



# FCC Test Report

for

## 47 CFR Part 22H, 24E

Equipment : GSM/GPRS with Bluetooth Cellular Phone  
Trade Name : GPLUS  
Model No. : GP800  
FCC ID : VPV-GP800  
Tx Frequency Range : GSM850 : 824.2 ~ 848.8MHz  
PCS1900 : 1850.2 ~1909.8 MHz  
Max. ERP/EIRP Power : GGSM850 : 0.54 W  
PCS1900 : 0.43 W  
Emission Designator : GSM : 300KGXW  
Applicant : TOTAL LIGHT ENTERPRISE CO., LTD.  
5F., No. 62, Zhouzi St., Neihu District, Taipei City 114,  
Taiwan (R.O.C.)

- The test result refers exclusively to the test presented test model / sample.
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- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**
- The data shown in this test report were carried out on Oct. 19, 2007 at **Sporton International Inc. LAB.**
- Report No.: FG751505-02, Report Version: Rev. 01.

Jones Tsai  
Manager

**SPORTON International Inc.**

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.



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### History of this test report

Report Issue Date: Oct. 25, 2007

Report No.	Description



## 1. General Information

### 1.2 Applicant

**TOTAL LIGHT ENTERPRISE CO., LTD.**

5F., No. 62, Zhouzi St., Neihs District, Taipei City 114, Taiwan (R.O.C.)

### 1.3 Manufacturer

**GPLUS TELCOM CO., LTD.**

4F, POLARIS I BLDG., 15-3, JEONGJA-DONG BUNDANG-GU, SEONGNAM-SI, GYEONGGI-DO,  
KOREA 463-811

### 1.4 Basic Description of Equipment under Test

<b>Equipment</b>		GSM/GPRS with Bluetooth Cellular Phone
<b>Trade Name</b>		GPLUS
<b>Model Name</b>		GP800
<b>FCC ID</b>		VPV-GP800
<b>AC Adapter</b>	<b>Brand Name</b>	GPLUS
	<b>Model Name</b>	GT-TA-005-A3
	<b>Power Rating</b>	100-240Vac, 50-60Hz, 0.2A
	<b>AC Power Cord Type</b>	1.55 meter non-shielded cable without ferrite core
<b>Battery</b>	<b>Brand Name</b>	GPLUS
	<b>Model Name</b>	GP800/810
	<b>Rating</b>	3.7Vdc, 600mAh
	<b>Type</b>	Li-ion
<b>Earphone</b>	<b>Brand Name</b>	GPLUS
	<b>Model Name</b>	GP800
	<b>Signal line Type</b>	1.65 meter non-shielded cable without ferrite core
<b>USB Cable</b>	<b>Brand Name</b>	GPLUS
	<b>Model Name</b>	GP800
	<b>Signal line Type</b>	1.5 meter non-shielded cable without ferrite core

Remark: Above EUT's information was declared by manufacturer. Please refer to the specifications of manufacturer or User's Manual for more detailed features description.

**1.5 Feature of Equipment under Test**

<b>DUT Type :</b>	GSM/GPRS with Bluetooth Cellular Phone
<b>Trade Name :</b>	GPLUS
<b>Model Name :</b>	GP800
<b>FCC ID :</b>	VPV-GP800
<b>Tx Frequency :</b>	GSM850 : 824 ~ 849 MHz PCS1900 : 1850 ~ 1910 MHz Bluetooth : 2400 ~ 2483.5 MHz
<b>Rx Frequency :</b>	GSM850 : 869 ~ 894 MHz PCS1900 : 1930 ~ 1990 MHz Bluetooth : 2400 ~ 2483.5 MHz
<b>Maximum Output Power to Antenna :</b>	GSM850 : 31.82 dBm (GSM) PCS1900 : 29.30 dBm (GSM) Bluetooth : -1.62 dBm
<b>Maximum ERP/EIRP :</b>	GSM850(GSM) : 0.54 W ( 27.31 dBm) PCS1900(GSM) : 0.43 W ( 26.32 dBm)
<b>Antenna Type :</b>	Bluetooth : Chip Antenna
<b>Type of Antenna Connector</b>	N/A
<b>Power Rating (DC/AC , Voltage and Current of RF element or PA) :</b>	4.2Vdc / 270mA
<b>Digital Modulation Emission :</b>	GSM : GMSK Bluetooth : GFSK
<b>Type of Emission :</b>	GSM : 300KGXW
<b>DUT Stage :</b>	Production Unit



## **1.6 Report Date**

EUT Received : Oct. 11, 2007

Report Date : Oct. 25, 2007

## 2. Test Configuration of Equipment under Test

### 2.1 Test Manner

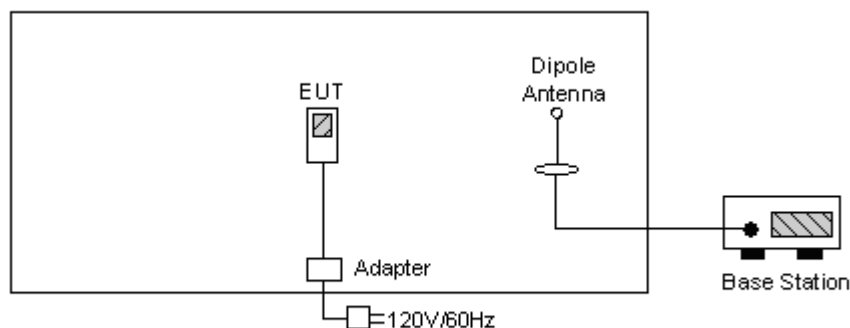
1. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.
2. During all testings, EUT is in link mode with base station emulator at maximum power level.
3. Frequency range investigated: radiated emission 30 MHz to 9000 MHz for GSM850 and 30MHz to 19000 MHz for PCS1900.

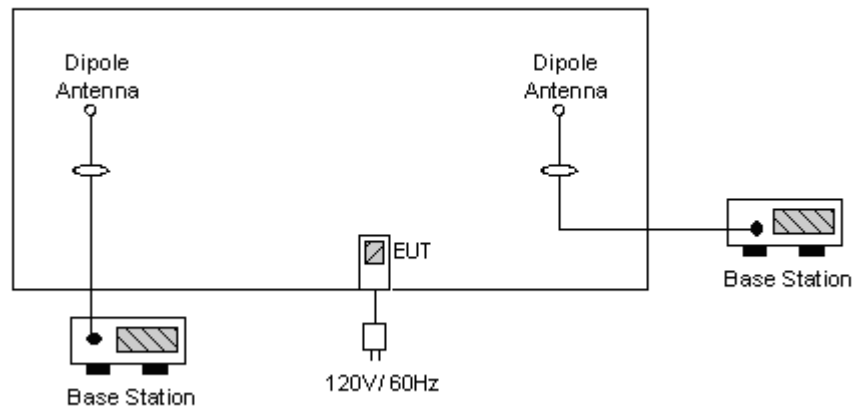
### 2.2 Test Mode

Application	GSM850	PCS1900
Radiated Emission	<input checked="" type="checkbox"/> Mode 1: GSM Link	<input checked="" type="checkbox"/> Mode 2: GSM Link
	<input checked="" type="checkbox"/> Mode 3: GSM Link + BT Link	
Conducted Measurement	<input checked="" type="checkbox"/> Mode 1: GSM Link	<input checked="" type="checkbox"/> Mode 2: GSM Link

### 2.3 Connection Diagram of Test System

#### Phone with Link Mode



**Bluetooth**

**2.4 Ancillary Equipment List**

Item	Equipment	Trade Name	Model No.	FCC ID	Cable Cord / Power Code
1.	Base Station	R&S	CMU200	N/A	Unshielded, 1.8m
2.	BT Base Station	Anritus	8852A	N/A	Unshielded, 1.8m





### **3. General Information of Test Site**

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,  
Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.  
TEL : 886-3-327-3456  
FAX : 886-3-318-0055  
Test Site No : 03CH06-HY, TH02-HY

The chamber meets the characteristics of ANSI C63.4-2003. This site is on file with the FCC.

#### **3.1 Test Voltage**

AC 120V / 60Hz

#### **3.2 Test Compliance**

47 CFR Part 22H, 24E, Part 2

#### **3.3 Frequency Range**

- a. Radiation: from 30MHz to 9000MHz for GSM850.
- b. Radiation: from 30 MHz to 19000 MHz for PCS1900.

#### **3.4 Test Distance**

The test distance of radiated emission from antenna to EUT is 3 m.



## 4. Test Data and Test Result

### 4.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result	Section
§2.1046	RF Output Power	Passed	4.2
§ 22.913 §24.232	ERP / EIRP	Passed	4.3
§2.1049, § 22.917, § 24.238(b)	Occupied Bandwidth & Band Edge Measurement	Passed	4.4
§2.1051	Conducted Emission	Passed	4.5
§2.1053	Field Strength of Spurious Radiation	Passed	4.6
§2.1055, § 22.355, §24.235	Frequency Stability vs. Temperature	Passed	4.7
§2.1055, §22.355, §24.235	Frequency Stability vs. Voltage	Passed	4.8

In order to compliance with FCC rule, EMC test was performed according worst case scenario.

## 4.2 RF Output Power

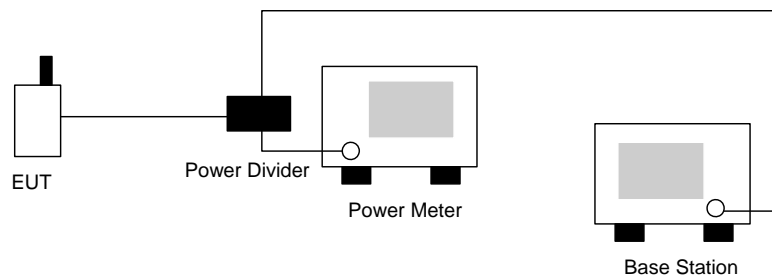
### 4.2.1 Measurement Instruments :

As described in chapter 5 of this test report.

### 4.2.2 Test Procedure :

1. The transmitter output was connected to power meter and base station through power divider.
2. Set EUT at PCL=5 for GSM850 and/or PCL=0 for PCS1900 maximum power through base station.
3. Select lowest, middle, and highest channels for each band.

### 4.2.3 Test Setup Layout :



**4.2.4 Test Result :**

<b>Bands</b>	<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Conducted Power (dBm)</b>	<b>Conducted Power (Watts)</b>
GSM850	128	824.2 (Low)	31.68	1.472
	189	836.4 (Mid)	31.82	1.521
	251	848.8 (High)	31.80	1.514
PCS1900	512	1850.2 (Low)	29.30	0.851
	661	1880.0 (Mid)	29.17	0.826
	810	1909.8 (High)	29.17	0.826



### 4.3 ERP / EIRP Measurement

Equivalent isotropic radiated power measurements by substitution method according to ANSI/TIA/EIA-603-C.

#### 4.3.1 Measurement Instruments

As described in chapter 5 of this test report.

#### 4.3.2 Test Procedure

1. The EUT was placed on a table with 1.0 meter height in an fully anechoic chamber.
2. The EUT was set 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 also kept at 1.0M height.
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.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

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

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

$E_t = R_t + AF$

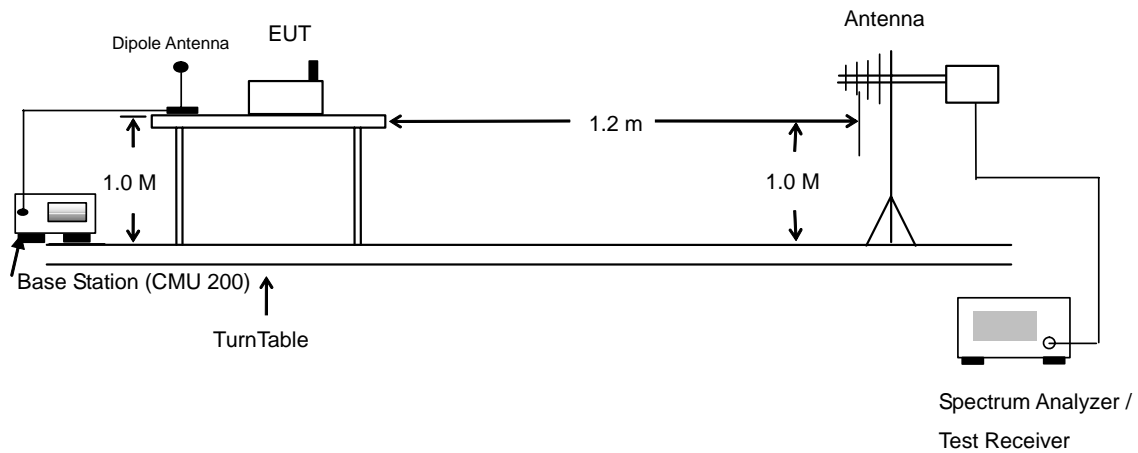
$E_s = R_s + AF$

$AF$  (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.

#### 4.3.3 Test Setup Layout of ERP/EIRP



**4.3.4 Test Result**

<b>GSM850 Radiated Power ERP</b>						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-31.70	-48.12	0.00	-1.08	15.34	0.03
836.40	-32.57	-48.28	0.00	-0.93	14.78	0.03
848.80	-33.24	-48.35	0.00	-0.76	14.35	0.03
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-20.07	-47.97	0.00	-1.08	26.82	0.48
836.40	-20.34	-48.01	0.00	-0.93	26.74	0.47
848.80	-19.98	-48.05	0.00	-0.76	27.31	0.54

<b>PCS1900 Radiated Power EIRP</b>						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-34.68	-51.88	0.00	1.96	19.16	0.08
1880.00	-34.92	-52.99	0.00	2.00	20.07	0.10
1909.80	-35.03	-54.28	0.00	1.98	21.23	0.13
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-27.77	-52.13	0.00	1.96	26.32	0.43
1880.00	-29.14	-53.17	0.00	2.00	26.03	0.40
1909.80	-30.77	-54.13	0.00	1.98	25.34	0.34

## 4.4 Occupied Bandwidth and Band Edge Measurement

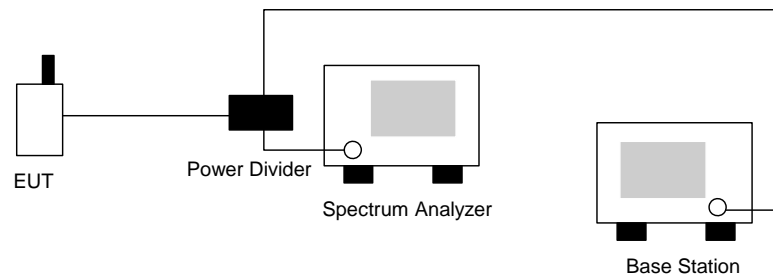
### 4.4.1 Measurement Instruments

As described in chapter 5 of this test report.

### 4.4.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% occupied bandwidth of middle channel for the highest and lowest RF powers were measured.
3. The bandedge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.

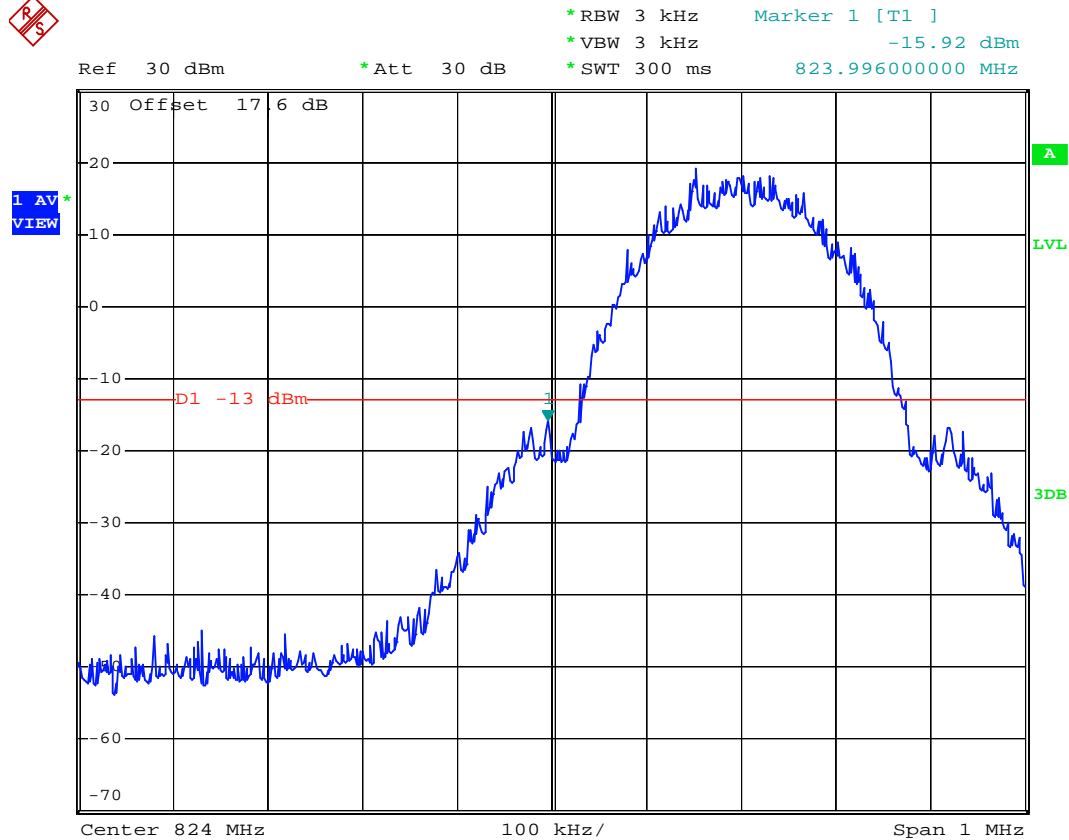
### 4.4.3 Test Setup Layout





**4.4.4 Test Result**

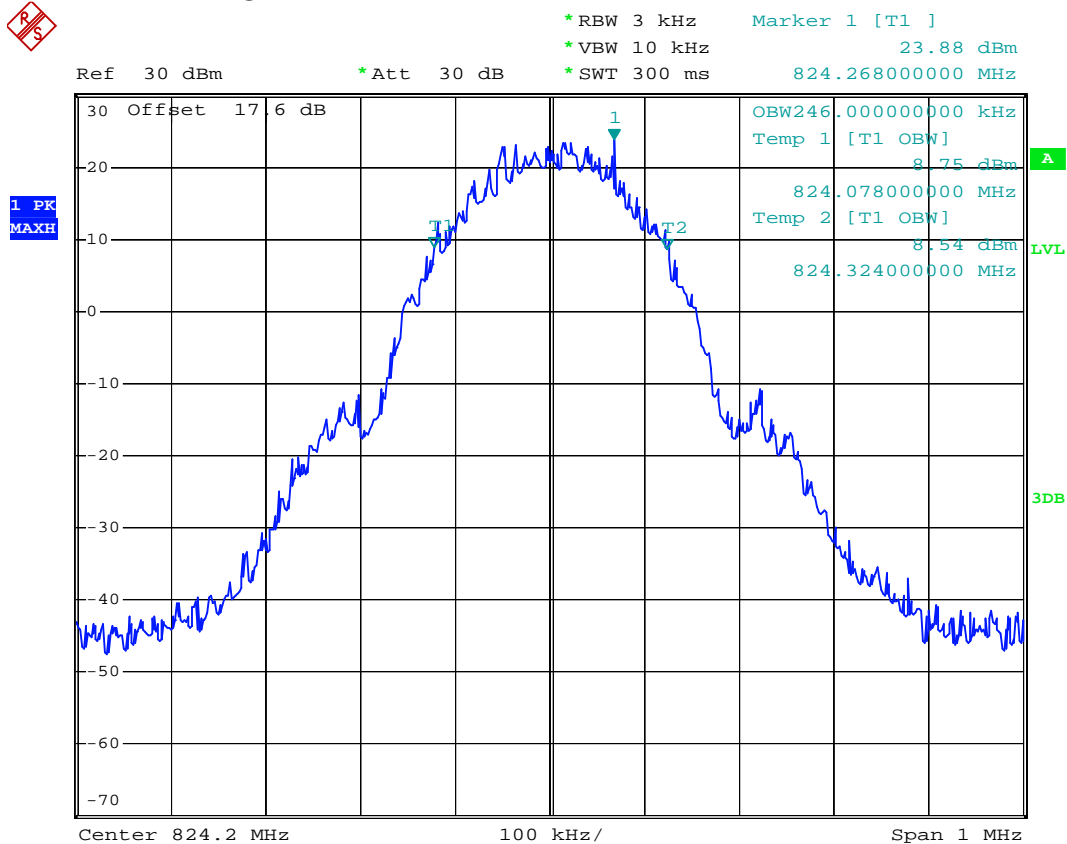
- Mode 1
- Test Mode : GSM850 (GSM) CH128 Lower Band Edge
- Power State : High



Date: 15.OCT.2007 21:05:44



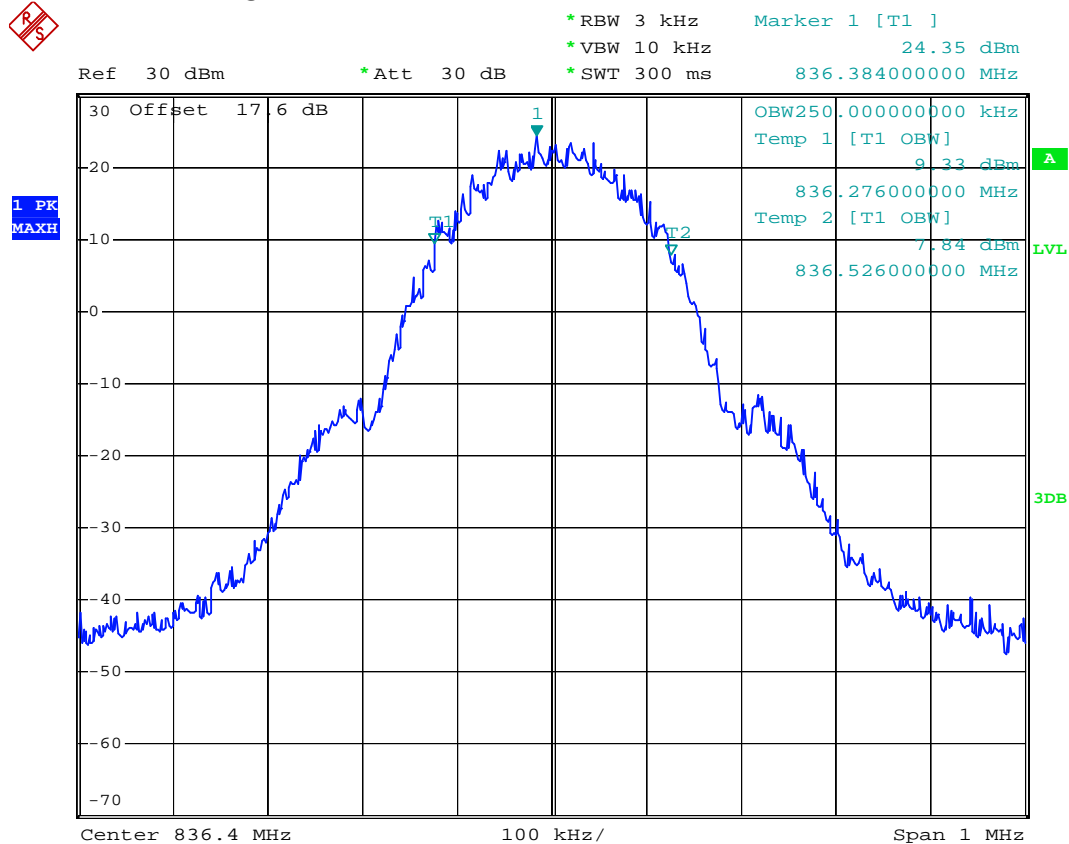
- Test Mode : GSM850 (GSM) CH128 99% Occupied Bandwidth
- Power State : High



Date: 15.OCT.2007 21:01:22



- Test Mode : GSM850 (GSM) CH189 99% Occupied Bandwidth
- Power State : High



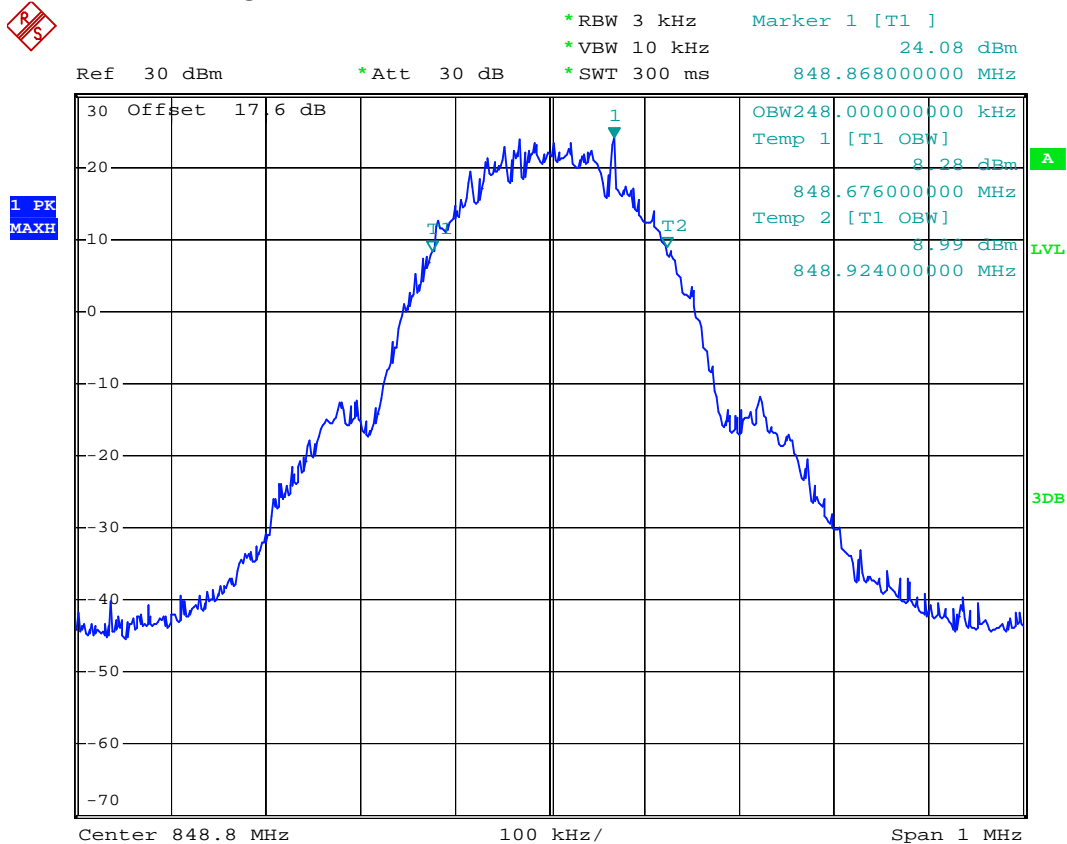
Date: 15.OCT.2007 21:02:07



# FCC TEST REPORT

Report No. : FG751505-02

- Test Mode : GSM850 (GSM) CH 251 99% Occupied Bandwidth
- Power State : High



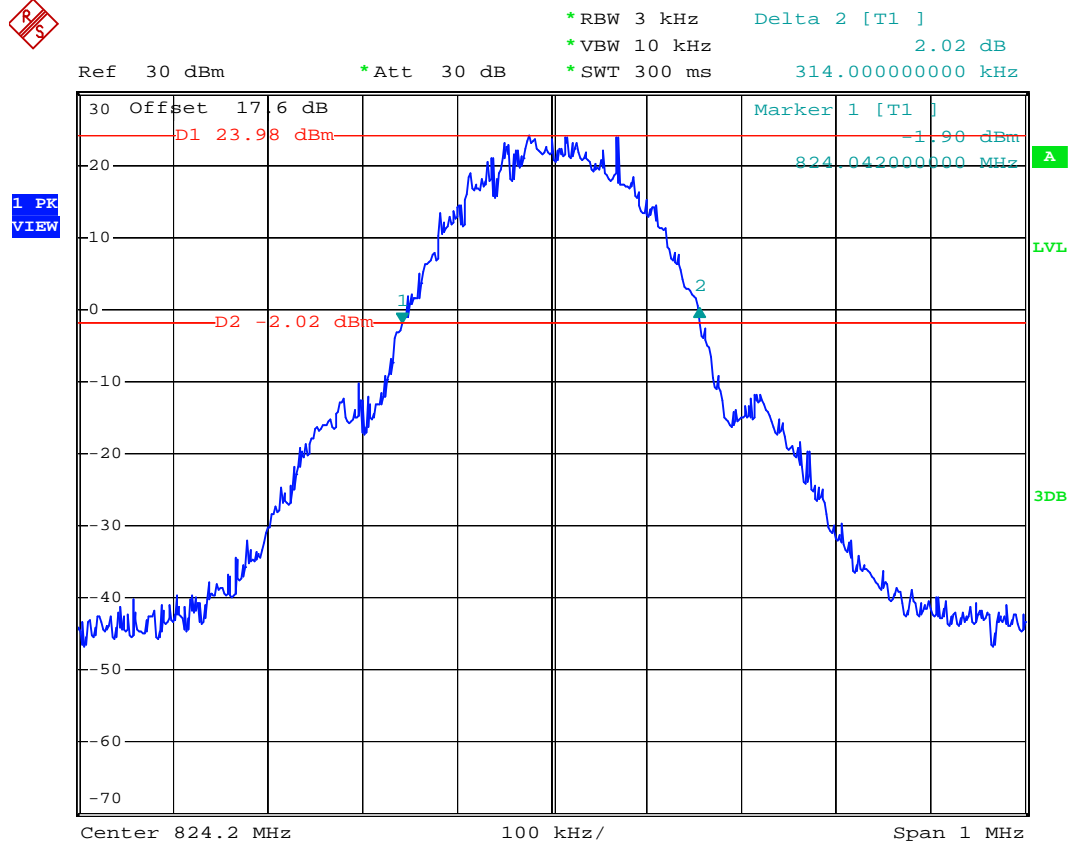
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# FCC TEST REPORT

Report No. : FG751505-02

- Test Mode : GSM850 (GSM) CH128 26dB Bandwidth
- Power State : High



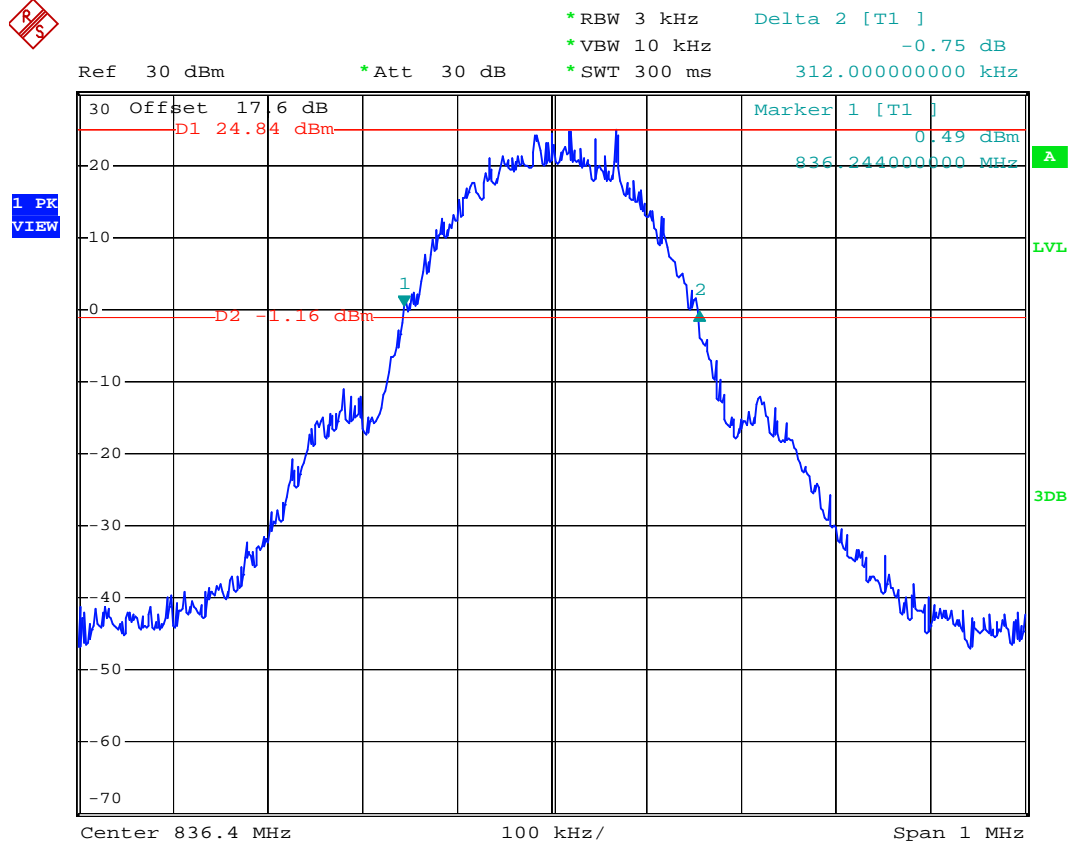
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# FCC TEST REPORT

Report No. : FG751505-02

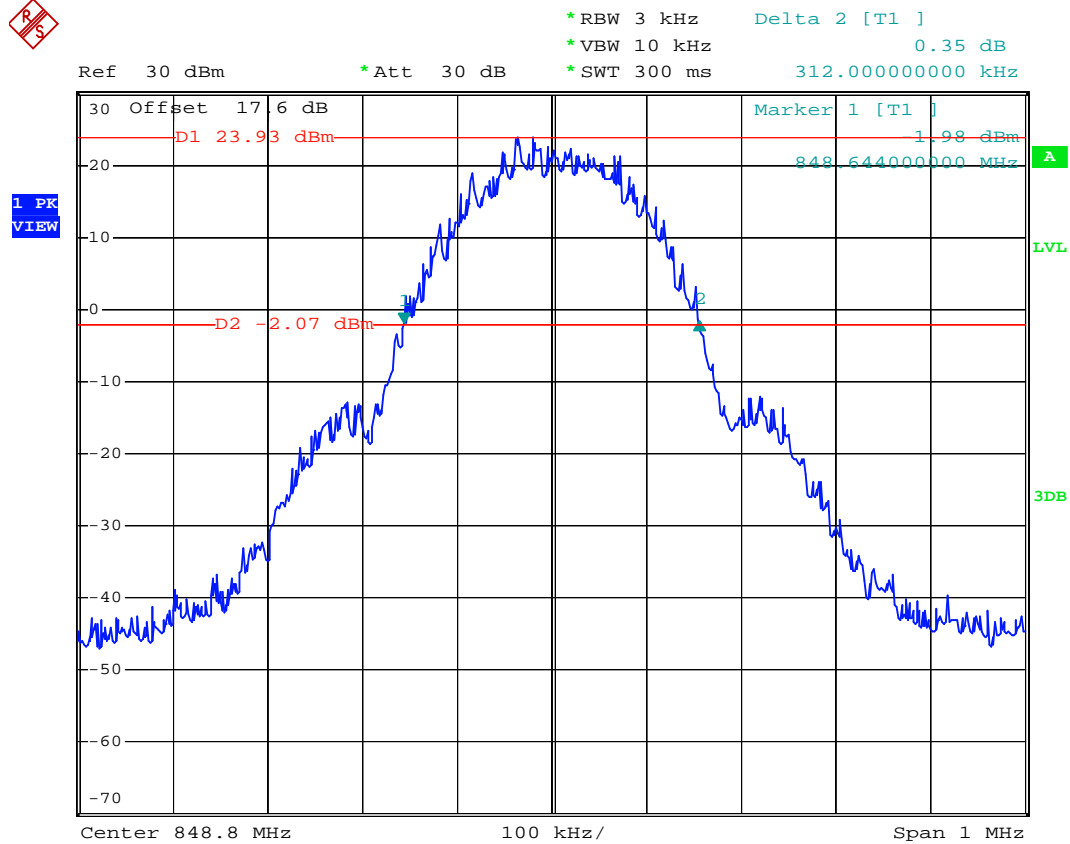
- Test Mode : GSM850 (GSM) CH189 26dB Bandwidth
- Power State : High



Date: 15.OCT.2007 20:58:16



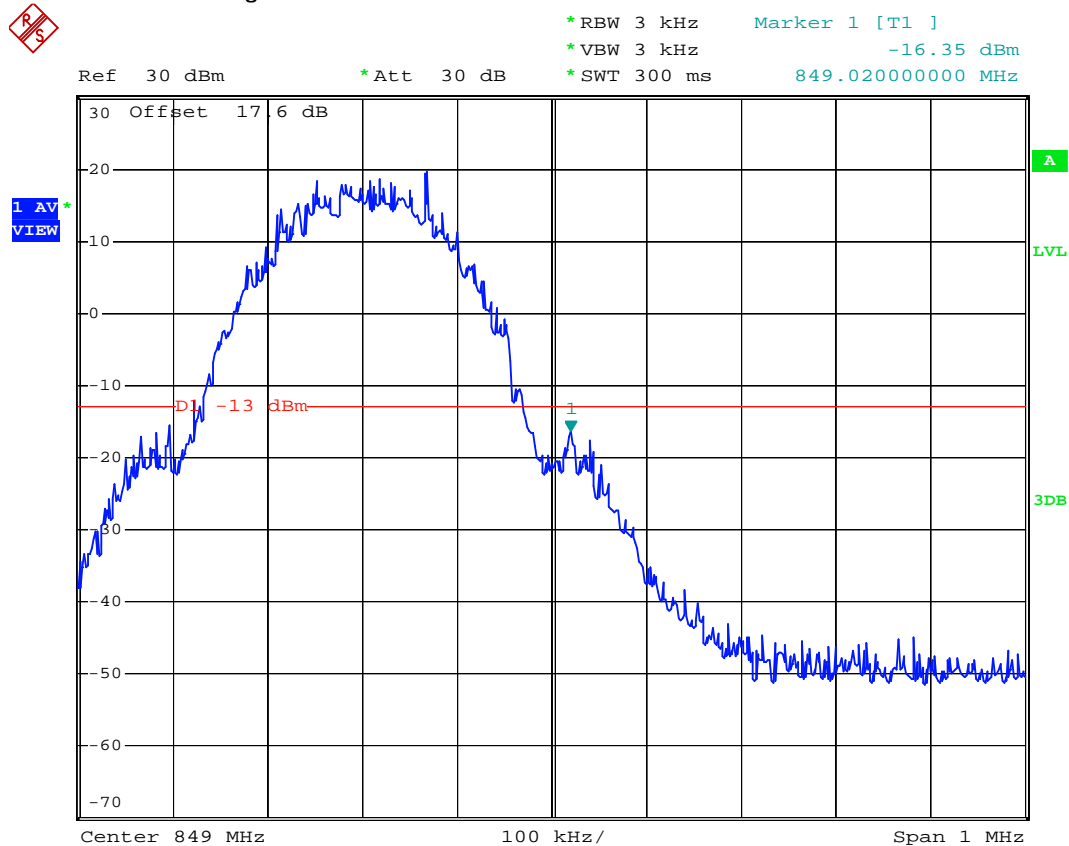
- Test Mode : GSM850 (GSM) CH 251 26dB Bandwidth
- Power State : High



Date: 15.OCT.2007 20:59:29



- Test Mode : GSM850 (GSM) CH251 Higher Band Edge
- Power State : High

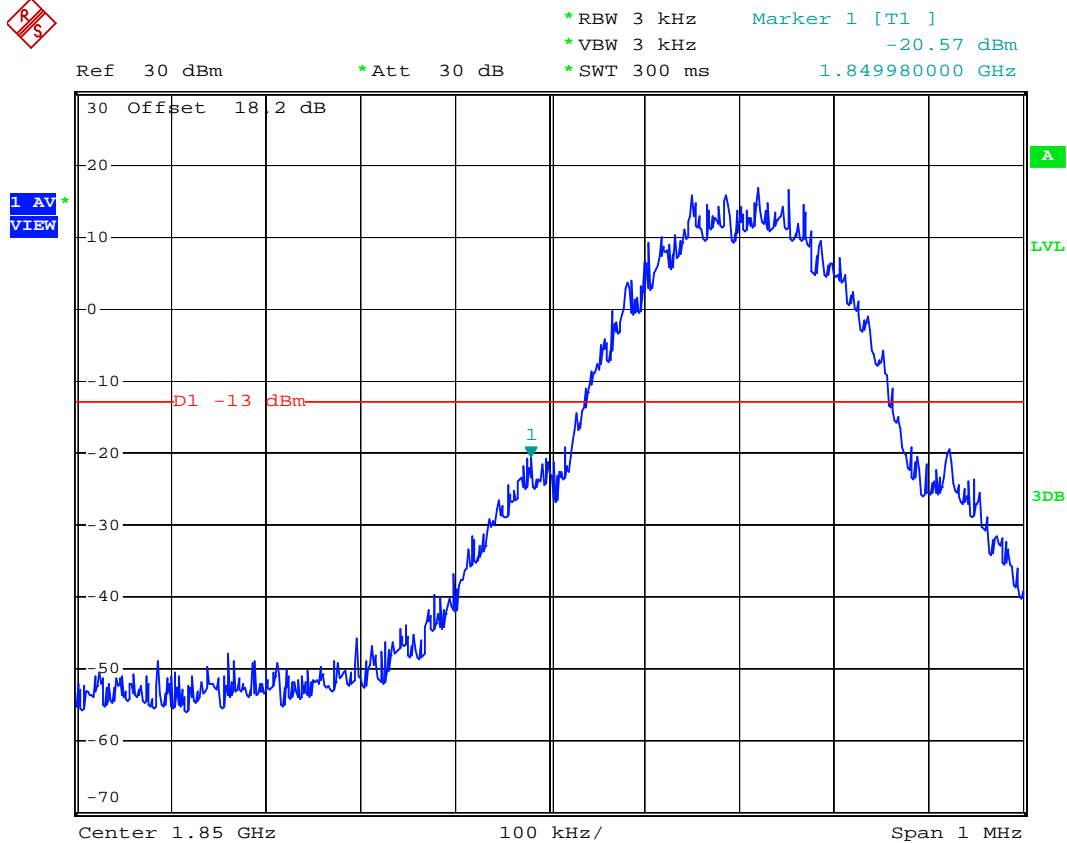


Date: 15.OCT.2007 21:09:41





- Mode 2
- Test Mode : PCS1900 (GSM) CH512 Lower Band Edge
- Power State : High



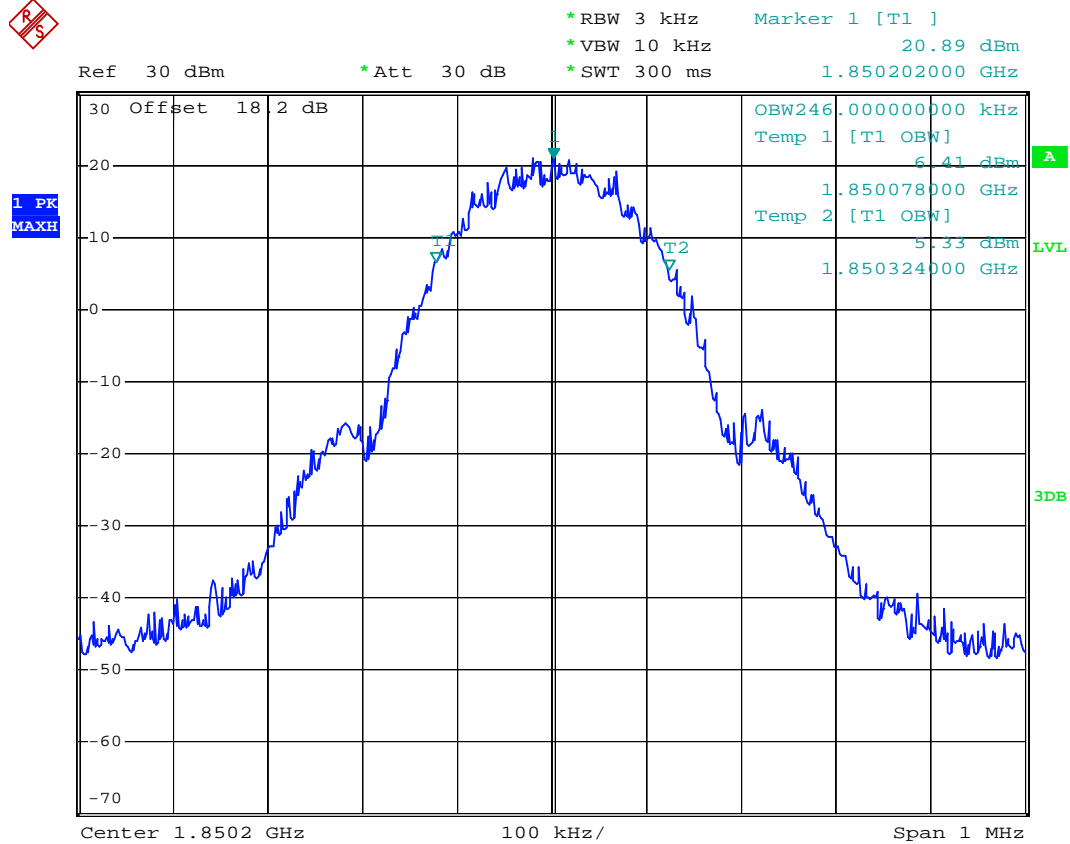
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# FCC TEST REPORT

Report No. : FG751505-02

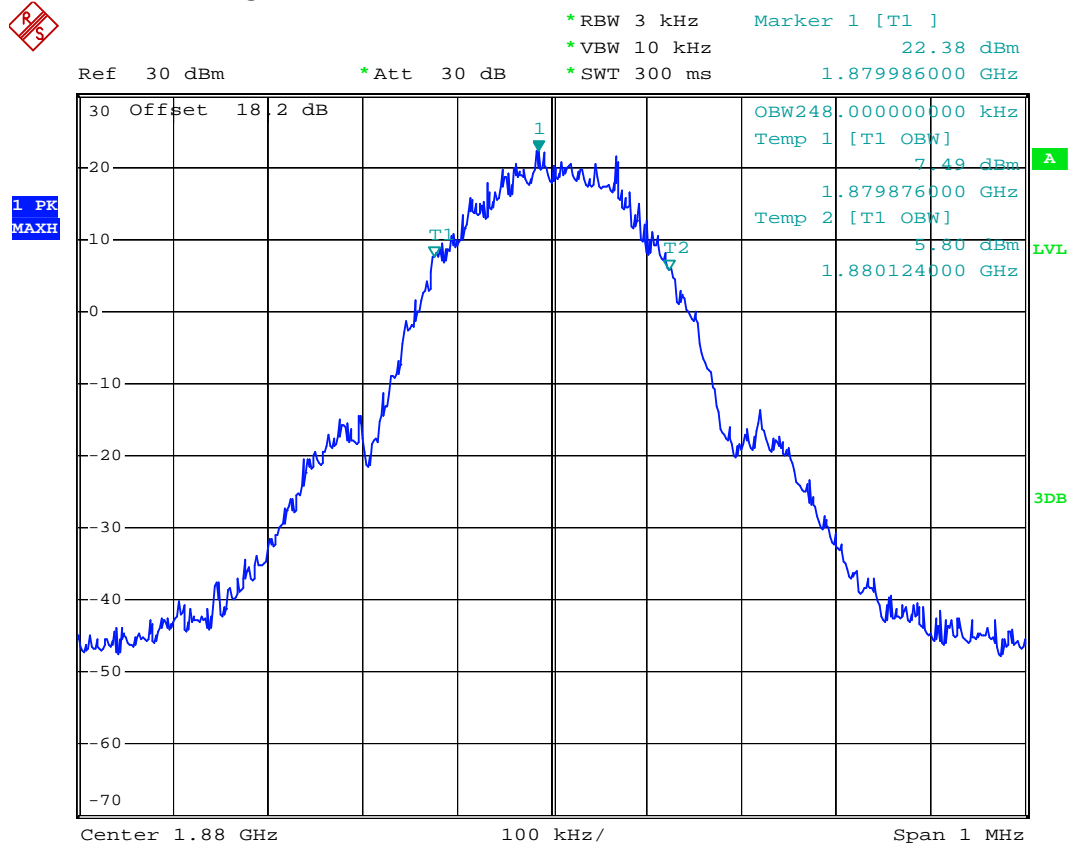
- Test Mode : PCS1900 (GSM) CH512 99% Occupied Bandwidth
- Power State : High



Date: 17.OCT.2007 00:22:54



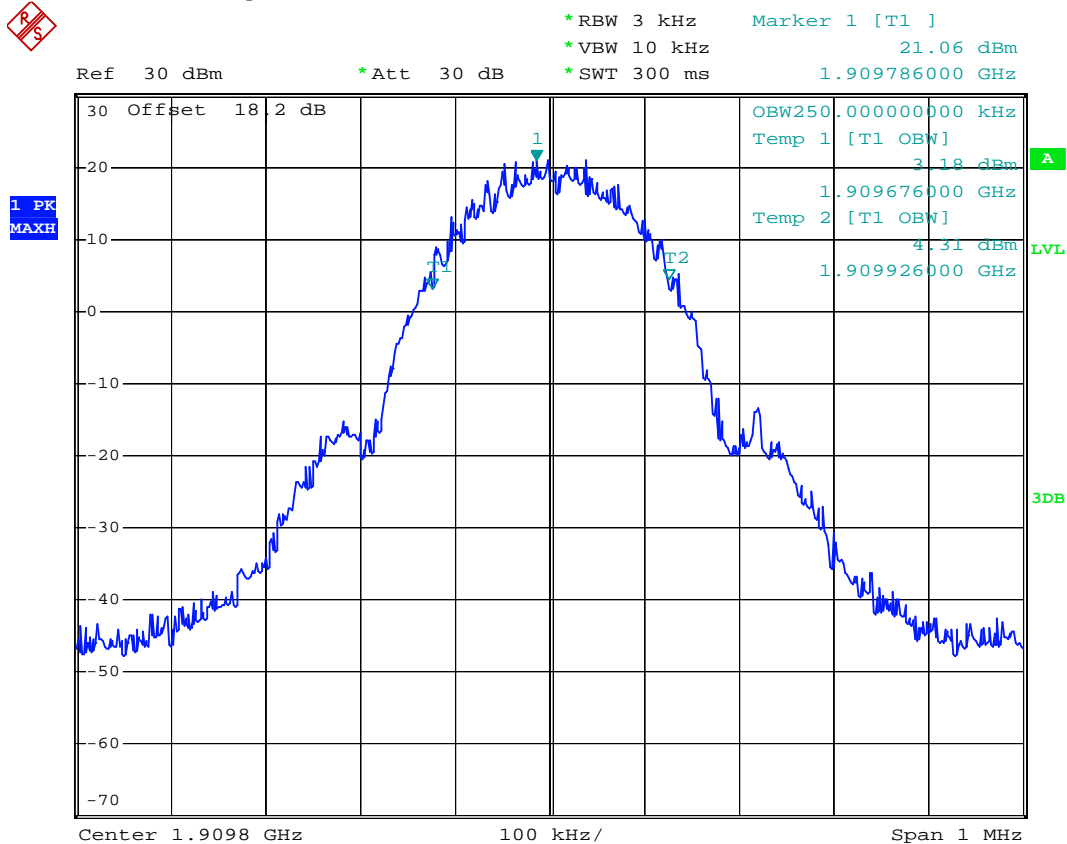
- Test Mode : PCS1900 (GSM) CH661 99% Occupied Bandwidth
- Power State : High



Date: 17.OCT.2007 00:24:20



- Test Mode : PCS1900 (GSM) CH810 99% Occupied Bandwidth
- Power State : High



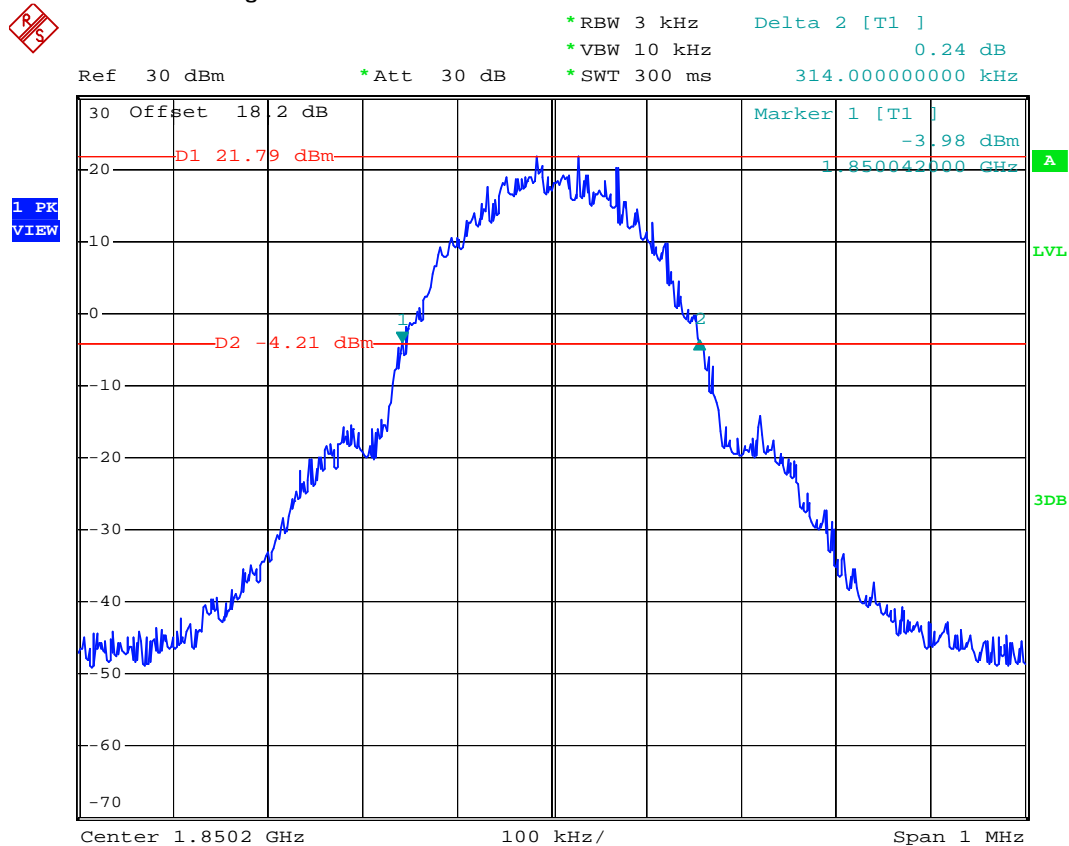
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# FCC TEST REPORT

Report No. : FG751505-02

- Test Mode : PCS1900 (GSM) CH512 26dB Bandwidth
- Power State : High



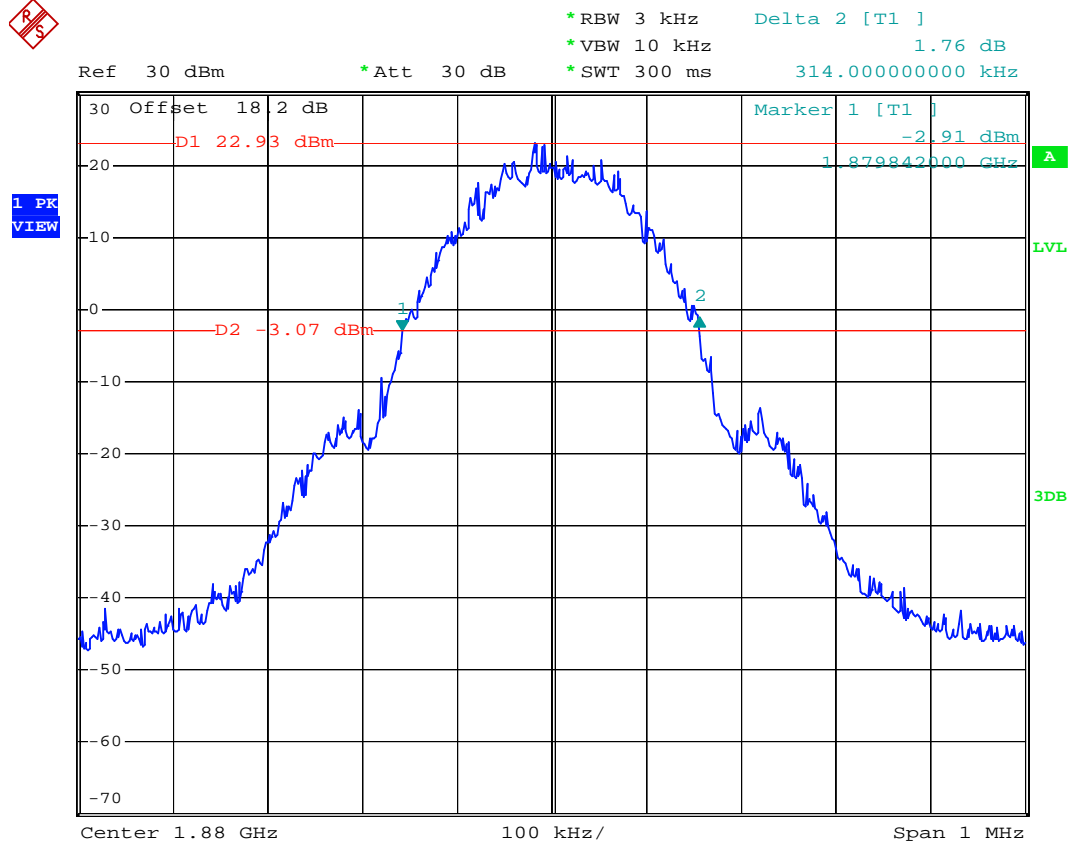
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# FCC TEST REPORT

Report No. : FG751505-02

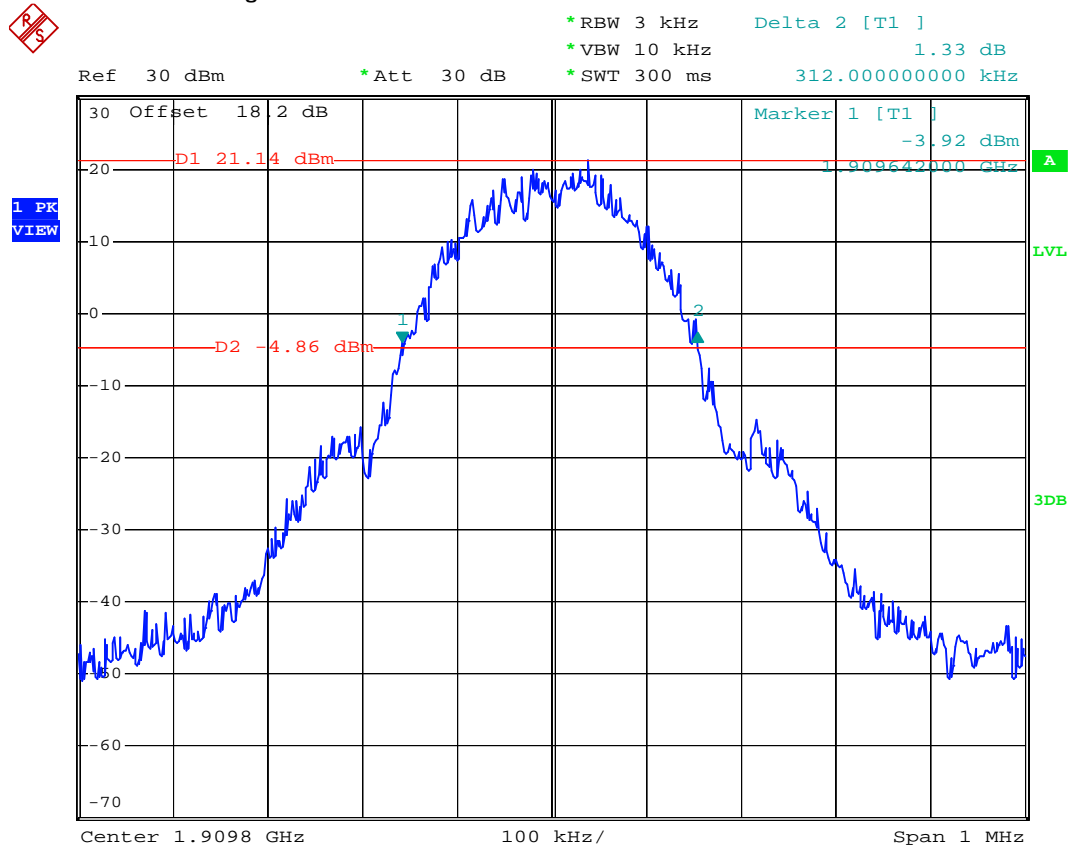
- Test Mode : PCS1900 (GSM) CH661 26dB Bandwidth
- Power State : High



Date: 17.OCT.2007 00:20:59



- Test Mode : PCS1900 (GSM) CH810 26dB Bandwidth
- Power State : High



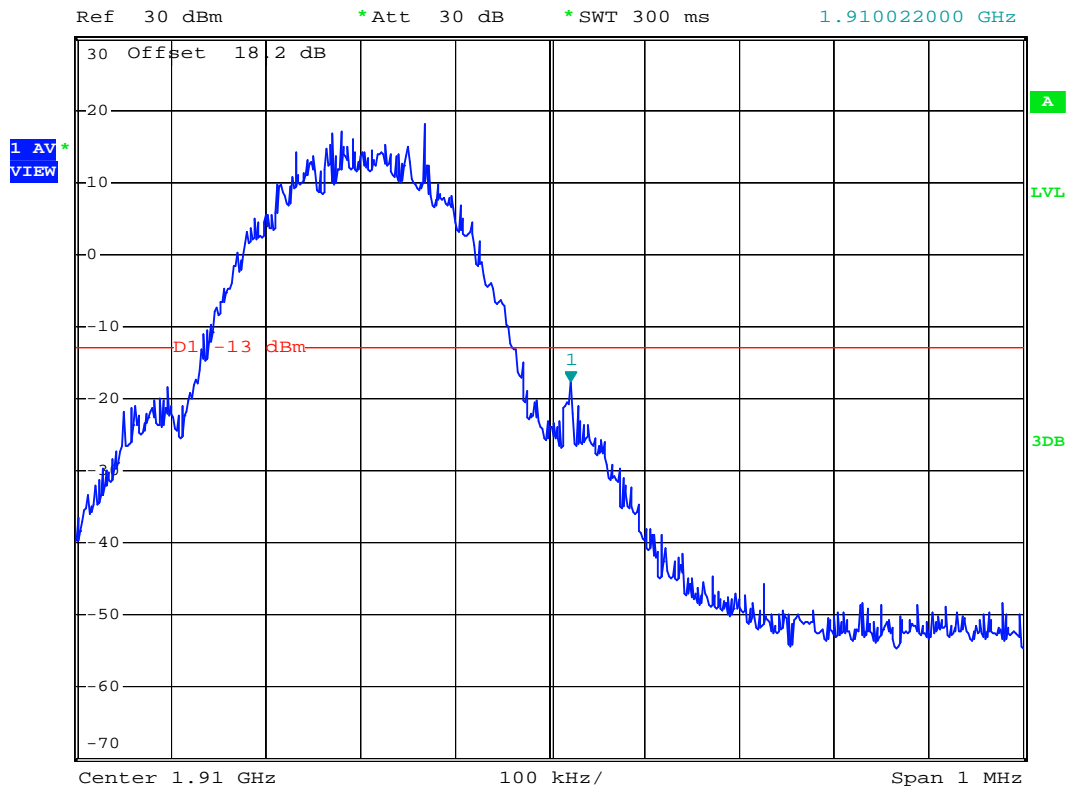
Date: 17.OCT.2007 00:18:27



- Test Mode : PCS1900 (GSM) CH810 Higher Band Edge
- Power State : High



\*RBW 3 kHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -17.67 dBm  
\*SWT 300 ms      1.910022000 GHz



Date: 17.OCT.2007 00:31:32



## 4.5 Conducted Emission

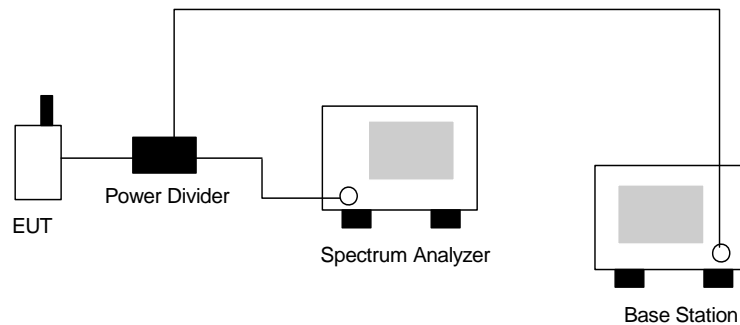
### 4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

### 4.5.2 Test Procedure

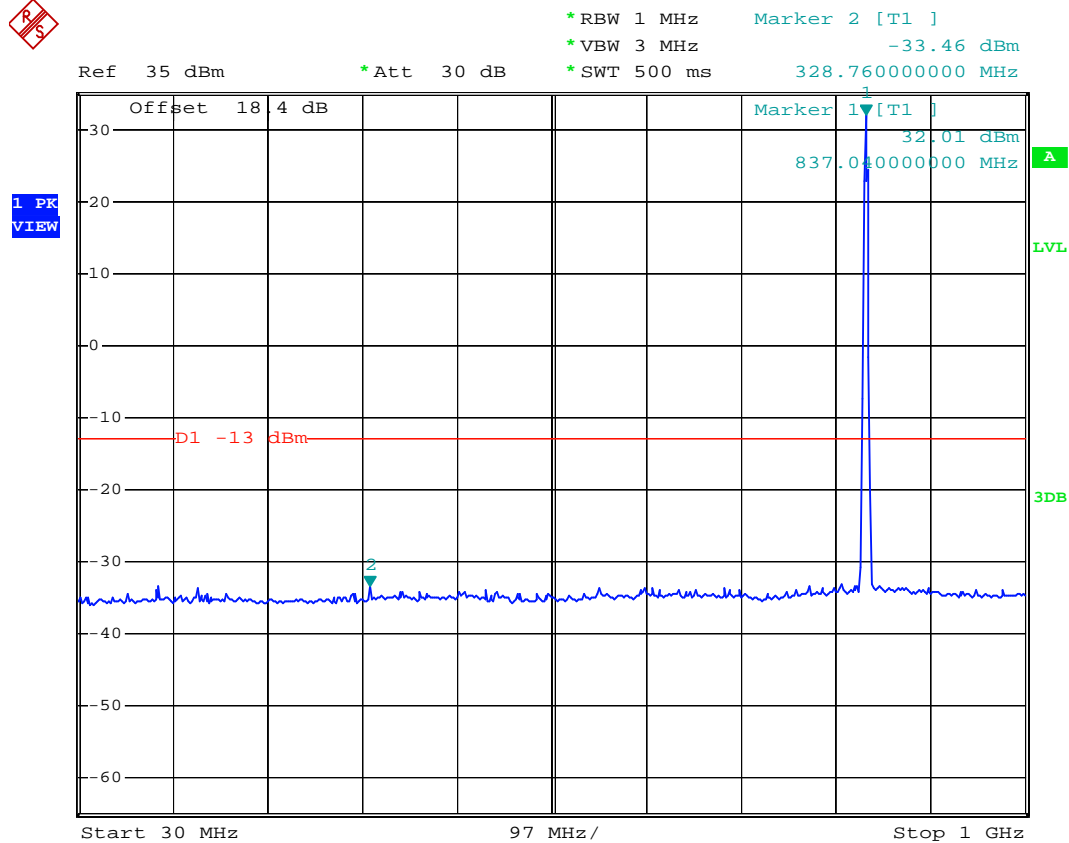
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

### 4.5.3 Test Setup Layout



**4.5.4 Test Result**

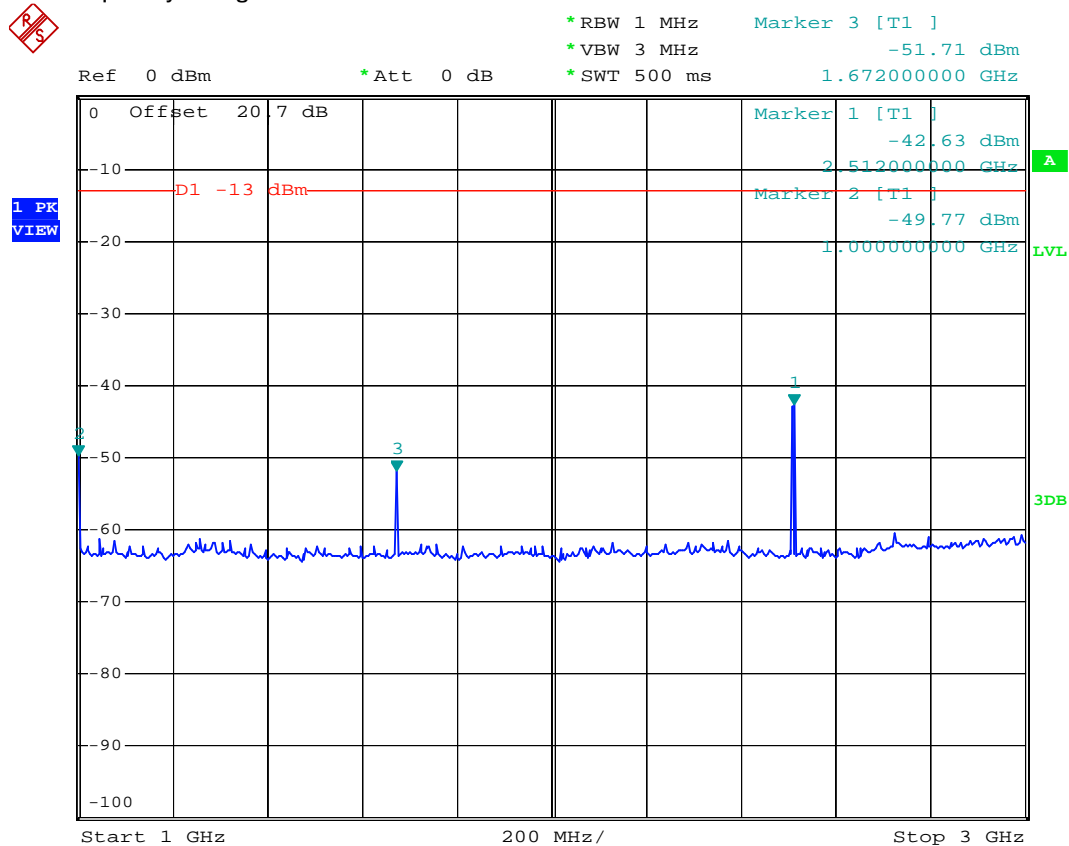
- Mode 1
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 30M-1G



Date: 17.OCT.2007 00:44:44



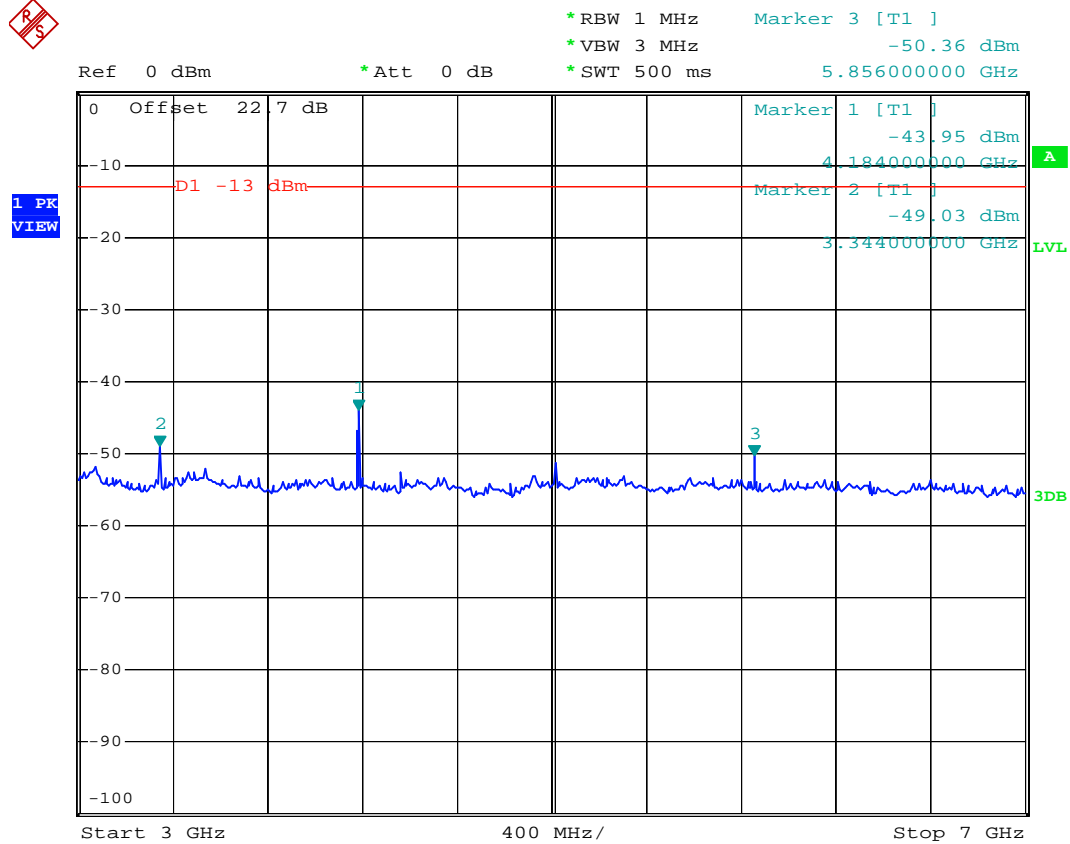
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 1G-3G



Date: 17.OCT.2007 01:23:39



- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 3G-7G



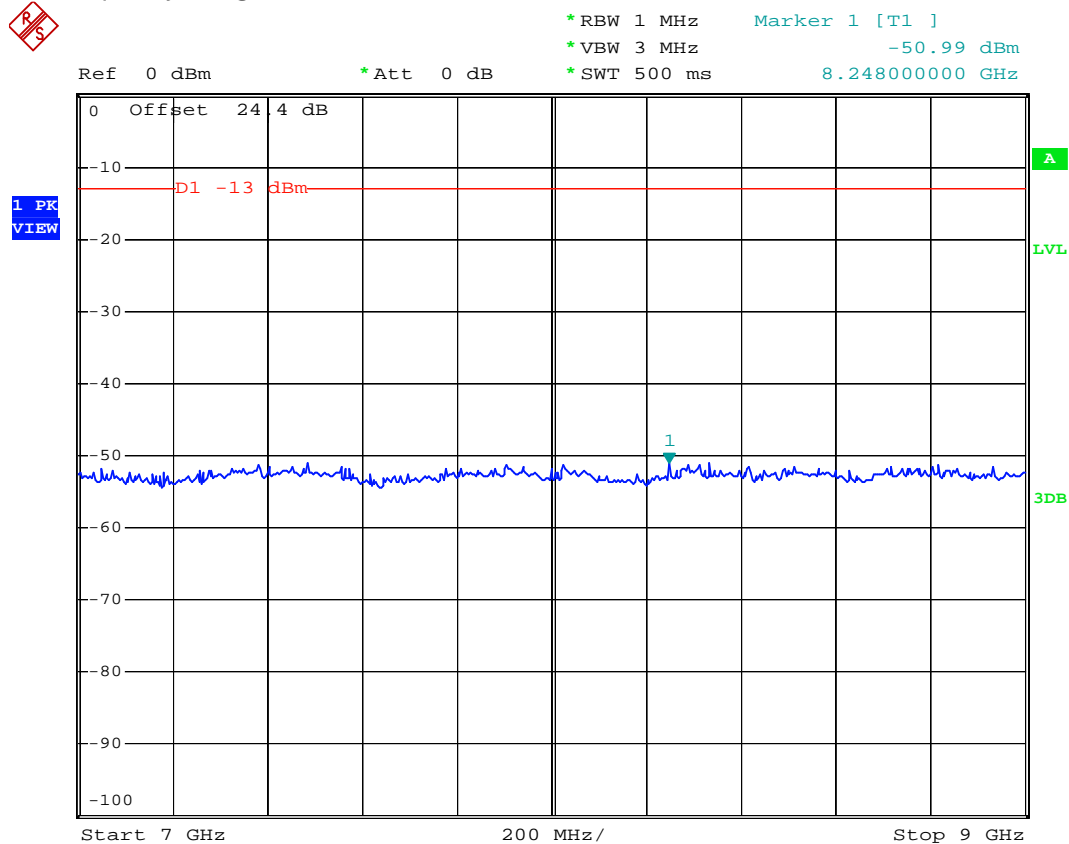
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## FCC TEST REPORT

Report No. : FG751505-02

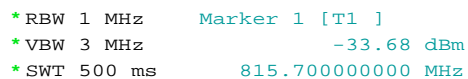
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 7G-9G



Date: 17.OCT.2007 00:56:34



- Mode 2
- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 30M-1G



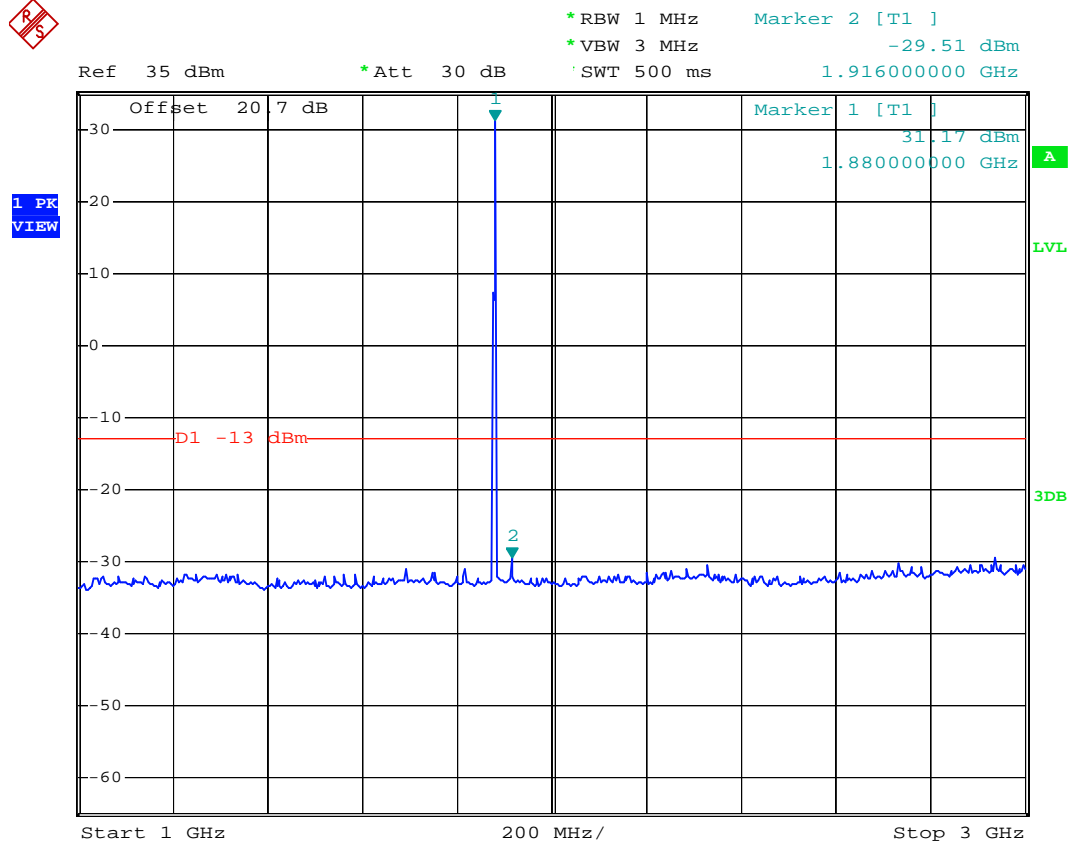
**A**

LVL

3DB



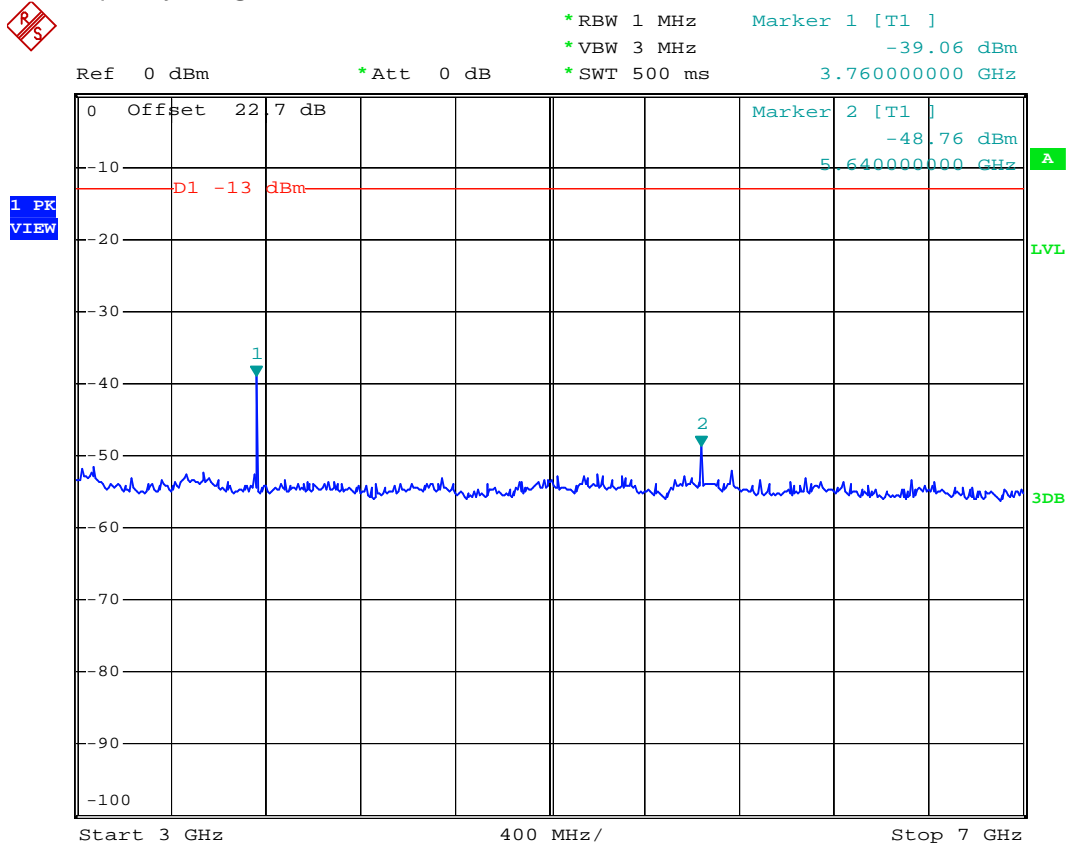
- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 1G-3G



Date: 17.OCT.2007 01:03:47



- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 3G-7G

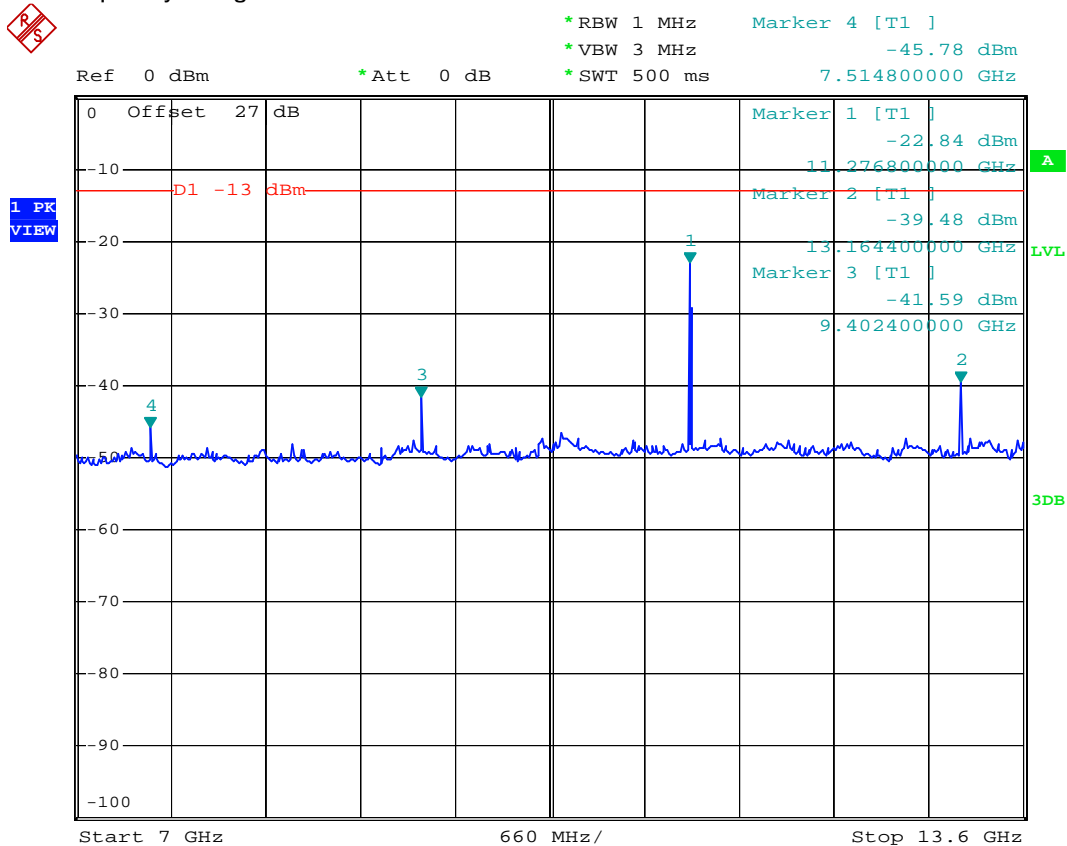


Date: 17.OCT.2007 00:55:13





- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 7G-13.6G



Date: 17.OCT.2007 01:00:19



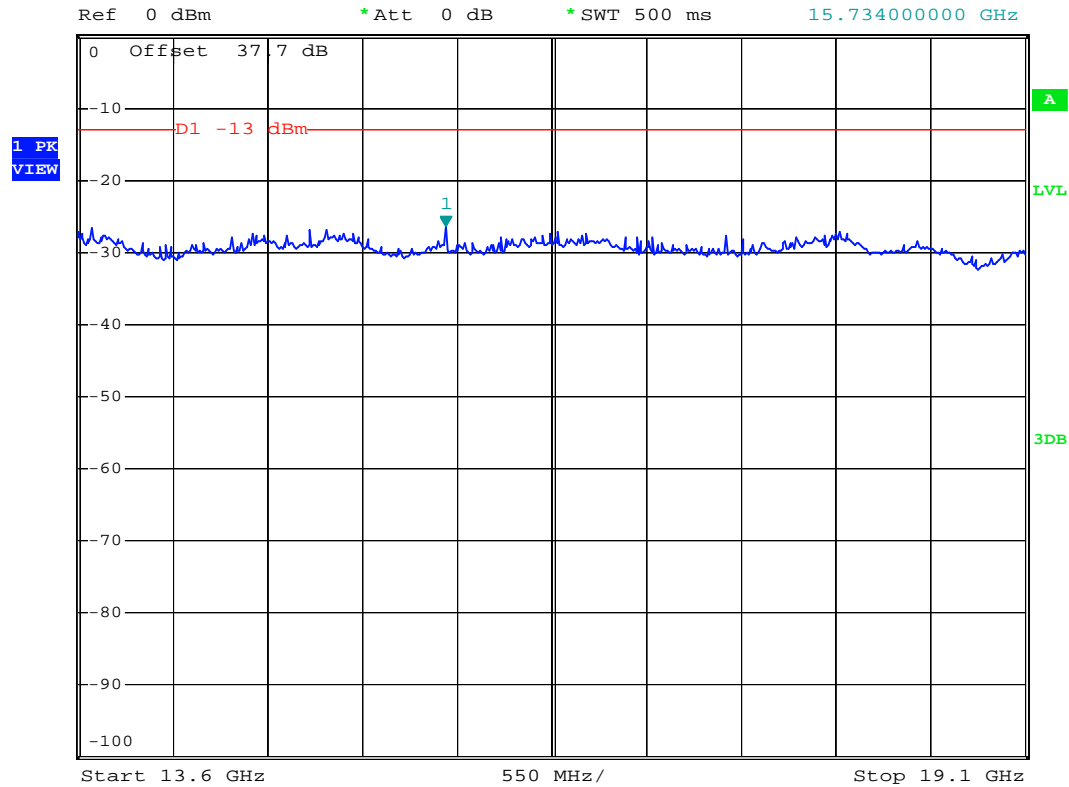
## FCC TEST REPORT

Report No. : FG751505-02

- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 13.6G-19.1G



\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -26.31 dBm  
\*SWT 500 ms      15.734000000 GHz



Date: 17.OCT.2007 01:01:04

## 4.6 Field Strength of Spurious Radiation

Equivalent isotropic radiated Power Measurements by substitution method according to ANSI/TIA/EIA-603-C.

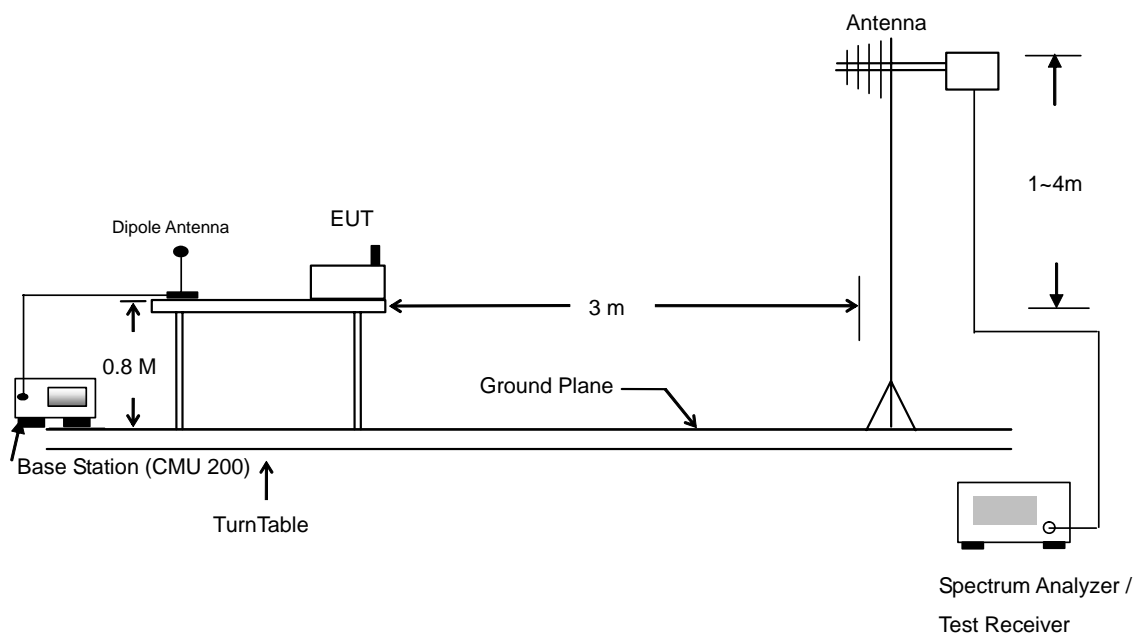
### 4.6.1 Measurement Instruments

As described in chapter 5 of this test report.

### 4.6.2 Test Procedure

1. The EUT was placed on a rotatable wooden table with 0.8 meter about 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 reach the maximum spurious emission for both horizontal and vertical polarizations.
5. 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. Emission level (dBm) = output power + substitution Gain.

### 4.6.3 Test Setup Layout



**4.6.4 Test Result**

▪ Test Mode : Mode 1

<b>GSM850 Radiated Spurious ERP</b>							
<b>H Polarization</b>				<b>V Polarization</b>			
Frequency	ERP (dBm)	Limit	Margin	Frequency	ERP (dBm)	Limit	Margin
(MHz)		(dBm)	(dB)	(MHz)		(dBm)	(dB)
31.890	-64.320	-13	-51.32	57.540	-58.240	-13	-45.24
41.880	-51.960	-13	-38.96	81.030	-56.080	-13	-43.08
97.230	-68.030	-13	-55.03	207.930	-65.260	-13	-52.26
997.900	-66.780	-13	-53.78	981.800	-65.240	-13	-52.24
1674.000	-48.250	-13	-35.25	1674.000	-52.270	-13	-39.27
2508.000	-42.860	-13	-29.86	2508.000	-47.370	-13	-34.37
1674.000	-48.250	-13	-35.25	1674.000	-52.270	-13	-39.27
2508.000	-42.860	-13	-29.86	2508.000	-47.370	-13	-34.37



▪ Test Mode : Mode 2

PCS1900 Radiated Spurious EIRP							
H Polarization				V Polarization			
Frequency	EIRP (dBm)	Limit	Margin	Frequency	EIRP (dBm)	Limit	Margin
(MHz)		(dBm)	(dB)	(MHz)		(dBm)	(dB)
33.780	-61.010	-13	-48.01	51.330	-59.400	-13	-46.40
99.390	-65.670	-13	-52.67	177.690	-65.150	-13	-52.15
108.840	-65.990	-13	-52.99	207.930	-65.030	-13	-52.03
418.300	-59.040	-13	-46.04	826.400	-63.750	-13	-50.75
899.900	-65.630	-13	-52.63	871.900	-63.230	-13	-50.23
990.900	-64.900	-13	-51.90	978.300	-62.630	-13	-49.63
1688.000	-47.740	-13	-34.74	1688.000	-51.110	-13	-38.11
2068.000	-50.520	-13	-37.52	2068.000	-48.970	-13	-35.97
3758.000	-39.200	-13	-26.20	3044.000	-50.160	-13	-37.16
5638.000	-29.600	-13	-16.60	3758.000	-34.150	-13	-21.15
7518.000	-40.330	-13	-27.33	5638.000	-30.150	-13	-17.15
9398.000	-26.580	-13	-13.58	7518.000	-38.450	-13	-25.45
11278.000	-20.770	-13	-7.77	9398.000	-34.010	-13	-21.01
13158.000	-26.760	-13	-13.76	11278.000	-23.040	-13	-10.04
15042.000	-32.990	-13	-19.99	13158.000	-28.150	-13	-15.15
16917.000	-25.560	-13	-12.56	15042.000	-31.130	-13	-18.13
				16917.000	-25.930	-13	-12.93



▪ Test Mode : Mode 3

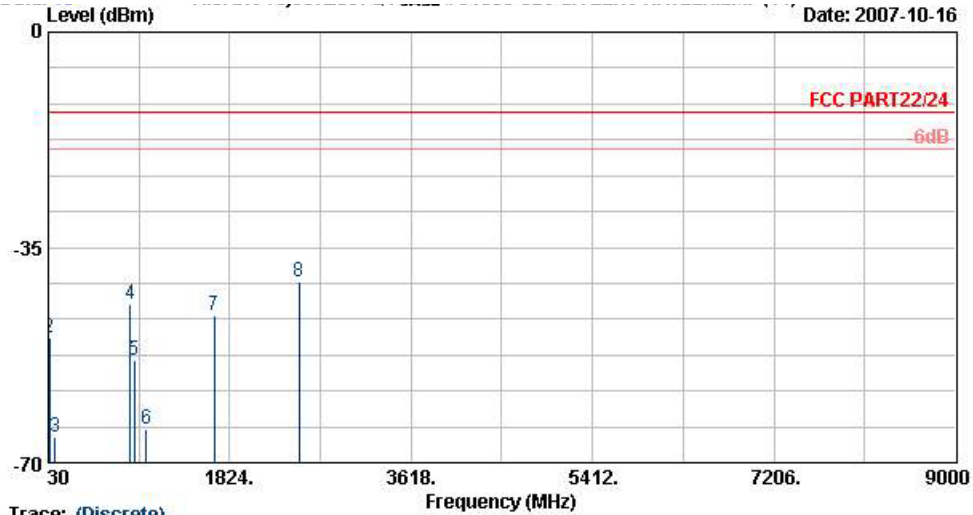
GSM850 with Bluetooth Co-location Radiated Spurious ERP							
H Polarization				V Polarization			
Frequency	ERP (dBm)	Limit	Margin	Frequency	ERP (dBm)	Limit	Margin
(MHz)		(dBm)	(dB)	(MHz)		(dBm)	(dB)
36.480	-52.780	-13	-39.78	66.990	-55.900	-13	-42.90
66.180	-54.960	-13	-41.96	153.390	-60.070	-13	-47.07
82.380	-61.680	-13	-48.68	180.390	-59.000	-13	-46.00
990.900	-66.750	-13	-53.75	679.400	-61.770	-13	-48.77
1674.000	-50.820	-13	-37.82	1674.000	-47.320	-13	-34.32
2508.000	-35.680	-13	-22.68	2508.000	-36.540	-13	-23.54
4958.000	-45.370	-13	-32.37	4958.000	-47.490	-13	-34.49



## 4.6.5 Test Data

## 4.6.5.1 Mode 1

## Horizontal Polarization



Trace: (Discrete)

Site : 03CH06-HV  
 Condition : FCC PART22/24 HF-SPURIOUS-060929 HORIZONTAL  
 EUT : GSM/GPRS(CLASS 12) 850/1900 With BT  
 : Mobile Phone  
 Power : 120Vac/60Hz  
 Model : FG 751505-02  
 Name : GSM 850 LINC+Adaptor  
 Plane : E1

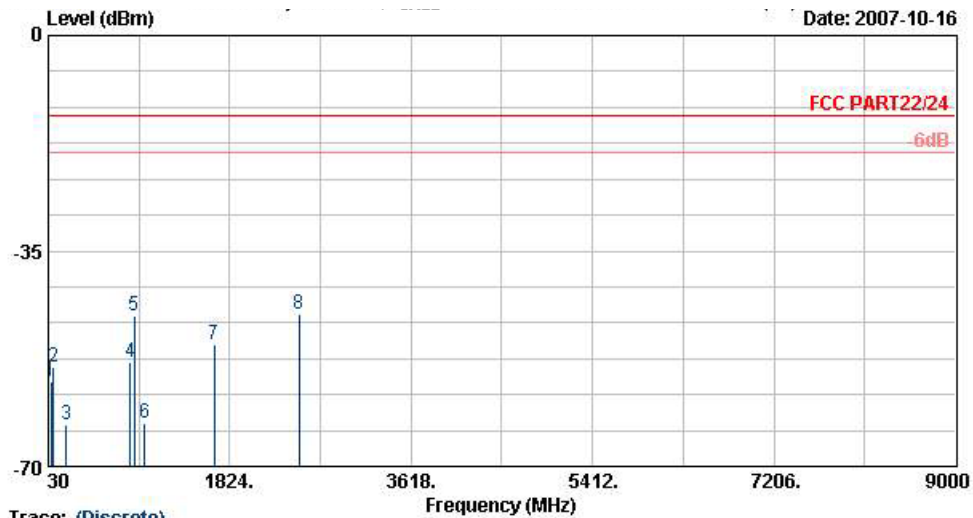
	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	31.89	-62.17	-49.17	-13.00	-61.31	-0.86	Peak
2	41.88	-49.81	-36.81	-13.00	-42.86	-6.95	Peak
3	97.23	-65.88	-52.88	-13.00	-53.63	-12.25	Peak
4 @	836.90	-44.14			-42.80	-1.33	Peak
5	880.30	-53.36			-52.45	-0.91	Peak
6	997.90	-64.63	-51.63	-13.00	-64.85	0.22	Peak
7	1674.00	-46.10	-33.10	-13.00	-48.46	2.36	Peak
8 @	2508.00	-40.71	-27.71	-13.00	-47.40	6.69	Peak

## Remark:

- #4: MS Signal
- #5: BS Signal



## Vertical Polarization



## Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC PART 22/24 HF-SPURIOUS-060920 VERTICAL  
 EUT : GSM/GPRS(CLASS 12) 850/1900 With BT  
 : Mobile Phone  
 Power : 120Vac/60Hz  
 Model : FG 751505-02  
 Name : GSM 850 LTX+Adaptor  
 Plane : E1

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	57.54	-56.09	-43.09	-13.00	-42.24	-13.84	Peak
2	81.03	-53.93	-40.93	-13.00	-43.59	-10.35	Peak
3	207.93	-63.11	-50.11	-13.00	-54.68	-8.42	Peak
4	836.90	-53.17			-54.53	1.36	Peak
5	880.30	-45.63			-47.34	1.71	Peak
6	981.80	-63.09	-50.09	-13.00	-65.60	2.51	Peak
7	1674.00	-50.12	-37.12	-13.00	-52.28	2.16	Peak
8 @	2508.00	-45.22	-32.22	-13.00	-52.40	7.18	Peak

## Remark:

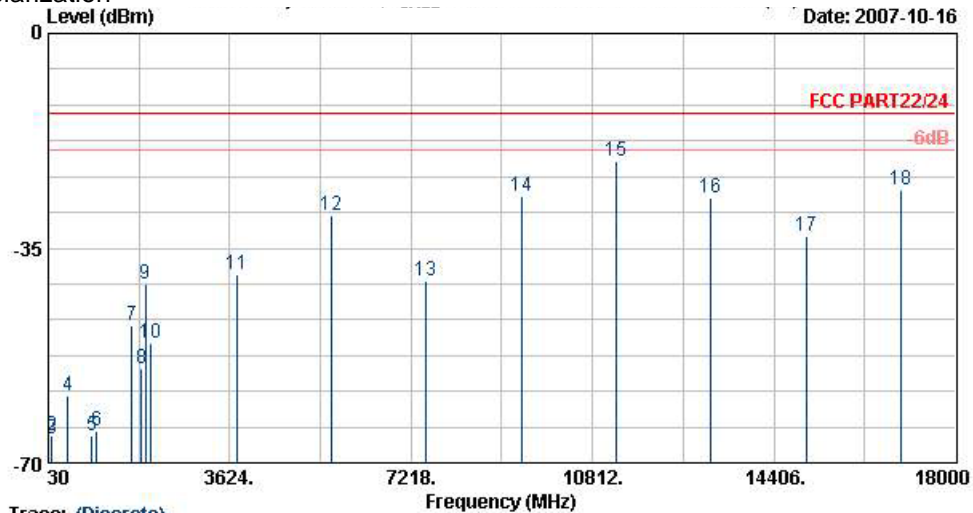
- #4: MS Signal
- #5: BS Signal
- There is no more obvious emission except the listings above.





## 4.6.5.2 Mode 2

Horizontal Polarization



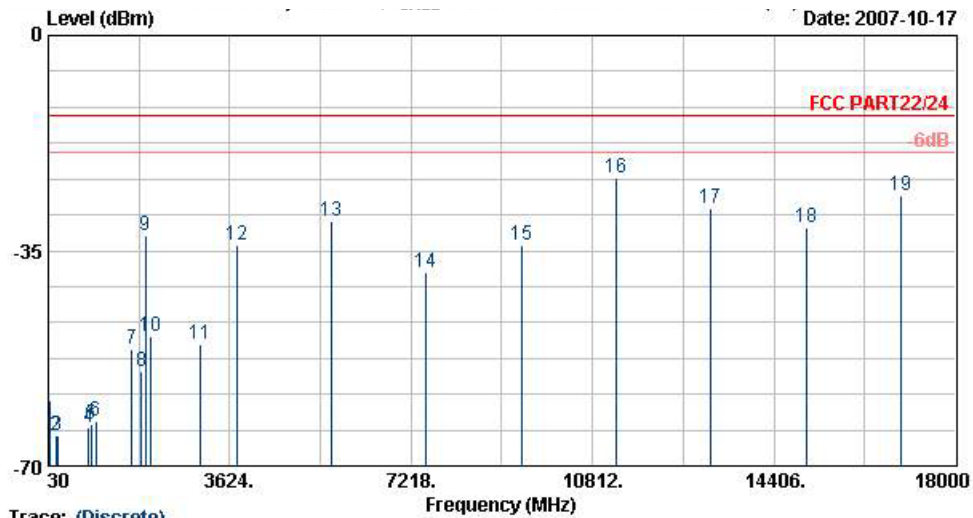
Trace: (Discrete)

Site : 03CH06-HV  
 Condition : FCC PART 22/24 HF-SPURIOUS-060929 HORIZONTAL  
 EUT : GSM/GPRS(CLASS 12) 850/1900 With BT  
 : Mobile Phone  
 Power : 120Vac/60Hz  
 Model : FC 751505-02  
 Meme : PCS 1900 LTNK+Adaptor  
 Plane : EI

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
	MHz	dBm	dB	dBm	dBm	dB	
1	33.78	-61.01	-48.01	-13.00	-58.93	-2.08	Peak
2	99.39	-65.67	-52.67	-13.00	-53.43	-12.24	Peak
3	108.84	-65.99	-52.99	-13.00	-53.65	-12.34	Peak
4	418.30	-59.04	-46.04	-13.00	-52.79	-6.25	Peak
5	899.90	-65.63	-52.63	-13.00	-64.90	-0.73	Peak
6	990.90	-64.90	-51.90	-13.00	-65.06	0.16	Peak
7	1688.00	-47.74	-34.74	-13.00	-50.10	2.36	Peak
8	1878.00	-54.63	-41.63	-13.00	-58.53	3.90	Peak
9	1958.00	-40.74	-27.74	-13.00	-45.15	4.41	Peak
10	2068.00	-50.52	-37.52	-13.00	-55.57	5.05	Peak
11	3758.00	-39.20	-26.20	-13.00	-49.61	10.41	Peak
12	5638.00	-29.60	-16.60	-13.00	-48.04	18.45	Peak
13	7518.00	-40.33	-27.33	-13.00	-61.58	21.25	Peak
14	9398.00	-26.58	-13.58	-13.00	-47.99	21.40	Peak
15 @	11278.00	-20.77	-7.77	-13.00	-45.50	24.72	Peak
16	13158.00	-26.76	-13.76	-13.00	-54.52	27.76	Peak
17	15042.00	-32.99	-19.99	-13.00	-61.16	28.17	Peak
18	16917.00	-25.56	-12.56	-13.00	-60.09	34.53	Peak



## Vertical Polarization



Site : 03CH06-HY  
Condition : FCC PART 22/24 HF-SPURIOUS-060920 VERTICAL  
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT  
: Mobile Phone  
Power : 120Vac/60Hz  
Model : FG 751505-02  
Plane : PCS 1900 LTNK+Adaptor  
: EI

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	51.33	-59.40	-46.40	-13.00	-44.72	-14.68	Peak
2	177.69	-65.15	-52.15	-13.00	-56.76	-8.39	Peak
3	207.93	-65.03	-52.03	-13.00	-56.61	-8.42	Peak
4	826.40	-63.75	-50.75	-13.00	-65.03	1.28	Peak
5	871.90	-63.23	-50.23	-13.00	-64.87	1.64	Peak
6	978.30	-62.63	-49.63	-13.00	-65.12	2.49	Peak
7	1688.00	-51.11	-38.11	-13.00	-53.26	2.16	Peak
8	1878.00	-54.55	-41.55	-13.00	-58.85	4.29	Peak
9	1958.00	-32.57	-19.57	-13.00	-37.58	5.01	Peak
10	2068.00	-48.97	-35.97	-13.00	-54.73	5.76	Peak
11	3044.00	-50.16	-37.16	-13.00	-57.78	7.62	Peak
12	3758.00	-34.15	-21.15	-13.00	-44.04	9.89	Peak
13	5638.00	-30.15	-17.15	-13.00	-47.12	16.97	Peak
14	7518.00	-38.45	-25.45	-13.00	-57.89	19.44	Peak
15	9398.00	-34.01	-21.01	-13.00	-53.90	19.89	Peak
16	11278.00	-23.04	-10.04	-13.00	-46.48	23.44	Peak
17	13158.00	-28.15	-15.15	-13.00	-54.61	26.46	Peak
18	15042.00	-31.13	-18.13	-13.00	-58.32	27.19	Peak
19	16917.00	-25.93	-12.93	-13.00	-59.20	33.27	Peak

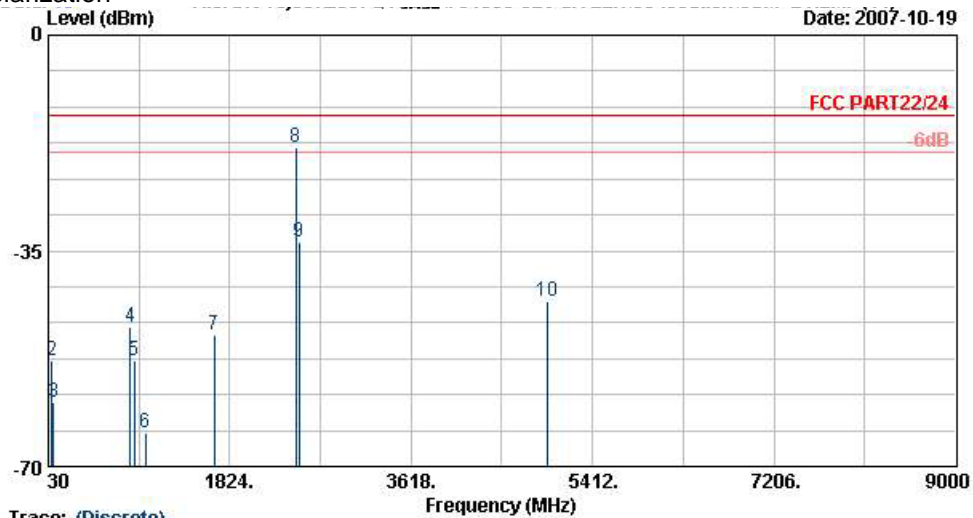
## Remark:

1. There is no more obvious emission except the listings above.



## 4.6.5.3 Mode 3

## Horizontal Polarization



Trace: (Discrete)  
 Site : 03CH06-HY  
 Condition : FCC PART22/24 HF-SPURIOUS-060920 HORIZONTAL  
 EUT : GSM/GPRS(CLASS 12) 850/1900 With BT  
 : Mobile Phone  
 Power : 120Vac/60Hz  
 Model : FG 751505-02  
 Name : GSM 850 Link;Ch189 + BT Tx\_Ch76  
 : + Adaptor  
 Plane : EI

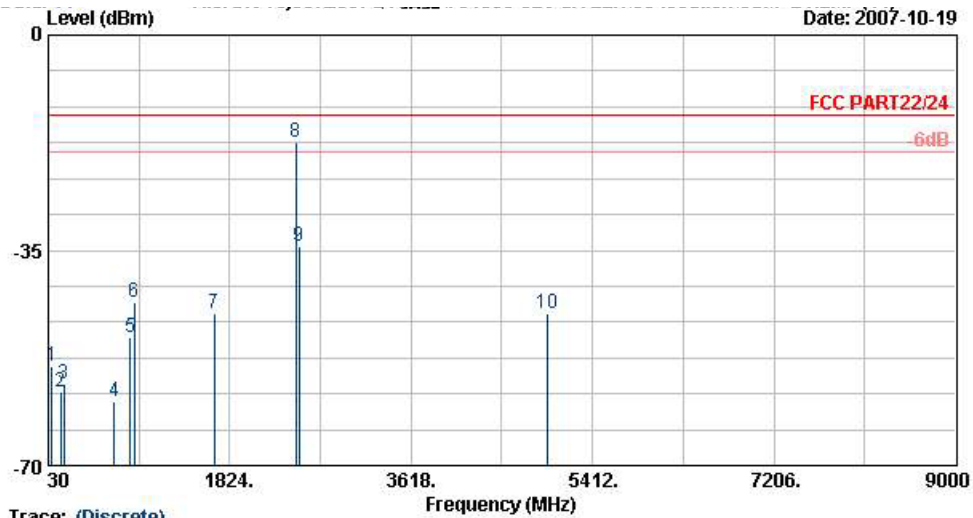
	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
		dBm	dB	dBm	dBm	dB	
1	36.48	-50.63	-37.63	-13.00	-46.73	-3.90	Peak
2	66.18	-52.81	-39.81	-13.00	-40.44	-12.37	Peak
3	82.38	-59.53	-46.53	-13.00	-47.22	-12.31	Peak
4	836.90	-47.23			-45.90	-1.33	Peak
5	882.40	-52.94			-52.05	-0.89	Peak
6	990.90	-64.60	-51.60	-13.00	-64.75	0.16	Peak
7	1674.00	-48.67	-35.67	-13.00	-51.03	2.36	Peak
8 @	2478.00	-18.14			-24.71	6.57	Peak
9	2508.00	-33.53	-20.53	-13.00	-40.22	6.69	Peak
10	4958.00	-43.22	-30.22	-13.00	-59.09	15.87	Peak

## Remark:

1. #4: MS Signal
2. #5: BS Signal
3. #8: BT Signal



## Vertical Polarization



## Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC PART22/24 HF-SPURIOUS-060929 VERTICAL  
 EUT : GSM/GPRS(CLASS 12) 850/1900 With BT  
 : Mobile Phone  
 Power : 120Vac/60Hz  
 Model : FG 751505-02  
 Mome : GSM 850 Link;Ch189 + BT Tx\_Ch78  
 : + Adaptor  
 Plane : EI

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	66.99	-53.75	-40.75	-13.00	-41.31	-12.44	Peak
2	153.39	-57.92	-44.92	-13.00	-49.75	-8.17	Peak
3	180.39	-56.85	-43.85	-13.00	-48.44	-8.42	Peak
4	679.40	-59.62	-46.62	-13.00	-58.87	-0.75	Peak
5	836.90	-49.26			-50.63	1.36	Peak
6	882.40	-43.52			-45.25	1.73	Peak
7	1674.00	-45.17	-32.17	-13.00	-47.32	2.16	Peak
8 @	2478.00	-17.45			-24.57	7.11	Peak
9	2508.00	-34.39	-21.39	-13.00	-41.57	7.18	Peak
10	4958.00	-45.34	-32.34	-13.00	-59.88	14.54	Peak

## Remark:

1. #5: MS Signal
2. #6: BS Signal
3. #8: BT Signal
4. There is no more obvious emission except the listings above.

## **4.7 Frequency Stability (Temperature Variation)**

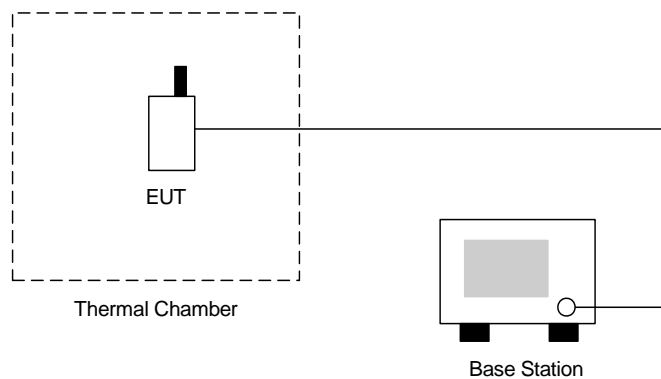
### **4.7.1 Measurement Instrument**

As described in chapter 5 of this test report.

### **4.7.2 Test Procedure**

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to  $-30^{\circ}\text{C}$  and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The temperature tests were performed for the worst case.
5. Test data was recorded.

### **4.7.3 Test Setup Layout**



**4.7.4 Test Result**

- Test Mode : GSM850 CH189

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	44	0.02	2.5	Passed
-20	-25	-0.03		
-10	-21	-0.02		
0	-18	-0.02		
10	-15	-0.02		
20	-14	-0.02		
30	-16	-0.02		
40	-15	-0.02		
50	-11	-0.01		

- Test Mode : PCS1900 CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	-31	-0.02	2.5	Passed
-20	-57	-0.03		
-10	-36	-0.02		
0	-34	-0.02		
10	-33	-0.02		
20	-31	-0.02		
30	-28	-0.01		
40	-29	-0.02		
50	-34	-0.02		

## 4.8 Frequency Stability (Voltage Variation)

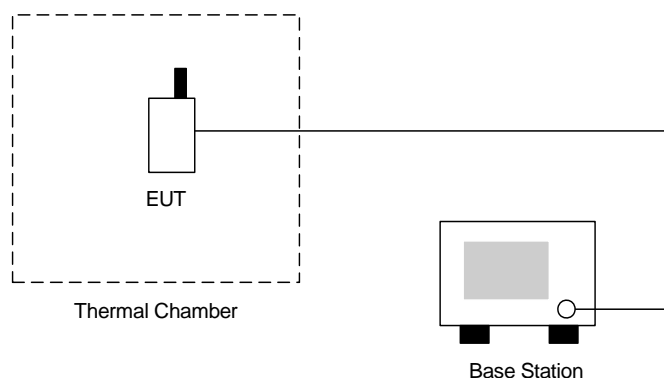
### 4.8.1 Measurement Instrument

As described in chapter 5 of this test report.

### 4.8.2 Test Procedure

1. The EUT was placed in a temperature chamber at  $25 \pm 5$  °C and connected as the following section.
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.

### 4.8.3 Test Setup Layout



### 4.8.4 Test Result

- Test Mode : GSM850 CH189

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-24.0	-0.03	2.5	Passed
BEP	27.0	0.03		
4.2	-17.0	-0.02		

- Test Mode : PCS1900 CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-23.0	-0.01	2.5	Passed
BEP	-24.0	-0.01		
4.2	-23.0	-0.01		

Remark:

1. Normal Voltage=3.7V.
2. Battery End Point (BEP)= 3.4 V.



## 5. List of Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY44211028	9KHz-26.5GHz	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 26, 2007	Jul. 25, 2008	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Com-Power	AH118	071025	1G~18G	Jun. 04, 2007	Jun. 03, 2008	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Nov. 20, 2006	Nov. 19, 2008	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Pre Amplifier	Mini Circuits	ZKL-2	D092004-1	10~2500MHz	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	106656	WCDMA	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Thermal Chamber	Tenxi technology	TTH-D35P	TBN-930701	N/A	Aug. 02, 2007	Aug. 01, 2008	Conduction (TH02-HY)
Spectrum	R&S	FSP40	100055	9KHz~40GHz	Jun. 25, 2007	Jun. 24, 2008	Conduction (TH02-HY)
Bluetooth Test	ANRITSU	MT8852A	6K00003939	N/A	N/A	N/A	Conduction (TH02-HY)
Power Divider	ARRA	5200-1	3871	N/A	Oct. 01, 2007	Nov. 01, 2007	Conduction (TH02-HY)
DC Power Supply	TOPWARD	3303D	740889	N/A	May 25, 2007	May 24, 2009	Conduction (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 08, 2007	Feb. 07, 2008	Conduction (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 08, 2007	Feb. 07, 2008	Conduction (TH02-HY)



## 6. Uncertainty Evaluation

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

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 (1GHz ~ 40GHz)

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 = $20 \log(1 - \Gamma_1 * \Gamma_2 * \Gamma_3)$	+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>				

END OF TEST REPORT