

TEST REPORT

Applicant: Starlink SYS Inc.
Address: 451 W Lambert Road Ste 211 Brea, CA 92821
Equipment Type: 4G Wireless Data Terminal
Model Name: X1271
Brand Name: Skylink global
FCC ID: 2BBUT-X1271
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Sample Arrival Date: Nov. 06, 2023
Test Date: Dec. 04, 2023 - Jan. 08, 2024
Date of Issue: Jan. 15, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Xiong Lining**Checked by:** Xu Rui**Approved by:** Tolan Tu
(Testing Director)

Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Jan. 15, 2024</u>	<u>Initial Issue</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	Starlink SYS Inc.
Address	451 W Lambert Road Ste 211 Brea, CA 92821

2.2 Manufacturer Information

Manufacturer	Starlink SYS Inc.
Address	451 W Lambert Road Ste 211 Brea, CA 92821

2.3 General Description for Equipment under Test (EUT)

EUT Name	4G Wireless Data Terminal
Model Name Under Test	X1271
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V1.0
Software Version	CS_C6343R_HW6041_R80_MT7621A_SPI_16M256M_V9.1.0u.6844_0d6f45d_B20231018 6.web
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	4G Network LTE FDD Band 2/4/5/7/12/13/14/25/26/30/66/71 LTE TDD Band 41/48 LTE CA Uplink (UL): CA_7C, CA_41C, CA_5B 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80) U-NII-1/2A/2C/3
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	LTE,WIFI		
Frequency Range	LTE Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 7	TX: 2500 ~ 2570 MHz	RX: 2620 ~ 2690 MHz
	LTE Band 12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz
	LTE Band 13	TX: 777 ~ 787 MHz	RX: 746 ~ 756 MHz
	LTE Band 14	TX: 788 ~ 798 MHz	RX: 758 ~ 768 MHz

	LTE Band 25	TX: 1850 ~ 1915 MHz	RX: 1930 ~ 1995 MHz
	LTE Band 26	TX: 814 ~ 824 MHz	RX: 859 ~ 869 MHz
		TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 30	TX: 2305 ~ 2315 MHz	RX: 2350 ~ 2360 MHz
	LTE Band 66	TX: 1710 ~ 1780 MHz	RX: 2110 ~ 2180 MHz
	LTE Band 71	TX: 663 ~ 698 MHz	RX: 617 ~ 652 MHz
	LTE Band 41	TX: 2496 ~ 2690 MHz	RX: 2496 ~ 2690 MHz
	LTE Band 48	TX: 3550 ~ 3700 MHz	RX: 3550 ~ 3700 MHz
	802.11b/g	2400 ~ 2483.5 MHz	
	802.11n(HT20/HT40)	2400 ~2483.5 MHz	
	802.11 a	5150 ~ 5350 MHz	
		5470 ~ 5725 MHz	
		5725 ~ 5850 MHz	
	802.11 n(HT20/HT40)	5150 ~ 5350 MHz	
		5470 ~ 5725 MHz	
		5725 ~ 5850 MHz	
	802.11 ac(VHT20/VHT40/VH T80)	5150 ~ 5350 MHz	
		5470 ~ 5725 MHz	
		5725 ~ 5850 MHz	
Antenna Type	WWAN	Dipole Antenna	
	WLAN	IFA Antenna	
Exposure Category	General Population/Uncontrolled Exposure		
Product 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 Devices:

CFR Title 47 §2.1091(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).

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

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

LTE								
Mode	Band 2	Band 4	Band 5	Band 7	Band 12	Band 13	Band 14	Band 25
Conducted Power (dBm)	23.35	23.14	23.19	22.93	23.05	23.09	23.15	23.09
Antenna Gain (dBi)	2.96	3.06	1.78	3.28	2.63	2.30	2.30	2.96
EIRP/ERP (dBm)	26.31	26.20	22.52	26.21	23.53	23.24	23.30	26.05
Note: This report listed the worst case power value, please refer to SEWA2208000034RG01 report for more details.								

LTE							
Mode	Band 26 (814-824 MHz)	Band 26 (824-849 MHz)	Band 30	Band 66	Band 71	Band 41	Band 48
Conducted Power (dBm)	23.09	23.02	22.73	23.42	23.46	22.88	22.67
Antenna Gain (dBi)	1.78	1.78	1.62	3.19	2.63	3.65	2.83
EIRP/ERP (dBm)	22.72	22.65	24.35	26.61	23.94	26.53	25.50
Note: This report listed the worst case power value, please refer to SEWA2208000034RG01 report for more details.							

LTE			
Mode	CA_7C	CA_41C	CA_5B
Conducted Power (dBm)	24.71	23.47	23.85
Antenna Gain (dBi)	3.28	3.65	1.78
EIRP/ERP (dBm)	27.99	27.12	23.48
Note: This report listed the worst case power value, please refer to SEWA2208000034RG01 report for more details.			

2.4G WIFI			
Mode	SISO-Antenna 0	SISO-Antenna 1	MIMO
Conducted Power (dBm)	16.58	16.61	12.42
Antenna Gain (dBi)	3.48	3.52	3.50
EIRP/ERP (dBm)	20.06	20.13	15.92
Note: This report listed the worst case power value, please refer to BL-SZ23B0294-601 report for more details.			

5G WIFI SISO-Antenna 0

Mode	5.2G	5.3G	5.6G	5.8G
Conducted Power (dBm)	16.92	16.93	17.00	16.71
Antenna Gain (dBi)	3.26	3.46	3.52	3.58
EIRP/ERP (dBm)	20.18	20.39	20.52	20.29

Note: This report listed the worst case power value, please refer to BL-SZ23B0294-602 report for more details.

5G WIFI SISO-Antenna 1

Mode	5.2G	5.3G	5.6G	5.8G
Conducted Power (dBm)	17.06	14.15	14.81	12.41
Antenna Gain (dBi)	1.24	2.04	2.89	3.22
EIRP/ERP (dBm)	18.30	16.19	17.70	15.63

Note: This report listed the worst case power value, please refer to BL-SZ23B0294-602 report for more details.

5G WIFI MIMO

Mode	5.2G	5.3G	5.6G	5.8G
Conducted Power (dBm)	12.93	12.66	12.77	12.88
Antenna Gain (dBi)	2.37	2.81	3.22	3.55
EIRP/ERP (dBm)	15.30	15.47	15.99	16.43

Note: This report listed the worst case power value, please refer to BL-SZ23B0294-602 report for more details.

5.2 Tune-up power

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
LTE- Band 2	[22.00,24.00]	[25.00,27.00]	[22.85,24.85]
LTE- Band 4	[22.00,24.00]	[25.00,27.00]	[22.85,24.85]
LTE- Band 5	[22.00,24.00]	/	[21.85,23.85]
LTE- Band 7	[21.00,23.00]	[25.00,27.00]	[22.85,24.85]
LTE- Band 12	[22.00,24.00]	/	[21.85,23.85]
LTE- Band 13	[22.00,24.00]	/	[21.85,23.85]
LTE- Band 14	[22.00,24.00]	/	[21.85,23.85]
LTE- Band 25	[22.00,24.00]	[25.00,27.00]	[22.85,24.85]
LTE- Band 26 (814-824 MHz)	[22.00,24.00]	/	[21.85,23.85]
LTE- Band 26 (824-849 MHz)	[22.00,24.00]	/	[21.85,23.85]
LTE- Band 30	[21.00,23.00]	[23.00,25.00]	[20.85,22.85]
LTE- Band 66	[22.00,24.00]	[25.00,27.00]	[22.85,24.85]
LTE- Band 71	[22.00,24.00]	/	[21.85,23.85]
LTE- Band 41	[21.00,23.00]	[25.00,27.00]	[22.85,24.85]
LTE- Band 48	[21.00,23.00]	[24.00,26.00]	[21.85,23.85]
CA_7C	[23.00,25.00]	[26.00,28.00]	[23.85,25.85]
CA_41C	[22.00,24.00]	[26.00,28.00]	[23.85,25.85]
CA_5B	[22.00,24.00]	/	[21.85,23.85]
Max 2.4G WIFI SISO-Antenna 0	[15.00,17.00]	[19.00,21.00]	[16.85,18.85]
Max 2.4G WIFI SISO-Antenna 1	[15.00,17.00]	[19.00,21.00]	[16.85,18.85]
Max 2.4G WIFI MIMO	[11.00,13.00]	[14.00,16.00]	[11.85,13.85]
Max 5G WIFI SISO-Antenna 0	[16.00,18.00]	[19.00,21.00]	[16.85,18.85]
Max 5G WIFI SISO-Antenna 1	[16.00,18.00]	[17.00,19.00]	[14.85,16.85]
Max 5G WIFI MIMO	[11.00,13.00]	[15.00,17.00]	[12.85,14.85]
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)	Power / Limit	Verdict
LTE- Band 2	24.85	305.49	200	3060.00	0.100	Pass
LTE- Band 4	24.85	305.49	200	3060.00	0.100	Pass
LTE- Band 5	24.00	251.19	200	1680.96	0.149	Pass
LTE- Band 7	24.85	305.49	200	3060.00	0.100	Pass
LTE- Band 12	24.00	251.19	200	1425.96	0.176	Pass
LTE- Band 13	24.00	251.19	200	1585.08	0.158	Pass
LTE- Band 14	24.00	251.19	200	1607.52	0.156	Pass
LTE- Band 25	24.85	305.49	200	3060.00	0.100	Pass
LTE- Band 26 (814-824 MHz)	24.00	251.19	200	1660.56	0.151	Pass
LTE- Band 26 (824-849 MHz)	24.00	251.19	200	1680.96	0.149	Pass
LTE- Band 30	23.00	199.53	200	3060.00	0.065	Pass
LTE- Band 66	24.85	305.49	200	3060.00	0.100	Pass
LTE- Band 71	24.00	251.19	200	1352.52	0.186	Pass
LTE- Band 41	24.85	305.49	200	3060.00	0.100	Pass
LTE- Band 48	23.85	242.66	200	3060.00	0.079	Pass
CA_7C	25.85	384.59	200	3060.00	0.126	Pass
CA_41C	25.85	384.59	200	3060.00	0.126	Pass
CA_5B	24.00	251.19	200	1680.96	0.149	Pass
Max 2.4G WIFI SISO-Antenna 0	18.85	76.74	200	3060.00	0.025	Pass
Max 2.4G WIFI SISO-Antenna 1	18.85	76.74	200	3060.00	0.025	Pass
Max 2.4G WIFI MIMO	13.85	24.27	200	3060.00	0.008	Pass
Max 5G WIFI SISO-Antenna 0	18.85	76.74	200	3060.00	0.025	Pass
Max 5G WIFI SISO-Antenna 1	18.00	63.10	200	3060.00	0.021	Pass
Max 5G WIFI MIMO	14.85	30.55	200	3060.00	0.010	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency(MHz)	Power /Limit	$\Sigma(\text{Power / Limit})$ of WWAN + WLAN	Verdict
WWAN	663 ~ 698 MHz	0.186	0.236	Pass
Max 2.4G WIFI	2400 ~ 2483.5 MHz	0.025		
Max 5G WIFI	5150 ~ 5850 MHz	0.025		

Note:

1. $\Sigma(\text{Power / Limit})$: This is a summation of [(power for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding Power limit)], for WWAN+WLAN 2.4GHz+WLAN 5GHz.
2. Both of the WWAN/2.4GHz/5GHz can transmit simultaneously, the formula of calculated the Power is $CP1 / LP1 + CP2 / LP2 + \dots \text{etc.} < 1$
 CP = Calculation power
 LP = Limit of power
3. The worst-case situation is 0.231, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
4. The DUT work frequency range used is 663 ~ 698 MHz ,2400 MHz ~ 2483.5 MHz, 5150 MHz~ 5250 MHz and 5725 MHz ~ 5850 MHz the result close to the limit by the above formula, so we select worst case power to calculate the exclusion power threshold.
5. More power list please refer to SEWA2208000034RG01, BL-SZ23B0294-601,602 test report.

5.5 Conclusion

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

Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
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6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--