

# FCC RF Test Report

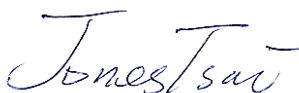
APPLICANT : Emerging Technology (Holdings) Ltd.  
EQUIPMENT : 3G Tablet  
BRAND NAME : OiOO  
MODEL NAME : Model 2V, Model 2  
MARKETING NAME : OiOO  
FCC ID : 2AAW7-CTM-2US  
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)  
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Aug. 05, 2013 and testing was completed on Nov. 15, 2013. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown to be compliant with the applicable technical standards.

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



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



**SPORTON INTERNATIONAL (SHENZHEN) INC.**

No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.

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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG380501	Rev. 01	Initial issue of report	Nov. 21, 2013

## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	N/A	PASS	-
3.2	§24.232(d) §27.50(d)(5)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
3.3	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.3	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.4	§2.1049 §22.917(a) §24.238(b) §27.53(g)	Occupied Bandwidth	N/A	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a) §27.53(g)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a) §27.53(g)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a) §27.53(g)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 14.16 dB at 11280.000 MHz
3.8	§2.1055 §22.355 §24.235 §27.54	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

# 1 General Description

## 1.1 Applicant

**Emerging Technology (Holdings) Ltd.**

17/F, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

## 1.2 Manufacturer

**WELCO WONG'S TECHNOLOGY (SHENZHEN) LIMITED**

2-3 floor of block 14, 1-4 floor of block 34, No2 of WanFeng WanZhangPu Industrial Estate. ShaJing Bao'an ShenZhen, China

## 1.3 Feature of Equipment Under Test

Product Feature	
<b>Equipment</b>	3G Tablet
<b>Brand Name</b>	OiOO
<b>Model Name</b>	Model 2V, Model 2
<b>Marketing Name</b>	OiOO
<b>FCC ID</b>	2AAW7-CTM-2US
<b>EUT supports Radios application</b>	GSM/GPRS/EGPRS(Downlink Only)/ WCDMA/HSPA/HSPA+(Downlink Only)/ WLAN 2.4GHz 802.11bgn HT20/Bluetooth v3.0+EDR
<b>HW Version</b>	CT2-7iMB13-3.0
<b>SW Version</b>	wecct_def-userdebug 4.2.2 JDQ39 CT2_20130730.151820 test-keys for Mode 2V wecct_def-userdebug 4.2.2 JDQ39-20131022.112919 CT2 test-keys for Mode 2
<b>EUT Stage</b>	Identical Prototype

### Remark:

- There are two models of this project. The differences between them are summary below:

Sample 1 (Model 2V)	Sample 2 (Model 2)
data+voice	data only (voice function disabled by software)

In this report, we use Sample 1 to perform the test.

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

## 1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
<b>Tx Frequency</b>	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
<b>Rx Frequency</b>	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz
<b>Maximum Output Power to Antenna</b>	GSM850 : 32.67 dBm GSM1900 : 30.37 dBm WCDMA Band V : 21.90 dBm WCDMA Band IV : 21.45 dBm WCDMA Band II : 21.30 dBm
<b>Antenna Type</b>	Flexi PCB Antenna
<b>Type of Modulation</b>	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK (Downlink Only) WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) HSPA+: 16QAM (Downlink Only)

## 1.5 Modification of EUT

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

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

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	GSM850 GSM	GMSK	1.63	0.02 ppm	242KGXW
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.17	0.02 ppm	4M20F9W
Part 24	GSM1900 GSM	GMSK	0.84	0.01 ppm	242KGXW
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.13	0.01 ppm	4M20F9W
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	0.07	0.01 ppm	4M20F9W

## 1.7 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL (SHENZHEN) INC.		
<b>Test Site Location</b>	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC Registration No.</b>
	TH01-SZ	03CH01-SZ	831040

<b>Test Site</b>	SPORTON INTERNATIONAL (SHENZHEN) INC.		
<b>Test Site Location</b>	No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755-8637-9589 FAX: +86-755-8637-9595		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		
	OTA01-SZ		

## 1.8 Applied Standards

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

- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

### **Remark:**

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



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

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

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GSM Link	■ GSM Link
GSM 1900	■ GSM Link	■ GSM Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

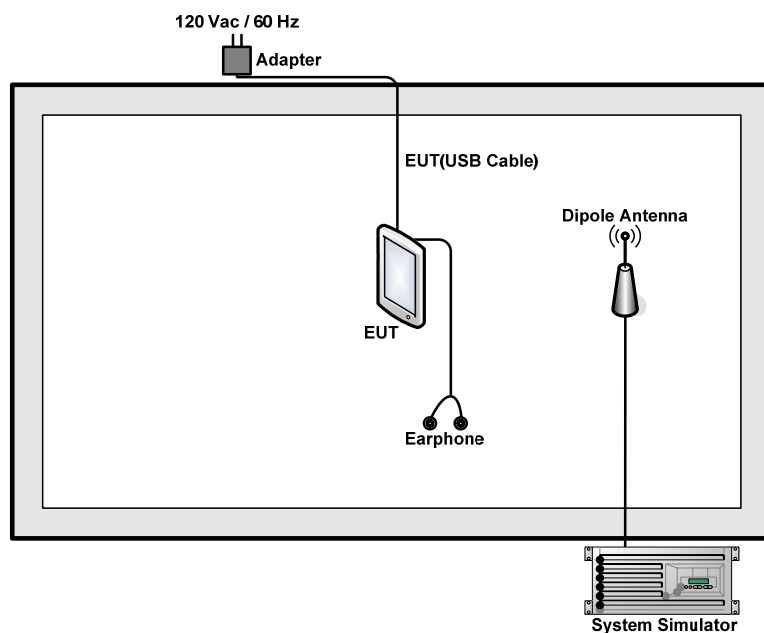
**Note:** The maximum power levels are GSM mode for GMSK link, RMC 12.2Kbps mode for WCDMA band V, RMC 12.2Kbps mode for WCDMA band IV, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GSM	32.59	32.63	32.67	30.37	30.26	29.95
GPRS class 8	32.53	32.57	32.63	30.33	30.22	29.91
GPRS class 10	30.68	30.71	30.73	29.49	29.44	29.29
GPRS class 11	28.47	28.50	28.52	28.04	27.99	27.86
GPRS class 12	26.65	26.69	26.72	26.21	26.17	26.06

Conducted Power (*Unit: dBm)									
Band	WCDMA Band V			WCDMA Band II			WCDMA Band IV		
Channel	4132	4182	4233	9262	9400	9538	1312	1413	1513
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
AMR 12.2K	21.40	21.66	21.89	21.15	21.28	21.06	21.33	21.28	21.43
RMC 12.2K	21.42	21.70	21.90	21.19	21.30	21.11	21.34	21.31	21.45
HSDPA Subtest-1	21.38	21.56	21.81	21.23	21.26	21.16	21.28	21.40	21.35
HSDPA Subtest-2	21.66	21.74	21.89	21.27	21.24	21.25	21.36	21.39	21.40
HSDPA Subtest-3	21.23	21.26	21.54	21.03	21.27	21.06	21.03	21.04	21.20
HSDPA Subtest-4	21.17	21.27	21.53	21.15	21.25	21.14	21.00	21.03	21.20
HSUPA Subtest-1	21.19	21.20	21.31	20.63	21.02	20.49	20.76	20.81	20.91
HSUPA Subtest-2	19.33	19.45	19.65	19.37	19.48	19.34	19.59	19.31	19.23
HSUPA Subtest-3	19.54	19.74	19.75	18.09	19.61	19.52	19.48	19.54	19.55
HSUPA Subtest-4	19.35	19.42	19.39	19.36	19.68	19.37	19.16	19.48	19.36
HSUPA Subtest-5	20.27	20.53	19.90	19.54	20.04	19.69	20.07	19.98	20.14

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Agilent	8960	N/A	N/A	N/A
2.	DC Power Supply	TOPWORD	3303DR	N/A	N/A	N/A
3.	Adapter	Leader	MU10-O050200-A1	FCC DoC	N/A	N/A
4.	Earphone	Eimuse	E-500MV	N/A	Unshielded, 2.2 m	N/A

## 2.4 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 7 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 7 + 10 = 17 \text{ (dB)}\end{aligned}$$

### 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.

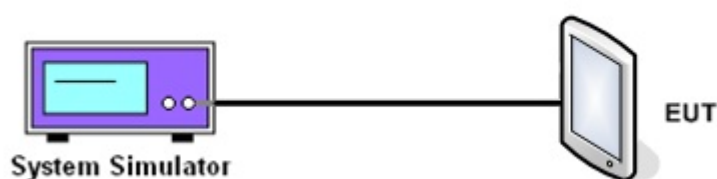
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. 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

Cellular Band						
Modes	GSM850 (GSM)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	32.59	32.63	32.67	21.42	21.70	21.90
Conducted Power (Watts)	1.82	1.83	1.85	0.14	0.15	0.15

PCS Band						
Modes	GSM1900 (GSM)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1852.4	1880	1907.6
Conducted Power (dBm)	30.37	30.26	29.95	21.19	21.30	21.11
Conducted Power (Watts)	1.09	1.06	0.99	0.13	0.13	0.13

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Conducted Power (dBm)	21.34	21.31	21.45
Conducted Power (Watts)	0.14	0.14	0.14

**Note:** Maximum burst average power for GSM, and maximum average power for WCDMA.

## **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.

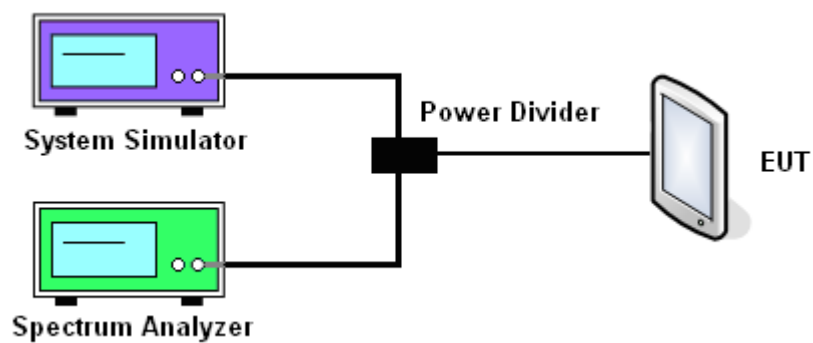
### **3.2.2 Measuring Instruments**

See list of measuring instruments of this test report.

### **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





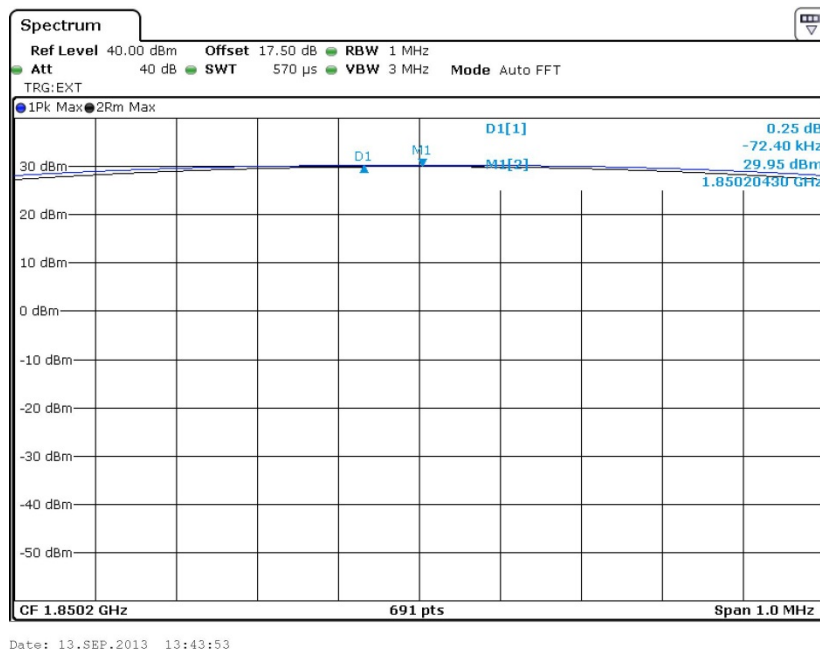
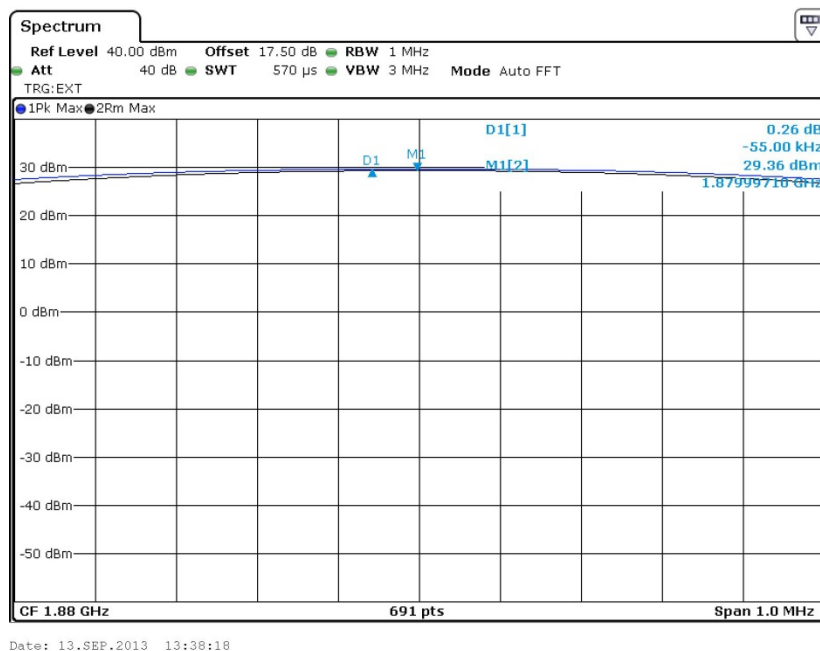
### 3.2.5 Test Result of Peak-to-Average Ratio

PCS Band						
Modes	GSM1900 (GSM)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1852.4	1880	1907.6
Peak-to-Average Ratio (dB)	0.25	0.26	0.26	3.04	3.28	3.24

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Peak-to-Average Ratio (dB)	3.00	3.08	3.04

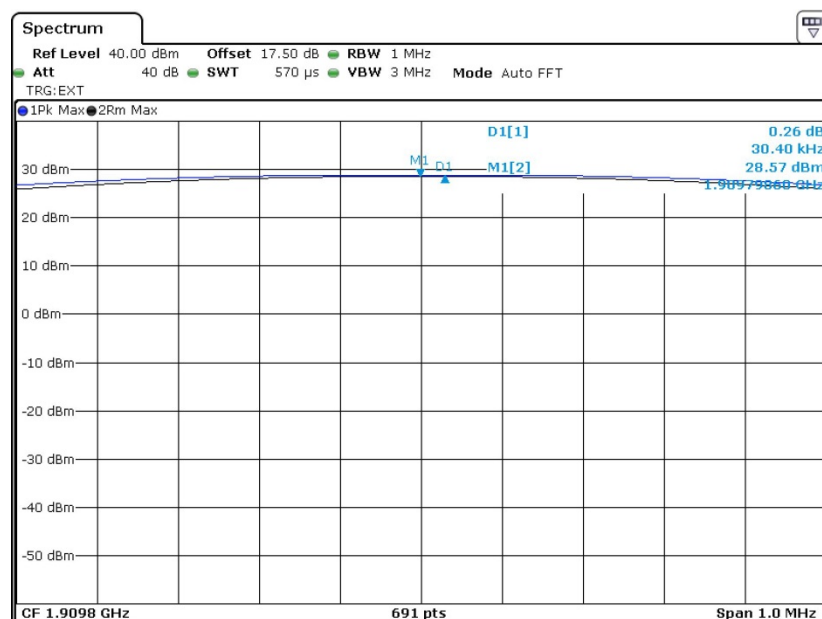
### 3.2.6 Test Result (Plots) of Peak-to-Average Ratio

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

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


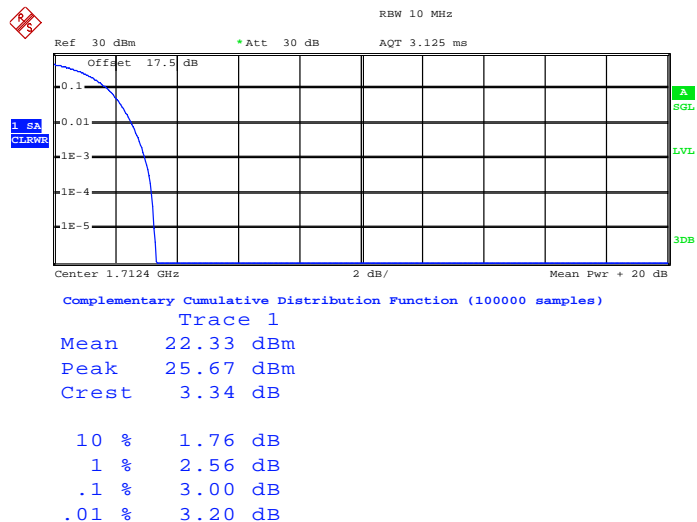


Peak-to-Average Ratio on Channel 810 (1909.8 MHz)

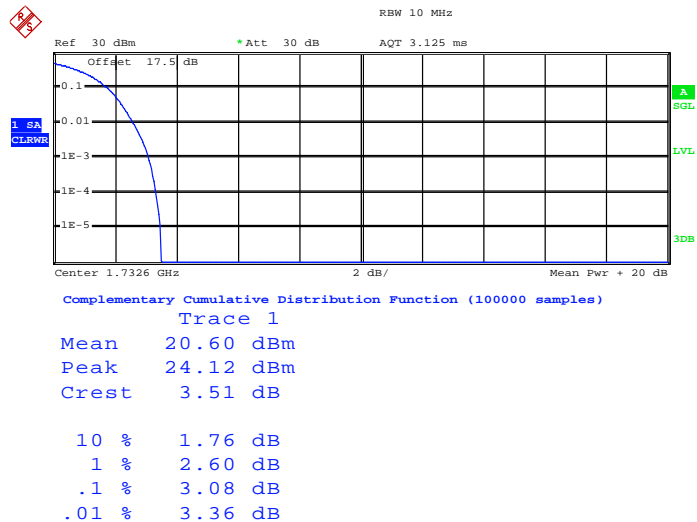


Date: 13.SEP.2013 13:46:58

<b>Band :</b>	WCDMA Band IV	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
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**Peak-to-Average Ratio on Channel 1312 (1712.4 MHz)**


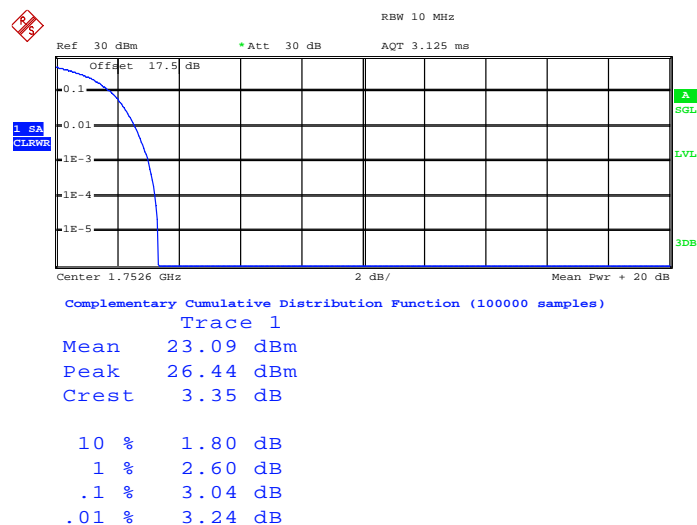
Date: 15.SEP.2013 09:43:28

**Peak-to-Average Ratio on Channel 1413 (1732.6 MHz)**


Date: 15.SEP.2013 09:41:55

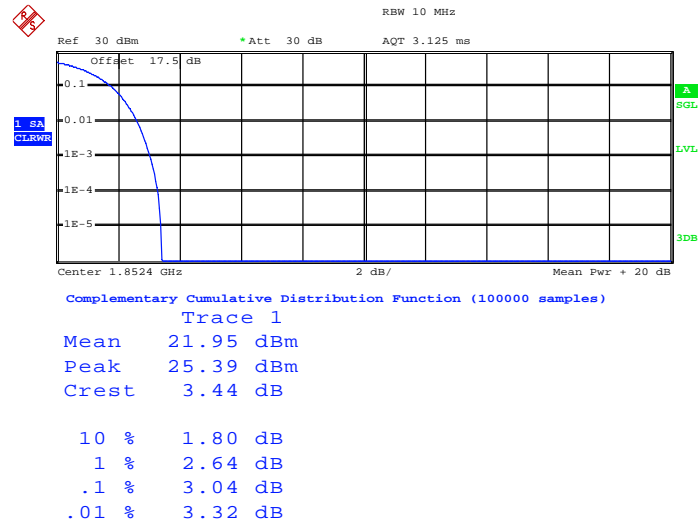


Peak-to-Average Ratio on Channel 1513 (1752.6 MHz)

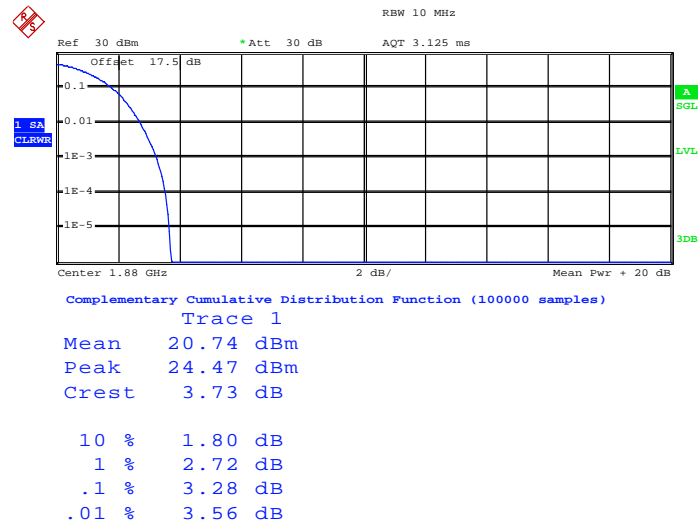


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<b>Band :</b>	WCDMA Band II	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
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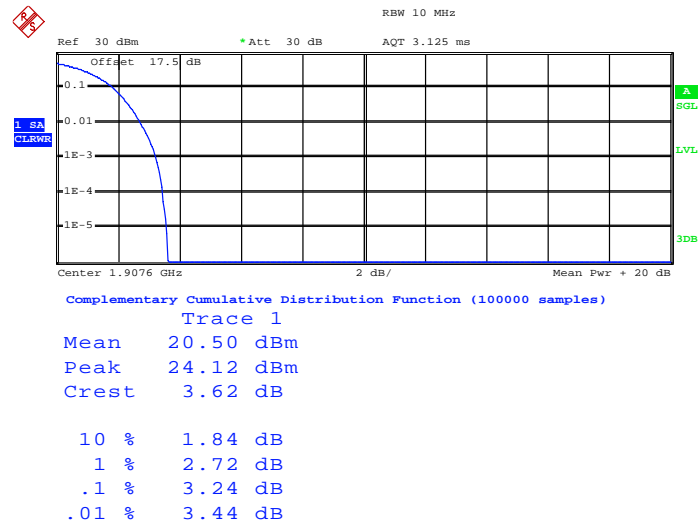
**Peak-to-Average Ratio on Channel 9262 (1852.4 MHz)**


Date: 15.SEP.2013 09:46:47

**Peak-to-Average Ratio on Channel 9400 (1880.0 MHz)**


Date: 15.SEP.2013 09:45:39

Peak-to-Average Ratio on Channel 9538 (1907.6 MHz)



Date: 15.SEP.2013 09:47:59

### 3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

#### 3.3.1 Description of the ERP/EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band).

#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;  
UMTS operating modes: Set RBW= 100 kHz, VBW= 300 kHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

$P_s$  (dBm) : Input power to substitution antenna.

$G_s$  (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

$E_s = R_s + AF$

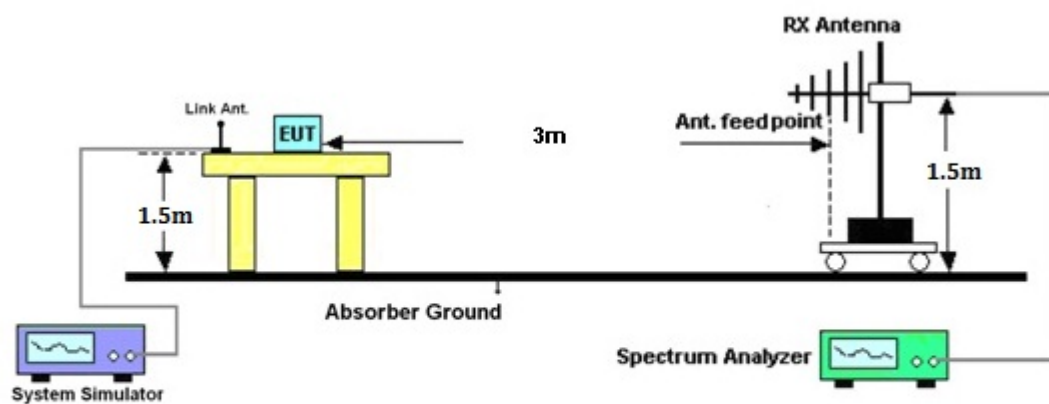
$AF$  (dB/m) : Receive antenna factor

$R_t$  : The highest received signal in spectrum analyzer for EUT.

$R_s$  : The highest received signal in spectrum analyzer for substitution antenna.



### 3.3.4 Test Setup



### 3.3.5 Test Result of ERP

<b>GSM850 (GSM) Radiated Power ERP</b>						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-18.45	-48.12	0.00	-1.08	28.59	0.72
836.40	-17.67	-48.28	0.00	-0.93	29.68	0.93
848.80	-16.75	-48.35	0.00	-0.76	30.84	1.21
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-17.74	-47.97	0.00	-1.08	29.15	0.82
836.40	-16.60	-48.01	0.00	-0.93	30.48	1.12
848.80	-15.18	-48.05	0.00	-0.76	32.11	1.63

<b>WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP</b>						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-27.03	-48.12	0.00	-1.08	20.01	0.10
836.40	-29.15	-48.28	0.00	-0.93	18.20	0.07
846.60	-26.60	-48.35	0.00	-0.76	20.99	0.13
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-26.34	-47.97	0.00	-1.08	20.55	0.11
836.40	-27.99	-48.01	0.00	-0.93	19.09	0.08
846.60	-25.09	-48.05	0.00	-0.76	22.20	0.17

### 3.3.6 Test Result of EIRP

<b>GSM1900 (GSM) Radiated Power EIRP</b>						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.58	-51.88	0.00	1.96	28.26	0.67
1880.00	-27.06	-52.99	0.00	2.00	27.93	0.62
1909.80	-27.11	-54.28	0.00	1.98	29.15	0.82
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-27.97	-52.13	0.00	1.96	26.12	0.41
1880.00	-27.87	-53.17	0.00	2.00	27.30	0.54
1909.80	-26.89	-54.13	0.00	1.98	29.22	0.84

<b>WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP</b>						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.40	-36.43	-51.88	0.00	1.96	17.41	0.06
1732.60	-36.51	-52.99	0.00	2.00	18.48	0.07
1752.60	-38.15	-54.28	0.00	1.98	18.11	0.06
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.40	-36.97	-52.13	0.00	1.96	17.12	0.05
1732.60	-37.10	-53.17	0.00	2.00	18.07	0.06
1752.60	-37.96	-54.13	0.00	1.98	18.15	0.07

WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-33.07	-51.88	0.00	1.96	20.77	0.12
1880.00	-34.81	-52.99	0.00	2.00	20.18	0.10
1907.60	-35.24	-54.28	0.00	1.98	21.02	0.13
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-35.43	-52.13	0.00	1.96	18.66	0.07
1880.00	-36.03	-53.17	0.00	2.00	19.14	0.08
1907.60	-35.51	-54.13	0.00	1.98	20.60	0.11

### 3.4 Occupied Bandwidth and 26dB Bandwidth Measurement

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

The 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.

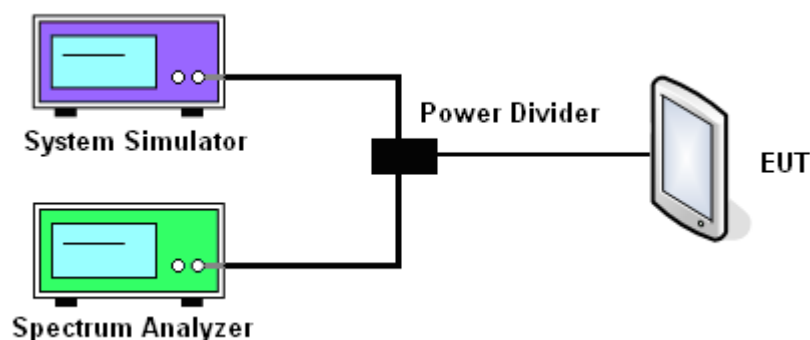
#### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 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 were measured, set RBW= 1% of span, VBW= 3\*RBW, sample detector, trace maximum hold.
4. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3\*RBW, peak detector, trace maximum hold.

#### 3.4.4 Test Setup



**3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth**

Cellular Band			
Modes	GSM850 (GSM)		
Channel	128 (Low)	189 (Mid)	251 (High)
Frequency (MHz)	824.2	836.4	848.8
99% OBW (kHz)	242.00	240.00	242.00
26dB BW (kHz)	314.00	316.00	312.00

PCS Band			
Modes	GSM1900 (GSM)		
Channel	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8
99% OBW (kHz)	242.00	242.00	242.00
26dB BW (kHz)	312.00	308.00	312.00

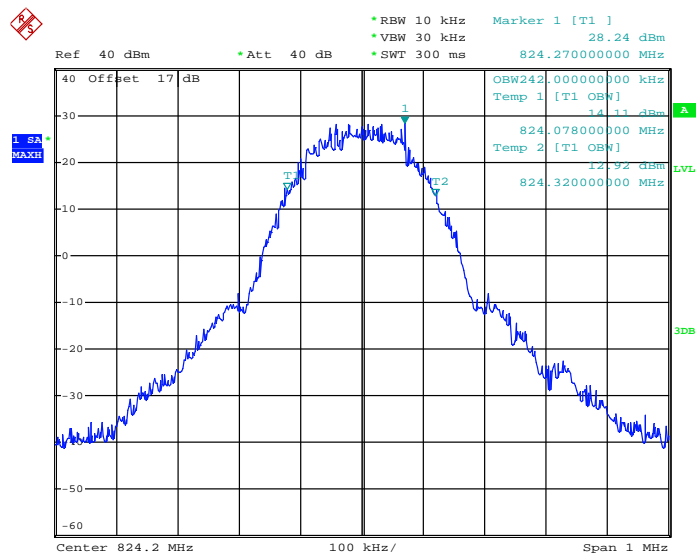
Cellular Band			
Modes	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
99% OBW (MHz)	4.20	4.16	4.18
26dB BW (MHz)	4.74	4.72	4.74

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
99% OBW (MHz)	4.18	4.20	4.20
26dB BW (MHz)	4.74	4.72	4.72

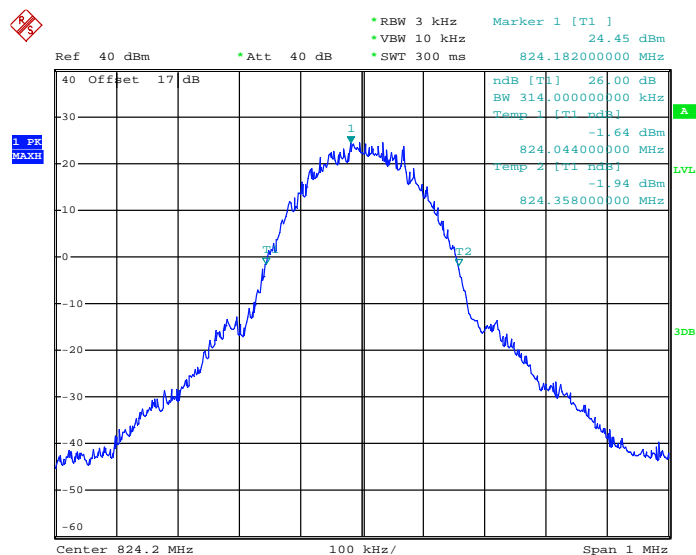
PCS Band			
Modes	WCDMA Band II (RMC 12.2Kbps)		
Channel	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1852.4	1880	1907.6
99% OBW (MHz)	4.18	4.16	4.20
26dB BW (MHz)	4.74	4.74	4.72

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

<b>Band :</b>	GSM 850	<b>Test Mode :</b>	GSM Link (GMSK)
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**99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)**


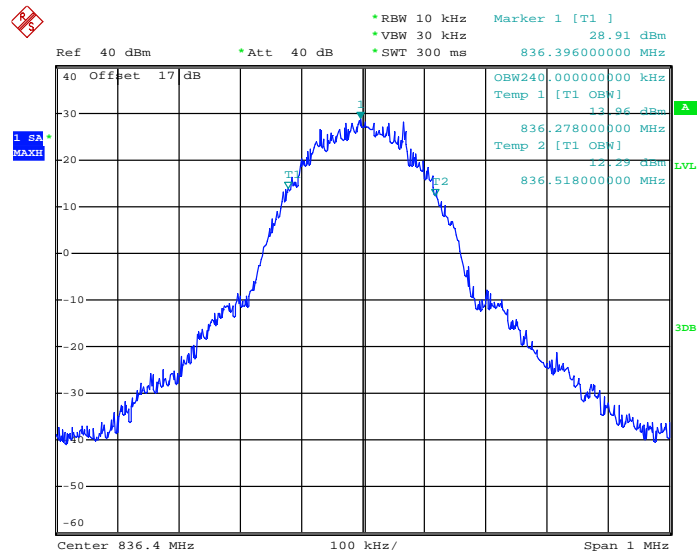
Date: 13.SEP.2013 21:59:23

**26dB Bandwidth Plot on Channel 128 (824.2 MHz)**


Date: 13.SEP.2013 21:50:30

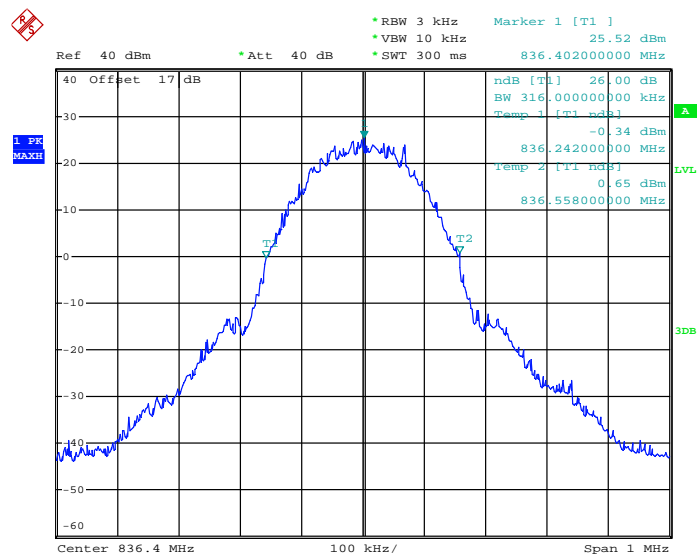


## 99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 13.SEP.2013 21:57:41

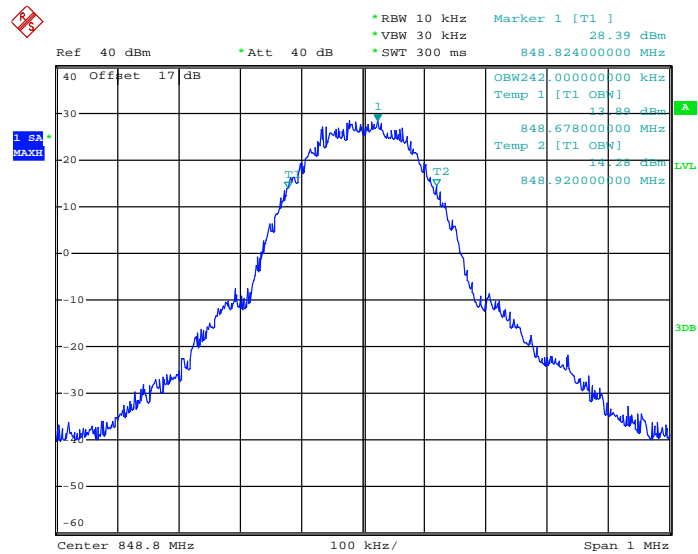
## 26dB Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 13.SEP.2013 21:48:54

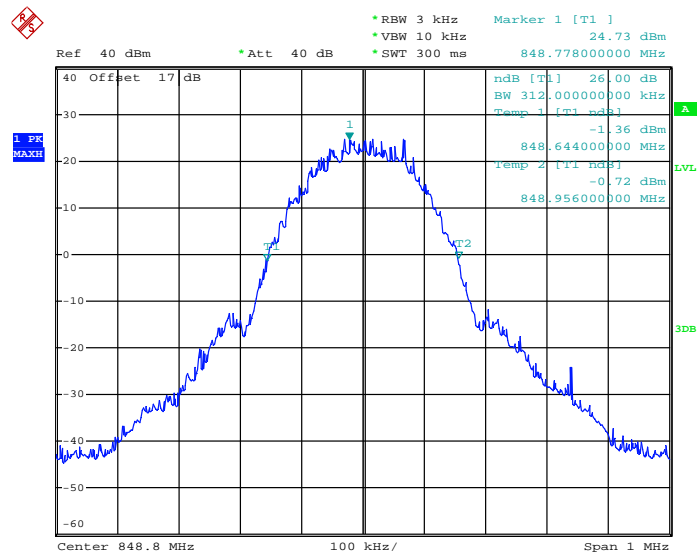


99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 13.SEP.2013 21:55:25

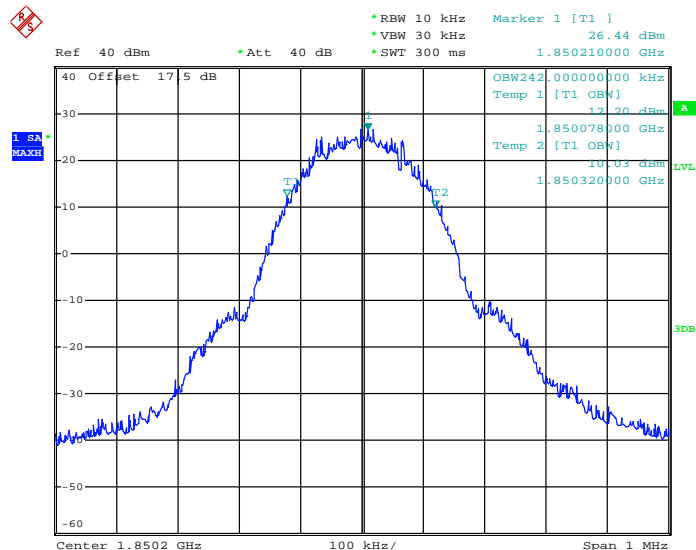
26dB Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 13.SEP.2013 21:52:05

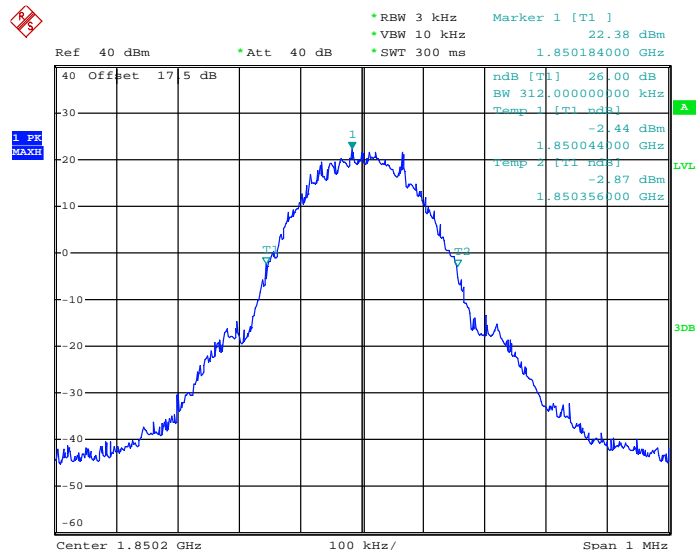
Band :	GSM 1900	Test Mode :	GSM Link (GMSK)
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## 99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



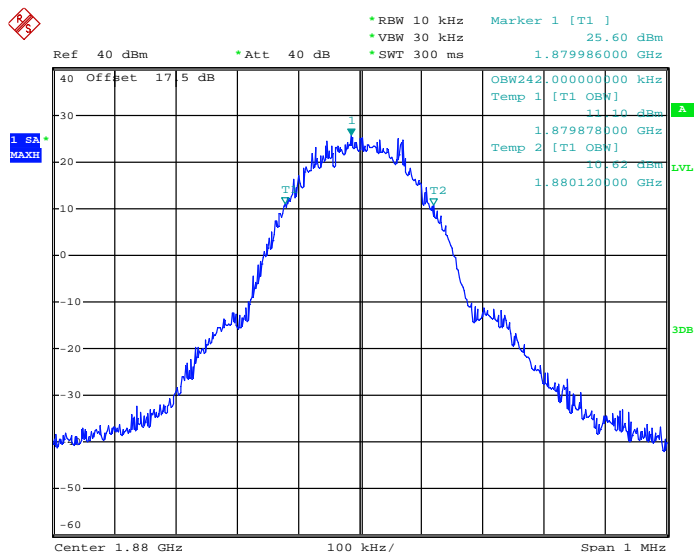
Date: 13.SEP.2013 22:16:34

## 26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



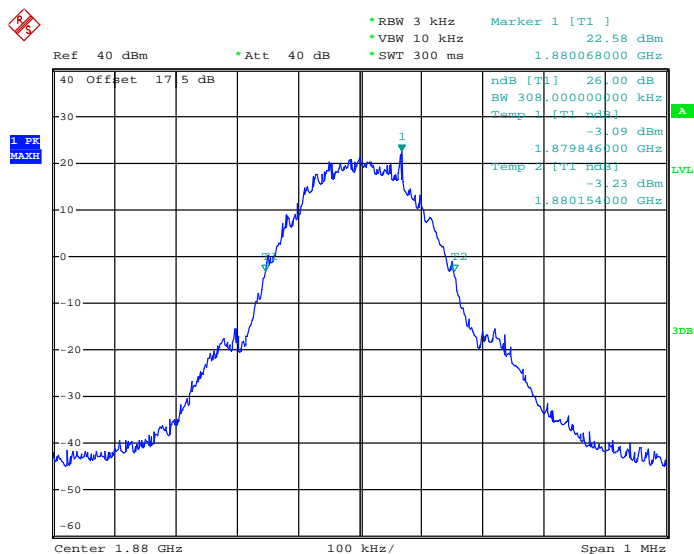
Date: 13.SEP.2013 22:27:02

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



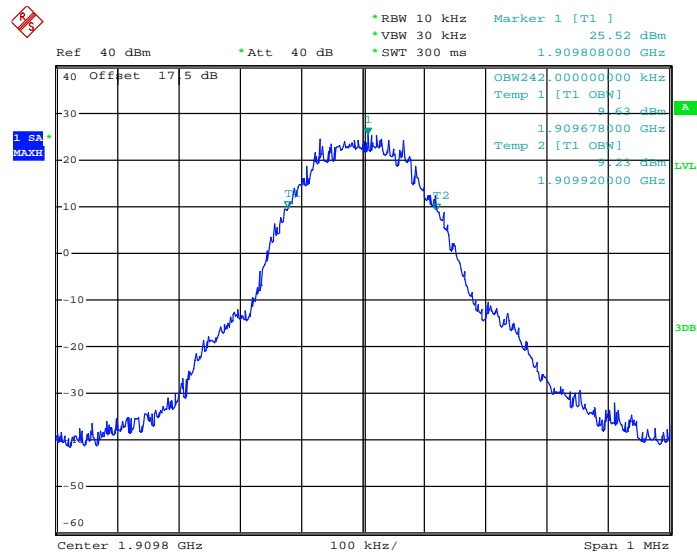
Date: 13.SEP.2013 22:19:03

## 26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



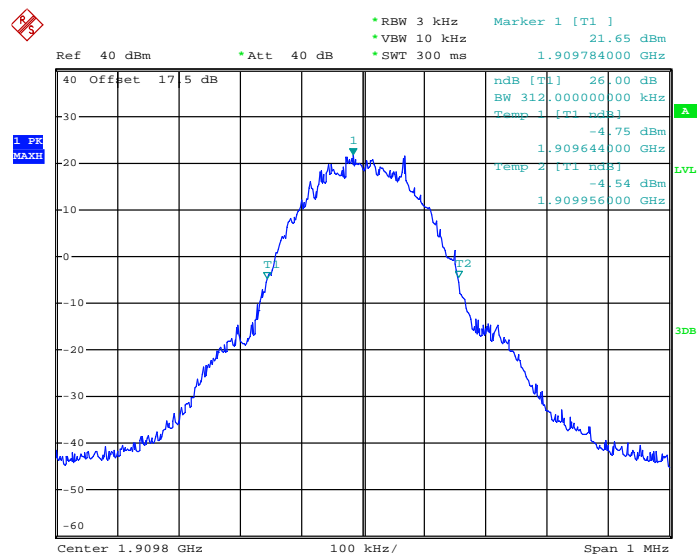
Date: 13.SEP.2013 22:28:27

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



Date: 13.SEP.2013 22:21:46

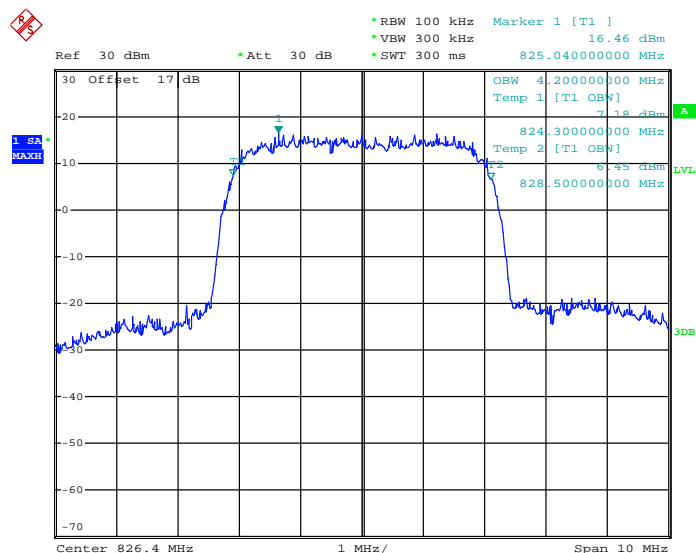
## 26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 13.SEP.2013 22:25:06

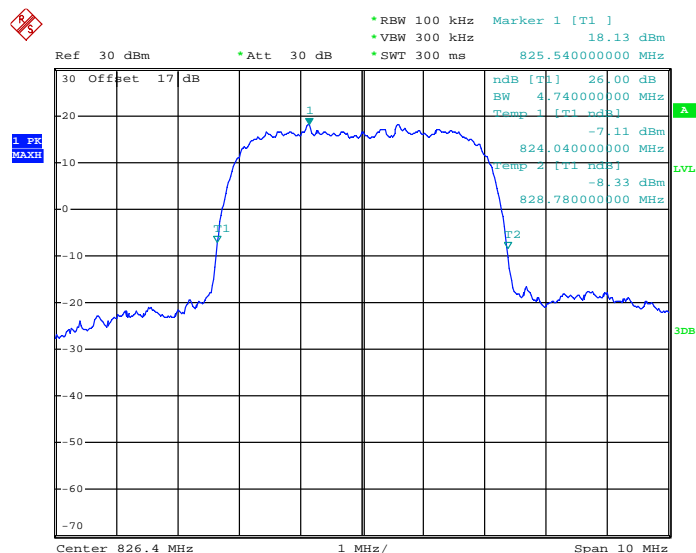
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
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## 99% Occupied Bandwidth Plot on Channel 4132 (826.4 MHz)



Date: 15.SEP.2013 09:16:04

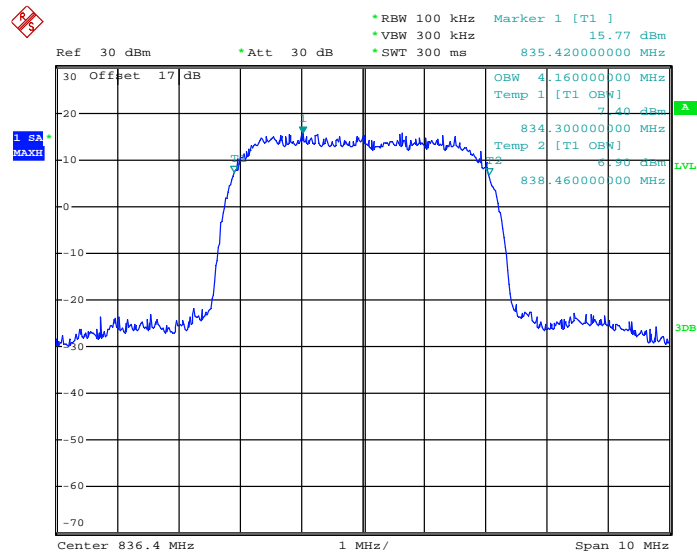
## 26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



Date: 15.SEP.2013 08:50:00

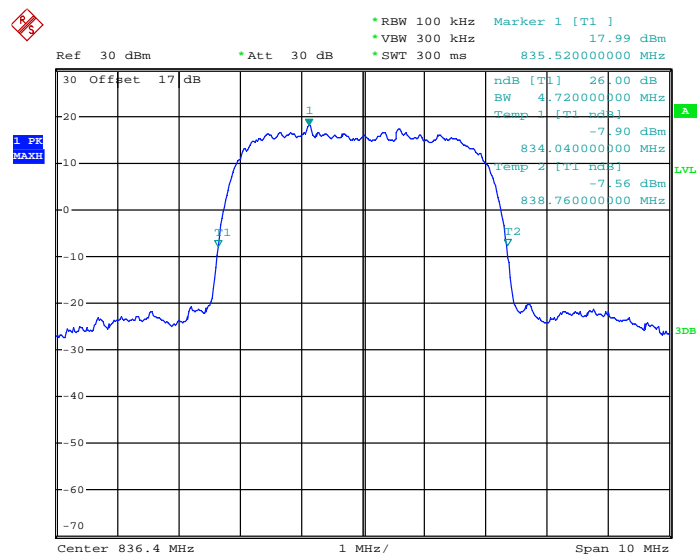


99% Occupied Bandwidth Plot on Channel 4182 (836.4 MHz)



Date: 15.SEP.2013 09:13:09

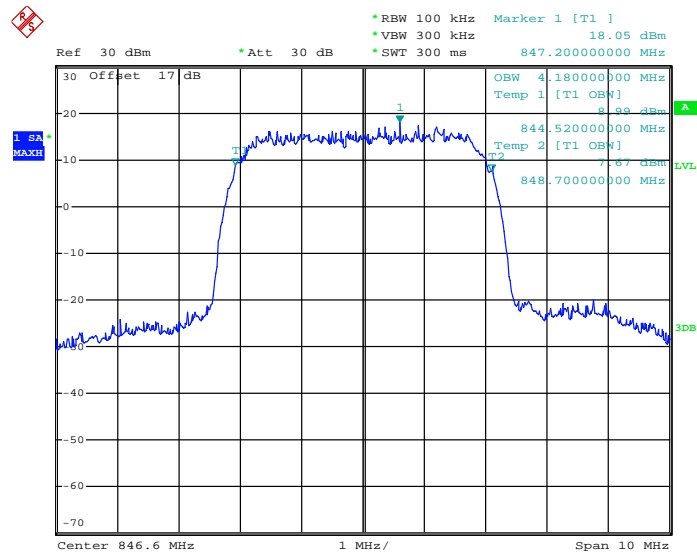
26dB Bandwidth Plot on Channel 4182 (836.4 MHz)



Date: 15.SEP.2013 08:46:54

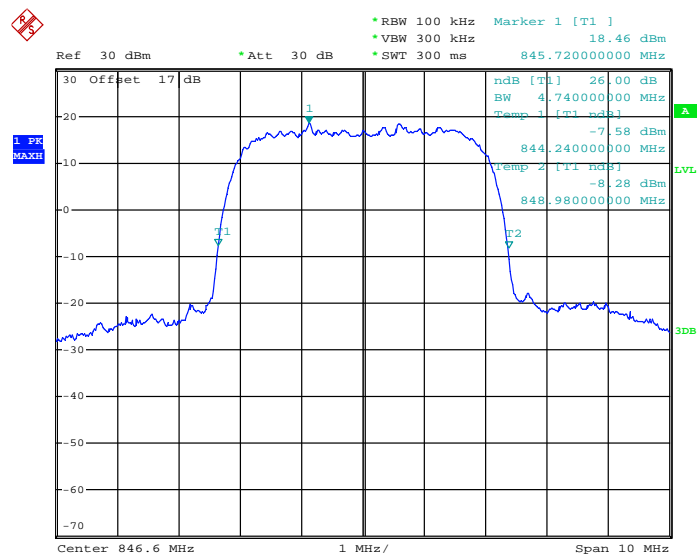


99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 15.SEP.2013 09:18:19

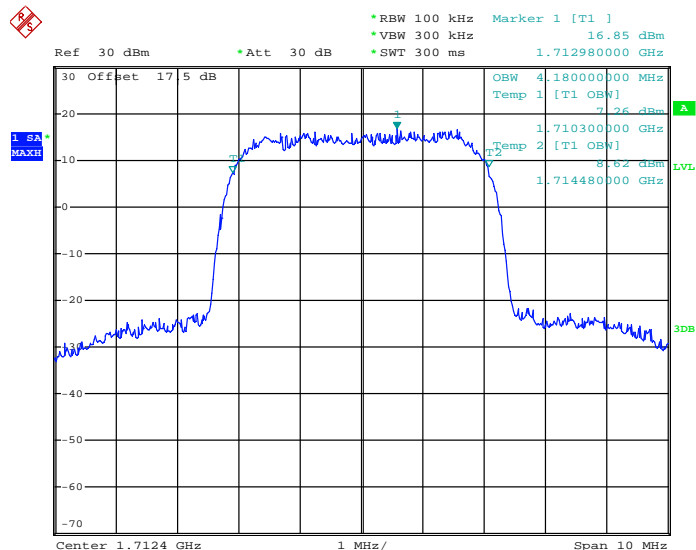
26dB Bandwidth Plot on Channel 4233 (846.6 MHz)



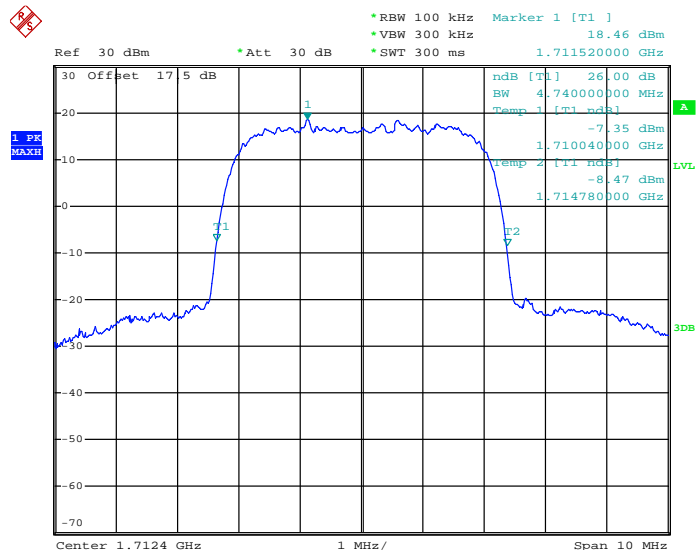
Date: 15.SEP.2013 08:48:19



<b>Band :</b>	WCDMA Band IV	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
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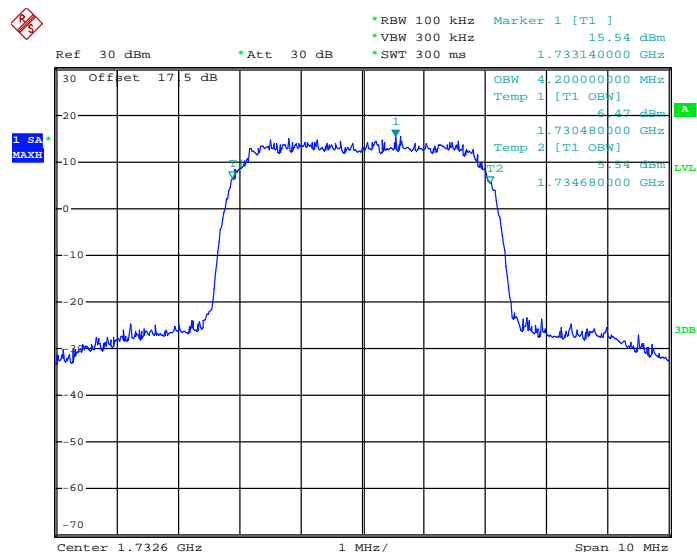
**99% Occupied Bandwidth Plot on Channel 1312 (1712.4 MHz)**


Date: 15.SEP.2013 08:58:44

**26dB Bandwidth Plot on Channel 1312 (1712.4 MHz)**


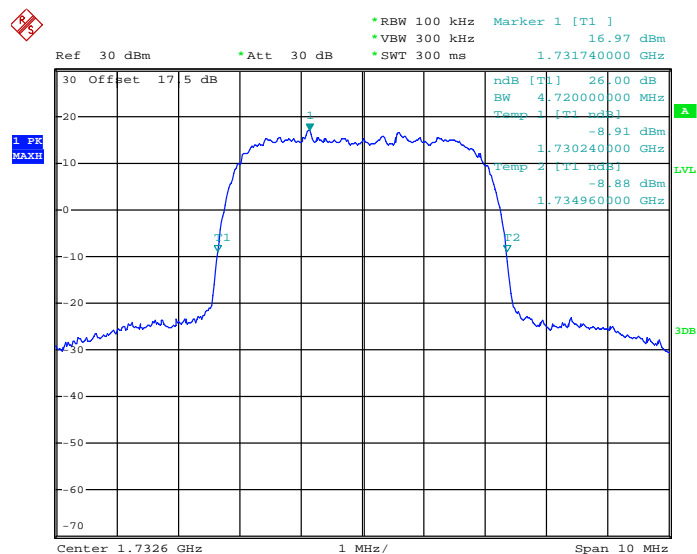
Date: 15.SEP.2013 08:53:08

## 99% Occupied Bandwidth Plot on Channel 1413 (1732.6 MHz)

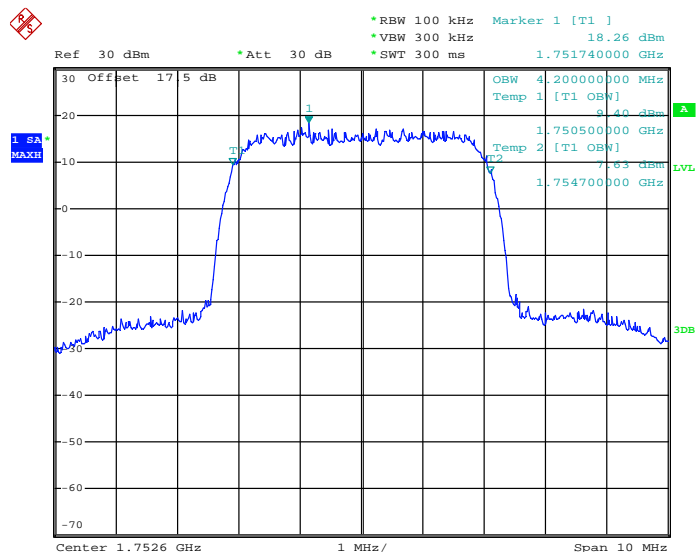


Date: 15.SEP.2013 09:02:03

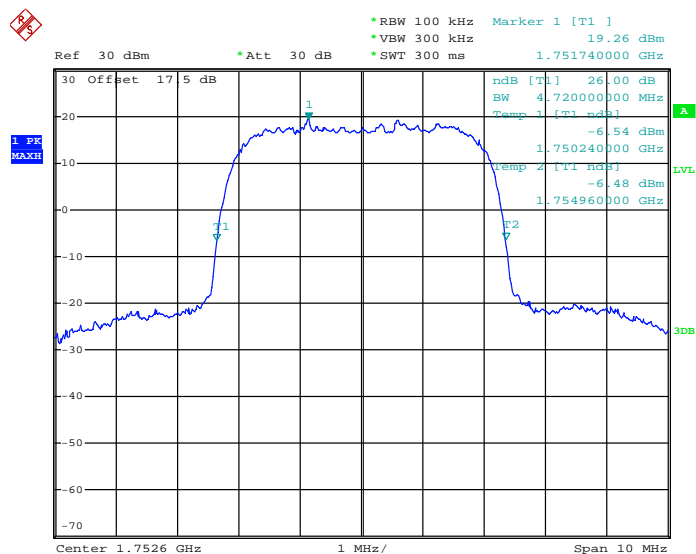
## 26dB Bandwidth Plot on Channel 1413 (1732.6 MHz)



Date: 15.SEP.2013 08:51:50

**99% Occupied Bandwidth Plot on Channel 1513 (1752.6 MHz)**


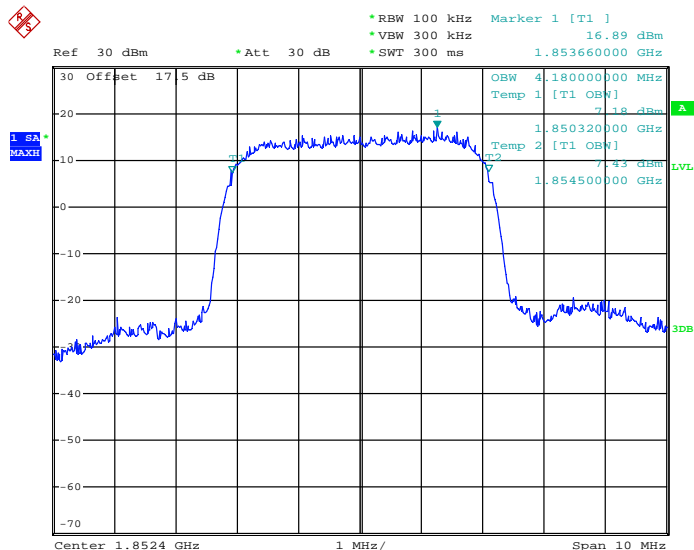
Date: 15.SEP.2013 08:56:33

**26dB Bandwidth Plot on Channel 1513 (1752.6 MHz)**


Date: 15.SEP.2013 08:54:17

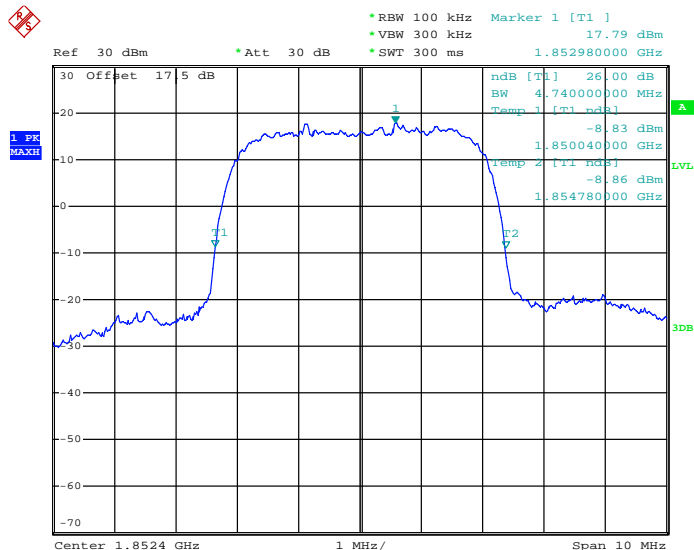
Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
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## 99% Occupied Bandwidth Plot on Channel 9262 (1852.4 MHz)



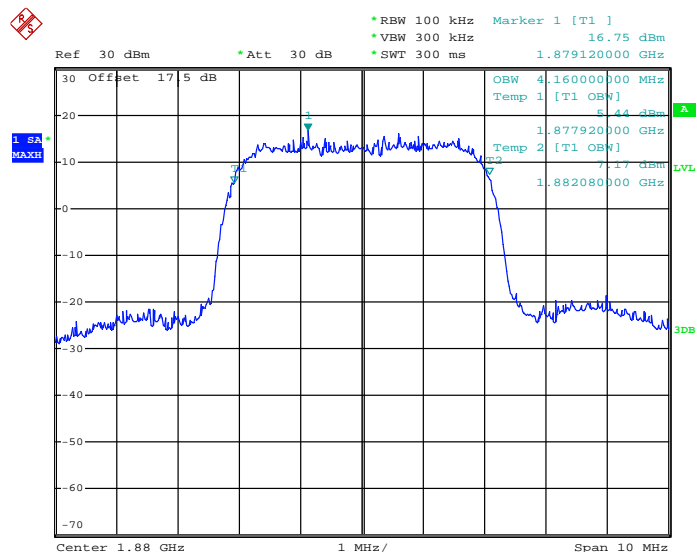
Date: 15.SEP.2013 09:08:04

## 26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)



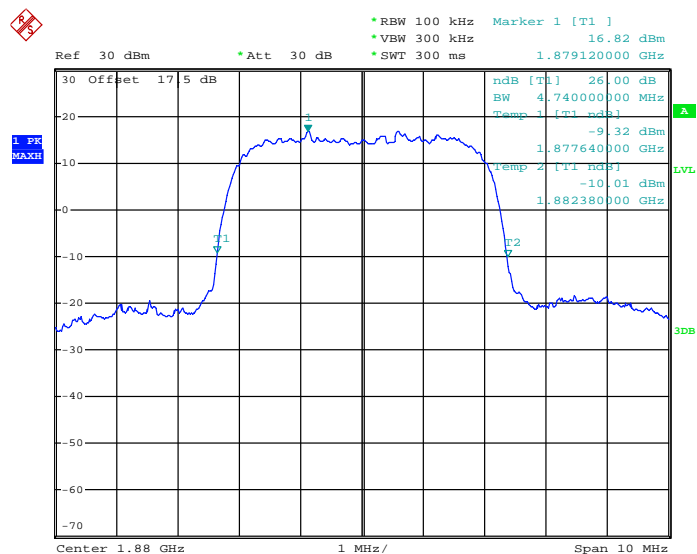
Date: 15.SEP.2013 08:42:06

### 99% Occupied Bandwidth Plot on Channel 9400 (1880.0 MHz)



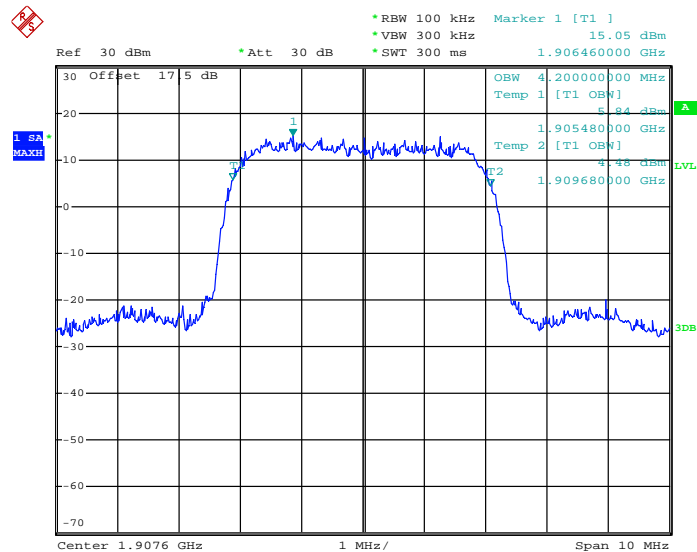
Date: 15.SEP.2013 09:05:39

### 26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)



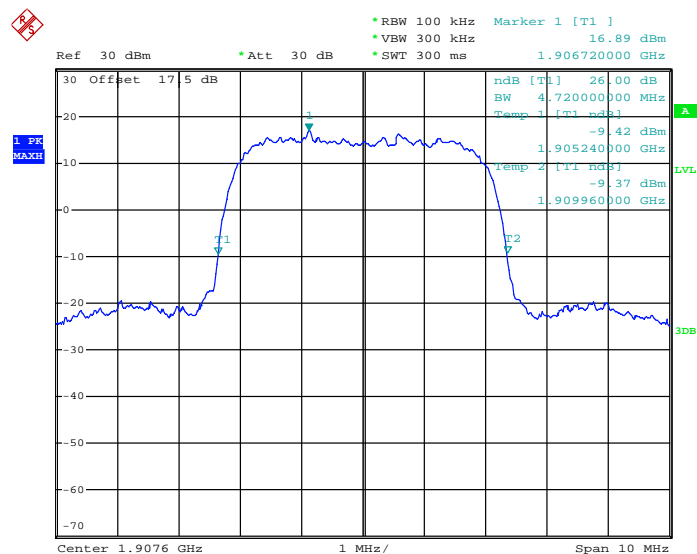
Date: 15.SEP.2013 08:40:25

### 99% Occupied Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 15.SEP.2013 09:09:54

### 26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 15.SEP.2013 08:44:28

### 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.

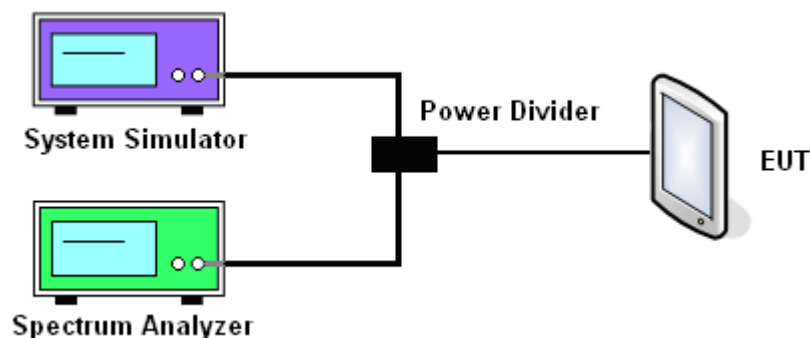
#### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 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 RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$   
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$   
 $= -13\text{dBm}.$

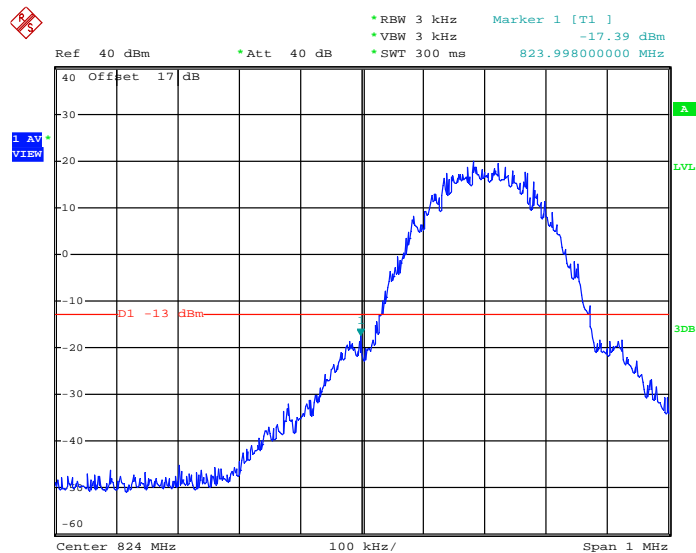
#### 3.5.4 Test Setup



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

<b>Band :</b>	GSM850	<b>Test Mode :</b>	GSM Link (GMSK)
<b>Correction Factor :</b>	0.23dB	<b>Maximum 26dB Bandwidth :</b>	0.316MHz
<b>Band Edge :</b>	-17.16dBm	<b>Measurement Value :</b>	-17.39dBm

**Lower Band Edge Plot on Channel 128 (824.2 MHz)**

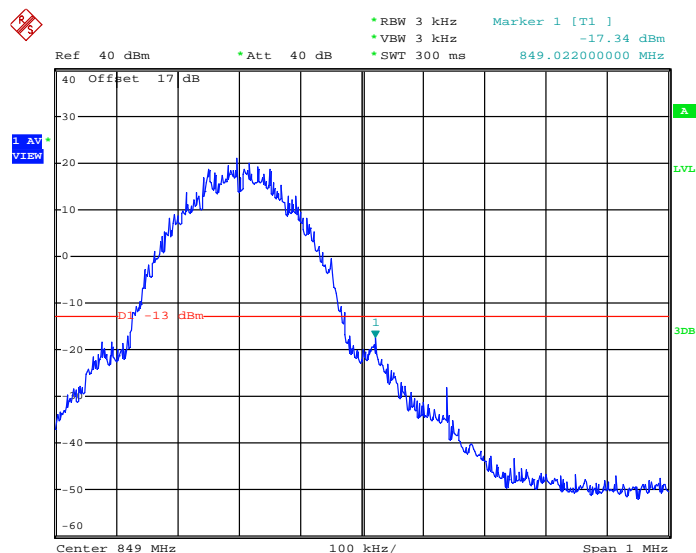


Date: 13.SEP.2013 22:01:30

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)



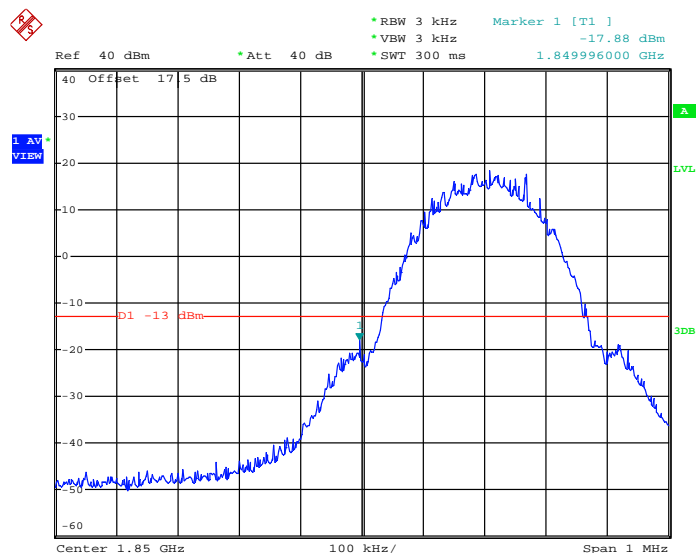
<b>Band :</b>	GSM850	<b>Test Mode :</b>	GSM Link (GMSK)
<b>Correction Factor :</b>	0.23dB	<b>Maximum 26dB Bandwidth :</b>	0.316MHz
<b>Band Edge :</b>	-17.11dBm	<b>Measurement Value :</b>	-17.34dBm

**Higher Band Edge Plot on Channel 251 (848.8 MHz)**


Date: 13.SEP.2013 22:02:45

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

<b>Band :</b>	GSM1900	<b>Test Mode :</b>	GSM Link (GMSK)
<b>Correction Factor :</b>	0.17dB	<b>Maximum 26dB Bandwidth :</b>	0.312MHz
<b>Band Edge :</b>	-17.71dBm	<b>Measurement Value :</b>	-17.88dBm

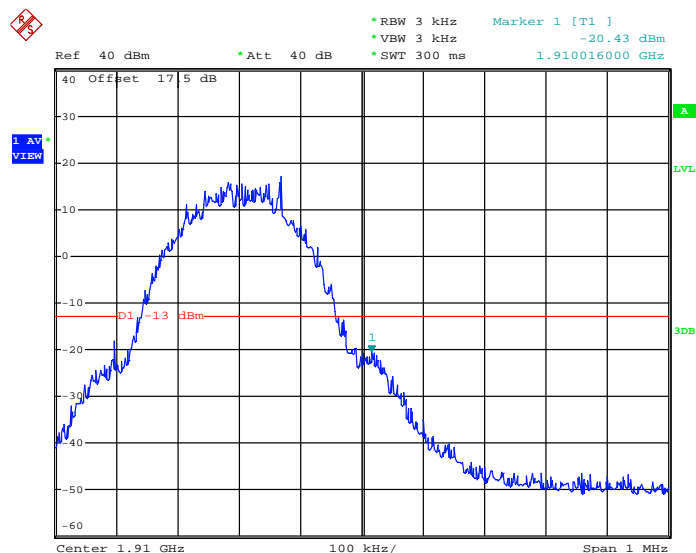
**Lower Band Edge Plot on Channel 512 (1850.2 MHz)**


Date: 13.SEP.2013 22:11:42

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

<b>Band :</b>	GSM1900	<b>Test Mode :</b>	GSM Link (GMSK)
<b>Correction Factor :</b>	0.17dB	<b>Maximum 26dB Bandwidth :</b>	0.312MHz
<b>Band Edge :</b>	-20.26dBm	<b>Measurement Value :</b>	-20.43dBm

### Higher Band Edge Plot on Channel 810 (1909.8 MHz)

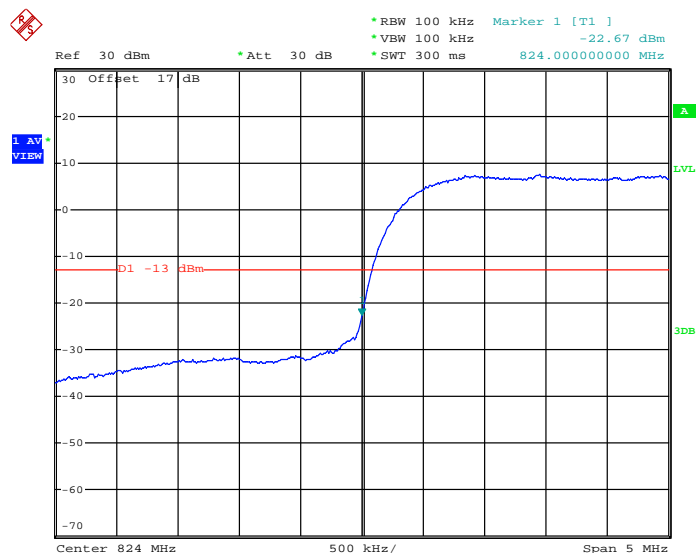


Date: 13.SEP.2013 22:05:50

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.24dB	Maximum 26dB Bandwidth :	4.740MHz
Band Edge :	-25.91dBm	Measurement Value :	-22.67dBm

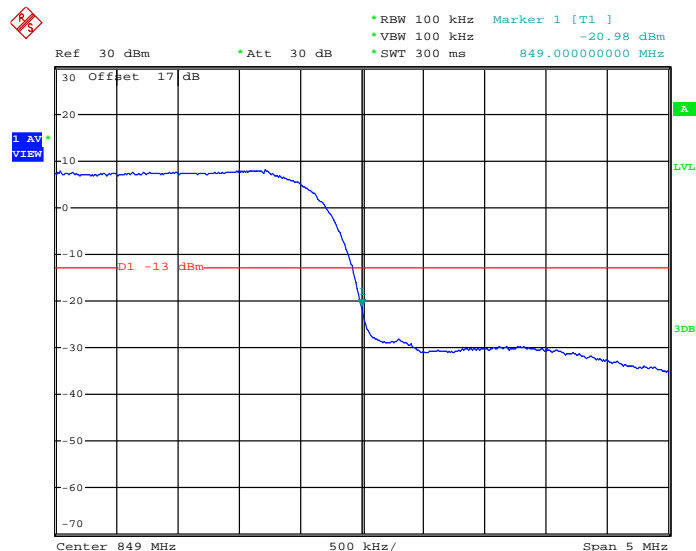
### Lower Band Edge Plot on Channel 4132 (826.4 MHz)



Date: 15.SEP.2013 11:08:24

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

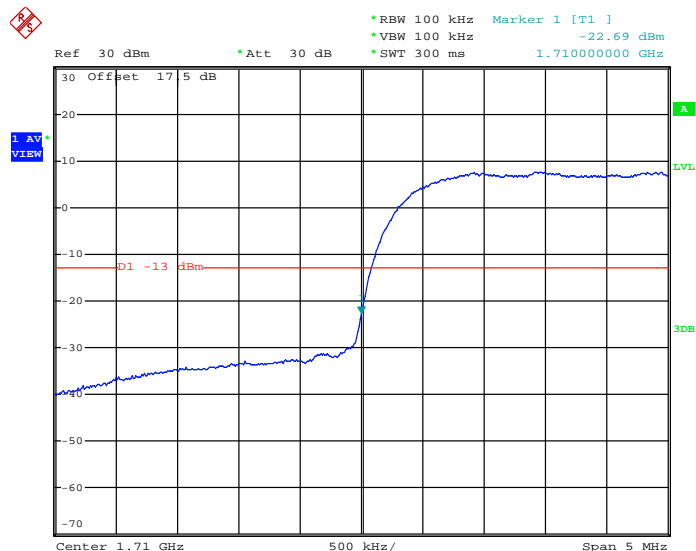
<b>Band :</b>	WCDMA Band V	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
<b>Correction Factor :</b>	-3.24dB	<b>Maximum 26dB Bandwidth :</b>	4.740MHz
<b>Band Edge :</b>	-24.22dBm	<b>Measurement Value :</b>	-20.98dBm

**Higher Band Edge Plot on Channel 4233 (846.6 MHz)**


Date: 15.SEP.2013 09:20:45

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

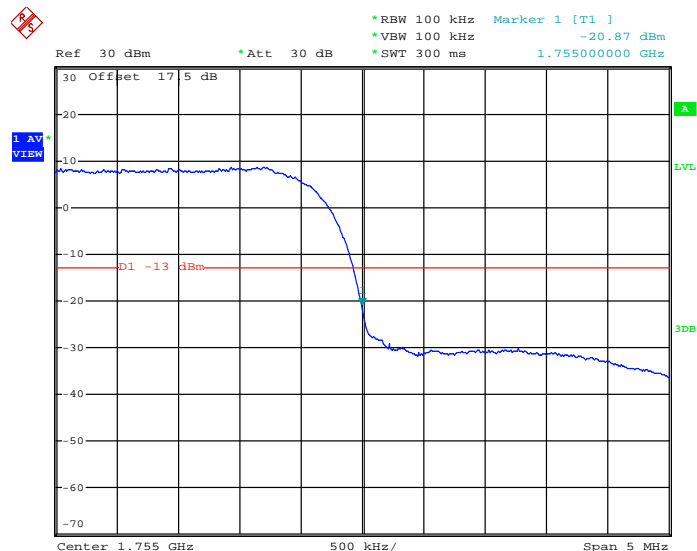
<b>Band :</b>	WCDMA Band IV	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
<b>Correction Factor :</b>	-3.24dB	<b>Maximum 26dB Bandwidth :</b>	4.740MHz
<b>Band Edge :</b>	-25.93dBm	<b>Measurement Value :</b>	-22.69dBm

**Lower Band Edge Plot on Channel 1312 (1712.4 MHz)**


Date: 15.SEP.2013 09:33:11

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

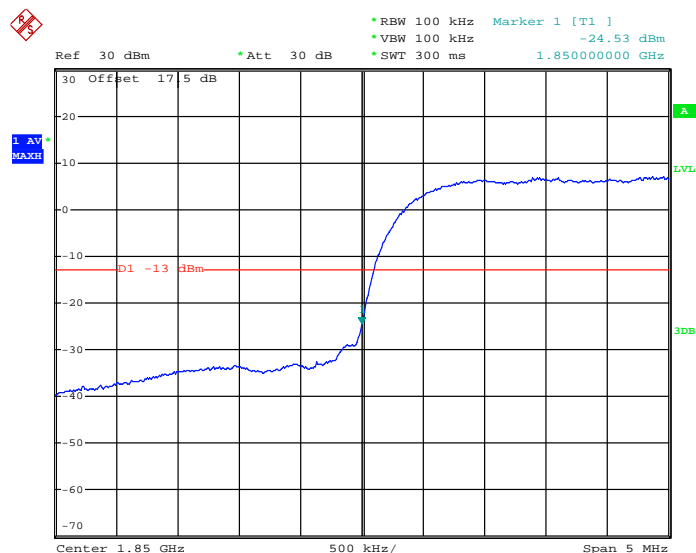
<b>Band :</b>	WCDMA Band IV	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
<b>Correction Factor :</b>	-3.24dB	<b>Maximum 26dB Bandwidth :</b>	4.740MHz
<b>Band Edge :</b>	-24.11dBm	<b>Measurement Value :</b>	-20.87dBm

**Higher Band Edge Plot on Channel 1513 (1752.6 MHz)**


Date: 15.SEP.2013 09:34:25

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

<b>Band :</b>	WCDMA Band II	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
<b>Correction Factor :</b>	-3.24dB	<b>Maximum 26dB Bandwidth :</b>	4.740MHz
<b>Band Edge :</b>	-27.77dBm	<b>Measurement Value :</b>	-24.53dBm

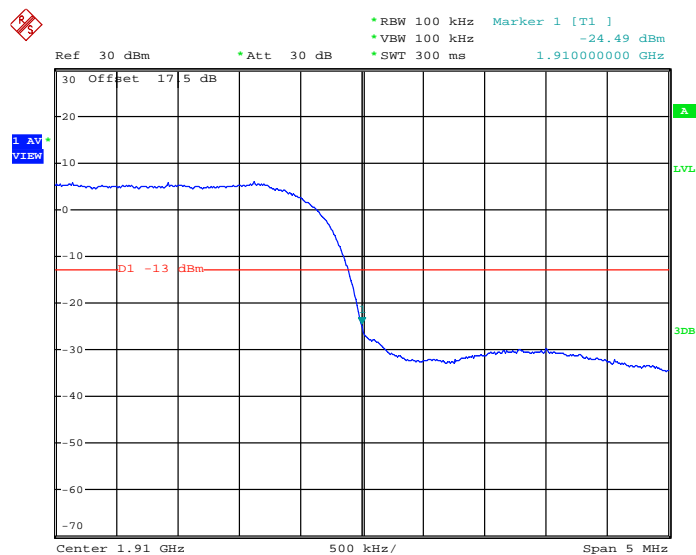
**Lower Band Edge Plot on Channel 9262 (1852.4 MHz)**


Date: 15.SEP.2013 09:27:05

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)



<b>Band :</b>	WCDMA Band II	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
<b>Correction Factor :</b>	-3.24dB	<b>Maximum 26dB Bandwidth :</b>	4.740MHz
<b>Band Edge :</b>	-27.73dBm	<b>Measurement Value :</b>	-24.49dBm

**Higher Band Edge Plot on Channel 9538 (1907.6 MHz)**


Date: 15.SEP.2013 09:28:55

1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

## 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.

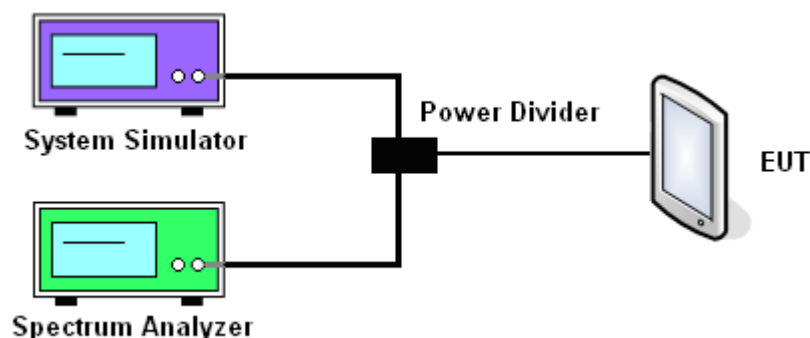
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

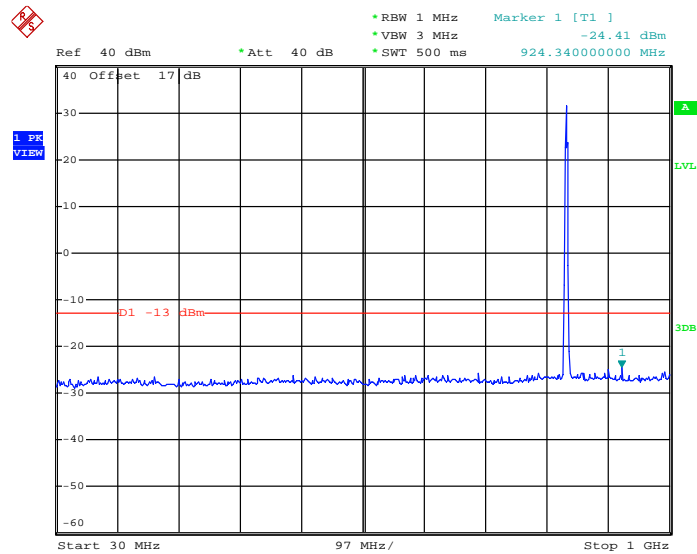
1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. 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)  
 $= -13\text{dBm}$ .

### 3.6.4 Test Setup

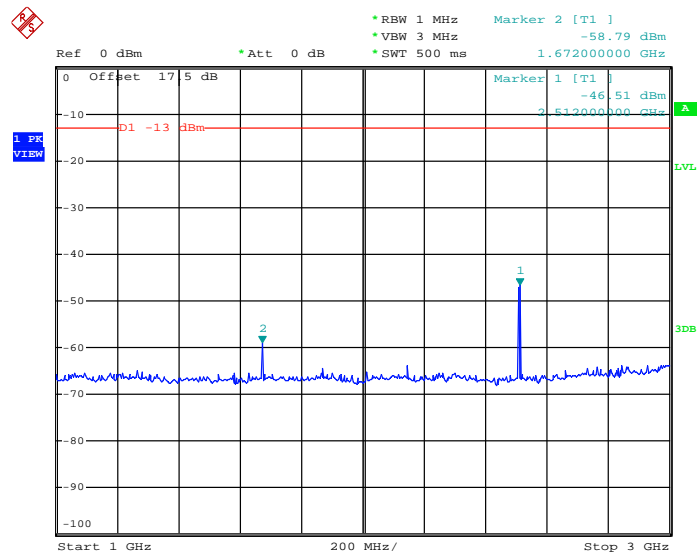


### 3.6.5 Test Result (Plots) of Conducted Emission

<b>Band :</b>	GSM850	<b>Channel :</b>	CH189
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Frequency :</b>	836.4 MHz

**Conducted Spurious Emission Plot between 30MHz ~ 1GHz**


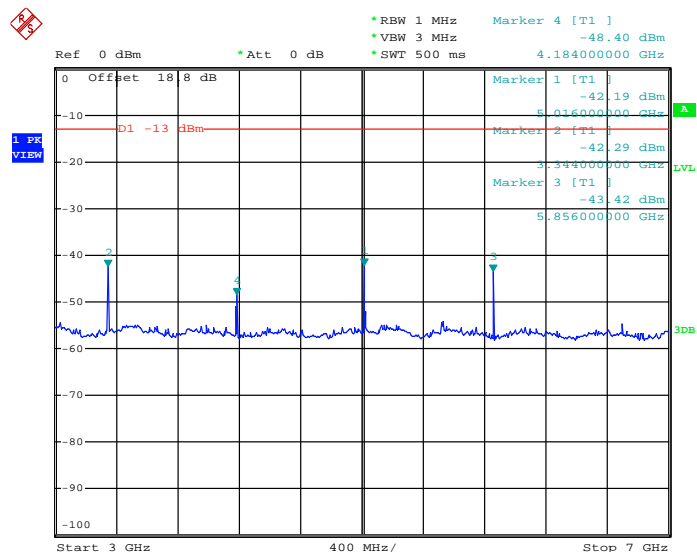
Date: 13.SEP.2013 23:03:52

**Conducted Spurious Emission Plot between 1GHz ~ 3GHz**


Date: 15.SEP.2013 11:18:10

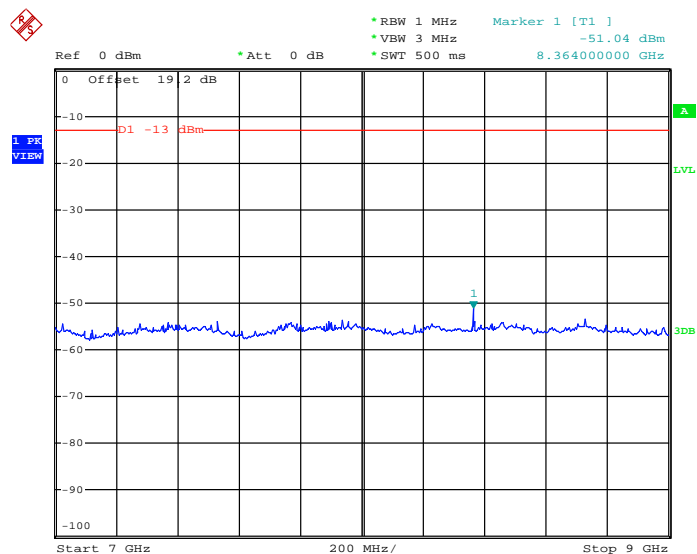


### Conducted Spurious Emission Plot between 3GHz ~ 7GHz



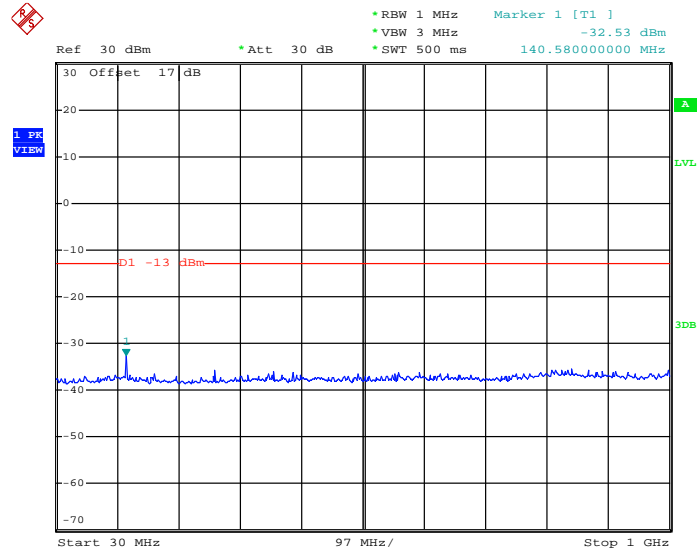
Date: 13.SEP.2013 22:57:40

### Conducted Spurious Emission Plot between 7GHz ~ 9GHz

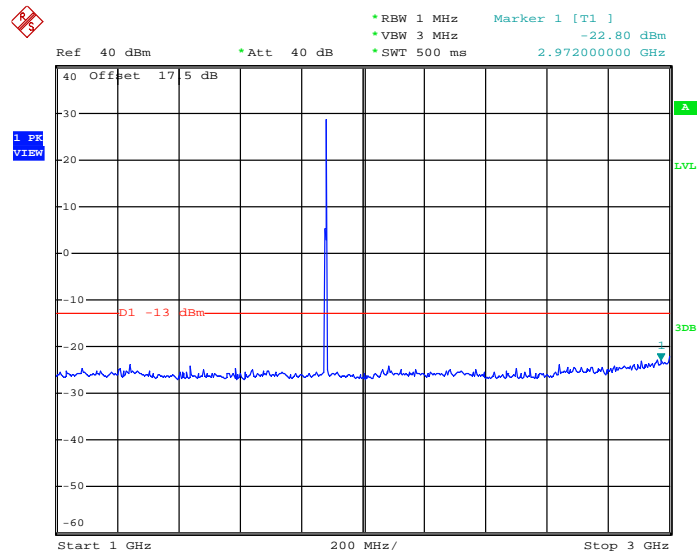


Date: 13.SEP.2013 22:58:52

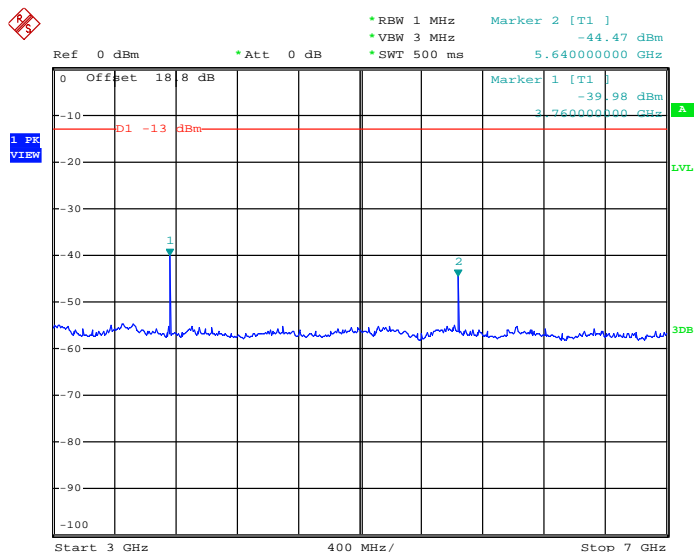
<b>Band :</b>	GSM1900	<b>Channel :</b>	CH661
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Frequency :</b>	1880.0 MHz

**Conducted Spurious Emission Plot between 30MHz ~ 1GHz**


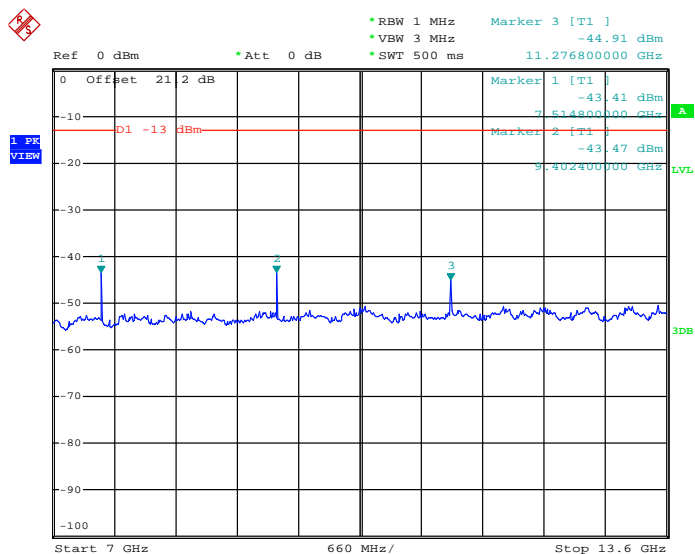
Date: 13.SEP.2013 22:31:11

**Conducted Spurious Emission Plot between 1GHz ~ 3GHz**


Date: 13.SEP.2013 22:32:53

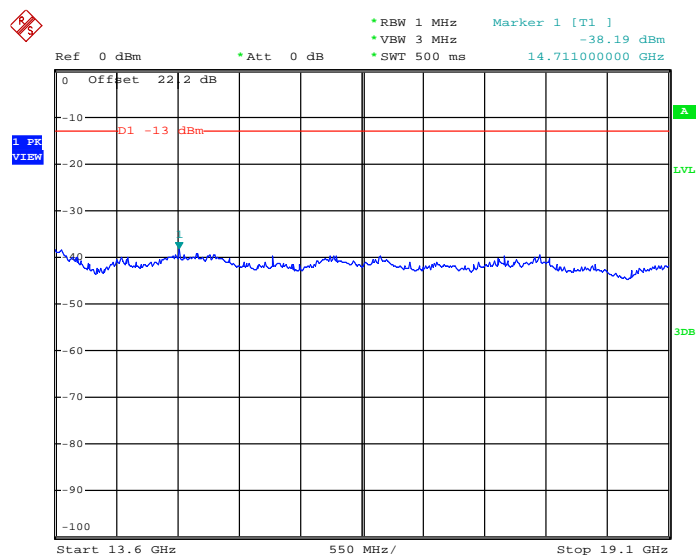
**Conducted Spurious Emission Plot between 3GHz ~ 7GHz**


Date: 13.SEP.2013 22:35:43

**Conducted Spurious Emission Plot between 7GHz ~ 13.6G**


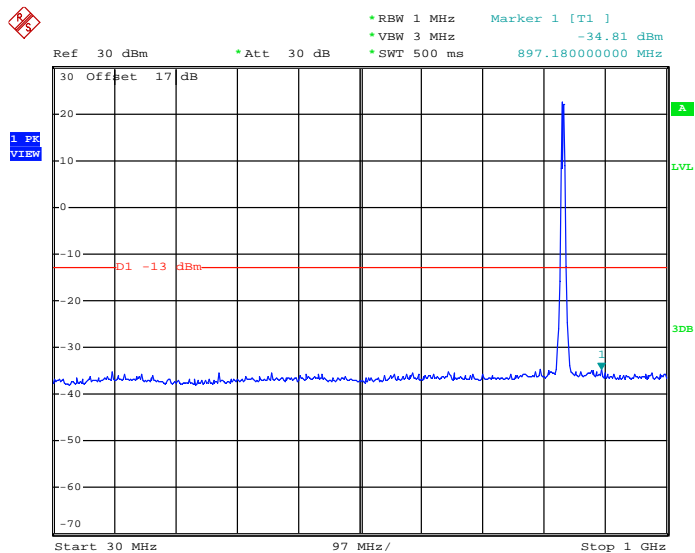
Date: 13.SEP.2013 22:37:07

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

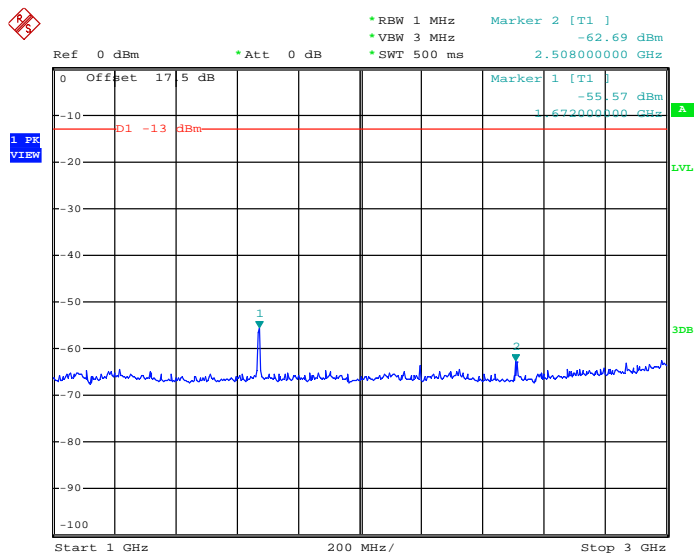


Date: 13.SEP.2013 22:40:06

<b>Band :</b>	WCDMA Band V	<b>Channel :</b>	CH4182
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Frequency :</b>	836.4 MHz

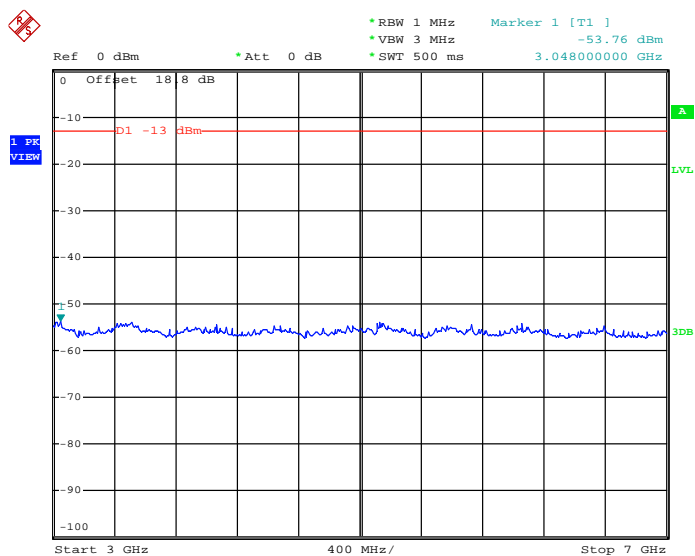
**Conducted Spurious Emission Plot between 30MHz ~ 1GHz**


Date: 15.SEP.2013 10:03:21

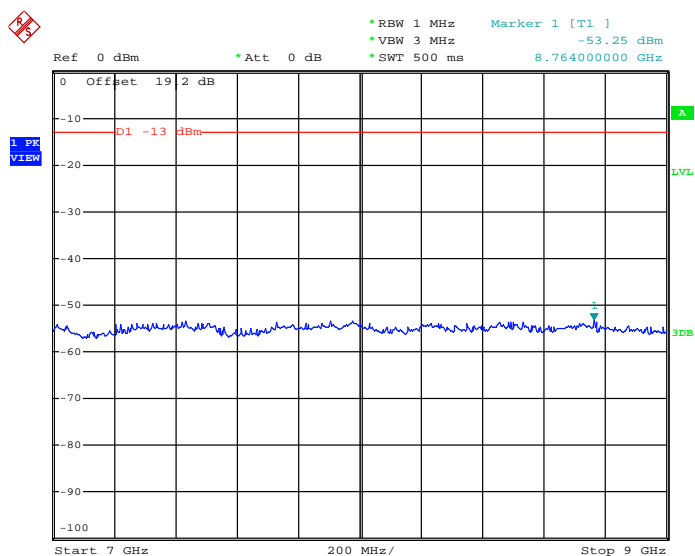
**Conducted Spurious Emission Plot between 1GHz ~ 3GHz**


Date: 15.SEP.2013 10:08:09



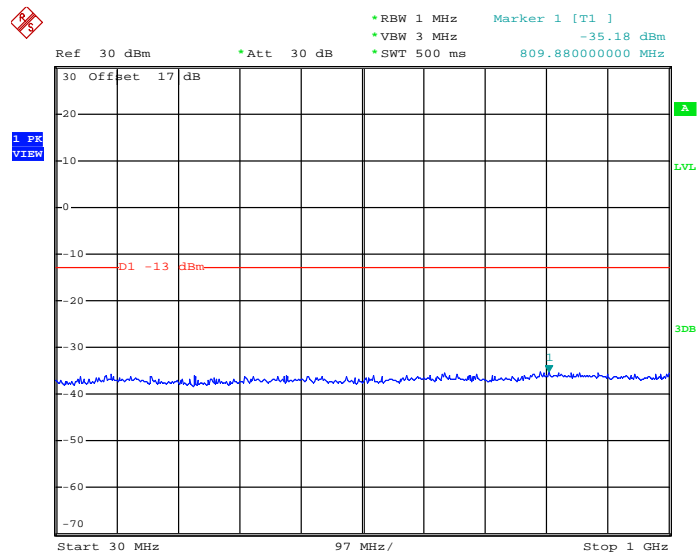
**Conducted Spurious Emission Plot between 3GHz ~ 7GHz**


Date: 15.SEP.2013 10:10:29

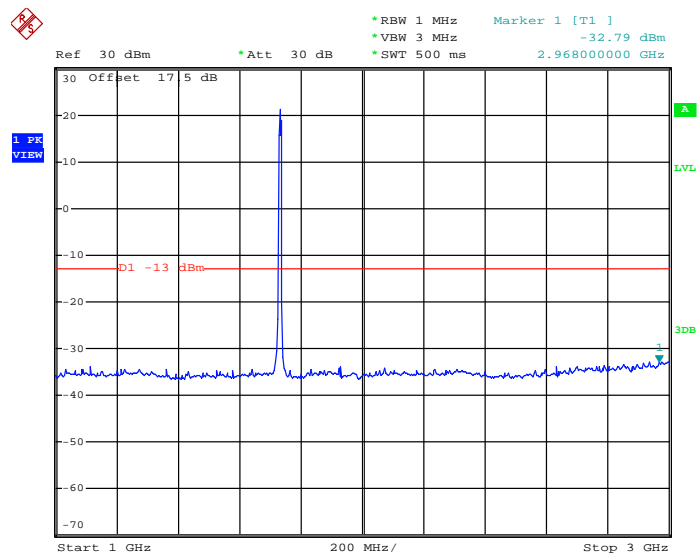
**Conducted Spurious Emission Plot between 7GHz ~ 9GHz**


Date: 15.SEP.2013 10:12:25

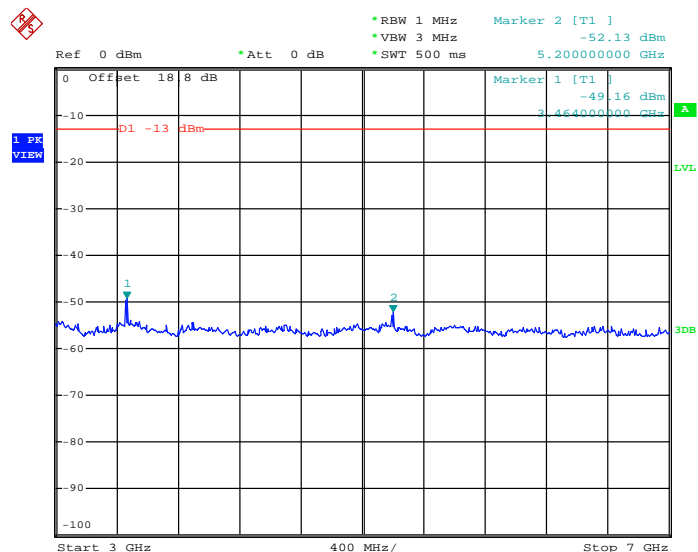
<b>Band :</b>	WCDMA Band IV	<b>Channel :</b>	CH1413
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Frequency :</b>	1732.6 MHz

**Conducted Spurious Emission Plot between 30MHz ~ 1GHz**


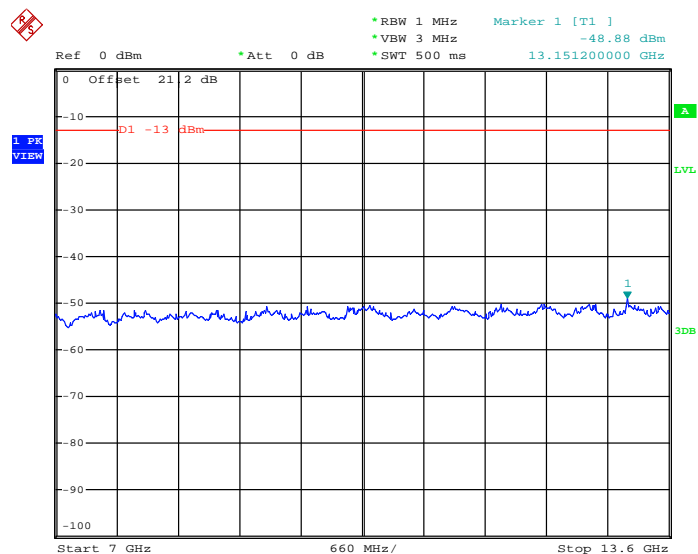
Date: 15.SEP.2013 10:44:41

**Conducted Spurious Emission Plot between 1GHz ~ 3GHz**


Date: 15.SEP.2013 10:39:45

**Conducted Spurious Emission Plot between 3GHz ~ 7GHz**


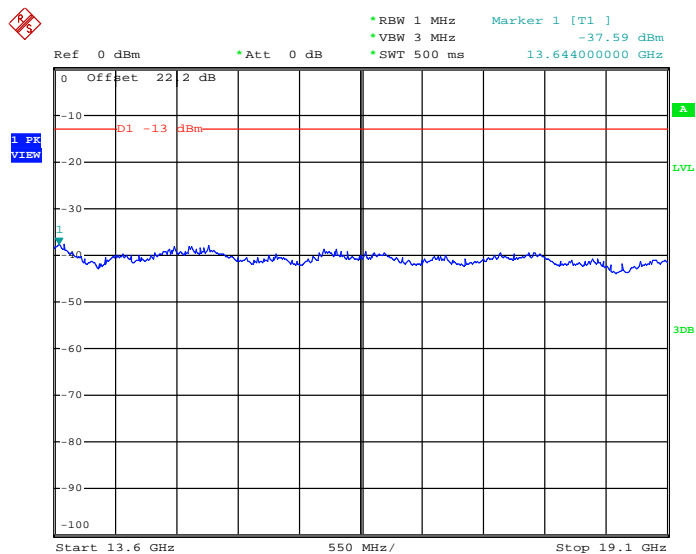
Date: 15.SEP.2013 10:32:57

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


Date: 15.SEP.2013 10:30:59



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

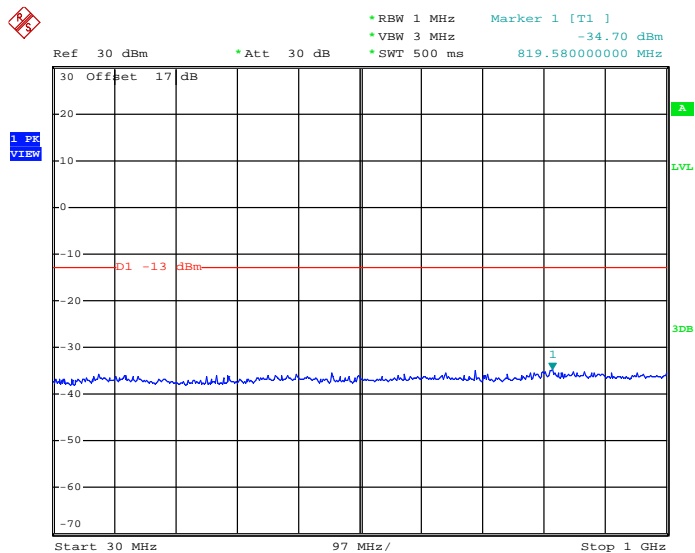


Date: 15.SEP.2013 10:29:32



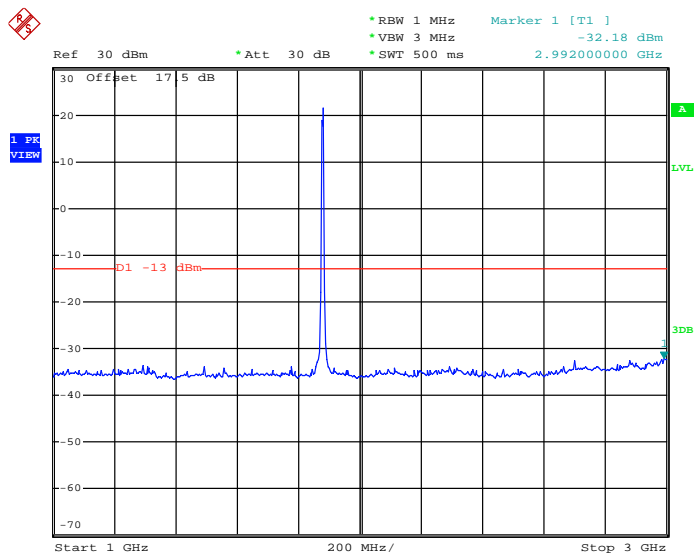
Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz

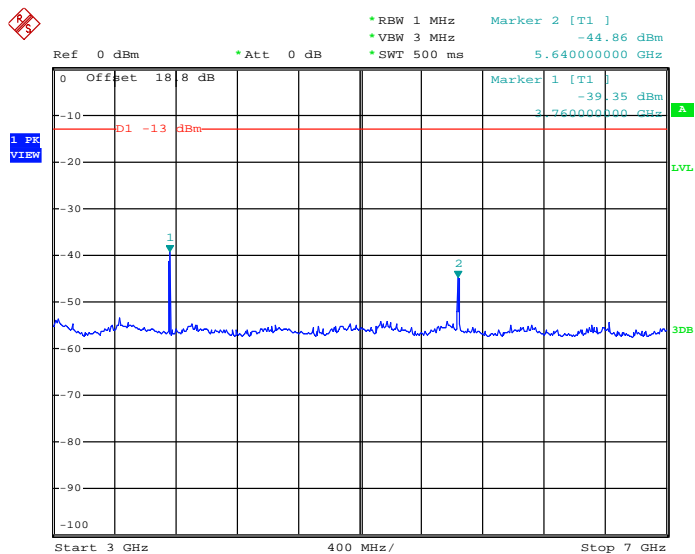


Date: 15.SEP.2013 10:16:54

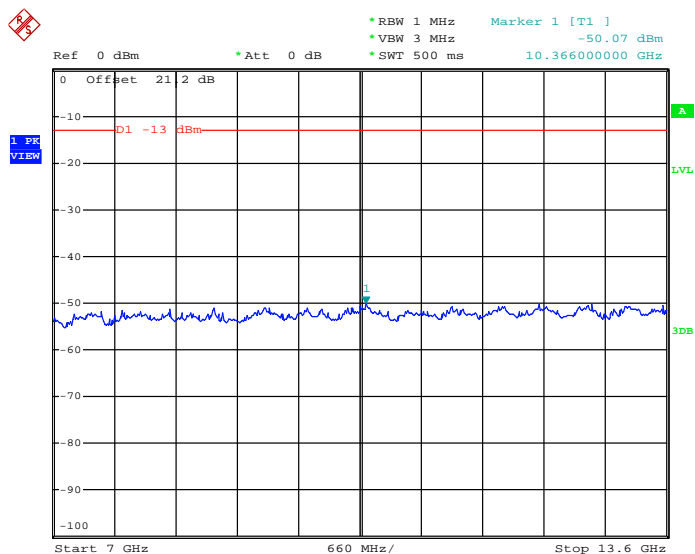
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 15.SEP.2013 10:42:12

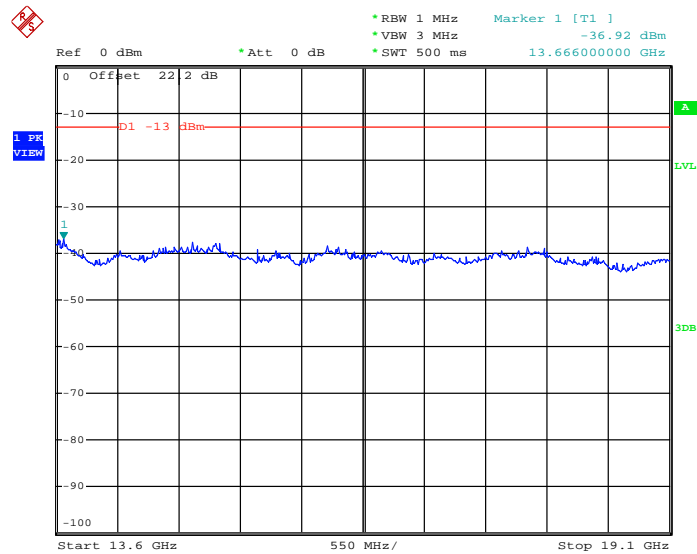
**Conducted Spurious Emission Plot between 3GHz ~ 7GHz**


Date: 15.SEP.2013 10:25:20

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


Date: 15.SEP.2013 10:26:21

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



Date: 15.SEP.2013 10:27:35

## 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

See list of measuring instruments of this test report.

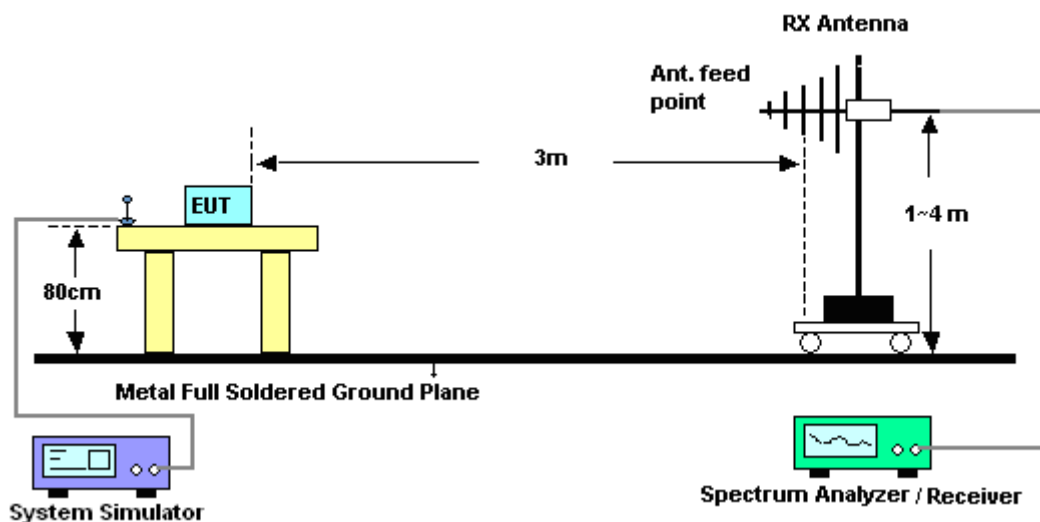
### 3.7.3 Test Procedures

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.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11.  $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$   
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$   
 $= -13\text{dBm}.$

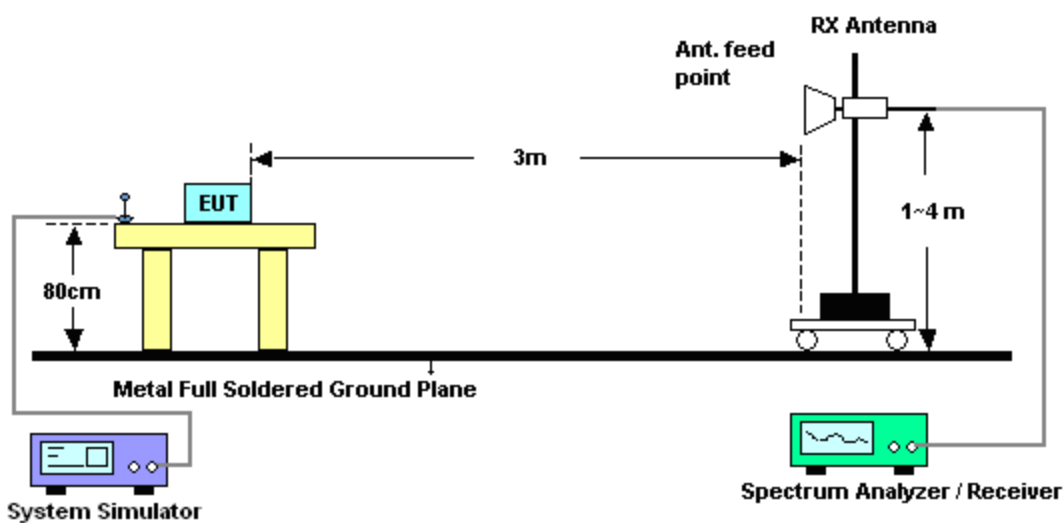


### 3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz

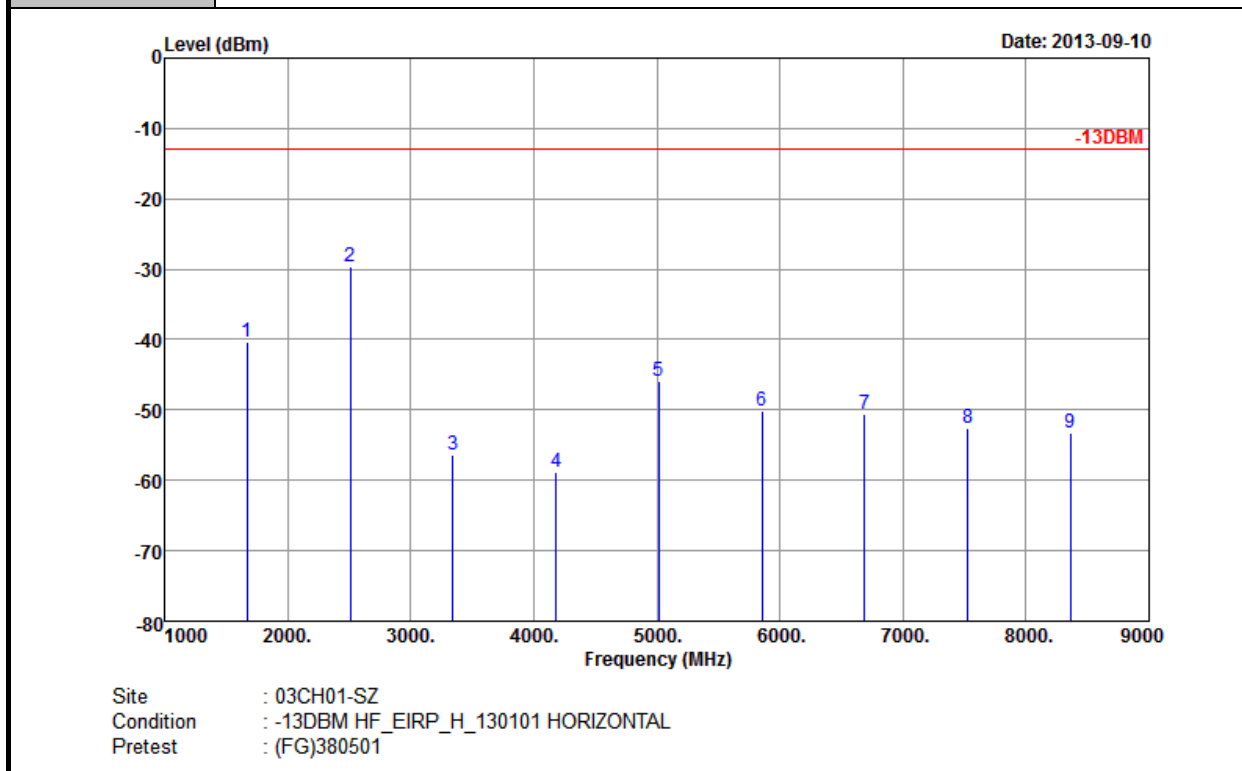


For radiated emissions above 1GHz



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

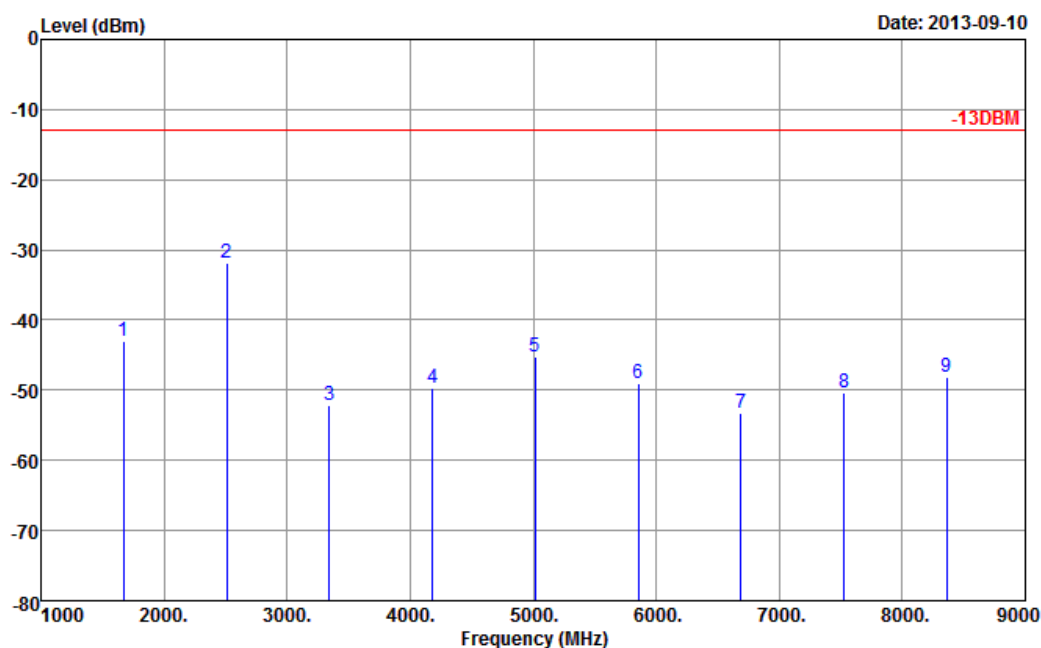
<b>Band :</b>	GSM850	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	ERP ( 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
1672	-40.28	-13	-27.28	-56.92	-43.25	0.88	6.00	H	Pass
2510	-29.69	-13	-16.69	-55.07	-32.30	1.08	5.84	H	Pass
3346	-56.32	-13	-43.32	-66.92	-60.69	1.14	7.66	H	Pass
4182	-58.74	-13	-45.74	-73.50	-64.01	1.37	8.79	H	Pass
5018	-45.93	-13	-32.93	-64.22	-52.07	1.51	9.80	H	Pass
5854	-50.24	-13	-37.24	-68.46	-56.77	1.62	10.30	H	Pass
6691	-50.48	-13	-37.48	-71.95	-53.45	0.88	6.00	H	Pass
7528	-52.56	-13	-39.56	-75.41	-55.53	0.88	6.00	H	Pass
8364	-53.16	-13	-40.16	-76.66	-56.13	0.88	6.00	H	Pass



<b>Band :</b>	GSM850	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

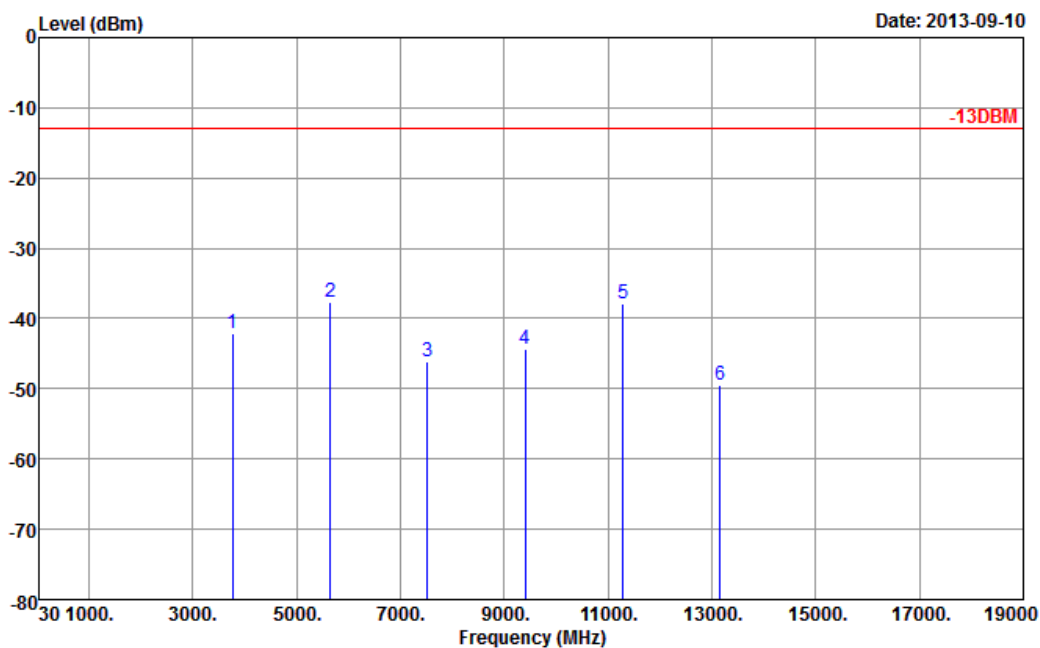


Site : 03CH01-SZ  
Condition : -13DBM HF\_EIRP\_V\_130101 VERTICAL  
Pretest : (FG)380501

Frequency ( MHz )	ERP ( 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
1672	-42.93	-13	-29.93	-56.29	-45.90	0.88	6.00	V	Pass
2510	-31.93	-13	-18.93	-54.91	-34.54	1.08	5.84	V	Pass
3346	-52.08	-13	-39.08	-63.91	-56.45	1.14	7.66	V	Pass
4182	-49.73	-13	-36.73	-64.95	-55.00	1.37	8.79	V	Pass
5018	-45.32	-13	-32.32	-62.77	-51.46	1.51	9.80	V	Pass
5854	-48.94	-13	-35.94	-66.84	-55.47	1.62	10.30	V	Pass
6691	-53.15	-13	-40.15	-74.11	-56.12	0.88	6.00	V	Pass
7528	-50.34	-13	-37.34	-72.50	-53.31	0.88	6.00	V	Pass
8364	-48.22	-13	-35.22	-71.17	-51.19	0.88	6.00	V	Pass



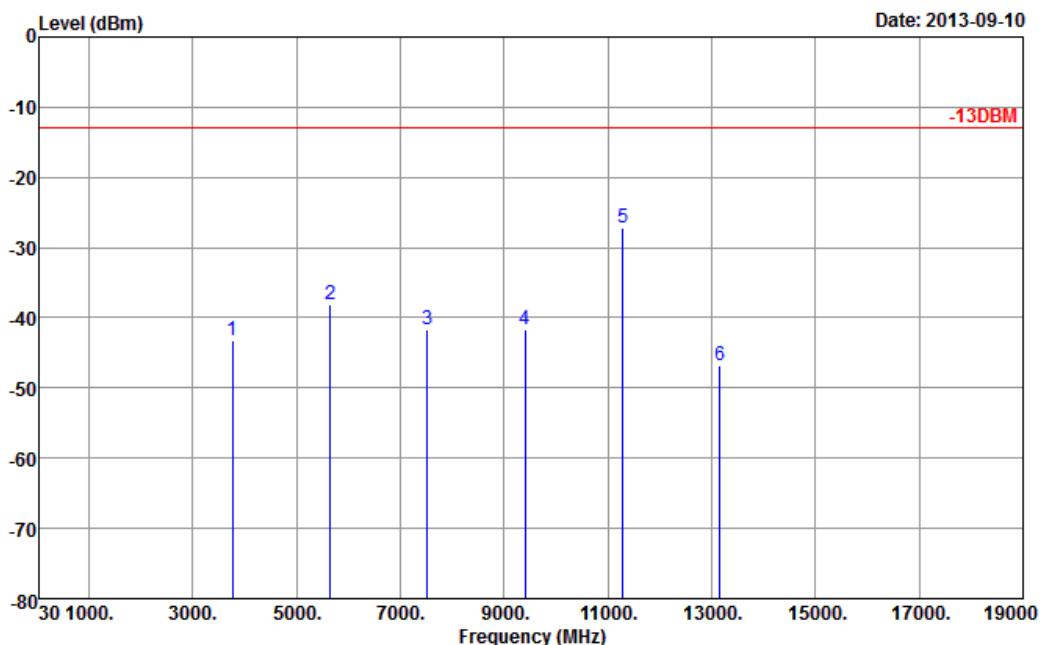
<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ  
Condition : -13DBM HF\_EIRP\_H\_130101 HORIZONTAL  
Pretest : (FG)380501

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	-42.11	-13	-29.11	-57.92	-48.85	1.28	8.02	H	Pass
5640	-37.70	-13	-24.70	-58.25	-46.12	1.58	10.00	H	Pass
7520	-46.13	-13	-33.13	-68.07	-56.45	1.78	12.10	H	Pass
9400	-44.34	-13	-31.34	-66.46	-55.12	2.22	13.00	H	Pass
11280	-37.85	-13	-24.85	-66.34	-48.70	2.16	13.01	H	Pass
13160	-49.37	-13	-36.37	-79.95	-60.43	2.64	13.70	H	Pass

<b>Band :</b>	GSM1900	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	GSM Link (GMSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

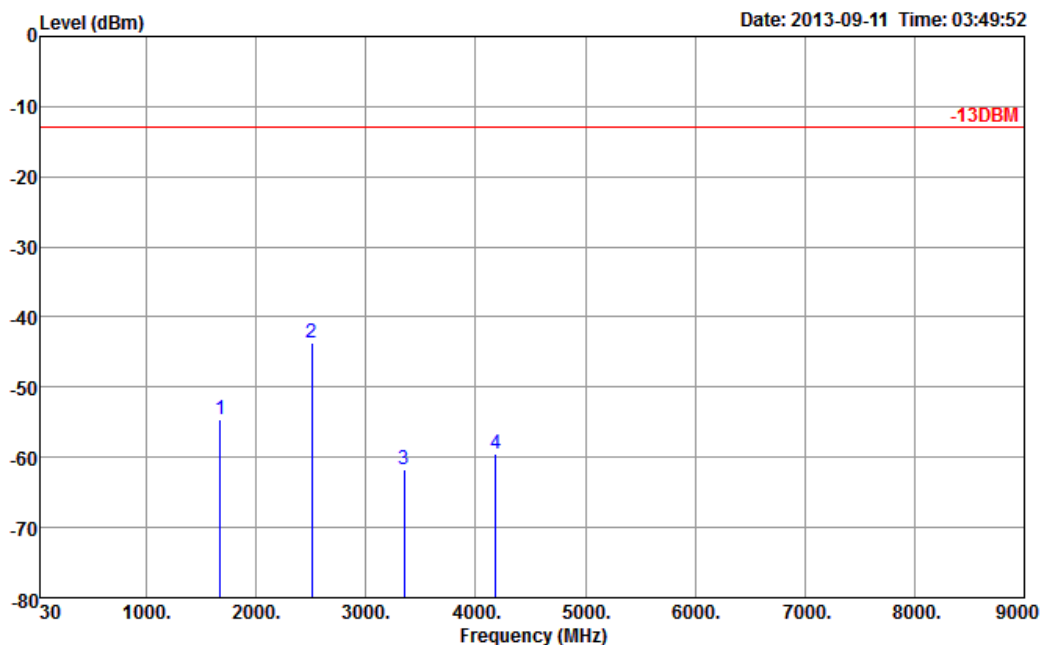


Site : 03CH01-SZ  
 Condition : -13DBM HF\_EIRP\_V\_130101 VERTICAL  
 Pretest : (FG)380501

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	-43.13	-13	-30.13	-59.58	-49.87	1.28	8.02	V	Pass
5640	-38.07	-13	-25.07	-57.75	-46.49	1.58	10	V	Pass
7520	-41.58	-13	-28.58	-63.83	-51.90	1.78	12.1	V	Pass
9400	-41.64	-13	-28.64	-65.26	-52.42	2.22	13	V	Pass
11280	-27.16	-13	-14.16	-58.07	-38.01	2.16	13.01	V	Pass
13160	-46.83	-13	-33.83	-77.48	-57.89	2.64	13.7	V	Pass



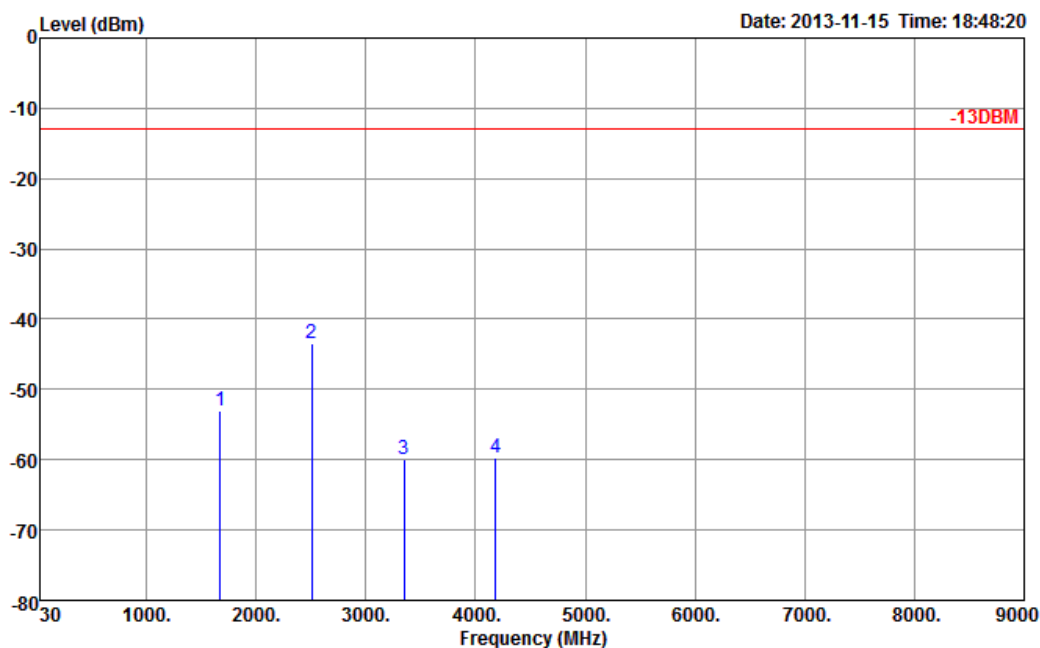
<b>Band :</b>	WCDMA Band V	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ  
Condition : -13DBM HF\_EIRP\_H\_130101 HORIZONTAL  
Pretest : (FG)380501

Frequency ( MHz )	ERP ( 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
1672	-54.66	-13	-41.66	-67.58	-57.63	0.88	6.00	H	Pass
2510	-43.72	-13	-30.72	-67.20	-46.33	1.08	5.84	H	Pass
3346	-61.78	-13	-48.78	-72.38	-66.15	1.14	7.66	H	Pass
4182	-59.58	-13	-46.58	-74.34	-64.85	1.37	8.79	H	Pass

<b>Band :</b>	WCDMA Band V	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

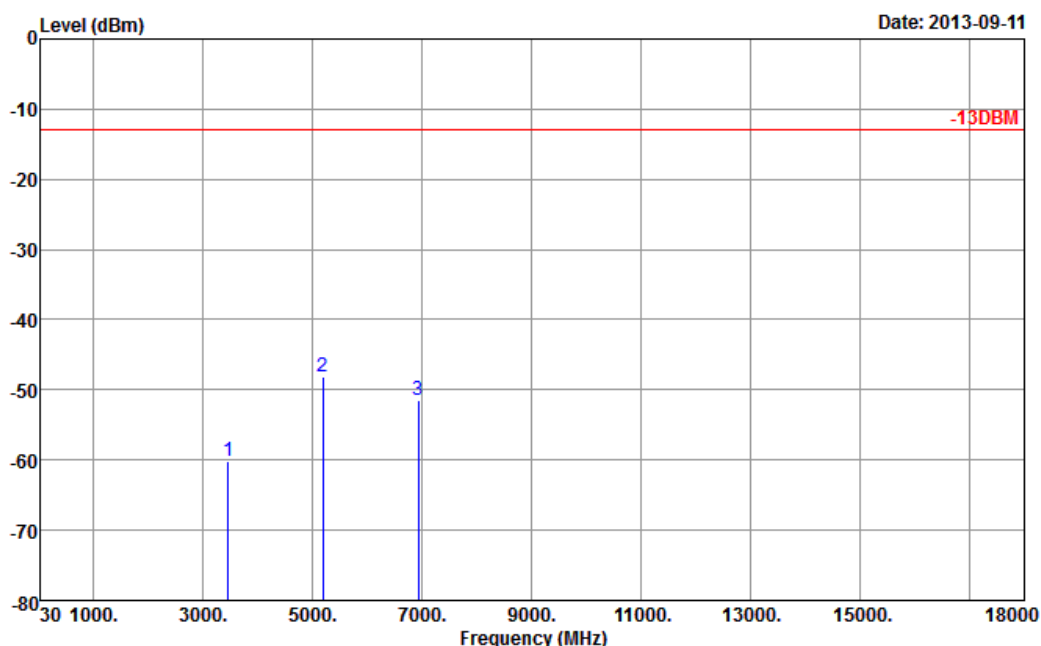


Site : 03CH01-SZ  
Condition : -13DBM HF\_EIRP\_V\_130101 VERTICAL  
Pretest : (FG)380501

Frequency ( MHz )	ERP ( 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
1672	-53.02	-13	-40.02	-64.56	-55.99	0.88	6.00	V	Pass
2510	-43.46	-13	-30.46	-64.90	-46.07	1.08	5.84	V	Pass
3346	-59.97	-13	-46.97	-71.80	-64.34	1.14	7.66	V	Pass
4182	-59.76	-13	-46.76	-74.98	-65.03	1.37	8.79	V	Pass



Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	48~52%
Test Engineer :	Gavin Zhang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



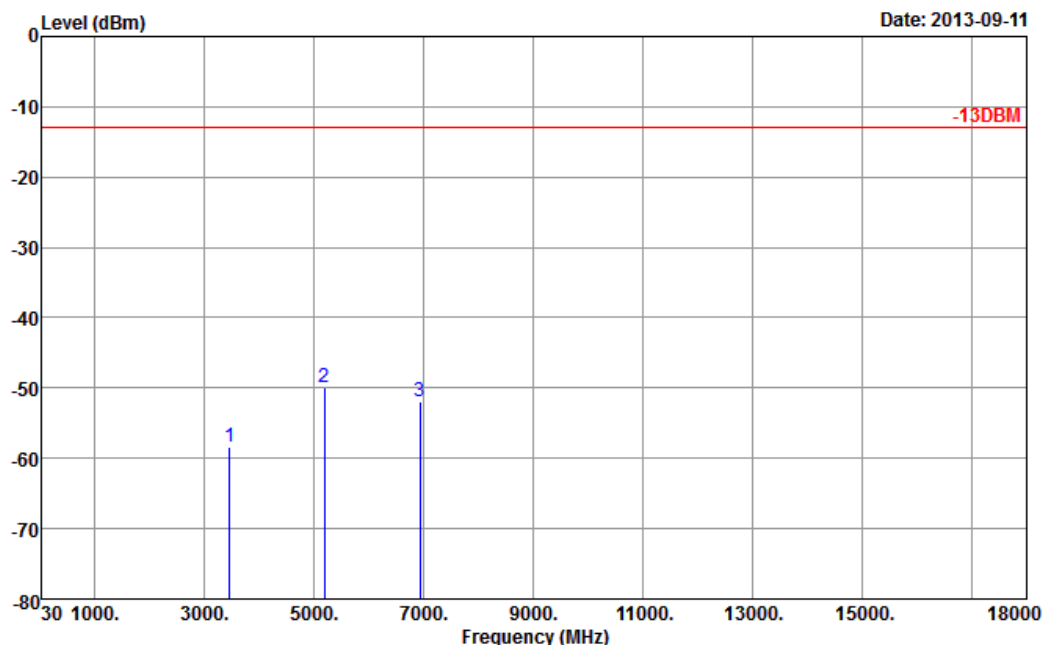
Site : 03CH01-SZ  
Condition : -13DBM HF\_EIRP\_H\_130101 HORIZONTAL  
Pretest : (FG)380501

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
3465.20	-60.25	-13	-47.25	-71.33	-38.20	1.15	7.54	H	Pass
5197.80	-48.18	-13	-35.18	-67.14	-68.60	1.51	9.80	H	Pass
6930.40	-51.40	-13	-38.40	-75.02	-67.90	1.75	11.51	H	Pass





Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	48~52%
Test Engineer :	Gavin Zhang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

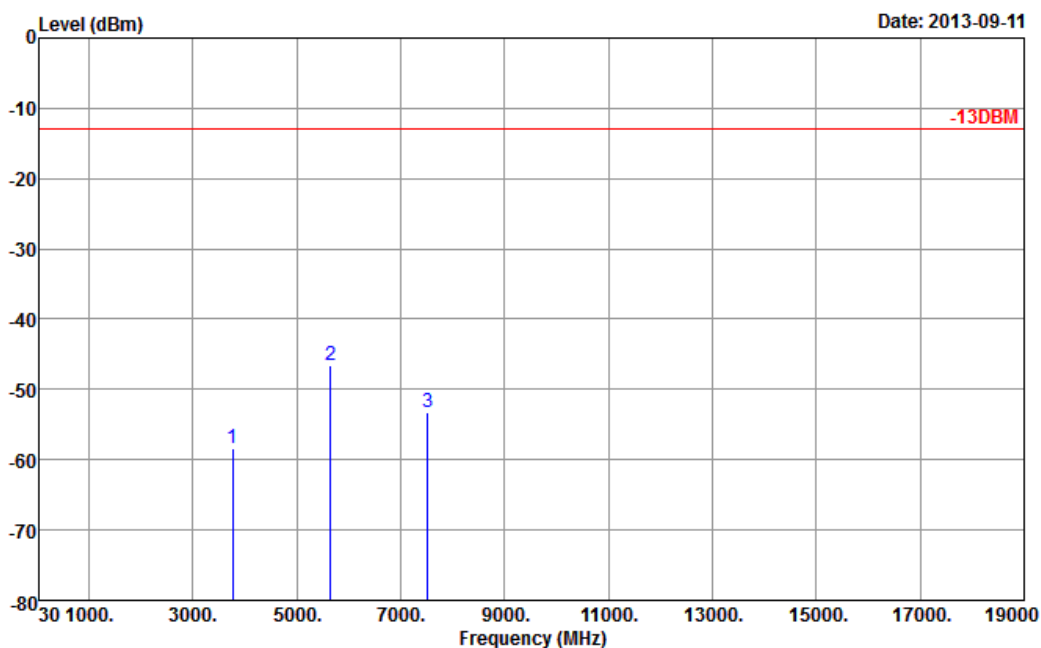


Site : 03CH01-SZ  
Condition : -13DBM HF\_EIRP\_V\_130101 VERTICAL  
Pretest : (FG)380501

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
3465.2	-58.45	-13	-45.45	-71.31	-43.20	1.15	7.54	V	Pass
5197.8	-49.89	-13	-36.89	-69.29	-70.30	1.51	9.80	V	Pass
6930.4	-51.84	-13	-38.84	-75.17	-64.60	1.75	11.51	V	Pass



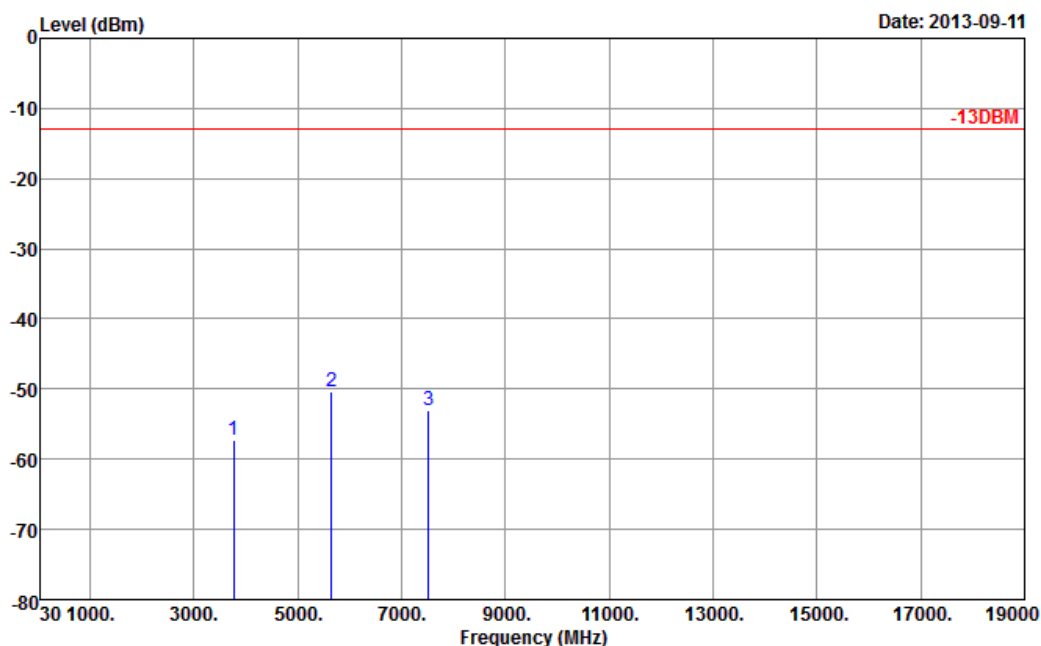
<b>Band :</b>	WCDMA Band II	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-58.28	-13	-45.28	-70.43	-65.02	1.28	8.02	H	Pass
5640	-46.47	-13	-33.47	-64.46	-54.89	1.58	10.00	H	Pass
7520	-53.33	-13	-40.33	-75.27	-63.65	1.78	12.10	H	Pass



<b>Band :</b>	WCDMA Band II	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	48~52%
<b>Test Engineer :</b>	Gavin Zhang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-57.24	-13	-44.24	-72.27	-63.98	1.28	8.02	V	Pass
5640	-50.39	-13	-37.39	-67.47	-58.81	1.58	10	V	Pass
7520	-53.07	-13	-40.07	-75.32	-63.39	1.78	12.1	V	Pass

### 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

See list of measuring instruments of this test report.

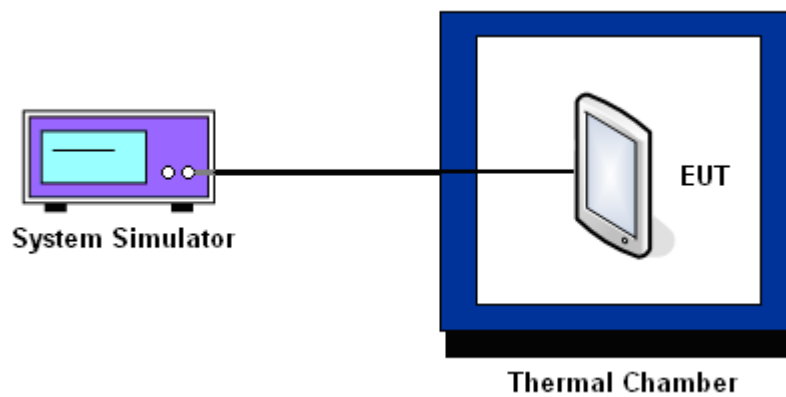
#### 3.8.3 Test Procedures for Temperature Variation

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.

#### 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 850	<b>Channel :</b>	189
<b>Limit (ppm) :</b>	2.5	<b>Frequency :</b>	836.4 MHz

Temperature (°C)	GSM		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-12	-0.01	PASS
-20	-13	-0.02	
-10	-11	-0.01	
0	-9	-0.01	
10	-10	-0.01	
20	-10	-0.01	
30	-9	-0.01	
40	-11	-0.01	
50	-12	-0.01	

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

Temperature (°C)	GSM		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	10	+0.01	PASS
-20	10	+0.01	
-10	9	+0.01	
0	10	+0.01	
10	8	+0.01	
20	9	+0.01	
30	11	+0.01	
40	10	+0.01	
50	11	+0.01	

<b>Band :</b>	WCDMA Band V	<b>Channel :</b>	4182
<b>Limit (ppm) :</b>	2.5	<b>Frequency :</b>	836.4 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	7	+0.01	PASS
-20	9	+0.01	
-10	13	+0.02	
0	11	+0.01	
10	13	+0.02	
20	14	+0.02	
30	12	+0.01	
40	15	+0.02	
50	16	+0.02	

<b>Band :</b>	WCDMA Band IV	<b>Channel :</b>	1413
<b>Limit (ppm) :</b>	2.5	<b>Frequency :</b>	1732.6 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-8	-0.01	PASS
-20	-10	-0.01	
-10	-14	-0.01	
0	-15	-0.01	
10	18	+0.01	
20	17	+0.01	
30	16	+0.01	
40	-15	-0.01	
50	-17	-0.01	

<b>Band :</b>	WCDMA Band II	<b>Channel :</b>	9400
<b>Limit (ppm) :</b>	2.5	<b>Frequency :</b>	836.4 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	26	+0.01	PASS
-20	24	+0.01	
-10	25	+0.01	
0	23	+0.01	
10	-22	-0.01	
20	-20	-0.01	
30	-25	-0.01	
40	19	+0.01	
50	17	+0.01	



**3.8.7 Test Result of Voltage Variation**

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GSM	3.7	-10	-0.01	2.5	PASS
		BEP	-12	-0.01		
		4.2	-11	-0.01		
GSM 1900 CH661	GSM	3.7	9	+0.01		
		BEP	10	+0.01		
		4.2	9	+0.01		
WCDMA Band V CH4182	RMC 12.2Kbps	3.7	14	+0.02		
		BEP	16	+0.02		
		4.2	16	+0.02		
WCDMA Band IV CH1413	RMC 12.2Kbps	3.7	17	+0.01		
		BEP	-18	-0.01		
		4.2	17	+0.01		
WCDMA Band II CH9400	RMC 12.2Kbps	3.7	-20	-0.01		
		BEP	-23	-0.01		
		4.2	-21	-0.01		

**Note:**

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.35 V.

## 4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	100845	9kHz~30GHz	Nov. 06, 2012	Sep. 13, 2013~ Sep. 15, 2013	Nov. 05, 2013	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Mar. 28, 2013	Sep. 13, 2013~ Sep. 15, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	N/A	Mar. 28, 2013	Sep. 13, 2013~ Sep. 15, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA2411B	1207253	N/A	Mar. 28, 2013	Sep. 13, 2013~ Sep. 15, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
Thermal Chamber	Hongzhan	LP-150U	HD20120425	N/A	Mar. 28, 2013	Sep. 13, 2013~ Sep. 15, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
Spectrum Analyzer	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	Apr. 04, 2013	Sep. 10, 2013~ Nov. 15, 2013	Apr. 03, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Dec. 12, 2012	Sep. 10, 2013~ Nov. 15, 2013	Dec. 11, 2013	Radiation (03CH01-SZ)
Bilog Antenna	SCHAFFNER	CBL6112B	2614	30MHz~2GHz	Dec. 03, 2012	Sep. 10, 2013~ Nov. 15, 2013	Dec. 02, 2013	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz GAIN 30db	Mar. 28, 2013	Sep. 10, 2013~ Nov. 15, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	Mar. 28, 2013	Sep. 10, 2013~ Nov. 15, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
SHF-EHF -Horn	Schwarzbeck	BBHA9170	BBHA9170249	14GHz~40GHz	Nov. 23, 2012	Sep. 10, 2013~ Nov. 15, 2013	Nov. 22, 2013	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0 ~ 360 degree	N/A	Sep. 10, 2013~ Nov. 15, 2013	N/A	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m - 4 m	N/A	Sep. 10, 2013~ Nov. 15, 2013	N/A	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSP 7	100818	9kHz~7GHz	Sep. 03, 2013	Sep. 13, 2013~ Sep. 15, 2013	Sep. 02, 2014	ERP/EIRP (OTA01-SZ)
Quad-Ridged Horn	ETS-Lindgren	3164-08	00102954	700MHz~10000MHz	NCR	Sep. 13, 2013~ Sep. 15, 2013	NCR	ERP/EIRP (OTA01-SZ)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00108147	N/A	NCR	Sep. 13, 2013~ Sep. 15, 2013	NCR	ERP/EIRP (OTA01-SZ)
Switch Control Mainframe	Agilent	3499A	MY42005451	N/A	NCR	Sep. 13, 2013~ Sep. 15, 2013	NCR	ERP/EIRP (OTA01-SZ)

## 5 Uncertainty of Evaluation

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

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

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