## Shenzhen Huatongwei International Inspection Co., Ltd.

1/F,Bldg 3,Hongfa Hi-tech Industrial Park,Genyu Road,Tianliao,Gongming,Shenzhen,China Phone:86-755-26748019 Fax:86-755-26748089 http://www.szhtw.com.cn



# **FCC REPORT**

Report Reference No.....: CHTEW19070001

SHT1905093901EW

FCC ID.....: ZSW-30-090

Project No....::

Applicant's name.....: b mobile HK Limited

Address...... Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak

Street; Kwai Chung; New Territories; Hong Kong.

Report verification:

Manufacturer..... b mobile HK Limited

Address...... Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak

Street; Kwai Chung; New Territories; Hong Kong.

Test item description .....: Mobile Phone

Trade Mark ...... Bmobile

Model/Type reference...... AX751

Listed Model(s) ..... AX751+

Standard .....: FCC CFR Title 47 Part 2

FCC CFR Title 47 Part 22 FCC CFR Title 47 Part 24

Date of receipt of test sample........... May 31,2019

Date of testing...... Jun 01,2019- Jun 28,2019

Result...... Pass

Compiled by

( position+printedname+signature)...: File administrators Silvia Li

Silvia Li

Supervised by

(position+printedname+signature)....: Project Engineer Aaron Fang

Aaron.Fang

Approved by

(position+printedname+signature)....: Manager Hans Hu

Testing Laboratory Name .....: Shenzhen Huatongwei International Inspection Co., Ltd.

Tianliao, Gongming, Shenzhen, China

Shenzhen Huatongwei International Inspection Co., Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Huatongwei International Inspection Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Huatongwei International Inspection Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

The test report merely correspond to the test sample.

Report No.: CHTEW19070001 Page: 2 of 31 Issued: 2019-07-01

## **Contents**

<u>1.</u>	TEST STANDARDS AND REPORT VERSION	3
1.1.	Applicable Standards	3
1.2.	Report version information	3
<u>2.</u>	TEST DESCRIPTION	4
<u>3.</u>	SUMMARY	5
3.1.	Client Information	5
3.2.	Product Description	5
3.3.	Operation state	6
3.4.	EUT configuration	6
3.5.	Modifications	6
<u>4.</u>	TEST ENVIRONMENT	7
		_
4.1.	Address of the test laboratory	7
4.2.	Test Facility	7
4.3.	Equipments Used during the Test	8
4.4.	Environmental conditions	9
4.5.	Statement of the measurement uncertainty	9
<u>5.</u>	TEST CONDITIONS AND RESULTS	10
5.1.	Conducted Output Power	10
5.2.	Peak-to-Average Ratio	11
5.3.	99% Occupied Bandwidth & 26 dB Bandwidth	12
5.4.	Band Edge	13
5.5.	Conducted Spurious Emissions	14
5.6.	Frequency stability VS Temperature measurement	15
5.7.	Frequency stability VS Voltage measurement	16
5.8.	ERP and EIRP	17
5.9.	Radiated Spurious Emission	20
<u>6.</u>	TEST SETUP PHOTOS	24
<u>7.</u>	EXTERNAL AND INTERNAL PHOTOS	25
8.	APPENDIX REPORT	31

Report No.: CHTEW19070001 Page: 3 of 31 Issued: 2019-07-01

## 1. TEST STANDARDS AND REPORT VERSION

## 1.1. Applicable Standards

The tests were performed according to following standards:

FCC Rules Part 2: FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

FCC Rules Part 22: PUBLIC MOBILE SERVICES

FCC Rules Part 24: PERSONAL COMMUNICATIONS SERVICES

<u>TIA/EIA 603 E March 2016:</u> Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

KDB 971168 D01 Power Meas License Digital Systems v03: MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

## 1.2. Report version information

Revision No.	Date of issue	Description
N/A	2019-07-01	Original

Report No.: CHTEW19070001 Page: 4 of 31 Issued: 2019-07-01

## 2. Test Description

Test Item	Section in CFR 47	Result	Test Engineer
	Part 2.1046		
Conducted Output Power	Part 22.913(a)	Pass	Jiongsheng Feng
	Part 24.232(c)		
Peak-to-Average Ratio	Part 24.232	Pass	Jiongsheng Feng
000/ 0 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1	Part 2.1049		
99% Occupied Bandwidth & 26 dB Bandwidth	Part 22.917(b)	Pass	Jiongsheng Feng
Baridwidtii	Part 24.238(b)		
	Part 2.1051		
Band Edge	Part 22.917	Pass	Jiongsheng Feng
	Part 24.238		
	Part 2.1051		
Conducted Spurious Emissions	Part 22.917	Pass	Jiongsheng Feng
	Part 24.238		
	Part 2.1055(a)(1)(b)		
Frequency stability VS Temperature	Part 22.355	Pass	Jiongsheng Feng
	Part 24.235		
	Part 2.1055(d)(1)(2)		
Frequency stability VS Voltage	Part 22.355	Pass	Jiongsheng Feng
	Part 24.235		
ERP and EIRP	Part 22.913(a)	Pass	Shower Dai
ERP and EIRP	Part 24.232(b)	Pass	Snower Dai
	Part 2.1053		
Radiated Spurious Emissions	Part 22.917	Pass	Shower Dai
	Part 24.238		

Note: The measurement uncertainty is not included in the test result.

Report No.: CHTEW19070001 Page: 5 of 31 Issued: 2019-07-01

## 3. **SUMMARY**

## 3.1. Client Information

Applicant:	b mobile HK Limited		
Address:	Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong.		
Manufacturer:	b mobile HK Limited		
Address:	Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong.		

## 3.2. Product Description

Name of EUT:	Mobile Phone		
Trade Mark:	Bmobile		
Model No.:	AX751		
Listed Model(s):	AX751+		
IMEI Code:	Conducted: 359982070012097 Radiated: 359982070012311		
SIM Information:	Support Two SIM Card		
Power supply:	DC 3.8V		
Adapter information:	Input:100-240Va.c., 50/60Hz, 0.2A Output:5.0Vd.c., 700mA		
Hardware version:	7130DW_MMI_V10		
Software version:	Bmobile_AX751_OM_LTM_V009		
2G:			
Support Network:	GSM, GPRS		
Support Band:	GSM850, PCS1900		
Modulation:	GSM/GPRS: GMSK		
Transmit Frequency:	GSM850: 824.20MHz-848.80MHz		
	PCS1900: 1850.20MHz-1909.80MHz		
Receive Frequency:	GSM850: 869.20MHz-893.80MHz		
	PCS1900: 1930.20MHz-1989.80MHz		
GPRS Multislot Class:	12		
Antenna type:	PIFA Antenna		
Antenna gain:	GSM850: -1.0dBi PCS1900: -1.0dBi		

Report No.: CHTEW19070001 Page: 6 of 31 Issued: 2019-07-01

## 3.3. Operation state

#### > Test frequency list

GSN	1850	PCS1900		
Channel Frequency (MHz)		Channel	Frequency (MHz)	
128	824.20	512	1850.20	
190	836.60	661	1880.00	
251	848.80	810	1909.80	

## > Test mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03 and ANSI C63.26-2015 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

30 MHz to 10th harmonic for GSM850, PCS1900.

The Test EUT support two SIM card(SIM1,SIM2),so all the tests are performed at each SIM card (SIM1,SIM2) mode, the datum recorded is the worst case for all the mode at SIM1 Card mode.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test modes				
Band	Radiated Conducted			
GSM 850	■ GSM link ■ GPRS Class 8 link	■ GSM link ■ GPRS Class 8 link		
PCS 1900	■ GSM link ■ GPRS Class 8 link	■ GSM link ■ GPRS Class 8 link		

## 3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

• - supplied by the manufacturer

Э	- sup	plied	bν	the	lab
---	-------	-------	----	-----	-----

/	Manufacturer:	/
/	Model No.:	1
1	Manufacturer:	1
	Model No.:	/

#### 3.5. Modifications

No modifications were implemented to meet testing criteria.

Report No.: CHTEW19070001 Page: 7 of 31 Issued: 2019-07-01

## 4. TEST ENVIRONMENT

## 4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

## 4.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

#### IC-Registration No.:5377A-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377A-1.

#### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

Report No.: CHTEW19070001 Page: 8 of 31 Issued: 2019-07-01

## 4.3. Equipments Used during the Test

Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
•	Signal and spectrum Analyzer	R&S	FSV40	100048	2018/10/28	2019/10/27
•	Spectrum Analyzer	Agilent	N9020A	MY50510187	2018/09/29	2019/09/28
•	Radio communication tester	R&S	CMW500	137688-Lv	2018/09/29	2019/09/28
•	Test software	Tonscend	JS1120-1(LTE)	N/A	N/A	N/A
•	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A
•	Test software	Tonscend	JS1120-3(WCDMA)	N/A	N/A	N/A
•	Test software	Tonscend	JS1120-4(GSM)	N/A	N/A	N/A

•	Radiated Spurious Emission					
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
•	Semi-Anechoic Chamber	Albatross projects	SAC-3m-01	N/A	2018/09/30	2021/09/29
•	Spectrum Analyzer	R&S	FSP40	100597	2018/10/27	2019/10/26
•	Loop Antenna	R&S	HFH2-Z2	100020	2017/11/20	2020/11/19
•	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	538	2017/04/05	2020/04/04
•	Horn Antenna	SCHWARZBECK	9120D	1011	2017/04/01	2020/03/31
0	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2017/03/27	2020/03/26
0	Pre-amplifier	BONN	BLWA0160-2M	1811887	2018/11/14	2019/11/13
•	Pre-amplifier	CD	PAP-0102	12004	2018/11/14	2019/11/13
•	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-248	2019/04/26	2020/04/25
•	RF Connection Cable	HUBER+SUHNER	RE-7-FH	N/A	2018/11/15	2019/11/14
•	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	2018/11/15	2019/11/14
•	EMI Test Software	Audix	E3	N/A	N/A	N/A
•	Turntable	MATURO	TT2.0	N/A	N/A	N/A
•	Antenna Mast	MATURO	TAM-4.0-P	N/A	N/A	N/A

Report No.: CHTEW19070001 Page: 9 of 31 Issued: 2019-07-01

### 4.4. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

	VN=Nominal Voltage	DC 3.8V	
Voltage	VL=Lower Voltage	DC 3.6V	
	VH=Higher Voltage	DC 4.2V	
Tomporoturo	TN=Normal Temperature	25 °C	
Temperature	Extreme Temperature From -30° to + 50° centigrade		
Humidity	30~60 %		
Air Pressure 950-1050 hPa			

## 4.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01"Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes	
Transmitter power conducted	0.51 dB	(1)	
Transmitter power Radiated	2.66dB for <1GHz 3.44dB for >1GHz	(1)	
Conducted spurious emissions 9kHz~40GHz	0.51 dB	(1)	
Radiated spurious emissions	2.66dB for <1GHz	(1)	
	3.44dB for >1GHz	( )	
Occupied Randwidth	18Hz for <1GHz	(1)	
Occupied Bandwidth	69Hz for >1GHz	(1)	
Fraguency orrer	15Hz for <1GHz	(1)	
Frequency error	70Hz for >1GHz	(1)	

<sup>(1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

Report No.: CHTEW19070001 Page: 10 of 31 Issued: 2019-07-01

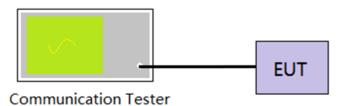
## 5. TEST CONDITIONS AND RESULTS

## 5.1. Conducted Output Power

## **LIMIT**

N/A

## **TEST CONFIGURATION**



## **TEST PROCEDURE**

- 1. The EUT output port was connected to communication tester.
- 2. Set EUT at maximum power through communication tester.
- 3. Select lowest, middle, and highest channels for each band and different modulation.
- 4. Measure the maximum burst average power.

## **TEST MODE:**

Please refer to the clause 3.3

## **TEST RESULTS**

Refer to appendix A on the section 8 appendix report

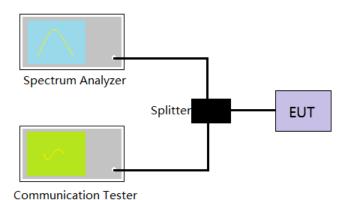
Report No.: CHTEW19070001 Page: 11 of 31 Issued: 2019-07-01

## 5.2. Peak-to-Average Ratio

#### **LIMIT**

13dB

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. Center Frequency = Carrier frequency, RBW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed.
  - i. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.
  - ii. For bursttransmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that issynced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in whichthetransmitter is operating at maximum power
- 6. Record the maximum PAPR level associated with a probability of 0.1%.

#### **TEST MODE:**

Please refer to the clause 3.3

#### **TEST RESULTS**

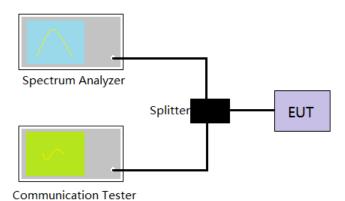
Refer to appendix B on the section 8 appendix report

Report No.: CHTEW19070001 Page: 12 of 31 Issued: 2019-07-01

## 5.3. 99% Occupied Bandwidth & 26 dB Bandwidth

### LIMIT N/A

## **TEST CONFIGURATION**



## **TEST PROCEDURE**

- 1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. Spectrum analyzer setting as follow:

Center Frequency= Carrier frequency, RBW=1% to 5% of anticipated OBW, VBW= 3 \* RBW, Detector=Peak,

Trace maximum hold.

4. Record the value of 99% Occupied bandwidth and -26dB bandwidth.

## **TEST MODE:**

Please refer to the clause 3.3

## **TEST RESULTS**

Refer to appendix C on the section 8 appendix report

Report No.: CHTEW19070001 Page: 13 of 31 Issued: 2019-07-01

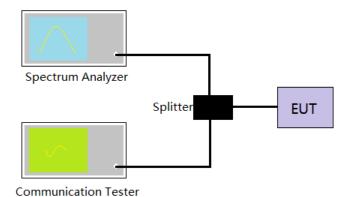
## 5.4. Band Edge

#### LIMIT

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

#### **TEST CONFIGURATION**



## **TEST PROCEDURE**

- 1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. The band edges of low and high channels were measured.
- Spectrum analyzer setting as follow:
   RBW=3KHz, VBW = 10KHz, Sweep time= Auto
- 5. Record the test plot.

#### **TEST MODE:**

Please refer to the clause 3.3

### **TEST RESULTS**

Refer to appendix D on the section 8 appendix report

Report No.: CHTEW19070001 Page: 14 of 31 Issued: 2019-07-01

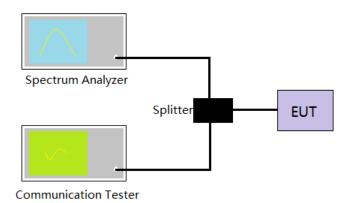
## 5.5. Conducted Spurious Emissions

#### **LIMIT**

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

#### **TEST CONFIGURATION**



## **TEST PROCEDURE**

- 1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. Spectrum analyzer setting as follow:

Below 1GHz, RBW=100KHz, VBW = 300KHz, Detector=Peak, Sweep time= Auto Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peak, Sweep time= Auto Scan frequency range up to 10<sup>th</sup> harmonic.

4. Record the test plot.

#### **TEST MODE:**

Please refer to the clause 3.3

## **TEST RESULTS**

Refer to appendix E on the section 8 appendix report

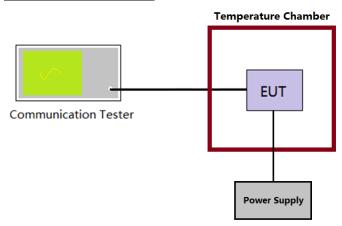
Report No.: CHTEW19070001 Page: 15 of 31 Issued: 2019-07-01

## 5.6. Frequency stability VS Temperature measurement

#### **LIMIT**

2.5ppm

## **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. The equipment under test was connected to an external DC power supply and input rated voltage.
- 2. The EUT output port was connected to communication tester.
- 3. The EUT was placed inside the temperature chamber.
- 4. Turn EUT off and set the chamber temperature to −30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
- 5. Repeat step 4 measure with 10°C increased per stage until the highest temperature of +50°C reached.

## **TEST MODE:**

Please refer to the clause 3.3

## **TEST RESULTS**

Refer to appendix F on the section 8 appendix report

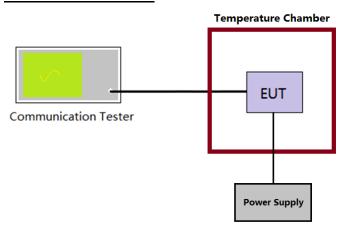
Report No.: CHTEW19070001 Page: 16 of 31 Issued: 2019-07-01

## 5.7. Frequency stability VS Voltage measurement

## **LIMIT**

2.5ppm

## **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. The equipment under test was connected to an external DC power supply and input rated voltage.
- 2. The EUT output port was connected to communication tester.
- 3. The EUT was placed inside the temperature chamber at 25°C
- 4. The power supply voltage to the EUT was varied  $\pm 15\%$  of the nominal value measured at the input to the EUT
- 5. Record the maximum frequency change.

## **TEST MODE:**

Please refer to the clause 3.3

## **TEST RESULTS**

Refer to appendix F on the section 8 appendix report

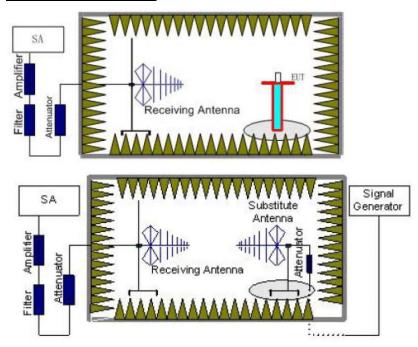
Report No.: CHTEW19070001 Page: 17 of 31 Issued: 2019-07-01

#### 5.8. ERP and EIRP

#### **LIMIT**

GSM850: 7W (38.45dBm) ERP PCS1900: 2W (33dBm) EIRP

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. EUT was placed on a 0.8 meter for below 1GHz and 1.5 meter for above 1GHz high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.0m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- 3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100kHz, VBW=300kHz for 30MHz to 1GHz,, And the maximum value of the receiver should be recorded as (Pr).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest isconnected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- 5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

Report No.: CHTEW19070001 Page: 18 of 31 Issued: 2019-07-01

6. The measurement results are obtained as described below:

Power(EIRP)=PMea- PAg - Pcl + Ga

We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below: Power(EIRP)=PMea- Pcl + Ga

7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

## **TEST MODE:**

Please refer to the clause 3.3

#### **TEST RESULTS**

Mode	Channel	Antenna Pol.	ERP	Limit (dBm)	Result
	128	V	30.46	<38.45	Pass
		Н	24.08		
CCMOEO	190	V	30.25		
GSM850		Н	25.17		
	251	V	29.84		
		Н	24.23		
GPRS850	128	V	30.54	<38.45	Pass
		Н	24.23		
	190	V	30.41		
		Н	25.30		
	251	V	30.02		
		Н	24.36		

Report No.: CHTEW19070001 Page: 19 of 31 Issued: 2019-07-01

Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
D004000	512	V	22.17	<33.00	Pass
		Н	28.09		
	661	V	23.43		
PCS1900		Н	29.16		
	810	V	23.31		
		Н	29.22		
GPRS1900	512	V	22.13	<33.00	Pass
		Н	28.29		
	661	V	23.54		
		Н	29.22		
	810	V	23.38		
		Н	29.26		

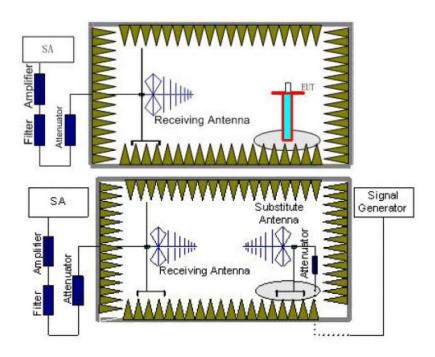
Report No.: CHTEW19070001 Page: 20 of 31 Issued: 2019-07-01

## 5.9. Radiated Spurious Emission

#### LIMIT

-13dBm

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. EUT was placed on a 0.8 meter for below 1GHz and 1.5 meter for above 1GHz high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.0m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- 3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz for above 1GHz and RBW=100kHz,VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest isconnected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- 5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (PcI) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

Report No.: CHTEW19070001 Page: 21 of 31 Issued: 2019-07-01

6. The measurement results are obtained as described below:

Power(EIRP)=PMea- PAg - Pcl + Ga

- We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below: Power(EIRP)=PMea- Pcl + Ga
- 7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
  - ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

#### **TEST MODE:**

Please refer to the clause 3.3

#### **TEST RESULTS**

⊠ Passed	☐ Not Applicable
----------	------------------

Note: Worst case at GSM850/PCS1900

Report No.: CHTEW19070001 Page: 22 of 31 Issued: 2019-07-01

		GS	M850		
Channal	Frequency	requency Spurious Emission			- I
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
	91.14	Vertical	-71.51	<-13.00 F	
	397.75	V	-71.91		Pass
	1648.51	V	-48.26		
	2472.57	V	-39.05		
	4119.70	V	-56.74		
128	9094.06	V	-44.82		
120	39.47	Horizontal	-70.70		
	419.30	Н	-71.30		
	1648.51	Н	-47.96	40.00	Dana
	2472.57	Н	-40.90	<-13.00	Pass
	6716.17	Н	-48.66		
	11173.64	Н	-42.31		
	89.87	Vertical	-71.75		Pass
	587.67	V	-71.03		
	1672.22	V	-47.06	<-13.00	
	2510.89	V	-39.43		
	3343.25	V	-58.33		
190	8027.71	V	-45.80		
190	35.64	Horizontal	-71.30	<-13.00	Pass
	385.36	Н	-71.72		
	1672.22	Н	-46.45		
	2510.89	Н	-40.89		
	3343.25	Н	-57.51		
	7242.24	Н	-47.03		
	90.19	Vertical	-71.41	<-13.00 I	
	800.80	V	-62.76		Pass
	1698.14	V	-46.34		
	2547.01	V	-37.61		
	4054.50	V	-56.05		
251	10729.00	V	-42.15		
231	39.19	Horizontal	-71.04	<-13.00 Pas	
	480.93	Н	-71.64		
	1698.14	Н	-43.55		Page
	2547.01	Н	-36.11		Fa88
	8027.71	Н	-44.18		
	9877.76	Н	-44.55		

## Remark:

- 1. The emission behaviour belongs to narrowband spurious emission.
- 2. The emission levels of not record in the report are very lower than the limit and not show in test report.

Report No.: CHTEW19070001 Page: 23 of 31 Issued: 2019-07-01

		PCS	S1900		
Channal	Spannel Frequency Spurious Emission			Limit (dDm)	D 14
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
	88.93	Vertical	-72.23	<-13.00 Pas	
	806.46	V	-65.85		Pass
	1914.16	V	-42.00		
	2227.52	V	-44.58		
	5554.08	V	-40.61		
540	8519.52	V	-44.62		
512	40.45	Horizontal	-70.25		
	841.22	Н	-65.74		
	2157.67	Н	-45.15	40.00	Dana
	2802.46	Н	-43.06	<-13.00	Pass
	3700.48	Н	-46.77		
	5554.08	Н	-44.10		
	91.46	Vertical	-70.53		Pass
	800.80	V	-65.16		
	1905.77	V	-36.76	<-13.00	
	2416.18	V	-45.18		
	3759.98	V	-50.75		
004	5643.40	V	-38.74		
661	35.89	Horizontal	-71.77	<-13.00 Pass	Dave
	844.18	Н	-65.51		
	1914.16	Н	-35.61		
	2802.46	Н	-42.86		Pass
	3759.98	Н	-47.03		
	5643.40	Н	-39.47		
	89.55	Vertical	-72.39	<-13.00 Pass	
	800.80	V	-65.53		Paga
	1360.17	V	-49.37		
	2541.42	V	-44.99		Pass
	3820.45	V	-47.94		
040	5725.84	V	-40.71		
810	40.59	Horizontal	-71.14		
	623.87	Н	-69.56		
	1370.67	Н	-49.45		Doce
	2332.71	Н	-44.99		rass
	3820.45	Н	-47.28		
	5725.84	Н	-38.91		

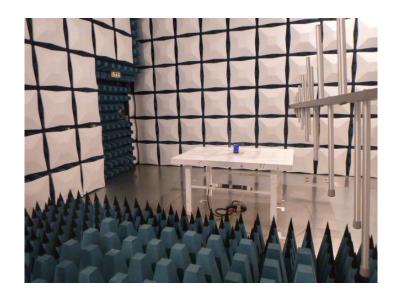
## Remark:

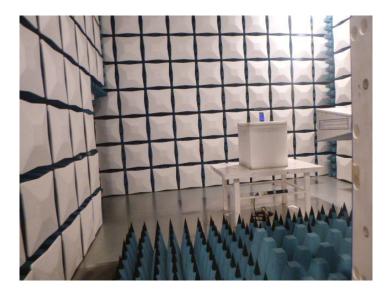
- 1. The emission behaviour belongs to narrowband spurious emission.
- 2. The emission levels of not record in the report are very lower than the limit and not show in test report.

Report No.: CHTEW19070001 Page: 24 of 31 Issued: 2019-07-01

# 6. TEST SETUP PHOTOS OF THE EUT

Radiated emission:

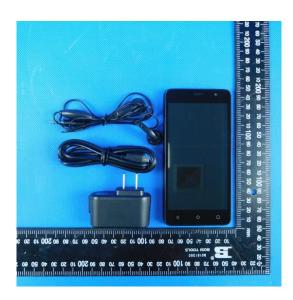




Report No.: CHTEW19070001 Page: 25 of 31 Issued: 2019-07-01

# 7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

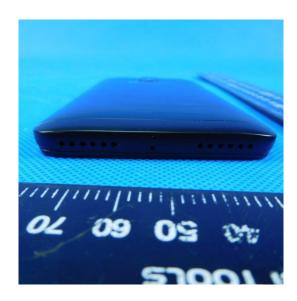
## **External photos of the EUT**



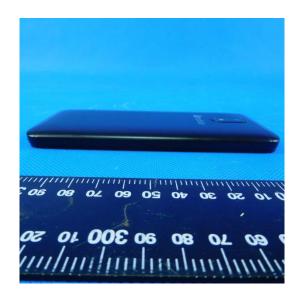




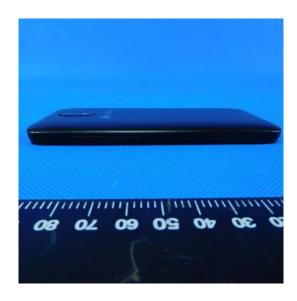
Report No.: CHTEW19070001 Page: 26 of 31 Issued: 2019-07-01

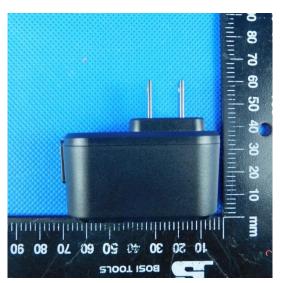


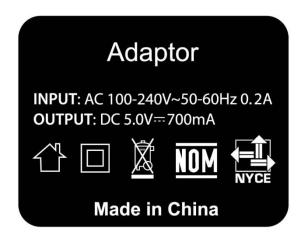




Report No.: CHTEW19070001 Page: 27 of 31 Issued: 2019-07-01







Report No.: CHTEW19070001 Page: 28 of 31 Issued: 2019-07-01

## **Internal photos of the EUT**







Report No.: CHTEW19070001 Page: 29 of 31 Issued: 2019-07-01



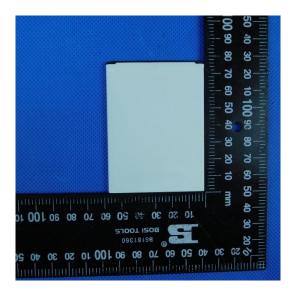




Report No.: CHTEW19070001 Page: 30 of 31 Issued: 2019-07-01







Report No.: CHTEW19070001 Page: 31 of 31 Issued: 2019-07-01



## 8. APPENDIX REPORT