

# RF EXPOSURE EVALUATION REPORT

**Application No.:** SZCR2304001206AT  
**Applicant:** GL Technologies (Hong Kong) Limited  
**Address of Applicant:** Unit 601, Building 5W Hong Kong Science Park, Shatin, N.T., Hong Kong  
**Manufacturer:** Shenzhen Guanglian Zhitong Technology Co., LTD  
**Address of Manufacturer:** Room 305-306, Skyworth Digital Building, Shiyan Street, Baoan District, Shenzhen, China  
**Factory:** Shenzhen Guanglian Zhitong Technology Co., LTD  
**Address of Factory:** Room 305-306, Skyworth Digital Building, Shiyan Street, Baoan District, Shenzhen, China

### Equipment Under Test (EUT):

**EUT Name:** 5G NR Wi-Fi 6 Router  
**Model No.:** GL-XE3000NR  
**Trade Mark:** GL.iNET  
**FCC ID:** 2AFIW-XE3000  
**Standard(s) :** FCC Rules 47 CFR §2.1091  
KDB 447498 D04 interim General RF Exposure Guidance v01  
**Date of Receipt:** 2023-04-25  
**Date of Evaluation:** 2023-05-09 to 2023-06-20  
**Date of Issue:** 2023-06-30

**Evaluation Result:**

**Pass\***

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



Keny Xu

EMC Laboratory Manager



| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2023-06-30 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                                 |  |                             |  |
|---------------------------------|--|-----------------------------|--|
| <b>Authorized for issue by:</b> |  |                             |  |
|                                 |  | 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: | <input type="checkbox"/> Portable device          |
|               | <input checked="" type="checkbox"/> Mobile device |
|               | <input type="checkbox"/> Fixed device             |

#### 3.2 Details of E.U.T.

|                               |   |
|-------------------------------|---|
| Power supply:                 | Lithium-ion rechargeable battery (DC 7.4V 6400mAh) which can be charged from AC adapter.<br>Adapter Model: ICP30A-120-2500<br>Input: AC 100-240V 50/60Hz 0.8A<br>Output: DC 12V 2.5A.                     |
| Cable(s):                     | DC cable:100cm unshielded<br>Network cable:70cm unshielded  |
| <b>For 2.4G WIFI:</b>         |   |
| Operation Frequency:          | 802.11b/g/n(HT20)/ax(HEW20): 2412MHz to 2462MHz,<br>802.11n(HT40)/ax(HEW40): 2422MHz to 2452MHz   |
| Modulation Type:              | 802.11b: DSSS (CCK, DQPSK, DBPSK),<br>802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>802.11ax: OFDMA(16QAM, 64QAM, 256QAM, 1024QAM, QPSK, BPSK)  |
| Number of Channels:           | 802.11b/g/n(HT20)/ax(HEW20): 11, 802.11n(HT40)/ax(HEW40):7  |
| Channel Spacing:              | 5MHz  |
| Antenna Type:                 | Dipole Antenna  |
| Antenna Gain:                 | ANT1 & ANT2: 1.63dBi; Directional Gain:4.64dBi.   |
| <b>For 5G WIFI:</b>           |   |
| Operation Frequency (20MHz):  | U-NII-1: 5180-5240MHz; U-NII-2A: 5260-5320MHz; U-NII-2C: 5500-5700MHz; U-NII-3: 5745-5825MHz  |
| Operation Frequency (40MHz):  | U-NII-1: 5190-5230MHz; U-NII-2A: 5270-5310MHz; U-NII-2C: 5510-5670MHz; U-NII-3: 5755-5795MHz  |
| Operation Frequency (80MHz):  | U-NII-1: 5210MHz; U-NII-2A: 5290MHz; U-NII-2C: 5530-5610MHz; U-NII-3: 5775MHz   |
| Operation Frequency (160MHz): | 5250MHz/5570MHz   |
| Modulation Type:              | 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK);<br>802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM);<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA(16QAM, 64QAM, 256QAM, 1024QAM, QPSK, BPSK) |
| DFS Function:                 | Master  |



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|                      |   |                  |                  |
|----------------------|---|------------------|------------------|
| TPC Function:        | Support   |                  |                  |
| Antenna Type:        | For ANT1 & ANT2:Dipole Antenna;<br>For ANT3:FPC Antenna     |                  |                  |
| Antenna Gain:        | ANT1 &ANT2: 2.5dBi ANT3:3.65dBi; Directional Gain: 7.67dBi. |                  |                  |
| <b>For 5G NR:</b>    |   |                  |                  |
| Operation Frequency: | UMTS Band II  | 1850 to 1910 MHz | 1930 to 1990 MHz |
|                      | UMTS Band IV  | 1710 to 1755 MHz | 2110 to 2155 MHz |
|                      | UMTS Band V   | 824 to 849 MHz   | 869 to 894 MHz   |
|                      | 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 7  | 2500 to 2570 MHz | 2620 to 2690 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 14   | 788 to 798 MHz   | 758 to 768 MHz   |
|                      | LTE Band 17   | 704 to 716 MHz   | 734 to 746 MHz   |
|                      | LTE Band 25   | 1850 to 1915MHz  | 1930 to 1995 MHz |
|                      | LTE Band 26<br>(814 to 824 MHz)                             | 814 to 824MHz    | 859 to 869 MHz   |
|                      | LTE Band 26<br>(824 to 849 MHz)                             | 824 to 849 MHz   | 869 to 894 MHz   |
|                      | LTE Band 30   | 2305 to 2315 MHz | 2350 to 2360 MHz |
|                      | LTE Band 38   | 2570 to 2620 MHz | 2570 to 2620 MHz |
|                      | LTE Band 41   | 2496 to 2690MHz  | 2496 to 2690MHz  |
|                      | LTE Band 42   | 3450 to 3500 MHz | 3450 to 3500 MHz |
|                      | LTE Band 43   | 3700 to 3800 MHz | 3700 to 3800 MHz |
|                      | 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   |                  |



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|  |   |                  |                  |
|--|---|------------------|------------------|
| Operation Frequency:                                   | NR Band n7  | 2500 to 2570 MHz | 2620 to 2690 MHz |
|  | NR Band n12   | 699 to 716 MHz   | 729 to 746 MHz   |
|  | NR Band n13   | 777 to 787 MHz   | 746 to 756 MHz   |
|  | NR Band n14   | 788 to 798 MHz   | 758 to 768 MHz   |
|  | NR Band n25   | 1850 to 1915MHz  | 1930 to 1995 MHz |
|  | NR Band n26<br>(814 to 824 MHz)   | 814 to 824MHz    | 859 to 869 MHz   |
|  | NR Band n26<br>(824 to 849 MHz)   | 824 to 849 MHz   | 869 to 894 MHz   |
|  | NR Band n30   | 2305 to 2315 MHz | 2350 to 2360 MHz |
|  | NR Band n38   | 2570 to 2620 MHz | 2570 to 2620 MHz |
|  | NR Band n41   | 2496 to 2690 MHz | 2496 to 2690 MHz |
|  | NR Band n66   | 1710 to 1780 MHz | 2110 to 2180 MHz |
|  | NR Band n70   | 1695 to 1710 MHz | 1995 to 2020 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 |
|  | NR Band n78   | 3700 to 3800 MHz | 3700 to 3800 MHz |
|  |   | 3450 to 3550 MHz | 3450 to 3550 MHz |
|  | GNSS (BDS+<br>Galileo+ GLONASS+<br>GPS+ SBAS)   | N/A              | 1559-1610        |
|  | CA:   |                  |                  |
|  | UL CA_2C; UL CA_5B; UL CA_7C; UL CA_38C; UL CA_41C; UL CA_43C;<br>UL CA_66C; UL CA_66B; UL CA_48C; UL CA_42C;<br>UL CA_2A-4A; UL CA_2A-5A; UL CA_2A-7A; UL CA_2A-12A; UL CA_2A-13A;<br>UL CA_2A-30A; UL CA_2A-66A;<br>UL CA_4A-5A; UL CA_4A-7A; UL CA_4A-12A; UL CA_4A-13A;<br>UL CA_4A-30A;<br>UL CA_5A-7A; UL CA_5A-30A; UL CA_5A-66A;<br>UL CA_12A-30A; UL CA_12A-66A; UL CA_13A-66A; UL CA_14A-30A; |                  |                  |
| ENDC:  |   |                  |                  |
| DC_13A_n66A;DC_5A_n2A;DC_14A_n2A;DC_30A_n2A;DC_2A_n5A; |   |                  |                  |



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|  |  |
|--|--|
|  | <p>DC_30A_n5A;DC_66A_n5A;DC_2A_n12A;DC_66A_n12A;DC_2A_n66A;<br/> DC_5A_n66A;DC_12A_n66A;DC_14A_n66A;DC_30A_n66A;DC_12A_n2A;<br/> DC_66A_n2A;DC_71A_n2A;DC_12A_n41A;DC_71A_n66A;DC_2A_n71A<br/> DC_66A_n71A;DC_66A_n25A;DC_25A_n41A;DC_12A_n78A;DC_13A_n78A<br/> DC_25A_n78A;DC_12A_n77A;DC_13A_n77A;DC_14A_n77A;DC_26A_n78A<br/> DC_2A_n78A;DC_26A_n41A;DC_2A_n41A;DC_7A_n5A;DC_38A_n78A<br/> DC_7A_n71A;DC_41A_n78A;DC_5A_n7A;DC_12A_n7A;DC_66A_n7A<br/> DC_13A_n2A;DC_48A_n5A;DC_48A_n66A;DC_7A_n66A;<br/> DC_4A_n78A;DC_20A_n77A<br/> DC_5A_n78A;DC_4A_n41A;DC_66A_n38A;DC_2A_n38A;DC_12A_n38A<br/> DC_4A_n38A;DC_5A_n38A;DC_66A_n78A;DC_12A_n25A;DC_25A_n77A<br/> DC_2A_n77A;DC_71A_n78A;DC_71A_n38A;DC_13A_n7A;DC_5A_n41A<br/> DC_66A_n41A;DC_2A_n7A;DC_7A_n2A;DC_5A_n40A;DC_30A_n77A<br/> DC_41A_n77A;DC_7A_n78A;DC_48A_n25A;DC_66A_n28A;DC_71A_n41A<br/> DC_28A_n66A;DC_30A_n12A;DC_2A_n14A;DC_30A_n14A;DC_66A_n14A<br/> DC_2A_n30A;DC_5A_n30A;DC_12A_n30A;DC_14A_n30A;DC_66A_n30A<br/> DC_71A_n7A;DC_7A_n12A;DC_5A_n77A;DC_66A_n77A;DC_71A_n77A<br/> DC_4A_n2A;DC_7A_n25A;DC_71A_n25A;DC_5A_n25A;DC_26A_n25A<br/> DC_4A_n7A;DC_13A_n25A;DC_7A_n77A;DC_48A_n71A;DC_48A_n12A<br/> NR UL CA:<br/> n25A-n41A;n41A-n66A;n41A-n71A;n7A-n78A;n5A-n78A<br/> n66A-n78A;n7A-n77A;n2A-n77A;n5A-n77A;n66A-n77A<br/> n30A-n77A;n71A-n77A;n71A-n78A;n25A-n78A;n38A-n66A<br/> n25A-n77A;n25A-n38A;n13A-n77A</p> |
| <p>Antenna Type:</p>   | <p>Dipole Antenna</p>  |
| <p>Antenna Gain:</p>   | <p>600-960MHz:0.11 dBi; 1176-1280MHz:-0.54 dBi;<br/> 1400-1610MHz:0.63 dBi;1710-2170MHz:2.01 dBi;<br/> 2170-2690MHz:1.42 dBi;3300-4000MHz:2.33 dBi<br/> 4000-5000MHz:3.3 dBi,5000-6000MHz:3.38 dBi<br/> (Note: This device changed the antenna gain as above.)</p>   |
| <p>Note:Based on Module certification(FCC ID: XMR2022RM520NGL)</p> |  |

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**3.3 Separation Distance**

|   |      |
|---|------|
| Minimum test separation distance:   | 20cm |
| 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. |      |



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### 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 <sup>2</sup>                 |
| 1.34                | – | 30        | 35.6 m             | – | 1.6 m              | 3,450 R <sup>2</sup> /f <sup>2</sup> |
| 30                  | – | 300       | 1.6 m              | – | 159 mm             | 3.83 R <sup>2</sup>                  |
| 300                 | – | 1,500     | 159 mm             | – | 31.8 mm            | 0.0128 R <sup>2</sup> f              |
| 1,500               | – | 100,000   | 31.8 mm            | – | 0.5 mm             | 19.2R <sup>2</sup>                   |

Subscripts L and H are low and high;  $\lambda$  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  $\lambda/2\pi$ . 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)].

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

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.

| Limit calculation |                |                        |                  |
|-------------------|----------------|------------------------|------------------|
| Frequency range   | Frequency(MHz) | R( $\lambda/2\pi$ )(m) | Threshold ERP(W) |
| 300~1500MHz       | <b>915</b>     | 0.0522                 | 0.032            |
| 1500~100000MHz    | <b>2480</b>    | 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  $\lambda/4$ .

As for devices with antennas of length greater than  $\lambda/4$  where the gain is not well defined, but always less than that of a half-wave dipole (length  $\lambda/2$ ), 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).

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

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).



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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              | <b>0.915</b>   | 1.474 | <b>0.5</b>   | <b>8.133</b> |
| 1.5~6                | <b>2.48</b>    | 1.905 | <b>0.5</b>   | <b>2.717</b> |



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## 5 Measurement and Calculation

### 5.1 Maximum transmit power

#### For 2.4G WIFI:

The Power Data is based on the RF Test Report SZCR230400120602.

Antenna Gain: ANT1 &ANT2: 1.63dBi;Directional Gain:4.64dBi.

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Frequency | Maximum EIRP [dBm] | Maximum EIRP (mW) | Limit (mW) | Ratio | Result |
|-----------|--------------------|-------------------|------------|-------|--------|
| 2437      | 18.92+4.64=23.56   | 226.99            | 3060       | 0.07  | Pass   |

#### For 5G WIFI:

The Power Data is based on the RF Test Report SZCR230400120603.

Antenna Gain: ANT1 &ANT2: 2.5dBi ANT3:3.65dBi; Directional Gain: 7.67dBi.

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Frequency | Maximum EIRP [dBm] | Maximum EIRP (mW) | Limit (mW) | Ratio | Result |
|-----------|--------------------|-------------------|------------|-------|--------|
| 5825      | 21.65+7.67=29.32   | 855.07            | 3060       | 0.28  | Pass   |

#### For 3G/4G/5G:

Based on Module certification(FCC ID: XMR2022RM520NGL), refer to test Max Conducted Peak Output Power value.

The distance r calculated from the far-field transmission formula is at distances 20 cm or greater from any object.

| Test Mode             | Max Conducted Power (dBm) | Antenna Gain (dBi) | Max Power (mW) | Limit (mW) | Ratio | Result |
|-----------------------|---------------------------|--------------------|----------------|------------|-------|--------|
| WCDMA B2<br>1850-1910 | 25                        | 2.01               | 502.34         | 3060.00    | 0.16  | Pass   |
| WCDMA B4<br>1710-1755 | 25                        | 2.01               | 502.34         | 3060.00    | 0.16  | Pass   |
| WCDMA B5<br>824-849   | 25                        | 0.11               | 324.34         | 1680.96    | 0.19  | Pass   |
| LTE B2/CA_2C/n2       | 25                        | 2.01               | 502.34         | 3060.00    | 0.16  | Pass   |



|                                 |    |      |         |         |      |      |
|---------------------------------|----|------|---------|---------|------|------|
| 1850-1910                       |    |      |         |         |      |      |
| LTE B4<br>1710-1755             | 25 | 2.01 | 502.34  | 3060.00 | 0.16 | Pass |
| LTE B5/CA_5B/n5<br>824-849      | 25 | 0.11 | 324.34  | 1680.96 | 0.19 | Pass |
| LTE B7/CA_7C/n7<br>2500-2570    | 25 | 1.42 | 438.53  | 3060.00 | 0.14 | Pass |
| LTE B12/n12<br>699-716          | 25 | 0.11 | 324.34  | 1425.96 | 0.23 | Pass |
| LTE B13/n13<br>777-787          | 25 | 0.11 | 324.34  | 1585.08 | 0.20 | Pass |
| LTE B14/n14<br>788-798          | 25 | 0.11 | 324.34  | 1607.52 | 0.20 | Pass |
| LTE B17<br>704-716              | 25 | 0.11 | 324.34  | 1436.16 | 0.23 | Pass |
| LTE B25/n25<br>1850-1915        | 25 | 2.01 | 502.34  | 3060.00 | 0.16 | Pass |
| LTE B26/n26<br>814-824          | 25 | 0.11 | 324.34  | 1660.56 | 0.20 | Pass |
| LTE B26/n26<br>824-849          | 25 | 0.11 | 324.34  | 1680.96 | 0.19 | Pass |
| LTE B30/n30<br>2305-2315        | 25 | 1.42 | 438.53  | 3060.00 | 0.14 | Pass |
| LTE B38/CA_38C/n38<br>2570-2620 | 28 | 1.42 | 874.98  | 3060.00 | 0.29 | Pass |
| LTE B48/CA_48C<br>3550-3700     | 25 | 2.33 | 540.75  | 3060.00 | 0.18 | Pass |
| LTE B41/CA_41C/n41<br>2496-2690 | 28 | 1.42 | 874.98  | 3060.00 | 0.29 | Pass |
| LTE B42/CA_42C<br>3450-3500     | 28 | 2.33 | 1078.95 | 3060.00 | 0.35 | Pass |
| LTE B43<br>3700-3800            | 28 | 2.33 | 1078.95 | 3060.00 | 0.35 | Pass |
| LTE B66/n66<br>1710-1780        | 25 | 2.01 | 502.34  | 3060.00 | 0.16 | Pass |
| NR n70<br>1695-1710             | 25 | 2.01 | 502.34  | 3060.00 | 0.16 | Pass |



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|                                  |    |      |        |         |      |      |
|----------------------------------|----|------|--------|---------|------|------|
| LTE B71/n71<br>663-698           | 25 | 0.11 | 324.34 | 1352.52 | 0.24 | Pass |
| NR N77<br>3700-3980<br>3450-3550 | 25 | 3.3  | 676.08 | 3060.00 | 0.22 | Pass |
| NR N78<br>3700-3800<br>3450-3550 | 25 | 2.33 | 540.75 | 3060.00 | 0.18 | Pass |

**RF Exposure Calculation**

Remark: we used the maximum power between the conducted power and ERP/EIRP to perform RF exposure exemption evaluation.

So, the device is to qualify for SAR test exemption, the exemption report is in lieu of the SAR report.

**Exposure condition for simultaneous transmission operations**

Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluated<sub>k</sub> term) shall be used to determine exemption for simultaneous transmission according to Formula (C.1) [repeated from § 1.1307(b)(3)(ii)(B)].

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1 \quad (C.1)$$

**Remark:**

- a -number of fixed, mobile, or portable RF sources claiming exemption using the §1.1307(b)(3)(i)(B) formula for P<sub>th</sub>, including existing exempt transmitters and those being added.
- b -number of fixed, mobile, or portable RF sources claiming exemption using the applicable § 1.1307(b)(3)(i)(C) Table 1 formula for Threshold ERP, including existing exempt transmitters and those being added.
- c -number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance.
- P<sub>i</sub> -the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).
- P<sub>th,i</sub> -the exemption threshold power (P<sub>th</sub>) according to the § 1.1307(b)(3)(i)(B) formula for fixed, mobile, or portable RF source i.
- ERP<sub>j</sub> -the available maximum time-averaged power or the ERP, whichever is greater, of fixed, mobile, or portable RF source j. ERP<sub>th,j</sub> -exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π, according to the applicable § 1.1307(b)(3)(i)(C) Table 1 formula at the location in question.





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Evaluated<sub>k</sub> -the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation.

Exposure Limit<sub>k</sub> -either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable sources, as applicable

Due to the EUT support ENDC and CA,The worst-case(CA\_42C)situation is  $0.35+0.35=0.70$

The sum of the ratios =5G WiFi +CA= $0.28+0.70 = 0.98 < 1$

Therefore, the device is to qualify for simultaneous transmission SAR test exemption, the exemption report is in lieu of the SAR report.



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## 6 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2304001206AT.

--End of the Report--

