

TEST REPORT

Applicant: Ningbo Sunvot Technology Co., Ltd
Address: Building 3, NO 55 Longtan Shan Road, Beilun Daqi, Ningbo, Zhejiang
Equipment Type: LC600 LTE CPE
Model Name: LC600 (refer section 2.4)
Brand Name: Sunvot
FCC ID: 2AZGN-LC600-202302
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Sample Arrival Date: Feb. 07, 2023
Test Date: Feb. 08, 2023 - Mar. 01, 2023
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ISSUED BY:

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Huang Jinsheng

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Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Mar. 13, 2023</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Mar. 21, 2023</u>	<u>Updated Section 5 ASSESSMENT RESULT</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☒ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Ningbo Sunvot Technology Co., Ltd
Address	Building 3, NO 55 Longtan Shan Road, Beilun Daqi, Ningbo, Zhejiang

2.2 Manufacturer Information

Manufacturer	N/A
Address	N/A

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	LC600 LTE CPE
Model Name Under Test	LC600
Series Model Name	LC600C, LC600T, LC600L, LC600A, LC600B
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only differ in model name. (this information provided by the customer)
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Note: Not Applicable.

2.6 Technical Information

Network and Wireless connectivity	3G Network WCDMA/HSDPA/HSUPA Band 2/4/5 4G Network LTE FDD Band 2/4/5 LTE TDD Band 40/42/43/48 LTE CA Uplink (UL): CA_42C, CA_5B
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	WCDMA; LTE		
Frequency Range	WCDMA B2	1850 ~ 1910 MHz	1930 ~ 1990 MHz
	WCDMA B4	1710 ~ 1755 MHz	2110 ~ 2155 MHz
	WCDMA B5	824 ~ 849 MHz	869 ~ 894 MHz
	LTE B2	1850 ~ 1910 MHz	1930 ~ 1990 MHz
	LTE B4	1710 ~ 1755 MHz	2110 ~ 2155 MHz
	LTE B5	824 ~ 849 MHz	869 ~ 894 MHz
	LTE B40(2305-2315)	2305 ~ 2315 MHz	2305 ~ 2315 MHz
	LTE B40(2350-2360)	2350 ~ 2360 MHz	2350 ~ 2360 MHz
	LTE B42(3450-3550)	3450 ~ 3550 MHz	3450 ~ 3550 MHz
	LTE B43(3700-3800)	3700 ~3800 MHz	3700 ~3800 MHz
	LTE B48	3550 ~ 3700 MHz	3550 ~ 3700 MHz
Antenna Type	WWAN	PCB	
Exposure Category	General Population/Uncontrolled Exposure		
EUT Type	Mobile Device		

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Device:

CFR Title 47 §2.1091(b)

(b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{\text{th}} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
		5	10	15	20	25	30	35	40	45	50
300		39	65	88	110	129	148	166	184	201	217
450		22	44	67	89	112	135	158	180	203	226
835		9	25	44	66	90	116	145	175	207	240
1900		3	12	26	44	66	92	122	157	195	236
2450		3	10	22	38	59	83	111	143	179	219
3600		2	8	18	32	49	71	96	125	158	195
5800		1	6	14	25	40	58	80	106	136	169

5 ASSESSMENT RESULT

5.1 Output Power

WCDMA			
Mode	Band 2	Band 4	Band 5
Conducted Power (dBm)	22.40	22.93	22.86
Antenna Gain (dBi)	7.19	6.56	1.84
EIRP (dBm)	29.59	29.49	22.55
Note: This table listed the worst case power value, please refer to BL-SZ2320202-501 report for more details.			

LTE				
Mode	LTE B2	LTE B4	LTE B5	LTE B40(2305-2315)
Conducted Power (dBm)	22.38	22.69	22.80	13.21
Antenna Gain (dBi)	7.19	6.56	1.84	7.00
EIRP (dBm)	29.57	29.25	22.49	20.21
Note: This table listed the worst case power value, please refer to BL-SZ2320203-501 report for more details.				

LTE				
Mode	LTE B40(2350-2360)	LTE B42(3450-3550)	LTE B43(3700-3800)	LTE B48
Conducted Power (dBm)	13.09	13.84	12.88	12.62
Antenna Gain (dBi)	6.84	8.45	8.41	8.24
EIRP (dBm)	19.93	22.29	21.29	20.86
Note: This table listed the worst case power value, please refer to BL-SZ2320203-501 report for more details.				

LTE		
Mode	CA_5B	CA_42C
Conducted Power (dBm)	24.77	14.13
Antenna Gain (dBi)	1.84	8.45
EIRP (dBm)	24.46	22.58
Note: This table listed the worst case power value, please refer to BL-SZ2320203-501 report for more details.		

5.2 Tune-up power

Mode		Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
WCDMA	Band 2	[21.00, 23.00]	[28.19, 30.19]	[26.04, 28.04]
	Band 4	[21.00, 23.00]	[27.56, 29.56]	[25.41, 27.41]
	Band 5	[21.00, 23.00]	/	[22.84, 24.84]
LTE	LTE B2	[21.00, 23.00]	[28.19, 30.19]	[26.04, 28.04]
	LTE B4	[21.00, 23.00]	[27.56, 29.56]	[25.41, 27.41]
	LTE B5	[23.00, 25.00]	/	[24.84, 26.84]
	LTE B40 (2305-2315)	[12.00, 14.00]	[19.00, 21.00]	[16.85, 18.85]
	LTE B40 (2350-2360)	[12.00, 14.00]	[18.84, 20.84]	[16.69, 18.69]
	LTE B42 (3450-3550)	[13.00, 15.00]	[21.45, 23.45]	[19.30, 21.30]
	LTE B43 (3700-3800)	[12.00, 14.00]	[20.41, 22.41]	[18.26, 20.26]
	LTE B48	[12.00, 14.00]	[20.24, 22.24]	[18.09, 20.09]

Note1: ERP= EIRP -2.15dB.

Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.

5.3 RF Exposure Evaluation Result

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Verdict
WCDMA B2	28.04	636.80	200	3060.00	Pass
WCDMA B4	27.41	550.81	200	3060.00	Pass
WCDMA B5	24.84	304.79	200	1731.96	Pass
LTE B2	28.04	636.80	200	3060.00	Pass
LTE B4	27.41	550.81	200	3060.00	Pass
LTE B5	26.84	483.06	200	1731.96	Pass
LTE B40 (2305-2315)	18.85	76.74	200	3060.00	Pass
LTE B40 (2350-2360)	18.69	73.96	200	3060.00	Pass
LTE B42 (3450-3550)	21.30	134.90	200	3060.00	Pass
LTE B43 (3700-3800)	20.26	106.17	200	3060.00	Pass
LTE B48	20.09	102.09	200	3060.00	Pass

5.4 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

Statement

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