# **FCC RF Test Report**

APPLICANT : Motorola Mobility LLC EQUIPMENT : Mobile Cellular Phone

**BRAND NAME**: Motorola

MODEL NAME : XT1922-6, XT1922-7, XT1922-9

FCC ID : IHDT56XB1

STANDARD : FCC 47 CFR Part 2, and 90(S)

**CLASSIFICATION**: PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Dec. 13, 2017 and testing was completed on Dec. 31, 2017. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI/TIA-603-E and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Shenzhen) Inc., the test report shall not be reproduced except in full.



Approved by: Eric Shih / Manager

Sporton International (Shenzhen) Inc.

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City Guangdong Province 518055 China

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 1 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01

Report No.: FW7D1310A

### **TABLE OF CONTENTS**

RE	EVISIO	N HISTORY	3
SL	JMMAF	RY OF TEST RESULT	4
1		ERAL DESCRIPTION	
•			
	1.1	Applicant	
	1.2	Manufacturer	
	1.3 1.4	Feature of Equipment Under Test	
	1.4	Product Specification of Equipment Under Test	
	1.5	Specification of Accessory	
	1.7	Maximum Frequency Tolerance, Emission Designator and Conducted Power	
	1.8	Testing Site	
	1.9	Applied Standards	
2	TEST	CONFIGURATION OF EQUIPMENT UNDER TEST	9
	2.1	Test Mode	g
	2.2	Connection Diagram of Test System	
	2.3	Support Unit used in test configuration and system	10
	2.4	Measurement Results Explanation Example	10
3	TEST	「RESULT	11
	3.1	Conducted Output Power Measurement	11
	3.2	99% Occupied Bandwidth and 26dB Bandwidth Measurement	13
	3.3	Emissions Mask Measurement	18
	3.4	Emissions Mask – Out Of Band Emissions Measurement	20
	3.5	Field Strength of Spurious Radiation Measurement	
	3.6	Frequency Stability Measurement	26
4	LIST	OF MEASURING EQUIPMENT	29
5	UNC	ERTAINTY OF EVALUATION	30

**APPENDIX A. SETUP PHOTOGRAPHS** 

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 2 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01

Report No.: FW7D1310A

## **REVISION HISTORY**

Report No.: FW7D1310A

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FW7D1310A	Rev. 01	Initial issue of report	Feb. 12, 2018

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 3 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01
Report Template No.: BU5-FWCDMA Version 1.0

### **SUMMARY OF TEST RESULT**

Report No.: FW7D1310A

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	Reporting only	PASS	-
3.2	§2.1049 §90.209	99% Occupied Bandwidth and 26dB Bandwidth	Reporting only	PASS	-
3.3	§2.1051 §90.691	Emission masks – In-band emissions	< 50+10log <sub>10</sub> (P[Watts])	PASS	-
3.4	§2.1051 §90.691	Emission masks – Out of band emissions	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.5	§2.1053 §90.691	Field Strength of Spurious Radiation	< 43+10log <sub>10</sub> (P[Watts])	PASS	Under limit 56.63 dB at 3282.00 MHz
3.6	§2.1055 §90.213	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 4 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01

## 1 General Description

### 1.1 Applicant

#### **Motorola Mobility LLC**

222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

### 1.2 Manufacturer

#### **Motorola Mobility LLC**

222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

### 1.3 Feature of Equipment Under Test

Product Feature & Specification				
Equipment	Mobile Cellular Phone			
Brand Name	Motorola			
Model Name	XT1922-6, XT1922-7, XT1922-9			
FCC ID	IHDT56XB1			
EUT supports Radios application	CDMA/EV-DO/GSM/GPRS/EGPRS/WCDMA/HSPA/ DC-HSDPA/HSPA+(16QAM uplink is not supported)/LTE WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth v3.0 + EDR/Bluetooth v4.0 LE/ Bluetooth v4.1 LE/Bluetooth v4.2 LE			
IMEI Code	Conducted: 351864090027578 Radiation: 351864090024591			
HW Version	DVT1B			
SW Version	jeter_oem_userdebug_8.0.0_OPP27.34_970_intcfg-test-keys_oem			
EUT Stage	Identical Prototype			

Report No.: FW7D1310A

#### Remark:

- For XT1922-6, XT1922-7, XT1922-9, they are the same product except model name different for market segment.
- The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

 Sporton International (Shenzhen) Inc.
 Page Number
 : 5 of 30

 TEL: +86-755-8637-9589
 Report Issued Date
 : Feb. 12, 2018

 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

FCC ID : IHDT56XB1 Report Template No.: BU5-FWCDMA Version 1.0

## 1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard				
Tx Frequency	CDMA2000 BC10 : 817.9 MHz ~ 823.1 MHz			
Rx Frequency	CDMA2000 BC10 : 862.9 MHz ~ 868.1 MHz			
Maximum Output Power to Antenna	CDMA2000 BC10 : 24.63 dBm			
Antenna Type	PIFA Antenna			
Type of Modulation	CDMA2000 1xRTT : QPSK			
Type of Modulation	CDMA2000 1xEV-DO : QPSK/8PSK			

**Remark:** This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).

Report No.: FW7D1310A

## 1.5 Specification of Accessory

Specification of Accessory					
AC Adoptor 1	Brand Name	Motorola (Acbel)	Model Name	C-P35 SPN5945A	
AC Adapter 1	Power Rating	I/P: 100-240 Vac, 300	mA, O/P: 5.2V	dc,2000mA	
AC Adapter 2	Brand Name	Motorola (Salom)	Model Name	SSW-2919UMTJ C-P35 SPN5945A	
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA			
Dottom:	Brand Name	Motorola (SCUD)	Model Name	BL270	
Battery	Power Rating	3.85Vdc,4000mAh	Туре	Li-ion, ATL426580	
USB Cable	Brand Name	Motorola (Saibao)	Model Name	SLQ-A077A	
USB Cable	Signal Line Type	1.0 meter, shielded ca	ble, without fe	rrite core	

### 1.6 Modification of EUT

No modifications are made to the EUT during all test items.

 Sporton International (Shenzhen) Inc.
 Page Number
 : 6 of 30

 TEL: +86-755-8637-9589
 Report Issued Date
 : Feb. 12, 2018

 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

FCC ID : IHDT56XB1 Report Template No.: BU5-FWCDMA Version 1.0

# 1.7 Maximum Frequency Tolerance, Emission Designator and Conducted Power

FCC Rule	System	Type of Modulation	Frequency Tolerance (ppm)	Emission Designator	Maximum Conducted power(W)
Part 90S	CDMA2000 BC10 1xRTT	QPSK	0.0156 ppm	1M27F9W	0.2904

Report No.: FW7D1310A

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 7 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01

### 1.8 Testing Site

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No are CN5018 and CN5019.

Test Site	Sporton International (Shenzhen) Inc.		
	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan		
Test Site Location	Shenzhen City Guangdong Province 518055 China		
rest Site Location	TEL: +86-755-8637-9589		
	FAX: +86-755-8637-9595		
Took Site No.	Sporton Site No. FCC Test Firm Registration		
Test Site No.	TH01-SZ	251365	

Test Site	Sporton International (Shenzhen) Inc.			
	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan			
Test Site Location	Warehouse, Nanshan District Shenzhen City Guangdong Province			
rest Site Location	518055 China			
	TEL: +86-755-3320-2398			
Toot Site No	Sporton Site No.	FCC Test Firm Registration No.		
Test Site No.	03CH03-SZ	577730		

Note: The test site complies with ANSI C63.4 2014 requirement.

## 1.9 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 47 CFR Part 2, 90
- ANSI/TIA-603-E

#### Remark:

- All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

Sporton International (Shenzhen) Inc. TEL: +86-755-8637-9589

FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 8 of 30 Report Issued Date : Feb. 12, 2018

Report No.: FW7D1310A

Report Version : Rev. 01

## 2 Test Configuration of Equipment Under Test

#### 2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Report No.: FW7D1310A

Frequency range investigated for radiated emission: 30MHz to 10<sup>th</sup> harmonic.

Test Modes				
Band	Radiated TCs	Conducted TCs		
CDMA2000 BC10	■ 1xRTT Link	■ 1xRTT Link		

**Note:** The maximum RF output power levels are 1xRTT RC1 SO55 mode for CDMA2000 BC10 on QPSK Link; only these modes were used for all tests.

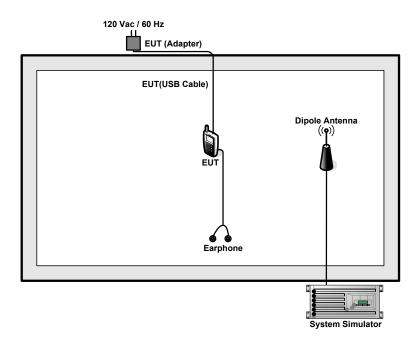
 Sporton International (Shenzhen) Inc.
 Page Number
 : 9 of 30

 TEL: +86-755-8637-9589
 Report Issued Date
 : Feb. 12, 2018

 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

FCC ID : IHDT56XB1 Report Template No.: BU5-FWCDMA Version 1.0

### 2.2 Connection Diagram of Test System



### 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW INSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
3.	Earphone	Ashley ROW	N/A	N/A	Unshielded,1.2m	N/A

### 2.4 Measurement Results Explanation Example

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

#### Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.0 dB and 10dB attenuator.

Offset (dB) = RF cable loss (dB) + attenuator factor (dB).

$$= 4.0 + 10 = 14.0 (dB)$$

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 10 of 30

Report No.: FW7D1310A

Report Issued Date: Feb. 12, 2018
Report Version: Rev. 01

### 3 Test Result

### 3.1 Conducted Output Power Measurement

#### 3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

Report No.: FW7D1310A

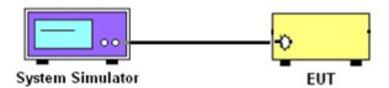
#### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.1.3 Test Procedures

- 1. The transmitter output port was connected to base station.
- 2. Set EUT at maximum power through base station.
- 3. Select lowest, middle, and highest channels for each band and different modulation.

#### 3.1.4 Test Setup



Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Report Issued Date: Feb. 12, 2018
Report Version: Rev. 01

Page Number

Report Template No.: BU5-FWCDMA Version 1.0

: 11 of 30

### 3.1.5 Test Result of Conducted Output Power

Conducted Power (*Unit: dBm)					
Band		CDMA2000 BC10			
Channel	476	580	684		
Frequency	817.9	820.5	823.1		
1xRTT RC1+SO55	24.60	24.60	<mark>24.63</mark>		
1xRTT RC3+SO55	24.58	24.59	24.61		
1xRTT RC3 SO32(+ F-SCH)	24.32	24.44	24.45		
1xRTT RC3 SO32 (+SCH)	24.31	24.42	24.43		
1xEVDO RTAP 153.6Kbps	24.57	24.53	24.54		
1xEVDO RETAP 4096Bits	24.52	24.51	24.52		

Note: Maximum burst average power for CDMA.

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 12 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01

Report No.: FW7D1310A

### 3.2 99% Occupied Bandwidth and 26dB Bandwidth Measurement

#### 3.2.1 Description of (Occupied) Bandwidth Limitations Measurement

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

Report No.: FW7D1310A

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

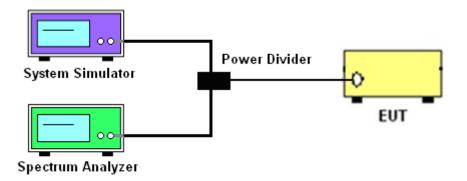
#### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.2.3 Test Procedures

- 1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
- 2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

#### 3.2.4 Test Setup



Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 13 of 30
Report Issued Date : Feb. 12, 2018

Report Version : Rev. 01

### 3.2.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

CDMA2000 BC10							
Test Mode		CDMA 2000 1xRTT					
Test Status	RC3 SO32						
Channel	476 (Low) 580 (Mid) 684 (High)						
Frequency (MHz)	817.9	820.5	823.1				
99% OBW (MHz)	1.27	1.27	1.27				
26dB BW (MHz)	1.43	1.43 1.43 1.43					

Sporton International (Shenzhen) Inc.

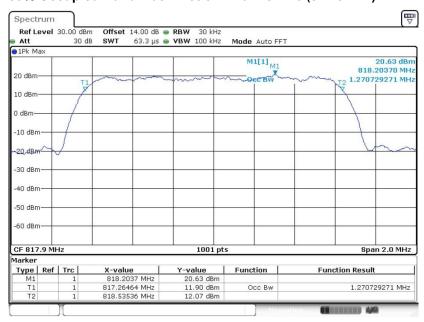
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 14 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01
Report Template No.: BU5-FWCDMA Version 1.0

Report No.: FW7D1310A

#### 3.2.6 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth

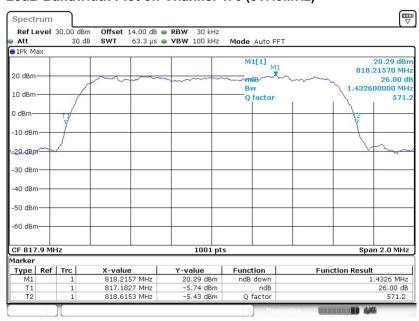
 Band :
 CDMA2000 BC 10
 Test Mode :
 1xRTT\_RC1 SO55

#### 99% Occupied Bandwidth Plot on Channel 476 (817.9MHz)



Date: 27.DEC.2017 09:12:09

#### 26dB Bandwidth Plot on Channel 476 (817.9MHz)



Date: 27.DEC.2017 09:05:36

Sporton International (Shenzhen) Inc.

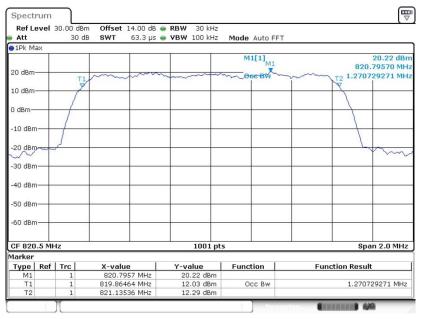
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 15 of 30
Report Issued Date : Feb. 12, 2018

Report No.: FW7D1310A

Report Version : Rev. 01

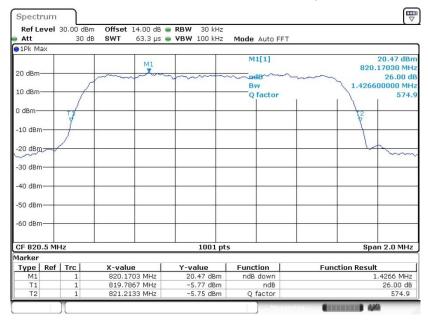
#### Report No.: FW7D1310A

#### 99% Occupied Bandwidth Plot on Channel 580 (820.5MHz)



Date: 27.DEC.2017 09:12:45

#### 26dB Bandwidth Plot on Channel 580 (820.5MHz)



Date: 27.DEC.2017 09:06:12

Sporton International (Shenzhen) Inc.

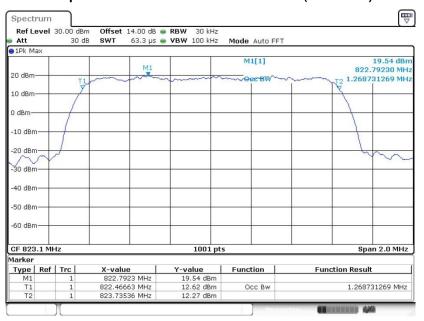
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 16 of 30

Report Issued Date: Feb. 12, 2018
Report Version: Rev. 01



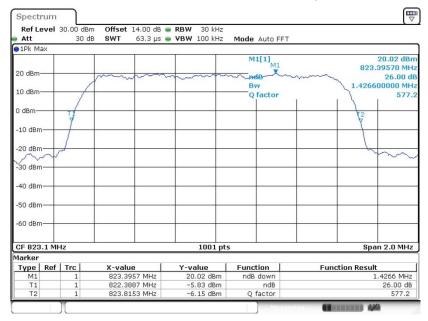
Report No.: FW7D1310A

#### 99% Occupied Bandwidth Plot on Channel 684 (823.1MHz)



Date: 27.DEC.2017 09:13:29

#### 26dB Bandwidth Plot on Channel 684 (823.1MHz)



Date: 27.DEC.2017 09:07:26

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 17 of 30 Report Issued Date : Feb. 12, 2018

Report Version : Rev. 01



#### 3.3 **Emissions Mask Measurement**

#### 3.3.1 **Description of Emissions Mask Measurement**

Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of FCC Part 90.691.(a)(1)

Report No.: FW7D1310A

- (a). Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
  - (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

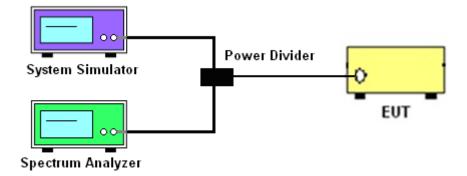
#### 3.3.2 **Measuring Instruments**

The measuring equipment is listed in the section 4 of this test report.

#### 3.3.3 **Test Procedures**

- 1. The EUT was connected to spectrum analyzer and base station via power divider.
- 2. The emissions mask of low and high channels for the highest RF powers were measured.
- 3. The RBW was set 1% of 99% Occupied Bandwidth, and VBW was set 3 times of RBW.
- 4. The final test results were shown below plots with a correction offset factor including cable loss, insertion loss of power divider.

#### 3.3.4 Test Setup



Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1

Page Number Report Issued Date: Feb. 12, 2018 Report Version : Rev. 01

Report Template No.: BU5-FWCDMA Version 1.0

: 18 of 30

### 3.3.5 Test Result (Plots) of Conducted Emissions Mask

#### Lower Band Edge Plot on Channel 476 (817.9MHz)



Date: 27.DEC.2017 15:52:06

#### Higher Band Edge Plot on Channel 684 (823.1MHz)



Date: 27.DEC.2017 12:56:08

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 19 of 30 Report Issued Date : Feb. 12, 2018

Report No.: FW7D1310A

Report Version : Rev. 01

#### 3.4 Emissions Mask - Out Of Band Emissions Measurement

#### 3.4.1 Description of Conducted Emissions Out of band emissions measurement

The power of any emission FCC Part 90.691 (a)(2) on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43 + 10 log (P) dB. It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10<sup>th</sup> harmonic.

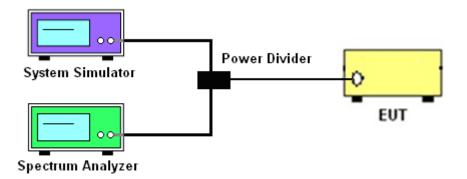
### 3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.4.3 Test Procedures

- The EUT was connected to spectrum analyzer and base station via power divider.
- 2. The middle channel for the highest RF power within the transmitting frequency was measured.
- 3. The conducted spurious emission for the whole frequency range was taken.
- 4. The final test results were shown below plots with a correction offset factor including cable loss, insertion loss of power divider.

#### 3.4.4 Test Setup



Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 20 of 30
Report Issued Date : Feb. 12, 2018

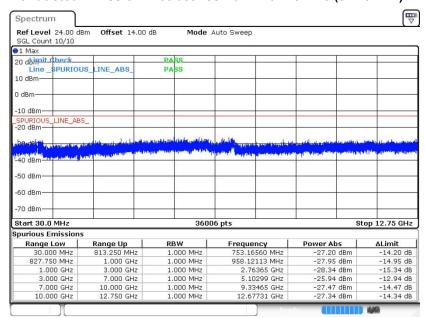
Report No.: FW7D1310A

Report Version : Rev. 01

#### 3.4.5 Test Result (Plots) of Conducted Emission

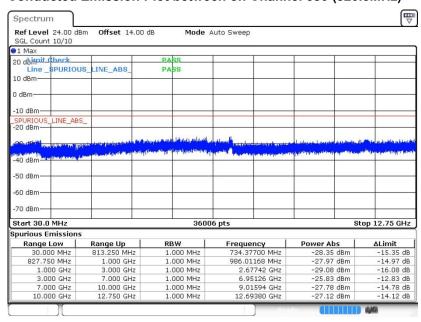
Band: CDMA2000 BC10	Test Mode:	1xRTT_RC1 SO55
---------------------	------------	----------------

#### Conducted Emission Plot between on Channel 476 (817.9MHz)



Date: 27.DEC.2017 09:21:35

#### Conducted Emission Plot between on Channel 580 (820.5MHz)



Date: 27.DEC.2017 09:22:57

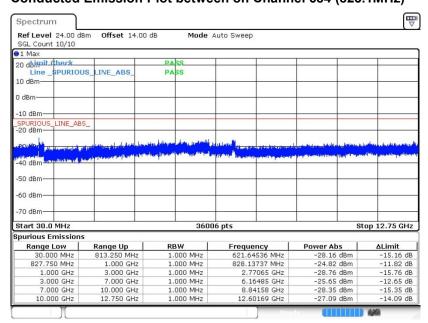
Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 21 of 30 Report Issued Date : Feb. 12, 2018

Report No.: FW7D1310A

Report Version : Rev. 01

### Conducted Emission Plot between on Channel 684 (823.1MHz)



Date: 27.DEC.2017 09:24:18

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 22 of 30 Report Issued Date : Feb. 12, 2018

Report No.: FW7D1310A

Report Version : Rev. 01

### 3.5 Field Strength of Spurious Radiation Measurement

#### 3.5.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43+10log<sub>10</sub>(P[Watts]) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

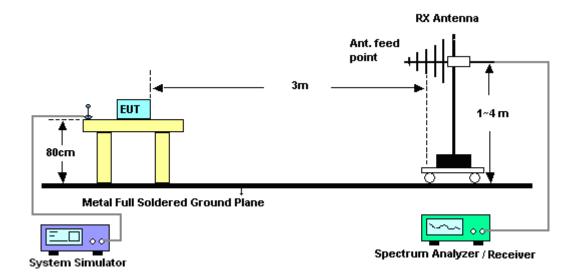
#### 3.5.3 Test Procedures

- The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
- 2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- 4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
- 6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- 7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- 8. Taking the record of output power at antenna port.
- 9. Repeat step 7 to step 8 for another polarization.
- 10. EIRP (dBm) = S.G. Power Tx Cable Loss + Tx Antenna Gain
- 11. ERP (dBm) = EIRP 2.15
- 12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 13. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
  - = P(W) [43 + 10log(P)] (dB)
  - = [30 + 10log(P)] (dBm) [43 + 10log(P)] (dB)
  - = -13dBm.

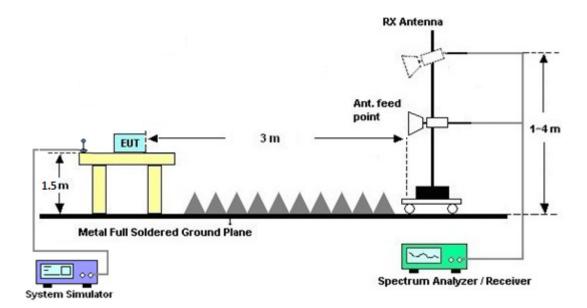
Report No.: FW7D1310A



### 3.5.4 Test Setup



Report No.: FW7D1310A



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 24 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01

### 3.5.5 Test Result of Field Strength of Spurious Radiated

Band :		CDMA2000	BC10				Temperature :	2	21~25°(	O
Test Mode :		1xRTT_RC	1 SO55				Relative Humic	lity: 5	56~62%	
Test Engine	er:	Watt Tseng	/att Tseng Channel :						Low	
Remark :		Spurious e	ourious emissions within 30-1000MHz were found more than 20dB below limit line.							t line.
Frequency	ERF	Limit	Over	SPA	S.G.	TX Ca	ble TX Antenna	Polari	ization	Result
			Limit	Reading	Power	loss	s Gain			
(MHz)	(dBn	n) (dBm)	( dB )	(dBm)	(dBm)	( dB	) (dBi)	(H	/V)	
1635.8	-73.8	32 -13	-60.82	-75.53	-78.22	2.76	9.31	ŀ	Н	Pass
2453.7	-70.9	3 -13	-57.93	-76.99	-76.79	2.45	5 10.46	ŀ	Н	Pass
3271.6	-69.8	-13	-56.81	-77.81	-75.51	4.58	3 12.43	ŀ	Н	Pass
1635.8	-73.6	7 -13	-60.67	-75.51	-78.07	2.76	9.31	`	V	Pass
2453.7	-71.2	.4 -13	-58.24	-77.19	-77.10	2.45	5 10.46	`	V	Pass
3271.6	-69.7	'4 -13	-56.74	-77.77	-75.44	4.58	3 12.43	•	V	Pass

Band :		CDMA200	D BC10				Tem	perature :		21~25°	С
Test Mode	:	1xRTT_RC	1 SO55				Rela	ative Humidi	ity:	56~62%	
Test Engine	eer:	Watt Tseng	I				Cha	innel :		Middle	
Remark :		Spurious e	missions	within 30-	1000MHz \	were fou	ınd n	nore than 20	dB be	low limi	t line.
Frequency	ERP	Limit	Over	SPA	S.G.	TX Ca	ble	TX Antenna	Polar	ization	Result
			Limit	Reading	Power	loss	3	Gain			
(MHz)	(dBm	n) (dBm)	( dB )	(dBm)	(dBm)	( dB	)	(dBi)	(H	<del>1</del> /V)	
1641	-73.7	2 -13	-60.72	-75.43	-78.03	2.88	3	9.34		Н	Pass
2461.5	-70.9	8 -13	-57.98	-77.04	-76.84	2.5		10.51		Н	Pass
3282	-69.6	3 -13	-56.63	-77.63	-75.35	4.63	3	12.50		Н	Pass
1641	-73.6	7 -13	-60.67	-75.51	-77.98	2.88	3	9.34		V	Pass
2461.5	-71.0	5 -13	-58.05	-77.00	-76.91	2.50	)	10.51		V	Pass
3282	-69.6	8 -13	-56.68	-77.71	-75.40	4.63	3	12.50		V	Pass

Band :		CDMA200	DMA2000 BC10 Temperature :						21~25°C	
Test Mode	:	1xRTT_RC	RTT_RC1 SO55 Relative Humidity :							, 0
Test Engine	eer:	Watt Tseng	J				Channel:	Н	ligh	
Remark :		Spurious e	purious emissions within 30-1000MHz were found more than 20dB below limit lii						t line.	
Frequency	ERF	Limit	Over	SPA	S.G.	TX Ca	ble TX Antenna	Polariz	zation	Result
			Limit	Reading	Power	loss	Gain			
(MHz)	(dBn	n) (dBm)	(dB)	(dBm)	(dBm)	(dB	) (dBi)	(H/	V)	
1646.2	-73.8	5 -13	-60.85	-75.56	-78.15	2.92	9.37	F	1	Pass
2469.3	-71.0	0 -13	-58.00	-77.06	-76.78	2.63	3 10.56	H	ł	Pass
3292.4	-69.9	2 -13	-56.92	-77.92	-75.60	4.74	12.57	H	ł	Pass
1646.2	-73.6	7 -13	-60.67	-75.51	-77.97	2.92	9.37	V	/	Pass
2469.3	-71.1	4 -13	-58.14	-77.09	-76.92	2.63	3 10.56	V	/	Pass
3292.4	-69.8	0 -13	-56.80	-77.83	-75.48	4.74	12.57	V	/	Pass

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 25 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01
Report Template No.: BU5-FWCDMA Version 1.0

Report No.: FW7D1310A

### 3.6 Frequency Stability Measurement

#### 3.6.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency according to FCC Part 90.213.

#### 3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.6.3 Test Procedures for Temperature Variation

- 1. The EUT was set up in the thermal chamber and connected with the base station.
- 2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
- 3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

#### 3.6.4 Test Procedures for Voltage Variation

- 1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
- 2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
- 3. The variation in frequency was measured for the worst case.

Sporton International (Shenzhen) Inc.

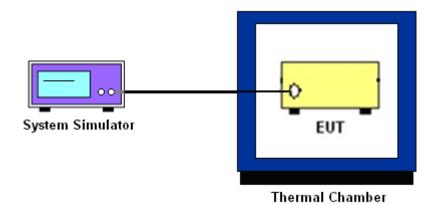
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 26 of 30 Report Issued Date : Feb. 12, 2018

Report No.: FW7D1310A

Report Version : Rev. 01



# 3.6.5 Test Setup



Report No.: FW7D1310A

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1

Page Number : 27 of 30 Report Issued Date: Feb. 12, 2018 Report Version : Rev. 01

### 3.6.6 Test Result of Temperature Variation

Test Conditions	Middle Channel	CDMA BC10 (1xRTT)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0035	
40	Normal Voltage	0.0145	
30	Normal Voltage	0.0028	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0020	
0	Normal Voltage	0.0021	
-10	Normal Voltage	0.0029	PASS
-20	Normal Voltage	0.0039	
-30	Normal Voltage	0.0156	
20	Maximum Voltage	0.0058	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0008	

Note: Normal Voltage = 3.8V. ; Battery End Point (BEP) = 3.6V. ; Maximum Voltage =4.4V

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1

Page Number Report Issued Date: Feb. 12, 2018 Report Version : Rev. 01

: 28 of 30

Report No.: FW7D1310A



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	9kHz~40GHz	Apr. 20, 2017	Dec. 27, 2017	Apr. 19, 2018	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 20, 2017	Dec. 27, 2017	Jul. 19, 2018	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 20, 2017	Dec. 30, 2017~ Dec. 31, 2017	Apr. 19, 2018	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 20, 2017	Dec. 30, 2017~ Dec. 31, 2017	Apr. 19, 2018	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	May 14, 2017	Dec. 30, 2017~ Dec. 31, 2017	May 13, 2018	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120 D	9120D-1355	1GHz~18GHz	Jul. 09, 2017	Dec. 30, 2017~ Dec. 31, 2017	Jul. 08, 2018	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Jun. 16, 2017	Dec. 30, 2017~ Dec. 31, 2017	Jun. 15, 2018	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102210	0.01Hz ~3000MHz	Oct. 19, 2017	Dec. 30, 2017~ Dec. 31, 2017	Oct. 18, 2018	Radiation (03CH03-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270156	0.5GHz~26.5Ghz	Apr. 20, 2017	Dec. 30, 2017~ Dec. 31, 2017	Apr. 19, 2018	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul. 18, 2017	Dec. 30, 2017~ Dec. 31, 2017	Jul. 17, .2018	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	61601000198 5	N/A	NCR	Dec. 30, 2017~ Dec. 31, 2017	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Dec. 30, 2017~ Dec. 31, 2017	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Dec. 30, 2017~ Dec. 31, 2017	NCR	Radiation (03CH03-SZ)

NCR: No Calibration Required

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 29 of 30
Report Issued Date : Feb. 12, 2018

Report No.: FW7D1310A

Report Version : Rev. 01
Report Template No.: BU5-FWCDMA Version 1.0



## 5 Uncertainty of Evaluation

#### **Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.0dB
---	-------

Report No.: FW7D1310A

#### <u>Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)</u>

Measuring Uncertainty for a Level of	3.6dB
Confidence of 95% (U = 2Uc(y))	3.600

Sporton International (Shenzhen) Inc.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56XB1 Page Number : 30 of 30
Report Issued Date : Feb. 12, 2018
Report Version : Rev. 01