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Report No.: GTI20140444F-5

Page 1 of 18

# TEST REPORT

**Product Name** .....: LTE mobile phone

**Trademark** .....: NUU

**Model/Type reference** .....: X1

**Listed Model(s)** .....: X1 Series

**Model difference** .....: X1 other series model No. are all the same with main model X1, except for body color, RAM and LOGO to meet different customer requirements

**FCC ID**.....: **2ADINNUUX1**

**Test Standards** .....: **FCC Part 15.225: Operation within the band 13.110–14.010 MHz**

**Applicant** .....: Sun Cupid Technology (HK) Ltd.

**Address of applicant** .....: 16/F, CEO Tower, 77 Wing Hong St, Cheung Sha Wan, Kowloon, Hong Kong

**Date of Receipt** .....: Nov.02, 2014

**Date of Test Date**.....: Nov.02, 2014 - Nov.28, 2014

**Data of issue.** .....: Nov.28, 2014

<b>Test result</b>	<b>Pass *</b>
--------------------	---------------

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

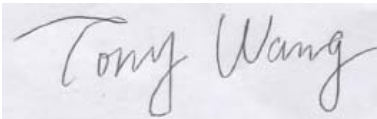
GENERAL DESCRIPTION OF EUT	
Equipment:	LTE Mobile Phone
Model Name:	X1
Manufacturer:	Sun Cupid Technology (Shenzhen) Ltd.
Manufacturer Address:	10A, No.3 Bldg, China Academy of Sci & Tech Development, No.1 High-Tech South St. Nanshan district, Shenzhen, China.
Power Source:	DC 3.8V from Li-ion battery
Power Rating:	Input: 100-240VAC, 50/60Hz 0.2A MAX Output: 5V==1.0A

Compiled By:



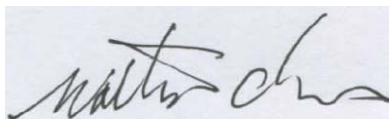
(Allen Wang)

Reviewed By:



(Tony Wang)

Approved By:



(Walter Chen)

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# 1. SUMMARY

## 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.225](#): Operation within the band 13.110–14.010 MHz

[ANSI C63.10-2009](#): American National Standard for Testing Unlicensed Wireless Devices

## 1.2. Test Description

FCC PART 15 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 2.1049	20dB Bandwidth	PASS
FCC Part 15.225(a) (b) (c)	In-band Emissions	PASS
FCC Part 15.225(d)/15.207	Out-of-band Emissions	PASS
FCC Part 15.225(e)	Frequency Stability Tolerance	PASS

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

## 1.3. Test Facility

### 1.3.1 Address of the test laboratory

#### Shenzhen General Testing & Inspection Technology Co., Ltd.

Add: 1F, 2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong, China

### 1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

#### IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

#### FCC-Registration No.: 214666

Shenzhen GTI Technology 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. Registration 214666, Sep 19, 2011

## 1.4. 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 CISPR 16 - 4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the Shenzhen General Testing & Inspection Technology 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 General Testing & Inspection laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)

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

## 2. GENERAL INFORMATION

### 2.1. Environmental conditions

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

Temperature:	-20~50°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

### 2.2. General Description of EUT

Product Name:	LTE Mobile Phone
Model/Type reference:	X1
Power supply:	DC 3.8V from Li-ion battery
Adapter information:	Model: HNFG050100UU Input: 100-240VAC, 50/60Hz 0.2A MAX Output: 5V---1.0A
Hardware version:	UALC04 VER E
Software version:	X1-US-01
<b>NFC</b>	
Operation frequency:	13.56MHz
Modulation :	ASK
No. of Channel :	1
Antenna type:	Loop Antenna

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

### 2.3. Description of Test Modes

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

### 2.4. Measurement Instruments List

20dB bandwidth					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Dec. 27,2014

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrate until
1	LISN	R&S	ENV216	101112	Dec. 26, 2014
2	LISN	R&S	ENV216	101113	Dec. 26, 2014
3	EMI Test Receiver	R&S	ESCI	100920	Dec. 26, 2014
4	Cable	Schwarzbeck	Cable001	--	Dec. 26, 2014

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100967	Dec 27,2014
2	High pass filter	Compliance Direction systems	BSU-6	34202	Oct 25,2015
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec 27,2014
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec 27,2014
5	Loop Antenna	LAPLAC	RF300	9138	Nov 15,2015
6	Spectrum Analyzer	HP	8563E	02052	Dec 27,2014
7	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Dec 27,2014
8	Pre-Amplifier	HP	8447D	1937A03050	Dec 26,2014
9	Pre-Amplifier	EMCI	EMC05183 5	980075	Dec 27,2014
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A
12	Cable	Schwarzbeck	Cable002	--	Dec. 26,2014
13	Cable	Schwarzbeck	Cable003	--	Dec. 26,2014

Note: 1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.

### 3. TEST CONDITIONS AND RESULTS

#### 3.1. Conducted Emission (AC Main)

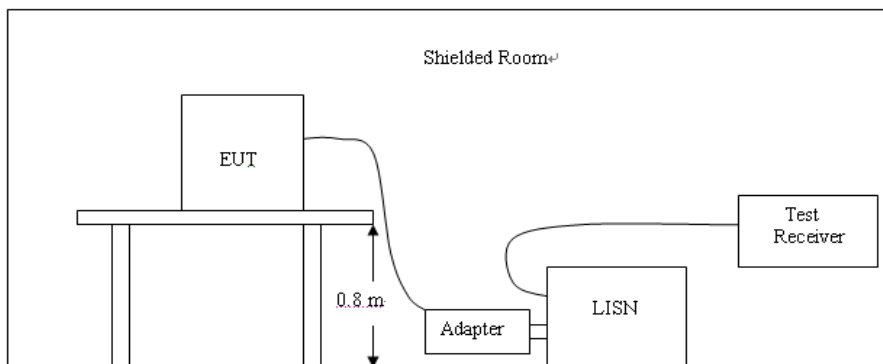
##### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

##### TEST CONFIGURATION



##### TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2009.
2. Support equipment, if needed, was placed as per ANSI C63.10-2009
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2009
4. The EUT received DC5V power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.



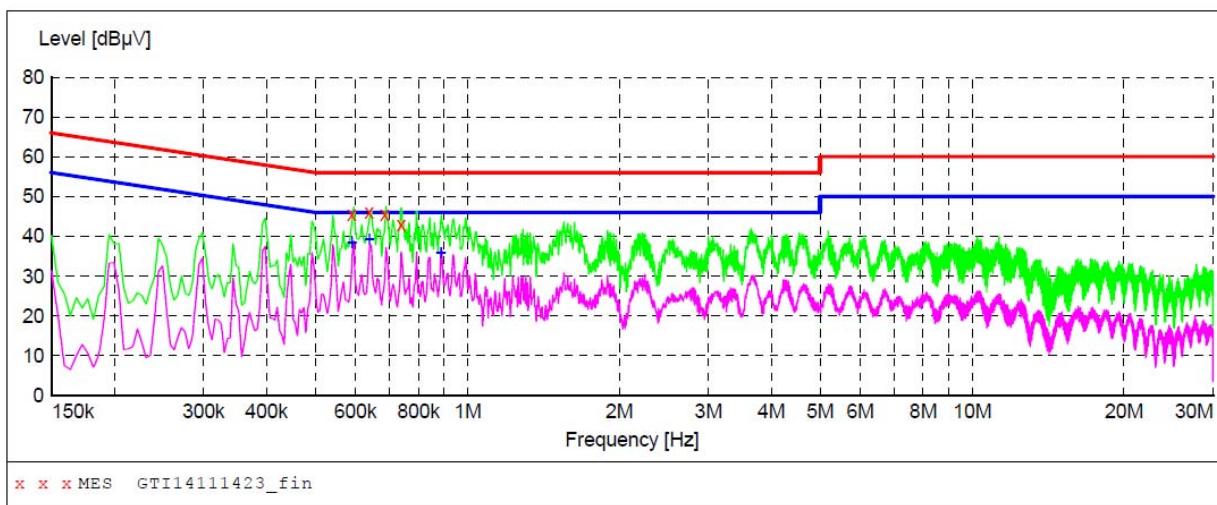
**TEST RESULTS**

LINE

L

**SCAN TABLE: "Voltage (9K-30M) FIN1"**

Short Description: 150K-30M Voltage



**MEASUREMENT RESULT: "GTI14111423\_fin"**

11/14/2014 2:12PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.590000	45.40	9.9	56	10.6	QP	L1	GND
0.638000	46.10	10.0	56	9.9	QP	L1	GND
0.686000	45.40	10.0	56	10.6	QP	L1	GND
0.740000	42.80	10.0	56	13.2	QP	L1	GND

**MEASUREMENT RESULT: "GTI14111423\_fin2"**

11/14/2014 2:12PM

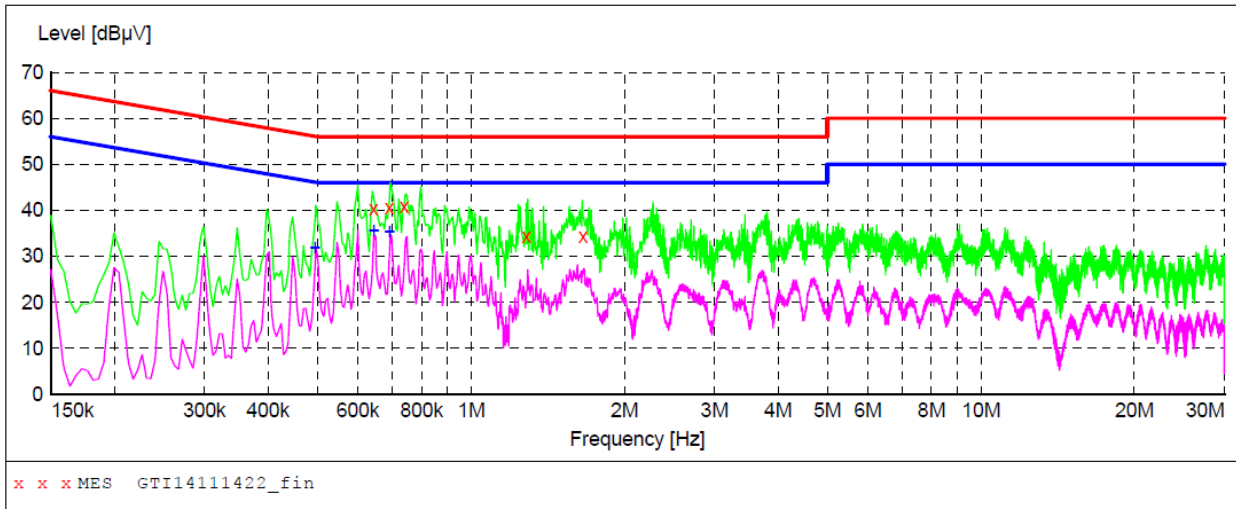
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.590000	38.30	9.9	46	7.7	AV	L1	GND
0.638000	39.20	10.0	46	6.8	AV	L1	GND
0.884000	35.80	10.1	46	10.2	AV	L1	GND

LINE

N

**SCAN TABLE: "Voltage (9K-30M) FIN1"**

Short Description: 150K-30M Voltage



**MEASUREMENT RESULT: "GTI14111422\_fin"**

11/14/2014 2:09PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.644000	40.20	10.0	56	15.8	QP	N	GND
0.692000	40.60	10.0	56	15.4	QP	N	GND
0.740000	40.80	10.0	56	15.2	QP	N	GND
1.286000	34.30	10.2	56	21.7	QP	N	GND
1.658000	34.30	10.3	56	21.7	QP	N	GND

**MEASUREMENT RESULT: "GTI14111422\_fin2"**

11/14/2014 2:09PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.494000	31.80	9.9	46	14.3	AV	N	GND
0.644000	35.50	10.0	46	10.5	AV	N	GND
0.692000	35.30	10.0	46	10.7	AV	N	GND

### 3.2. Radiated Emission

#### Limit

- a The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/ meter at 30 meters.
- b Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- c Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- d The field strength of any emissions appearing outside of the 13.110– 14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

Frequency (MHz)	Distance (Meters)	Radiated (dBuV/m)	Radiated (µV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-13.110	3	69.54	30
13.110-13.410	3	80.50	106
13410-13.553	3	90.47	334
13.553-13.567	3	124.00	15848
13.567-13.710	3	90.47	334
13.710-14.010	3	80.50	106
14.010-30.0	3	69.54	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

#### Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

#### Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

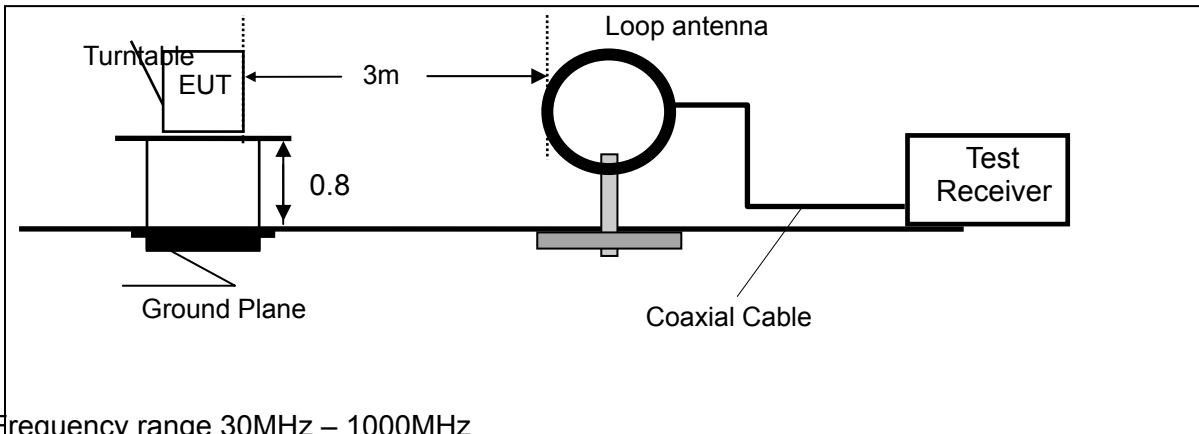
For example

Frequency (MHz)	FS (dBuV/m)	RA (dBuV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
150.00	40	58.1	12.2	1.6	31.90	-18.1

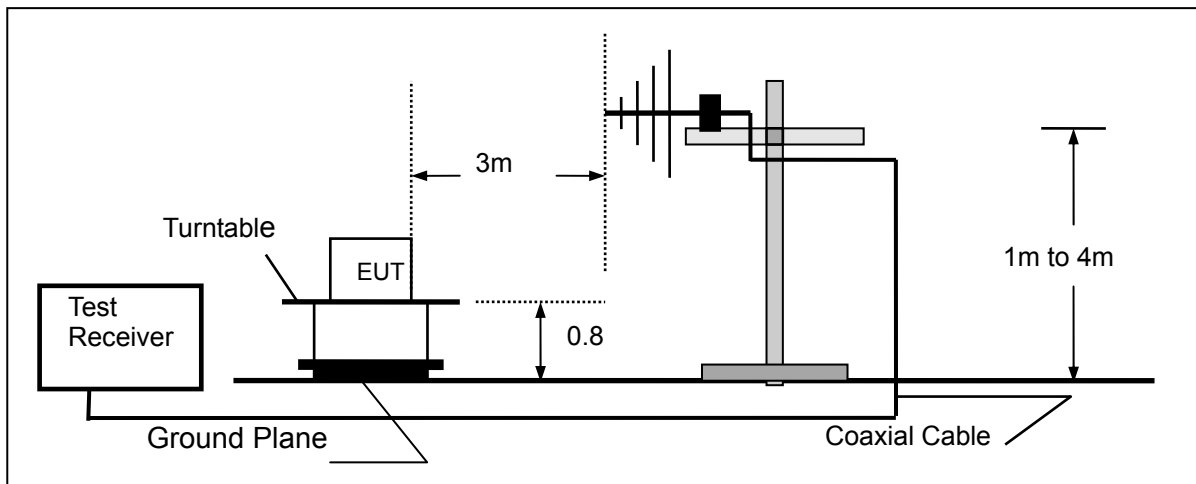
$$Transd=AF +CL-AG$$

### Test Configuration

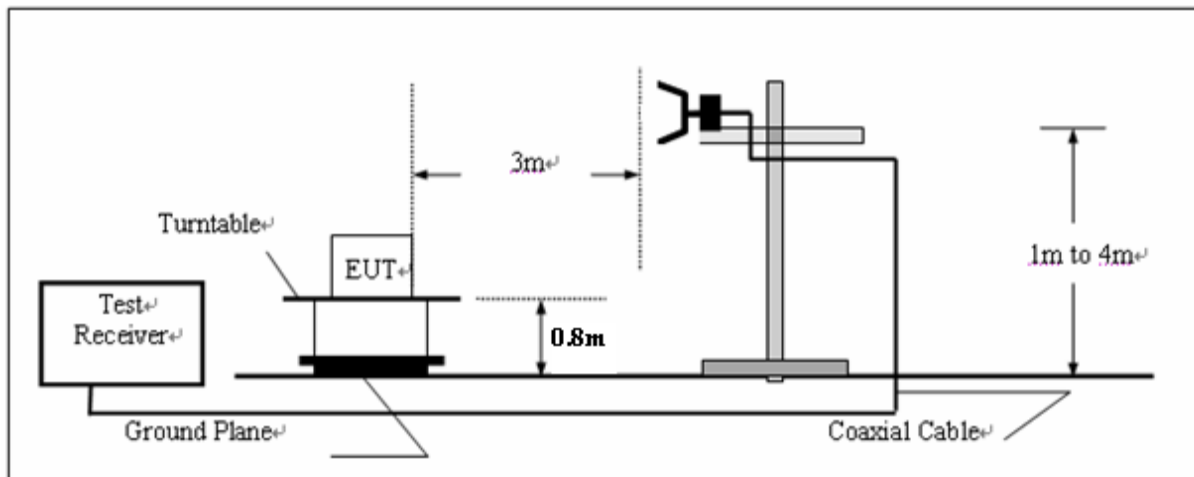
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



**Test Results**

**3.2.1 In-band Emissions**

Frequency(MHz):			13.56				Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)	Detector	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Correction Factor (dB/m)
1	13.15	39.62	PK	80.50	40.88	1.00 H	185	34.92	5.26	-0.56	4.70
2	13.55	49.36	PK	90.47	41.11	1.00 H	110	44.57	5.36	-0.57	4.79
3	13.56	85.63	PK	124.00	38.37	1.00 H	95	80.75	5.45	-0.57	4.88
4	13.57	49.22	PK	90.47	41.25	1.00 H	45	44.08	5.49	-0.35	5.14
5	13.75	40.23	PK	80.50	40.27	1.00 H	155	34.90	5.63	-0.30	5.33

Frequency(MHz):			13.56				Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)	Detector	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Correction Factor (dB/m)
1	13.15	40.50	PK	80.50	40.00	1.00 H	185	34.92	5.26	-0.56	4.70
2	13.55	49.14	PK	90.47	41.33	1.00 H	110	44.57	5.36	-0.57	4.79
3	13.56	86.32	PK	124.00	37.68	1.00 H	95	80.75	5.45	-0.57	4.88
4	13.57	49.78	PK	90.47	40.69	1.00 H	45	44.08	5.49	-0.35	5.14
5	13.75	40.47	PK	80.50	40.03	1.00 H	155	34.90	5.63	-0.30	5.33

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)
3. Margin value = Limit value- Emission level.
4. The other emission levels were very low against the limit.

**3.2.2 Out-of-band Emissions**

Frequency(MHz):			13.56				Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)	Detector	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Correction Factor (dB/m)
1	27.12	37.26	PK	69.54	32.28	1.00 H	135	29.76	7.25	0.25	7.50
2	40.68	33.15	PK	40.00	6.85	1.00 H	122	24.34	8.25	0.56	8.81
3	54.24	27.87	PK	40.00	12.13	1.00 H	85	18.83	8.30	0.74	9.04
4	67.80	28.15	PK	40.00	11.85	1.00 H	90	18.62	8.55	0.98	9.53

Frequency(MHz):			13.56				Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)	Detector	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Correction Factor (dB/m)
1	27.12	38.56	PK	69.54	30.98	1.00 H	135	31.06	7.25	0.25	7.50
2	40.68	34.25	PK	40.00	5.75	1.00 H	122	25.44	8.25	0.56	8.81
3	54.24	28.56	PK	40.00	11.44	1.00 H	85	19.52	8.30	0.74	9.04
4	67.80	28.36	PK	40.00	11.64	1.00 H	90	18.83	8.55	0.98	9.53

REMARKS:

5. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
6. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)
7. Margin value = Limit value- Emission level.
8. The other emission levels were very low against the limit.

### 3.3. 20dB Bandwidth

#### Limit

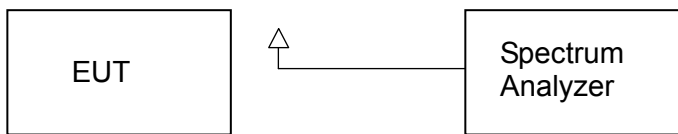
No limit for 20dB bandwidth.

#### Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 KHz RBW and 100 KHz VBW.

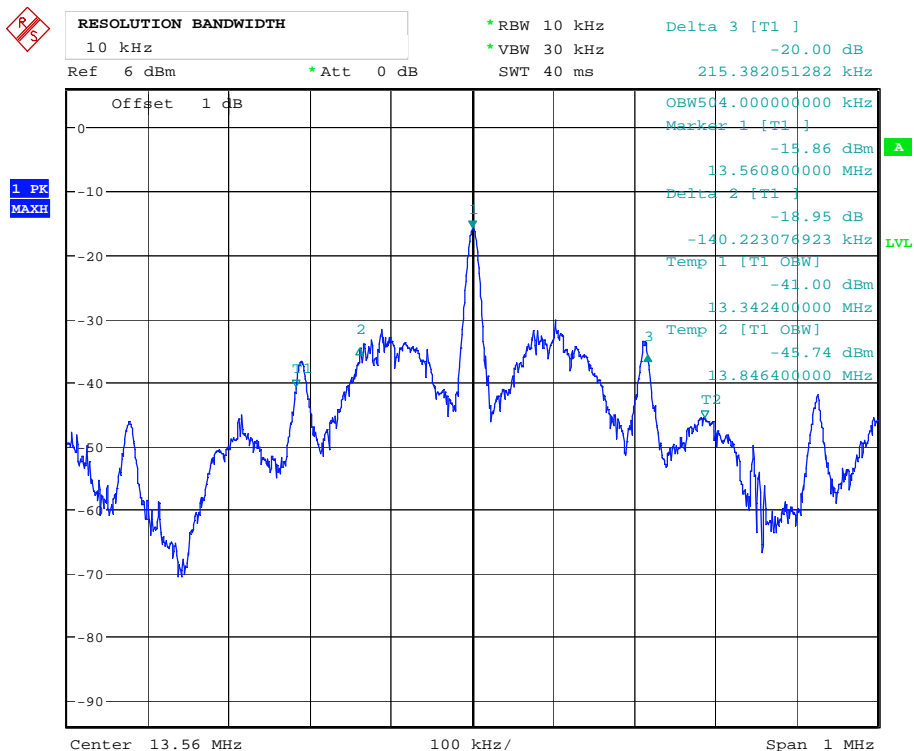
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

#### Test Configuration



#### Test Results

Modulation	Frequency	20dB bandwidth (MHz)	Result
ASK	CH00	355.605	Pass

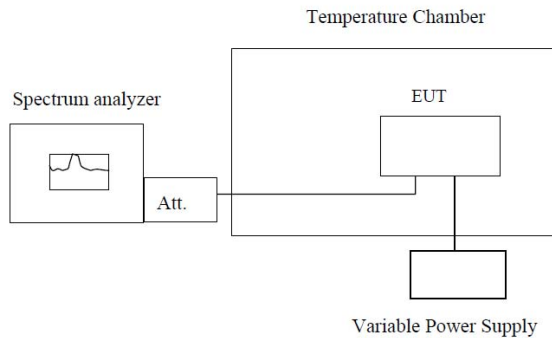


### 3.4. Frequency Stability Test Data

#### LIMIT

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of  $-20$  degrees to  $+50$  degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

#### TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

#### TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT  $20^{\circ}\text{C}$  operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to  $-20^{\circ}\text{C}$ . After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with  $10^{\circ}\text{C}$  increased per stage until the highest temperature of  $+50^{\circ}\text{C}$  reached.
7. Reduce the input voltage to specified extreme voltage variation ( $\pm 15\%$ ) or endpoint, record the maximum frequency change.

#### TEST RESULTS



Reference Frequency: 13.56MHz				
Voltage ( V )	Temperature (°C)	Frequency (Hz)	Frequency Deviation(Hz)	Deviation (%)
3.80	+20(Ref)	13,560,006	6	0.000044
	-20	13,560,015	15	0.000111
	-10	13,560,004	4	0.000029
	0	13,559,985	-15	-0.000111
	+10	13,560,003	3	0.000022
	+20	13,560,014	14	0.000103
	+25	13,560,020	20	0.000147
	+30	13,559,991	-9	-0.000066
	+40	13,559,990	-10	-0.000074
	+50	13,559,995	-5	-0.000037
4.35	+20	13,560,011	11	0.000081
End point 3.60	+20	13,560,006	6	0.000044



## 4. EUT TEST PHOTO

Radiated Emission



Conducted Emission





## 5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Please reference to the test report No.: GTI20140444F-1

\*\*\*\*\*THE END\*\*\*\*\*