

# TEST REPORT

REPORT NUMBER: B18W50495-MPE

ON

**Type of Equipment:** LTE Wireless Module  
**Type of Designation:** BM818  
**Manufacturer:** Top wise communication Co., Ltd  
**FCC ID:** 2AON8-BM818

ACCORDING TO

FCC CFR 47 Part 2.1091 《Radiofrequency radiation exposure evaluation: mobile devices》

FCC CFR 47 Part1.1310 《Radiofrequency radiation exposure limits》

Chongqing Academy of Information and Communication Technology

*Month date, year*

Nov 7, 2018

*Signature*



**Zhang Yan**

*Director*

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.

# Chongqing Academy of Information and Communications Technology

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## Revision Version

Report Number	Revision	Date	Memo
B18W50495-MPE	00	2018-11-7	Initial creation of test report

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# Chongqing Academy of Information and Communications Technology

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## 1. Test Laboratory

### 1.1. Testing Location

Company Name:	Chongqing Academy of Information and Communications Technology
Address:	No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

### 1.2. Testing Environment

Normal Temperature:	15-35°C
Relative Humidity:	20-75%

### 1.3. Project Data

Testing Start Date:	2018-11-7
Testing End Date:	2018-11-7

### 1.4. Signature




2018-11-7

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**Ang Xinyu**  
**(Prepared this test report)**

**Date**



2018-11-7

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**Wang Lili**  
**(Reviewed this test report)**

**Date**



2018-11-7

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**Zhang Yan**  
**Director of the laboratory**  
**(Approved this test report)**

**Date**

**2. Client Information**

**2.1. Applicant Information**

Company Name:	Shanghai BroadMobi Communication Technology Co., Ltd.
Address /Post:	15F,Building9,No99.Tianzhou Rd.,Xuhui District,Shanghai,P.R.China
Telephone:	+86 21-60913308-816
Fax:	+86 21-60913308-818
Email:	mayanxia@broadmobi.com
Contact Person:	Mayanxia

**2.2. Manufacturer Information**

Company Name:	Top wise communication Co., Ltd
Address /Post:	Room 601,5F, Music Building A8, No. 1002, Keyuan Road, Yuehai Street, Nanshan District, Shenzhen
Telephone:	+86 0755-61691666
Fax:	+86 0755-61691666
Email:	zenghaiqing@topwisesz.com
Contact Person:	Zenghaiqing

**3. Equipment Under Test (EUT) and Ancillary Equipment (AE)**

**3.1. About EUT**

Description:	LTE Wireless Module
Model name:	BM818
GSM Frequency Band	GSM850/1900
UMTS Frequency Band	FDD2/FDD5
E-UTRA Frequency Band	Band2/4/5/12/13/17
GPRS Multislot Class	12
EGPRS Multislot Class	E2
Note: Photographs of EUT are shown in ANNEX A of this test report.	

**3.2. Internal Identification of EUT used during the test**

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
S6	SN:2410018033000041	M100_2.0	M1.0.7_E1.0.1_R1.0.1	2018-10-09

\*EUT ID: is used to identify the test sample in the lab internally.

**3.3. Internal Identification of AE used during the test**

EUT ID*	SN	Description
B1	NA	NA

\*AE ID: is used to identify the test sample in the lab internally.

## 4. Reference Documents

### 4.1. Applicable Standards

The MPE report was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 2.1091.

**FCC CFR 47 Part 2.1091:** Radiofrequency radiation exposure evaluation: mobile devices

### 4.2. Test Limits

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

MPE for the upper tier (people in controlled environments)

Frequency Range [MHz]	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
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
1500-100000	--	--	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 <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100000	--	--	1.0	30

Note: f=frequency in MHz; \*Plane-wave equivalent power density

For the DUT, the limits for the general public when an RF safety program is unavailable.



## 5. Test Results

### 5.1. RF Power Output

Frequency Band	Highest Power Output(dBm)	Highest Frame-Averaged Output Power (dBm)	Antenna Gain(dBi)
GSM 850	35.0	25.97	2.80
GSM 1900	32.0	22.97	3.25
WCDMA Band2	25.7	25.7	3.25
WCDMA Band5	25.7	25.7	2.8
LTE Band2	25.0	25.0	3.25
LTE Band4	25.0	25.0	1.70
LTE Band5	25.0	25.0	2.80
LTE Band12	25.0	25.0	3.08
LTE Band13	25.0	25.0	2.24
LTE Band17	25.0	25.0	2.24

### 5.2. Calculation Information

For conservative evaluation consideration, only maximum power of each frequency band based on the tighter limits respectively are used to calculate the boundary power density.

Based on the FCC KDB 447498 D01 and 47 CFR §2.1091, the DUT is evaluated as a mobile device.

$$S = \frac{PG}{4\pi d^2}$$

Where

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

**5.3. Results**

Frequency range	Limit(W/m <sup>2</sup> )	Results(W/m <sup>2</sup> )	Verdict
GSM 850	0.549	0.313	Pass
GSM 1900	1.0	0.110	Pass
WCDMA Band2	1.0	0.241	Pass
WCDMA Band5	0.551	0.207	Pass
LTE Band2	1.0	0.204	Pass
LTE Band4	1.0	0.107	Pass
LTE Band5	0.549	0.176	Pass
LTE Band12	0.466	0.194	Pass
LTE Band13	0.497	0.045	Pass
LTE Band17	0.469	0.141	Pass

**5.4. Result of GSM850**

**Test Results:** MPE Limit Calculation: the EUT’S operating frequencies @ 824.2~848.8 MHz; The maximum conducted is 25.97 dBm. The maximum gain is 2.8 dBi. Therefore, maximum limit for general public RF exposure: 824.2/1500=0.549 mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (395 mW)

G = antenna gain (3.981 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(395*3.981)/(4 \pi *20^2)=0.313 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.549 mW/cm<sup>2</sup> limit for uncontrolled exposure.

**5.5. Result of GSM1900**

**Test Results:** MPE Limit Calculation: the EUT’S operating frequencies @ 1850.2~1909.8 MHz; The maximum conducted is 22.97 dBm. The maximum gain is 3.25 dBi. Therefore, maximum limit for general public RF exposure: 1.0 mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (198mW)

G = antenna gain (2.8 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(198*2.8)/(4 \pi *20^2)=0.110 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.0 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.6. Result of WCDMA BAND2

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1852.4~1907.6 MHz; The maximum conducted is 25.7 dBm. The maximum gain is 3.25 dBi. Therefore, maximum limit for general public RF exposure: 1.0 mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (372 mW)

G = antenna gain (3.25 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(372*3.25)/(4 \pi *20^2)=0.241 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.0 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.7. Result of WCDMA BAND5

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 826.4~846.6 MHz; The maximum conducted is 25.7 dBm. The maximum gain is 2.8 dBi. Therefore, maximum limit for general public RF exposure: 826.4/1500=0.551 mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (372 mW)

G = antenna gain (2.8 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(372*2.8)/(4 \pi *20^2)=0.207 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.551 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.8. Result of LTE Band2

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1850.0~1909.9 MHz; The maximum conducted is 25.0 dBm. The maximum gain is 3.25 dBi. Therefore, maximum limit for general public RF exposure: 1.0mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (316 mW)

G = antenna gain (3.25 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(316*3.25)/(4\pi*20^2)=0.204 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.0 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.9. Result of LTE Band4

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1710.0~1754.9 MHz; The maximum conducted is 25.0 dBm. The maximum gain is 1.7dBi. Therefore, maximum limit for general public RF exposure:1.0 mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (316 mW)

G = antenna gain (1.7 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(316*1.7)/(4\pi*20^2)=0.107 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.0 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.10. Result of LTE Band5

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 824.0~848.9 MHz; The maximum conducted is 25.0 dBm. The maximum gain is 2.8 dBi. Therefore, maximum limit for general public RF exposure:824.0 /1500=0.549mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (316 mW)

G = antenna gain (2.8 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(316*2.8)/(4\pi*20^2)=0.176\text{mW}/\text{cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.549 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.11. Result of LTE Band12

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 699.0~715.9 MHz; The maximum conducted is 25.0 dBm. The maximum gain is 3.08 dBi. Therefore, maximum limit for general public RF exposure: 699.0/1500=0.466 mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (316mW)

G = antenna gain (3.08 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(316*3.08)/(4\pi*20^2)=0.194\text{mW}/\text{cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.466 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.12. Result of LTE Band13

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 746.0~755.9 MHz; The maximum conducted is 25.0dBm. The maximum gain is 2.24 dBi. Therefore, maximum limit for general public RF exposure: 746.0/1500=0.497 mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (316 mW)

G = antenna gain (2.24numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(316*2.24)/(4\pi*20^2)=0.045\text{mW}/\text{cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.497mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.13. Result of LTE Band17

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 704.0~715.9 MHz; The maximum conducted is 25.0 dBm. The maximum gain is 2.24 dBi. Therefore, maximum limit for general public RF exposure: 704.0/1500=0.469mW/cm<sup>2</sup>.

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (316 mW)

G = antenna gain (2.24 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(316*2.24)/(4\pi*20^2)=0.141\text{mW}/\text{cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.469 mW/cm<sup>2</sup> limit for uncontrolled exposure.

# **Chongqing Academy of Information and Communications Technology**

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## **ANNEX A: EUT photograph**

See the document "BM818 -External Photos".

**\*\*\*END OF REPORT\*\*\***