

# FCC Part 22H & 24E Measurement and Test Report

For

LOWEX, LLC

**FCC ID: 2AREV-F1818M24**

<b>FCC Rules:</b>	<u>FCC Part 22H, FCC Part 24E</u>
<b>Product Description:</b>	<u>feature phone</u>
<b>Tested Model:</b>	<u>F18m</u>
<b>Report No.:</b>	<u>BSL008390301RF</u>
<b>Tested Date:</b>	<u>September 30-October 15, 2018</u>
<b>Issued Date:</b>	<u>October 15, 2018</u>
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**TABLE OF CONTENTS**

<b>1. GENERAL INFORMATION .....</b>	<b>3</b>
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	5
1.3 TEST METHODOLOGY .....	5
1.4 TEST FACILITY .....	5
1.5 EUT SETUP AND TEST MODE .....	5
1.6 MEASUREMENT UNCERTAINTY .....	6
1.7 EQUIPMENT LIST AND DETAILS .....	6
<b>2. SUMMARY OF TEST RESULTS.....</b>	<b>7</b>
<b>3. RF EXPOSURE.....</b>	<b>8</b>
3.1 STANDARD APPLICABLE.....	8
3.2 TEST RESULT.....	8
<b>4. CONDUCTED AV OUTPUT POWER.....</b>	<b>9</b>
<b>5. PEAK-TO-AVERAGE RATIO .....</b>	<b>11</b>
<b>6. OCCUPY BANDWIDTH .....</b>	<b>12</b>
<b>7. MODULATION CHARACTERISTIC .....</b>	<b>15</b>
<b>8. OUT OF BAND EMISSION AT ANTENNA TERMINALS .....</b>	<b>16</b>
<b>9. ERP, EIRP MEASUREMENT .....</b>	<b>23</b>
<b>10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT .....</b>	<b>29</b>
<b>11. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT .....</b>	<b>33</b>
<b>12. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT .....</b>	<b>36</b>
<b>13. TEST SETUP PHOTO .....</b>	<b>38</b>
<b>14. EUT CONSTRUCTIONAL DETAILS .....</b>	<b>39</b>

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

Applicant:	LOWEX, LLC
Address of applicant:	739 NW 105th Pl, Miami, Florida 33172, USA
Manufacturer:	LuZhou XinYu Communication Technology Co., LTD
Address of manufacturer:	NO.19, Section 5, JiuGu Avenue, High Tech District, LuZhou City, SiChuan Provice, China
Product Name:	feature phone
Model No.:	F18m, F18, F24
Test Model No:	F18m
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are color and model name for commercial purpose.	
Sample(s) Status:	Engineer sample
Quantity of tested samples	1
Serial No.:	N/A
Description test modes:	SIM 1 and SIM 2 is a chipset unit and tested as single chipset, SIM1 was worsecase by pre-test, So SIM 1 is used to test.
Hardware Version:	DF600_PCB
Software Version:	DF600_DF600E_HC
Support Networks:	GSM, GPRS
Support Bands:	GSM850, PCS1900,
TX Frequency:	GSM850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz
GPRS Class:	12
Modulation type:	GSM/GPRS: GMSK
Antenna type:	Internal antenna
Antenna gain:	0.6dBi(max.) For GSM 850 0.7dBi(max.) For DCS 1900
Power supply:	DC 3.7V by battery or DC 5V from adapter input AC 120V, 60Hz

**Operation Frequency List:**

<b>GSM 850</b>		<b>PCS1900</b>	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
· ∴	· ∴	· ∴	· ∴
189	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
· ∴	· ∴	· ∴	· ∴
250	848.60	809	1909.60
251	848.80	810	1909.80

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

**Final test channel:**

<b>GSM 850</b>		<b>PCS1900</b>	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
190	836.60	661	1880.00
251	848.80	810	1909.80

**EUT Cable List and Details**

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Earphone	1.0	Unshielded	Without Ferrite

**Auxiliary Equipment List and Details**

Description	Manufacturer	Model	Serial Number
Adapter	JINFULIN	A01	/

**Special Cable List and Details**

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

## 1.2 EUT Setup and 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. During the test, pre-scan F18m, F18, F24, and found the F18m model which it is worse case model.

Test modes		
Band	Radiated	Conducted
<b>GSM 850</b>	■ GSM link	■ GSM link
	■ GPRS 1 link	■ GPRS 1 link
<b>PCS 1900</b>	■ GSM link	■ GSM link
	■ GPRS 1 link	■ GPRS 1 link

Note: The maximum power levels are GSM mode for GMSK link, GPRS multi-slot class 8 mode for GMSK link. only these modes were used for all tests.

## 1.3 Test Standards

The following report accordance with FCC Part 2 subpart J, FCC Part 22 subpart H and FCC Part 24 subpart E of the Federal Communication Commission rules.

## 1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on ANSI/TIA-603-E (2016) and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057, ANSI C63.26-2015.

## 1.5 Test Facility

BSL Testing Co.,LTD.

NO. 24, ZH Park, Nantou, Shenzhen, 518000 China

Test Firm Registration Number: 866035

Designation Number: CN1217

Tel: Tel: 400-882-9628

Fax: 86- 755-26508703

## 1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Frequency Stability	Conducted	2.3%
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$
Transmitter Spurious Emissions	Conducted	$\pm 0.42\text{dB}$

## 1.7 Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
Communication Tester	Rohde & Schwarz	CMW500	100358	2017-10-21	2018-10-20
Spectrum Analyzer	R&S	FSP40	100550	2017-10-21	2018-10-20
Spectrum Analyzer	Agilent	N9020	MY499100461	2017-10-21	2018-10-20
Test Receiver	R&S	ESCI7	US47140102	2017-10-21	2018-10-20
Signal Generator	HP	83630B	3844A01028	2017-10-22	2018-10-21
Test Receiver	R&S	ESPI-3	100180	2017-10-21	2018-10-20
Amplifier	Agilent	8449B	4035A00116	2017-10-22	2018-10-21
Amplifier	HP	8447E	2945A02770	2017-10-22	2018-10-21
Signal Generator	IFR	2023A	202307/242	2017-10-22	2018-10-21
Broadband Antenna	SCHAFFNER	2774	2774	2017-10-17	2018-10-16
Biconical and log periodic antennas	ELECTRO-METRICS	EM-6917B-1	171	2017-10-17	2018-10-16
Horn Antenna	R&S	HF906	100253	2017-10-17	2018-10-16
Horn Antenna	EM	EM-6961	6462	2017-10-17	2018-10-16
LISN	R&S	ESH3-Z5	100196	2017-10-17	2018-10-16
LISN	COM-POWER	LI-115	02027	2017-10-17	2018-10-16
3m Semi-Anechoic Chamber	Chengyu Electron	9 (L)*6 (W)* 6 (H)	BSL086	2017-10-21	2018-10-20
Horn Antenna	A-INFOMW	LB-180400KF	BSL088	2017-10-21	2018-10-20
20dB Attenuator	ICPROBING	IATS1	BSL1003	2017-10-21	2018-10-20
POWER DIVIDER	Mini-circuits	PD-2SF-0010	N/A	2017-10-21	2018-10-20
POWER DIVIDER	Mini-circuits	PD-2SF-0010	N/A	2017-10-21	2018-10-20
Temp&Humi Programmable	OUIJENUO	ONJ-9606-150	BSTTIC-279	2018-05-28	2019-05-27

## 2. SUMMARY OF TEST RESULTS

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Peak-to-Average Ratio	Part 2.1046 Part 24.232 (d)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

### **3. RF EXPOSURE**

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#### **3.1 Standard Applicable**

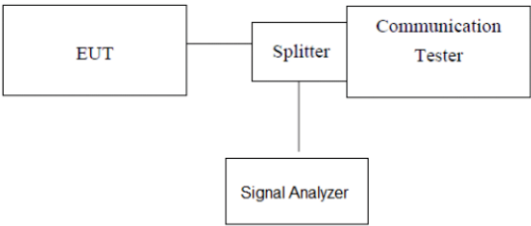
According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

#### **3.2 Test Result**

This product complied with the requirement of the RF exposure, please see the SAR report.



#### 4. CONDUCTED AV OUTPUT POWER

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W PCS1900, WCDMA Band II: 2W
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1. The transmitter output port was connected to base station.</li> <li>2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement.</li> <li>3. Set EUT at maximum power through base station.</li> <li>4. Select lowest, middle, and highest channels for each band and different modulation.</li> <li>5. Measure the maximum burst average power.</li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

## Measurement Data

GSM 850		Tune-up	Burst Conducted power (dBm)			Division Factors	Tune-up	Average power (dBm)		
			Channel/Frequency(MHz)					Channel/Frequency(MHz)		
		Max	128/824.2	190/836.6	251/848.8		Max	128/824.2	190/836.6	251/848.8
GSM		32.50	32.49	32.40	32.35	-9.03dB	23.47	23.46	23.37	23.32
GPRS (GMSK)	1TX slot	32.50	32.20	32.17	32.01	-9.03dB	23.97	23.17	23.14	22.98
	<b>2TX slot</b>	<b>31.50</b>	<b>31.22</b>	<b>30.99</b>	<b>31.12</b>	<b>-6.02dB</b>	<b>25.48</b>	<b>25.20</b>	<b>24.97</b>	<b>25.10</b>
	3TX slot	29.50	29.04	29.17	28.95	-4.26dB	25.24	24.78	24.91	24.69
	4TX slot	27.50	27.19	27.33	26.85	-3.01dB	24.49	24.18	24.32	23.84
GSM 1900		Tune-up	Burst Conducted power (dBm)			Division Factors	Tune-up	Average power (dBm)		
			Channel/Frequency(MHz)					Channel/Frequency(MHz)		
		Max	512/1850.2	661/1880	810/1909.8		Max.	512/1850.2	661/1880	810/1909.8
GSM		30.00	29.54	29.46	29.36	-9.03dB	20.97	20.51	20.43	20.33
GPRS (GMSK)	1TX slot	29.50	29.05	28.84	29.20	-9.03dB	20.97	20.02	19.81	20.17
	2TX slot	27.50	27.22	27.16	27.03	-6.02dB	21.48	21.20	21.14	21.01
	3TX slot	26.50	26.20	26.04	26.16	-4.26dB	22.24	21.94	21.78	21.90
	<b>4TX slot</b>	<b>25.50</b>	<b>25.05</b>	<b>25.18</b>	<b>25.26</b>	<b>-3.01dB</b>	<b>22.49</b>	<b>22.04</b>	<b>22.17</b>	<b>22.25</b>

**Notes:**

## 1. Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.00dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.00dB

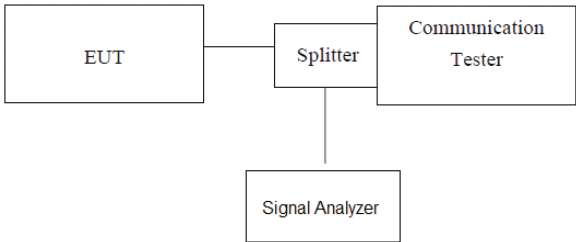
3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.00dB

2. According to the conducted power as above, the GPRS measurements are performed with 2Txslot for GPRS850 and 4Txslot GPRS1900.

3. This EUT owns two SIM cards , we found the SIM 1 is the worst case ,so its result is recorded in this report.

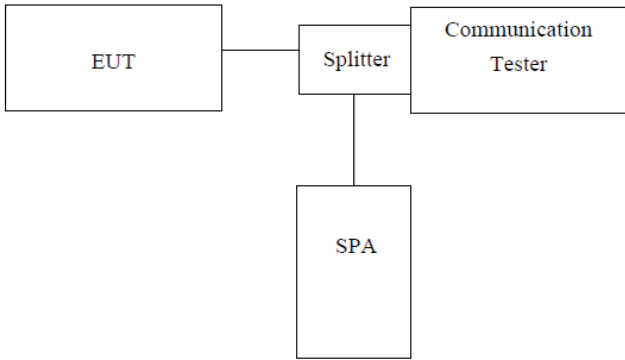
## 5. PEAK-TO-AVERAGE RATIO

Test Requirement:	FCC part24.232(d)
Test Method:	FCC part2.1046
Limit:	13db
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1. The transmitter output port was connected to base station.</li> <li>2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement.</li> <li>3. Set EUT at maximum power through base station.</li> <li>4. Select lowest, middle, and highest channels for each band and different modulation.</li> <li>5. Measure the maximum burst average power.</li> <li>6. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.</li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

### Measurement data

Test mode	Peak to Average Ratio (dB)			Limit (dB)	Result
	Low Ch.	Middle Ch.	High Ch.		
GSM1900	0.24	0.29	0.26	13	PASS
GPRS1900	0.21	0.25	0.19	13	PASS

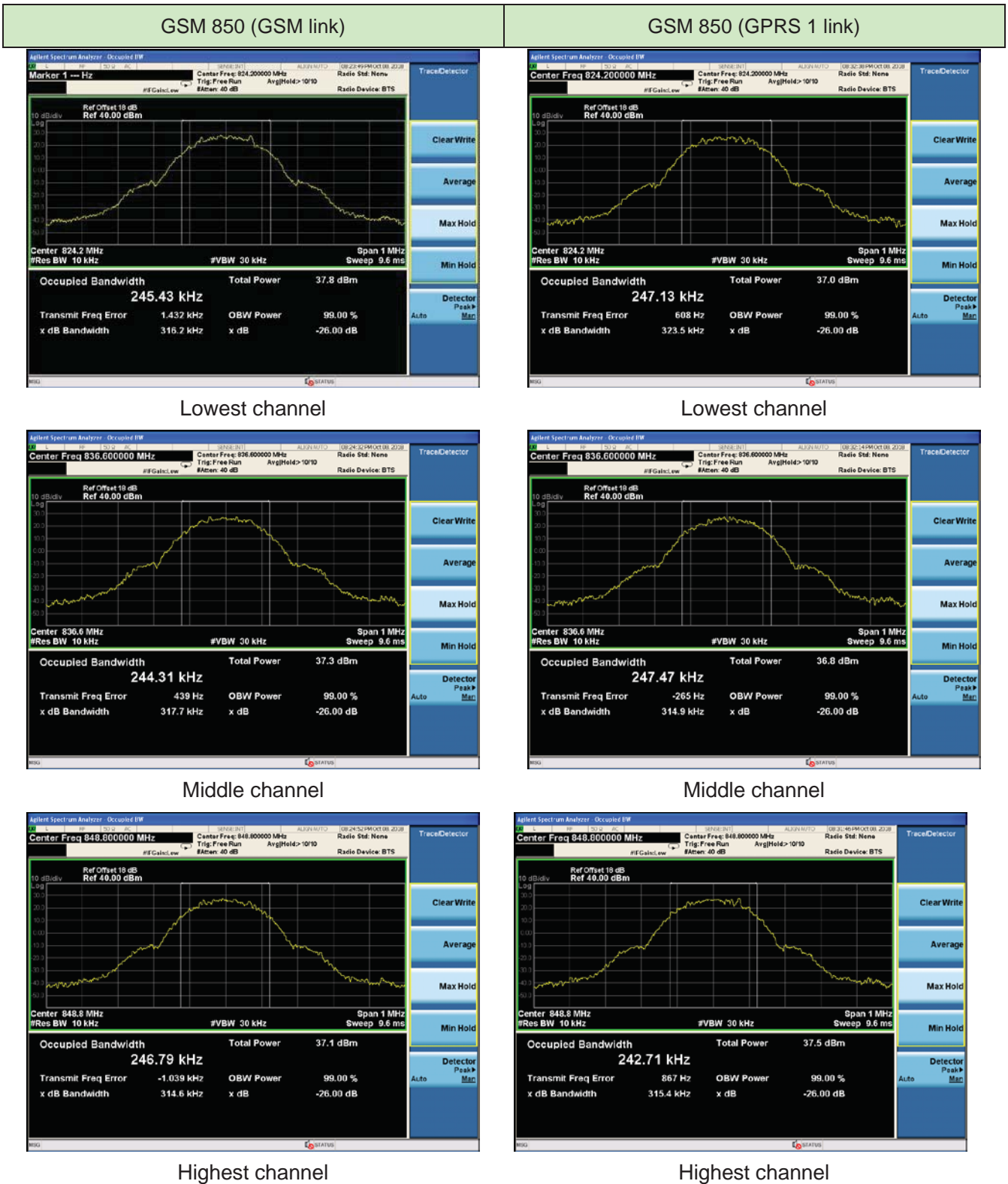
## 6. OCCUPY BANDWIDTH

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1049
Test setup:	 <pre> graph LR     EUT[EUT] --- Splitter[Splitter]     Splitter --- CT[Communication Tester]     Splitter --- SPA[SPA]   </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer</li> <li>2. RBW was set to about 1% of emission BW, VBW= 3 times RBW.</li> <li>3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.</li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

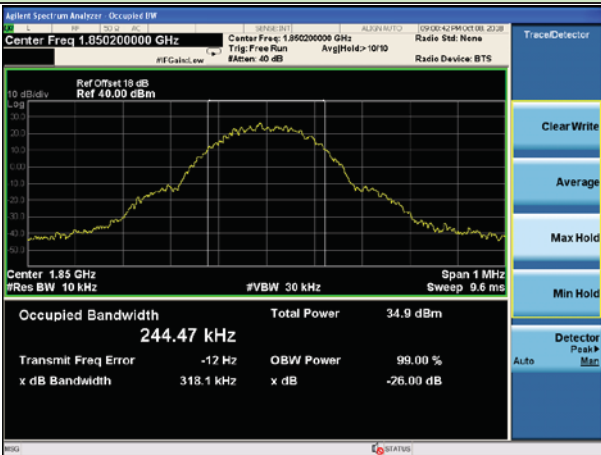
## Measurement Data

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GSM link)	128	824.20	245.43	316.2
	190	836.60	244.31	317.7
	251	848.80	246.79	314.6
GSM 850 (GPRS 1 link)	128	824.20	247.13	323.5
	190	836.60	247.47	314.9
	251	848.80	242.71	315.4
PCS 1900 (GSM link)	512	1850.20	244.47	318.1
	661	1880.00	245.35	320.7
	810	1909.80	244.42	316.1
PCS 1900 (GPRS 1 link)	512	1850.20	244.43	319.1
	661	1880.00	245.56	314.5
	810	1909.80	247.66	317.8

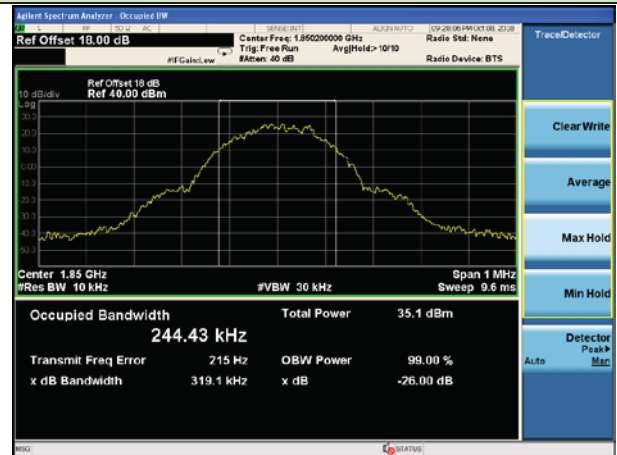
Test plot as follows:



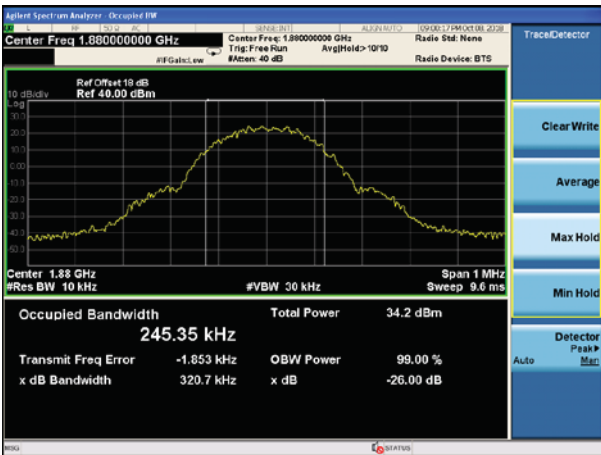
PCS 1900 (GSM link)	PCS 1900 (GPRS 1 link)
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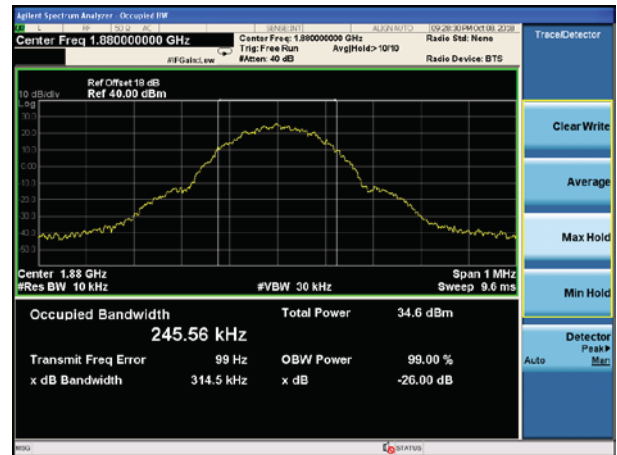
Lowest channel



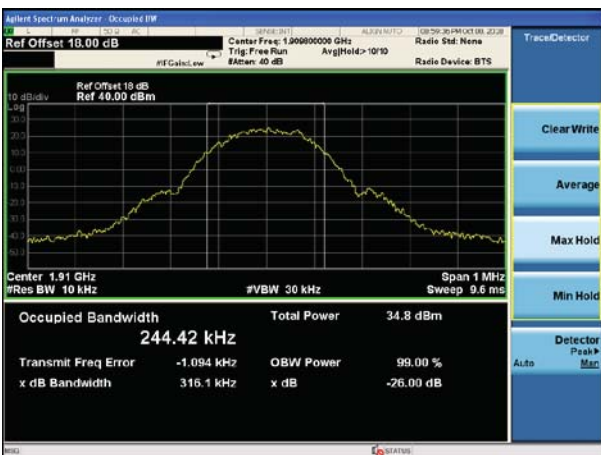
Lowest channel



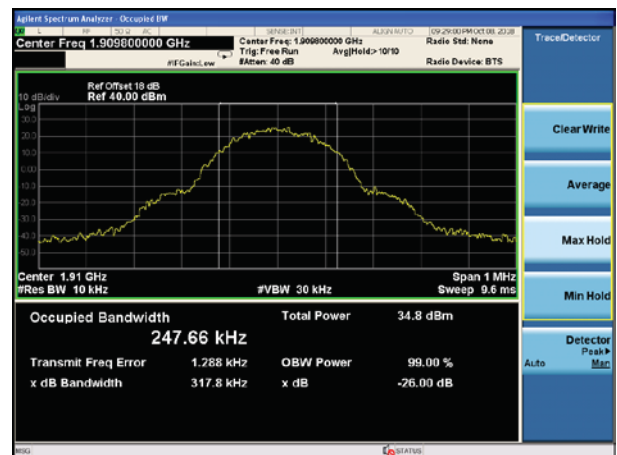
Middle channel



Middle channel



Highest channel

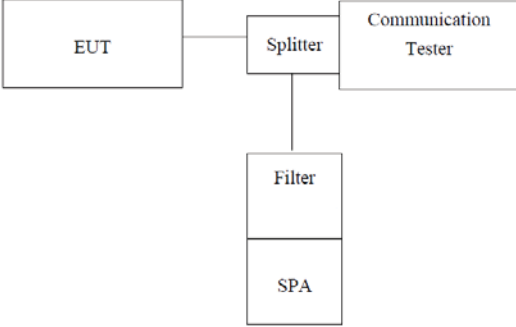


Highest channel

## 7. MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

## 8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

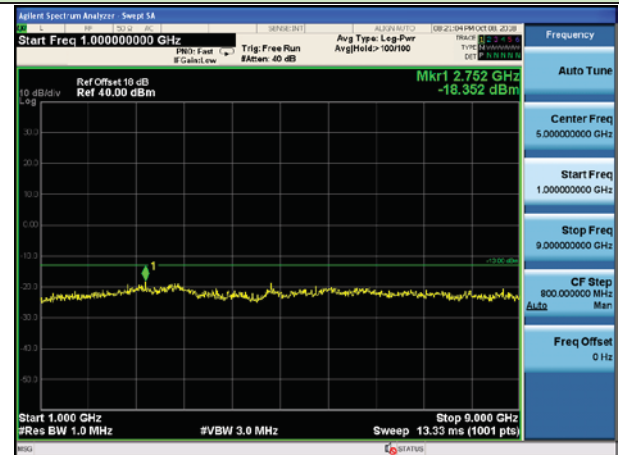
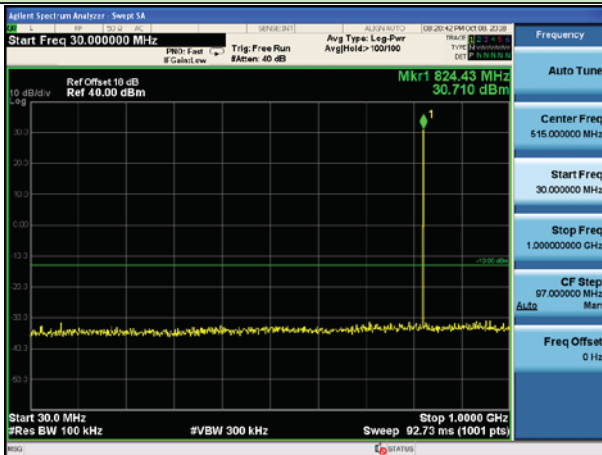
Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.</li> <li>3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic.</li> <li>4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.</li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

Test plot as follows:

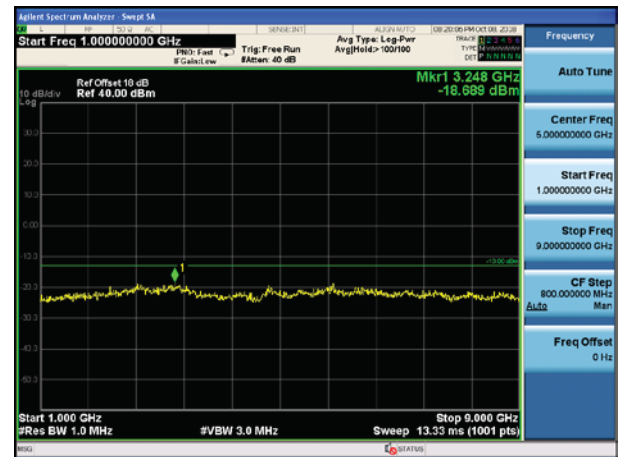
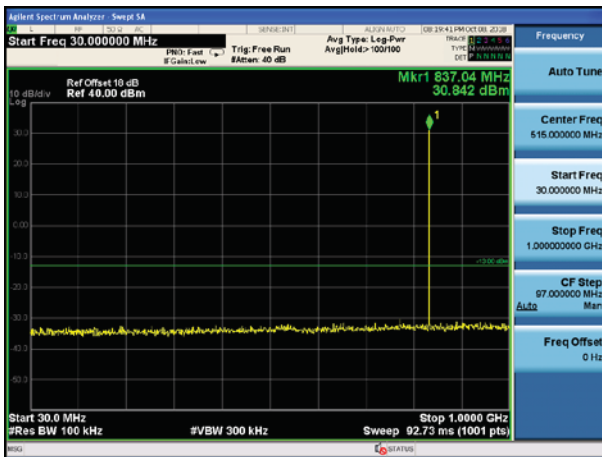
Note: During the conducted spurious emission test, a band filter was used. The information of the filter is reported at section 6.0 (refer to item 24, 25).



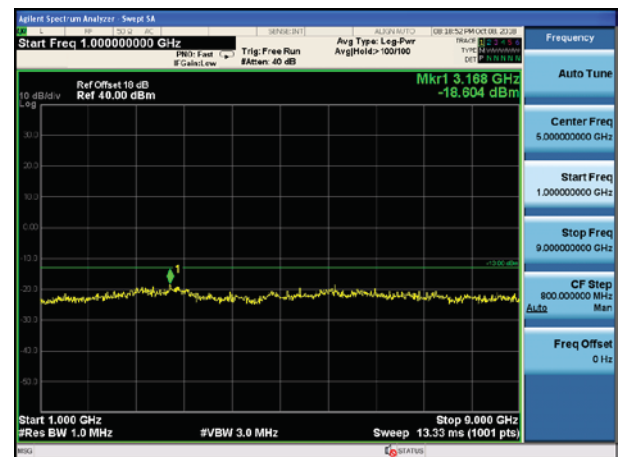
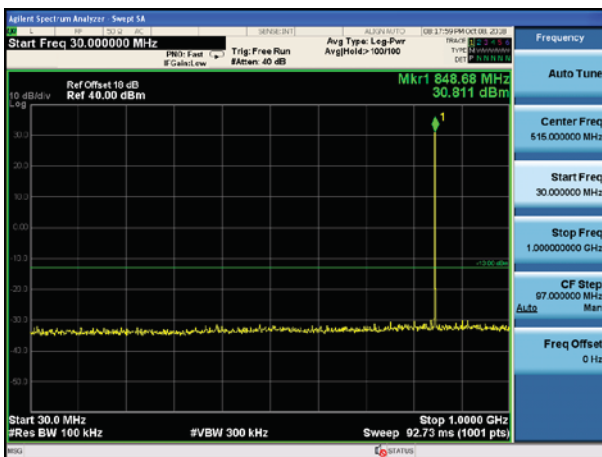
Test Mode: Traffic mode GSM 850 (GSM link)



Lowest channel

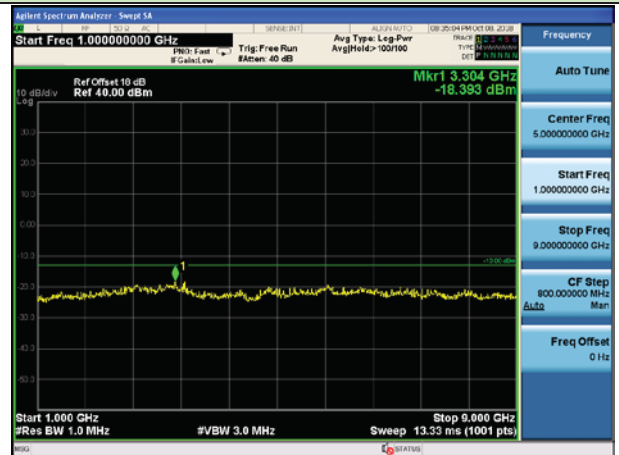
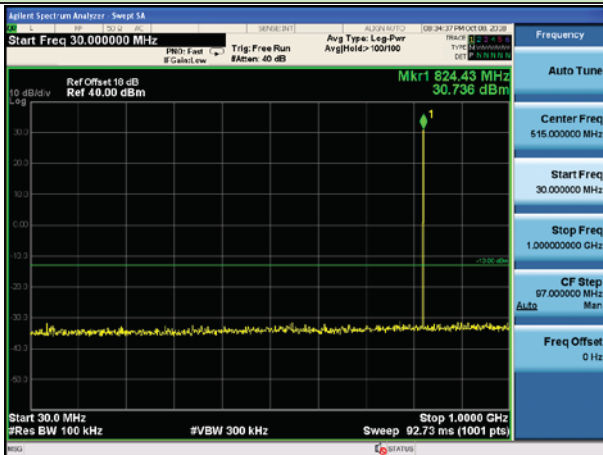


Middle channel

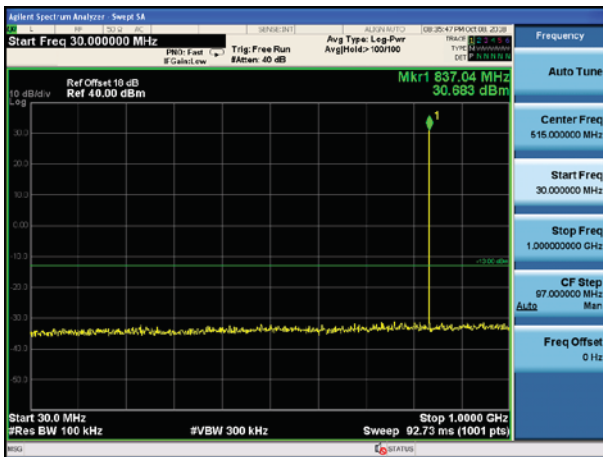


Highest channel

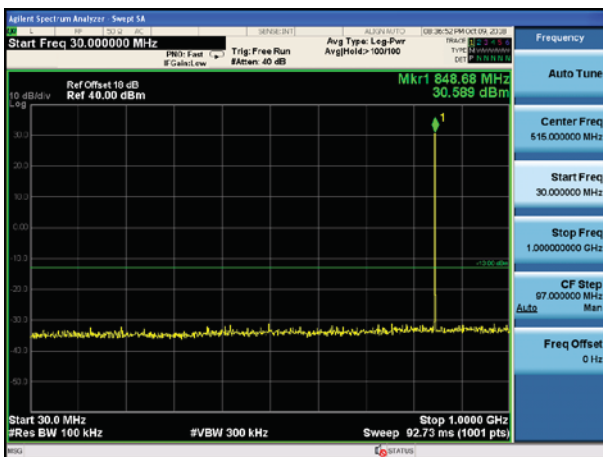
Test Mode: Traffic mode GSM 850 (GPRS 1 link)



Lowest channel

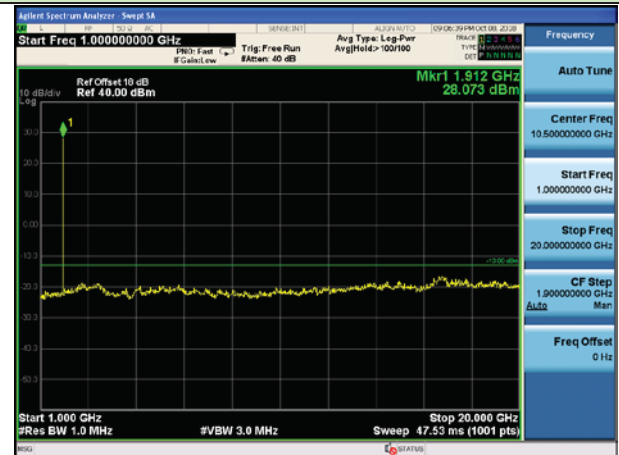
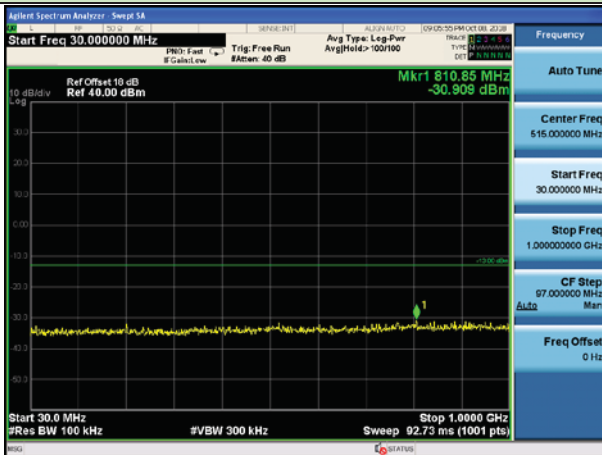


Middle channel

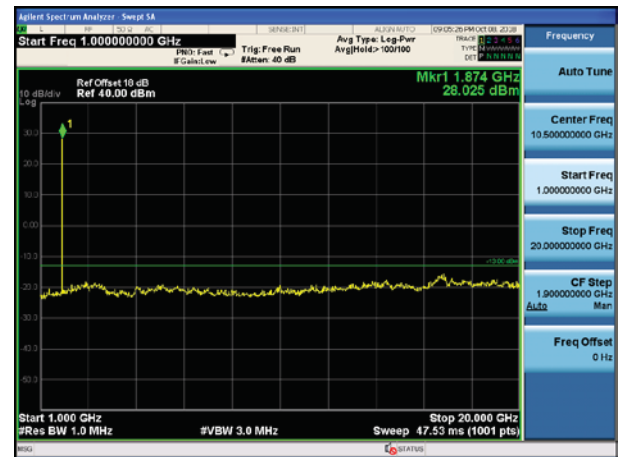
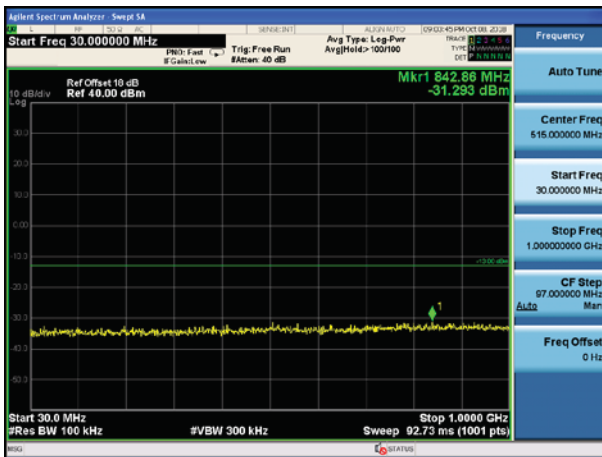


Highest channel

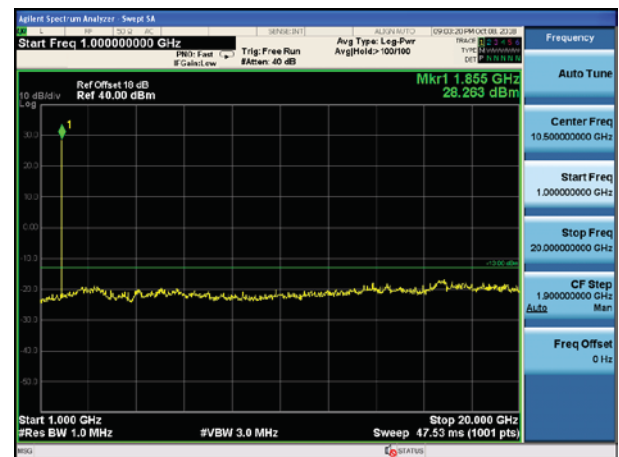
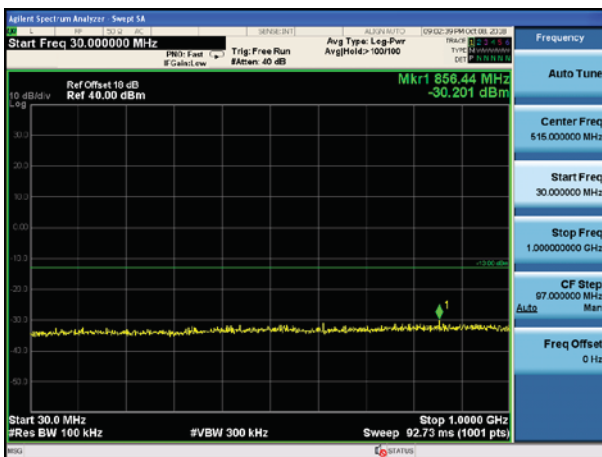
Test Mode: Traffic mode PCS1900 (GSM link)



Lowest channel

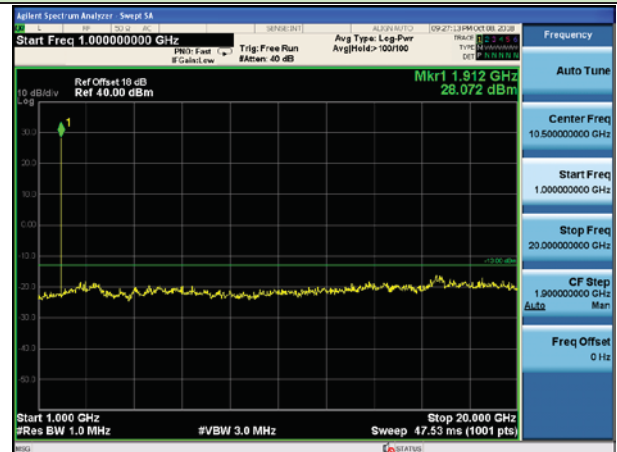
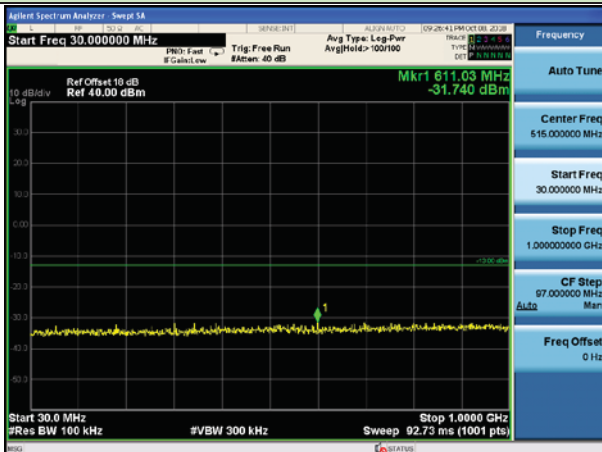


Middle channel

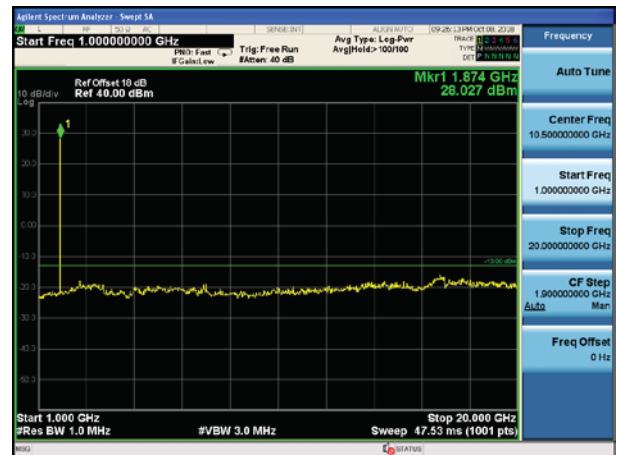
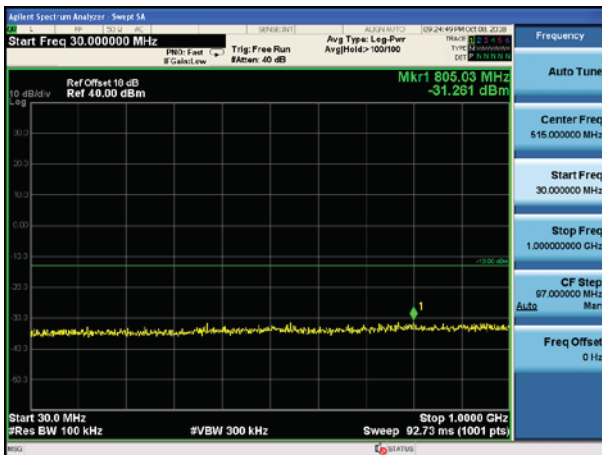


Highest channel

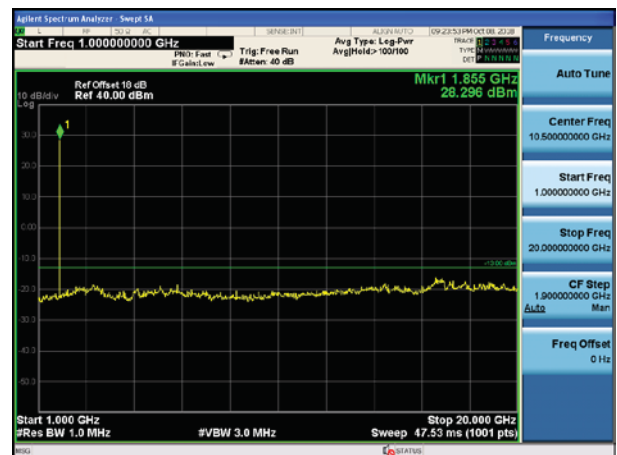
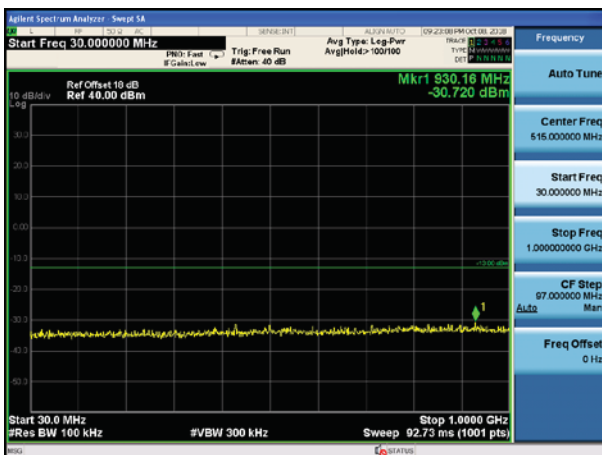
Test Mode: Traffic mode PCS1900 (GPRS 1 link)



Lowest channel



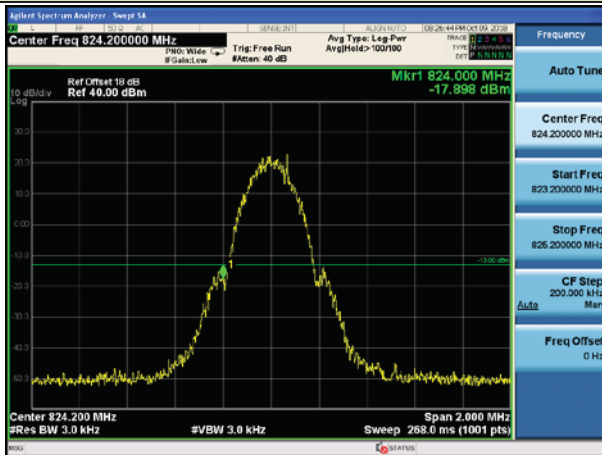
Middle channel



Highest channel

Band Edge:

Test Mode: Traffic mode GSM850 (GSM link)

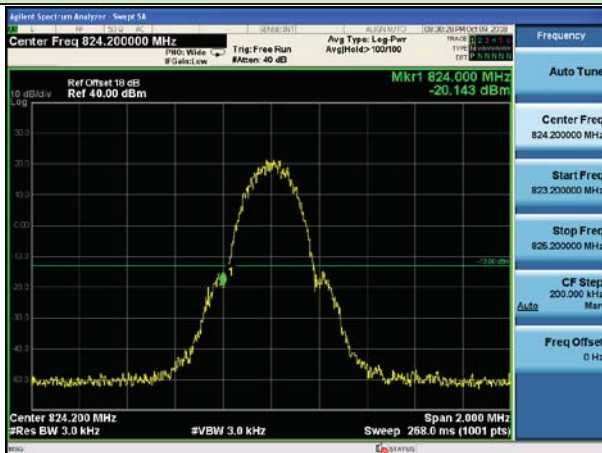


Lowest channel

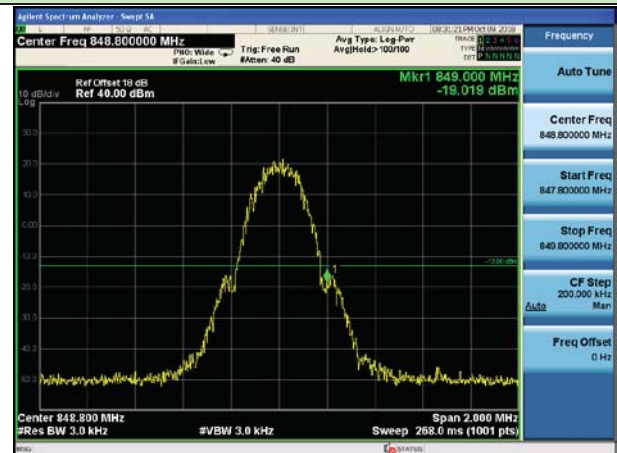


Highest channel

Test Mode: Traffic mode GSM850 (GPRS 1 link)

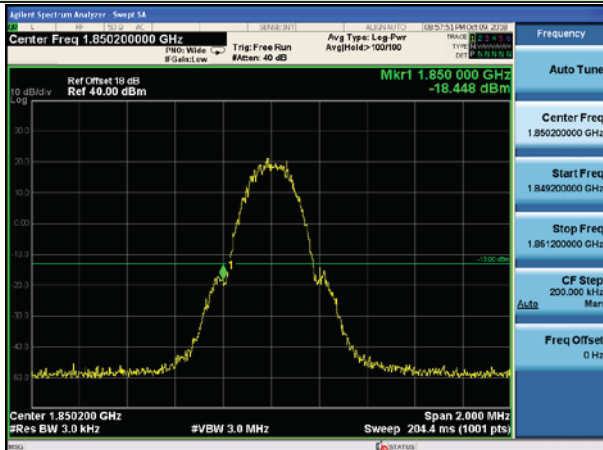


Lowest channel

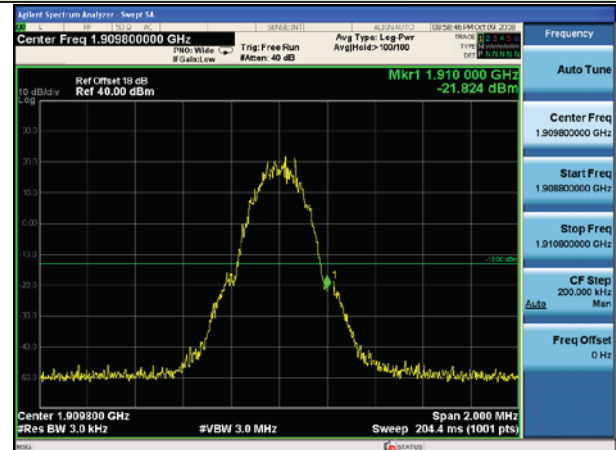


Highest channel

Test Mode: Traffic mode PCS1900 (GSM link)

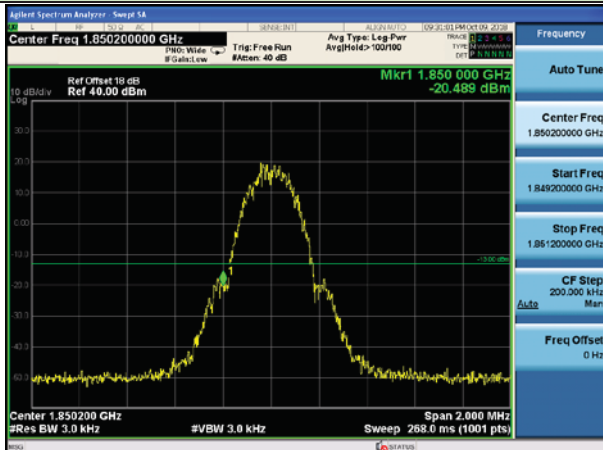


Lowest channel

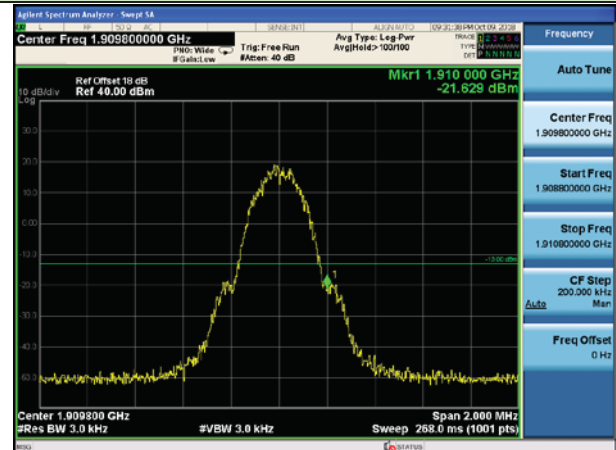


Highest channel

Test Mode: Traffic mode PCS1900 (GPRS 1 link)

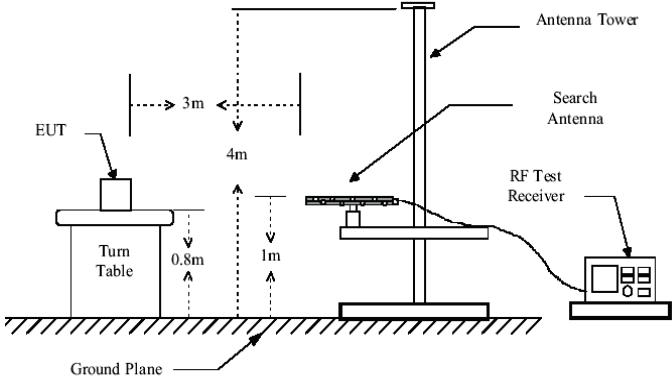
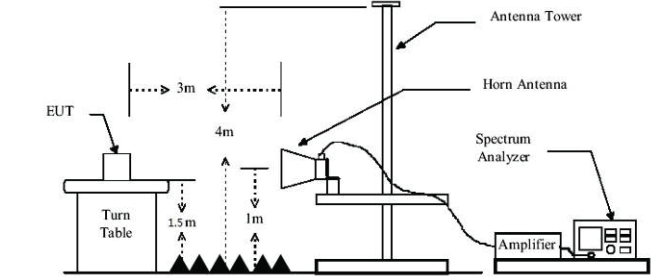
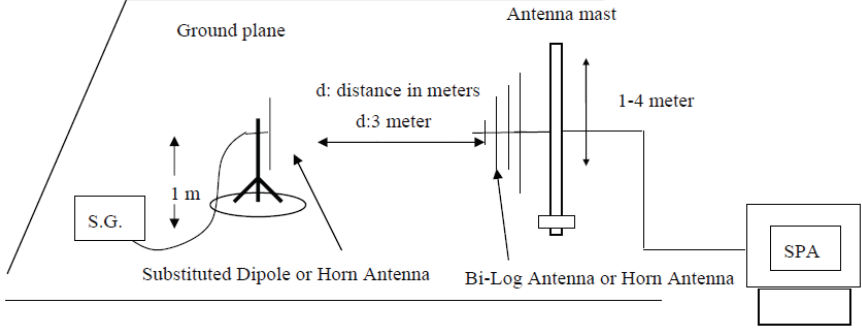


Lowest channel



Highest channel

## 9. ERP, EIRP MEASUREMENT

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W PCS1900, WCDMA Band II: 2W
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p> 

Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.</li> <li>3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows:  <math display="block">\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}</math> </li> <li>4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:  <math display="block">\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}</math> </li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

## Measurement Data



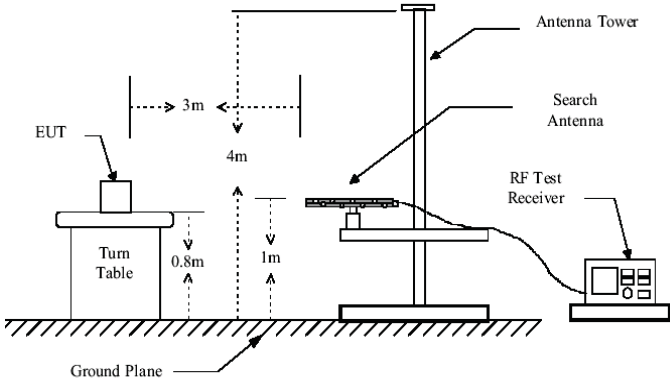
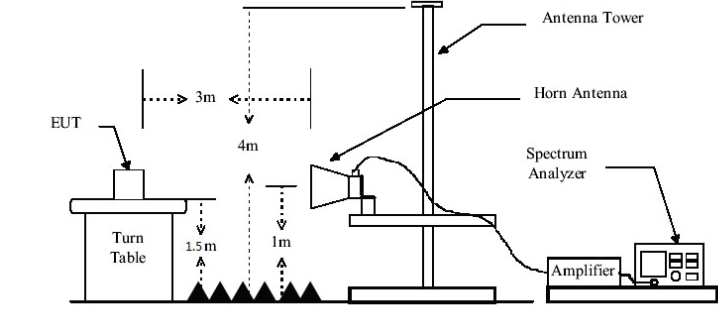
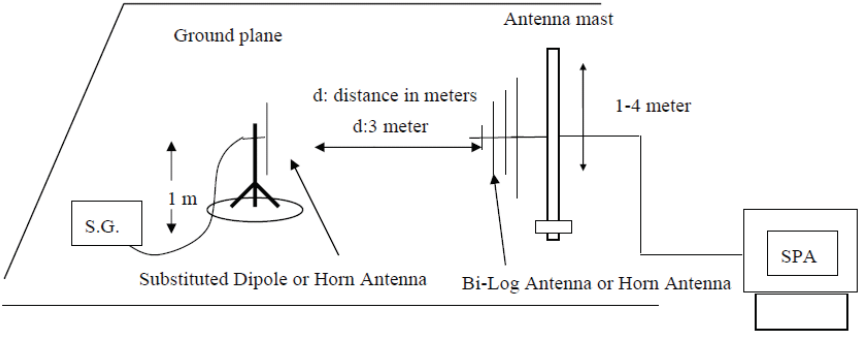
EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GSM link)	Lowest	H	V	26.72	38.45	Pass
			H	30.46		
		E1	V	26.34		
			H	29.76		
		E2	V	27.21		
			H	30.49		
	Middle	H	V	26.63	38.45	Pass
			H	30.87		
		E1	V	26.95		
			H	30.03		
		E2	V	26.22		
			H	29.71		
	Highest	H	V	26.46	38.45	Pass
			H	31.00		
		E1	V	27.51		
			H	31.21		
		E2	V	26.07		
			H	26.69		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GPRS 1 link)	Lowest	H	V	27.48	38.45	Pass
			H	31.08		
		E1	V	27.03		
			H	30.44		
		E2	V	27.24		
			H	31.58		
	Middle	H	V	27.89	38.45	Pass
			H	31.13		
		E1	V	27.08		
			H	29.96		
		E2	V	26.37		
			H	30.43		
	Highest	H	V	27.26	38.45	Pass
			H	31.61		
		E1	V	27.00		
			H	31.52		
		E2	V	27.19		
			H	30.24		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GSM link)	Lowest	H	V	24.18	33.01	Pass
			H	27.85		
		E1	V	24.30		
			H	26.81		
		E2	V	23.46		
			H	26.98		
	Middle	H	V	24.31	33.01	Pass
			H	27.42		
		E1	V	23.58		
			H	28.05		
		E2	V	24.17		
			H	26.90		
	Highest	H	V	24.99	33.01	Pass
			H	28.22		
		E1	V	23.95		
			H	27.46		
		E2	V	23.63		
			H	27.91		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GPRS 1 link)	Lowest	H	V	21.65	33.01	Pass
			H	24.76		
		E1	V	20.69		
			H	24.29		
		E2	V	23.13		
			H	26.16		
	Middle	H	V	23.36	33.01	Pass
			H	26.24		
		E1	V	22.72		
			H	24.91		
		E2	V	22.54		
			H	24.27		
	Highest	H	V	23.77	33.01	Pass
			H	27.25		
		E1	V	24.76		
			H	26.95		
		E2	V	22.82		
			H	25.56		

### 10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1053
Limit:	-13dBm
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p> 

Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.</li> <li>3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.</li> <li>4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.  <math display="block">\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}</math> </li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

## Measurement Data

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1648.40	Vertical	-35.53	-13.00	Pass
2472.60	V	-38.29		
3296.80	V	-39.65		
4121.00	V	-42.53		
4945.20	V	---		
1648.40	Horizontal	-40.34	-13.00	Pass
2472.60	H	-44.18		
3296.80	H	-46.02		
4121.00	H	-48.40		
4945.20	H	---		
Test mode:	GSM850		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-36.70	-13.00	Pass
2509.80	V	-39.08		
3346.40	V	-40.83		
4183.00	V	-42.60		
5019.60	V	---		
1673.20	Horizontal	-40.64	-13.00	Pass
2509.80	H	-44.05		
3346.40	H	-45.27		
4183.00	H	-47.62		
5019.60	H	---		
Test mode:	GSM850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.60	Vertical	-36.42	-13.00	Pass
2546.40	V	-38.33		
3395.20	V	-40.58		
4244.00	V	-41.76		
5092.80	V	---		
1697.60	Horizontal	-39.94	-13.00	Pass
2546.40	H	-43.17		
3395.20	H	-44.29		
4244.00	H	-46.47		
5092.80	H	---		

## Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

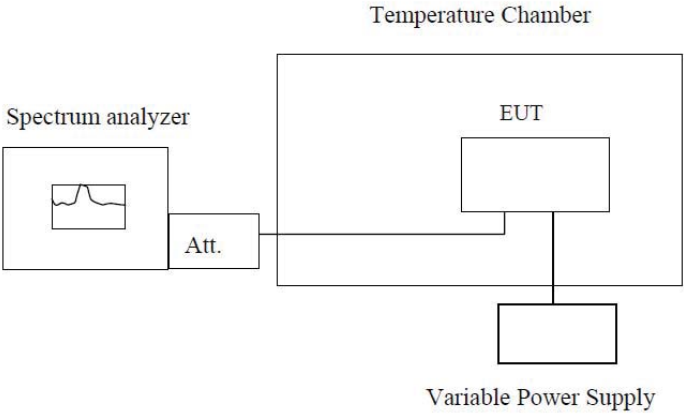
<b>Test mode:</b>	<b>PCS1900</b>		<b>Test channel:</b>	<b>Lowest</b>
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-34.87	-13.00	Pass
5550.60	V	-38.04		
7400.80	V	-39.64		
9251.00	V	-41.98		
11101.20	V	---		
3700.40	Horizontal	-39.63	-13.00	Pass
5550.60	H	-43.72		
7400.80	H	-44.31		
9251.00	H	-46.65		
11101.20	H	---		
<b>Test mode:</b>	<b>PCS1900</b>		<b>Test channel:</b>	<b>Middle</b>
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-33.27	-13.00	Pass
5640.00	V	-35.23		
7520.00	V	-37.70		
9400.00	V	-39.22		
11280.00	V	---		
3760.00	Horizontal	-37.74	-13.00	Pass
5640.00	H	-41.05		
7520.00	H	-42.83		
9400.00	H	-44.69		
11280.00	H	---		
<b>Test mode:</b>	<b>PCS1900</b>		<b>Test channel:</b>	<b>Highest</b>
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-33.66	-13.00	Pass
5729.40	V	-36.16		
7639.20	V	-38.21		
9549.00	V	-39.99		
11458.80	V	---		
3819.60	Horizontal	-39.21	-13.00	Pass
5729.40	H	-42.22		
7639.20	H	-43.67		
9549.00	H	-45.71		
11458.80	H	---		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.



## 11. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

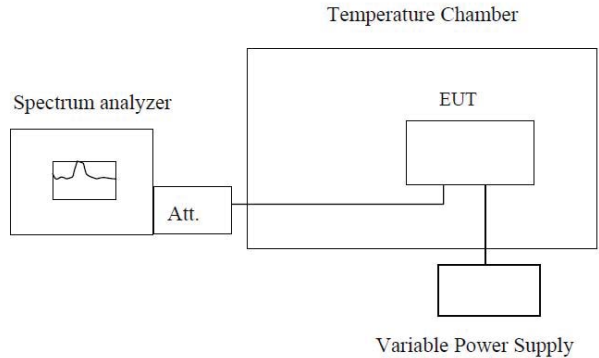
Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	2.5ppm
Test setup:	 <p><b>Note :</b> Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> <li>1. The equipment under test was connected to an external DC power supply and input rated voltage.</li> <li>2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.</li> <li>3. The EUT was placed inside the temperature chamber.</li> <li>4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.</li> <li>5. Turn EUT off and set the chamber temperature to –20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.</li> <li>6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.</li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

Measurement Data

<b>Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz</b>					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	47	0.0562	2.5	Pass
	-20	55	0.0657		
	-10	38	0.0454		
	0	46	0.0550		
	10	34	0.0406		
	20	31	0.0371		
	30	32	0.0383		
	40	53	0.0634		
	50	49	0.0586		
<b>Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz</b>					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	44	0.0526	2.5	Pass
	-20	56	0.0669		
	-10	58	0.0693		
	0	61	0.0729		
	10	28	0.0335		
	20	33	0.0394		
	30	21	0.0251		
	40	32	0.0383		
	50	40	0.0478		

<b>Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz</b>					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	46	0.0245	2.5	Pass
	-20	48	0.0255		
	-10	43	0.0229		
	0	31	0.0165		
	10	35	0.0186		
	20	35	0.0186		
	30	31	0.0165		
	40	42	0.0223		
	50	45	0.0239		
<b>Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz</b>					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	55	0.0293	2.5	Pass
	-20	43	0.0229		
	-10	39	0.0207		
	0	31	0.0165		
	10	29	0.0154		
	20	39	0.0207		
	30	45	0.0239		
	40	43	0.0229		
	50	41	0.0218		

## 12. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

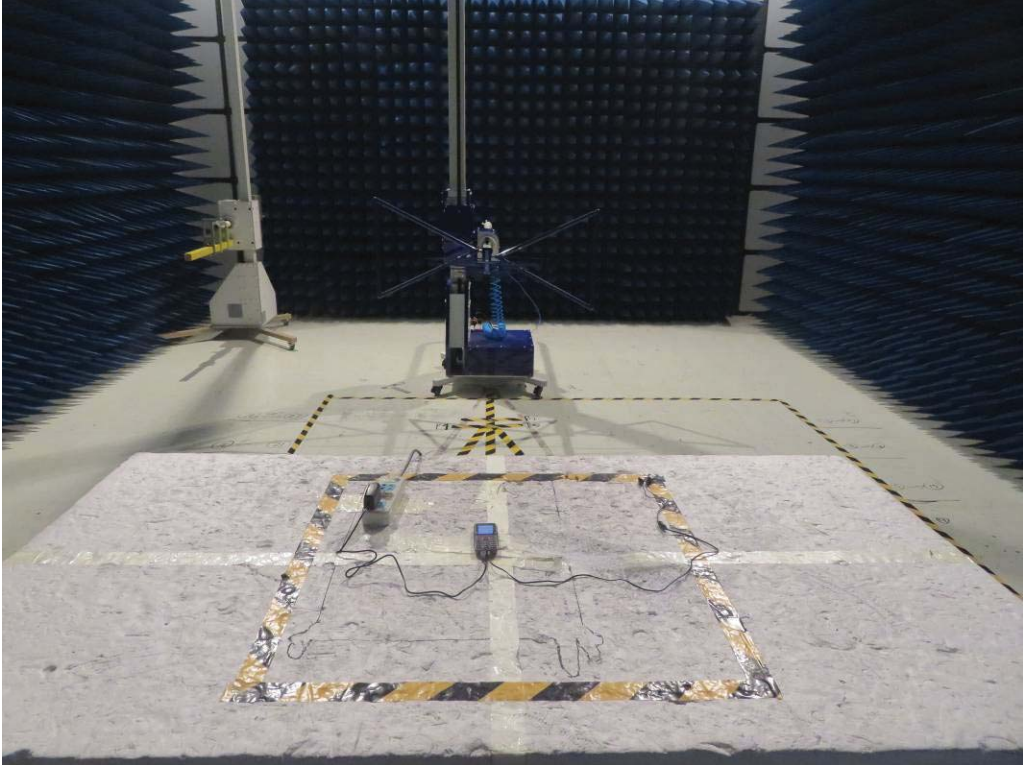
Test Requirement:	FCC Part2.1055(d)(1)(2)
Test Method:	FCC Part2.1055(d)(1)(2)
Limit:	2.5ppm
Test setup:	 <p style="text-align: center;">Temperature Chamber</p> <p style="text-align: center;">Spectrum analyzer</p> <p style="text-align: center;">Att.</p> <p style="text-align: center;">EUT</p> <p style="text-align: center;">Variable Power Supply</p> <p><b>Note :</b> Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> <li>1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage.</li> <li>2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.</li> <li>3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.</li> </ol>
Test Instruments:	Refer to section 1.7 for details
Test mode:	Refer to section 1.2 for details
Test results:	Pass

## Measurement Data

Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	52	0.0277	2.5	Pass
	3.7	59	0.0705		
	3.4	65	0.0777		
Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	45	0.0239	2.5	Pass
	3.7	39	0.0466		
	3.4	44	0.0526		
Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	53	0.0282	2.5	Pass
	3.7	50	0.0266		
	3.4	49	0.0261		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	49	0.0261	2.5	Pass
	3.7	43	0.0229		
	3.4	56	0.0298		

**13. TEST SETUP PHOTO**

Radiated Emission



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## 14. EUT CONSTRUCTIONAL DETAILS

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External Photographs:

Model No.: F18m

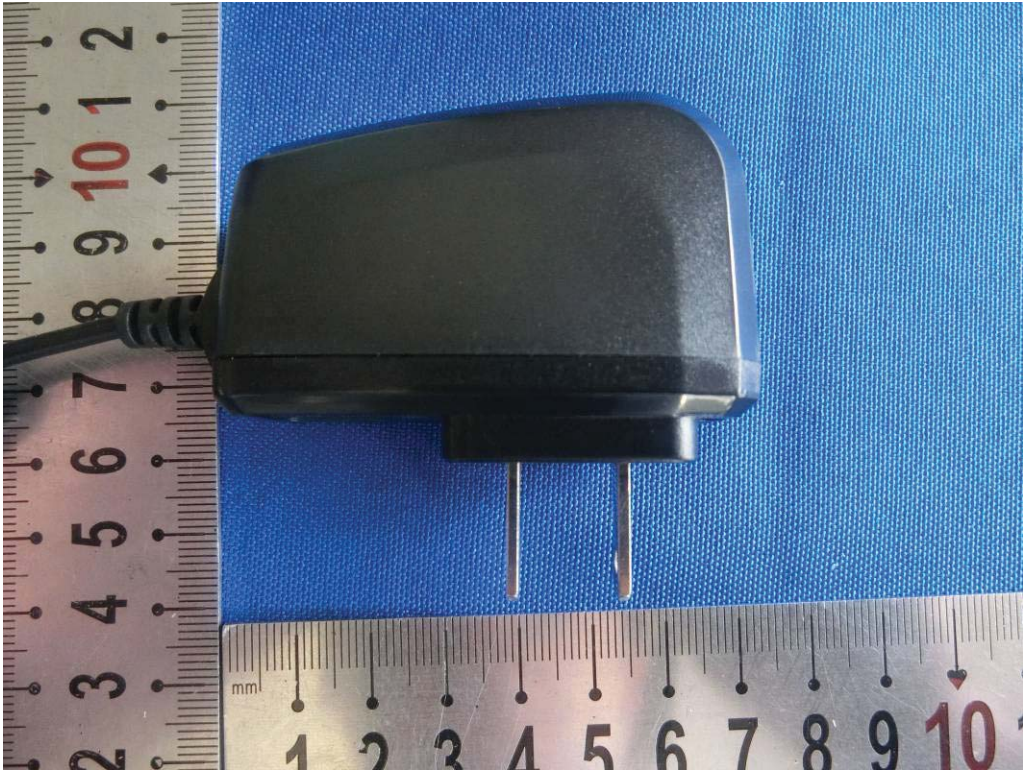












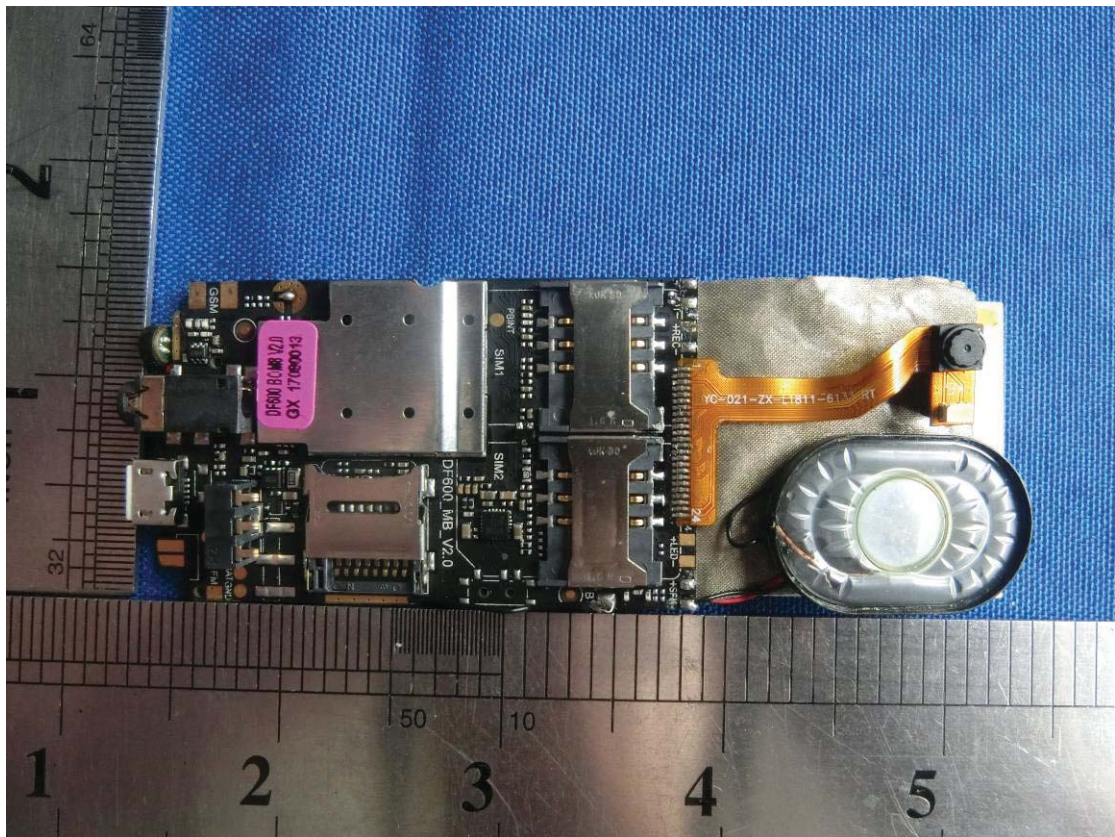
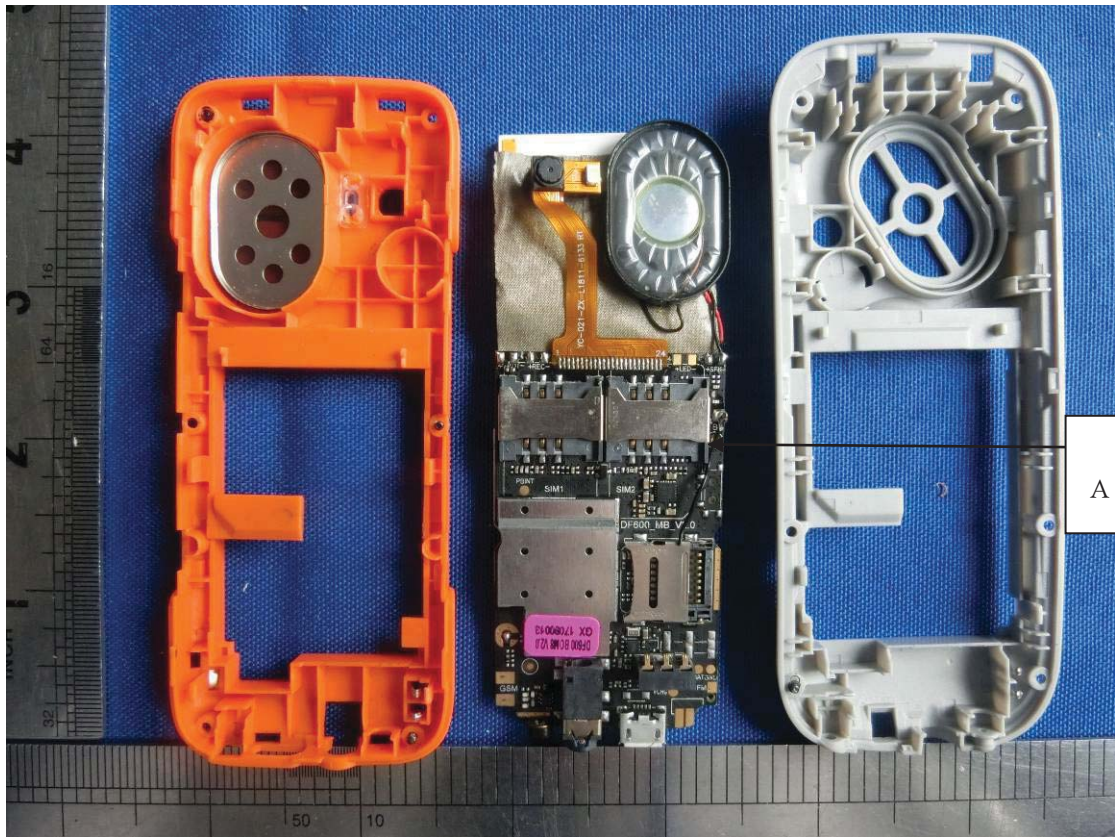


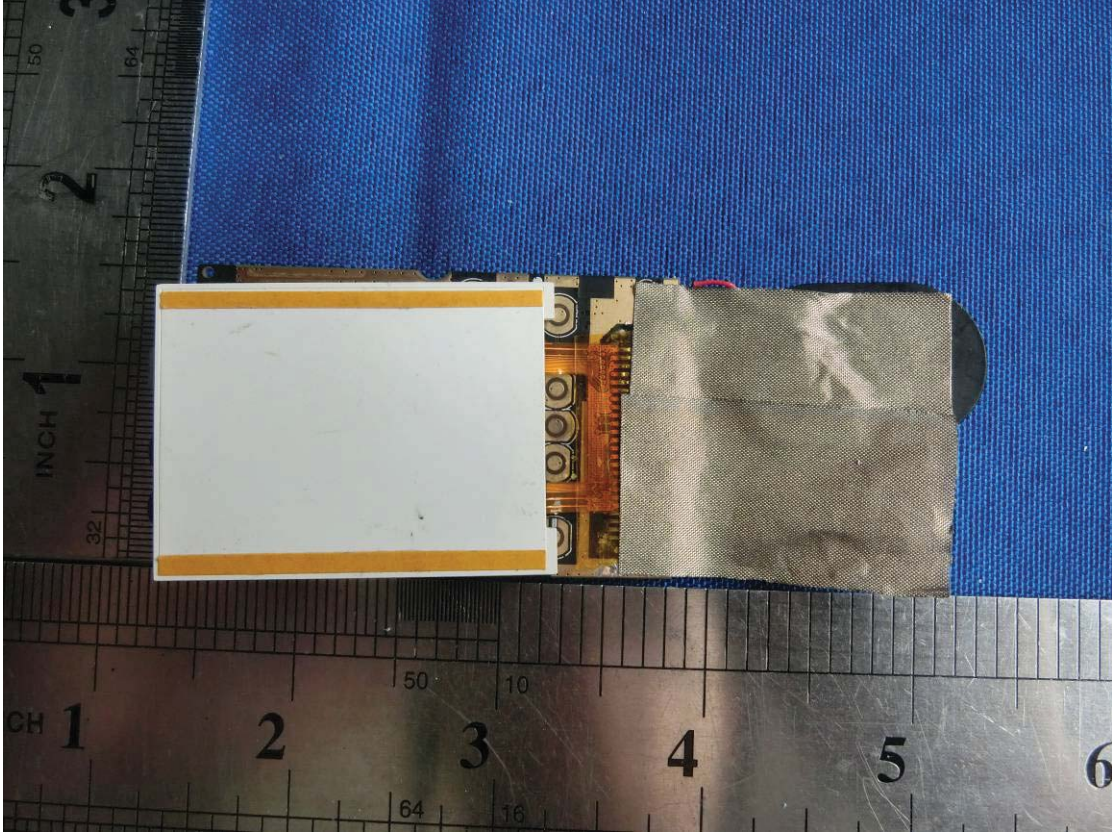
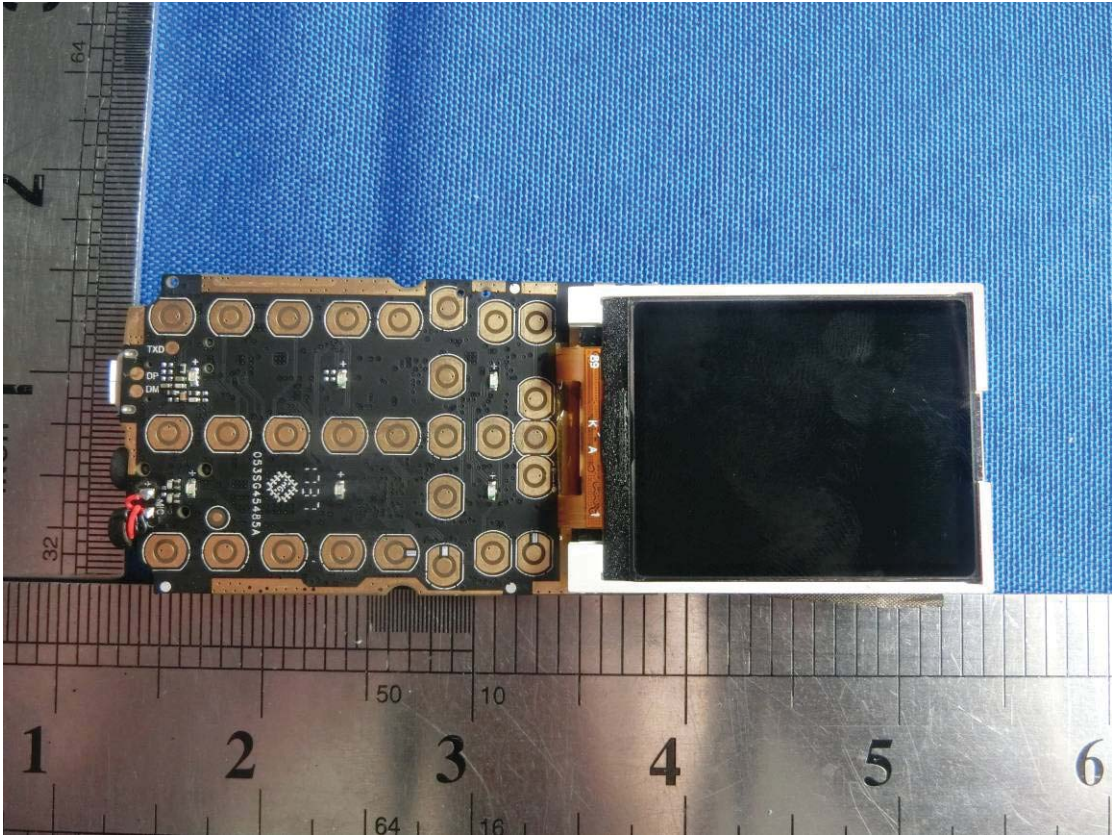
Internal Photographs

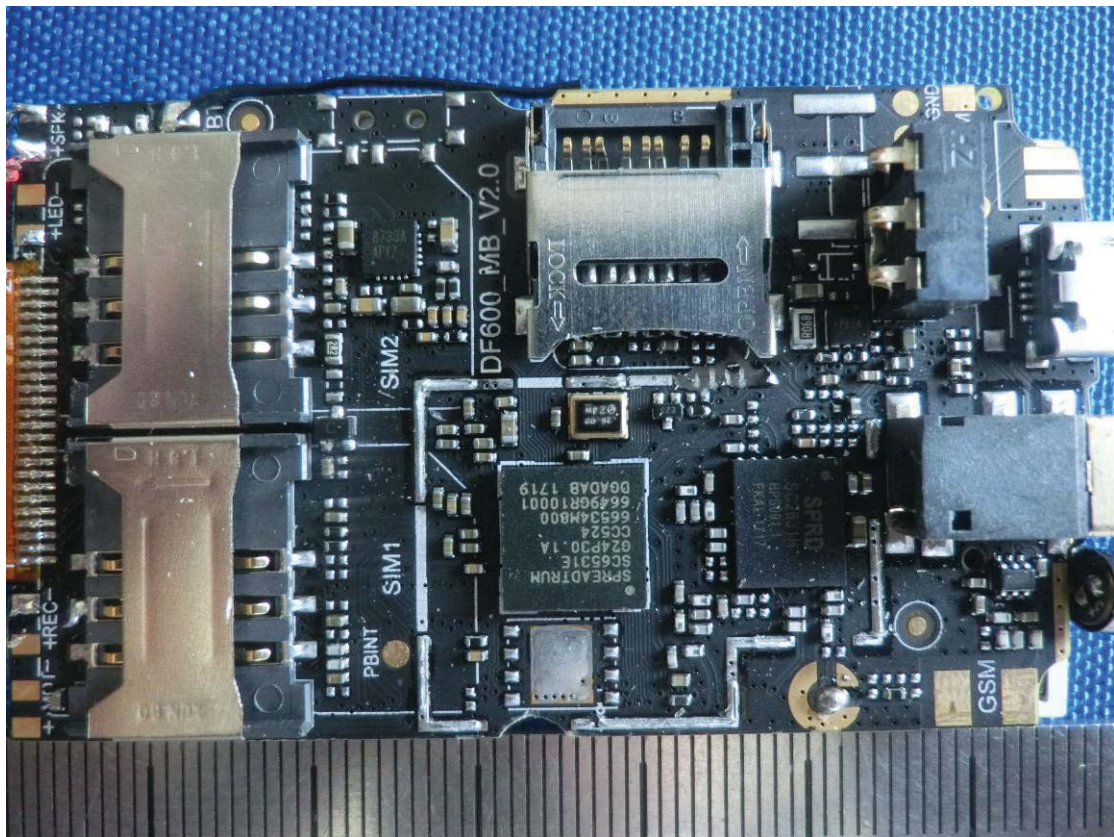
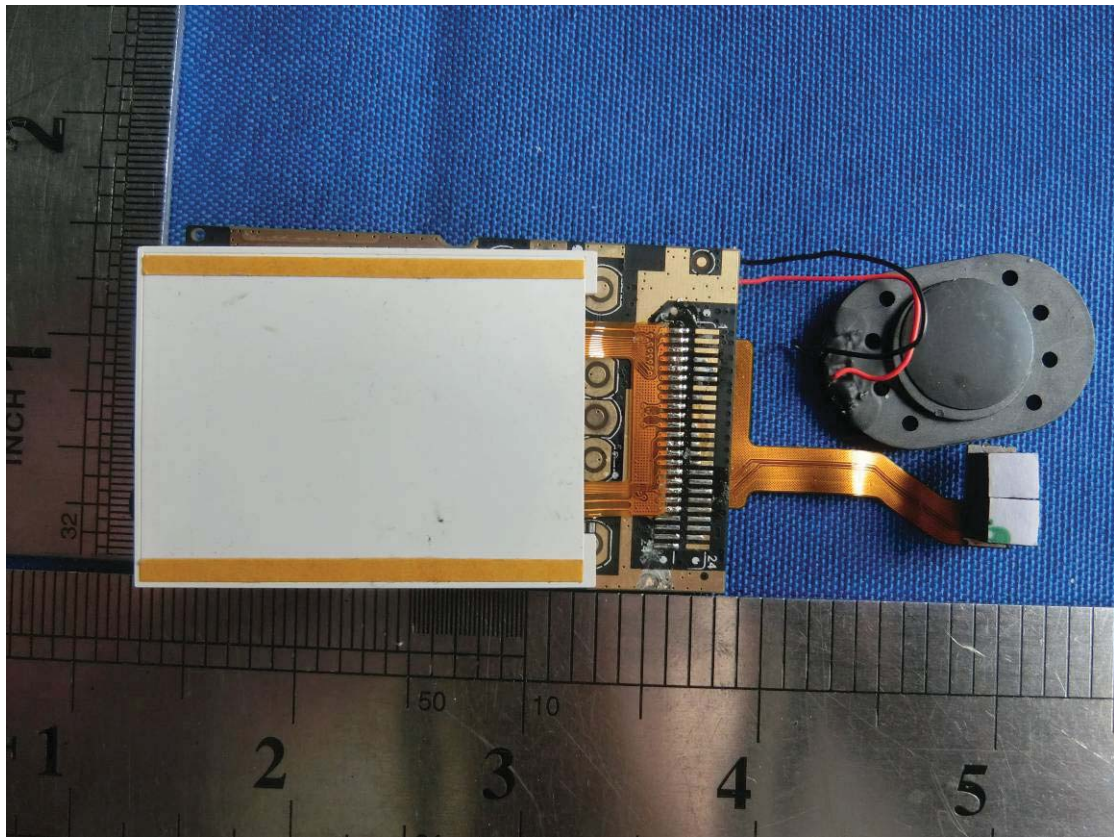
Test model internal photographs: F18m



GSM ANT









-----End-----