FCC RF TEST REPORT

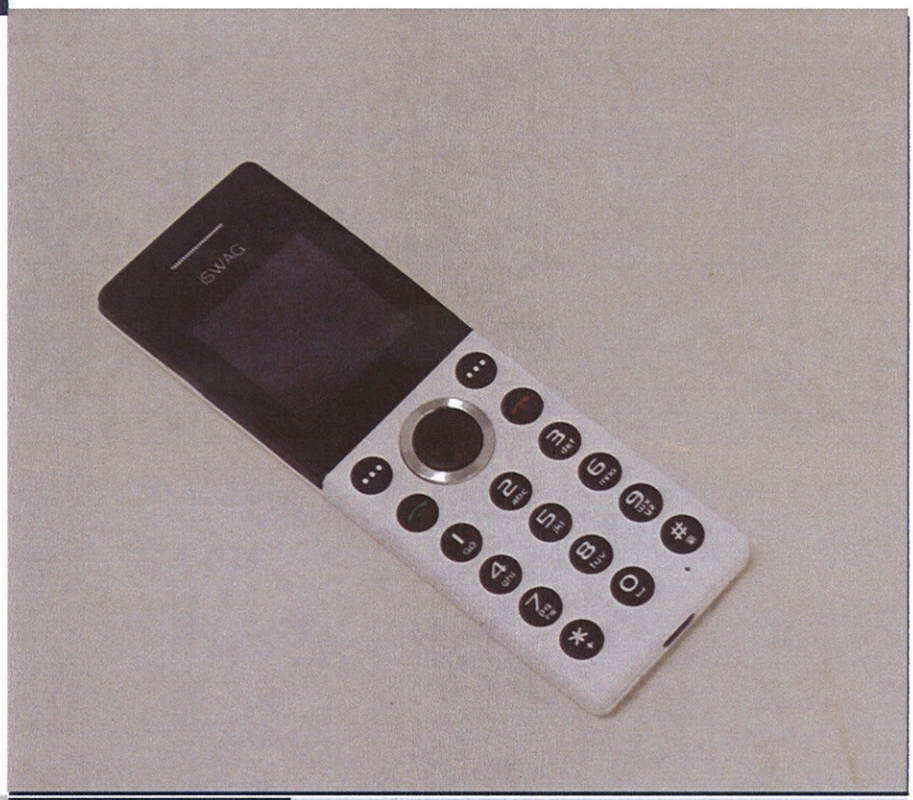
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

bluetooth partner

ISSUED TO
SHENZHEN FISE TECHNOLOGY HOLDING CO., LTD.

No.6 Building, Longfu Industrial Area, Huarong Road, Dalang Street, Longhua, Shenzhen, Guangdong, China



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(Reporting Specialist)
Date: May 7, 2015

Approved by:
Wei Yanquan
(Chief Engineer)
Date: May 7, 2015

Report No.:	BL-SZ1540092-602
EUT Type:	bluetooth partner
Model Name:	B1501
Brand Name:	N/A
Test Standard:	47 CFR Part 2
	47 CFR Part 22 Subpart H
	47 CFR Part 24 Subpart E
FCC ID:	2AE8V-B1501
Test conclusion:	Pass
Test Date:	Apr. 16, 2015 ~ Apr. 29, 2015
Date of Issue:	May. 7, 2015

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Revision History

Version	Issue Date	Revisions
Rev. 01	May. 7, 2015	Initial Issue

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6683 3402
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory has met the requirements of the IAS Accreditation Criteria for Testing Laboratories (AC89), has demonstrated compliance with ISO/IEC Standard 17025:2005. The accreditation certificate number is TL-588. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Announce

(1) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(2) The test report is invalid if there is any evidence and/or falsification.

(3) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(4) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant

Applicant	SHENZHEN FISE TECHNOLOGY HOLDING CO., LTD.
Address	No.6 Building, Longfu Industrial Area, Huarong Road, Dalang Street, Longhua, Shenzhen, Guangdong, China

2.2 Manufacturer

Manufacturer	SHENZHEN FISE TECHNOLOGY HOLDING CO., LTD.
Address	No.6 Building, Longfu Industrial Area, Huarong Road, Dalang Street, Longhua, Shenzhen, Guangdong, China

2.3 General Description for Equipment under Test (EUT)

EUT Type	bluetooth partner
Model Name	B1501
Hardware Version	6020_MB_V1.0
Software Version	N/A
Network and Wireless connectivity	2G Network GSM 850/1900 MHz Bluetooth 2.1 + EDR
About the Product	The equipment is smart phone, intended for used with information technology equipment, Only GSM modes was tested in this report.

2.4 Technical Information

Frequency Bands	GSM 850/1900 MHz
Modulation Type	GSM: GMSK
Tx Frequency Range	GSM 850: 824.20 - 848.80 MHz (at intervals of 200 kHz); GSM 1900: 1850.20 - 1909.80 MHz (at intervals of 200 kHz);
Rx Frequency Range	GSM 850: 869.20 - 893.80 MHz (at intervals of 200 kHz) GSM 1900: 1930.20 - 1989.80 MHz (at intervals of 200 kHz)
Power Class	GSM 850: 4 GSM 1900: 1
Antenna Type	PIFA Antenna
Antenna Gain	GSM 850: 0.9 dBi, GSM1900: 1.0 dBi

Note: The above EUT information in section 2.3 and 2.4 was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	Tanksun
	Model No	B1501
	Serial No	N/A
	Capacitance	330 mAh
	Rated Voltage	3.8 V
	Extreme Voltage	Low: 3.3 V / High: 4.2 V
Ancillary Equipment 2	Charger	
	Brand Name	N/A
	Model No	N/A
	Serial No	N/A
	Rated Input	~ 100-240 V, 0.15 A, 50/60 Hz
	Rated Output	⎓ 5 V, 1000 mA
Ancillary Equipment 3	Earphone	
	Length	1.0 m
Ancillary Equipment 4	USB Data Cable	
	Length	1.0 m

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2 (10–1–14 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10–1–14 Edition)	Public Mobile Services
3	47 CFR Part 24 (10–1–14 Edition)	Personal Communications Services
4	TIA/EIA 603.D-2010	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

3.2 Verdict

No.	Description	FCC Part No.	Test Result	Verdict
1	Conducted RF Output Power	2.1046	ANNEX A.1	Pass
2	Peak to average radio	2.1046 24.232	N/A	Note
3	Occupied Bandwidth	2.1049	ANNEX A.2	Pass
4	Frequency Stability	2.1055 22.355 24.235	ANNEX A.3	Pass
5	Conducted Out of Band Emissions	2.1051 2.1057 22.917 24.238	ANNEX A.4	Pass
6	Band Edge	2.1051 2.1057 22.917 24.238	ANNEX A.5	Pass
7	Transmitter Radiated Power (EIPR/ERP)	22.913 24.232	ANNEX A.6	Pass
8	Radiated Out of Band Emissions	2.1053 2.1057 22.917 24.238	ANNEX A.7	Pass
Note: The power was used peak power to demonstrate compliance, Peak to average radio measurement is not required.				

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

Relative Humidity	45% - 55%	
Atmospheric Pressure	100 kPa - 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	3.7 V

4.2 Test Equipment List

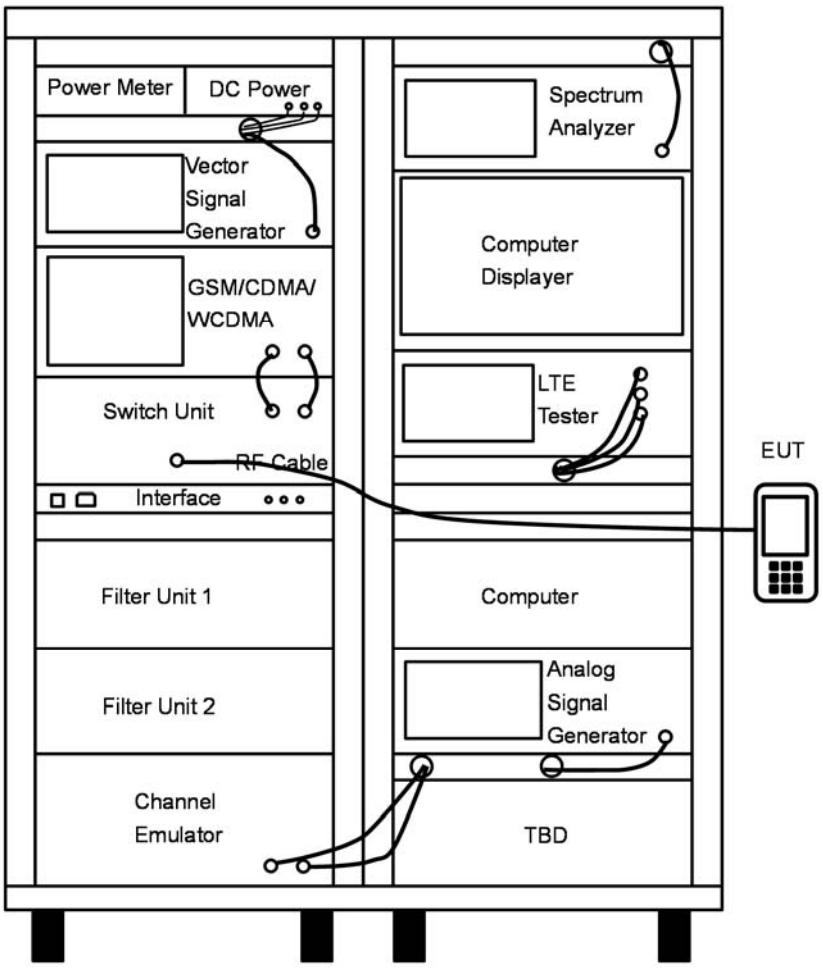
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2014.07.10	2015.07.09
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	177746	2014.07.09	2015.07.08
Signal Generator	ROHDE&SCHWARZ	SMB100A	260592	2014.07.21	2015.07.20
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2014.07.23	2015.07.22
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2014.10.18	2015.10.17
Universal Radio Communication Tester	ROHDE&SCHWARZ	CMU 200	123666	2014.10.18	2015.10.17
Wireless Communications Test Set	ROHDE&SCHWARZ	CMW 500	138884	2014.07.07	2015.07.06
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2014.07.07	2015.07.06
LISN	SCHWARZBECK	NSLK 8127	8127-687	2014.07.07	2015.07.06
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2014.07.07	2015.07.06
Power Splitter	KMW	DCPD-LDC	1305003215	2014.07.07	2015.07.06
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2014.07.07	2015.07.06
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2014.07.09	2015.07.08
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2014.07.07	2015.07.06
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2013.07.02	2015.07.01
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2013.07.03	2015.07.02
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2013.07.02	2015.07.01
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2013.07.02	2015.07.01
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2015.02.28	2016.02.27
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

4.3 Test Configurations

Test Configurations (TC) NO.	Description	
	Signal Description	Operating Frequency
Transmitter		
TC01	GMSK modulation, GSM 850	Ch No. 128/ 824.2 MHz
TC02	GMSK modulation, GSM 850	Ch No. 190/ 836.6 MHz
TC03	GMSK modulation, GSM 850	Ch No. 251/ 848.8 MHz
TC04	GMSK modulation, GSM 1900	Ch No. 512/ 1850.2 MHz
TC05	GMSK modulation, GSM 1900	Ch No. 661/ 1880.0 MHz
TC06	GMSK modulation, GSM 1900	Ch No. 810/ 1909.8 MHz

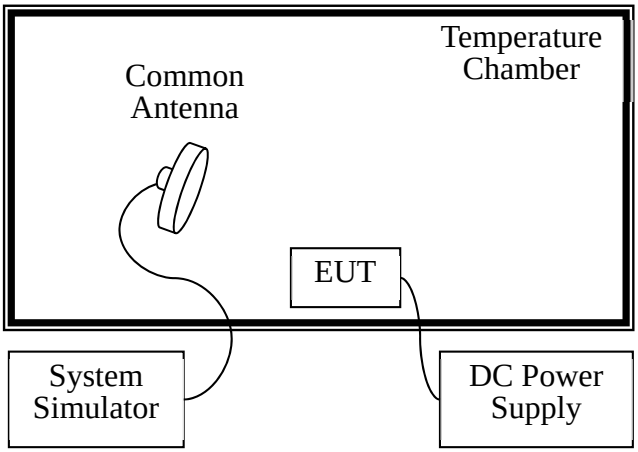
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



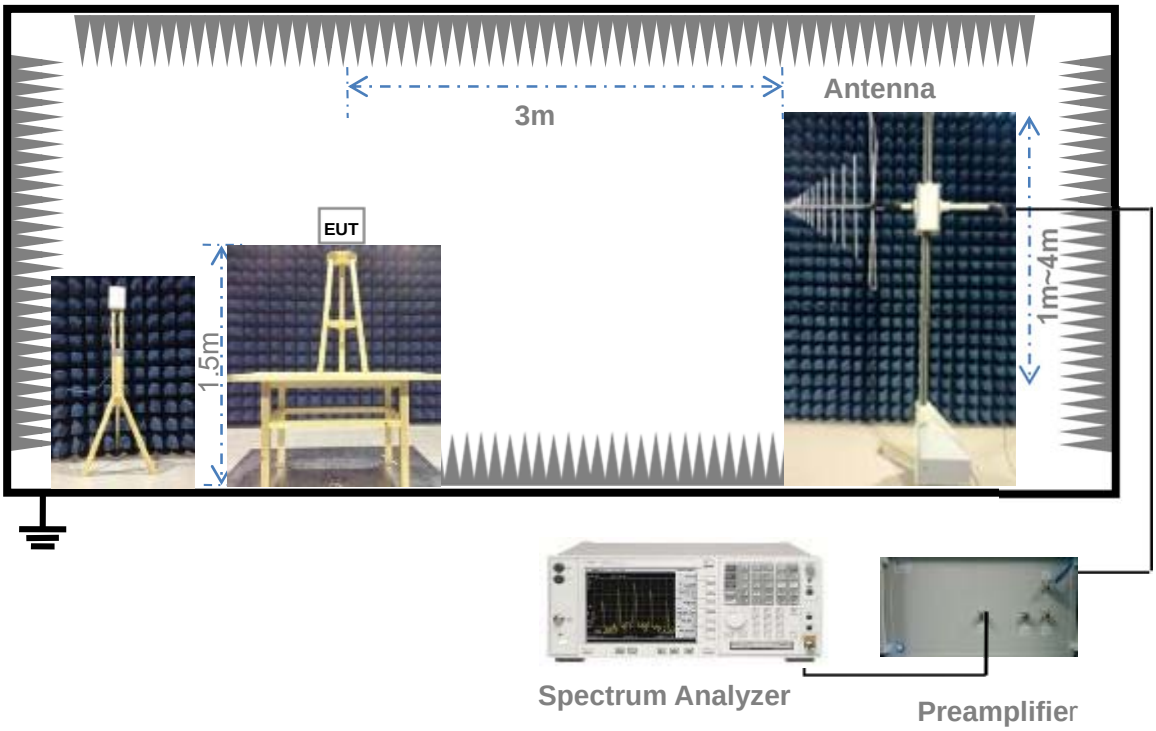
(Diagram 1)

4.4.2 For Frequency Stability Test



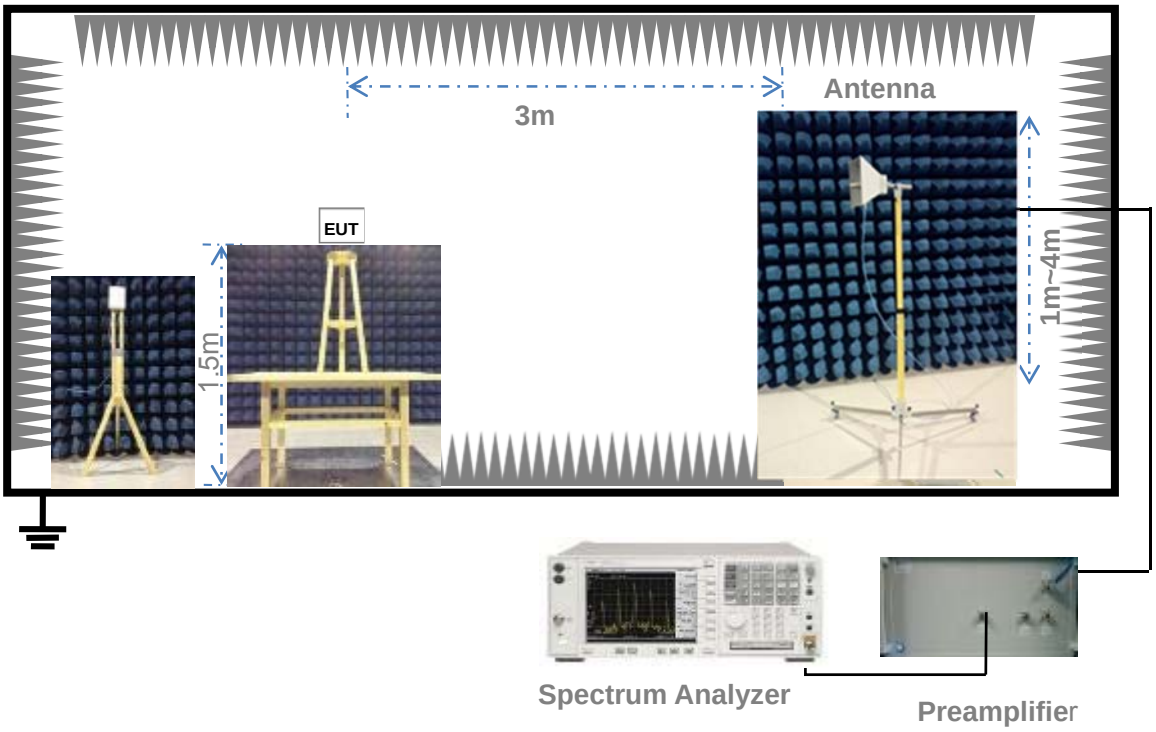
(Diagram 2)

4.4.3 For Radiated Test (30 MHz-1 GHz)



(Diagram 3)

4.4.4 For Radiated Test (Above 1 GHz)



(Diagram 4)

4.5 Test Conditions

Test Case	Test Conditions		
	Test Env.	Test Setup Note 1	Test Configuration Note 2
Conducted RF Output Power	NTNV	Test Setup 1	TC01~TC06
Occupied Bandwidth	NTNV	Test Setup 1	TC01~TC06
Frequency Stability	NTNV	Test Setup 2	TC01~TC06
Conducted Out of Band Emissions	NTNV	Test Setup 1	TC01~TC06
Band Edge	NTNV	Test Setup 1	TC01, TC03, TC04, TC06
Transmitter Radiated Power (EIPR/ERP)	NTNV	Test Setup 3 Test Setup 4	TC01~TC6
Radiated Out of Band Emissions	NTNV	Test Setup 3 Test Setup 4	TC01~TC6
Note: 1. Please refer to section 4.4 for test setup details. 2. Please refer to section 4.3 for test configuration details.			

5 TEST ITEMS

5.1 Conducted RF Output Power

5.1.1 Test Limit

FCC §2.1046 (a)

For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033 (c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

5.1.2 Test Procedure

The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

1. The RF output of the transmitter was connected to the input of the Mobile Communication Test Unit through sufficient attenuation.
2. The mobile was set up for the max, Output power with pseudo random data modulation.

FCC PART 22

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1 MHz, for CDMA modulated signal: RBW=VBW=3 MHz.
2. The low, middle and the high channels are selected to perform tests respectively. For GSM modulated, set the TCH number to 128 as the low channel, and for WCDMA modulated, set the TCH number to 4132 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 190 as the middle channel for GSM modulated, and Set the TCH number to 4175 as the middle channel for WCDMA modulated, then repeat step 3.
5. Set the TCH number to 251 as the high channel for GSM modulated, and Set the TCH number to 4233 as the middle channel for WCDMA modulated, then repeat step 3.

FCC PART 24

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1 MHz, for CDMA modulated signal: RBW=VBW=3 MHz.
2. The low, middle and the high channels are selected to perform tests respectively. Set the TCH number to 512 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 661 as the middle channel, then repeat step 3.
5. Set the TCH number to 810 as the high channel, then repeat step 3.

5.2 Occupied Bandwidth

5.2.1 Limit

FCC § 2.1049

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth

5.2.2 Test Procedure

The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The resolution bandwidth of the spectrum analyzer was set.

FCC PART 22

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=3 kHz, for CDMA modulated signal: RBW=VBW=30 kHz.
2. The low, middle and the high channels are selected to perform tests respectively. For GSM modulated, set the TCH number to 128 as the low channel, and for WCDMA modulated, set the TCH number to 4132 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 190 as the middle channel for GSM modulated, and Set the TCH number to 4175 as the middle channel for WCDMA modulated, then repeat step 3.
5. Set the TCH number to 251 as the high channel for GSM modulated, and Set the TCH number to 4233 as the middle channel for WCDMA modulated, then repeat step 3.

FCC PART 24

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=3 kHz, for CDMA modulated signal: RBW=VBW=30 kHz.
2. The low, middle and the high channels are selected to perform tests respectively. Set the TCH number to 512 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 661 as the middle channel, then repeat step 3.

Set the TCH number to 810 as the high channel, then repeat step 3.

5.3 Frequency Stability

5.3.1 Limit

FCC § 2.1055 & 22.355 & 24.235

§ 22.355
Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

TABLE C-1—FREQUENCY TOLERANCE FOR TRANSMITTERS IN THE PUBLIC MOBILE SERVICES

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

& 24.235
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

The test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

5.3.2 Test Procedure

1. The test is performed in a Temperature Chamber.
2. The EUT is configured as MS + DC Power Supply.

5.4 Conducted Out of Band Emissions

5.4.1 Limit

FCC §22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This calculated to be -13 dBm.

5.4.2 Test Procedure

The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

FCC PART 22

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1 MHz, for CDMA modulated signal: RBW=VBW=3 MHz.
2. The low, middle and the high channels are selected to perform tests respectively. For GSM modulated, set the TCH number to 128 as the low channel, and for WCDMA modulated, set the TCH number to 4132 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 190 as the middle channel for GSM modulated, and Set the TCH number to 4175 as the middle channel for WCDMA modulated, then repeat step 3.
5. Set the TCH number to 251 as the high channel for GSM modulated, and Set the TCH number to 4233 as the middle channel for WCDMA modulated, then repeat step 3.

FCC PART 24

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1 MHz, for CDMA modulated signal: RBW=VBW=3 MHz.
2. The low, middle and the high channels are selected to perform tests respectively. Set the TCH number to 512 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 661 as the middle channel, then repeat step 3.
5. Set the TCH number to 810 as the high channel, then repeat step 3.

5.5 Band Edge

5.5.1 Limit

FCC § 22.917(b) & 24.238(b)
In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

5.5.2 Test Procedure

The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The center of the spectrum analyzer was set to block edge frequency.

FCC PART 22

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1 MHz, for CDMA modulated signal: RBW=VBW=3 MHz.
2. The low, middle and the high channels are selected to perform tests respectively. Set the TCH number to 128 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 190 as the middle channel, then repeat step 3.
5. Set the TCH number to 251 as the high channel, then repeat step 3.

FCC PART 24

1. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1 MHz, for CDMA modulated signal: RBW=VBW=3 MHz.
2. The low, middle and the high channels are selected to perform tests respectively. Set the TCH number to 512 as the low channel.
3. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
4. Set the TCH number to 661 as the middle channel, then repeat step 3.
5. Set the TCH number to 810 as the high channel, then repeat step 3.

5.6 Transmitter Radiated Power (EIRP/ERP)

5.6.1 Limit

FCC §22.913 & 24.232

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2Watts e.i.r.p. peak power.

5.6.2 Test Procedure

The EUT, which is powered by the Battery charged with the AC Adapter, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna.

The EUT is commanded by the SS to operate at the maximum and minimum output power (i.e. GSM 850 MHz band Power Control Level (PCL) = 5/19 and Power Class = 4, GSM 1900 MHz band Power Control Level (PCL) = 0/15 and Power Class = 1), and only the test result of the maximum output power was recorded.

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

ASUBST = PSUBST_TX - PSUBST_RX - LSUBST_CABLES + GSUBST_TX_ANT

ATOT = LCABLES + ASUBST

Where ASUBST is the final substitution correction including receive antenna gain.

PSUBST_TX is signal generator level,

PSUBST_RX is receiver level,

LSUBST_CABLES is cable losses including TX cable,

GSUBST_TX_ANT is substitution antenna gain.

ATOT is total correction factor including cable loss and substitution correction

During the test, the data of ATOT was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of ATOT.

5.7 Radiated Out of Band Emissions

5.7.1 Limit

FCC § 22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This calculated to be -13 dBm.

5.7.2 Test Procedure

See section 5.6.2 of this report.

Note: when doing measurements above 1 GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

ANNEX A TEST RESULT

A.1 Conducted RF Output Power

GSM Mode Test Data

Band	Channel	Frequency (MHz)	Conducted Output Peak Power (dBm)	Conducted Output Peak Power (W)
GSM 850	128	824.2	32.99	1.99
	190	836.6	33.14	2.06
	251	848.8	33.15	2.07
GSM 1900	512	1850.2	29.51	0.89
	661	1880.0	29.21	0.83
	810	1909.8	28.85	0.77

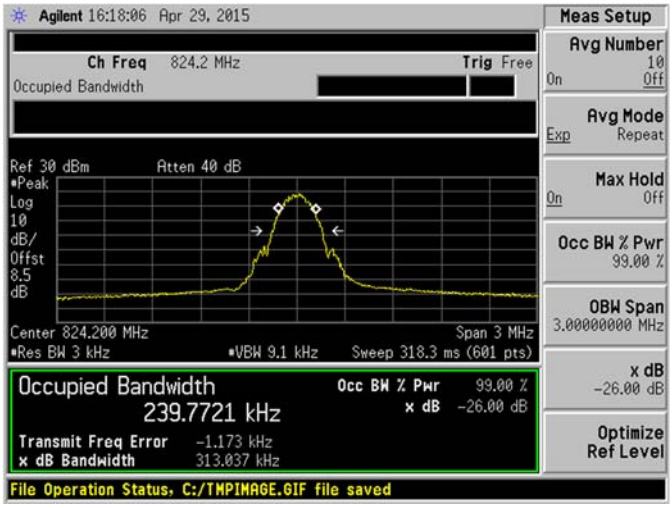
A.2 Occupied Bandwidth

Test Data

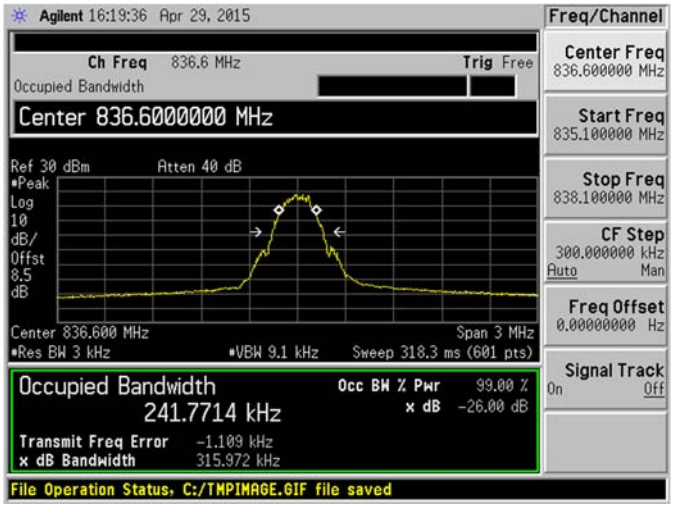
Band	Channel	Frequency (MHz)	Measured 99% Occupied Bandwidth (kHz)	Measured -26 dB Occupied Bandwidth (kHz)
GSM 850 MHz	128	824.2	239.7721	313.037
	190	836.6	241.7714	315.972
	251	848.8	242.6678	317.323
GSM 1900 MHz	512	1850.2	243.5867	311.620
	661	1880.0	250.0535	314.851
	810	1909.8	243.1640	316.019

Test plots

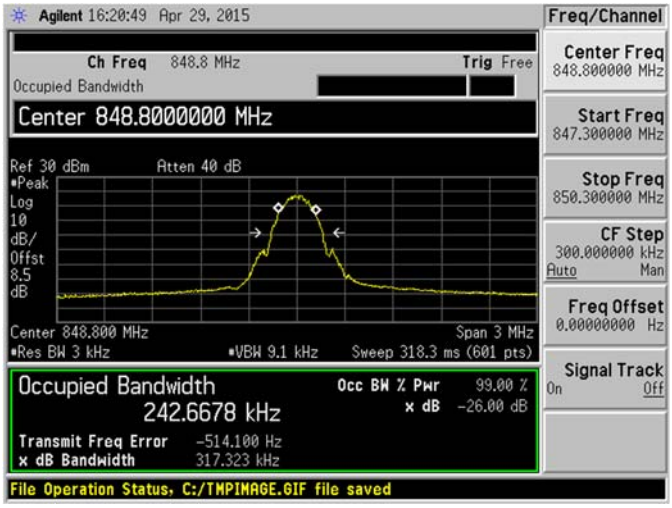
GSM 850 MHz CHANNEL 128



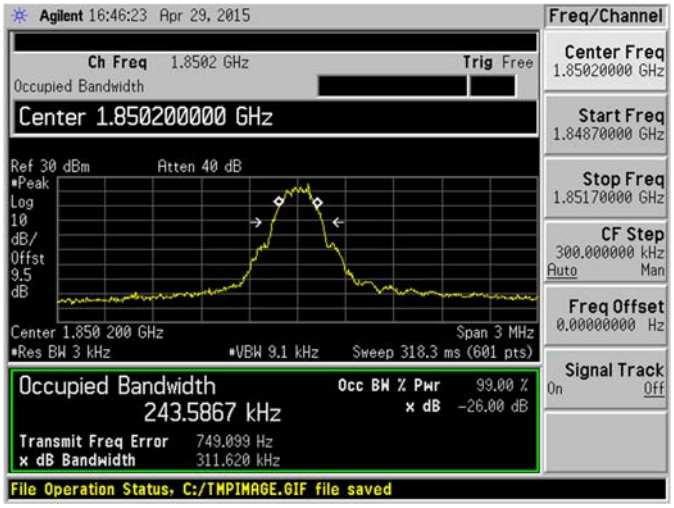
GSM 850 MHz CHANNEL 190



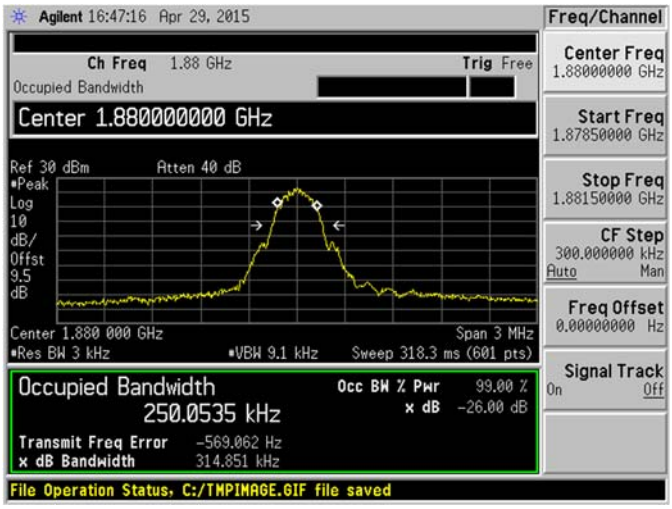
GSM 850 MHz CHANNEL 251



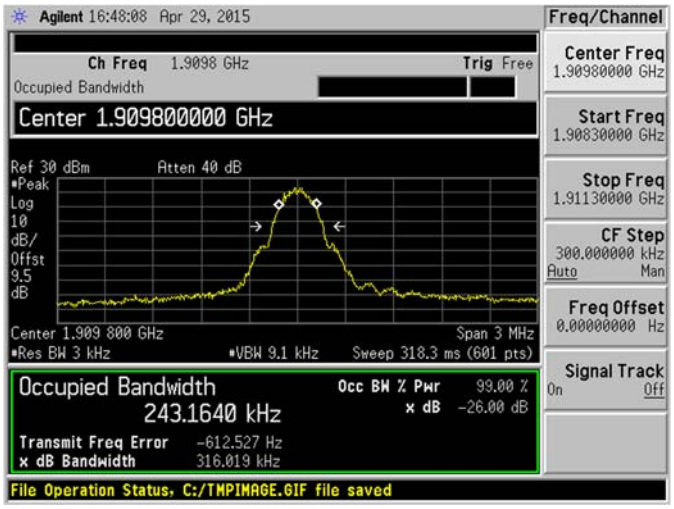
GSM 1900 MHz CHANNEL 512



GSM 1900 MHz CHANNEL 661



GSM 1900 MHz CHANNEL 810



A.3 Frequency Stability

GSM 850 MHz Band:

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 128 (824.2 MHz)		Channel = 190 (836.6 MHz)		Channel = 251 (848.8 MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	73.22	±2060.5	1.31	±2091.5	91.33	±2122	Pass
	-20	94.63		64.25		64.18		
	-10	14.52		14.06		91.40		
	0	64.87		83.44		9.42		
	+10	11.69		23.36		0.08		
	+20	28.65		85.07		20.40		
	+30	65.45		78.14		5.49		
	+40	76.92		76.35		16.75		
	+50	7.15		57.93		4.40		
4.3	+25	57.82		42.07		89.09		
3.2	+25	15.84		26.08		56.26		

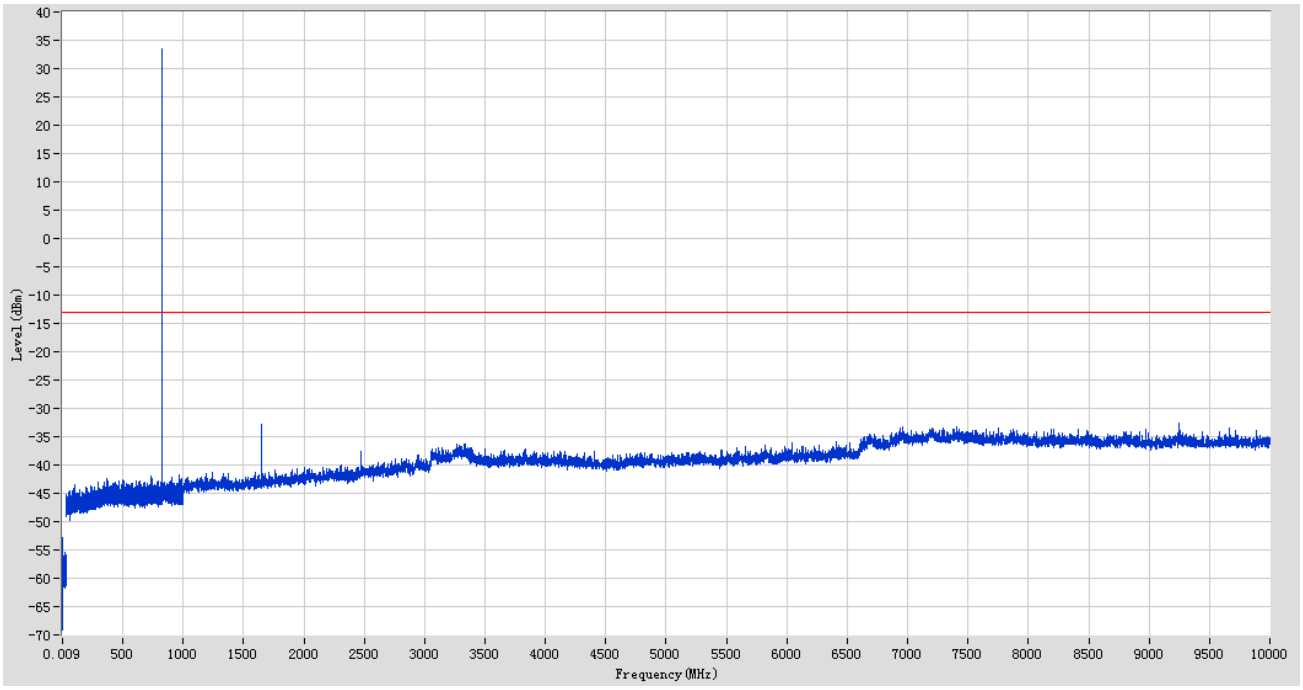
GSM 1900 MHz Band:

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 512 (1850.2 MHz)		Channel = 661 (1880.0 MHz)		Channel = 810 (1909.8 MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.7	-30	-28.69	±4625.5	-27.66	±4700.0	-28.33	±4774.5	Pass
	-20	-28.75		-28.57		-27.88		
	-10	-27.72		-28.62		-28.48		
	0	-27.70		-27.71		-28.38		
	+10	-28.11		-28.72		-27.59		
	+20	-28.61		-28.97		-28.52		
	+30	-28.10		-28.43		-28.04		
	+40	-27.89		-27.93		-28.72		
	+50	-28.91		-28.63		-28.70		
4.3	+25	-27.54		-28.73		-28.02		
3.2	+25	-27.64		-28.59		-28.62		

A.4 Conducted Out of Band Emissions

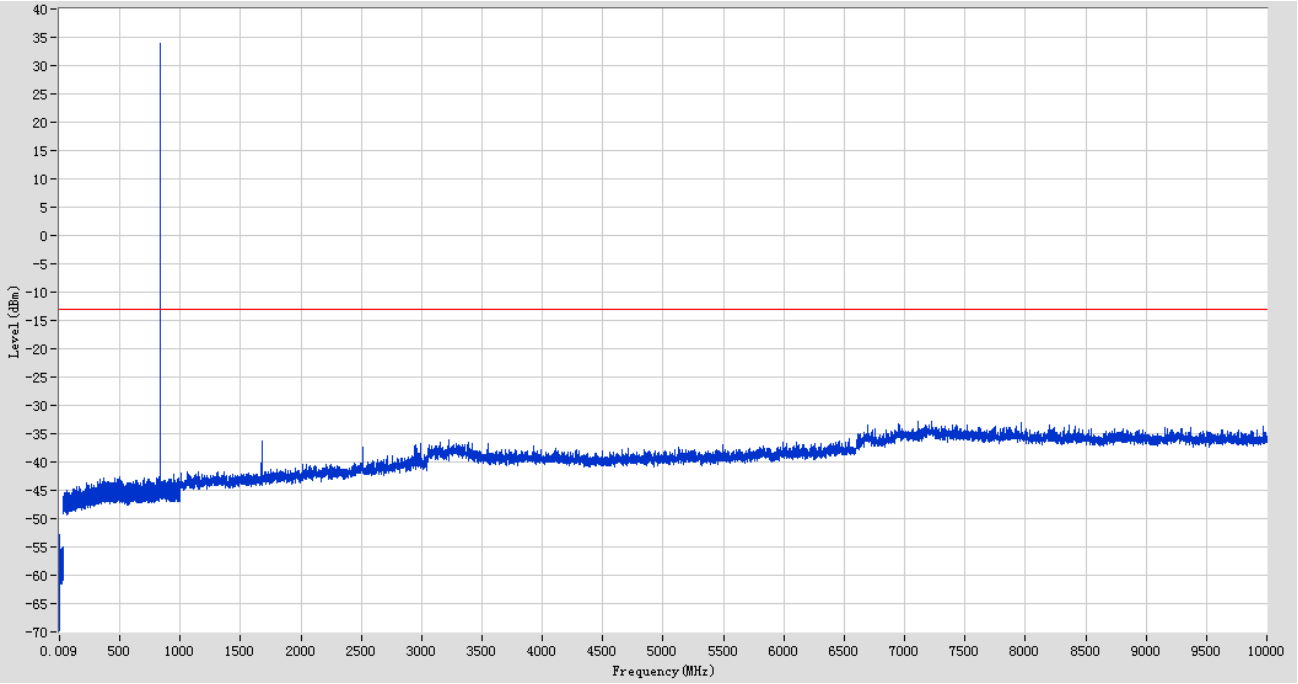
Test Data

GSM 850 MHz CHANNEL 128



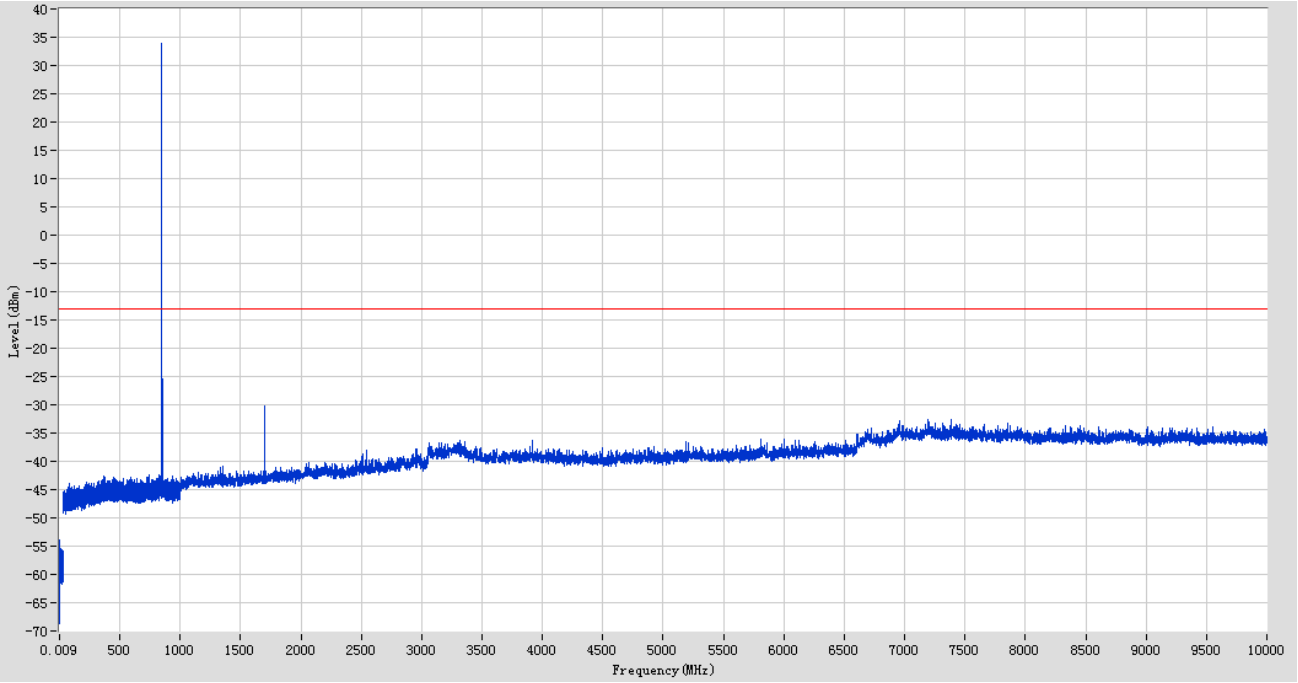
Start Frequency[MHz]	Stop Frequency[MHz]	RBW [MHz]	Detector	Frequency [MHz]	Emission[dBm]	Limit [dBm]	Margin [dB]	Verdict
0.009	0.15	0.001	Peak	0.01088	-56.6431	-13	43.6431	Pass
0.15	30	0.01	Peak	0.260037	-52.7178	-13	39.7178	Pass
30	500	0.1	Peak	363.0709	-42.3287	-13	29.3287	Pass
500	1000	0.1	Peak	824.1648	33.4316	N/A	N/A	N/A
1000	10000	1	Peak	9251.073	-32.5458	-13	19.5458	Pass

GSM 850 MHz CHANNEL 190



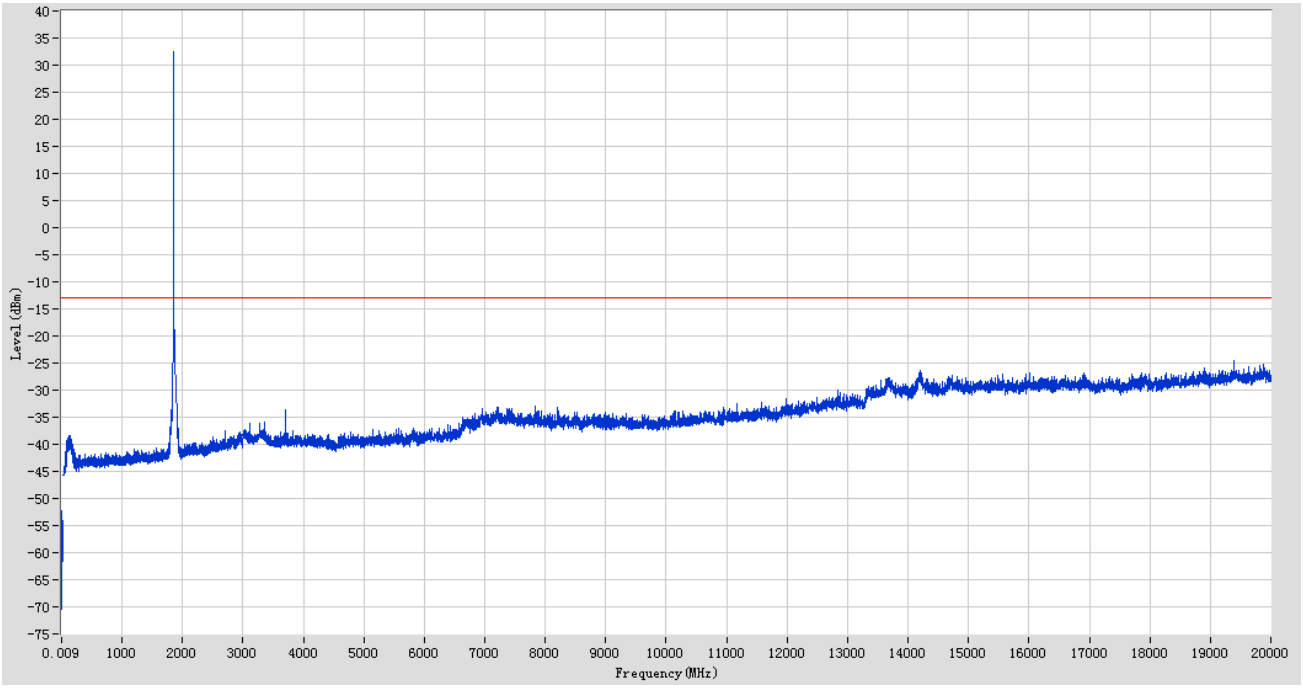
Start Frequency[MHz]	Stop Frequency[MHz]	RBW [MHz]	Detector	Frequency [MHz]	Emission[dBm]	Limit [dBm]	Margin [dB]	Verdict
0.009	0.15	0.001	Peak	0.00994	-56.1365	-13	43.1365	Pass
0.15	30	0.01	Peak	0.15	-52.8805	-13	39.8805	Pass
30	500	0.1	Peak	495.8991	-42.6515	-13	29.6515	Pass
500	1000	0.1	Peak	836.5673	33.9019	N/A	N/A	N/A
1000	10000	1	Peak	7111.746	-32.7537	-13	19.7537	Pass

GSM 850 MHz CHANNEL 251



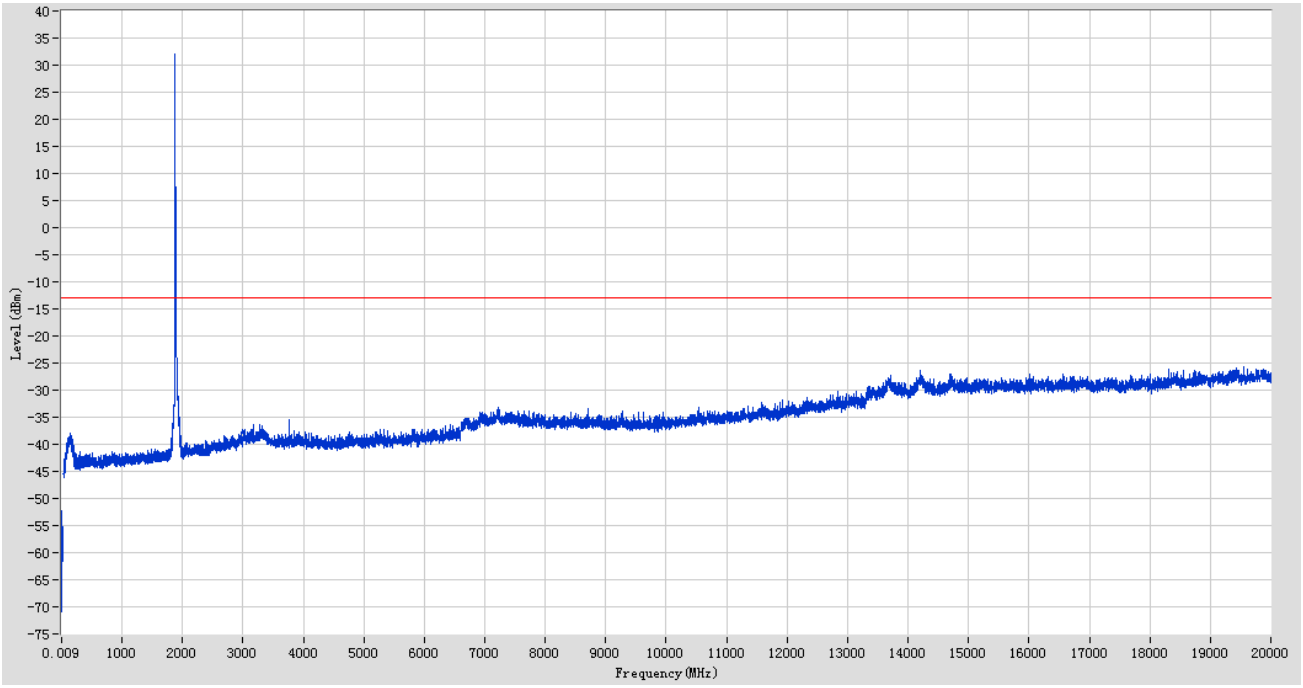
Start Frequency[MHz]	Stop Frequency[MHz]	RBW [MHz]	Detector	Frequency [MHz]	Emission[dBm]	Limit [dBm]	Margin [dB]	Verdict
0.009	0.15	0.001	Peak	0.009235	-55.4439	-13	42.4439	Pass
0.15	30	0.01	Peak	0.42009	-53.8892	-13	40.8892	Pass
30	500	0.1	Peak	368.9721	-42.5668	-13	29.5668	Pass
500	1000	0.1	Peak	848.7698	33.9652	N/A	N/A	N/A
1000	10000	1	Peak	1698.085	-30.1271	-13	17.1271	Pass

GSM 1900 MHz CHANNEL 512



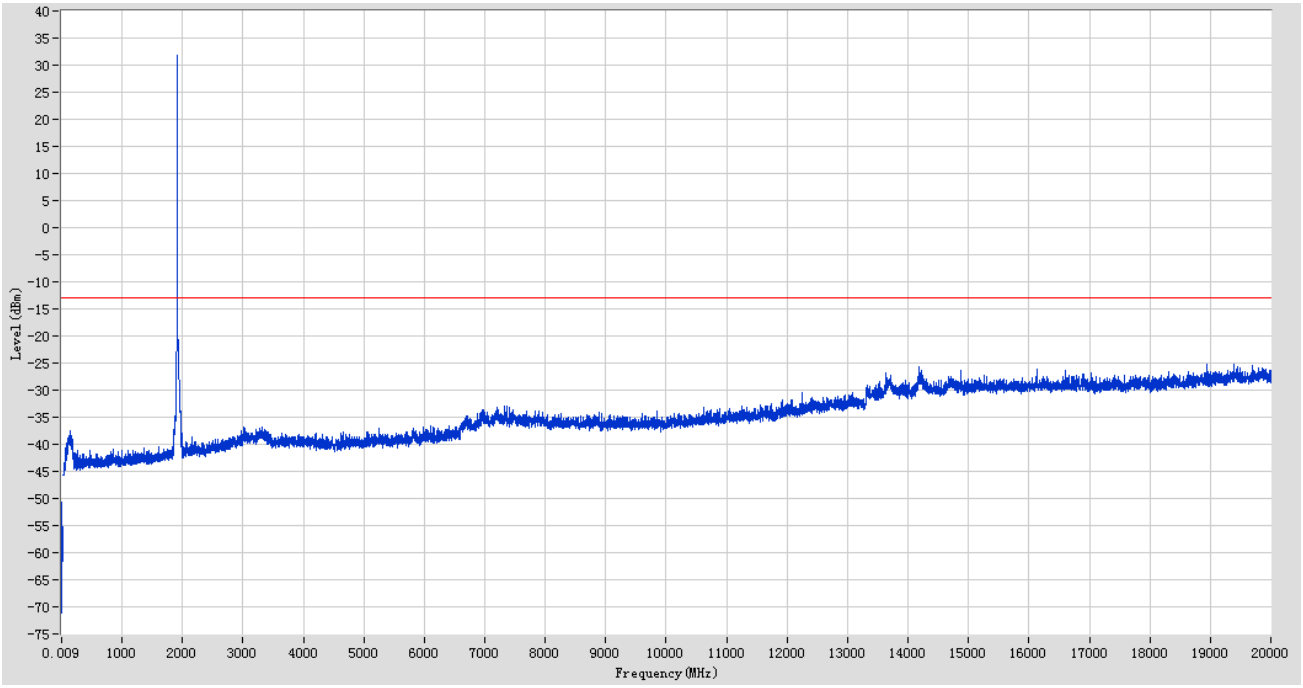
Start Frequency[MHz]	Stop Frequency[MHz]	RBW [MHz]	Detector	Frequency [MHz]	Emission[dBm]	Limit [dBm]	Margin [dB]	Verdict
0.009	0.15	0.001	Peak	0.010692	-56.3992	-13	43.3992	Pass
0.15	30	0.01	Peak	0.170007	-52.3439	-13	39.3439	Pass
30	1000	1	Peak	116.33	-38.3983	-13	25.3983	Pass
1000	3000	1	Peak	1850.425	32.4342	N/A	N/A	N/A
3000	20000	1	Peak	19396.04	-24.6088	-13	11.6088	Pass

GSM 1900 MHz CHANNEL 661



Start Frequency[MHz]	Stop Frequency[MHz]	RBW [MHz]	Detector	Frequency [MHz]	Emission[dBm]	Limit [dBm]	Margin [dB]	Verdict
0.009	0.15	0.001	Peak	0.010128	-56.0825	-13	43.0825	Pass
0.15	30	0.01	Peak	0.160003	-52.2277	-13	39.2277	Pass
30	1000	1	Peak	133.79	-38.0332	-13	25.0332	Pass
1000	3000	1	Peak	1880.44	32.0318	N/A	N/A	N/A
3000	20000	1	Peak	19547.55	-25.7458	-13	12.7458	Pass

GSM 1900 MHz CHANNEL 810



Start Frequency[MHz]	Stop Frequency[MHz]	RBW [MHz]	Detector	Frequency [MHz]	Emission[dBm]	Limit [dBm]	Margin [dB]	Verdict
0.009	0.15	0.001	Peak	0.009141	-57.2199	-13	44.2199	Pass
0.15	30	0.01	Peak	0.15	-50.6665	-13	37.6665	Pass
30	1000	1	Peak	135.73	-37.5655	-13	24.5655	Pass
1000	3000	1	Peak	1909.455	31.7598	N/A	N/A	N/A
3000	20000	1	Peak	19391.89	-25.1433	-13	12.143	Pass

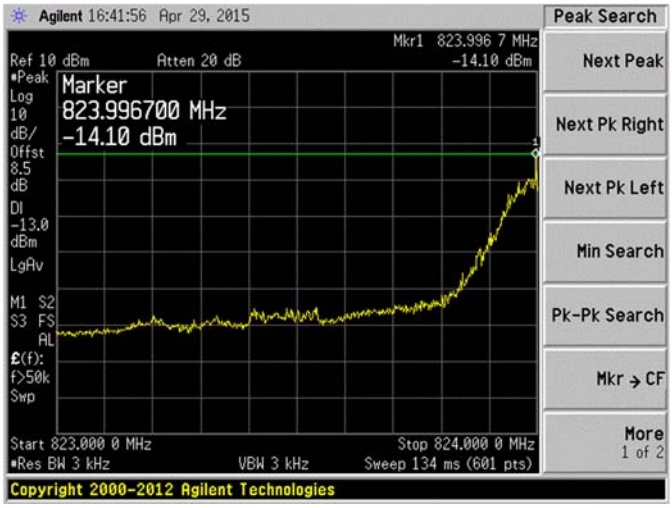
A.5 Band Edge

Test Data

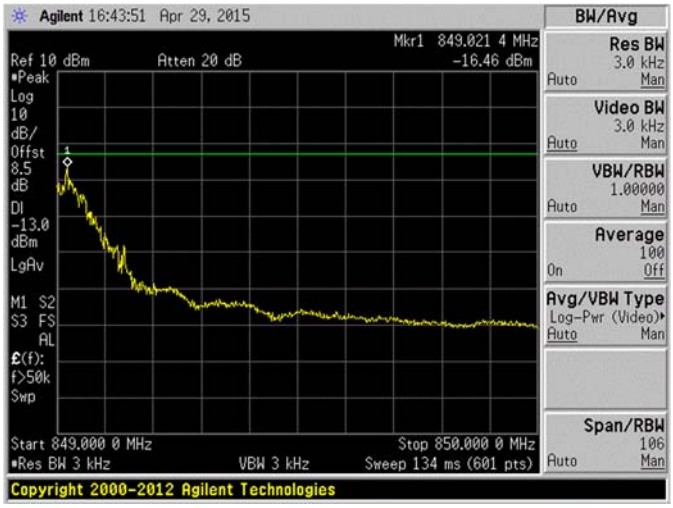
Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Limit (dBm)	Verdict
GSM 850	128	824.2	-14.10	-13	Pass
	251	848.8	-16.46		Pass
GSM 1900	512	1850.2	-14.23	-13	Pass
	810	1909.8	-14.34		Pass

Test Plots

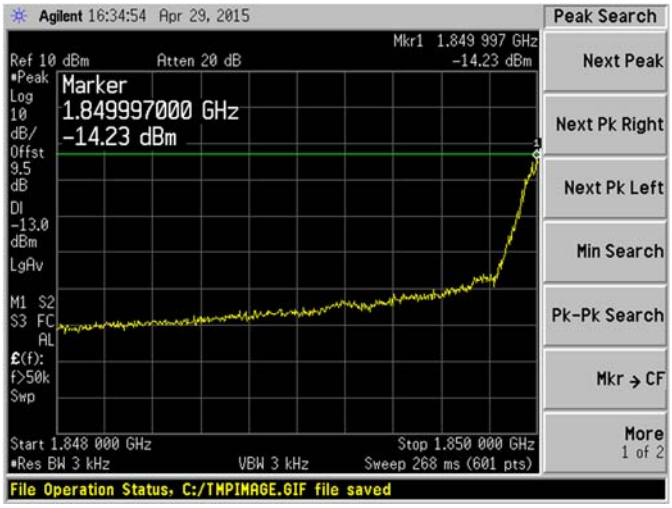
GSM 850 MHz CHANNEL 128



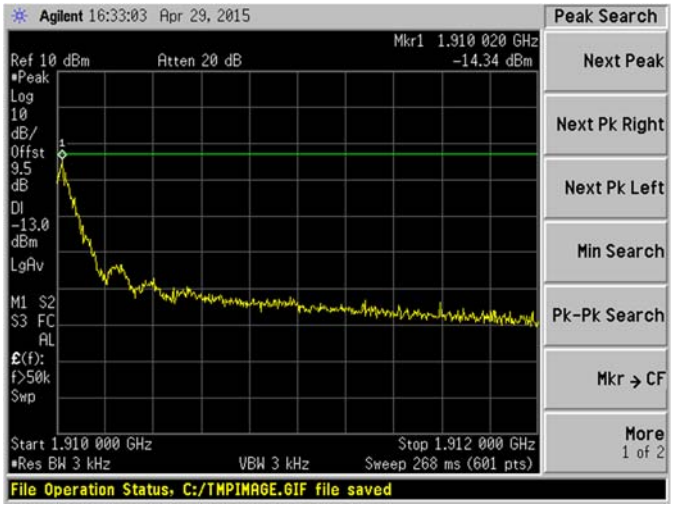
GSM 850 MHz CHANNEL 251



GSM 1900 MHz CHANNEL 512



GSM 1900 MHz CHANNEL 810



A.6 Transmitter Radiated Power (EIRP/ERP)

Minimum RF power: GSM 850 MHz: 5.21 dBm, GSM 1900 MHz: -0.48 dBm.

Test Data

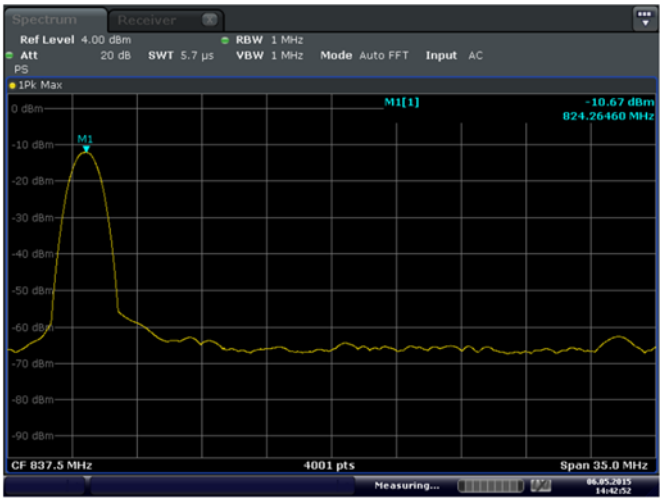
GSM Mode Test data:

Band	Channel	Frequency (MHz)	PCL	Measured ERP				Limit		Verdict
				SA Read Value dBm	Correction Factor(dB)	ERP (dBm)	ERP (W)	dBm	W	
GSM 850	128	824.20	5	-10.67	41	30.33	1.08	38.5	7	Pass
	190	836.60	5	-9.93	41	31.07	1.28			Pass
	251	848.80	5	-10.52	41	30.48	1.12			Pass

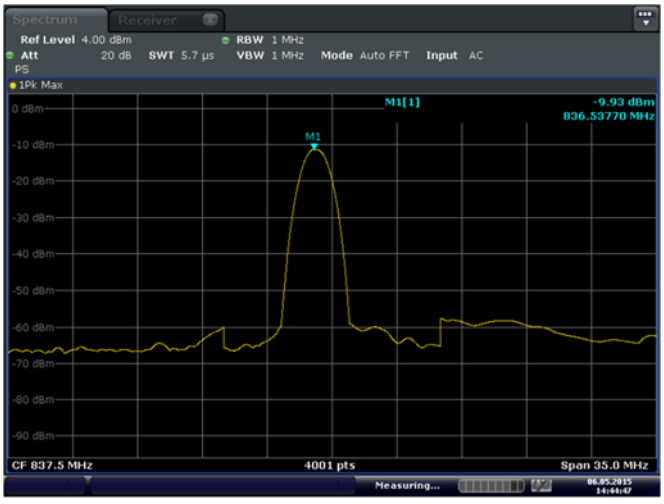
Band	Channel	Frequency (MHz)	PCL	Measured EIRP				Limit		Verdict
				SA Read Value (dBm)	Correction Factor(dB)	EIRP (dBm)	EIRP (W)	dBm	W	
GSM 1900	512	1850.2	0	-12.71	43	30.29	1.07	33	2	Pass
	661	1880.0	0	-11.24	43	31.76	1.50			Pass
	810	1909.8	0	-12.10	43	30.90	1.23			Pass

Test Plots

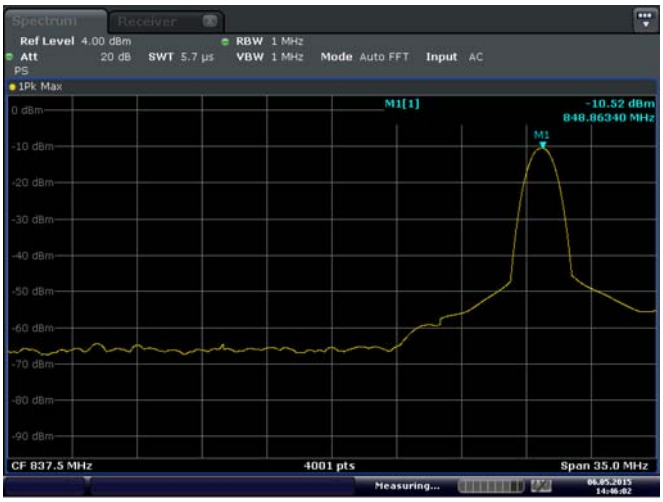
GSM 850 MHz CHANNEL 128



GSM 850 MHz CHANNEL 190



GSM 850 MHz CHANNEL 251

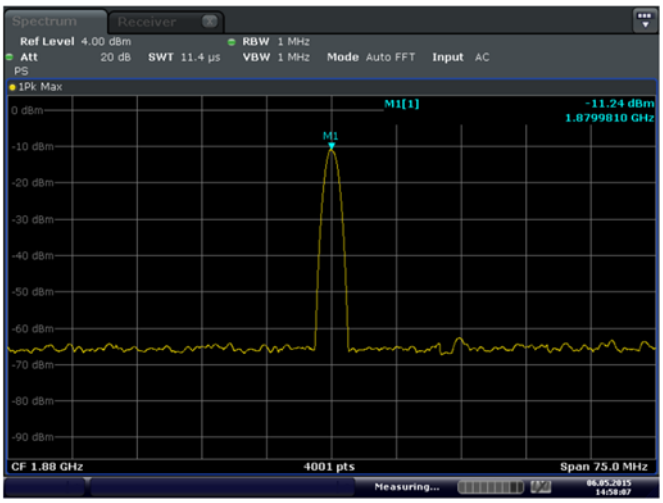


Date: 6.MAY.2015 14:46:02

GSM 1900 MHz CHANNEL 512

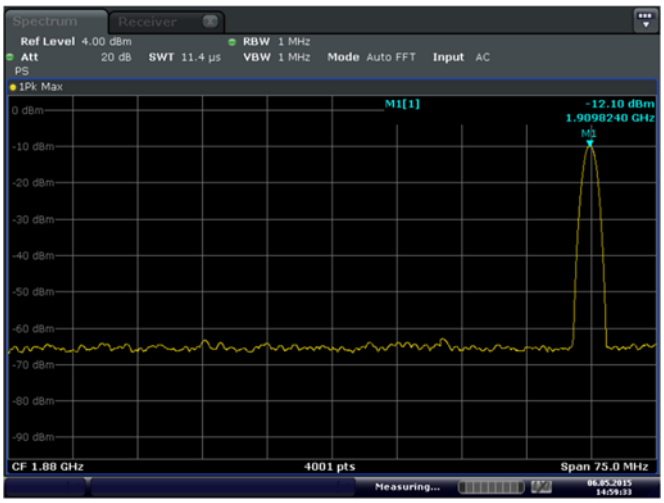
Date: 6.MAY.2015 14:56:51

GSM 1900 MHz CHANNEL 661



Date: 6.MAY.2015 14:58:08

GSM 1900 MHz CHANNEL 810

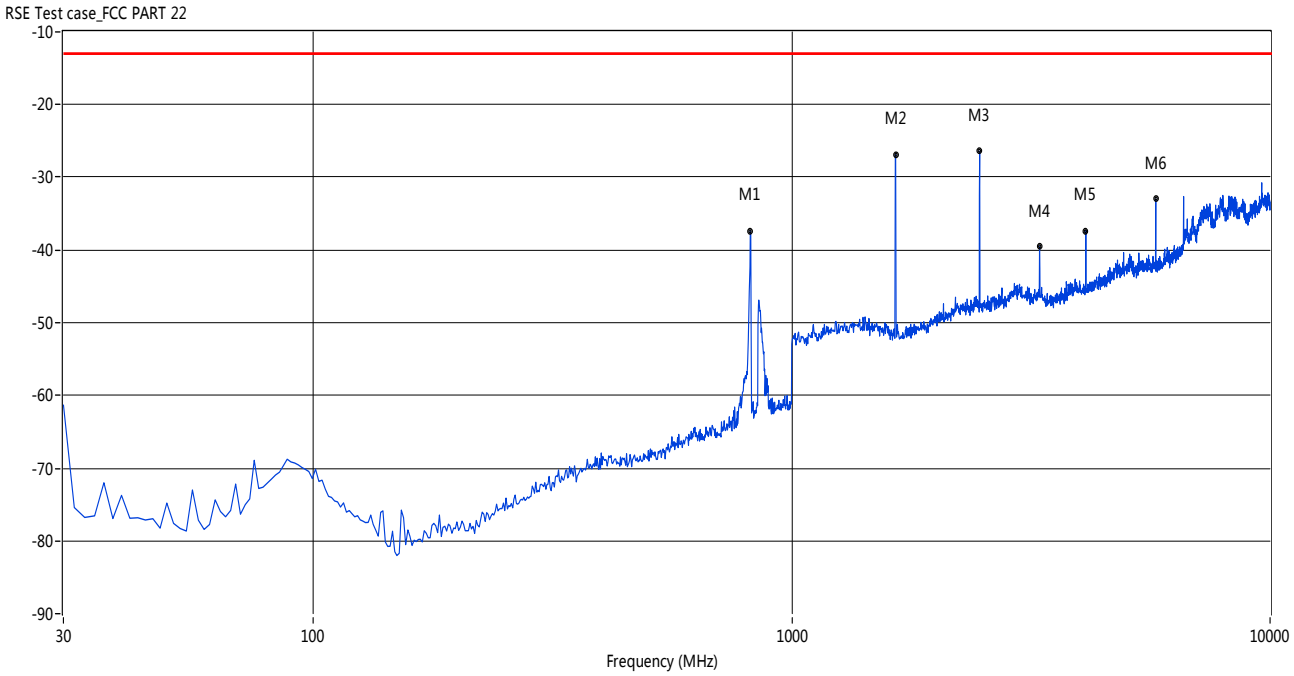


Date: 6.MAY.2015 14:59:33

A.7 Radiated Out of Band Emissions

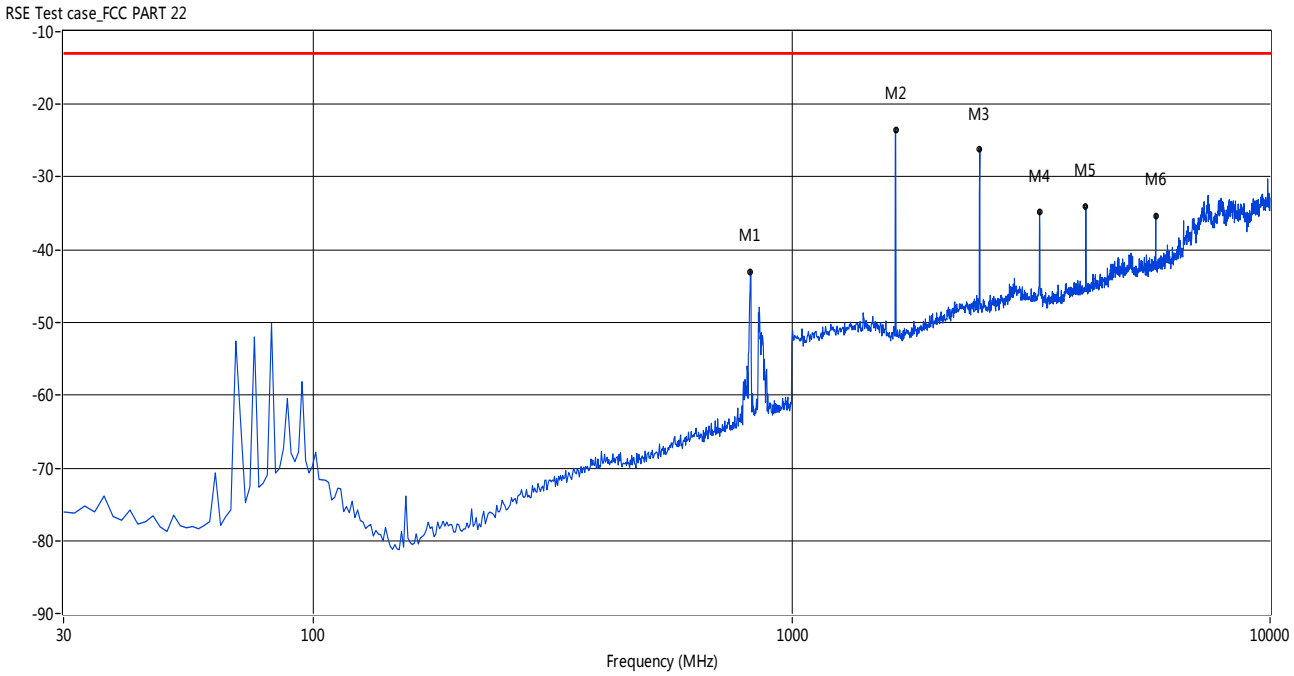
Test Data

GSM 850 MHz CHANNEL 128, ANT V



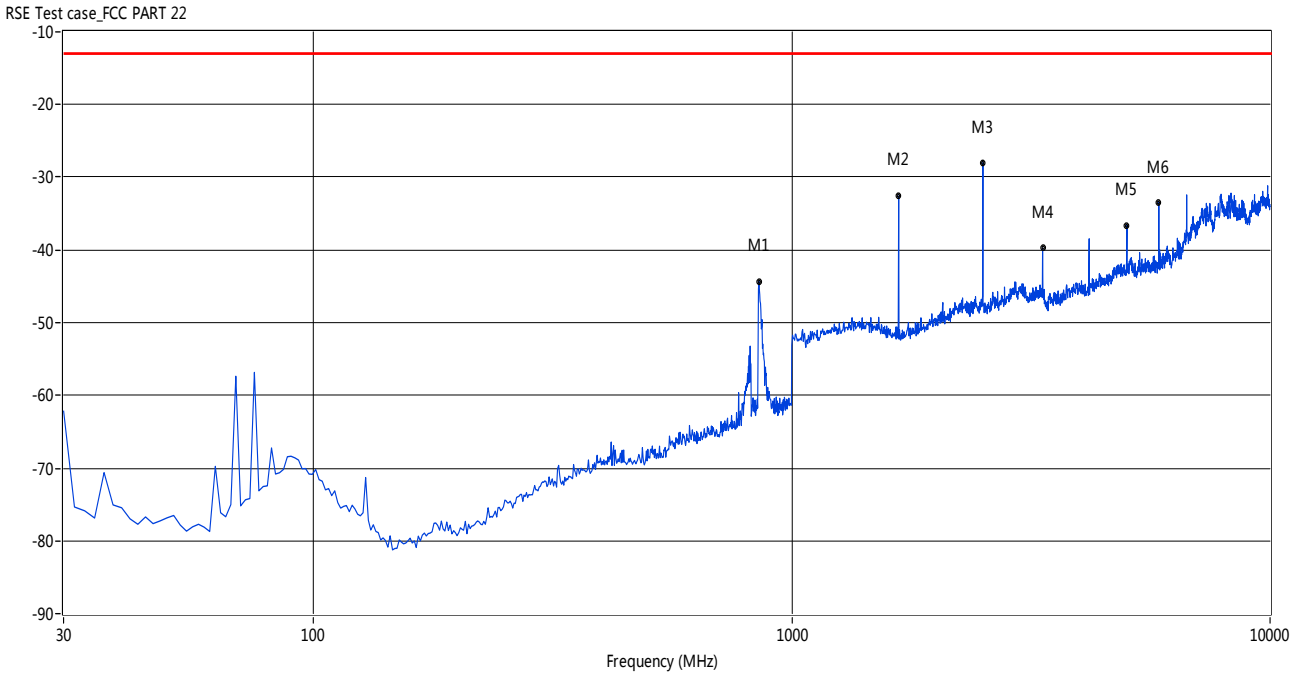
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
819.23	-37.39	5.16	-13.0	24.39	12.90	Vertical	Pass
1648.92	-26.82	8.86	-13.0	13.82	358.30	Vertical	Pass
2470.88	-26.42	13.05	-13.0	13.42	263.20	Vertical	Pass
3294.51	-39.55	21.40	-13.0	26.55	208.00	Vertical	Pass
4118.14	-37.33	24.21	-13.0	24.33	25.90	Vertical	Pass
5765.39	-32.98	27.95	-13.0	19.98	17.00	Vertical	Pass

GSM 85 MHz CHANNEL 128, ANT H



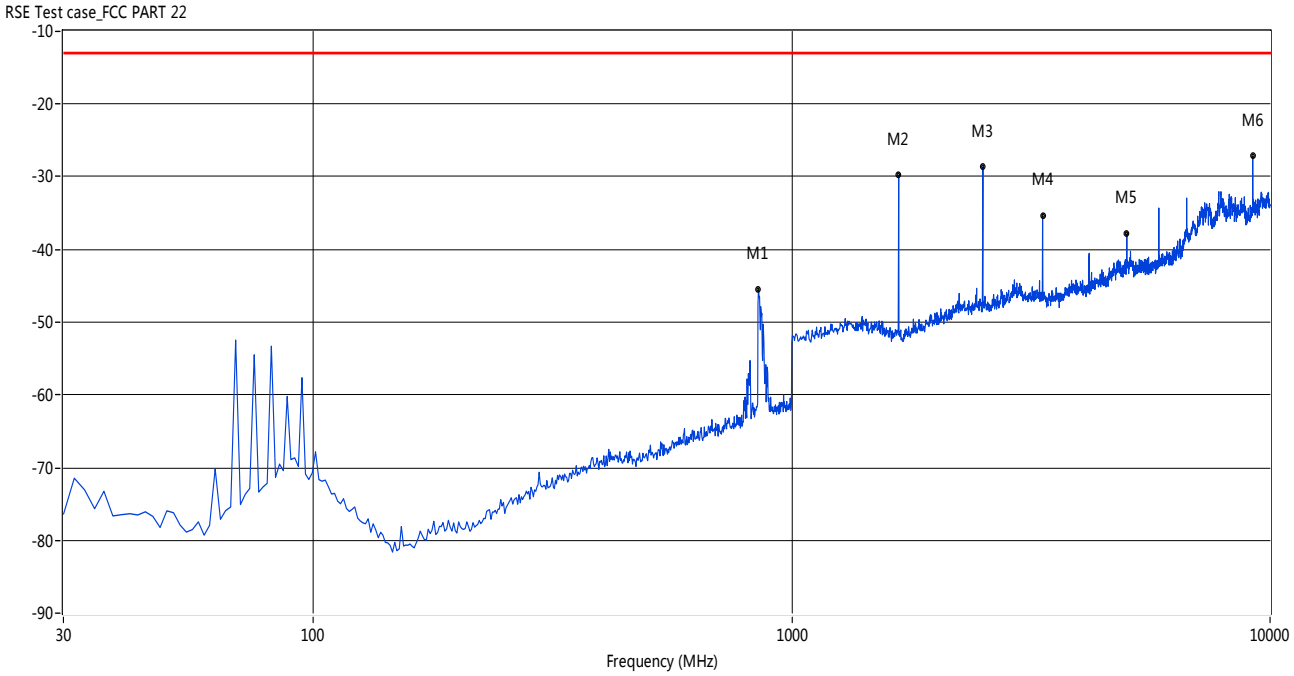
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
819.23	-43.00	5.16	-13.0	30.00	31.90	Horizontal	Pass
1648.92	-23.48	8.86	-13.0	10.48	296.30	Horizontal	Pass
2470.88	-26.14	13.05	-13.0	13.14	296.30	Horizontal	Pass
3294.51	-34.83	21.40	-13.0	21.83	315.30	Horizontal	Pass
4118.14	-34.11	24.21	-13.0	21.11	17.30	Horizontal	Pass
5765.39	-35.31	27.95	-13.0	22.31	87.40	Horizontal	Pass

GSM 850 MHz CHANNEL 190, ANT V



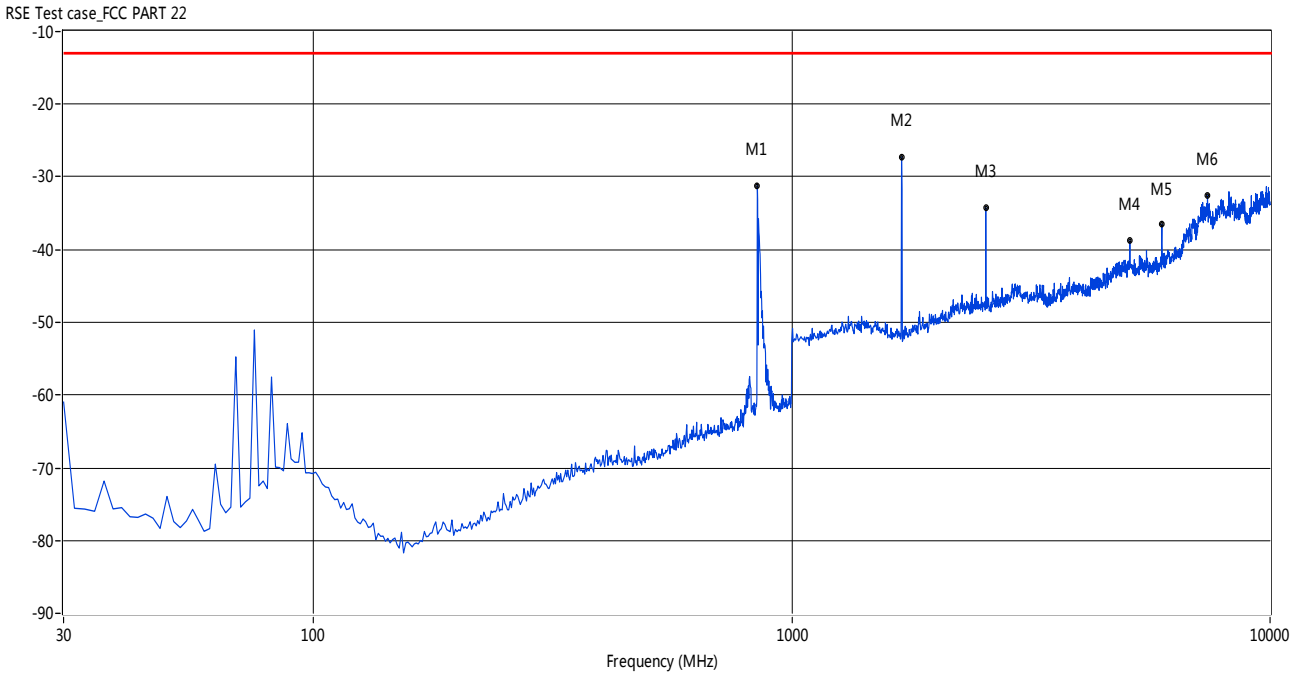
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
853.13	-44.29	5.71	-13.0	31.29	310.80	Vertical	Pass
1672.21	-36.25	8.78	-13.0	23.25	-0.30	Vertical	Pass
2507.49	-30.68	13.34	-13.0	17.68	49.10	Vertical	Pass
3344.43	-39.74	21.48	-13.0	26.74	220.40	Vertical	Pass
5016.64	-36.58	27.52	-13.0	23.58	312.30	Vertical	Pass
5850.25	-33.50	28.09	-13.0	20.50	62.80	Vertical	Pass

GSM 850 MHz CHANNEL 190, ANT H



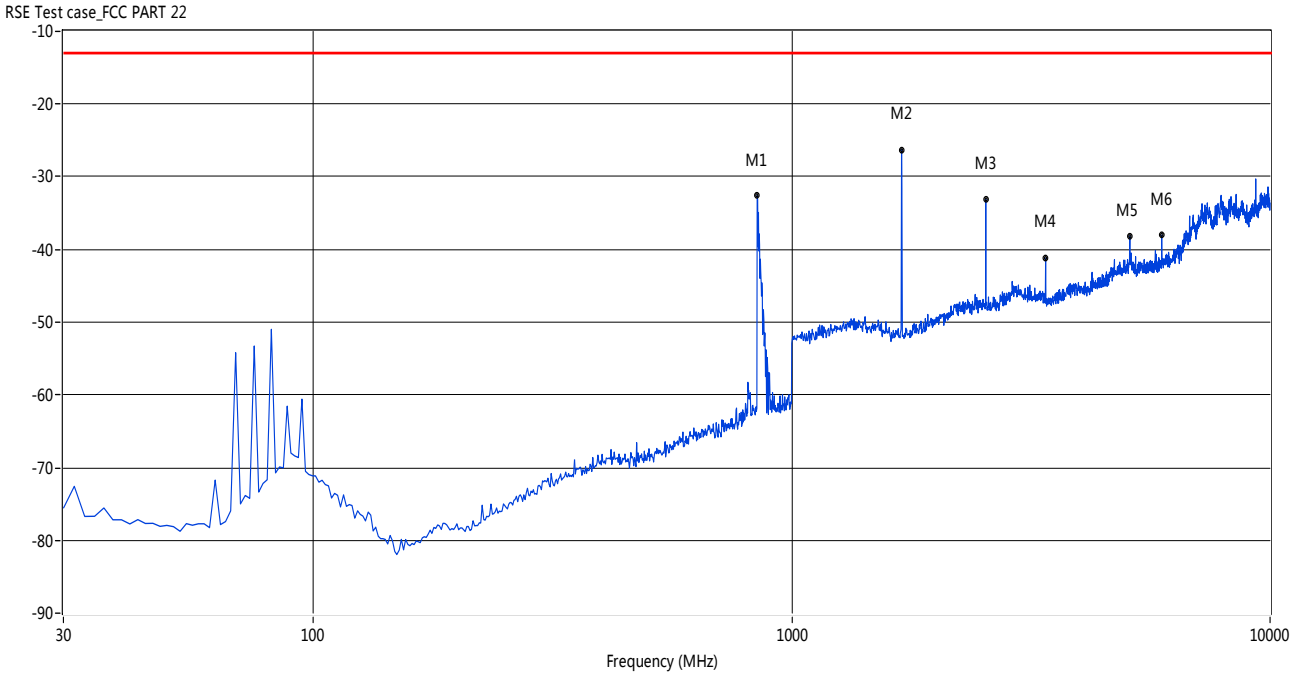
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
851.51	-45.51	5.68	-13.0	32.51	305.80	Horizontal	Pass
1672.21	-29.79	8.78	-13.0	16.79	316.60	Horizontal	Pass
2507.49	-28.64	13.34	-13.0	15.64	306.60	Horizontal	Pass
3344.43	-35.34	21.48	-13.0	22.34	308.90	Horizontal	Pass
5016.64	-37.84	27.52	-13.0	24.84	269.60	Horizontal	Pass
9201.33	-27.17	35.65	-13.0	14.17	125.70	Horizontal	Pass

GSM 850 MHz CHANNEL 251, ANT V



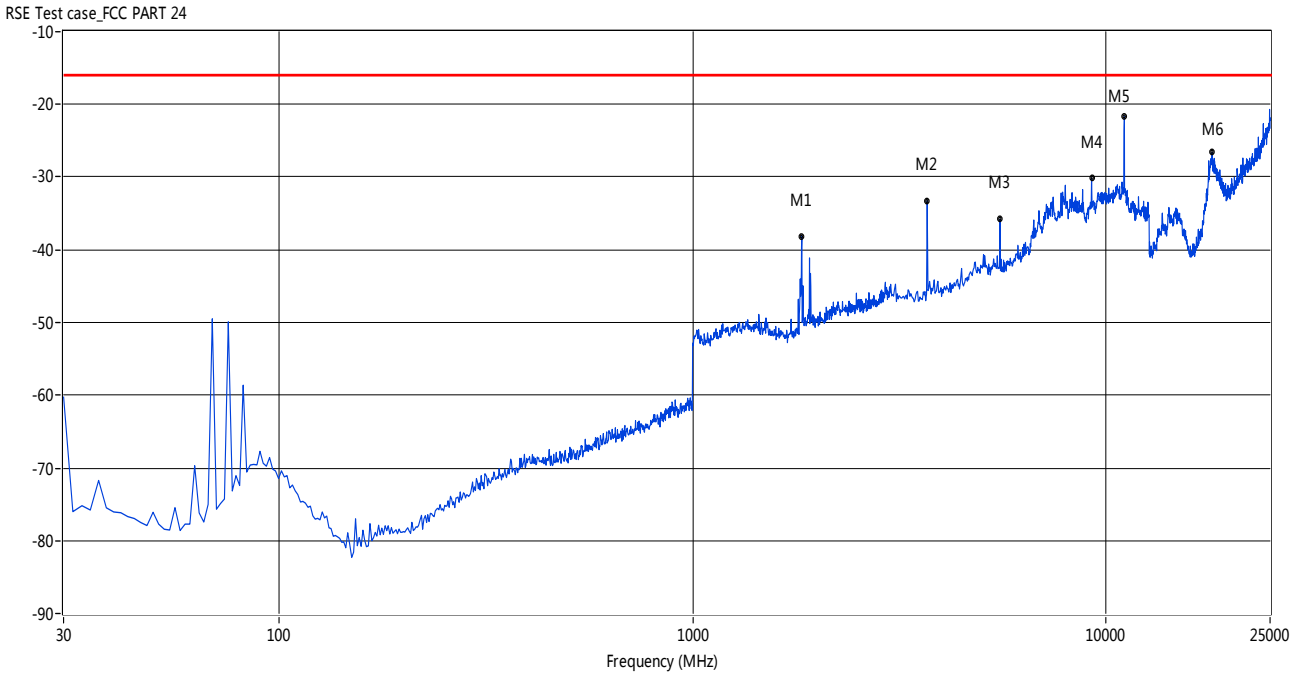
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
846.67	-31.14	5.60	-13.0	18.14	32.00	Vertical	Pass
1695.51	-27.25	8.81	-13.0	14.25	284.20	Vertical	Pass
2544.09	-34.23	13.41	-13.0	21.23	49.70	Vertical	Pass
5091.51	-38.77	28.29	-13.0	25.77	285.60	Vertical	Pass
5935.11	-36.55	28.42	-13.0	23.55	303.40	Vertical	Pass
7397.67	-32.51	33.94	-13.0	19.51	15.90	Vertical	Pass

GSM 850 MHz CHANNEL 251, ANT H



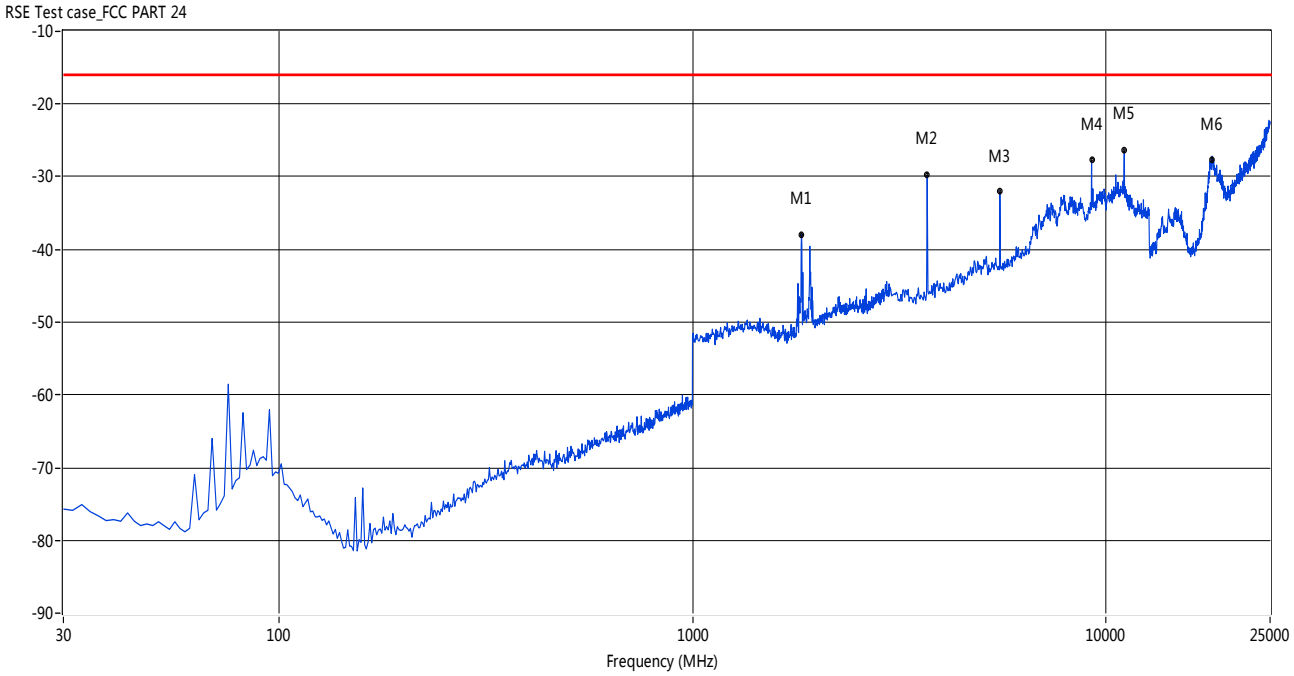
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
846.67	-32.56	5.60	-13.0	19.56	244.10	Horizontal	Pass
1695.51	-28.64	8.81	-13.0	15.64	307.10	Horizontal	Pass
2544.09	-34.04	13.41	-13.0	21.04	302.30	Horizontal	Pass
3394.34	-41.19	21.49	-13.0	28.19	314.20	Horizontal	Pass
5086.52	-38.19	28.24	-13.0	25.19	261.80	Horizontal	Pass
5935.11	-38.02	28.42	-13.0	25.02	248.90	Horizontal	Pass

GSM 1900 MHz CHANNEL 512, ANT V



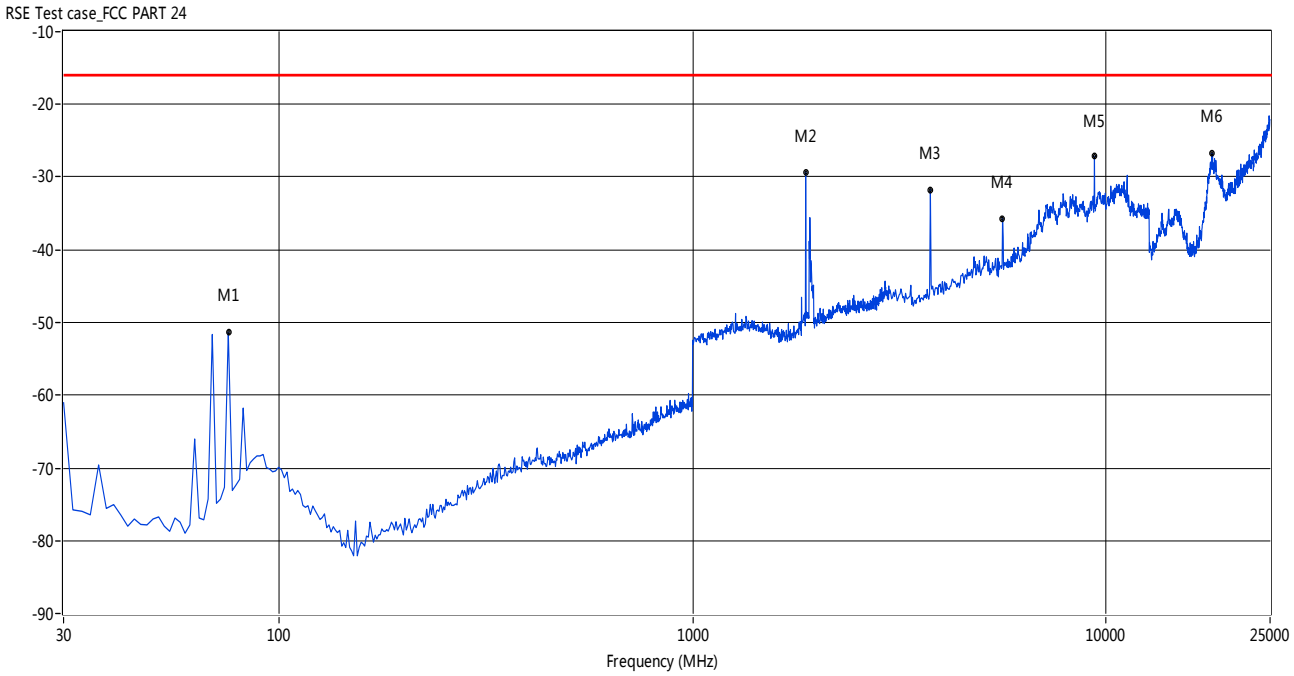
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
1838.60	-38.11	10.56	-16.0	22.11	321.10	Vertical	Pass
3697.59	-33.25	23.12	-16.0	17.25	340.70	Vertical	Pass
5547.00	-35.81	27.79	-16.0	19.81	235.40	Vertical	Pass
9245.84	-30.10	35.72	-16.0	14.10	7.30	Vertical	Pass
11095.26	-21.65	37.60	-16.0	5.65	313.20	Vertical	Pass
18090.27	-26.60	40.76	-16.0	10.60	344.70	Vertical	Pass

GSM 1900 MHz CHANNEL 512, ANT H



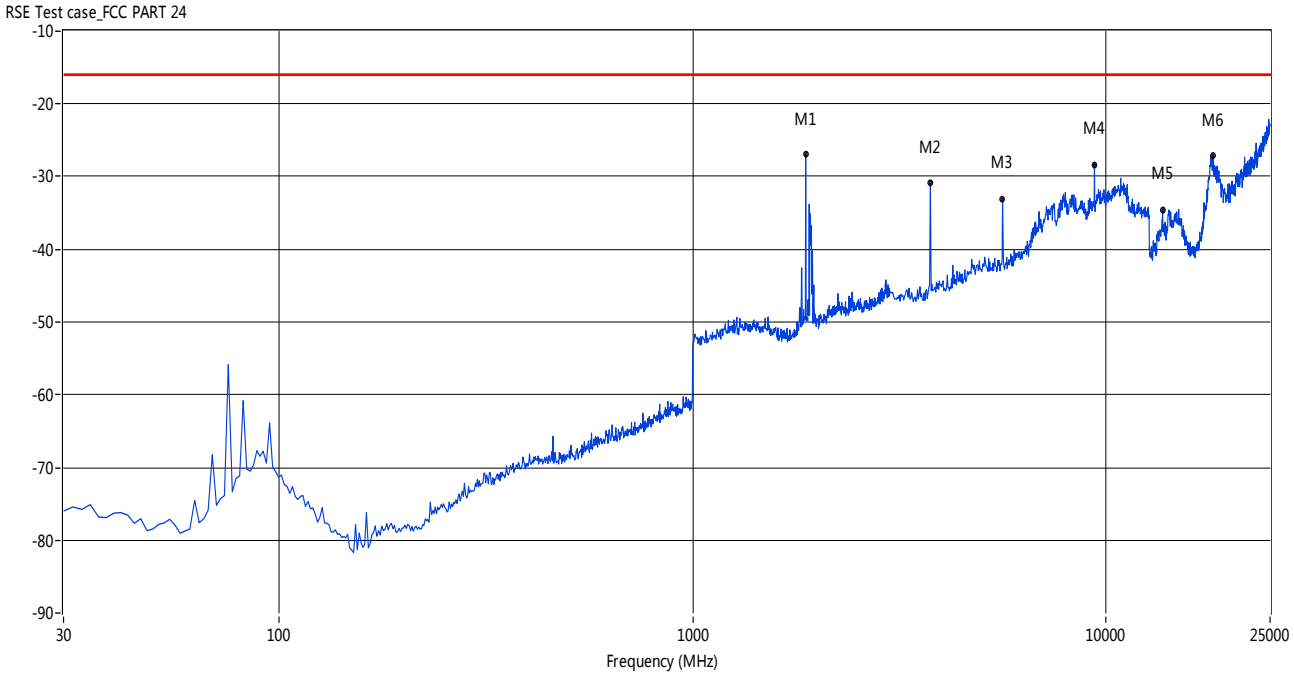
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
1835.27	-37.97	10.27	-16.0	21.97	356.10	Horizontal	Pass
3697.59	-30.76	23.12	-16.0	14.76	14.80	Horizontal	Pass
5547.00	-36.99	27.79	-16.0	20.99	146.70	Horizontal	Pass
9245.84	-27.72	35.72	-16.0	11.72	119.30	Horizontal	Pass
11095.26	-27.28	37.60	-16.0	11.28	23.70	Horizontal	Pass
18131.03	-27.73	40.60	-16.0	11.73	360.70	Horizontal	Pass

GSM 1900 MHz CHANNEL 661, ANT V



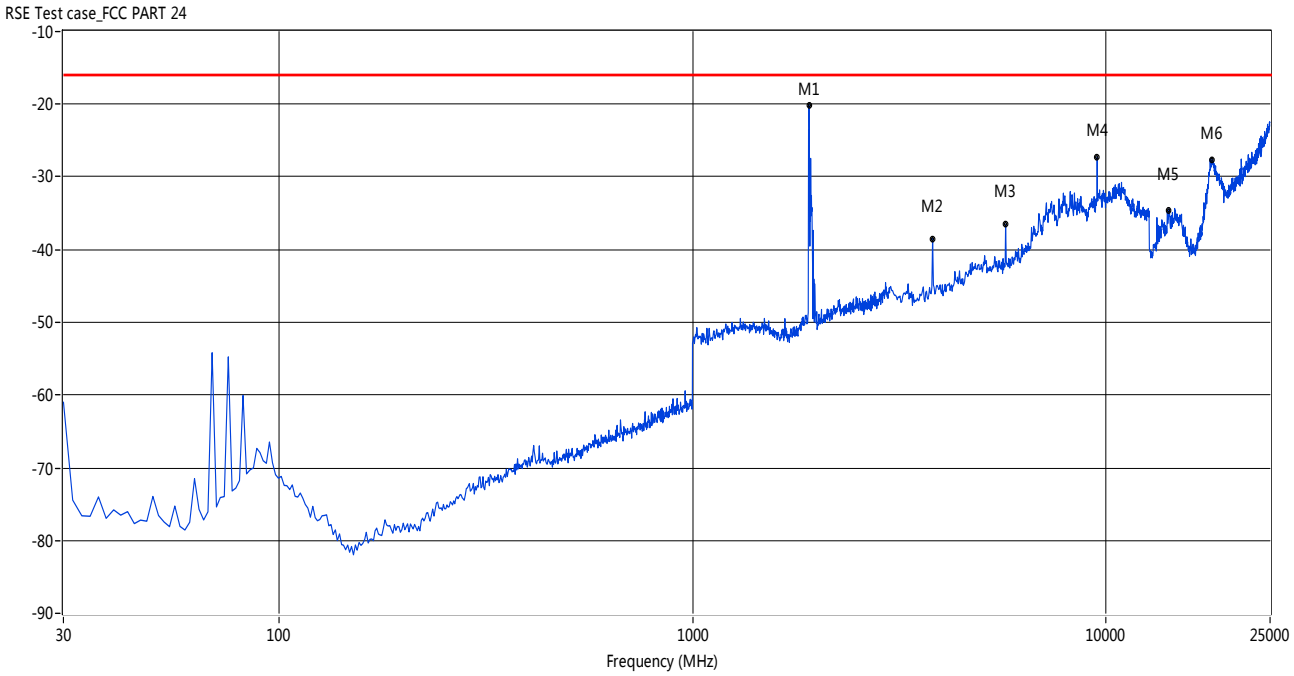
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
75.19	-51.33	-6.94	-16.0	35.33	81.00	Vertical	Pass
1878.54	-29.29	11.47	-16.0	13.29	300.80	Vertical	Pass
3762.48	-31.73	23.30	-16.0	15.73	347.60	Vertical	Pass
5628.12	-35.64	27.79	-16.0	19.64	4.80	Vertical	Pass
9391.85	-27.16	35.91	-16.0	11.16	360.00	Vertical	Pass
18049.50	-26.77	40.92	-16.0	10.77	315.60	Vertical	Pass

GSM 1900 MHz CHANNEL 661, ANT H



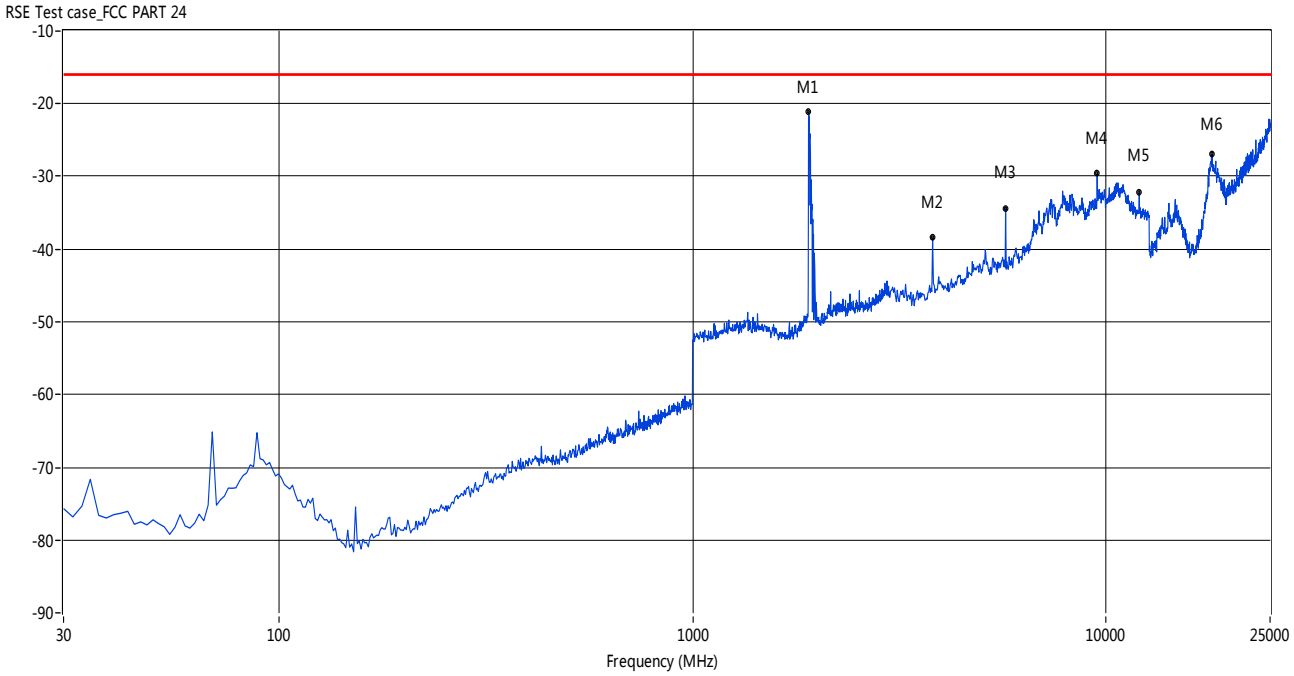
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
1878.54	-26.99	11.47	-16.0	10.99	281.90	Horizontal	Pass
3762.48	-34.83	23.30	-16.0	18.83	37.30	Horizontal	Pass
5628.12	-36.38	27.79	-16.0	20.38	14.80	Horizontal	Pass
9391.85	-28.37	35.91	-16.0	12.37	319.70	Horizontal	Pass
13728.37	-34.60	29.88	-16.0	18.60	283.00	Horizontal	Pass
18212.56	-27.14	40.27	-16.0	11.14	358.60	Horizontal	Pass

GSM 1900 MHz CHANNEL 810 , ANT V



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
1915.14	-20.17	12.17	-16.0	4.17	277.10	Vertical	Pass
3811.15	-38.46	23.49	-16.0	22.46	28.50	Vertical	Pass
5725.46	-36.56	28.14	-16.0	20.56	1.30	Vertical	Pass
9537.85	-27.26	36.78	-16.0	11.26	170.10	Vertical	Pass
14237.94	-34.55	30.70	-16.0	18.55	355.00	Vertical	Pass
18131.03	-27.62	40.60	-16.0	11.62	352.40	Vertical	Pass

GSM 1900 MHz CHANNEL 810 , ANT H

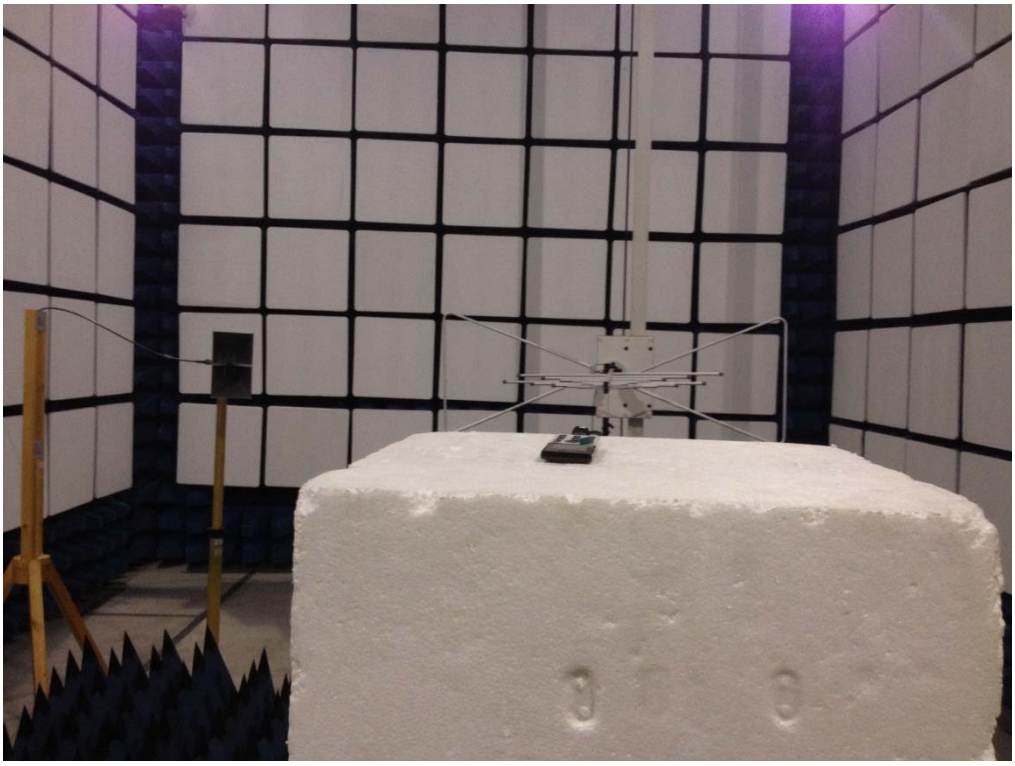


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	Verdict
1908.49	-21.01	12.02	-16.0	5.01	286.70	Horizontal	Pass
3811.15	-38.41	23.49	-16.0	22.41	157.20	Horizontal	Pass
5725.46	-34.42	28.14	-16.0	18.42	298.90	Horizontal	Pass
9537.85	-29.58	36.78	-16.0	13.58	312.60	Horizontal	Pass
12052.41	-32.11	34.76	-16.0	16.11	216.60	Horizontal	Pass
18090.27	-26.93	40.76	-16.0	10.93	360.70	Horizontal	Pass

ANNEX B TEST SETUP PHOTOS

B.1. Conducted Test Photo

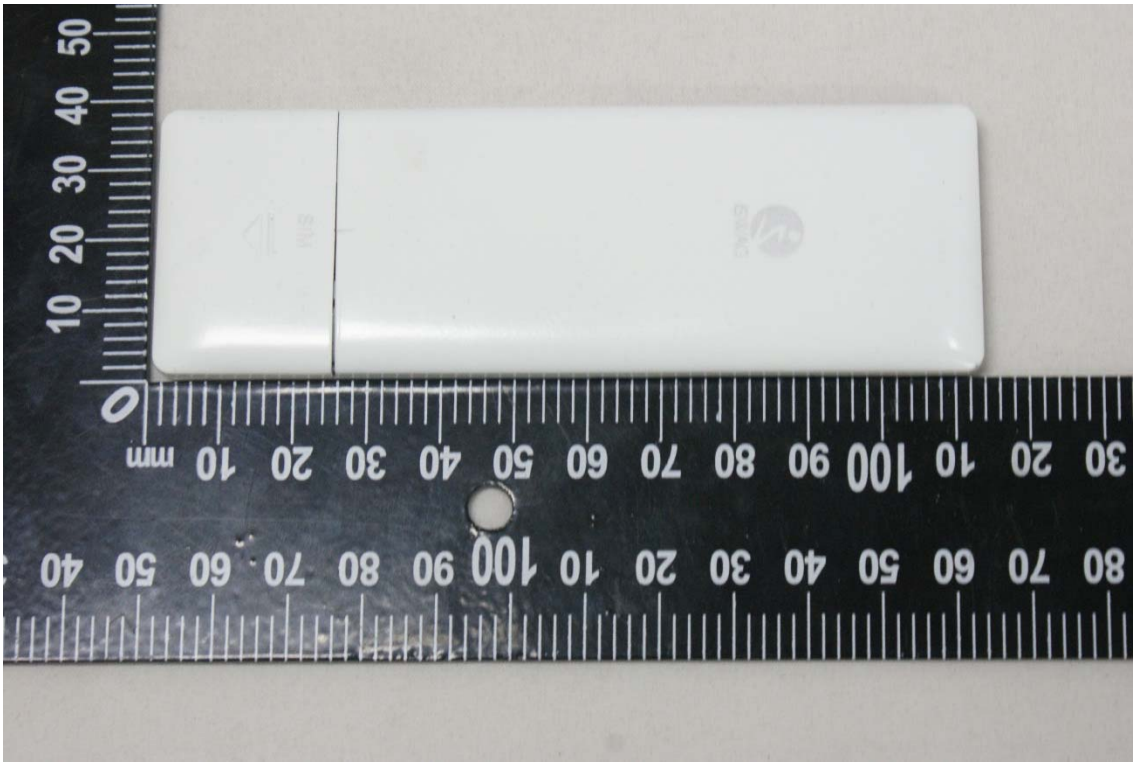
B.2. Radiated Test Photo



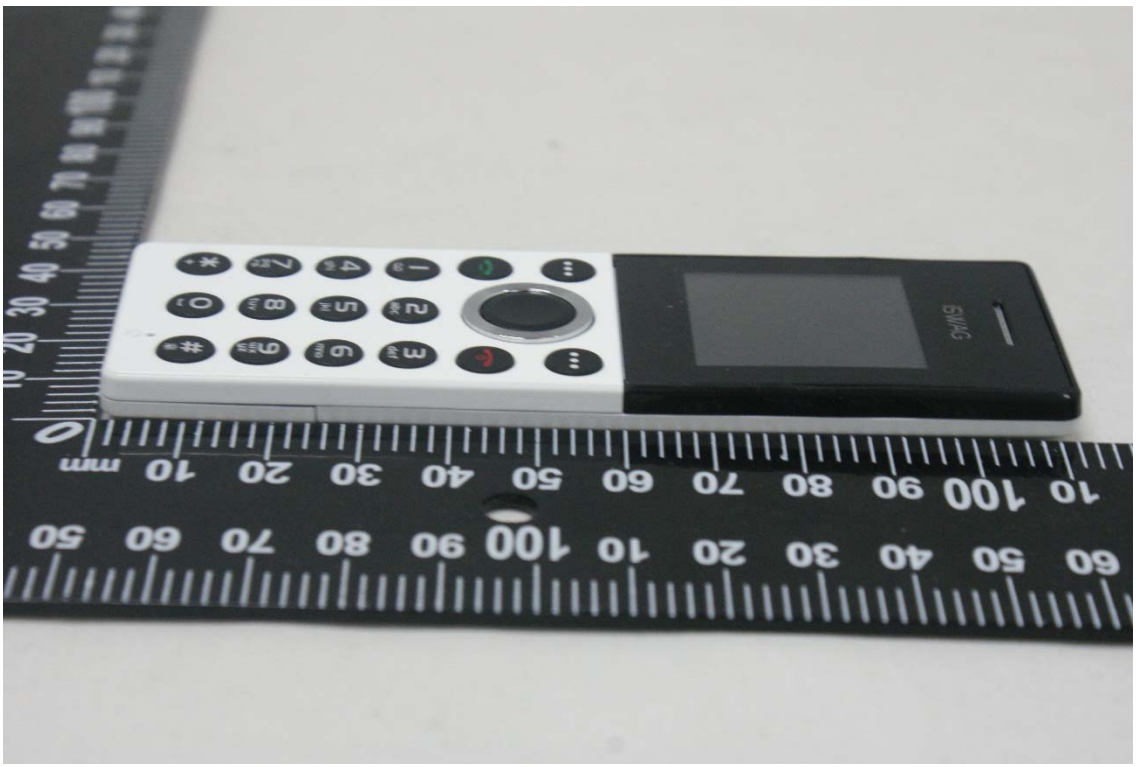
ANNEX C TEST SETUP PHOTOS

C.1 Appearance of the EUT

THE FRONT OF EUT

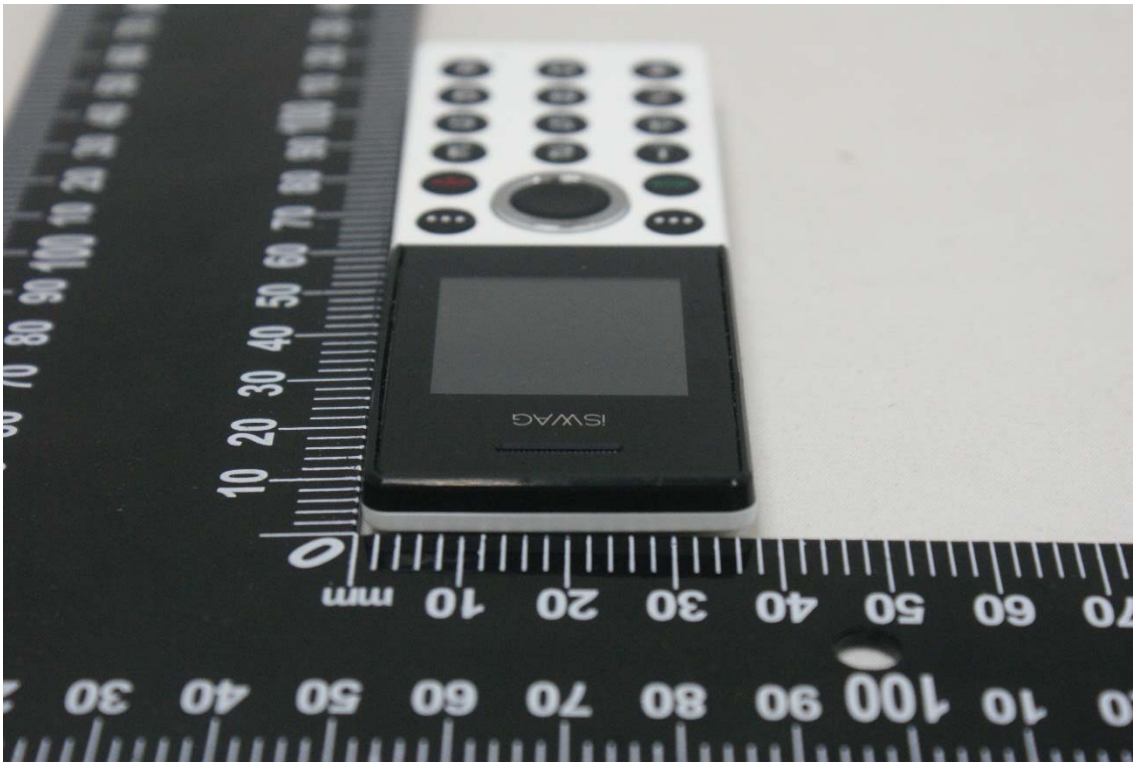


THE BACK OF EUT

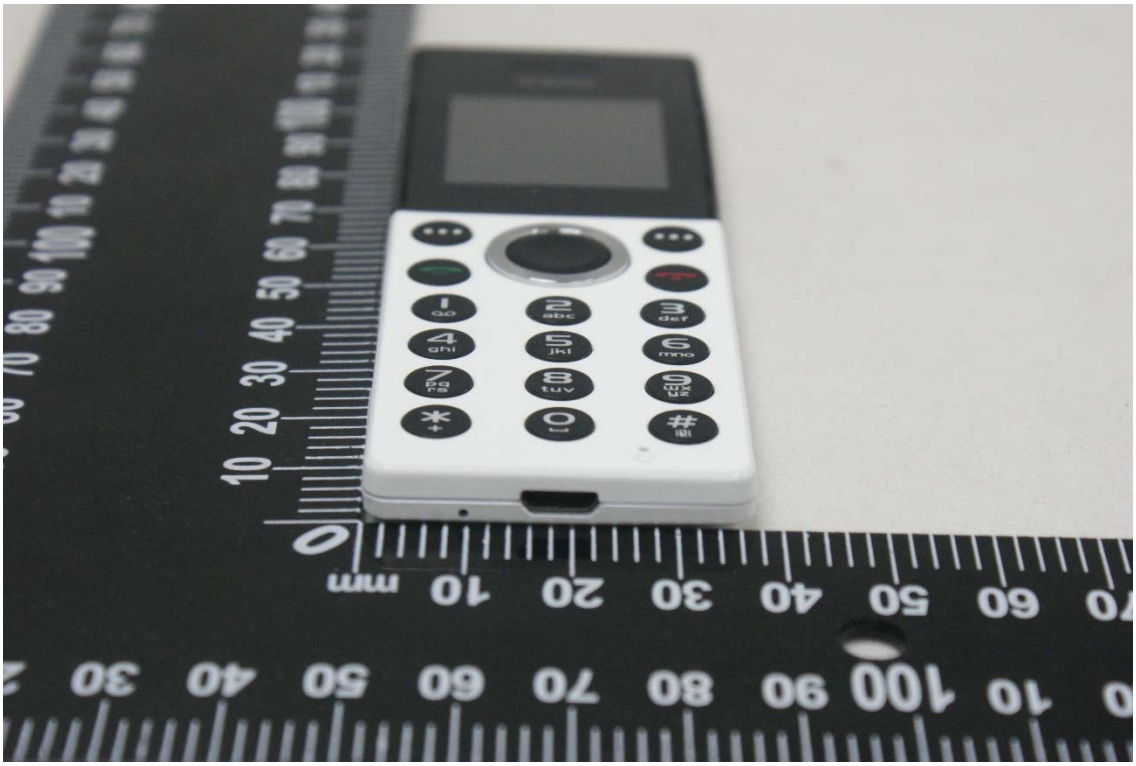


THE LEFT OF EUT

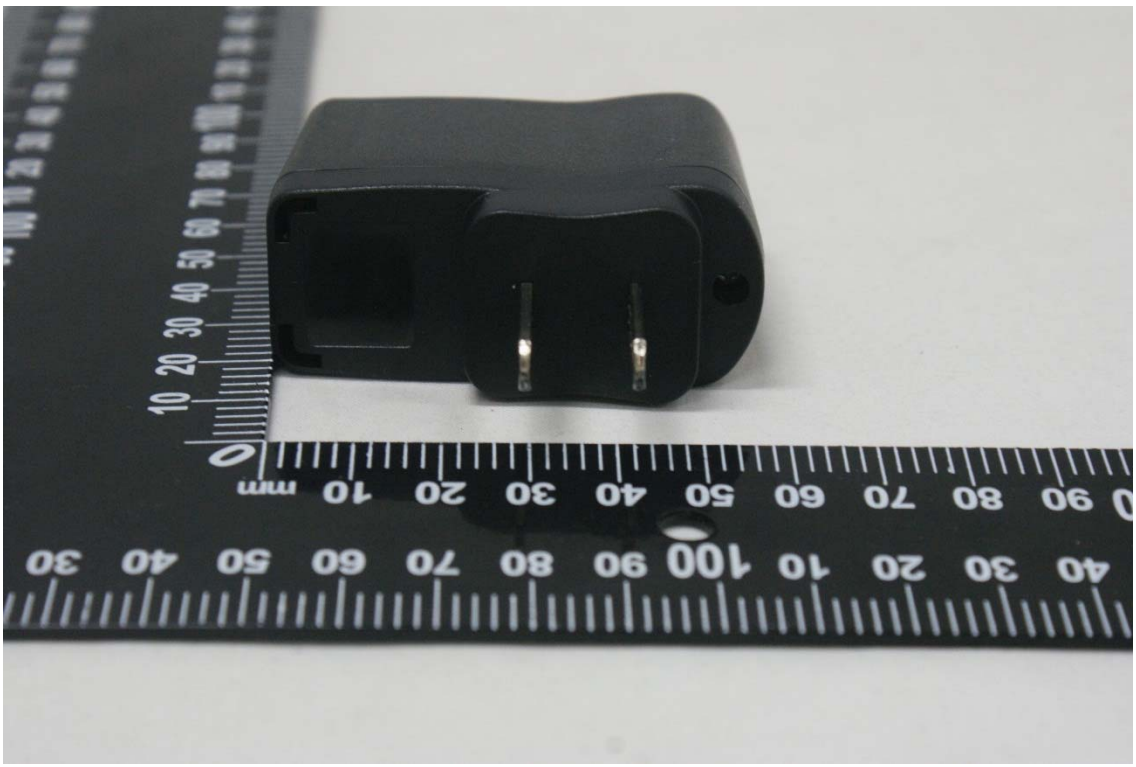
THE RIGHT OF EUT



THE UP OF EUT



THE DOWN OF EUT

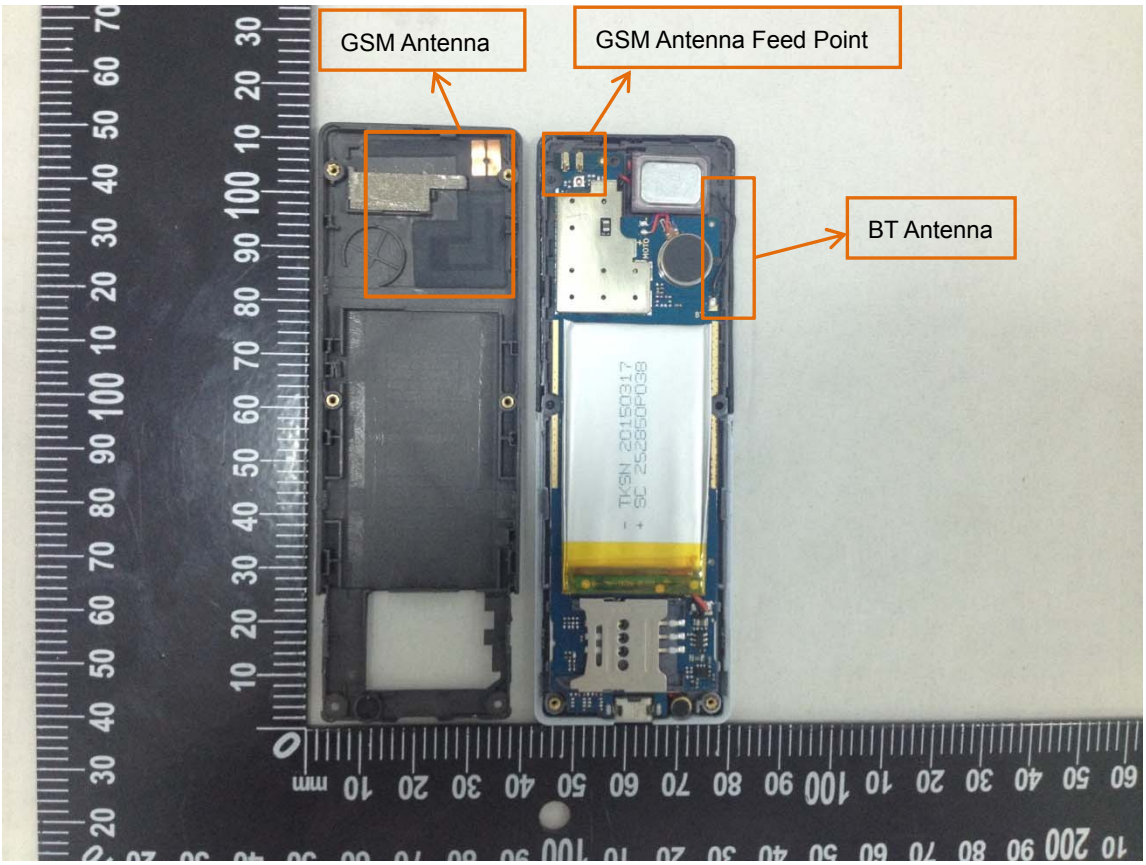


CHARGER

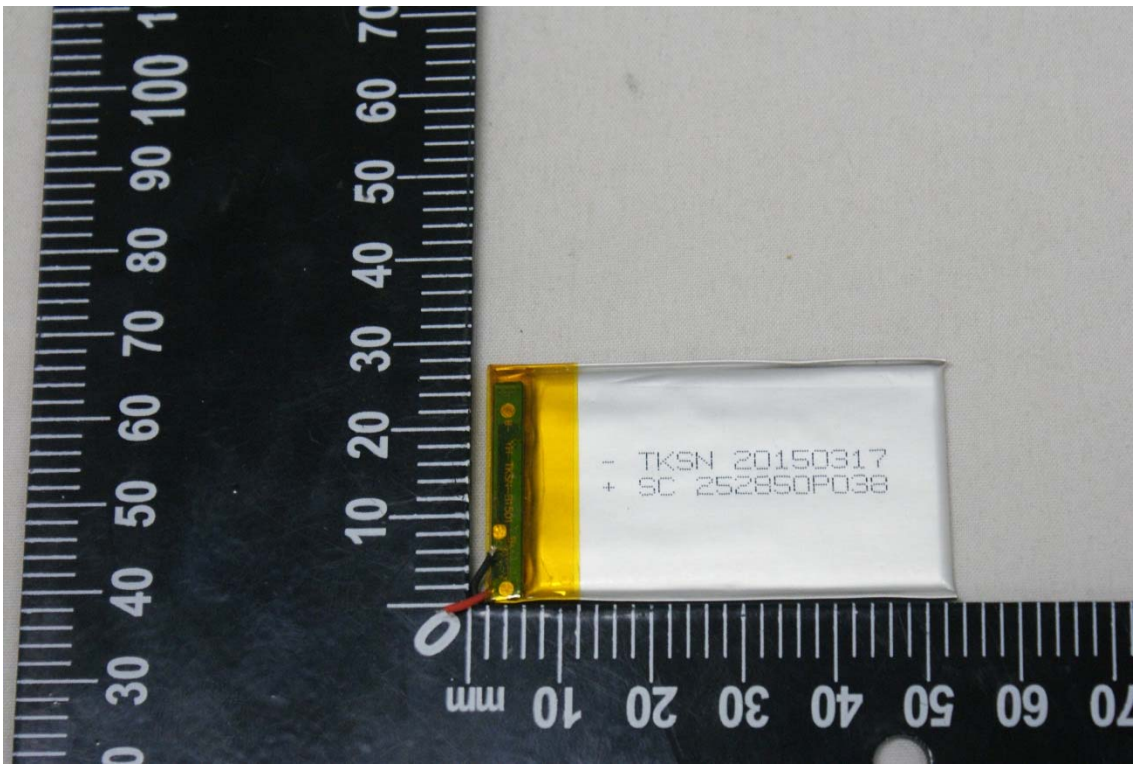
USB CABLE

C.2 Inside of the EUT

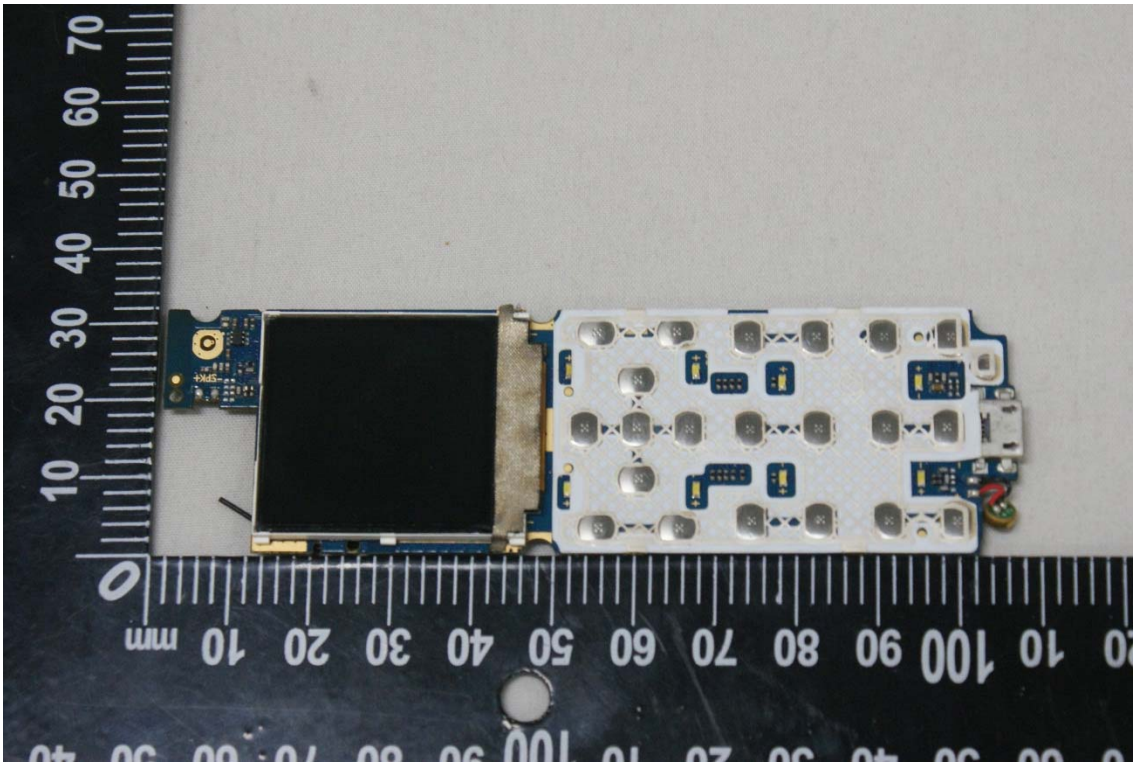
EUT UNCOVER VIEW 1



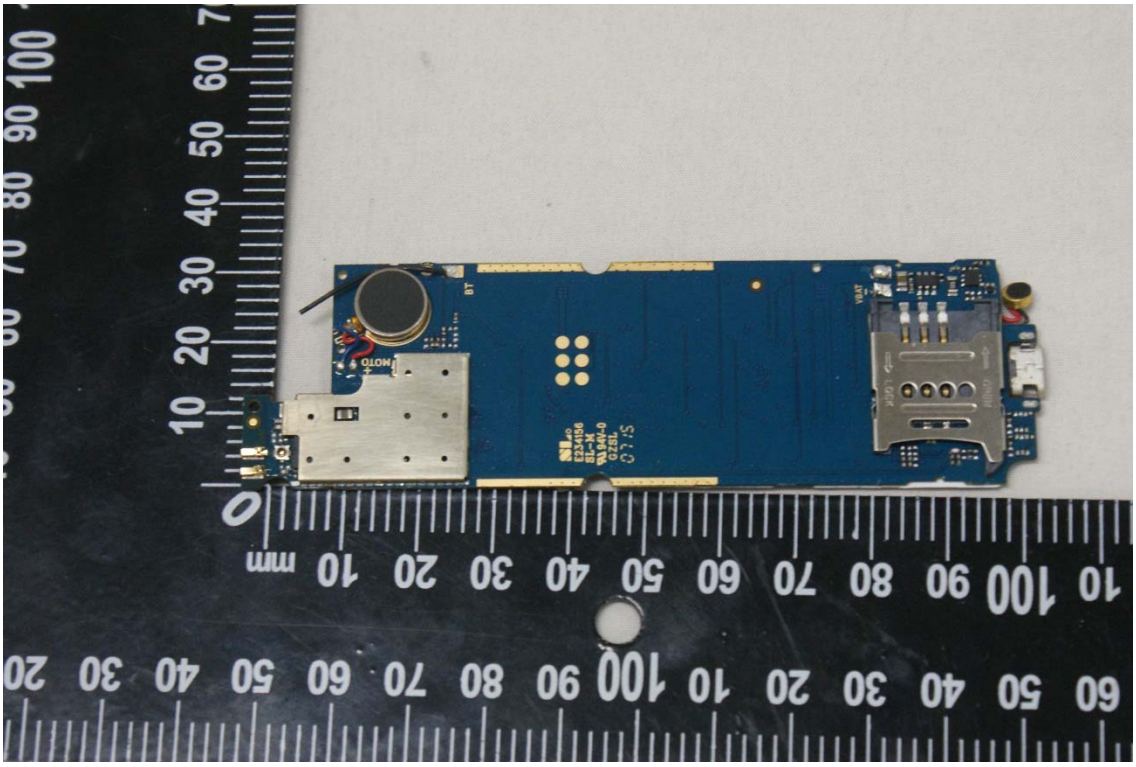
EUT UNCOVER VIEW 2



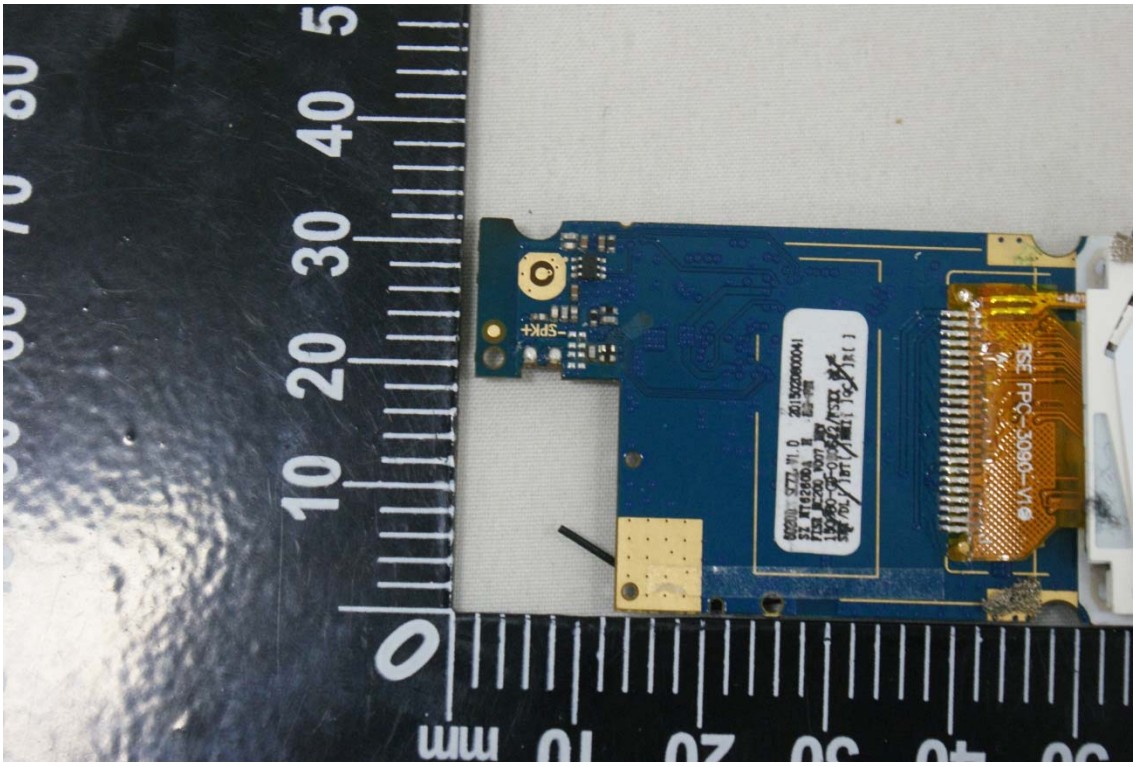
BATTERY



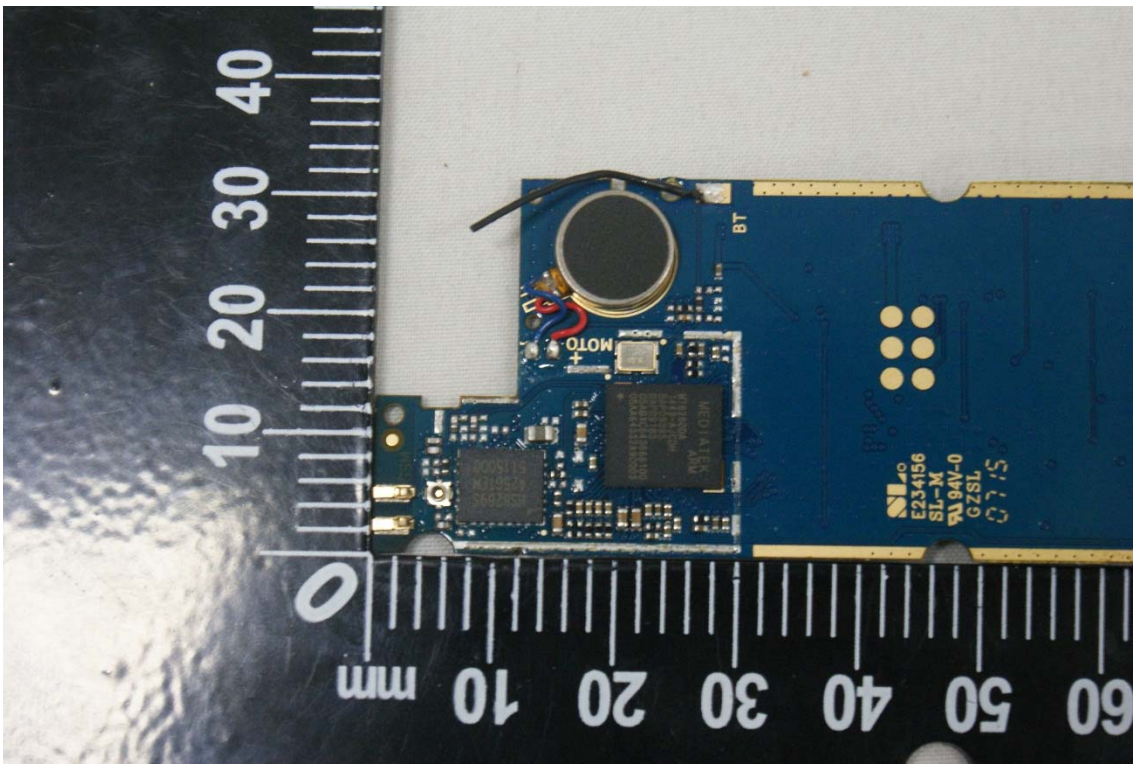
MAIN BOARD TOP VIEW 1



MAIN BOARD BACK VIEW 1



MAIN BOARD TOP VIEW 2



MAIN BOARD BACK VIEW 2

--END OF REPORT--