



# FCC RF Test Report

APPLICANT : BandRich Inc.  
EQUIPMENT : USB Dongle  
BRAND NAME : BandLuxe  
MODEL NAME : C325  
FCC ID : UZI-C325  
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)  
CLASSIFICATION : PCS Licensed Transmitter (PCB)  
Tx/Rx FREQUENCY RANGE : GSM850 : 824.2 ~ 848.8 MHz /  
869.2 ~ 893.8 MHz  
GSM1900 : 1850.2 ~ 1909.8 MHz /  
1930.2 ~ 1989.8 MHz  
WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz  
2112.4 MHz ~ 2152.6 MHz  
MAX. ERP/EIRP POWER : GSM850 (GPRS 8) : 0.48 W  
GSM850 (EDGE 8) : 0.14 W  
GSM1900 (GPRS 8) : 0.11 W  
GSM1900 (EDGE 8) : 0.05 W  
WCDMA Band IV (HSDPA) : 0.04 W  
EMISSION DESIGNATOR : GMSK : 246KGXW  
8PSK : 244KG7W  
QPSK : 4M18F9W

The product was received on Aug. 20, 2009 and completely tested on Aug. 29, 2009. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 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:

Roy Wu / Manager



## SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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### SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	N/A	Conducted Output Power	N/A	PASS	
3.2	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts for FCC (<6.3 Watts for IC)	PASS	-
3.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.2	§27.50(d)(2)	RSS-139 (6.4) SRSP-513(5.1.2)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.3	§2.1049 §22.917(a) §24.238(a) §27.53(g)	N/A	Occupied Bandwidth	N/A	PASS	-
3.4	§2.1051 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Band Edge Measurement	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Conducted Emission	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.6	§2.1053 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Field Strength of Spurious Radiation	< 43+10log <sub>10</sub> (P[Watts])	PASS	Under limit 9.17 dB at 16917 MHz
3.7	§2.1055 §22.355 §24.235 §27.54	RSS-132 (4.3) RSS-133 (6.3) RSS-139 (6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-



# **1 General Description**

## **1.1 Applicant**

**BandRich Inc.**

7F., No. 188, Baociao Rd., Sindian City, Taipei County 23146, Taiwan, R.O.C.

## **1.2 Manufacturer**

**FAIR GOAL ELECTRONIC CO.**

1F., No. 97-1, Haihu, Luzhu Township, Taoyuan County 338, Taiwan, R.O.C.



### 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	USB Dongle
Brand Name	BandLuxe
Model Name	C325
FCC ID	UZI-C325
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band IV : 1710 MHz ~ 1755 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band IV : 2110 MHz ~ 2155 MHz
Maximum Output Power to Antenna	GSM850 : 31.68 dBm GSM1900 : 28.97 dBm WCDMA Band IV : 22.74 dBm
Maximum ERP/EIRP	GSM850 (GPRS 8) : 0.48 W (26.79 dBm) GSM850 (EDGE 8) : 0.14 W (21.40 dBm) GSM1900 (GPRS 8) : 0.11 W (20.36 dBm) GSM1900 (EDGE 8) : 0.05 W (17.31 dBm) WCDMA Band IV (HSDPA) : 0.04 W (15.88 dBm)
Antenna Type	Fixed Internal Antenna
HW Version	V04
SW Version	135050_001_003
Type of Modulation	GSM / GPRS : GMSK EDGE : 8PSK WCDMA : QPSK HSDPA : QPSK / 16QAM / 64QAM HSUPA : BPSK
Type of Emission	GMSK : 246KGXW 8PSK : 244KG7W QPSK : 4M18F9W
EUT Stage	Production Unit

**Remark:** This test report recorded only product characteristics and test results of PCS Licensed Transmitter (PCB).



List of Accessory:

Specification of Accessory		
USB Cable	Brand Name	MEC
	Model Name	60_4315_301
	Signal Line Type	0.45 meter shielded cable without ferrite core

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. For accessories equipped with this EUT, please refer to the appendix of the external photo.

### 1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	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		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH07-HY	TW1022/4086B-1

### 1.5 Applied Standards

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

- ♦ Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ ANSI C63.4-2003
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ IC RSS-132 Issue 2
- ♦ IC RSS-133 Issue 5
- ♦ IC RSS-139 Issue 2

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 (DoC), recorded in a separate test report.



## 1.6 Ancillary Equipment List

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 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 is 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.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	<ul style="list-style-type: none"> <li>■ GPRS 8 Link</li> <li>■ EDGE 8 Link</li> </ul>	<ul style="list-style-type: none"> <li>■ GPRS 8 Link</li> <li>■ EDGE 8 Link</li> </ul>
GSM 1900	<ul style="list-style-type: none"> <li>■ GPRS 8 Link</li> <li>■ EDGE 8 Link</li> </ul>	<ul style="list-style-type: none"> <li>■ GPRS 8 Link</li> <li>■ EDGE 8 Link</li> </ul>
WCDMA Band IV	<ul style="list-style-type: none"> <li>■ HSDPA Link</li> </ul>	<ul style="list-style-type: none"> <li>■ HSDPA Link</li> </ul>

**Note:** The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, HSDPA mode for WCDMA band IV Link, only these modes were used for all tests.

The conducted power tables are as follows:

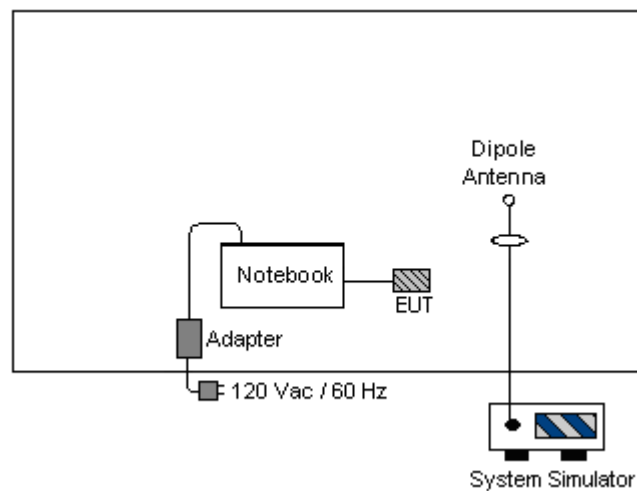
Conducted Power						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GPRS 8	31.68	31.63	31.59	28.80	28.92	28.97
GPRS 10	30.69	30.63	30.60	27.85	27.97	28.05
GPRS 12	27.62	27.67	27.54	24.86	24.96	25.01
EGPRS 8	26.85	26.86	26.79	25.92	26.04	26.05
EGPRS 10	26.82	26.81	26.73	25.88	26.00	26.05
EGPRS 12	25.64	25.67	25.64	24.86	24.99	25.00

(\*Unit: dBm)

Conducted Power						
Band	WCDMA Band IV			-		
Tx Channel	1312	1413	1513	-	-	-
Rx Channel	1537	1638	1738	-	-	-
Frequency	1712.4	1732.6	1752.6	-	-	-
RMC 12.2K	22.63	22.65	22.67	-	-	-
HSDPA Subtest-1	22.72	22.68	<b>22.74</b>	-	-	-
HSDPA Subtest-2	22.15	22.19	22.27	-	-	-
HSDPA Subtest-3	22.16	22.20	22.26	-	-	-
HSDPA Subtest-4	22.17	22.20	22.25	-	-	-
HSUPA Subtest-1	21.93	21.91	21.94	-	-	-
HSUPA Subtest-2	20.46	20.49	20.41	-	-	-
HSUPA Subtest-3	21.35	21.38	21.41	-	-	-
HSUPA Subtest-4	20.47	20.48	20.46	-	-	-
HSUPA Subtest-5	21.69	21.67	21.61	-	-	-

(\*Unit: dBm)

## 2.2 Connection Diagram of Test System



### 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.

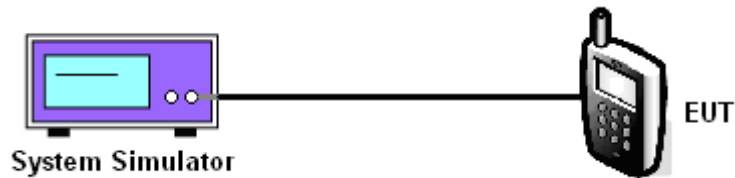
##### 3.1.2 Measuring Instruments

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.

##### 3.1.4 Test Setup





3.1.5 Test Result of Conducted Output Power

Cellular Band				
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
GSM850 (GPRS 8)	128 (Low)	824.2	31.68	1.47
	189 (Mid)	836.4	31.63	1.46
	251 (High)	848.8	31.59	1.44
GSM850 (EDGE 8)	128 (Low)	824.2	26.85	0.48
	189 (Mid)	836.4	26.86	0.49
	251 (High)	848.8	26.79	0.48

PCS Band				
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
GSM1900 (GPRS 8)	512 (Low)	1850.2	28.80	0.76
	661 (Mid)	1880.0	28.92	0.78
	810 (High)	1909.8	28.97	0.79
GSM1900 (EDGE 8)	512 (Low)	1850.2	25.92	0.39
	661 (Mid)	1880.0	26.04	0.40
	810 (High)	1909.8	26.05	0.40



AWS Band					
Modes		Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
WCDMA Band IV	RMC 12.2K	1312 (Low)	1712.4	22.63	0.18
		1413 (Mid)	1732.6	22.65	0.18
		1513 (High)	1752.6	22.67	0.18
	HSDPA Subtest-1	1312 (Low)	1712.4	22.72	0.19
		1413 (Mid)	1732.6	22.68	0.19
		1513 (High)	1752.6	22.74	0.19
	HSDPA Subtest-2	1312 (Low)	1712.4	22.15	0.16
		1413 (Mid)	1732.6	22.19	0.17
		1513 (High)	1752.6	22.27	0.17
	HSDPA Subtest-3	1312 (Low)	1712.4	22.16	0.16
		1413 (Mid)	1732.6	22.20	0.17
		1513 (High)	1752.6	22.26	0.17
	HSDPA Subtest-4	1312 (Low)	1712.4	22.17	0.16
		1413 (Mid)	1732.6	22.20	0.17
		1513 (High)	1752.6	22.25	0.17
	HSUPA Subtest-1	1312 (Low)	1712.4	21.93	0.16
		1413 (Mid)	1732.6	21.91	0.16
		1513 (High)	1752.6	21.94	0.16
	HSUPA Subtest-2	1312 (Low)	1712.4	20.46	0.11
		1413 (Mid)	1732.6	20.49	0.11
		1513 (High)	1752.6	20.41	0.11
	HSUPA Subtest-3	1312 (Low)	1712.4	21.35	0.14
		1413 (Mid)	1732.6	21.38	0.14
		1513 (High)	1752.6	21.41	0.14
	HSUPA Subtest-4	1312 (Low)	1712.4	20.47	0.11
		1413 (Mid)	1732.6	20.48	0.11
		1513 (High)	1752.6	20.46	0.11
	HSUPA Subtest-5	1312 (Low)	1712.4	21.69	0.15
		1413 (Mid)	1732.6	21.67	0.15
		1513 (High)	1752.6	21.61	0.14



## 3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

### 3.2.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts. The EIRP of mobile transmitters are limited to 2 Watts for 1850~1910 MHz and 1 watt for 1710~1755 MHz.

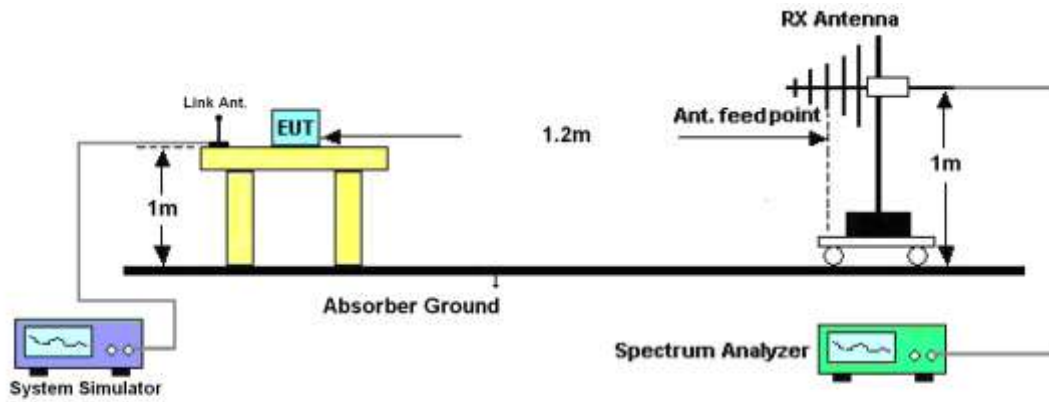
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 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 radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$   
Ps (dBm) : Input power to substitution antenna.  
Gs (dBi or dBd) : Substitution antenna Gain.  
 $E_t = R_t + AF$   
 $E_s = R_s + AF$   
AF (dB/m) : Receive antenna factor  
Rt : The highest received signal in spectrum analyzer for EUT.  
Rs : The highest received signal in spectrum analyzer for substitution antenna.

### 3.2.4 Test Setup





## 3.2.5 Test Result of ERP

GSM850 (GPRS 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-20.25	-48.12	0.00	-1.08	26.79	0.48
836.40	-21.22	-48.28	0.00	-0.93	26.13	0.41
848.80	-22.18	-48.35	0.00	-0.76	25.41	0.35
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-21.31	-47.97	0.00	-1.08	25.58	0.36
836.40	-22.27	-48.01	0.00	-0.93	24.81	0.30
848.80	-23.03	-48.05	0.00	-0.76	24.26	0.27

GSM850 (EDGE 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-25.64	-48.12	0.00	-1.08	21.40	0.14
836.40	-26.67	-48.28	0.00	-0.93	20.68	0.12
848.80	-27.56	-48.35	0.00	-0.76	20.03	0.10
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-26.12	-47.97	0.00	-1.08	20.77	0.12
836.40	-27.09	-48.01	0.00	-0.93	19.99	0.10
848.80	-27.73	-48.05	0.00	-0.76	19.56	0.09





## 3.2.6 Test Result of EIRP

GSM1900 (GPRS 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-34.65	-51.88	0.00	1.96	19.19	0.08
1880.00	-35.79	-52.99	0.00	2.00	19.20	0.08
1909.80	-35.90	-54.28	0.00	1.98	20.36	0.11
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-38.83	-52.13	0.00	1.96	15.26	0.03
1880.00	-39.89	-53.17	0.00	2.00	15.28	0.03
1909.80	-40.06	-54.13	0.00	1.98	16.05	0.04

GSM1900 (EDGE 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-37.55	-51.88	0.00	1.96	16.29	0.04
1880.00	-38.79	-52.99	0.00	2.00	16.20	0.04
1909.80	-38.95	-54.28	0.00	1.98	17.31	0.05
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-41.70	-52.13	0.00	1.96	12.39	0.02
1880.00	-42.75	-53.17	0.00	2.00	12.42	0.02
1909.80	-42.87	-54.13	0.00	1.98	13.24	0.02



WCDMA Band IV (HSDPA) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.4	-39.03	-51.88	0.00	1.96	14.81	0.03
1732.6	-39.11	-52.99	0.00	2.00	15.88	0.04
1752.6	-42.10	-54.28	0.00	1.98	14.16	0.03
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.4	-43.17	-52.13	0.00	1.96	10.92	0.01
1732.6	-44.06	-53.17	0.00	2.00	11.11	0.01
1752.6	-47.08	-54.13	0.00	1.98	9.03	0.01

### 3.3 Occupied Bandwidth Measurement

#### 3.3.1 Description of Occupied Bandwidth Measurement

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.

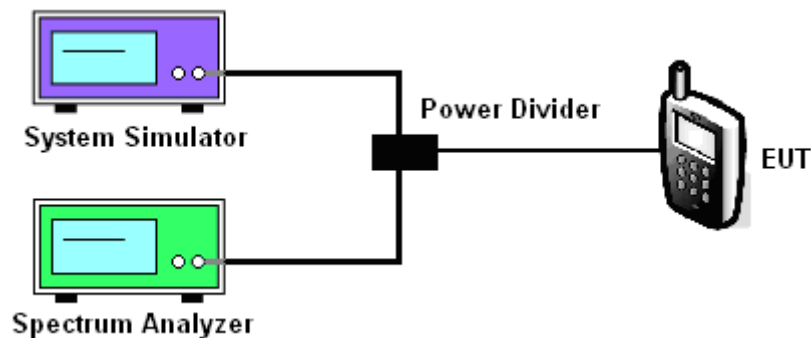
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.
3. The RBW was replaced by 10 kHz, due to the spectrum analyzer IF-Filter including an excess of the limit. A worst case correction factor of  $10 \log (1\% \text{ BW}/\text{measurement RBW})$  was implemented.

#### 3.3.4 Test Setup

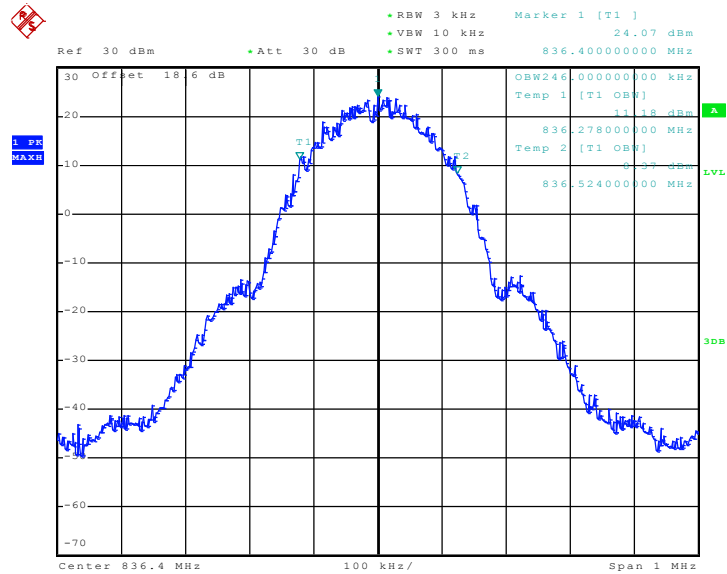




### 3.3.5 Test Result (Plots) of Occupied Bandwidth

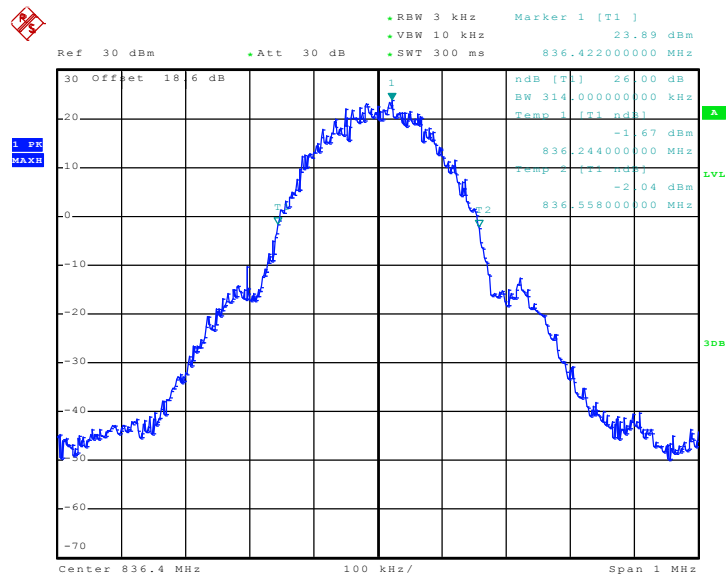
<b>Band :</b>	GSM 850	<b>Power Stage :</b>	High
<b>Test Mode :</b>	GPRS 8 Link		

99% Occupied Bandwidth Plot on Channel 189



Date: 28.AUG.2009 21:18:48

26dB Bandwidth Plot on Channel 189

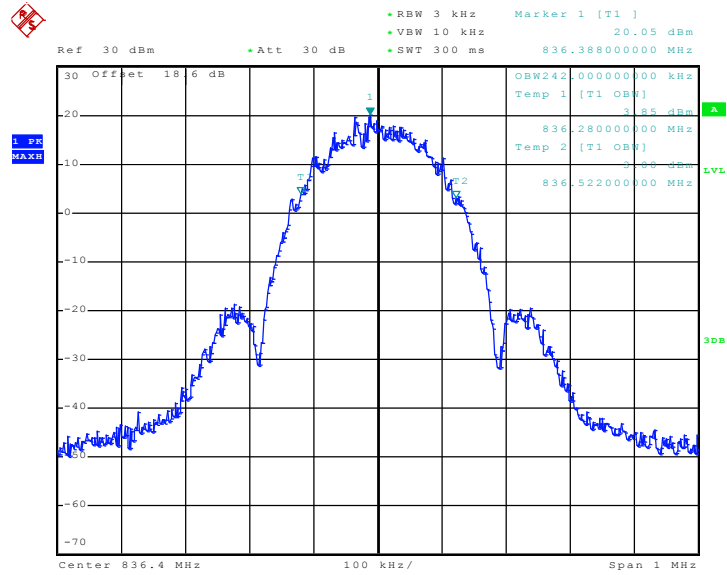


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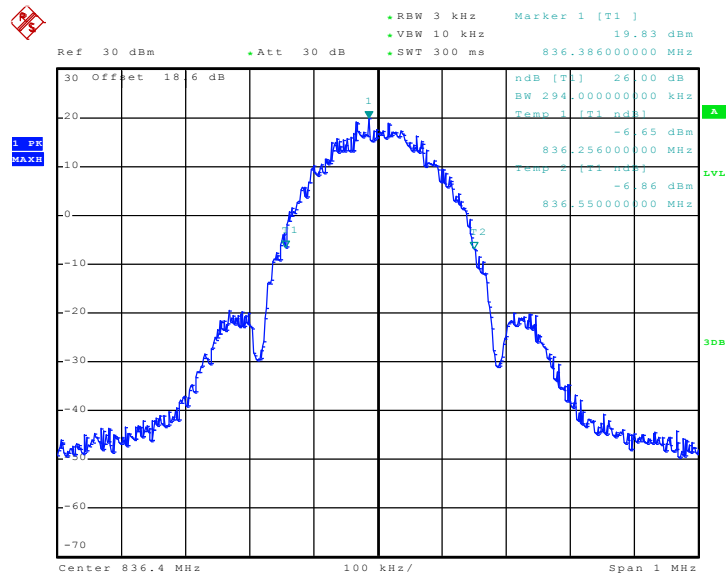
<b>Band :</b>	GSM 850	<b>Power Stage :</b>	High
<b>Test Mode :</b>	EDGE 8 Link		

99% Occupied Bandwidth Plot on Channel 189



Date: 28.AUG.2009 21:42:15

26dB Bandwidth Plot on Channel 189

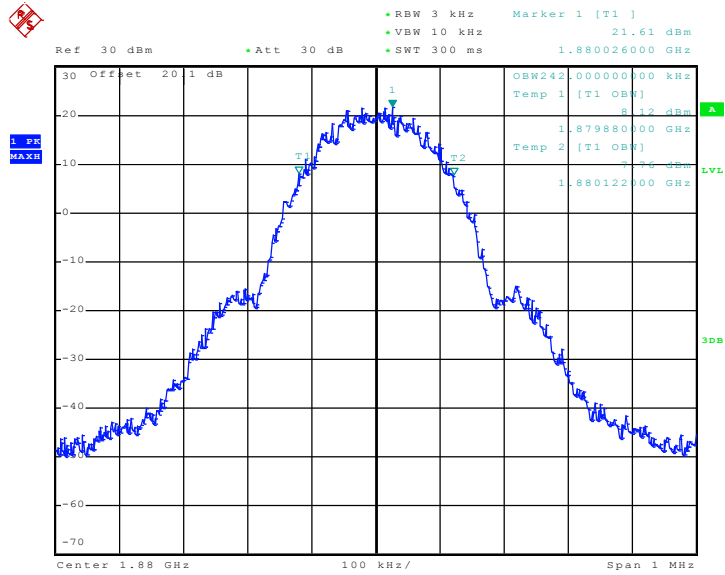


Date: 28.AUG.2009 21:38:24



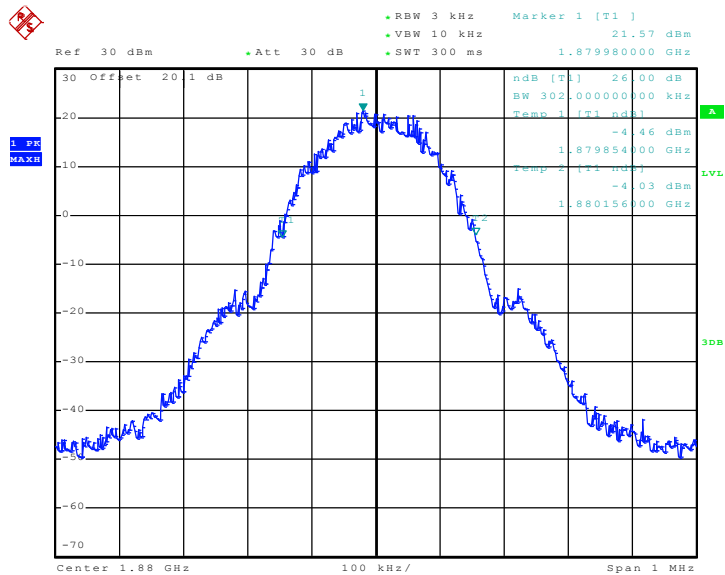
<b>Band :</b>	GSM 1900	<b>Power Stage :</b>	High
<b>Test Mode :</b>	GPRS 8 Link		

99% Occupied Bandwidth Plot on Channel 661



Date: 28.AUG.2009 22:16:19

26dB Bandwidth Plot on Channel 661

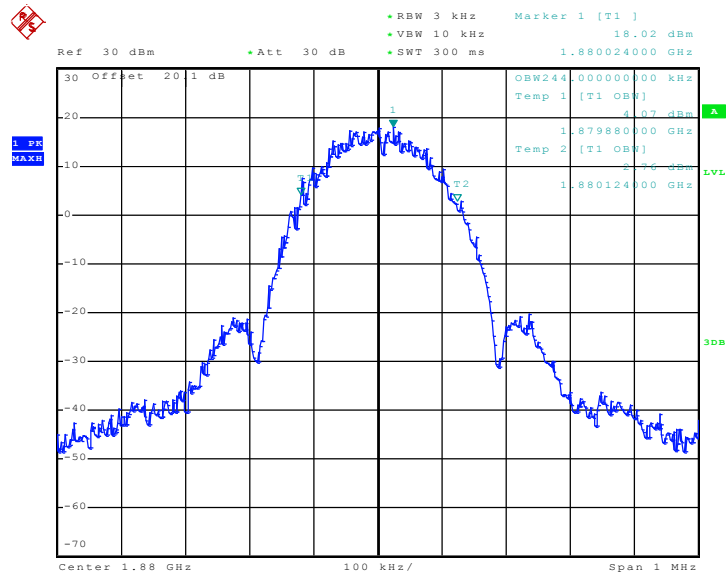


Date: 28.AUG.2009 22:05:05



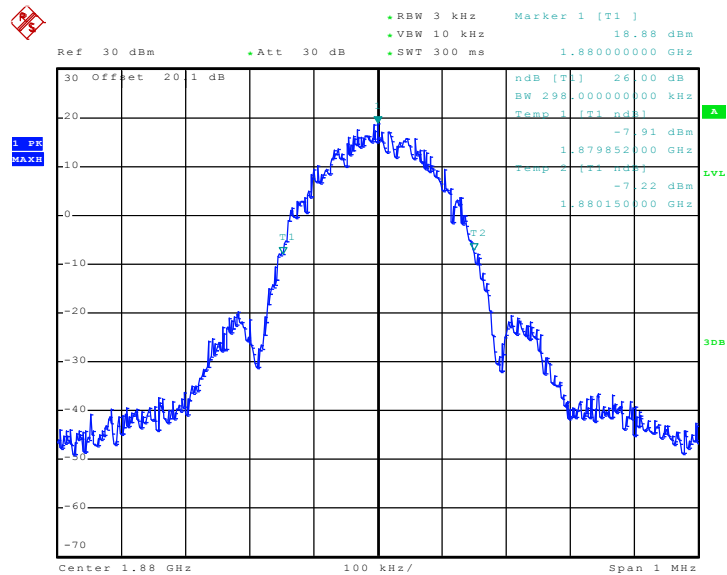
<b>Band :</b>	GSM 1900	<b>Power Stage :</b>	High
<b>Test Mode :</b>	EDGE 8 Link		

99% Occupied Bandwidth Plot on Channel 661



Date: 28.AUG.2009 23:42:32

26dB Bandwidth Plot on Channel 661

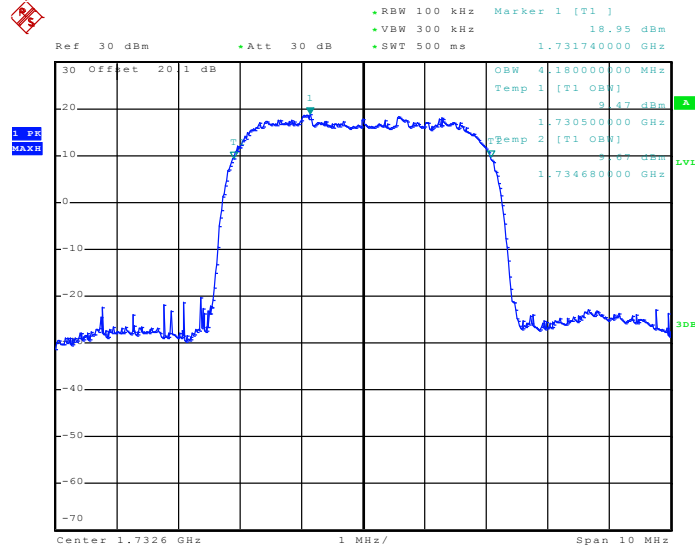


Date: 28.AUG.2009 23:40:56



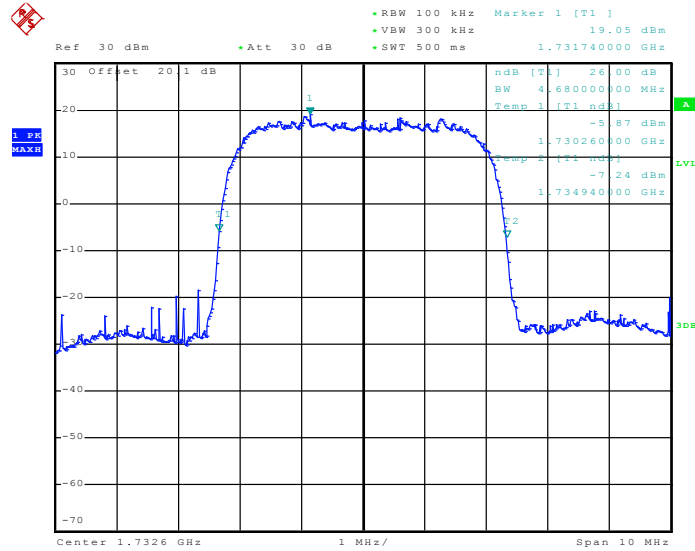
Band :	WCDMA Band IV	Power Stage :	High
Test Mode :	HSDPA Link		

99% Occupied Bandwidth Plot on Channel 1413



Date: 29.AUG.2009 00:03:12

26dB Bandwidth Plot on Channel 1413



Date: 29.AUG.2009 00:00:28



### 3.4 Band Edge Measurement

#### 3.4.1 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.

#### 3.4.2 Measuring Instruments

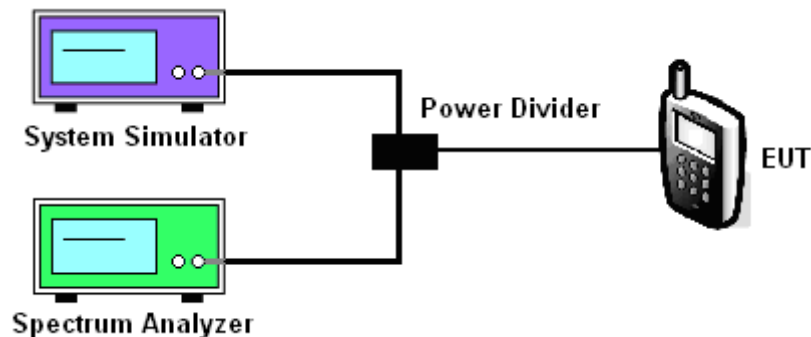
See list of measuring instruments of this test report.

#### 3.4.3 Test Procedures

4. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
5. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

#### 3.4.4 Test Setup

<Conducted Band Edge >

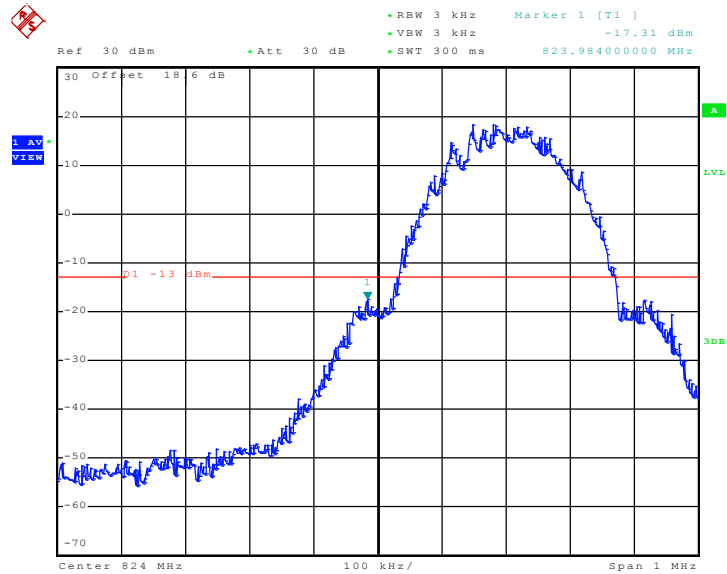




### 3.4.5 Test Result (Plots) of Conducted Band Edge

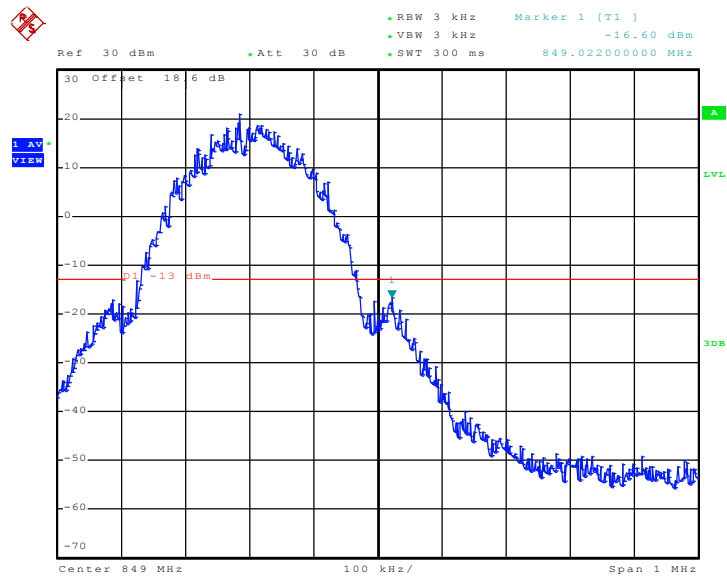
Band :	GSM850	Power Stage :	High
Test Mode :	GPRS 8 Link		

Lower Band Edge Plot on Channel 128



Date: 28.AUG.2009 21:21:08

Higher Band Edge Plot on Channel 251

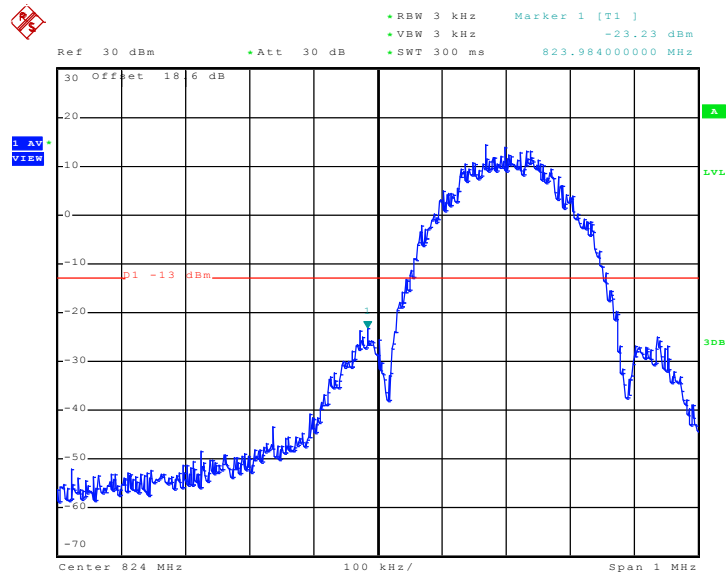


Date: 28.AUG.2009 21:24:21



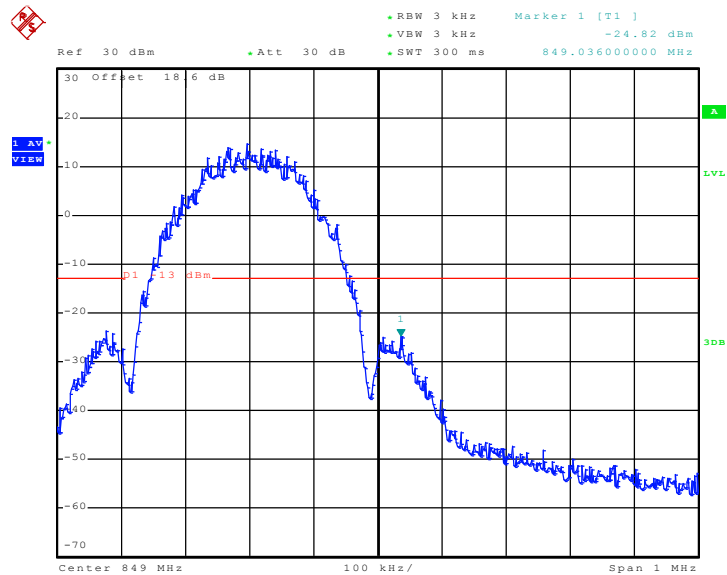
Band :	GSM850	Power Stage :	High
Test Mode :	EDGE 8 Link		

Lower Band Edge Plot on Channel 128



Date: 28.AUG.2009 21:44:58

Higher Band Edge Plot on Channel 251

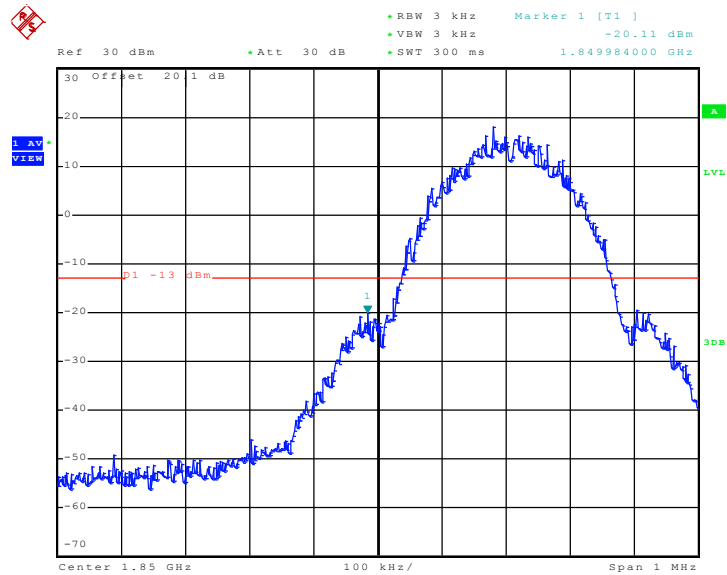


Date: 28.AUG.2009 21:47:49



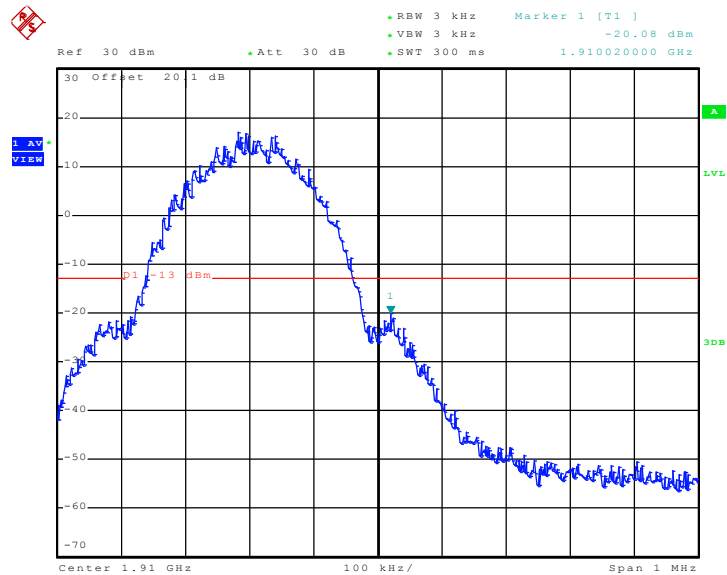
Band :	GSM1900	Power Stage :	High
Test Mode :	GPRS 8 Link		

Lower Band Edge Plot on Channel 512



Date: 28.AUG.2009 22:20:24

Higher Band Edge Plot on Channel 810

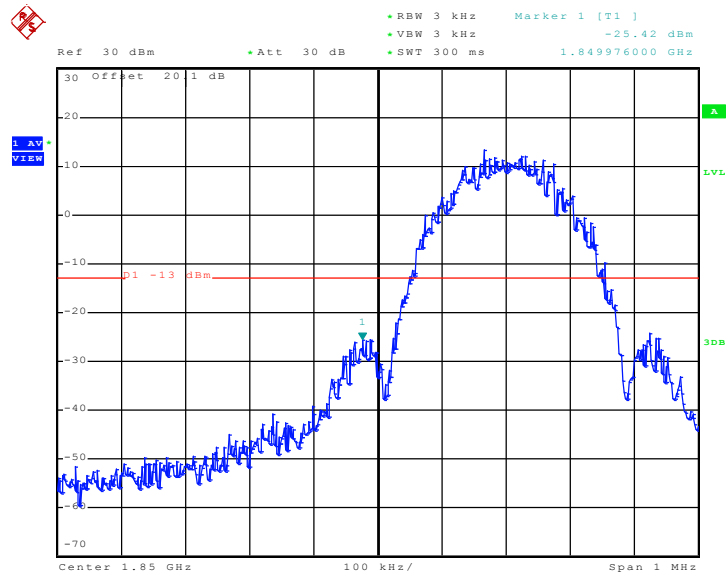


Date: 28.AUG.2009 22:23:08



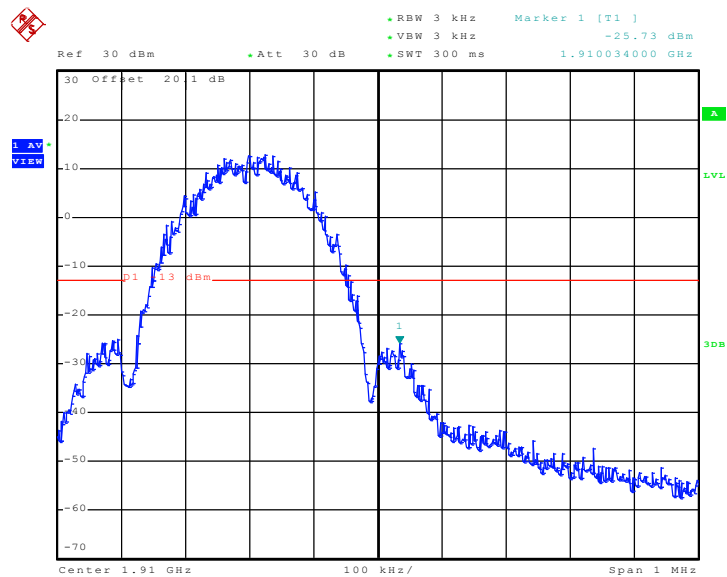
Band :	GSM1900	Power Stage :	High
Test Mode :	EDGE 8 Link		

Lower Band Edge Plot on Channel 512



Date: 28.AUG.2009 23:44:58

Higher Band Edge Plot on Channel 810

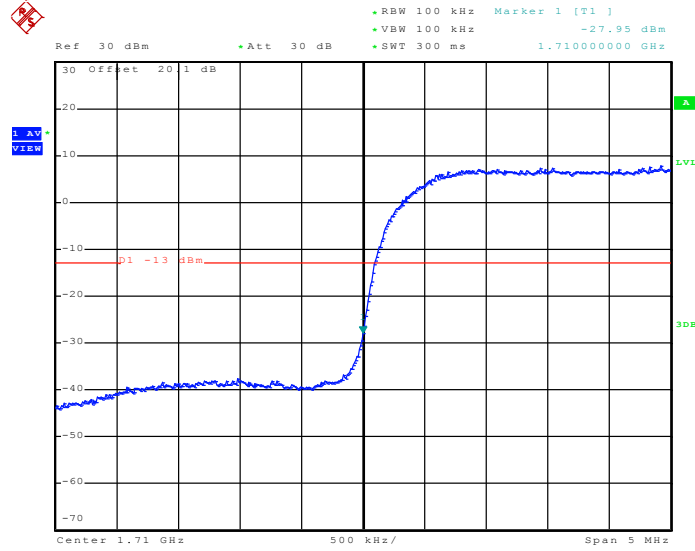


Date: 28.AUG.2009 23:47:22



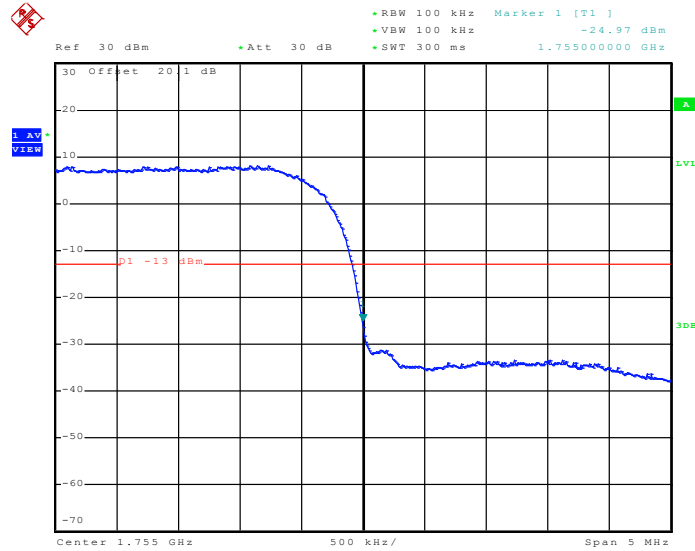
<b>Band :</b>	WCDMA Band IV	<b>Power Stage :</b>	High
<b>Test Mode :</b>	HSDPA Link		

**Lower Band Edge Plot on Channel 1312**



Date: 29.AUG.2009 00:04:48

**Higher Band Edge Plot on Channel 1513**



Date: 29.AUG.2009 00:06:37

## 3.5 Conducted Emission Measurement

### 3.5.1 Description of Conducted 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.

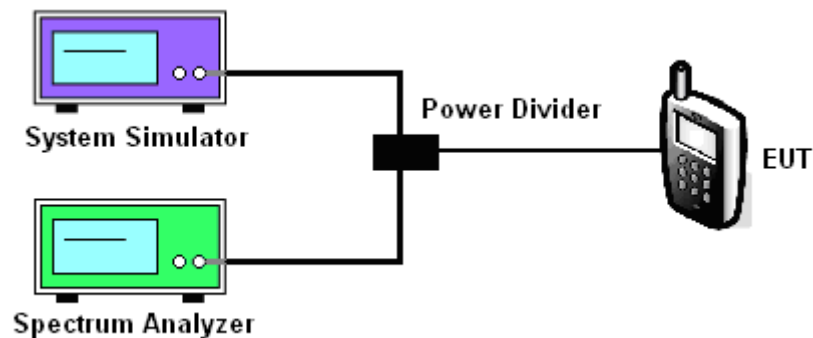
### 3.5.2 Measuring Instruments

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 middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

### 3.5.4 Test Setup

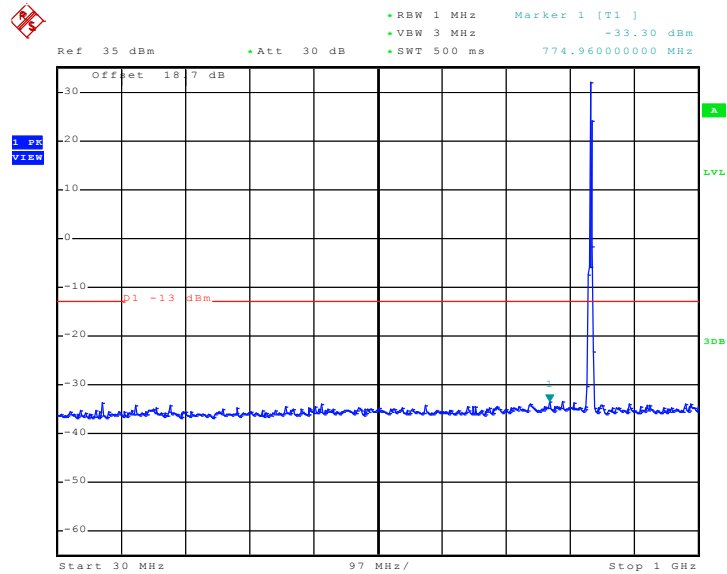




3.5.5 Test Result (Plots) of Conducted Emission

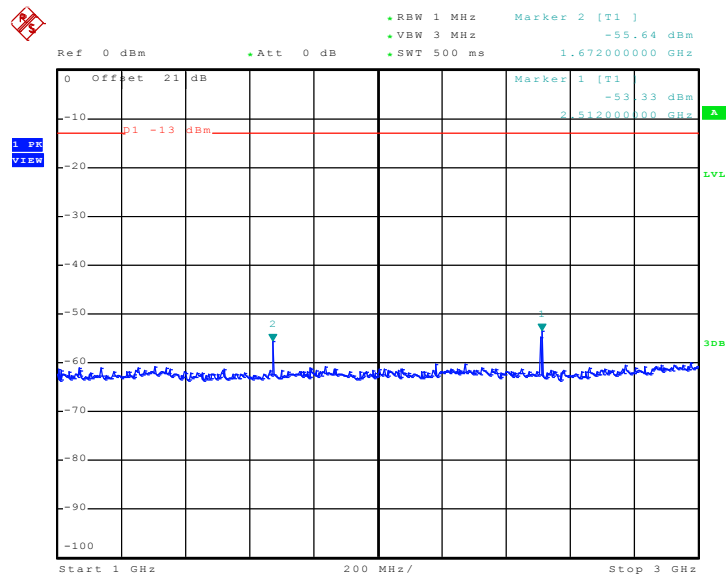
Band :	GSM850	Channel :	CH189
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 28.AUG.2009 21:28:07

Conducted Emission Plot between 1GHz ~ 3GHz

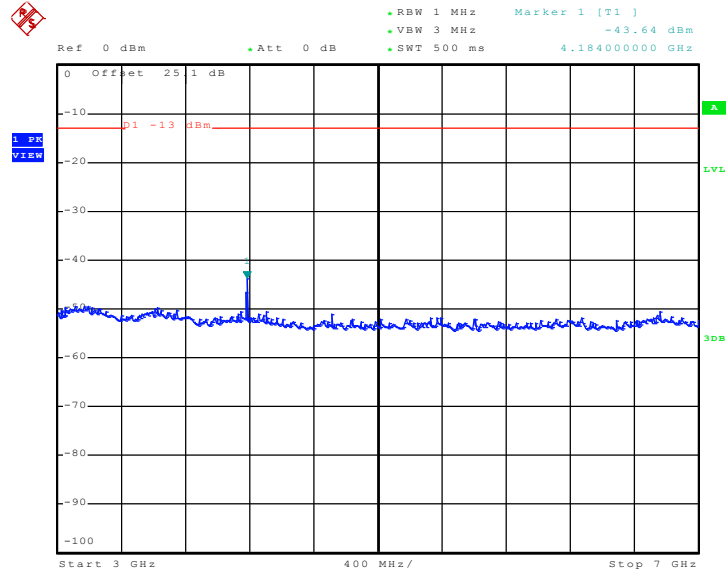


Date: 28.AUG.2009 21:29:16



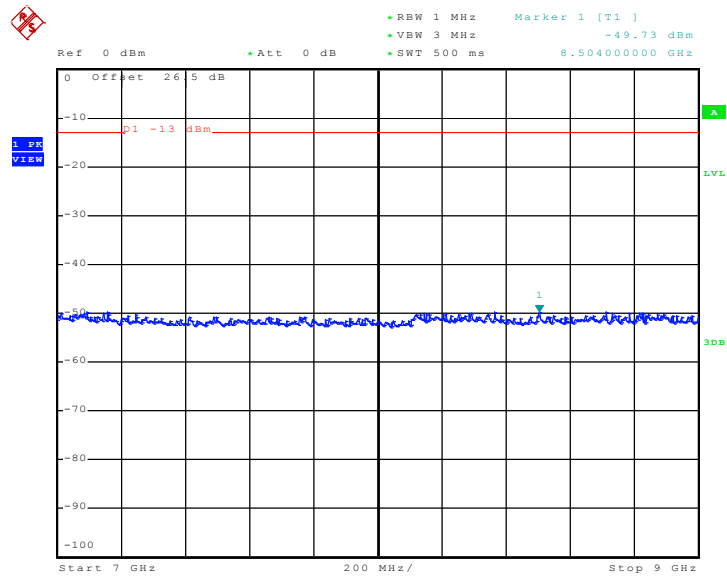


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 28.AUG.2009 21:29:49

Conducted Emission Plot between 7GHz ~ 9GHz

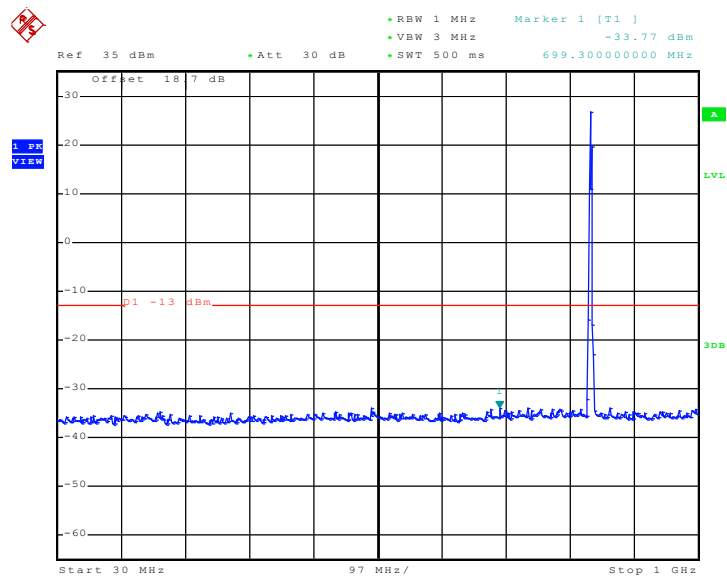


Date: 28.AUG.2009 21:30:16



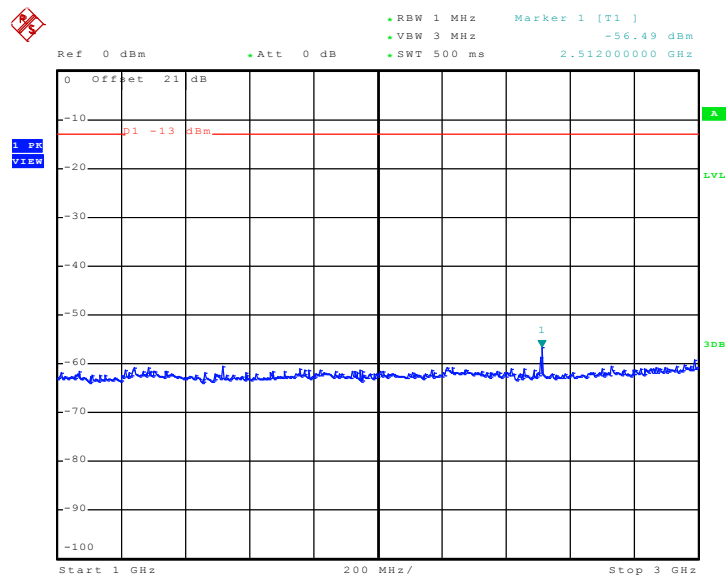
Band :	GSM850	Channel :	CH189
Test Mode :	EDGE 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 28.AUG.2009 21:34:21

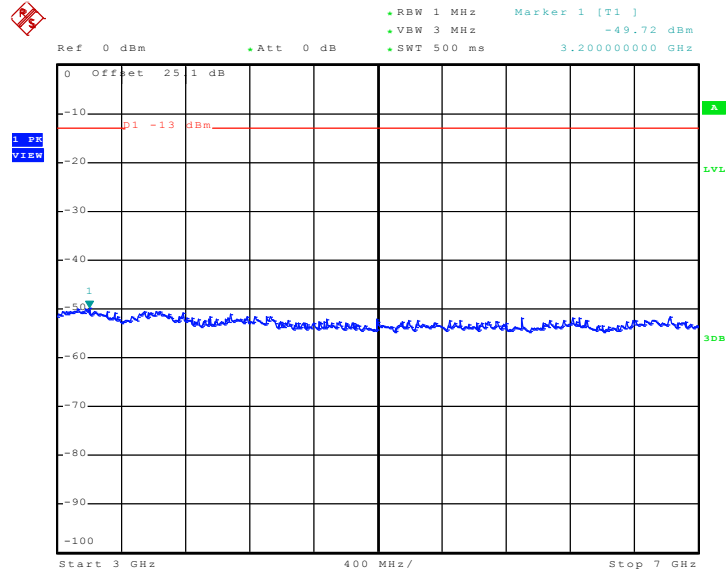
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 28.AUG.2009 21:35:12

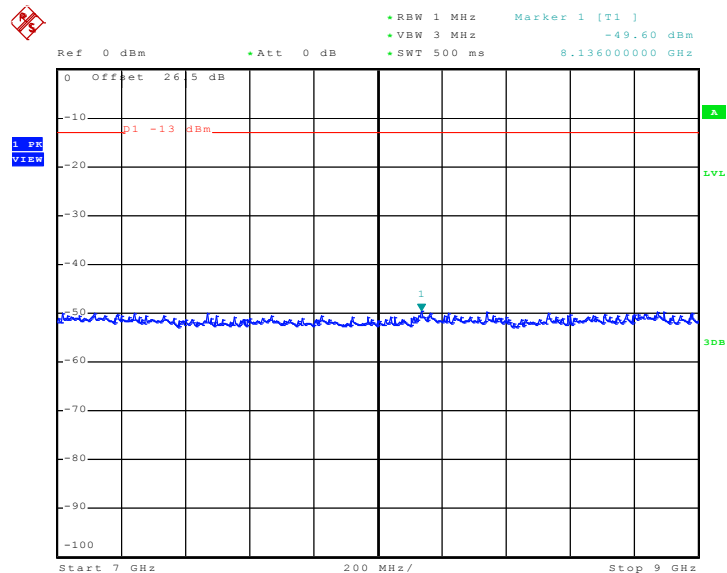


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 28.AUG.2009 21:35:39

Conducted Emission Plot between 7GHz ~ 9GHz

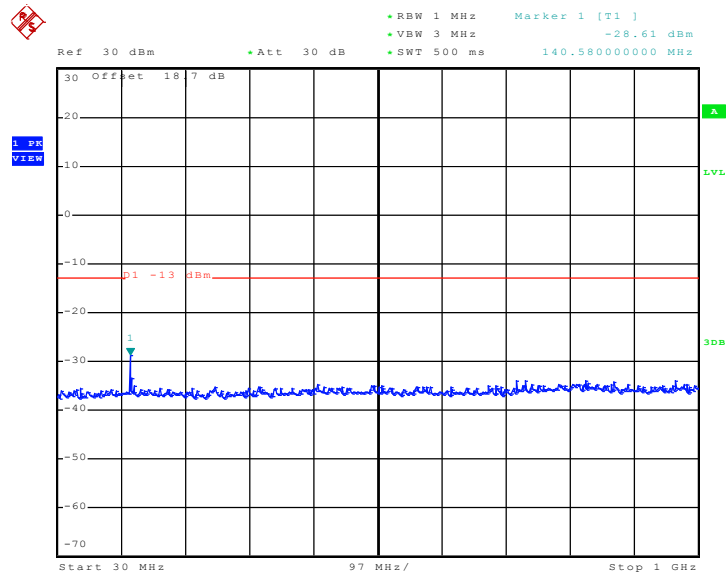


Date: 28.AUG.2009 21:36:05



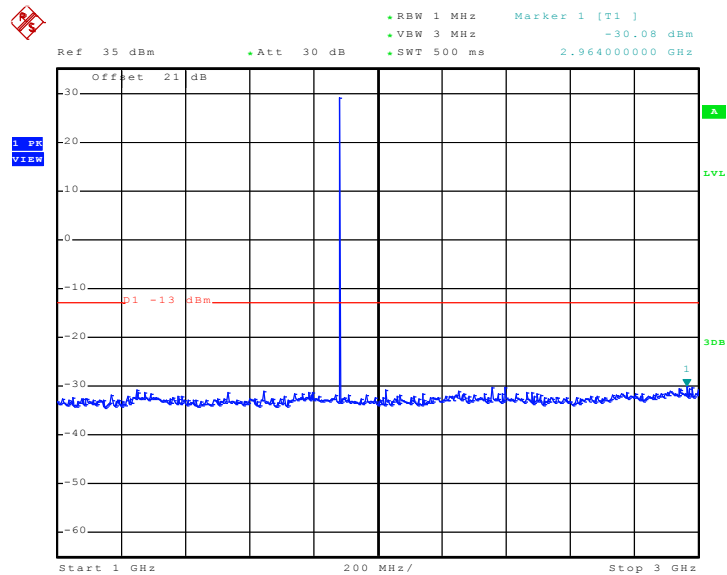
Band :	GSM1900	Channel :	CH661
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 28.AUG.2009 22:25:25

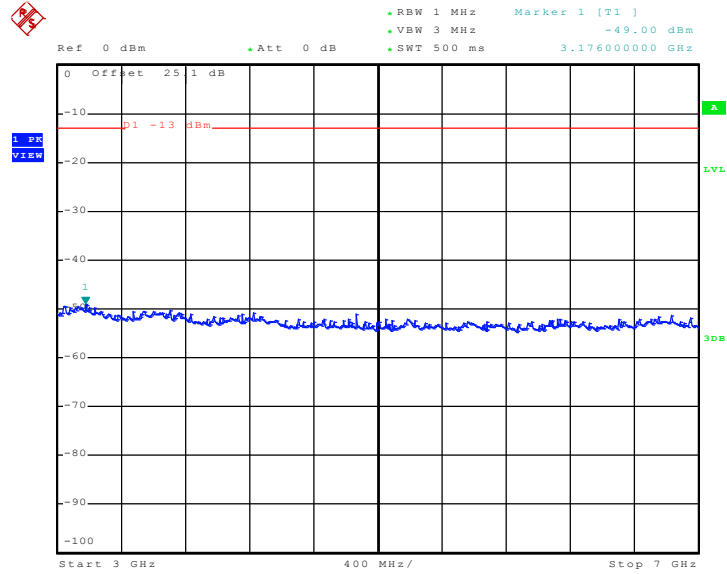
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 28.AUG.2009 22:28:27

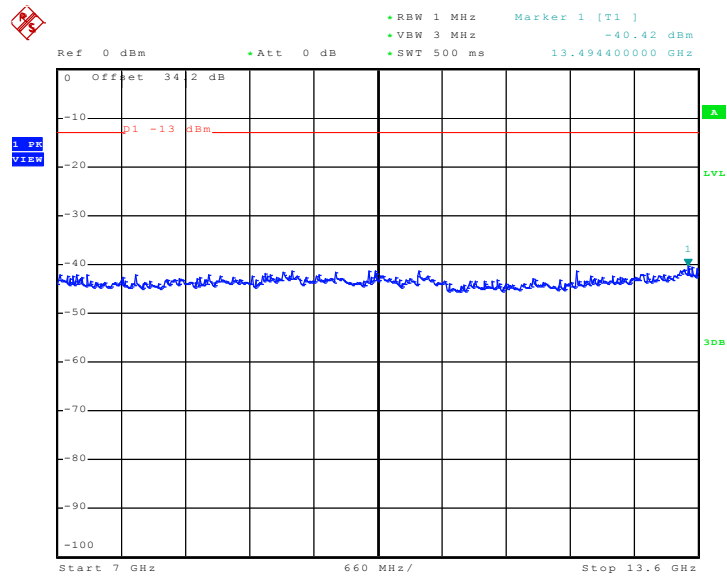


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 28.AUG.2009 22:28:58

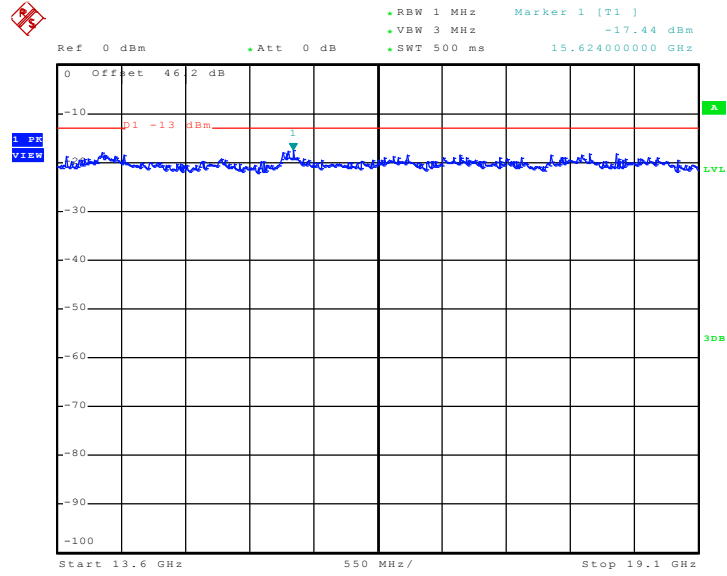
Conducted Emission Plot between 7GHz ~ 13.6G



Date: 28.AUG.2009 22:29:28



Conducted Emission Plot between 13.6GHz ~ 19.1GHz

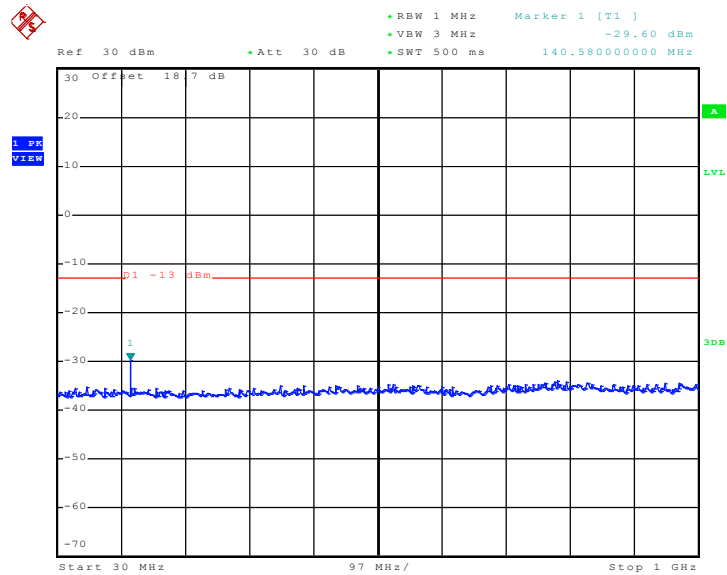


Date: 28.AUG.2009 22:29:59



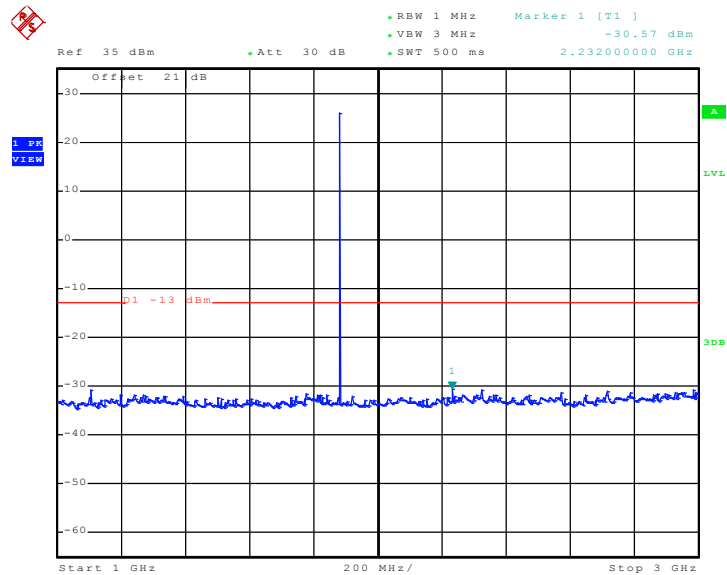
Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 28.AUG.2009 23:48:19

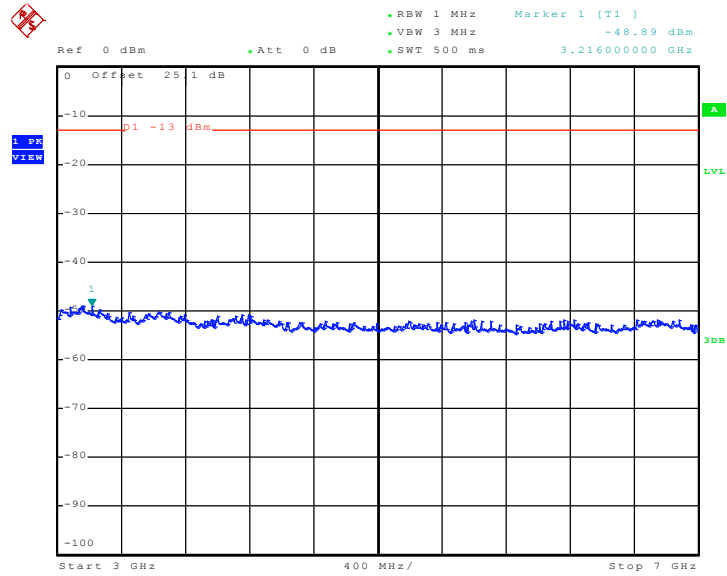
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 28.AUG.2009 23:49:45

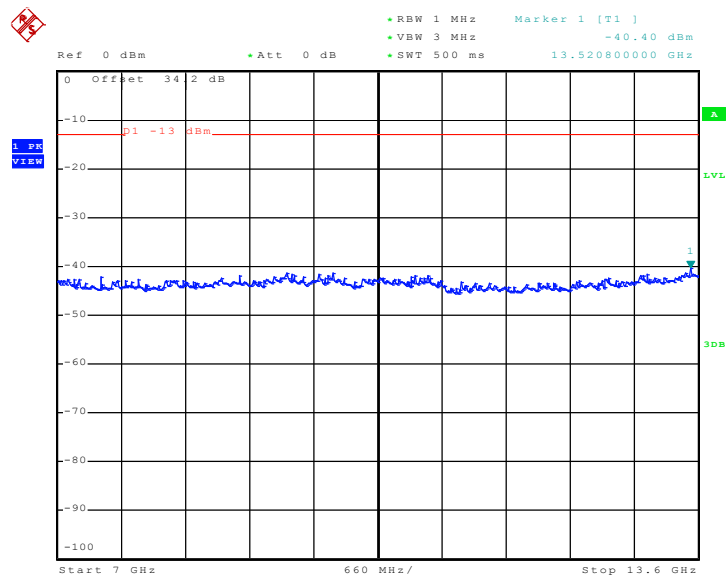


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 28.AUG.2009 23:50:13

Conducted Emission Plot between 7GHz ~ 13.6GHz

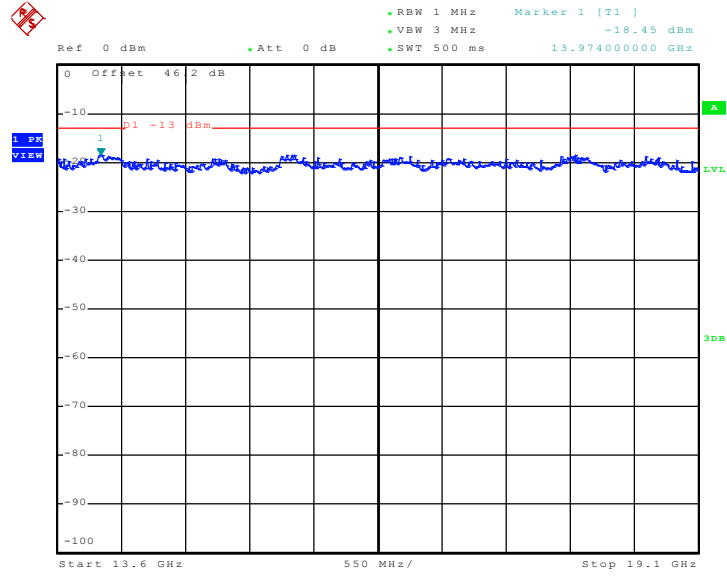


Date: 28.AUG.2009 23:50:44





Conducted Emission Plot between 13.6GHz ~ 19.1GHz

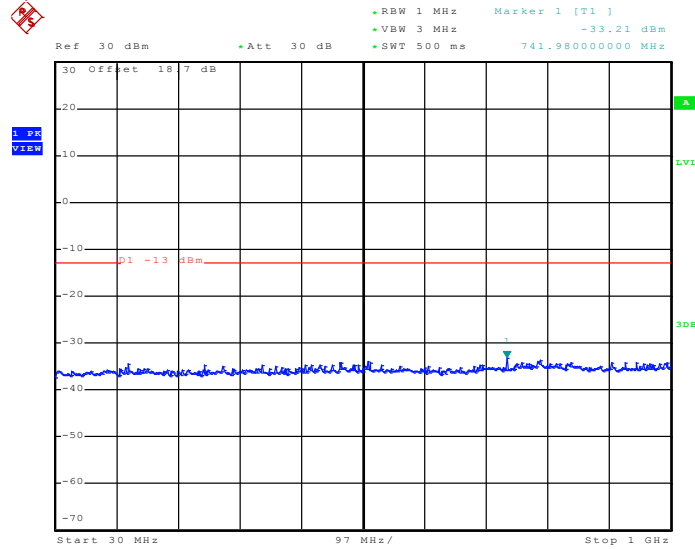


Date: 2R.AUG.2009 23:51:19



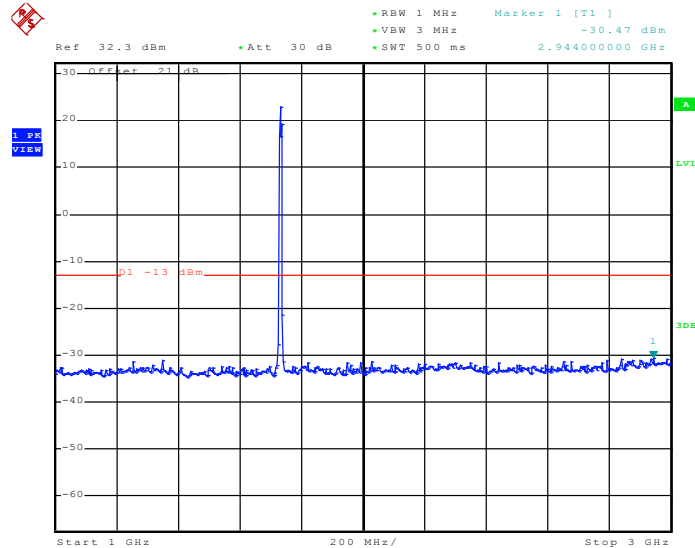
<b>Band :</b>	WCDMA Band IV	<b>Channel :</b>	CH1413
<b>Test Mode :</b>	HSDPA Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 29.AUG.2009 00:14:17

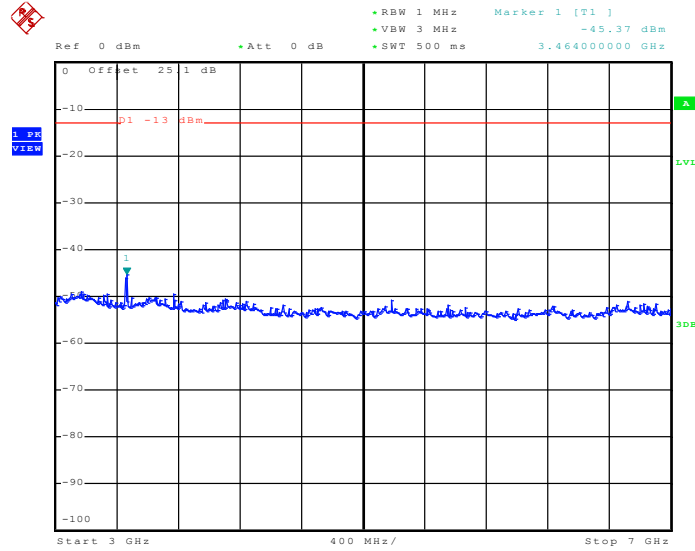
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 29.AUG.2009 00:15:02

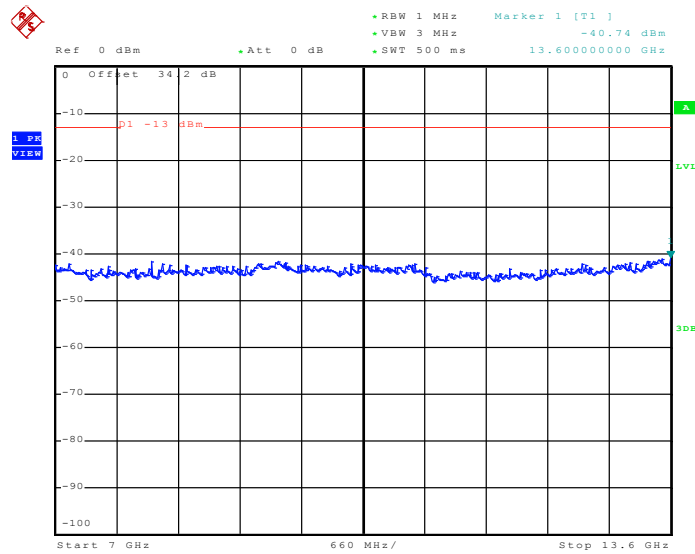


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 29.AUG.2009 00:15:29

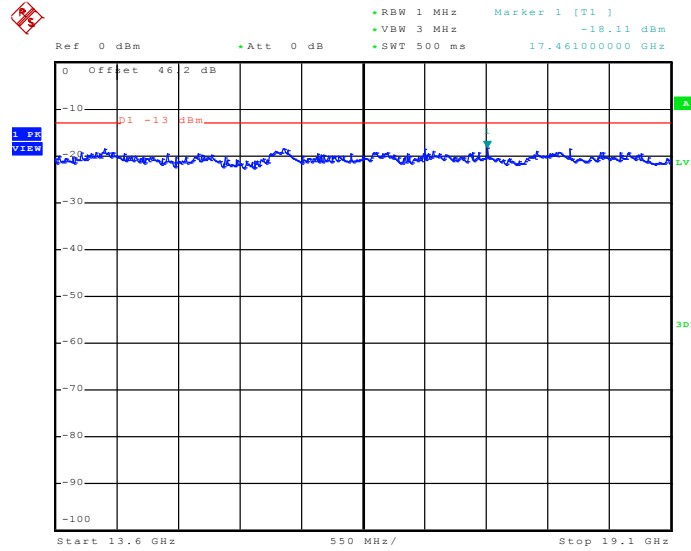
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 29.AUG.2009 00:15:56



Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 29.AUG.2009 00:16:22



## 3.6 Field Strength of Spurious Radiation Measurement

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

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. 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.

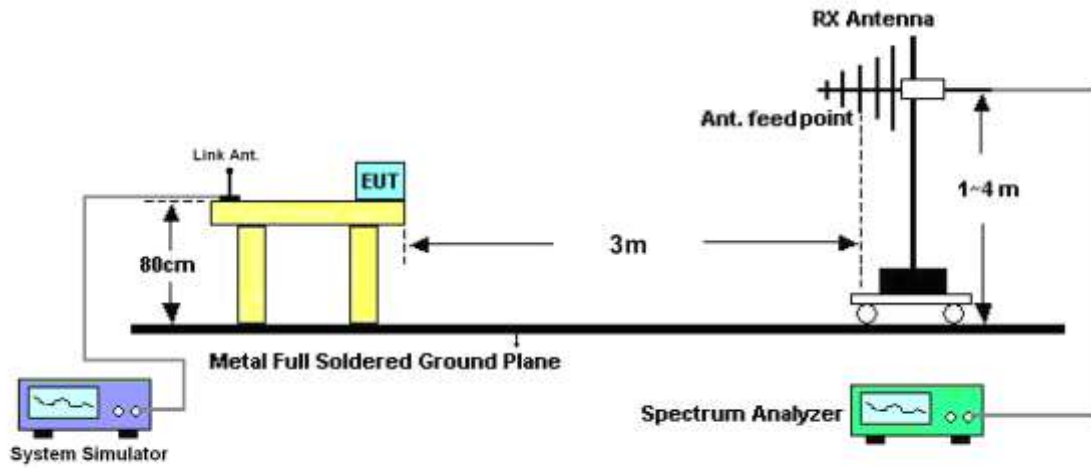
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

4. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
5. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
6. The table was rotated 360 degrees to determine the position of the highest spurious emission.
7. 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.
8. Taking the record of maximum spurious emission.
9. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
10. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
11. Taking the record of output power at antenna port.
12. Repeat step 7 to step 8 for another polarization.
13.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
14.  $ERP \text{ (dBm)} = EIRP - 2.15$

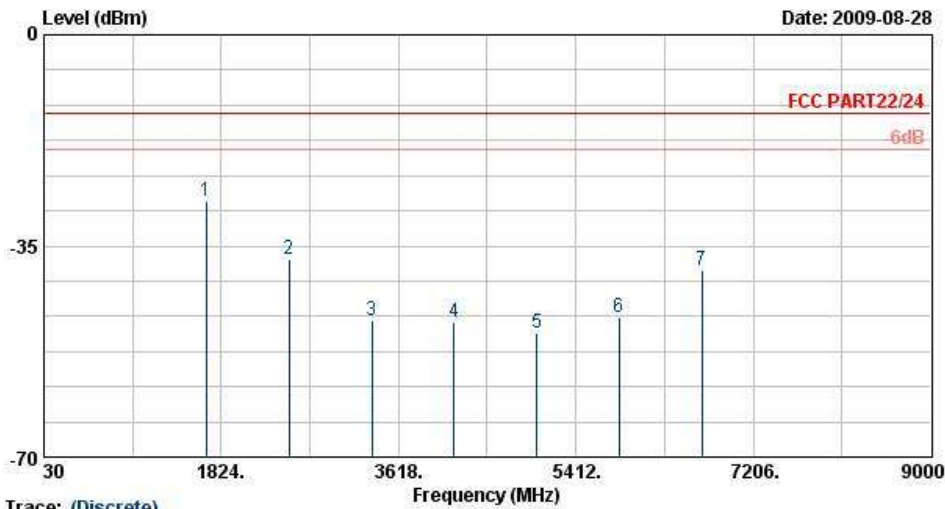
### 3.6.4 Test Setup





3.6.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	Temperature :	28~29 °C
Test Mode :	GPRS 8 Link	Relative Humidity :	41~42 %
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

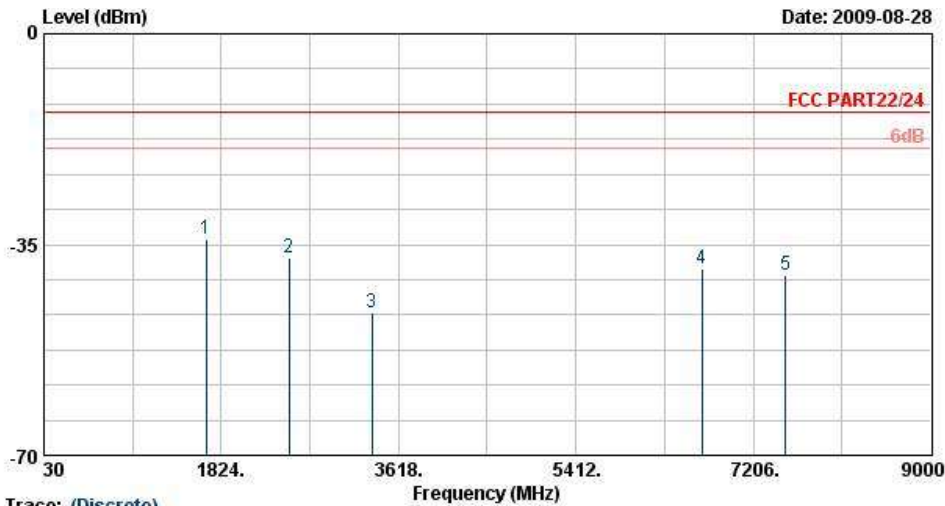


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) HORIZONTAL  
 Project : FG 982031  
 Mode : Mode 1  
 Power : From system

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
1669	-27.70	-13	-14.70	-37.18	-27.55	3.39	5.39	H	Pass
2509	-37.18	-13	-24.18	-45.54	-37.44	3.71	6.12	H	Pass
3346	-47.48	-13	-34.48	-58.43	-50.20	3.13	8.00	H	Pass
4175	-47.50	-13	-34.50	-60.60	-51.34	3.01	9.00	H	Pass
5015	-49.43	-13	-36.43	-64.19	-54.40	2.61	9.73	H	Pass
5850	-46.74	-13	-33.74	-65.14	-50.61	4.38	10.40	H	Pass
6690	-39.00	-13	-26.00	-60.81	-42.78	5.22	11.15	H	Pass



Band :	GSM850	Temperature :	28~29 °C
Test Mode :	GPRS 8 Link	Relative Humidity :	41~42 %
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



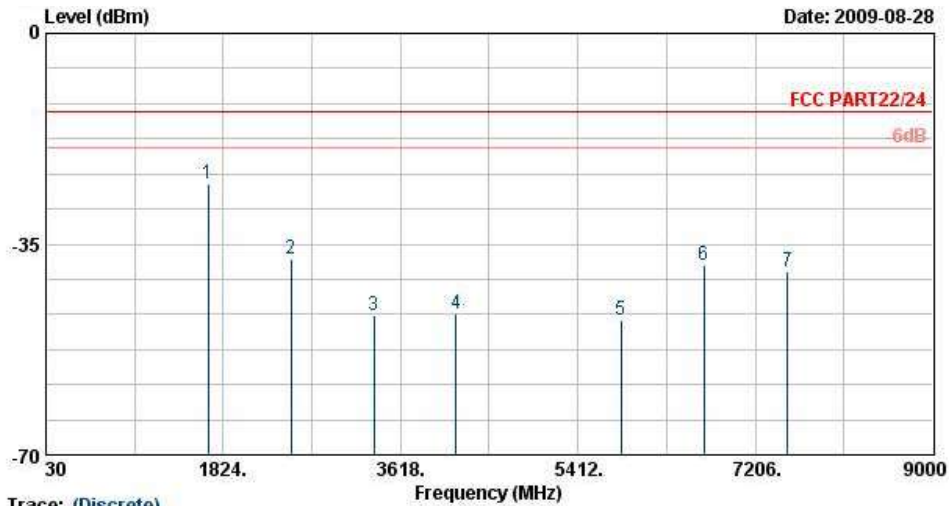
Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) VERTICAL  
 Project : FG 082031  
 Mode : Mode 1  
 Power : From system

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
1669	-34.20	-13	-21.20	-43.46	-34.05	3.39	5.39	V	Pass
2509	-37.27	-13	-24.27	-49.00	-37.53	3.71	6.12	V	Pass
3346	-46.32	-13	-33.32	-57.14	-49.04	3.13	8.00	V	Pass
6690	-39.16	-13	-26.16	-60.38	-42.94	5.22	11.15	V	Pass
7530	-40.01	-13	-27.01	-63.91	-43.86	6.22	12.22	V	Pass





Band :	GSM850	Temperature :	28~29 °C
Test Mode :	EDGE 8 Link	Relative Humidity :	41~42 %
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

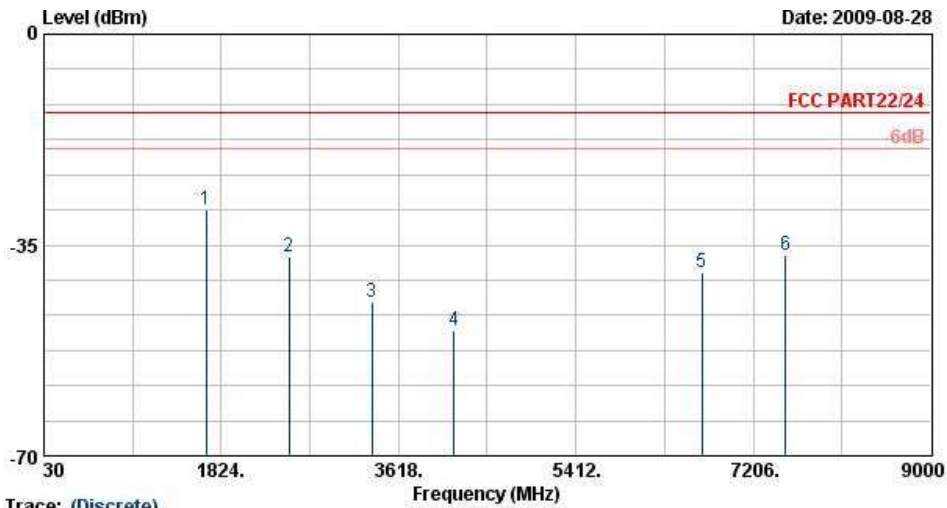


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) HORIZONTAL  
 Project : FG 982031  
 Mode : Mode 2  
 Power : From system

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
1669	-25.05	-13	-12.05	-34.55	-24.9	3.39	5.39	H	Pass
2509	-37.36	-13	-24.36	-45.72	-37.62	3.71	6.12	H	Pass
3346	-46.92	-13	-33.92	-55.06	-49.64	3.13	8.00	H	Pass
4175	-46.51	-13	-33.51	-59.61	-50.35	3.01	9.00	H	Pass
5850	-47.52	-13	-34.52	-65.92	-51.39	4.38	10.40	H	Pass
6690	-38.61	-13	-25.61	-60.42	-42.39	5.22	11.15	H	Pass
7530	-39.48	-13	-26.48	-63.60	-43.33	6.22	12.22	H	Pass



Band :	GSM850	Temperature :	28~29 °C
Test Mode :	EDGE 8 Link	Relative Humidity :	41~42 %
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

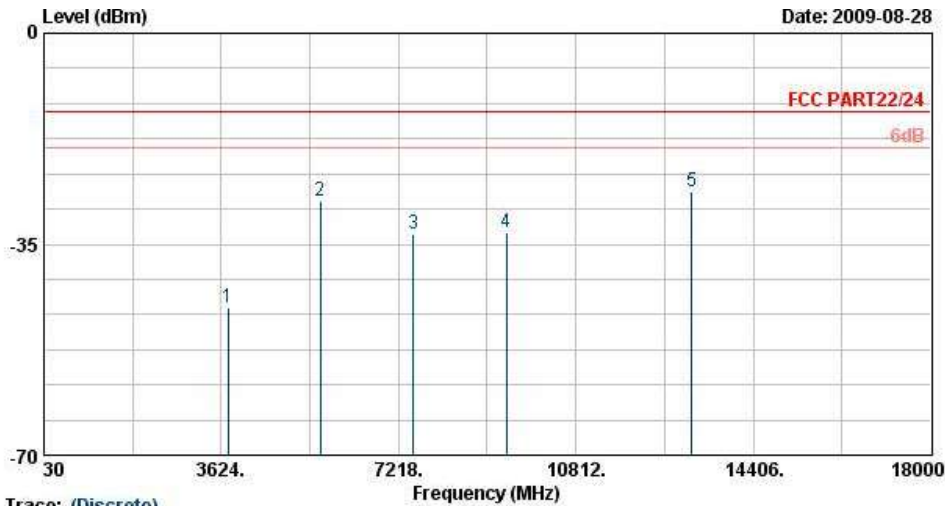


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) VERTICAL  
 Project : FG 082031  
 Mode : Mode 2  
 Power : From system

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
1669	-29.10	-13	-16.10	-38.50	-28.95	3.39	5.39	V	Pass
2509	-36.92	-13	-23.92	-48.70	-37.18	3.71	6.12	V	Pass
3346	-44.52	-13	-31.52	-55.76	-47.24	3.13	8.00	V	Pass
4175	-49.14	-13	-36.14	-63.07	-52.98	3.01	9.00	V	Pass
6690	-39.67	-13	-26.67	-57.20	-43.45	5.22	11.15	V	Pass
7530	-36.79	-13	-23.79	-60.69	-40.64	6.22	12.22	V	Pass



<b>Band :</b>	GSM1900	<b>Temperature :</b>	28~29 °C
<b>Test Mode :</b>	GPRS 8 Link	<b>Relative Humidity :</b>	41~42 %
<b>Test Engineer :</b>	Kay Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

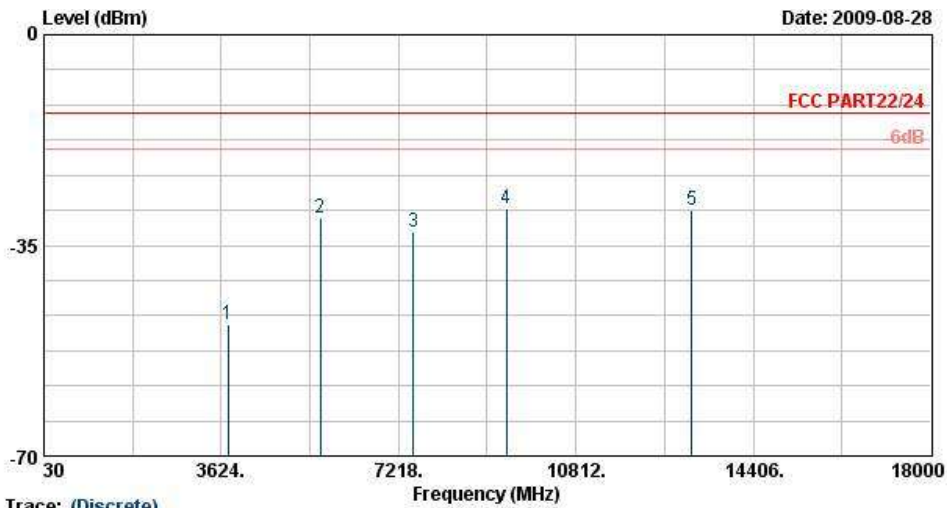


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) HORIZONTAL  
 Project : FG 982031  
 Mode : Mode 1  
 Power : From system

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	-45.65	-13	-32.65	-58.9	-48.17	4.88	7.40	H	Pass
5636	-27.92	-13	-14.92	-48.56	-31.18	5.55	8.81	H	Pass
7520	-33.32	-13	-20.32	-56.06	-36.39	6.64	9.71	H	Pass
9396	-33.02	-13	-20.02	-57.35	-36.83	6.91	10.72	H	Pass
13156	-26.39	-13	-13.39	-58.82	-28.62	8.80	11.03	H	Pass



<b>Band :</b>	GSM1900	<b>Temperature :</b>	28~29 °C
<b>Test Mode :</b>	GPRS 8 Link	<b>Relative Humidity :</b>	41~42 %
<b>Test Engineer :</b>	Kay Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

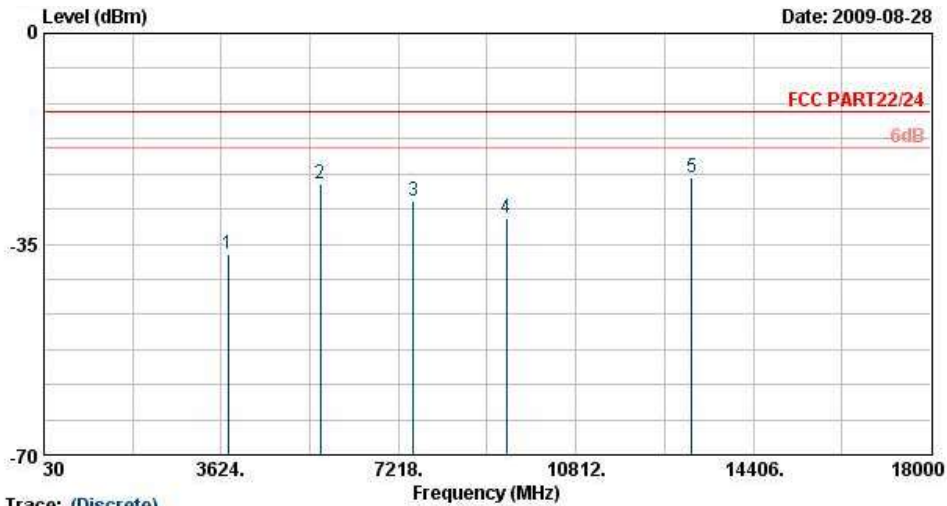


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) VERTICAL  
 Project : FG 082031  
 Mode : Mode 1  
 Power : From system

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	-48.13	-13	-35.13	-62.78	-51.16	4.88	7.91	V	Pass
5636	-30.55	-13	-17.55	-52.13	-34.77	5.55	9.77	V	Pass
7520	-32.80	-13	-19.80	-55.71	-36.97	6.64	10.81	V	Pass
9396	-28.83	-13	-15.83	-57.61	-33.44	6.91	11.52	V	Pass
13156	-29.25	-13	-16.25	-59.70	-32.61	8.80	12.16	V	Pass



<b>Band :</b>	GSM1900	<b>Temperature :</b>	28~29 °C
<b>Test Mode :</b>	EDGE 8 Link	<b>Relative Humidity :</b>	41~42 %
<b>Test Engineer :</b>	Kay Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

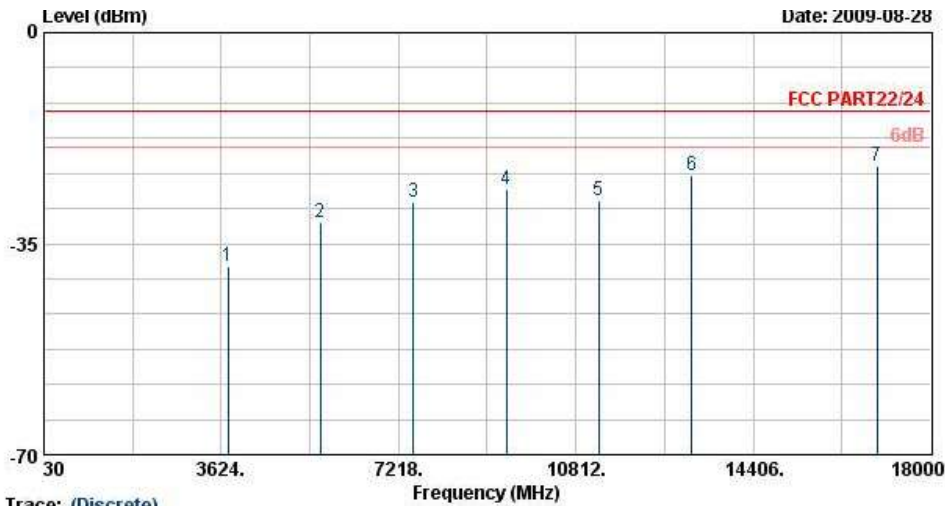


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) HORIZONTAL  
 Project : FG 982031  
 Mode : Mode 2  
 Power : From system

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	-36.64	-13	-23.64	-51.21	-39.16	4.88	7.40	H	Pass
5636	-25.07	-13	-12.07	-45.80	-28.33	5.55	8.81	H	Pass
7520	-27.88	-13	-14.88	-51.08	-30.95	6.64	9.71	H	Pass
9396	-30.60	-13	-17.60	-55.44	-34.41	6.91	10.72	H	Pass
13156	-23.99	-13	-10.99	-56.42	-26.22	8.80	11.03	H	Pass



<b>Band :</b>	GSM1900	<b>Temperature :</b>	28~29 °C
<b>Test Mode :</b>	EDGE 8 Link	<b>Relative Humidity :</b>	41~42 %
<b>Test Engineer :</b>	Kay Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

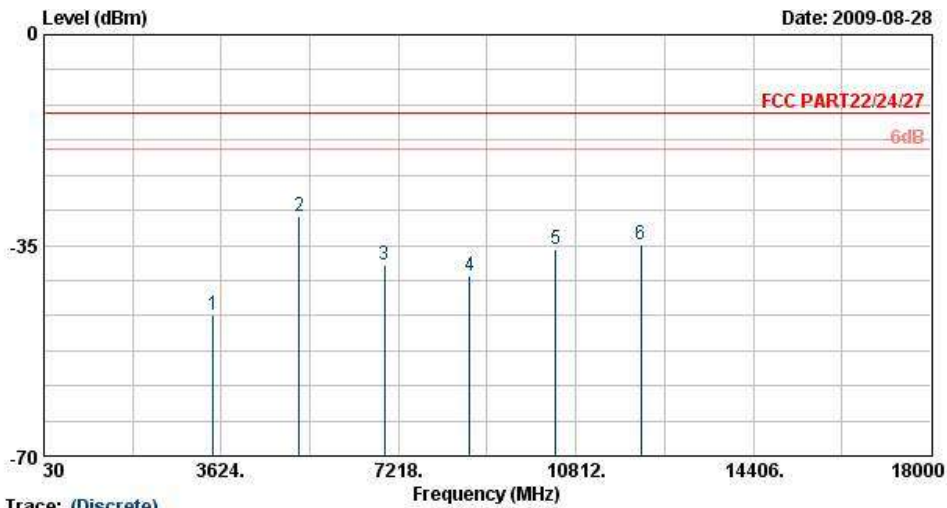


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24 HF-ETRP(080306) VERTICAL  
 Project : FG 082031  
 Mode : Mode 2  
 Power : From system

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	-38.84	-13	-25.84	-55.57	-41.87	4.88	7.91	V	Pass
5636	-31.44	-13	-18.44	-52.92	-35.66	5.55	9.77	V	Pass
7520	-28.03	-13	-15.03	-51.44	-32.20	6.64	10.81	V	Pass
9396	-26.03	-13	-13.03	-55.02	-30.64	6.91	11.52	V	Pass
11280	-27.82	-13	-14.82	-62.26	-31.95	7.23	11.36	V	Pass
13156	-23.74	-13	-10.74	-54.19	-27.10	8.80	12.16	V	Pass
16917	-22.17	-13	-9.17	-57.67	-21.55	11.22	10.60	V	Pass



<b>Band :</b>	WCDMA Band IV	<b>Temperature :</b>	28~29 °C
<b>Test Mode :</b>	HSDPA Link	<b>Relative Humidity :</b>	41~42 %
<b>Test Engineer :</b>	Kay Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

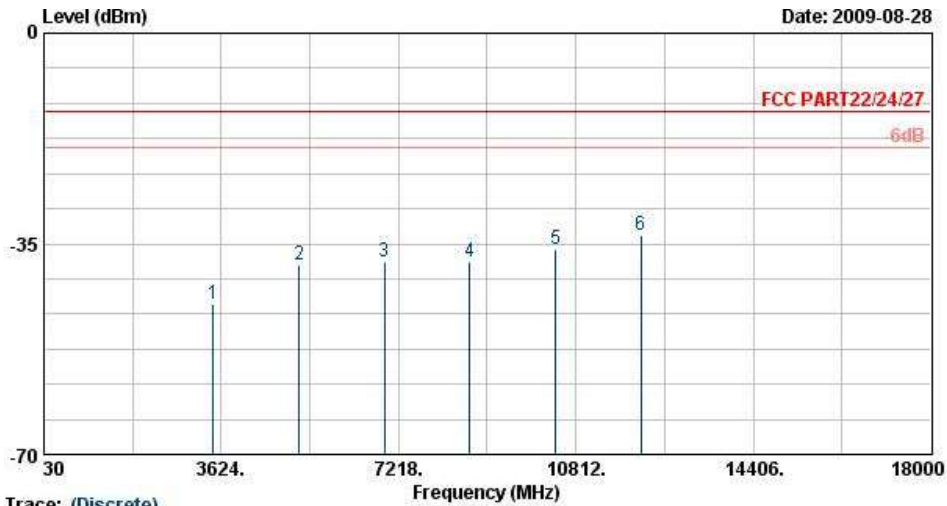


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24/27 HF-ETRP(060306) HORIZONTAL  
 Project : FG 982031  
 Mode : Mode 1  
 Power : From system

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	-46.50	-13	-33.50	-59.8	-50.33	4.48	8.31	H	Pass
5197	-30.27	-13	-17.27	-48.06	-34.91	5.33	9.98	H	Pass
6930	-38.32	-13	-25.32	-63.48	-43.56	6.10	11.34	H	Pass
8662	-40.15	-13	-27.15	-63.73	-45.07	8.25	13.17	H	Pass
10395	-35.59	-13	-22.59	-63.80	-39.88	8.65	12.94	H	Pass
12128	-34.89	-13	-21.89	-65.47	-39.20	8.59	12.90	H	Pass



<b>Band :</b>	WCDMA Band IV	<b>Temperature :</b>	28~29 °C
<b>Test Mode :</b>	HSDPA Link	<b>Relative Humidity :</b>	41~42 %
<b>Test Engineer :</b>	Kay Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24/27 HF-ETRP(060306) VERTICAL  
 Project : FG 982031  
 Mode : Mode 1  
 Power : From system

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	-44.97	-13	-31.97	-59.51	-48.8	4.48	8.31	V	Pass
5197	-38.43	-13	-25.43	-56.19	-43.07	5.33	9.98	V	Pass
6930	-37.93	-13	-24.93	-62.27	-43.17	6.10	11.34	V	Pass
8662	-38.12	-13	-25.12	-62.39	-43.04	8.25	13.17	V	Pass
10395	-35.91	-13	-22.91	-63.11	-40.20	8.65	12.94	V	Pass
12128	-33.67	-13	-20.67	-62.74	-37.98	8.59	12.90	V	Pass



## 3.7 Frequency Stability Measurement

### 3.7.1 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.

### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

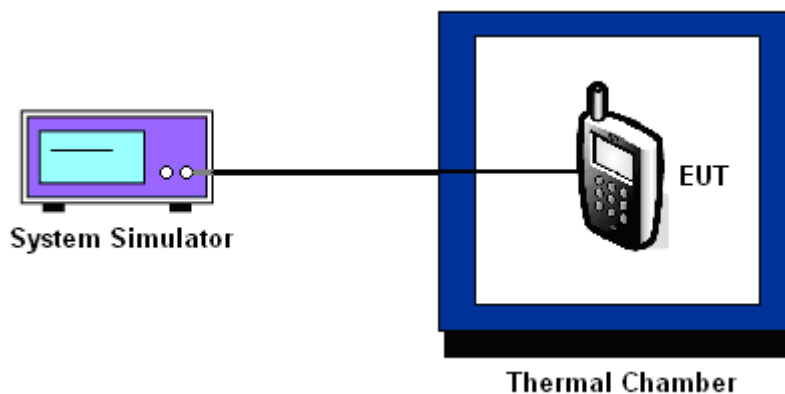
### 3.7.3 Test Procedures for Temperature Variation

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 for three hours. 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 can not 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.

### 3.7.4 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.

### 3.7.5 Test Setup





3.7.6 Test Result of Temperature Variation

Band :	GSM 850	Channel :	189
Limit (ppm) :	2.5		

Temperature (°C)	GPRS 8		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	N/A	N/A	N/A	N/A	
0	-26	-0.03	34	0.04	
10	-21	-0.02	28	0.03	
20	-66	-0.08	-49	-0.06	
30	-32	-0.04	-23	-0.03	
40	-23	-0.03	-78	-0.09	
50	-38	-0.04	-75	-0.09	

**Note:** The manufacturer declared that the EUT could work properly between temperatures 0°C~55°C.

Band :	GSM 1900	Channel :	661
Limit (ppm) :	2.5		

Temperature (°C)	GPRS 8		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	N/A	N/A	N/A	N/A	
0	-72	-0.04	36	0.02	
10	-60	-0.03	-81	-0.04	
20	-94	-0.05	-86	-0.05	
30	-75	-0.04	-56	-0.03	
40	-40	-0.02	-59	-0.03	
50	-45	-0.02	-66	-0.03	

**Note:** The manufacturer declared that the EUT could work properly between temperatures 0°C~55°C.



Band :	WCDMA Band IV	Channel :	1413
Limit (ppm) :	2.5		

Temperature (°C)	HSDPA		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	PASS
-20	N/A	N/A	
-10	N/A	N/A	
0	12	0.01	
10	16	0.01	
20	11	0.01	
30	22	0.01	
40	-6	0.00	
50	-10	-0.01	

**Note:** The manufacturer declared that the EUT could work properly between temperatures 0°C~55°C.

### 3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GPRS 8	5	-40	-0.05	2.5	PASS
	EDGE 8	5	12	0.01		
GSM 1900 CH661	GPRS 8	5	-62	-0.03		
	EDGE 8	5	-74	-0.04		
WCDMA Band IV CH1413	HSDPA	5	-11	-0.01		

**Note:** Normal Voltage = 5V.



## 4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	116456	N/A	Jun. 05, 2008	Jun. 04, 2010	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 23, 2009	Jun. 22, 2010	Conducted (TH02-HY)
Thermal Chamber	TEN BILLION	TTH-D35P	TBN-930701	N/A	Jul. 29, 2009	Jul. 28, 2010	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz~1GHz	Nov. 20, 2008	Nov. 19, 2009	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9kHz~30GHz	Dec. 02, 2008	Dec. 01, 2009	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1G~26.5GHz	Dec. 17, 2008	Dec. 16, 2009	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10~1000MHz. 32dB.GAIN	Mar. 27, 2009	Mar. 26, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00066584	1G~18GHz	Aug. 05, 2009	Aug. 04, 2010	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	May 22, 2008	May 21, 2010	Radiation (03CH07-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	BBHA917025 1	15G~40GHz	Oct. 16, 2008	Oct. 15, 2009	Radiation (03CH07-HY)
System Simulator	R&S	CMU200	117997	N/A	May 14, 2009	May 13, 2011	Radiation (03CH07-HY)

## 5 Uncertainty of Evaluation

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

Contribution	Uncertainty of $x_i$		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
<b>Combined standard uncertainty Uc(y)</b>	<b>1.27</b>		
<b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b>	<b>2.54</b>		

### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of $x_i$		$u(x_i)$	$C_i$	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 * \Gamma_2)$	+0.34/-0.35	U-shaped	0.244	1	0.244
<b>Combined standard uncertainty Uc(y)</b>	<b>2.36</b>				
<b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b>	<b>4.72</b>				

## 6 Certification of TAF Accreditation



Certificate No. : L1190-090318

財團法人全國認證基金會  
Taiwan Accreditation Foundation

### Certificate of Accreditation

This is to certify that

**Sporton International Inc.****EMC & Wireless Communications Laboratory**No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,  
Taiwan, R.O.C.**is accredited in respect of laboratory**

**Accreditation Criteria** : ISO/IEC 17025:2005  
**Accreditation Number** : 1190  
**Originally Accredited** : December 15, 2003  
**Effective Period** : January 10, 2007 to January 09, 2010  
**Accredited Scope** : Testing Field, see described in the Appendix  
**Specific Accreditation Program** : Accreditation Program for Designated Testing Laboratory for Commodities Inspection  
Accreditation Program for Telecommunication Equipment Testing Laboratory  
Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities



Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date : March 18, 2009

PI, total 19 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP982031 as below.