



# FCC RF Test Report

**APPLICANT** : Sony Mobile Communications AB  
**EQUIPMENT** : Smart phone  
**BRAND NAME** : Sony  
**MODEL NAME** : C2305  
**TYPE NAME** : PM-0570-BV  
**FCC ID** : PY7PM-0570  
**STANDARD** : FCC 47 CFR Part 2, 24(E)  
**CLASSIFICATION** : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Apr. 25, 2013 and completely tested on May 07, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

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FCC ID : PY7PM-0570

Page Number : 1 of 61

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### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	RESULT (PASS/FAIL)	Remark
3.1	§2.1046	Conducted Output Power	N/A	PASS	-
3.2	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.4	§2.1049 §24.238(b)	99% Occupied Bandwidth and 26dB Bandwidth Measurement	N/A	PASS	-
3.5	§2.1051 §24.238(a)	Band Edge Measurement	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	-
3.6	§2.1051 §24.238(a)	Conducted Spurious Emission	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	-
3.7	§2.1053 §24.238(a)	Field Strength of Spurious Radiation	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	Under limit 25.89 dB at 7400.000 MHz
3.8	§2.1055 §24.235	Frequency Stability Measurement	< 2.5 ppm	PASS	-



# 1 General Description

## 1.1 Applicant

Sony Mobile Communications AB  
Nya Vattentorget, 22188 Lund, Sweden

## 1.2 Manufacturer

Arima Communications Corp.  
6F., No. 866, Jhongjheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

## 1.3 Feature of Equipment Under Test

The Equipment Under Test (hereafter called: EUT) is smart phone supporting, GSM / WCDMA / Wi-Fi 2.4GHz 802.11b/g/n, Bluetooth with FM Receiver, and GPS features, and below is details of information.

General Information of Equipment Under Test	
Equipment	Smart phone
Brand Name	Sony
Model Name	C2305
Type Name	PM-0570-BV
FCC ID	PY7PM-0570
GSM Operating Band(s)	GSM 900/1800/1900MHz
WCDMA Operating Band(s)	FDD Band I / VIII
WCDMA Rel. Version	Rel. 8
GPRS / EGPRS Multi Slot Class	GPRS Class 12 , EGPRS Class 12
Wi-Fi Specification	802.11b/g/n (HT20/HT40)
Bluetooth Version	V2.1 + EDR / V3.0 / V4.0LE
Power Supply	Battery / AC Adapter / Car Charger

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

### 1.4 Details of Tested Sample (EUT) Information

Product Specification subjective to this standard	
Transmitter Frequency Range	1850.2 MHz ~ 1909.8MHz
Receiver Frequency Range	1930.2 MHz ~ 1989.8 MHz
Maximum Output Power to Antenna	29.95 dBm
Antenna Type / Gain	IFA Antenna / 0.88 dBi
Type of Modulation	GSM/GPRS : GMSK EGPRS : GSMK for MCS 0 ~ 4 / 8PSK for MCS5 ~9
EUT # 1	IMEI : 004402146642040 S/N : WUJ01319EH
H/W :	AP
S/W :	16.0.A.0.14
EUT Stage	Production Unit

Accessory List	
AC Adapter	Model No. : EP800
	Type No. : AC-0300-CN
Battery	Model No. : N/A
Earphone	Model No. : MH410c
	Type No. : AG-1100
USB Cable	Model No. : EC450
	Part No. : 1242-6715.2

**Note:**

1. Above EUT list and accessory list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report.
3. No modifications are made to the EUT during all test items.
4. For other wireless features of this EUT, test report will be issued separately.

### 1.5 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (% , Hz, ppm)	Emission Designator
Part 24	GSM1900 GSM	GMSK	1.1695	0.01 ppm	252KGXW
Part 24	GSM1900 EDGE Class 10	8PSK	0.7674	0.02 ppm	248KG7W

### 1.6 Testing Facility

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	TH02-HY	03CH07HY	722060/4086B-1

### 1.7 Applied Standards

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

- ♦ FCC 47 CFR Part 2, 24(E)
- ♦ ANSI / TIA / EIA-603-C-2004

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

## 2 Test Configuration of Equipment Under Test

### 2.1 Descriptions of Test Mode

- a. Preliminary tests were performed in different radio applications and recorded the RF output power in the following table:

Conducted Power (*Unit: dBm)			
Band	GSM1900		
Channel	512	661	810
Frequency	1850.2	1880.0	1909.8
GSM	29.95	29.94	29.90
GPRS class 8	29.94	29.93	29.90
GPRS class 10	28.78	28.77	28.74
GPRS class 11	26.80	26.79	26.75
GPRS class 12	26.03	26.01	26.00
EGPRS class 8	26.12	26.03	26.02
EGPRS class 10	26.14	26.08	26.06
EGPRS class 11	23.27	23.17	23.13
EGPRS class 12	22.20	22.10	22.04

- b. 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 X, Y, Z in three orthogonal panels to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

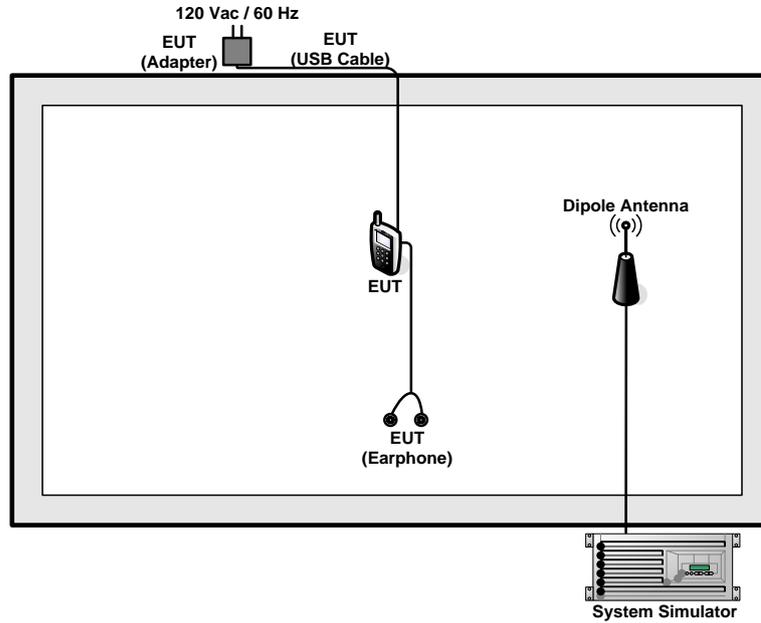
- 30 MHz to 19000 MHz for GSM1900.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 1900	<ul style="list-style-type: none"> <li>■ GSM Link</li> <li>■ EDGE Class 10 Link</li> </ul>	<ul style="list-style-type: none"> <li>■ GSM Link</li> <li>■ EDGE Class 10 Link</li> </ul>

**Note:**

- The maximum power level of GMSK modulation is 1-slot GSM/GPRS mode, 8PSK modulation is 2-slot (multi-slot class 10) EDGE mode among GSM, EDGE. All of all modes evaluated in report are demonstrated in compliance with FCC test standard.
- Because there are individual antennas for each WWAN, WLAN, and Bluetooth, the co-location test modes are not required.

## 2.2 Connection Diagram of EUT Test Configurations



## 2.3 Supported Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU200	N/A	N/A	Unshielded, 1.8 m



## **2.4 Measurement Results Explanation Example**

**For all conducted test items:**

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

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

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.2 + 10 = 14.2 \text{ (dB)} \end{aligned}$$

### 3 Test Result

#### 3.1 Conducted Output Power Measurement

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

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

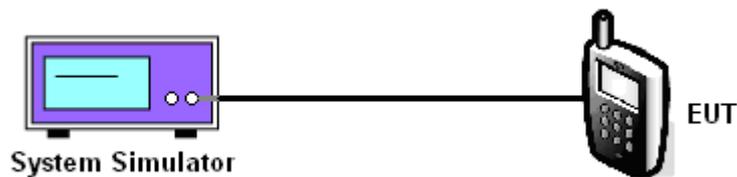
##### 3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

##### 3.1.4 Test Setup





3.1.5 Test Result of Conducted Output Power

PCS Band						
Modes	GSM1900 (GSM)			GSM1900 (EDGE Class 10)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
Conducted Power (dBm)	29.95	29.94	29.90	26.14	26.08	26.06
Conducted Power (Watts)	0.99	0.99	0.98	0.41	0.41	0.40

Note: maximum burst average power for GSM.



## **3.2 Peak-to-Average Ratio**

### **3.2.1 Description of the PAR Measurement**

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

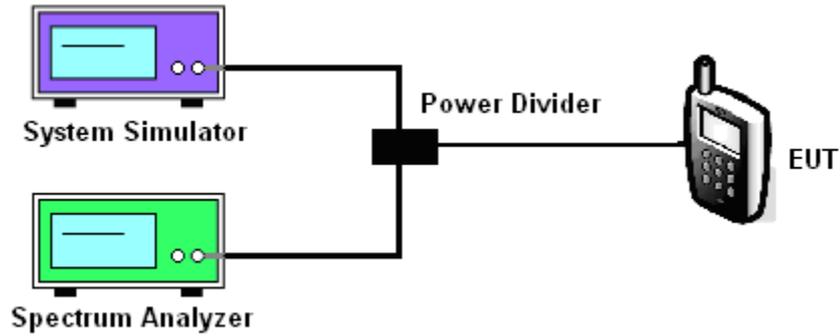
### **3.2.2 Measuring Instruments**

The section 4.0 of List of Measuring Equipment of this test report is used for test.

### **3.2.3 Test Procedures**

1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. For GSM/EGPRS operating modes:
  - a. Set EUT in maximum power output.
  - b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector in spectrum analyzer for first trace.
  - c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector in spectrum analyzer for second trace.
  - d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator synchronized with the spectrum analyzer.
3. For UMTS operating modes:
  - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
  - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak-to-Average Ratio

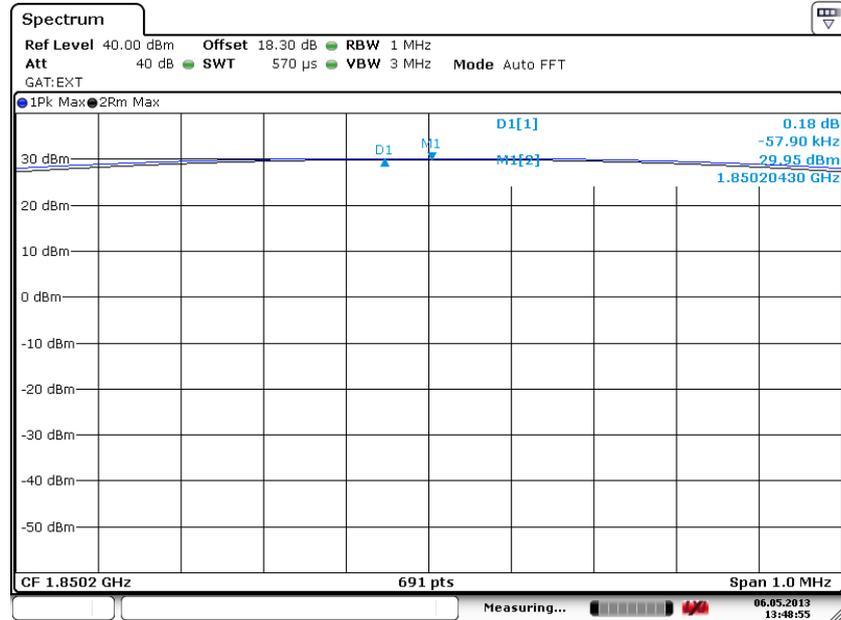
PCS Band						
Modes	GSM1900 (GSM)			GSM1900 (EDGE Class 10)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
Peak-to-Average Ratio (dB)	0.18	0.19	0.19	2.67	2.82	2.65



3.2.6 Test Result (Plots) of Peak-to-Average Ratio

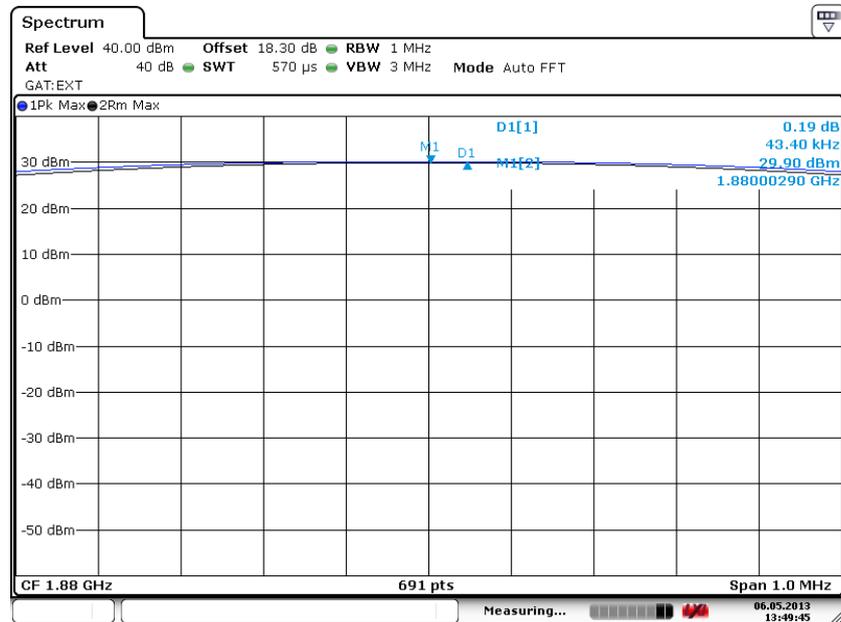
Band :	GSM 1900	Test Mode :	GSM Link (GMSK)
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Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



Date: 6.MAY.2013 13:48:56

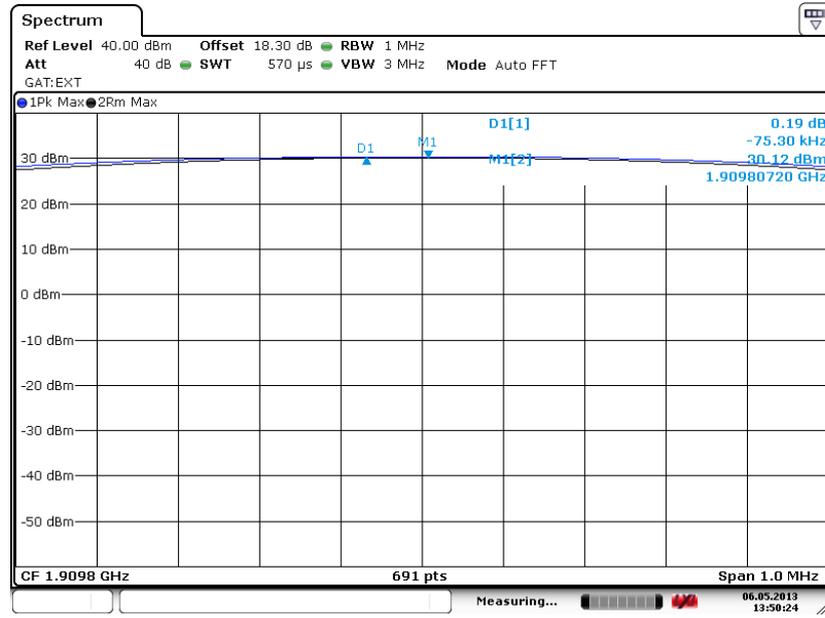
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 6.MAY.2013 13:49:45



Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



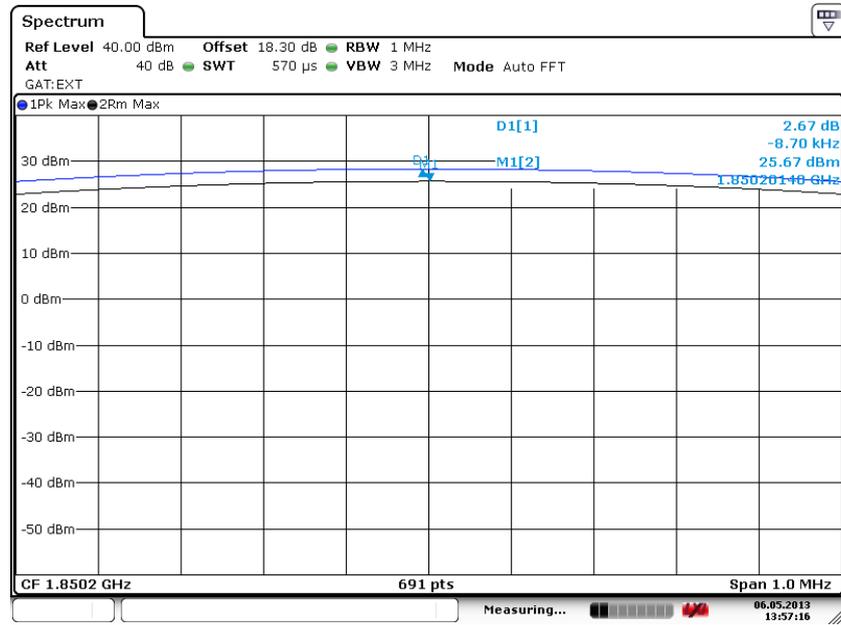
Date: 6.MAY.2013 13:50:24

**Note:** The total loss is 18.30 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.



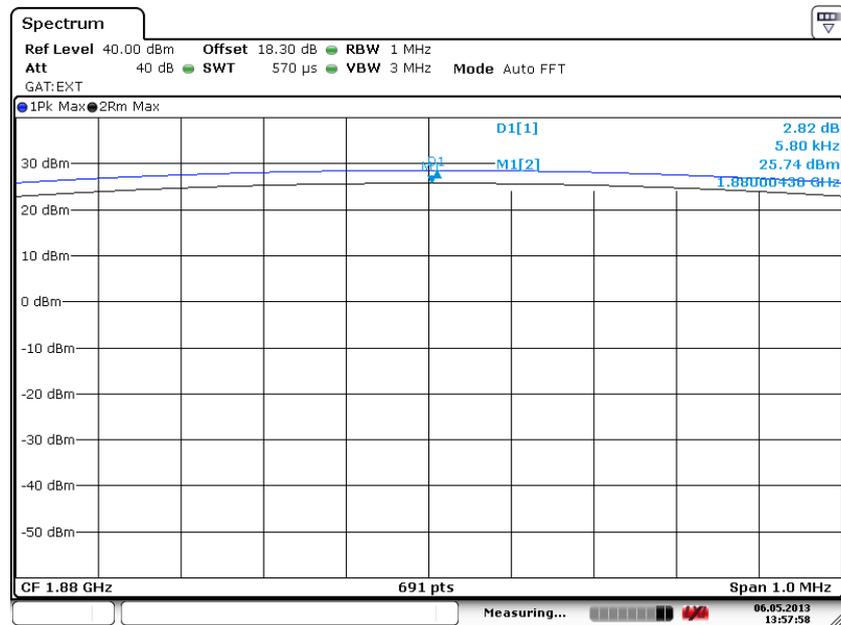
<b>Band :</b>	GSM 1900	<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)
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Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



Date: 6.MAY.2013 13:57:16

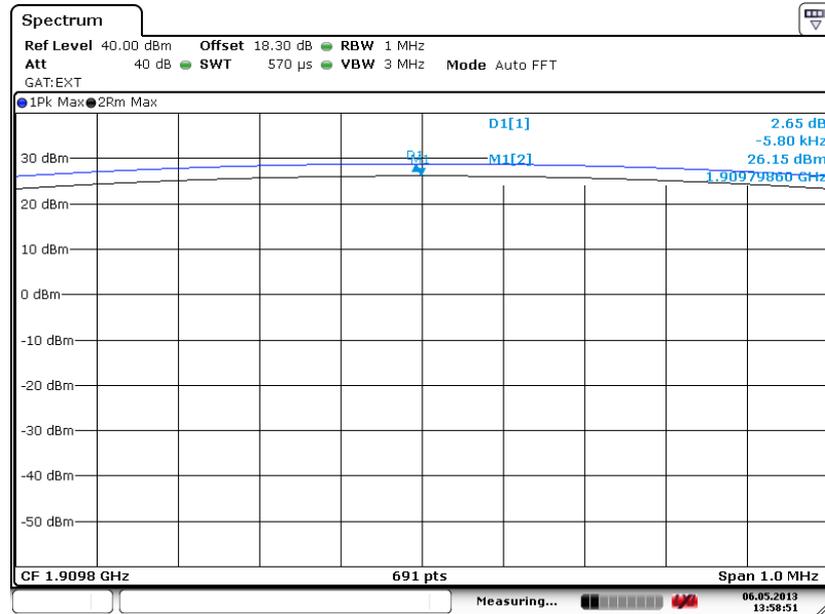
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 6.MAY.2013 13:57:59



Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



Date: 6.MAY.2013 13:58:51

**Note:** The total loss is 18.30 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.



### 3.3 Effective Isotropic Radiated Power Measurement

#### 3.3.1 Description of the EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for EIRP measurement. The EIRP of mobile transmitters are limited to 2 Watts.

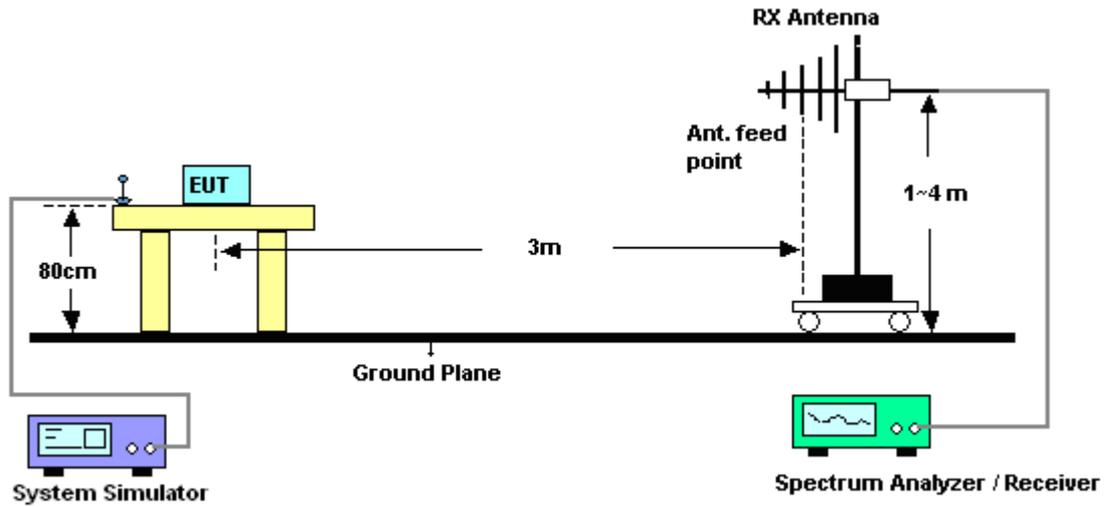
#### 3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

#### 3.3.3 Test Procedures

1. The EUT was placed on a non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 1MHz, VBW= 3MHz for GSM, and RMS detector.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and  $ERP = EIRP - 2.15$ .

### 3.3.4 Test Setup



3.3.5 Test Result of EIRP

GSM1900 (GSM) Radiated Power EIRP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-14.04	43.69	29.65	0.9226
1880.0	-14.11	44.79	30.68	1.1695
1909.8	-14.49	43.59	29.10	0.8128
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-17.59	45.72	28.13	0.6501
1880.0	-16.97	46.78	29.81	0.9572
1909.8	-16.77	46.77	30.00	1.0000

\* EIRP = LVL (dBm) + Correction Factor (dB)

GSM1900 (EDGE Class 10) Radiated Power EIRP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-17.29	43.69	26.40	0.4365
1880.0	-15.94	44.79	28.85	0.7674
1909.8	-17.08	43.59	26.51	0.4477
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-18.75	45.72	26.97	0.4977
1880.0	-18.86	46.78	27.92	0.6194
1909.8	-18.88	46.77	27.89	0.6152

\* EIRP = LVL (dBm) + Correction Factor (dB)

## 3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

### 3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

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

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

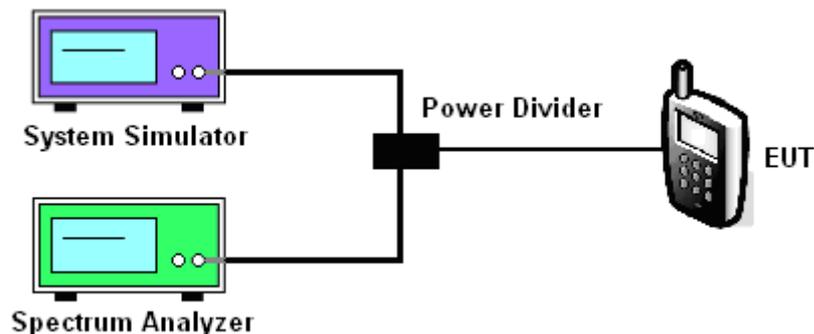
### 3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

### 3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth and 26 dB bandwidth of the middle channel for the highest RF powers were measured.

### 3.4.4 Test Setup





3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

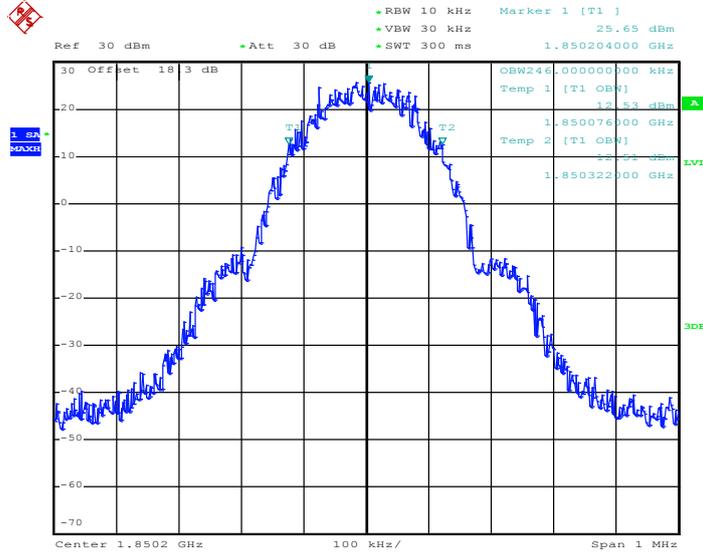
PCS Band						
Modes	GSM1900 (GSM)			GSM1900 (EDGE Class 10)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
99% OBW (KHz)	246.00	252.00	248.00	248.00	248.00	244.00
26dB BW (KHz)	312.00	312.00	302.00	312.00	306.00	310.00



### 3.4.6 Test Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

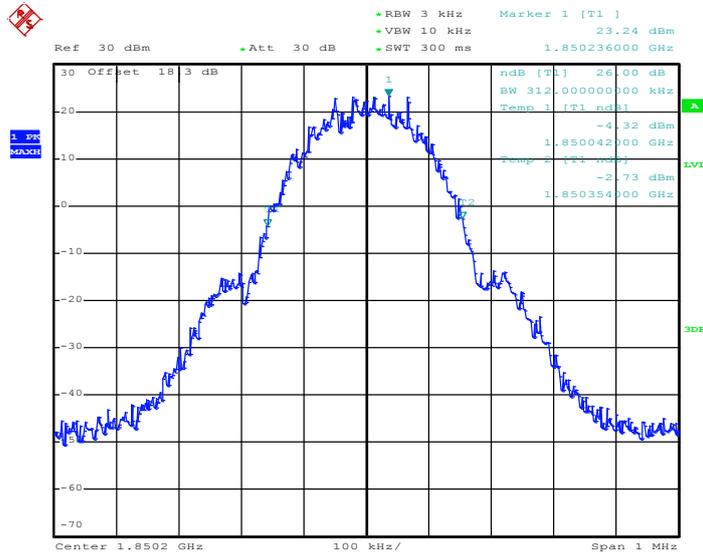
<b>Band :</b>	GSM 1900	<b>Test Mode :</b>	GSM Link (GMSK)
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99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 6.MAY.2013 10:24:03

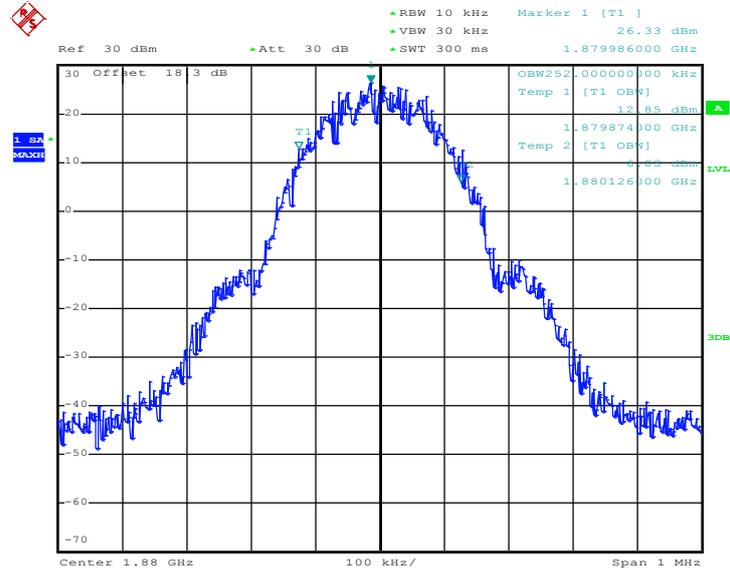
26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 6.MAY.2013 10:22:44

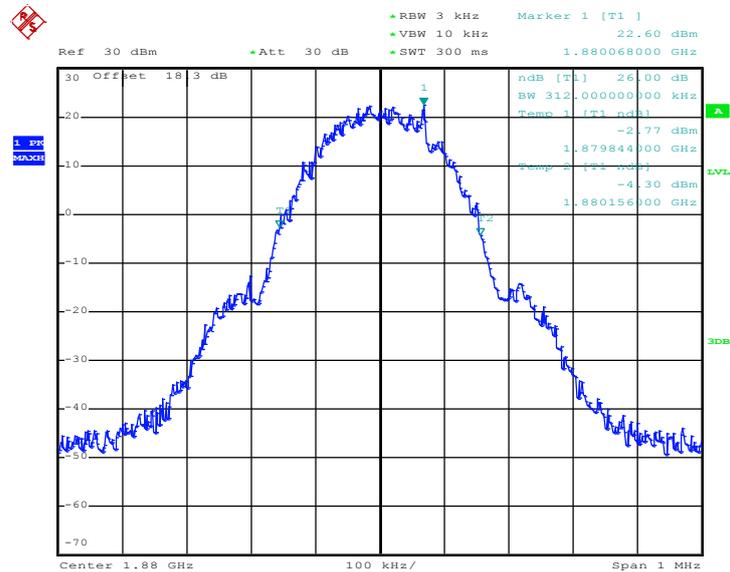


99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 6.MAY.2013 10:24:29

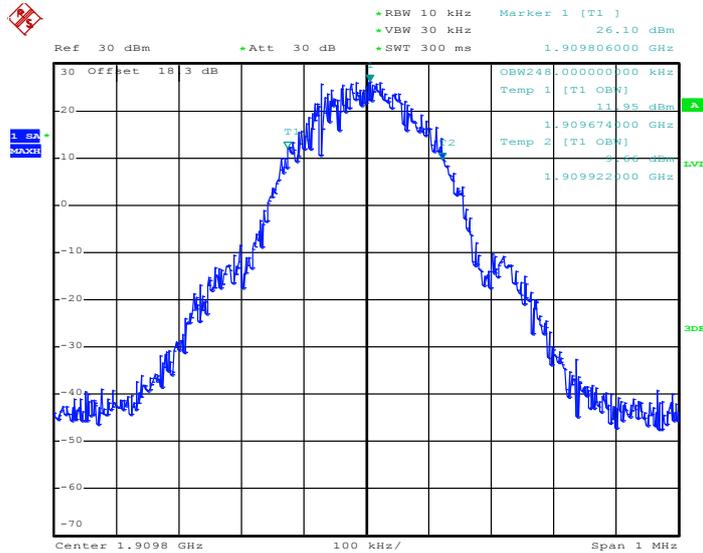
26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 6.MAY.2013 10:23:10

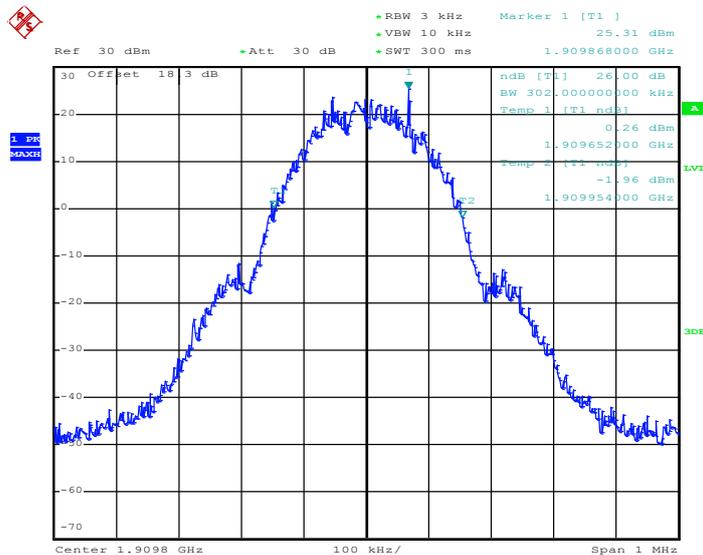


99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 6.MAY.2013 10:24:55

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



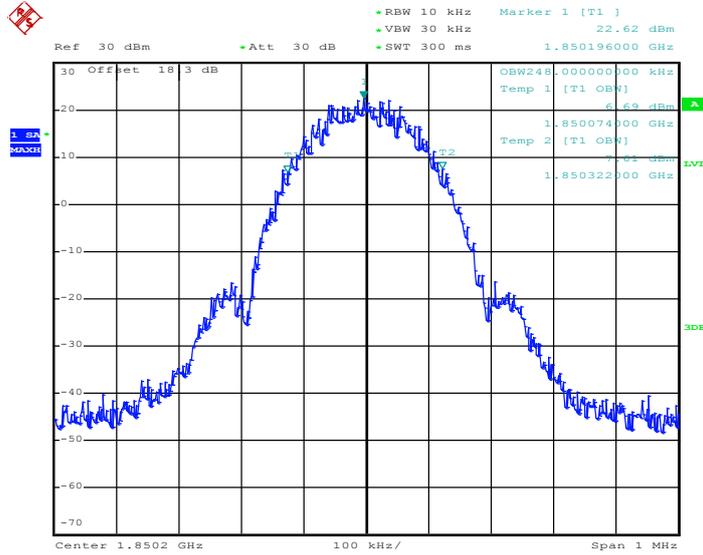
Date: 6.MAY.2013 10:23:36

**Note:** The total loss is 18.3 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.



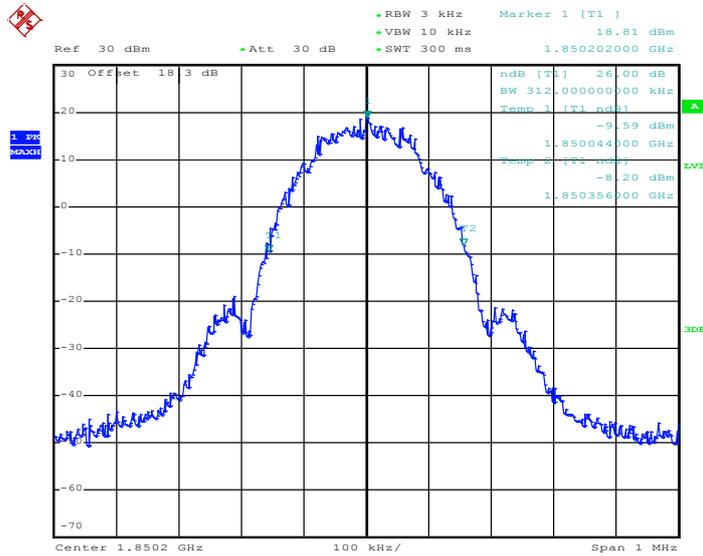
<b>Band :</b>	GSM 1900	<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)
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99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 6.MAY.2013 10:51:53

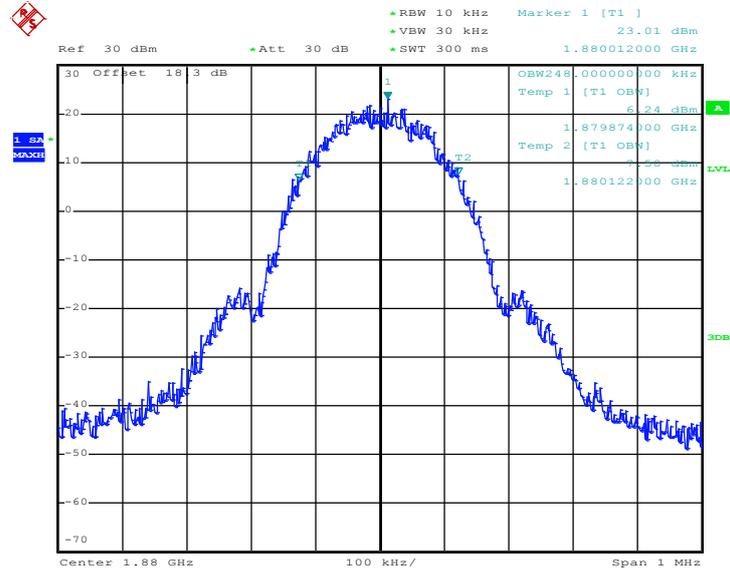
26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 6.MAY.2013 10:50:34

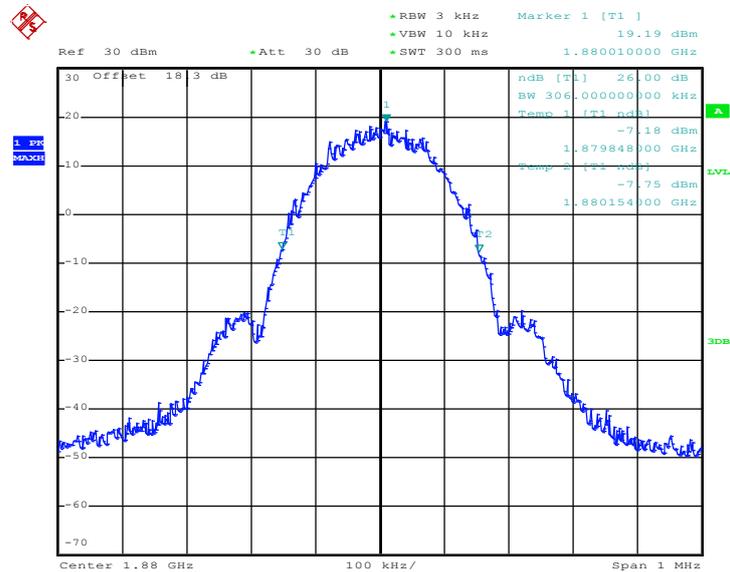


99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 6.MAY.2013 10:52:19

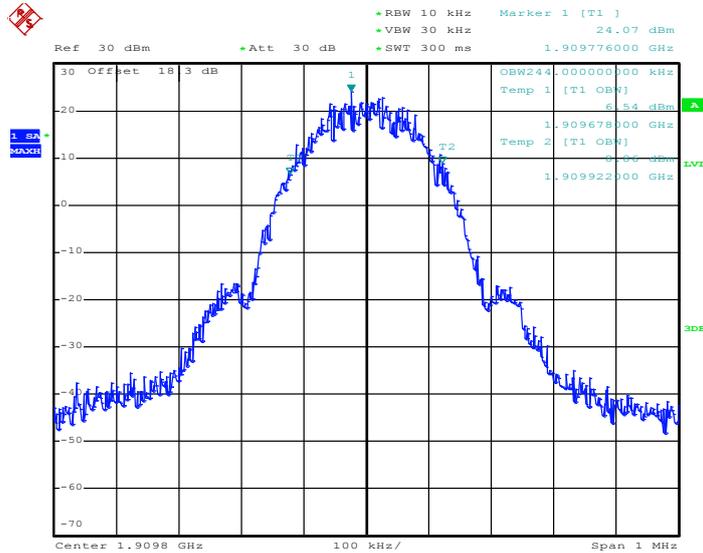
26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 6.MAY.2013 10:51:01

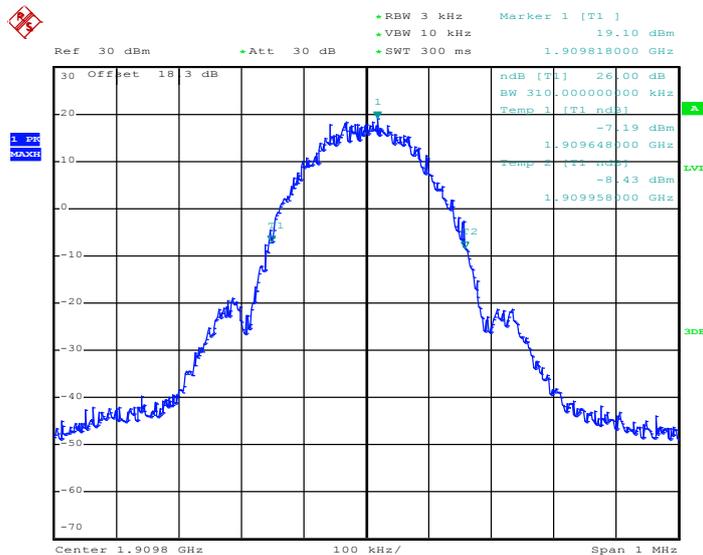


99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 6.MAY.2013 10:52:45

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 6.MAY.2013 10:51:27

Note: The total loss is 18.3 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

## 3.5 Band Edge Measurement

### 3.5.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

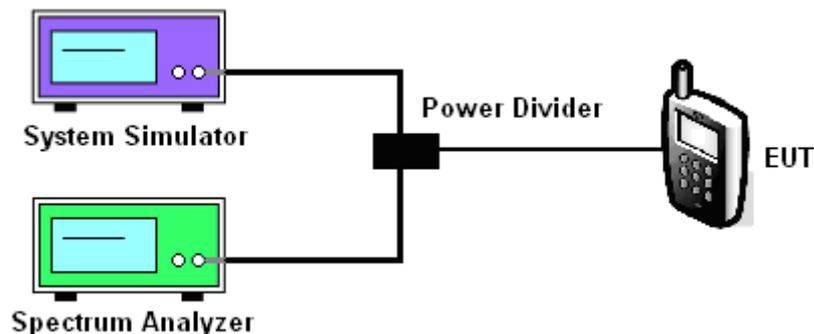
### 3.5.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

### 3.5.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly  $BW/100$ .
4. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)]$  (dB)  
 $= [30 + 10\log(P)]$  (dBm) -  $[43 + 10\log(P)]$  (dB)  
 $= -13\text{dBm}$ .

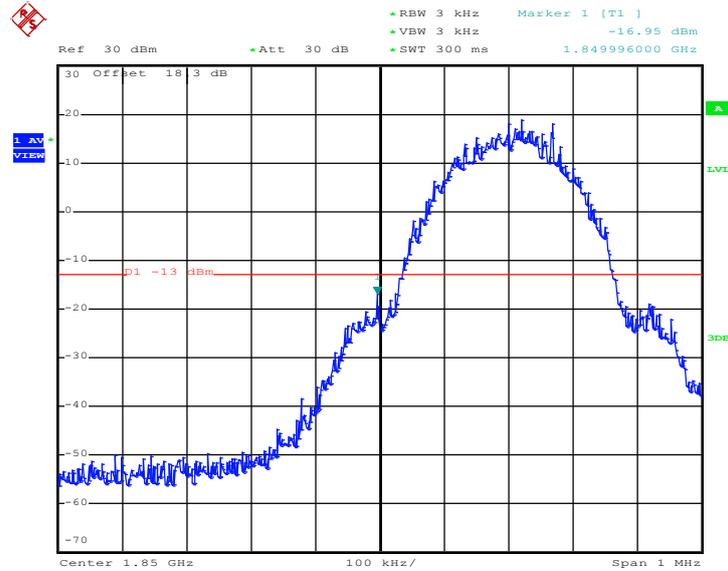
### 3.5.4 Test Setup



### 3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM1900	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-16.78dBm	Measurement Value :	-16.95dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



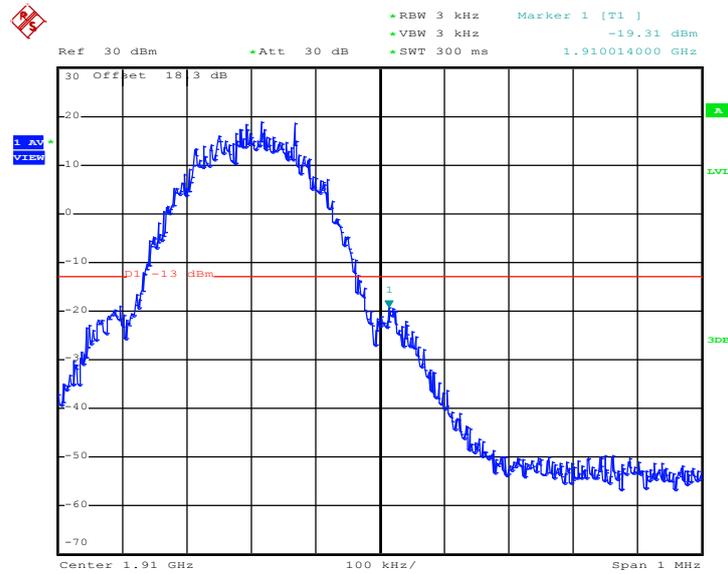
Date: 6.MAY.2013 10:27:48

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)
3. Band Edge= Measurement Value + Correction Factor(dB)  
For example,  $-16.95\text{dBm} + 0.17\text{dB} = -16.78\text{dBm}$
4. The total loss is 18.3 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.



Band :	GSM1900	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-19.14dBm	Measurement Value :	-19.31dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



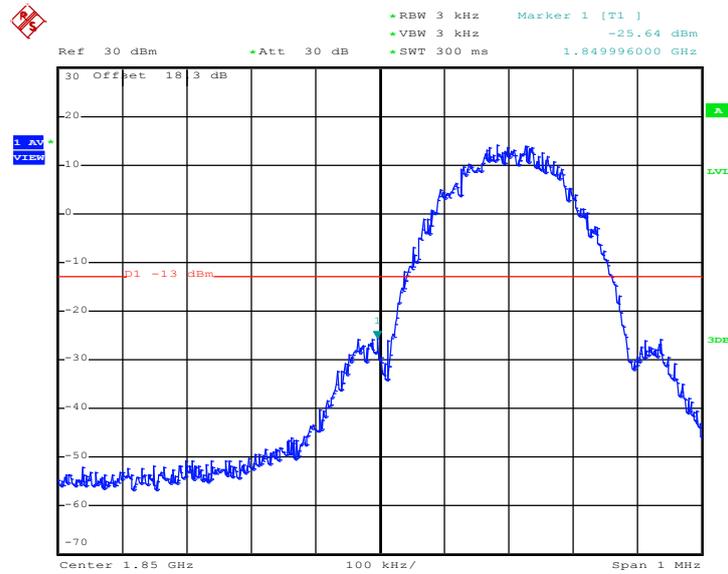
Date: 6.MAY.2013 10:28:14

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)
3. The total loss is 18.3 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.



Band :	GSM1900	Test Mode :	EDGE Class 10 Link (8PSK)
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-25.47dBm	Measurement Value :	-25.64dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



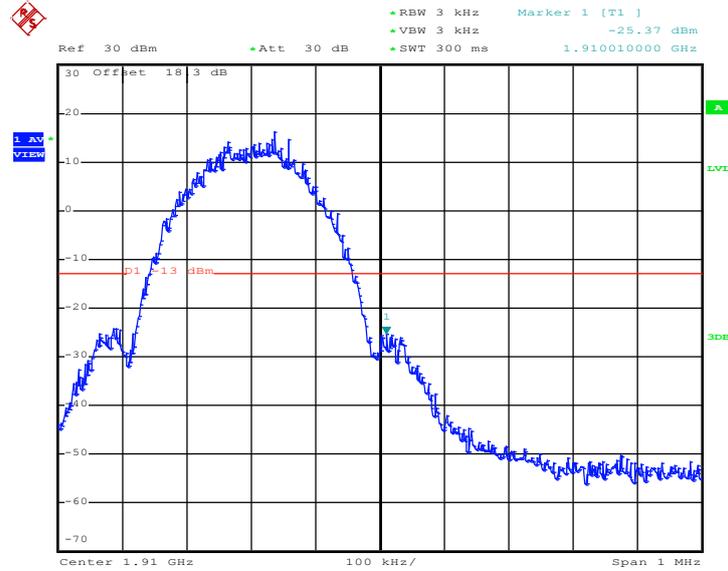
Date: 6.MAY.2013 10:55:23

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)
3. The total loss is 18.3 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.



Band :	GSM1900	Test Mode :	EDGE Class 10 Link (8PSK)
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-25.20dBm	Measurement Value :	-25.37dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



Date: 6.MAY.2013 10:53:38

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)
3. The total loss is 18.3 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

### 3.6 Conducted Spurious Emission Measurement

#### 3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10<sup>th</sup> harmonic.

#### 3.6.2 Measuring Instruments

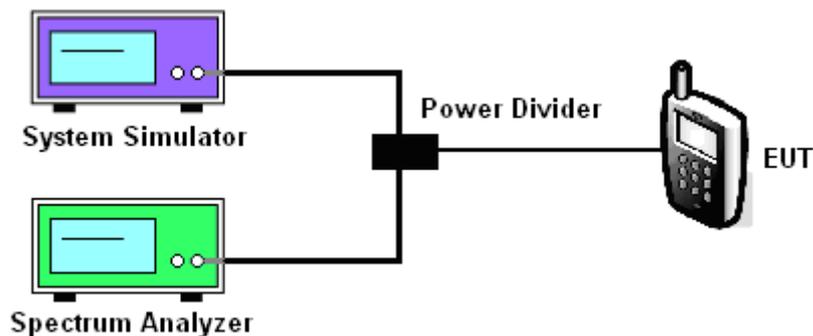
The section 4.0 of List of Measuring Equipment of this test report is used for test.

#### 3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)

$$\begin{aligned}
 &= P(W) - [43 + 10\log(P)] \text{ (dB)} \\
 &= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} \\
 &= -13\text{dBm}.
 \end{aligned}$$

#### 3.6.4 Test Setup

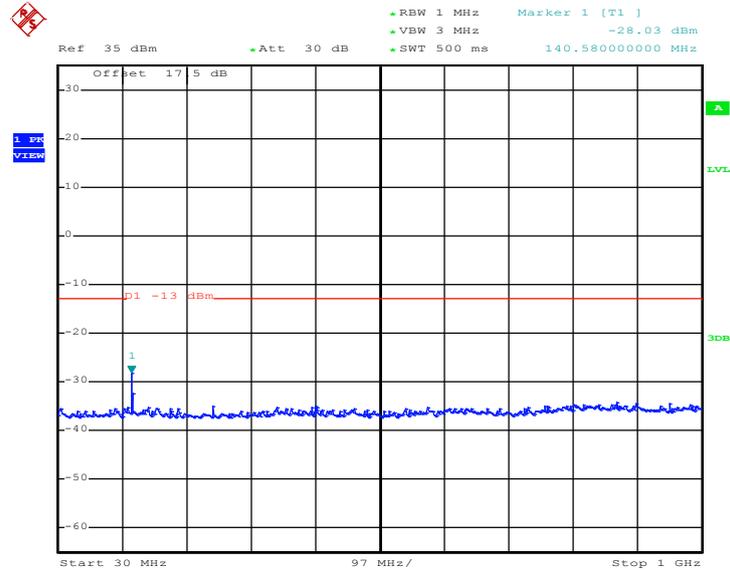




3.6.5 Test Result (Plots) of Conducted Spurious Emission

Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link (GMSK)	Frequency :	1880.0 MHz

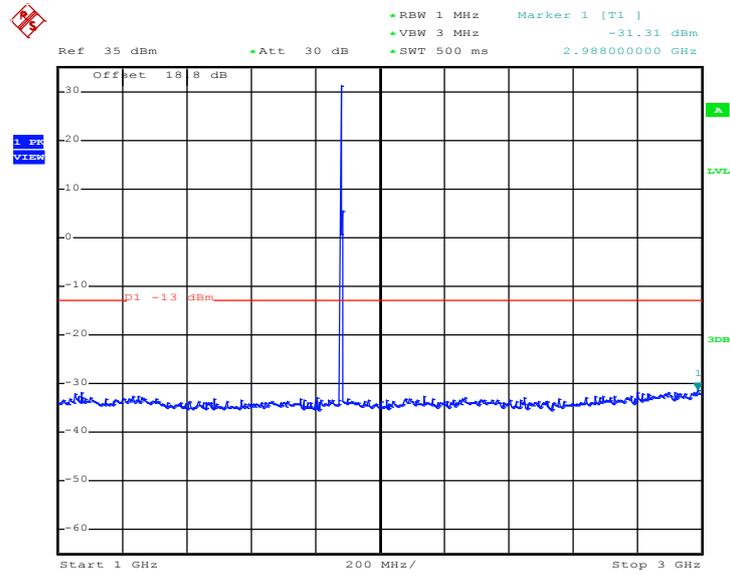
Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 6.MAY.2013 10:19:11



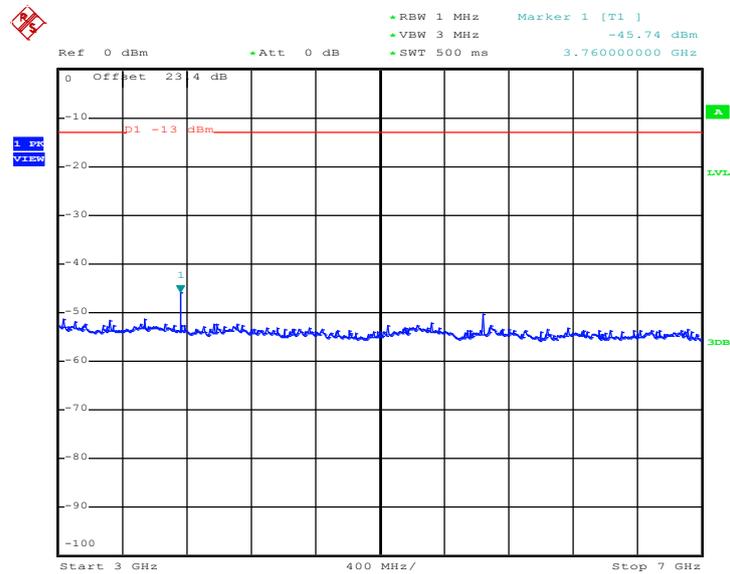
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 6.MAY.2013 10:19:24

**Note:** The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

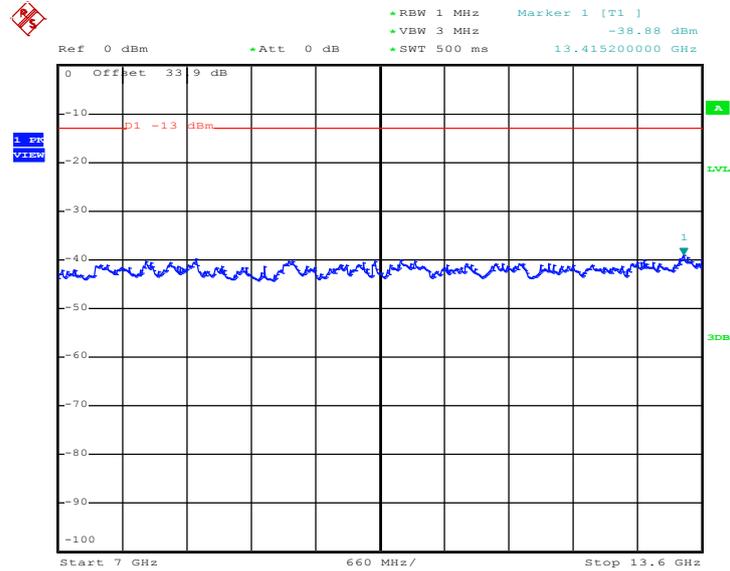
Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 6.MAY.2013 10:19:41

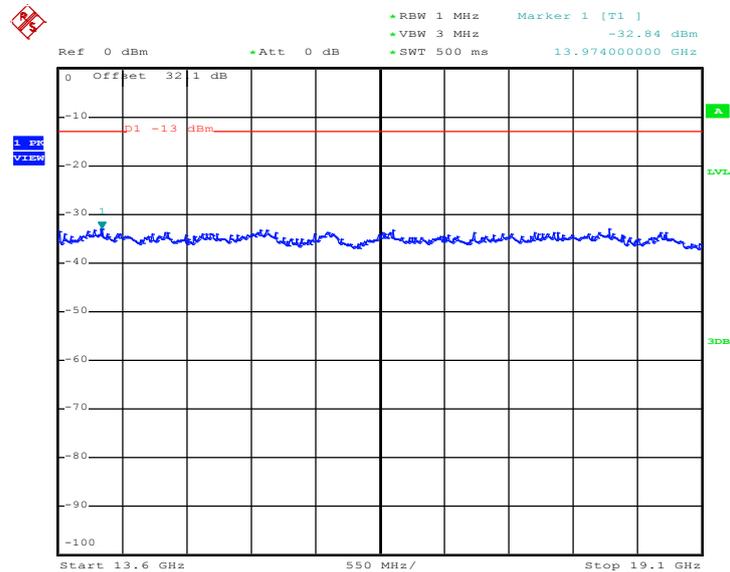


Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 6.MAY.2013 10:19:53

Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

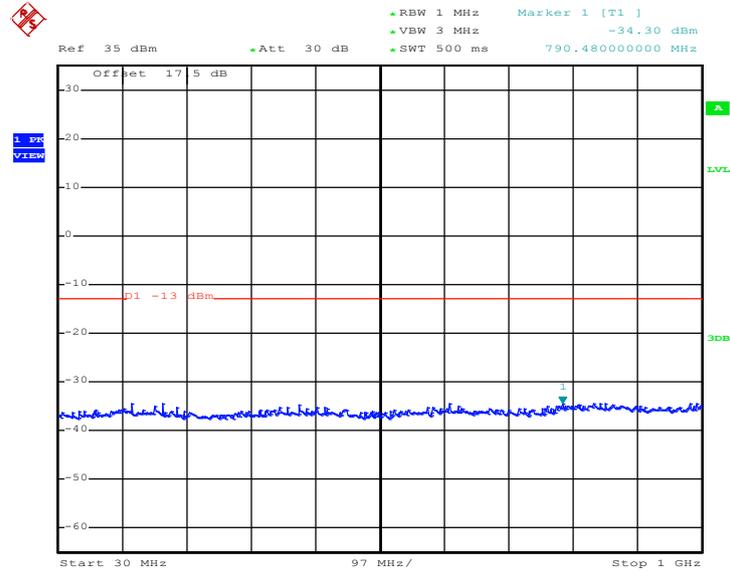


Date: 6.MAY.2013 10:20:05



Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE Class 10 Link (8PSK)	Frequency :	1880.0 MHz

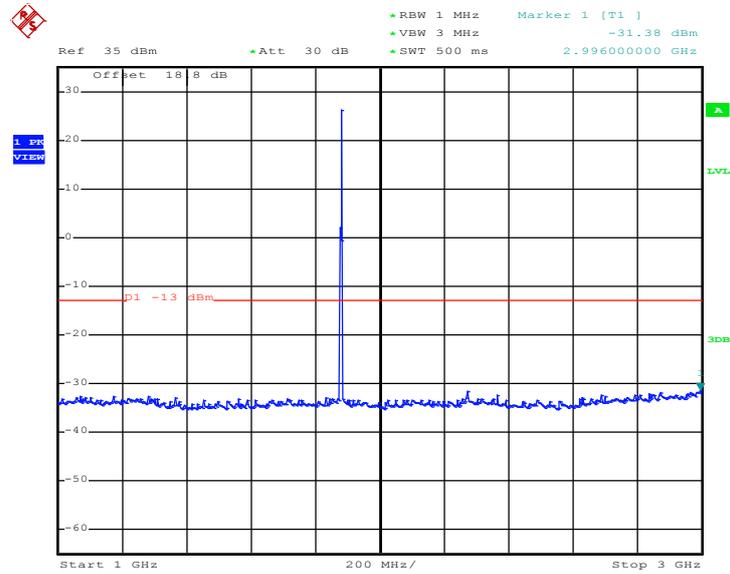
Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 6.MAY.2013 10:38:33



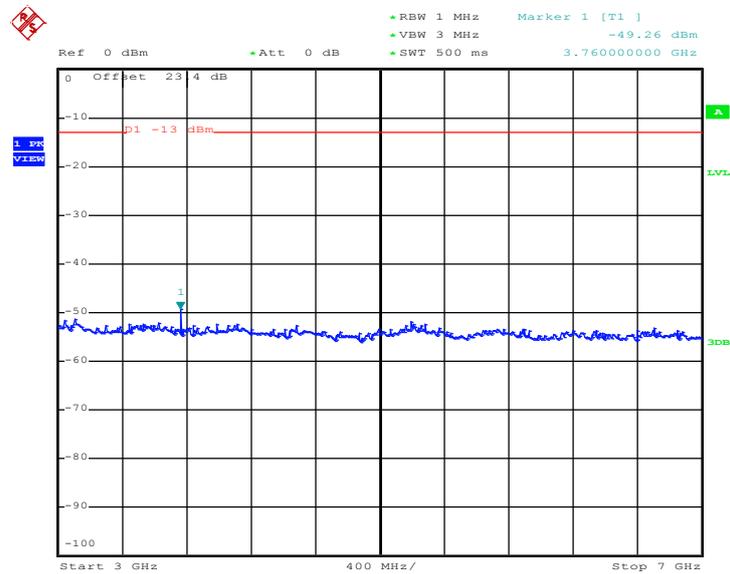
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 6.MAY.2013 10:38:46

**Note:** The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

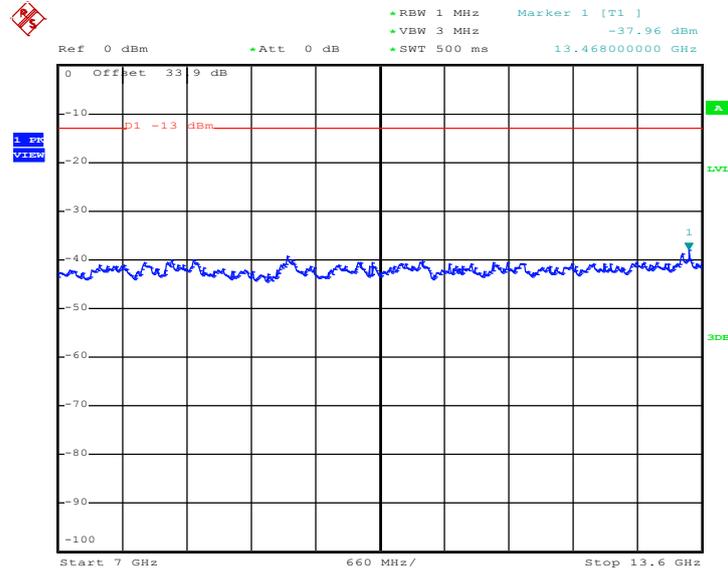
Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 6.MAY.2013 10:39:03

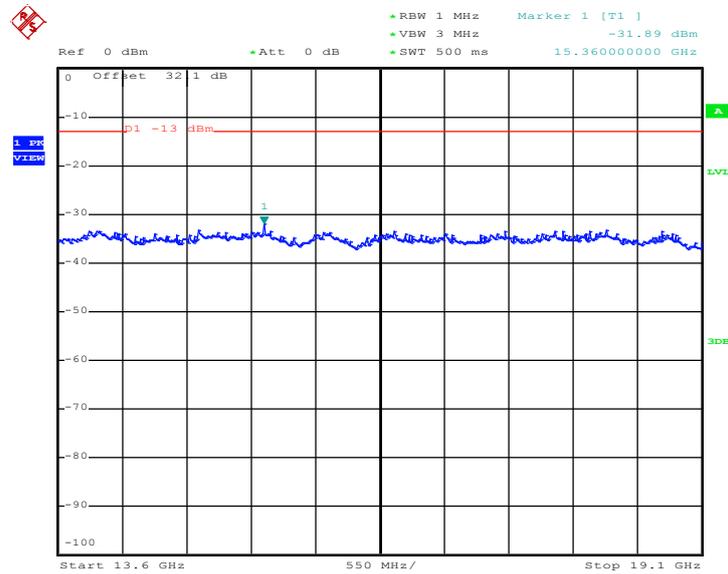


### Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 6.MAY.2013 10:39:15

### Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 6.MAY.2013 10:39:27

## 3.7 Field Strength of Spurious Radiation Measurement

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

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

### 3.7.2 Measuring Instruments

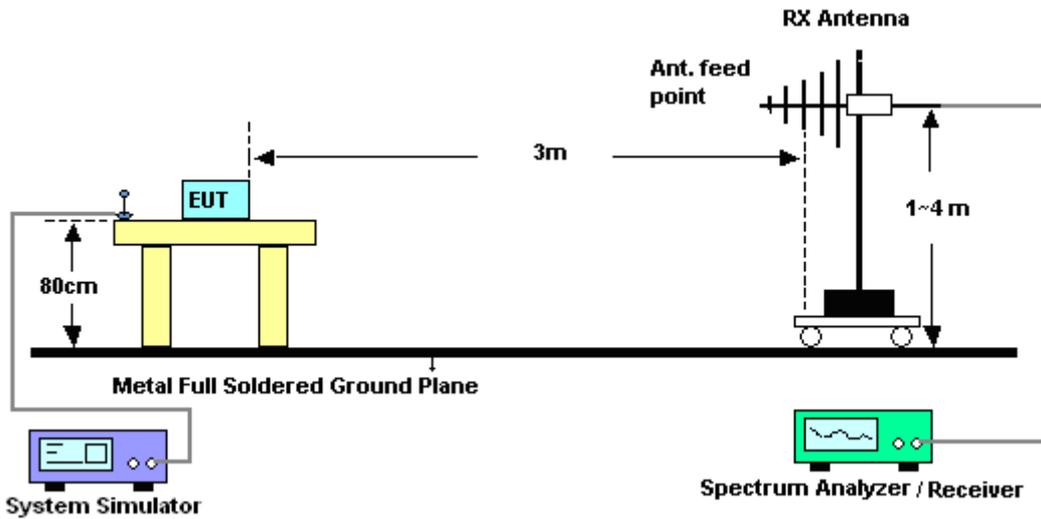
The section 4.0 of List of Measuring Equipment of this test report is used for test.

### 3.7.3 Test Procedures

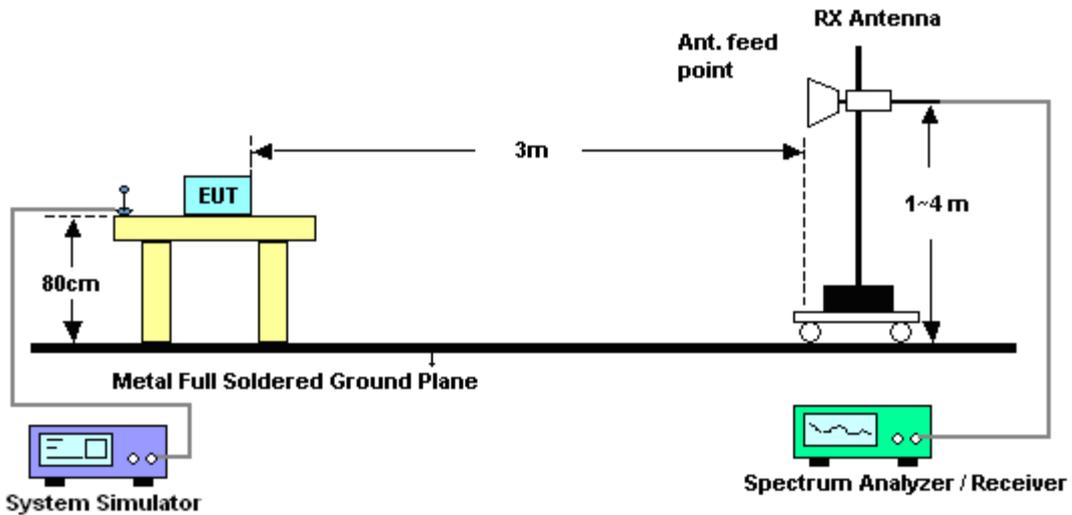
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving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

### 3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





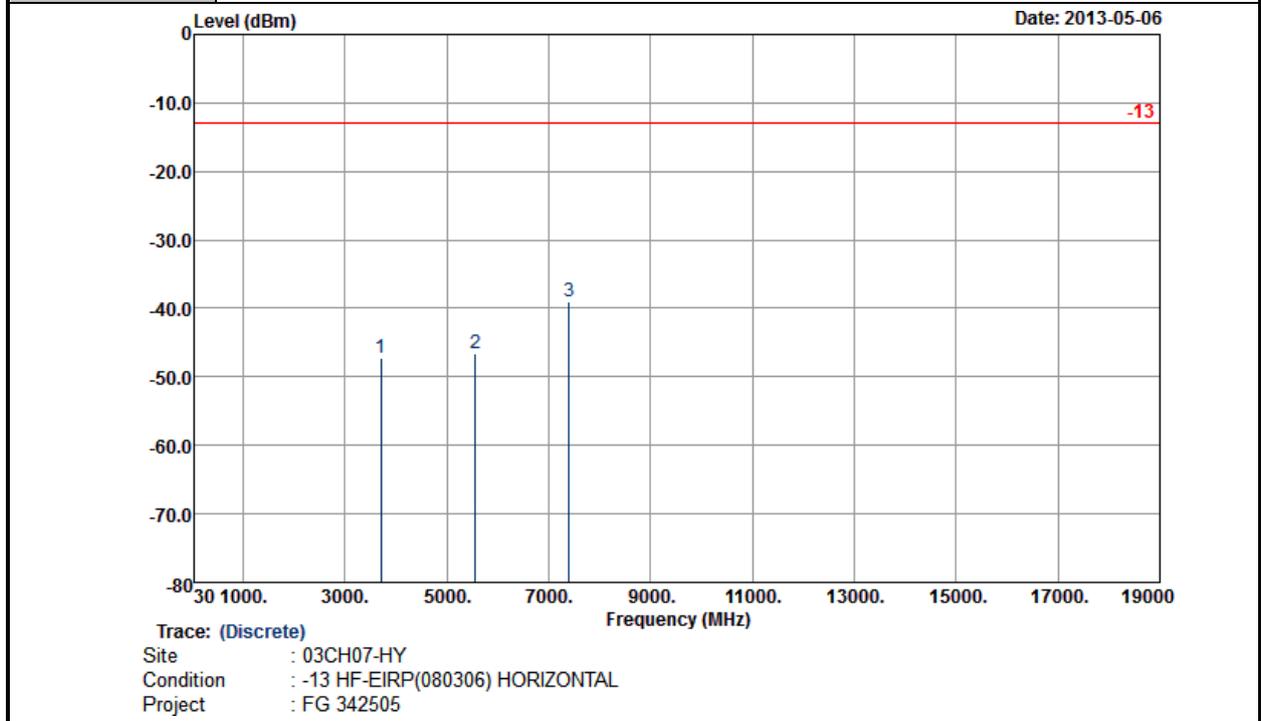
3.7.5 Test Result of Field Strength of Spurious Radiated

<Low Channel>

Band :	GSM1900	Temperature :	23~24°C
Test Mode :	GSM Link (GMSK)	Relative Humidity :	42~43%
Channel :	512		
Test Engineer :	Gavin Wu	Polarization :	Horizontal

**Remark :**

- Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- The harmonic (5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.

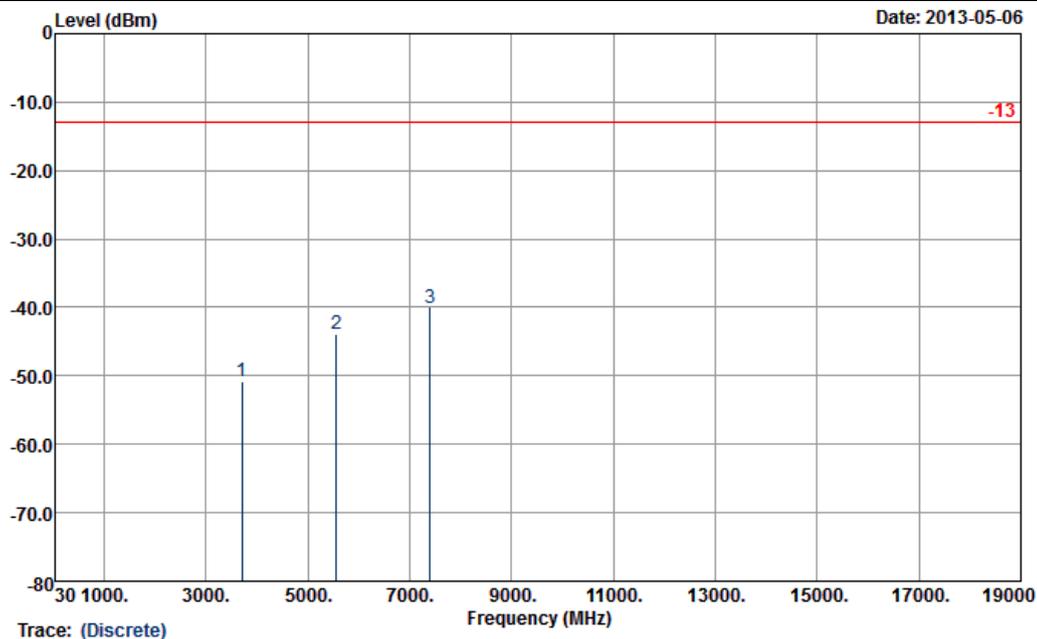


Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3700	-47.35	-13	-34.35	-62.5	-53.5	2.59	8.74	H	Pass
5552	-46.53	-13	-33.53	-66.97	-54.19	3.04	10.70	H	Pass
7400	-38.89	-13	-25.89	-66.21	-47.63	3.28	12.02	H	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	512		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



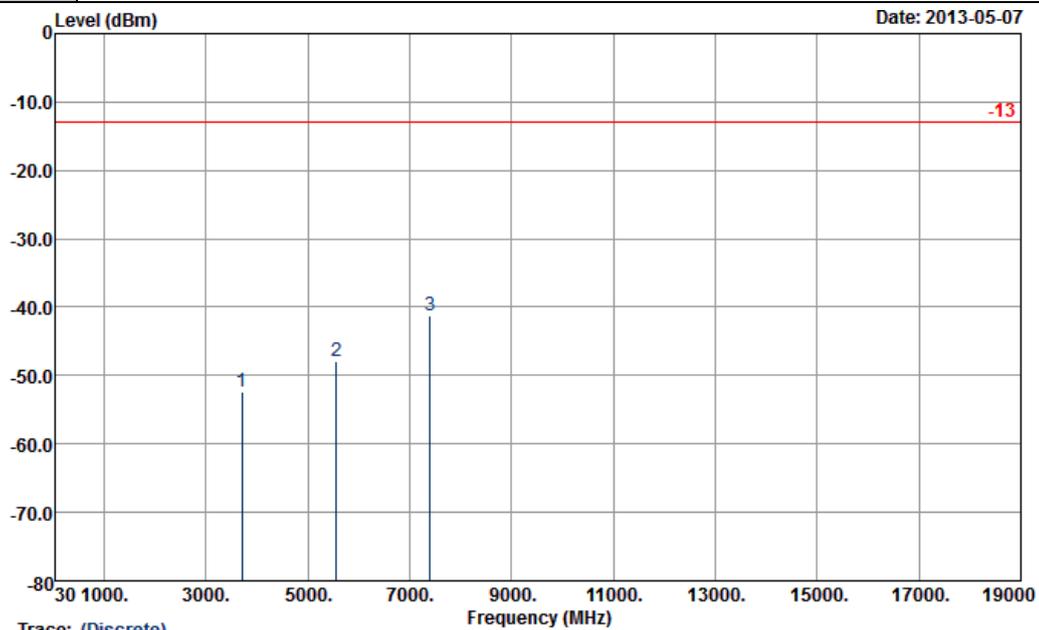
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) VERTICAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3700	-50.79	-13	-37.79	-66.94	-56.94	2.59	8.74	V	Pass
5552	-43.86	-13	-30.86	-64.13	-51.52	3.04	10.70	V	Pass
7400	-40.00	-13	-27.00	-66.95	-48.74	3.28	12.02	V	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	512		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



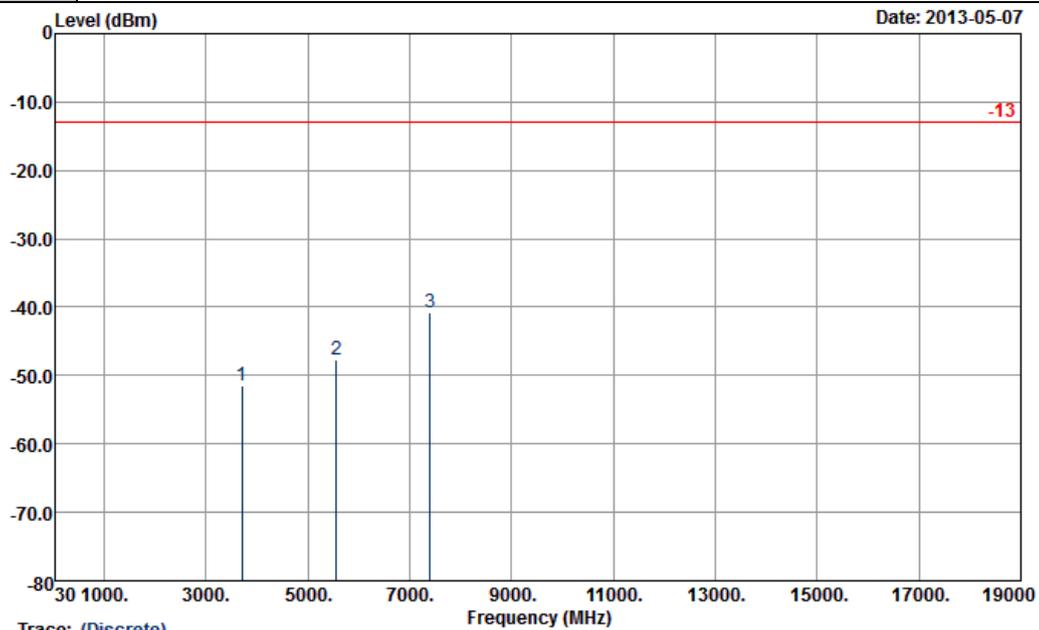
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) HORIZONTAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3700	-52.26	-13	-39.26	-67.41	-58.41	2.59	8.74	H	Pass
5552	-47.87	-13	-34.87	-68.31	-55.53	3.04	10.70	H	Pass
7400	-41.33	-13	-28.33	-68.65	-50.07	3.28	12.02	H	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	512		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) VERTICAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3700	-51.37	-13	-38.37	-67.52	-57.52	2.59	8.74	V	Pass
5552	-47.64	-13	-34.64	-67.91	-55.3	3.04	10.70	V	Pass
7400	-40.79	-13	-27.79	-67.74	-49.53	3.28	12.02	V	Pass

Other harmonics are lower than background noise

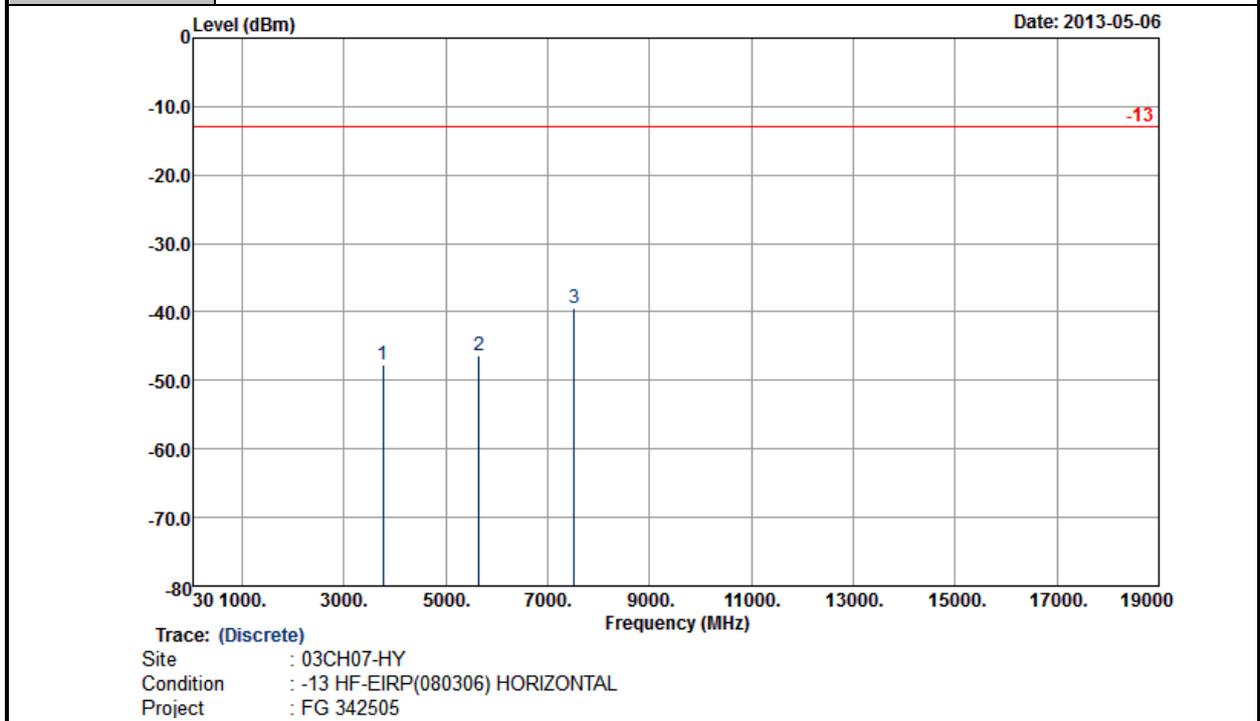


<Middle Channel>

<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	661		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Horizontal

**Remark :**

- Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- The harmonic (5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.

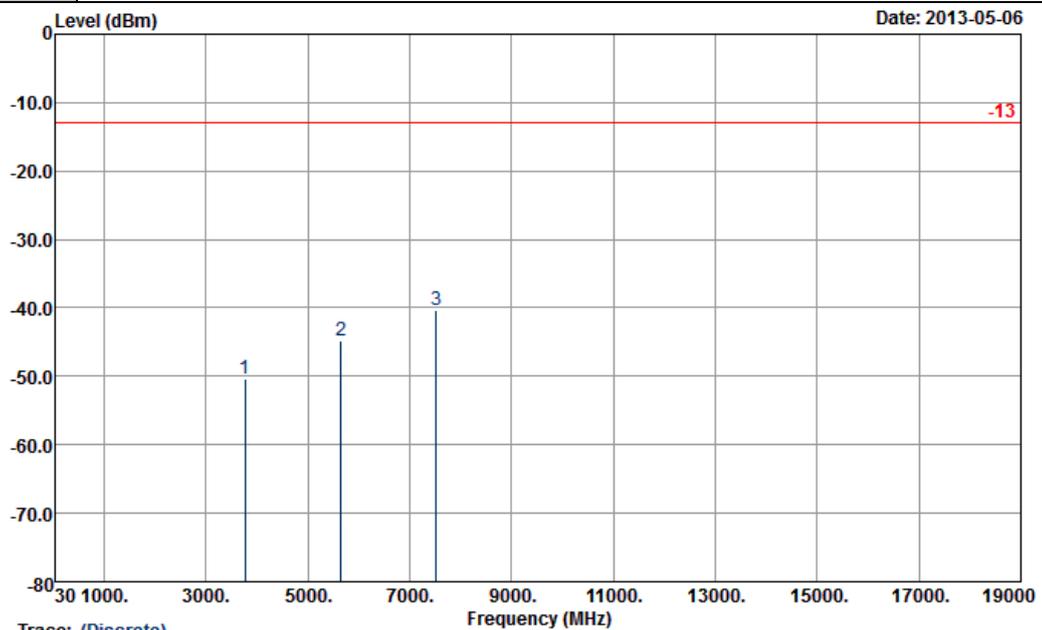


Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-47.68	-13	-34.68	-63.03	-53.98	2.51	8.81	H	Pass
5640	-46.44	-13	-33.44	-67.2	-54.15	2.99	10.70	H	Pass
7520	-39.42	-13	-26.42	-66.69	-47.95	3.59	12.12	H	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	661		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



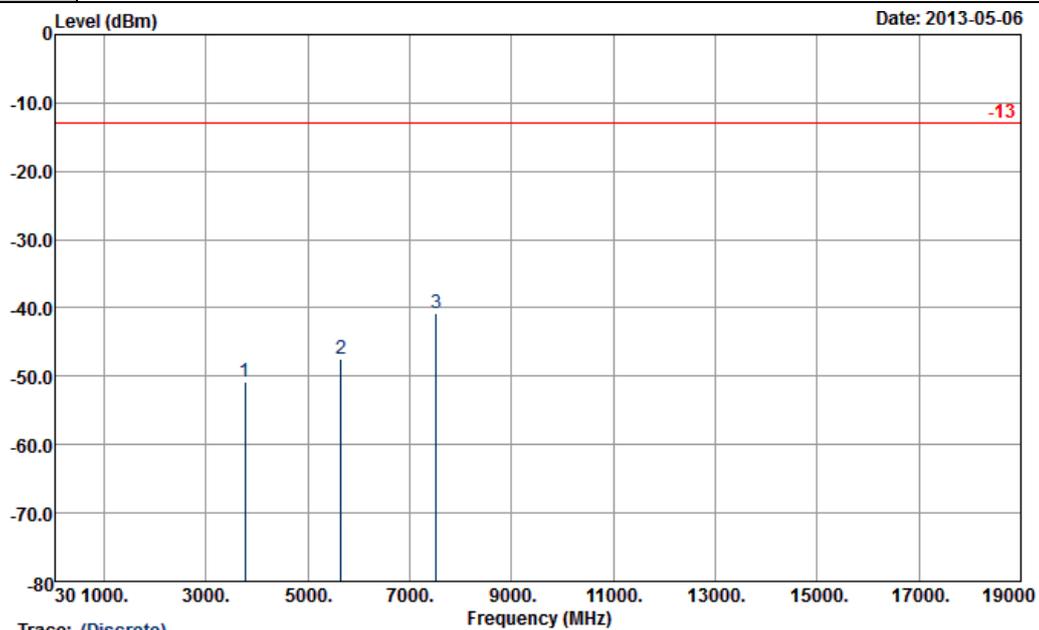
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) VERTICAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-50.44	-13	-37.44	-66.74	-56.74	2.51	8.81	V	Pass
5640	-44.87	-13	-31.87	-65.44	-52.58	2.99	10.70	V	Pass
7520	-40.40	-13	-27.40	-67.45	-48.93	3.59	12.12	V	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	661		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



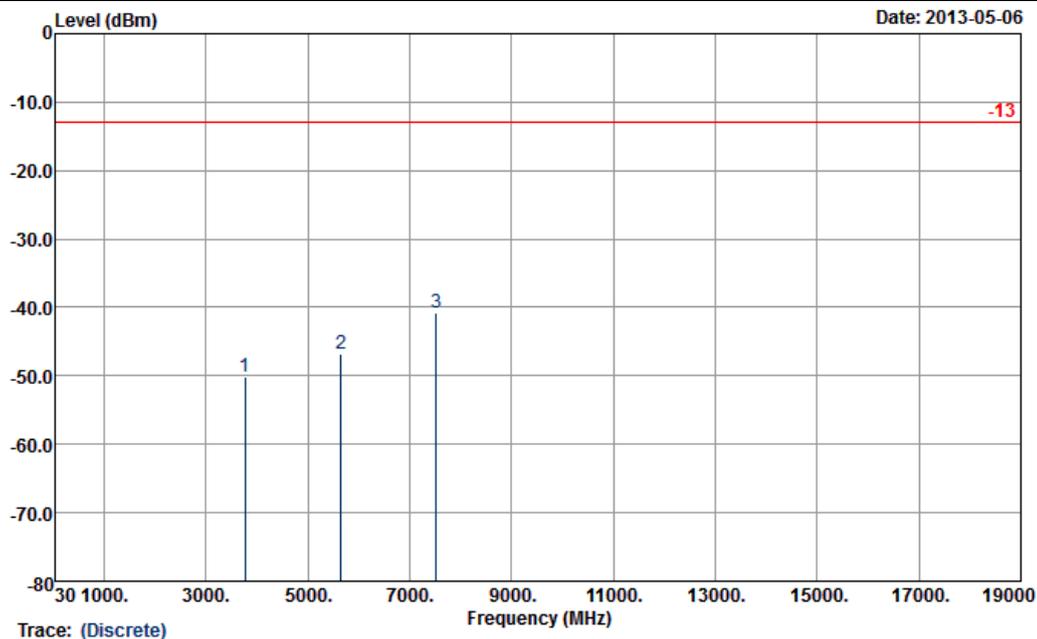
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) HORIZONTAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-50.84	-13	-37.84	-66.19	-57.14	2.51	8.81	H	Pass
5640	-47.57	-13	-34.57	-68.33	-55.28	2.99	10.70	H	Pass
7520	-40.83	-13	-27.83	-68.1	-49.36	3.59	12.12	H	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	661		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) VERTICAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-50.21	-13	-37.21	-66.51	-56.51	2.51	8.81	V	Pass
5640	-46.85	-13	-33.85	-57.42	-54.56	2.99	10.70	V	Pass
7520	-40.71	-13	-27.71	-67.76	-49.24	3.59	12.12	V	Pass

Other harmonics are lower than background noise

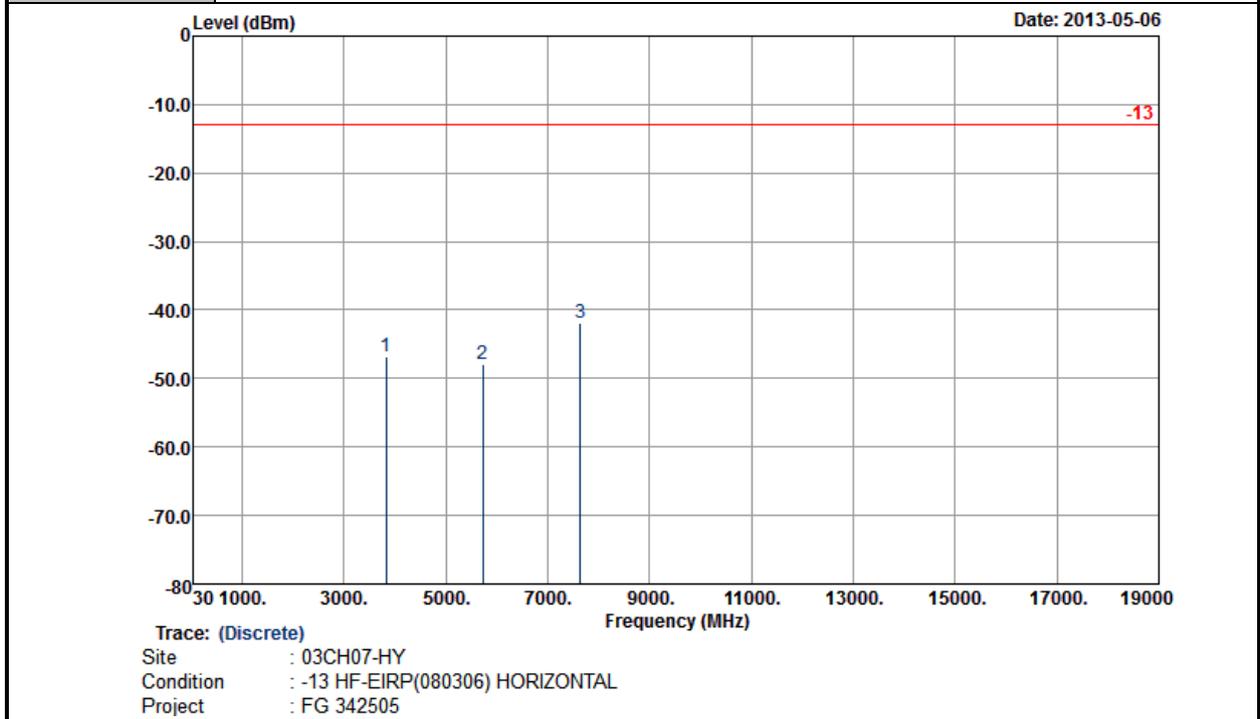


<High Channel>

<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	810		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Horizontal

**Remark :**

- Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- The harmonic (5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.

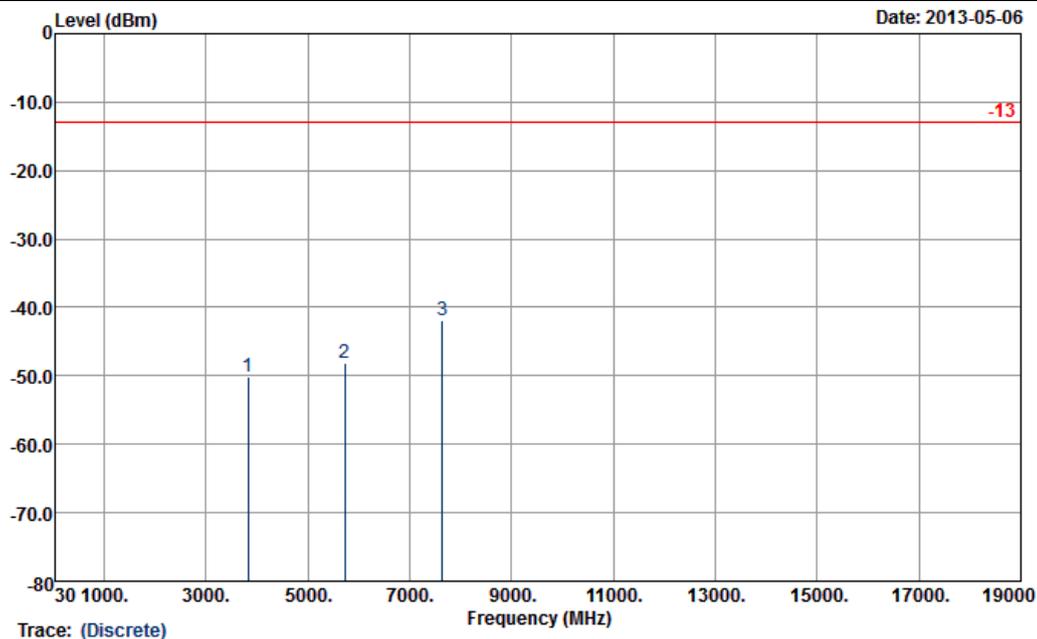


Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3820	-46.87	-13	-33.87	-62.49	-53.28	2.47	8.88	H	Pass
5728	-47.96	-13	-34.96	-69.05	-55.66	3	10.70	H	Pass
7640	-41.95	-13	-28.95	-68.29	-50.73	3.43	12.21	H	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	810		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



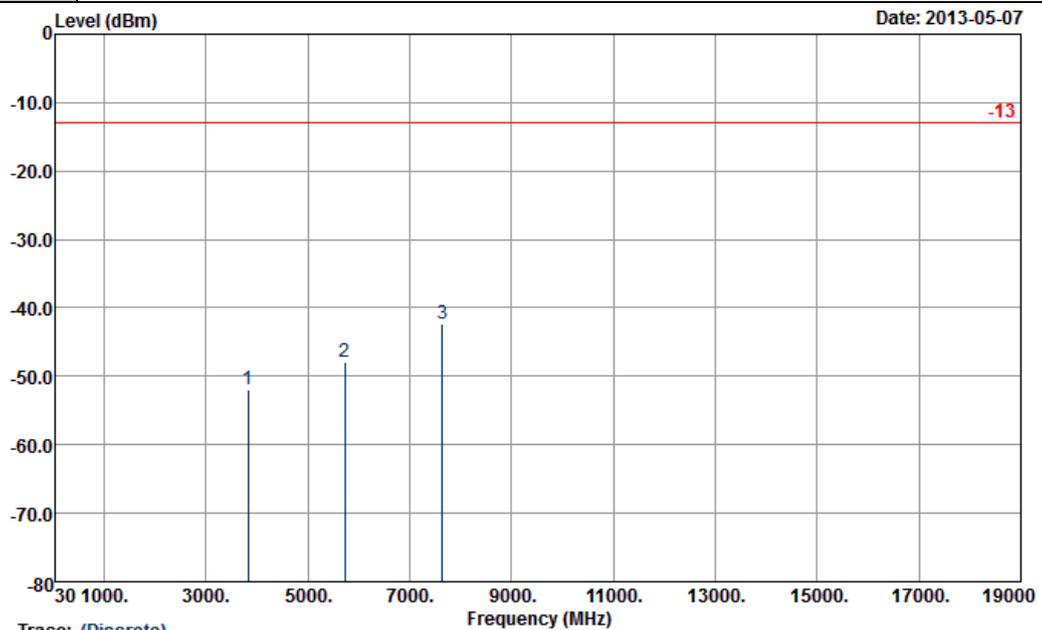
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) VERTICAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3820	-50.08	-13	-37.08	-66.59	-56.49	2.47	8.88	V	Pass
5728	-48.19	-13	-35.19	-69.05	-55.89	3	10.70	V	Pass
7640	-41.85	-13	-28.85	-68.01	-50.63	3.43	12.21	V	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	810		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



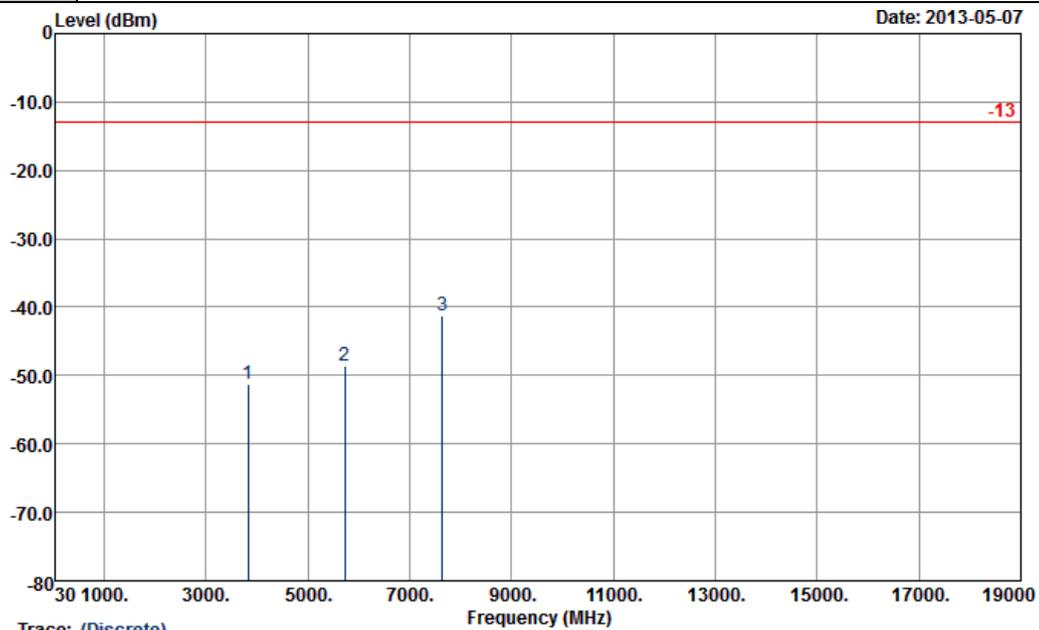
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) HORIZONTAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3820	-51.97	-13	-38.97	-67.59	-58.38	2.47	8.88	H	Pass
5728	-47.90	-13	-34.90	-68.99	-55.6	3	10.70	H	Pass
7640	-42.25	-13	-29.25	-68.59	-51.03	3.43	12.21	H	Pass

Other harmonics are lower than background noise



<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	EDGE Class 10 Link (8PSK)	<b>Relative Humidity :</b>	42~43%
<b>Channel :</b>	810		
<b>Test Engineer :</b>	Gavin Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line. 2. The harmonic (5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> ,...etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : -13 HF-EIRP(080306) VERTICAL  
 Project : FG 342505

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3820	-51.20	-13	-38.20	-67.71	-57.61	2.47	8.88	V	Pass
5728	-48.64	-13	-35.64	-69.5	-56.34	3	10.70	V	Pass
7640	-41.30	-13	-28.30	-67.46	-50.08	3.43	12.21	V	Pass

Other harmonics are lower than background noise

## 3.8 Frequency Stability Measurement

### 3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

### 3.8.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

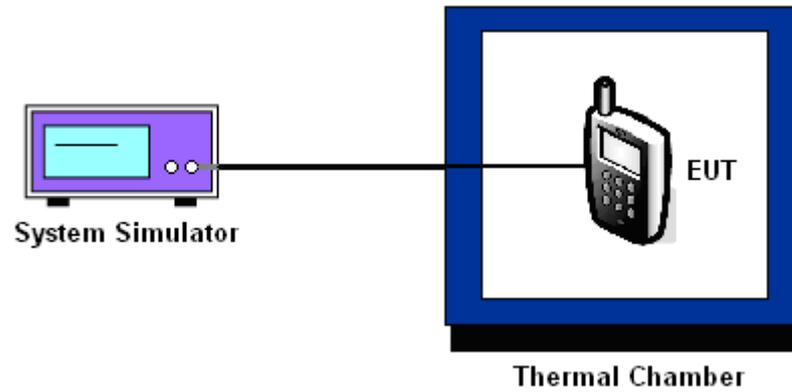
### 3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  step up to  $50^{\circ}\text{C}$ . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT cannot be turned on at  $-30^{\circ}\text{C}$ , the testing lowest temperature will be raised in  $10^{\circ}\text{C}$  step until the EUT can be turned on.

### 3.8.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at  $25\pm 5^{\circ}\text{C}$  and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

### 3.8.5 Test Setup



**3.8.6 Test Result of Temperature Variation**

<b>Band :</b>	GSM 1900	<b>Channel :</b>	661
<b>Limit (ppm) :</b>	2.5	<b>Frequency :</b>	1880.0 MHz

Temperature (°C)	GSM		EDGE Class 10		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-19	-0.01	-22	-0.01	PASS
-20	-21	-0.01	20	0.01	
-10	-20	-0.01	-25	-0.01	
0	22	0.01	26	0.01	
10	20	0.01	-24	-0.01	
20	24	0.01	-28	-0.01	
30	25	0.01	31	0.02	
40	24	0.01	-32	-0.02	
50	27	0.01	36	0.02	

**3.8.7 Test Result of Voltage Variation**

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 1900 CH661	GSM	3.7	-20	-0.01	2.5	PASS
		BEP	22	0.01		
		4.1	-25	-0.01		
	EDGE Class 10	3.7	20	0.01		
		BEP	25	0.01		
		4.1	-22	-0.01		

**Note:**

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.5 V.



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jul. 30, 2012	May 06, 2013	Jul. 29, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	May 06, 2013	Jun. 05, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	May 06, 2013	Jul. 22, 2013	Conducted (TH02-HY)
Thermometer	Wisewind	410	N/A	N/A	Nov. 20, 2012	May 06, 2013	Nov. 19, 2013	Conducted (TH02-HY)
Filter	WAINWRIGHT	whkx2..0/18g	N/A	2GHighPass Filter	Nov. 26, 2012	May 06, 2013	Nov. 25, 2013	Conducted (TH02-HY)
RF cable	HONOVA	MF86	N/A	N/A	Nov. 26, 2012	May 06, 2013	Nov. 25, 2013	Conducted (TH02-HY)
RF cable	HONOVA	MF86	N/A	N/A	Nov. 26, 2012	May 06, 2013	Nov. 25, 2013	Conducted (TH02-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 06, 2012	May 06, 2013 ~ May 07, 2013	Oct. 05, 2013	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz ~ 30GHz	Nov. 30, 2012	May 06, 2013 ~ May 07, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 22, 2012	May 06, 2013 ~ May 07, 2013	Aug. 21, 2013	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 01, 2012	May 06, 2013 ~ May 07, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-1	159088	1GHz ~ 18GHz	Feb. 27, 2013	May 06, 2013 ~ May 07, 2013	Feb. 26, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10-1000MHz. 32dB.GAIN	Feb. 26, 2013	May 06, 2013 ~ May 07, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 03, 2012	May 06, 2013 ~ May 07, 2013	Sep. 02, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	May 06, 2013 ~ May 07, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 21, 2011	May 06, 2013 ~ May 07, 2013	Oct. 20, 2013	Radiation (03CH07-HY)
Filter	WAINWRIGHT	WLKS1500-8SS	N/A	1.5G LPF	Dec. 28, 2012	May 06, 2013 ~ May 07, 2013	Dec. 27, 2013	Radiation (03CH07-HY)
Filter	Microwave	H3G018G1	N/A	3G HPF	Dec. 26, 2012	May 06, 2013 ~ May 07, 2013	Dec. 25, 2013	Radiation (03CH07-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Thermometer	Wisewind	410	N/A	N/A	Nov. 20, 2012	May 06, 2013 ~ May 07, 2013	Nov. 19, 2013	Radiation (03CH07-HY)
Test Software	Audix	E3	Version 6.2009-8-24	N/A	N/A	May 06, 2013 ~ May 07, 2013	N/A	Radiation (03CH07-HY)
Controller	HD GmbH	HD100	N/A	N/A	N/A	May 06, 2013 ~ May 07, 2013	N/A	Radiation (03CH07-HY)
Antenna Mast	HD GmbH	MA 240	N/A	N/A	N/A	May 06, 2013 ~ May 07, 2013	N/A	Radiation (03CH07-HY)
RF Cable	Huber+Suhner	RG 142	NA	30M~1G	Dec. 04, 2012	May 06, 2013 ~ May 07, 2013	Dec. 03, 2013	Radiation (03CH07-HY)
RF Cable	Huber+Suhner	SF104	NA	1G~26.5G	Dec. 04, 2012	May 06, 2013 ~ May 07, 2013	Dec. 03, 2013	Radiation (03CH07-HY)

**Note:** Test equipment calibration is traceable to the procedure of ISO17025.



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.54
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.72
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