TEST REPORT

Application No.:	SZCR2310003424AT
Applicant:	Baicells Technologies Co., Ltd.
Address of Applicant:	9-10F,1stBldg.,No.81BeiqingRoad,Haidian District,Beijing,China
Manufacturer:	Baicells Technologies Co., Ltd.
Address of Manufacturer:	9-10F,1stBldg.,No.81BeiqingRoad,Haidian District,Beijing,China
Equipment Under Test (EUT):	
EUT Name:	5G Indoor CPE
Model No.:	EG3661M-NR6
Trade Mark:	Baicells
FCC ID:	2AG32EG3661MNR6
Standard(s) :	47 CFR Part 1.1307
	47 CFR Part 1.1310
	FCC Rules 47 CFR §2.1091
	KDB 447498 D04 interim General RF Exposure Guidance v01
Date of Receipt:	2023-10-25
Date of Evaluation:	2024-07-02
Date of Issue:	2024-07-04
Evaluation Result:	**Pass***

* In the configuration evaluated, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2024-07-04		Original

Authorized for issue by:				
		Frank Chen **Frank Chen /Project Engineer**		
		Eric Fu **Eric Fu/Reviewer**		

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3 General Information

3.1 General Description of E.U.T.

Product Type:	☐ Portable device
	☒ Mobile device
	☐ Fixed device

3.2 Details of E.U.T.

Power supply:	AC/DC ADAPTOR Model: DCT36W120300US-A2 Input Power: AC 100-240V~, 50/60Hz 1.0A MAX; DC Output: 12V 3A		
Cable(s):	DC cable:150cm unshielded		
Hardware Version:	VER.B		
Software Version:	BaiCE_BQ6_2.0.5.3_NA		
Antenna Type:	☐ External, ☒ Integrated		
Frequency Bands:	Band	TX	RX
	LTE Band 2	1850 to 1910 MHz	1930 to 1990 MHz
	LTE Band 4	1710 to 1755 MHz	2110 to 2155 MHz
	LTE Band 5	824 to 849 MHz	869 to 894 MHz
	LTE Band 12	699 to 716 MHz	729 to 746 MHz
	LTE Band 13	777 to 787 MHz	746 to 756 MHz
	LTE Band 25	1850 to 1915MHz	1930 to 1995 MHz
	LTE Band 41	2496 to 2690MHz	2496 to 2690MHz
	LTE Band 48	3550 to 3700 MHz	3550 to 3700 MHz
	LTE Band 66	1710 to 1780 MHz	2110 to 2180 MHz
	LTE Band 71	663 to 698 MHz	617 to 652 MHz
	NR Band n2	1850 to 1910 MHz	1930 to 1990 MHz
	NR Band n5	824 to 849 MHz	869 to 894 MHz
	NR Band n12	699 to 716 MHz	729 to 746 MHz
	NR Band n25	1850 to 1915MHz	1930 to 1995 MHz
	NR Band n41	2496 to 2690 MHz	2496 to 2690 MHz
	NR Band n48	3550 to 3700 MHz	3550 to 3700 MHz
	NR Band n66	1710 to 1780 MHz	2110 to 2180 MHz

	NR Band n71	663 to 698 MHz	617 to 652 MHz
	NR Band n77	3700 to 3980 MHz	3700 to 3980 MHz
		3450 to 3550 MHz	3450 to 3550 MHz
	GNSS (BDS+ Galileo+ GLONASS+ GPS+ SBAS)	N/A	1559-1610
	CA: UL CA_2A-4A; UL CA_2A-5A; UL CA_2A-12A; UL CA_2A-13A; UL CA_2A-66A; UL CA_4A-12A; UL CA_4A-13A; UL CA_5A-66A; UL CA_12A-66A; UL CA_13A-66A; UL CA_2C; UL CA_5B; UL CA_41C; UL CA_48C; UL CA_66B; ENDC: DC_5A_n2A; DC_2A_n5A; DC_66A_n5A; DC_2A_n12A; DC_66A_n12A; DC_2A_n66A; DC_5A_n66A; DC_12A_n66A; DC_12A_n2A; DC_66A_n2A; DC_71A_n2A; DC_12A_n41A; DC_71A_n66A; DC_2A_n71A; DC_66A_n71A; DC_66A_n25A; DC_25A_n41A; DC_12A_n77A; DC_2A_n41A; DC_12A_n25A; DC_25A_n77A; DC_2A_n77A; DC_5A_n41A; DC_66A_n41A; DC_41A_n77A; DC_71A_n41A; DC_5A_n77A; DC_66A_n77A; DC_71A_n77A; DC_71A_n25A; DC_5A_n25A; NR UL CA: n25A-n41A; n41A-n66A; n41A-n71A; n2A-n77A; n5A-n77A; n66A-n77A n71A-n77A; n25A-n77A		
Antenna Gain*:	☒Provided by client		
	LTE Band 2:	4.08dBi(Ant0)	LTE Band 4: 2.99dBi(Ant0)
	LTE Band 5:	2.12dBi(Ant0)	LTE Band 12: 4.25dBi(Ant0)
	LTE Band 13:	2.95dBi(Ant0)	LTE Band 25: 4.08dBi(Ant0)
	LTE Band 41:	7.74dBi(Ant0)	LTE Band 48: 4.23dBi(Ant0)
	LTE Band 66:	2.99dBi(Ant0)	LTE Band 71: 4.25dBi(Ant0)
	NR Band 2:	4.08dBi(Ant0)	NR Band 5: 2.12dBi(Ant0)
	NR Band 12:	4.25dBi(Ant0)	NR Band 25: 4.08dBi(Ant0)
	NR Band 41 MIMO:	7.74dBi(Ant0) 7.74dBi(Ant2)	NR Band 48: 4.23dBi(Ant0)
	NR Band 66:	2.99dBi(Ant0)	NR Band 71: 4.25dBi(Ant0)
	NR Band 77:	4.75dBi(Ant0)	/ /
RF Cable:	0.8dB(Below 1GHz)		1.0dB(1.0~2.4GHz)
	1.2dB(2.4~3.4GHz)		1.5dB(Above 3.4GHz)
Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this			

report are only made for these data and/or information, SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

Remark:
As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

3.3 Separation Distance

Minimum test separation distance:	>30cm
Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.	

3.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

3.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

3.6 Deviation from Standards

None

3.7 Abnormalities from Standard Conditions

None

4 FCC Radiofrequency radiation exposure limits

Test exemptions apply for devices used in general population/uncontrolled exposure environments, according to the SAR-based, or MPE-based exemption thresholds.

4.1 Blanket 1 mW Blanket Exemption

The 1 mW Blanket Exemption of §1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

The 1-mW blanket exemption applies at separation distances less than 0.5 cm, including where there is no separation. This exemption shall not be used in conjunction with other exemption criteria other than those for multiple RF sources in paragraph §1.1307(b)(3)(ii)(A).

The 1-mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it shall not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period. Exposure from such higher-power transmitters would invalidate the underlying assumption that exposure from the lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

4.2 MPE-based Exemption

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table B.1—Thresholds For Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R^2
1.34	–	30	35.6 m	–	1.6 m	3,450 R^2/f^2
30	–	300	1.6 m	–	159 mm	3.83 R^2
300	–	1,500	159 mm	–	31.8 mm	0.0128 R^2f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R^2
Subscripts L and H are low and high; λ is wavelength. From §1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

The table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least λ/2π. The thresholds are

based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.

For mobile devices that are not exempt per Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, 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); also in §1.1307(b)(1)(i)(B)].

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

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 λ/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.

Limit calculation			
Frequency range	Frequency(MHz)	R(λ/2π)(m)	Threshold ERP(W)
300~1500MHz	**915**	0.0522	0.032
1500~100000MHz	**2480**	0.0193	0.007

4.3 SAR-based Exemption

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of λ/4.

As for devices with antennas of length greater than λ/4 where the gain is not well defined, but always less than that of a half-wave dipole (length λ/2), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

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).

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

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_{20cm} is per Formula (B.1).

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

Limit calculation				
Frequency range(GHz)	Frequency(GHz)	X	Distance(cm)	Pth (mW)
0.3~1.5	**0.915**	1.474	**0.5**	**8.133**
1.5~6	**2.48**	1.905	**0.5**	**2.717**

2. According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30
30–300	27.5	0.073	0.2	30
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4* Pi * R 2)

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 mW/cm2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5 Measurement and Calculation

Output Power Into Antenna & RF Exposure Evaluation Distance(30cm):

For WiFi:

Operating Band	Frequency (MHz)	Gain (dBi)	Max Conducted Average Output Power (dBm) (including tune up)	Maximum EIRP [dBm] (including tune up)	Power Density At R=30 cm (m w/cm^2)	Limit (m w/cm^2)	Ratio
2.4G WiFi	2412	5.46	11+2+3.01=16.01	21.47	0.0124	1.0000	0.012
5G WiFi	5180	4.96	22+2+3.01=27.01	31.97	0.1392	1.0000	0.139
6G WiFi	6115	4.96	9.5+2+3.01=14.51	19.47	0.0078	1.0000	0.008

For LTE/NR:

Operating Band	Frequency (MHz)	Gain (dBi)	Max Conducted Average Output Power (dBm) (including tune up)	Maximum EIRP/ERP [dBm] (including tune up)	Power Density atR=30 cm (m w/cm^2)	Limit (m w/cm^2)	Ratio
LTE B2/CA_2C/n2	1880	4.08	25	29.08	0.0715	1.0000	0.072
LTE B4	1710.7	2.99	25	27.99	0.0557	1.0000	0.056
LTE B5/CA 5B/n5	824.7	2.12	25	27.12	0.0456	0.5498	0.083
LTE B12/n12	699.7	4.25	25	29.25	0.0744	0.4665	0.159
LTE B13	779.5	2.95	25	27.95	0.0552	0.5197	0.106
LTE B25/n25	1850.7	4.08	25	29.08	0.0715	1.0000	0.072
LTE B41/CA 41C/n41	2498.5	7.74	25	32.74	0.1662	1.0000	0.166
LTE B48/n48/CA 48C	3550	4.23	28.01	32.24	0.1481	1.0000	0.148
LTE B66/n66	1710.7	2.99	25	27.99	0.0557	1.0000	0.056
LTE B71/n71	665.5	4.25	29.01	33.26	0.1873	0.4437	0.422
NR Band n77	3455.01	4.75	24.01	28.76	0.0665	1.0000	0.066

Due to the EUT support WiFi , NR ENDC and CA

WiFi+ LTE + NR/LTE band can transmit simultaneously, the formula of the calculated the MPE is:

$$\sum_{i=1}^{n} \frac{S_{E_i}(duty\,factor)}{MPE_{E_i}} < 1$$

NOTE The corresponding MEs must be expressed in terms of power density in the above summation

Therefore, the worst-case(5G WiFi + CA) situation is 0.139+0.422+0.422=0.983,which is less than “1”， this confirmed that the device comply with MPE limit.

.--End of the Report--

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