2480	AV	2483.500	-44.74	≤-41.20	50.46	≤54	PASS
				AV	2483.520	-44.74	≤-41.20	50.46	≤54	PASS
				AV	2500.000	-47.16	≤-41.20	48.04	≤54	PASS
				Peak	2483.500	-35.49	≤-21.20	59.71	≤74	PASS
				Peak	2483.520	-35.49	≤-21.20	59.71	≤74	PASS
				Peak	2500.000	-38.35	≤-21.20	56.85	≤74	PASS

Note:

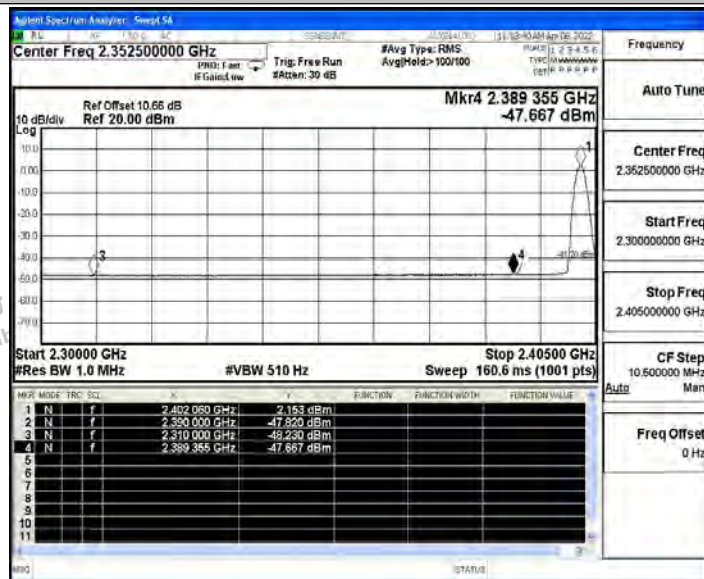
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



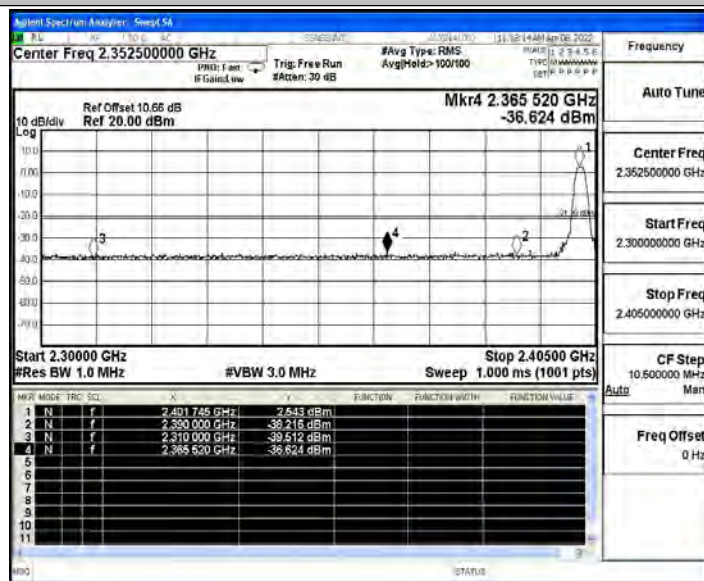


Test Graphs

BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV

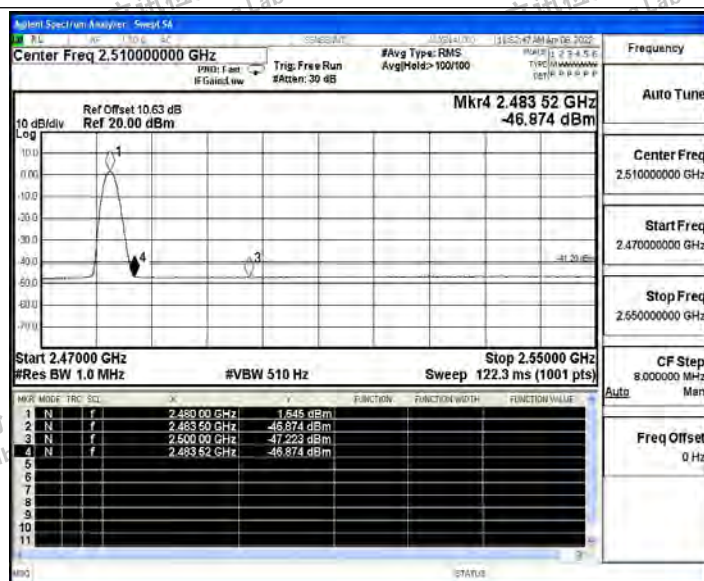


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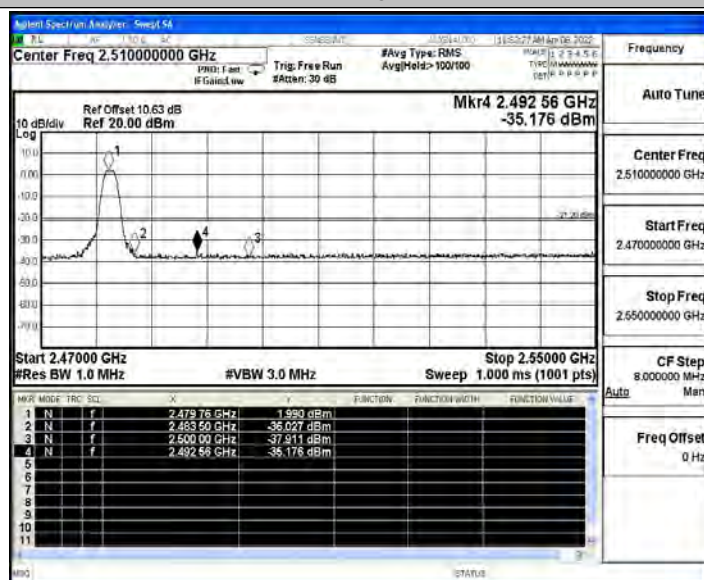
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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

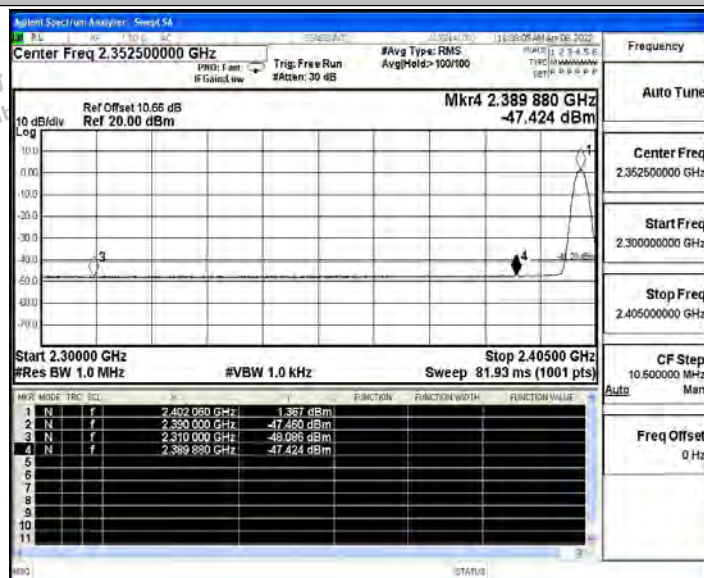
Scan code to check authenticity



BLE_1M_Ant1_High_2480_Peak



BLE_2M_Ant1_Low_2402_AV



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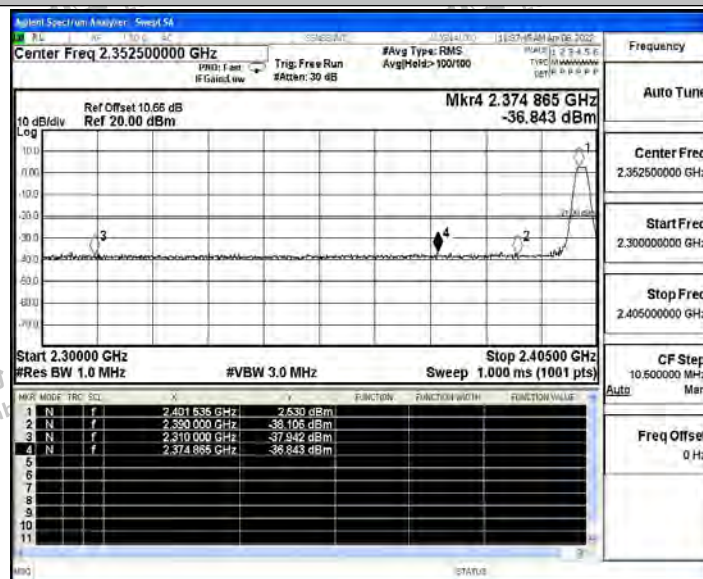
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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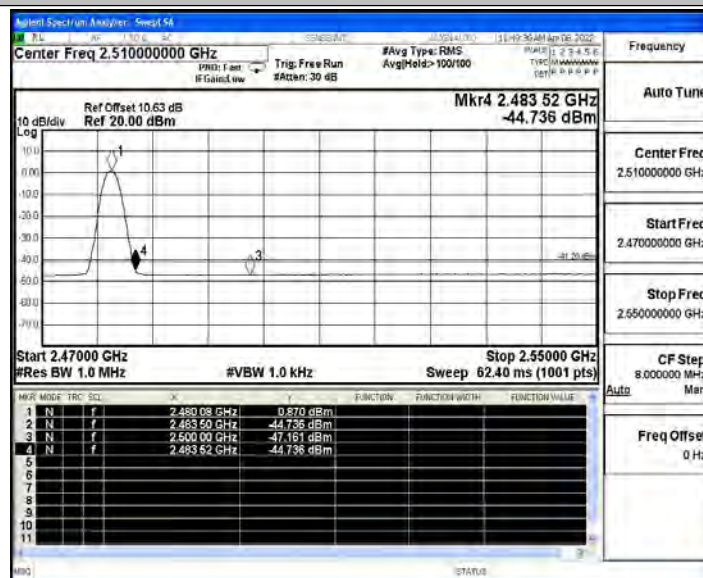
Scan code to check authenticity



BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak



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