



Report No.: SZEM200600450003

Page: 1 of 7

## RF Exposure Evaluation Report

**Application No.:** SZEM2006004500CR  
**Applicant:** BTI Wireless  
**Address of Applicant:** 6185 Phyllis Drive #D, Cypress, California 90630, United States  
**Manufacturer:** Bravo Tech Inc  
**Address of Manufacturer:** 14600 INDUSTRY CIRCLE LA MIRADA, CA 90638  
**Factory:** Bravo Tech Inc  
**Address of Factory:** 14600 INDUSTRY CIRCLE LA MIRADA, CA 90638  
**Product Name:** LTE Outdoor CPE  
**Model No.:** CP880-B  
**FCC ID:** WBKCP880-B  
47 CFR Part 1.1307  
**Standards:** 47 CFR Part 1.1310  
47 CFR Part 2.1091  
**Date of Receipt:** 2020-06-02  
**Date of Test:** 2020-06-06 to 2020-07-07  
**Date of Issue:** 2020-07-16

|                      |              |
|----------------------|--------------|
| <b>Test Result :</b> | <b>Pass*</b> |
|----------------------|--------------|

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

Keny Xu

Keny Xu  
EMC Laboratory Manager



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

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## 2 Version

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2020-07-16 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                     |  |
|--------------------------|--|-------------------------------------------------------------------------------------|--|
| Authorized for issue by: |  |                                                                                     |  |
|                          |  |   |  |
|                          |  | Jacky Li /Project Engineer                                                          |  |
|                          |  |  |  |
|                          |  | Eric Fu /Reviewer                                                                   |  |





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## 4 General Information

### 4.1 General Description of EUT

|                               |                                                                                                                            |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Power supply:                 | Adapter Model NO.: ASSA107A-240050<br>Input: 100-240V~50/60Hz, 0.45A<br>Output: 24.0V, 0.5A<br>POE Model NO.: GRT-HCQ-1000 |
| Test voltage:                 | AC 120V, 60Hz                                                                                                              |
| Cable:                        | RJ45 Cable: 100cm<br>DC cable: 148cm unshielded                                                                            |
| Sample Type:                  | Mobile production                                                                                                          |
| LTE Operation Frequency Band: | 48                                                                                                                         |
| Frequency range:              | 3550-3700 MHz                                                                                                              |
| Modulation Type:              | UL: QPSK, 16QAM, 64QAM<br>DL: QPSK, 16QAM, 64QAM, 256QAM                                                                   |
| LTE Release Version:          | R11                                                                                                                        |
| LTE Power Class:              | Level 3                                                                                                                    |
| CA Capability:                | DL 2CA 4x4 MIMO<br>DL 4CA 2x2 MIMO<br>UL 2CA<br>Support Intra-band contiguous CA                                           |
| MIMO:                         | DL 2x2 (4CA 256QAM)<br>DL 4x4 (2CA 64QAM)                                                                                  |
| Antenna Type:                 | Panel Antenna<br>Ant 1: TX & RX(SISO & UL CA)<br>Ant 3: TX & RX(UL CA)<br>Ant 2 & 4: RX                                    |
| Antenna Gain:                 | 14dBi                                                                                                                      |
| SIM Card:                     | This device has only one SIM Card sockets.                                                                                 |
| Extreme temp. Tolerance:      | -30 °C to +50 °C                                                                                                           |
| Extreme vol. Limits:          | 20.4VDC to 27.6VDC (nominal: 24.0VDC)                                                                                      |



## 4.2 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, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

## 4.3 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**

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. 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: CN1178**

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

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **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.

## 4.4 Deviation from Standards

None.

## 4.5 Abnormalities from Standard Conditions

None.

## 4.6 Other Information Requested by the Customer

None.



## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

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<br>(MHz)                                       | Electric field<br>strength<br>(V/m) | Magnetic field<br>strength<br>(A/m) | Power density<br>(mW/cm <sup>2</sup> ) | Averaging time<br>(minutes) |
|----------------------------------------------------------------|-------------------------------------|-------------------------------------|----------------------------------------|-----------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                                     |                                     |                                        |                             |
| 0.3–3.0 .....                                                  | 614                                 | 1.63                                | *(100)                                 | 6                           |
| 3.0–30 .....                                                   | 1842/f                              | 4.89/f                              | *(900/f <sup>2</sup> )                 | 6                           |
| 30–300 .....                                                   | 61.4                                | 0.163                               | 1.0                                    | 6                           |
| 300–1500 .....                                                 | .....                               | .....                               | f/300                                  | 6                           |
| 1500–100,000 .....                                             | .....                               | .....                               | 5                                      | 6                           |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                                     |                                     |                                        |                             |
| 0.3–1.34 .....                                                 | 614                                 | 1.63                                | *(100)                                 | 30                          |
| 1.34–30 .....                                                  | 824/f                               | 2.19/f                              | *(180/f <sup>2</sup> )                 | 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:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

For Uncontrolled Environment, the MPE limit of 1500MHz to 100000MHz is 1.0 mW/cm<sup>2</sup>. 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.

#### 5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.





### 5.1.3 EUT RF Exposure Evaluation

#### 1) Test Results

##### For LTE Band 48:

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

| Antenna | Max Antenna Gain (dBi) | Max Antenna Gain (Numeric) | Max tune-up tolerance power (dBm) | Max tune-up Tolerance power to Antenna (mW) | Power Density at R = 50 cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | MPE Ratios | Result |
|---------|------------------------|----------------------------|-----------------------------------|---------------------------------------------|--------------------------------------------------|-----------------------------|------------|--------|
| Ant1    | 14                     | 25.12                      | 25.0                              | 199.53                                      | 0.2829                                           | 1.0                         | 0.2829     | PASS   |

Note: Refer to report No. SZEM200600450002 or EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 50 cm separation requirement.

Since the SAR Exclusion Threshold Level is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

- End of the Report -

