



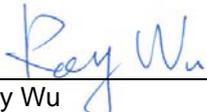
FCC Test Report

According to

47 CFR Part 22H, 24E

Equipment : GSM/GPRS Dual-band Digital Mobile Phone
Trade Name : ZTE
Model Name : F120
FCC ID : Q78-F120
Tx Frequency Range : GSM850 : 824.2 ~ 848.8 MHz
GSM1900 : 1850.2 ~ 1909.8 MHz
Max. ERP/EIRP Power : GSM850 : 0.53 W
GSM1900(GSM) : 0.93 W
Emission Designator : GSM : 300KGXW
Applicant : ZTE CORPORATION
ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,
Nanshan District, Shenzhen, Guangdong, P.R.China

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
- The data shown in this test report were carried out on Jul. 05, 2008 at **Sporton International Inc. LAB.**
- Report No.: FG871115, Report Version: Rev. 01.



Roy Wu
Manager

SPORTON International (Kunshan) Inc.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



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Appendix A. Photographs of EUT

Appendix B. Setup Photographs

1. General Information

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

1.3 Basic Description of Accessory

AC Adapter	Brand Name	ZTE
	Model Name	STC-A22O50U5-C
	Power Rating	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 700mA
	AC Power Cord Type	1.2 meter shielded cable without ferrite core
Battery	Brand Name	ZTE
	Model Name	Li3710T42P3h553457
	Power Rating	Nominal Voltage:3.7V Charge Up Voltage:4.2V
	Type	Li-ion
Earphone	Brand Name	ZTE
	Signal Line Type	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.

**1.4 Feature of Equipment under Test**

Product Feature & Specification	
DUT Type :	GSM/GPRS Dual-band Digital Mobile Phone
Trade Name :	ZTE
Model Name :	F120
FCC ID :	Q78-F120
Tx Frequency :	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz
Rx Frequency :	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna :	GSM850 : 32.78 dBm GSM1900 : 28.56 dBm
Maximum ERP/EIRP :	GSM850 : 0.53 W (27.22 dBm) GSM1900 : 0.93 W (29.67 dBm)
Antenna Type :	Fixed Internal
HW Version :	MT09AMB_B
SW Version :	M5010_E_EH4B4015
Power Rating (DC/AC , Voltage and Current of RF element or PA) :	DC 3.7V / 0.45A
Type of Modulation :	GMSK
Type of Emission :	300KGXW
DUT Stage :	Production Unit

2. Test Configuration of Equipment under Test

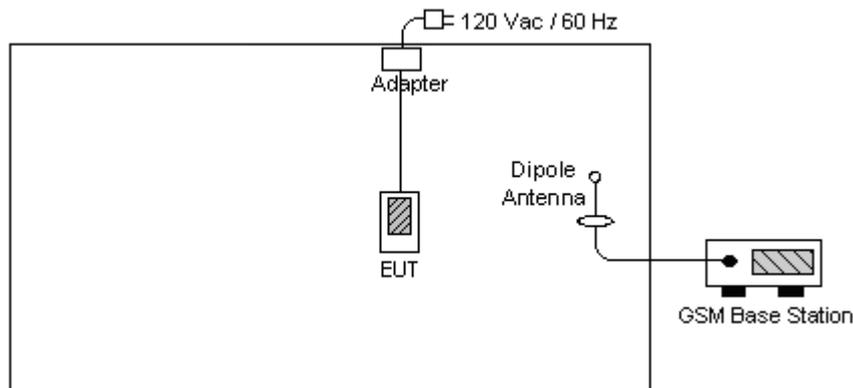
2.1 Test Manner

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; 30MHz to 19000 MHz for GSM1900.

2.2 Test Mode

Application	GSM850	GSM1900
Radiated Emission	<input checked="" type="checkbox"/> Mode 1: GSM Link	<input checked="" type="checkbox"/> Mode 1: GSM Link
Conducted Measurement	<input checked="" type="checkbox"/> Mode 1: GSM Link	<input checked="" type="checkbox"/> Mode 1: GSM Link

2.3 Connection Diagram of Test System



2.4 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Code
1.	GSM Base Station	R&S	CMU200	N/A	N/A	Unshielded, 1.8m



3. General Information of Test Site

Test Site Location : No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.
TEL : 86-0512-5790-0158
FAX : 86-0512-5790-0958
Test Site No : 03CH01-KS

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 GSM1900

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

4.2 RF Output Power

4.2.1 Measurement Instruments

As described in chapter 5 of this test report.

4.2.2 Test Procedure

- a. The transmitter output was connected to power meter and base station.
- b. Set EUT at PCL=5 for GSM850 and/or PCL=0 for GSM1900 maximum power through base station.
- c. Select lowest, middle, and highest channels for each band.

4.2.3 Test Setup Layout



4.2.4 Test Result

Bands	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
GSM850 (GSM)	128	824.2 (Low)	31.94	1.563
	189	836.4 (Mid)	32.33	1.710
	251	848.8 (High)	32.78	1.897
GSM1900 (GSM)	512	1850.2 (Low)	28.56	0.718
	661	1880.0 (Mid)	28.40	0.692
	810	1909.8 (High)	28.32	0.679



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

- a. The EUT was placed on a table with 1.0 meter height in an fully anechoic chamber.
- b. The EUT was set 1.2 meters from the receiving antenna which was mounted on the antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiated power.
- d. The height of the receiving antenna is also kept at 1.0M height.
- e. Taking the record of maximum ERP/EIRP.
- f. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
- g. The conducted power at the terminal of the dipole antenna is measured.
- h. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
- i. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

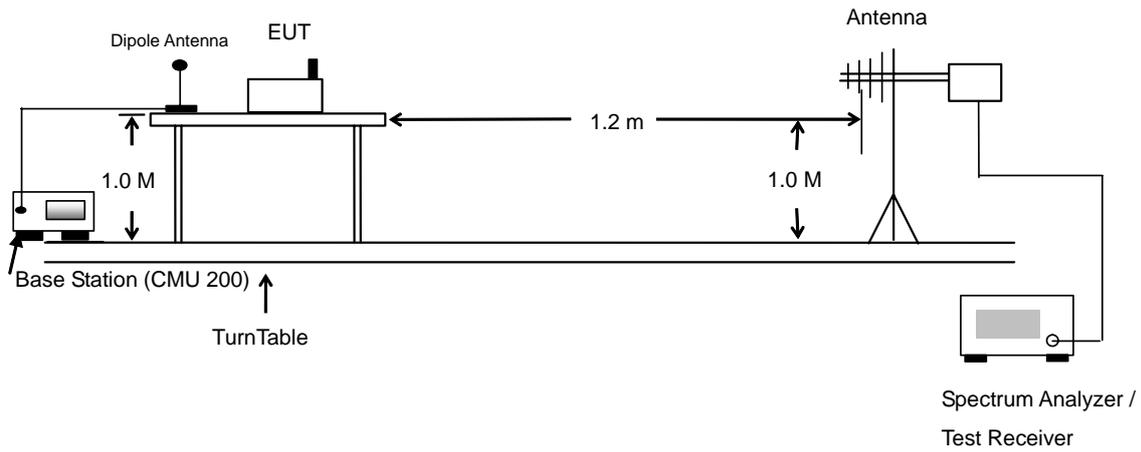
$E_s = R_s + AF$

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

GSM850 (GSM) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-19.82	-48.12	0.00	-1.08	27.22	0.53
836.40	-22.27	-48.28	0.00	-0.93	25.08	0.32
848.80	-25.01	-48.35	0.00	-0.76	22.58	0.18
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-32.67	-47.97	0.00	-1.08	14.22	0.03
836.40	-34.32	-48.01	0.00	-0.93	12.76	0.02
848.80	-36.19	-48.05	0.00	-0.76	11.10	0.01

GSM1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-24.17	-51.88	0.00	1.96	29.67	0.93
1880.00	-25.85	-52.99	0.00	2.00	29.14	0.82
1909.80	-27.96	-54.28	0.00	1.98	28.30	0.68
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-30.44	-52.13	0.00	1.96	23.65	0.23
1880.00	-33.39	-53.17	0.00	2.00	21.78	0.15
1909.80	-35.45	-54.13	0.00	1.98	20.66	0.12

4.4 Occupied Bandwidth and Band Edge Measurement

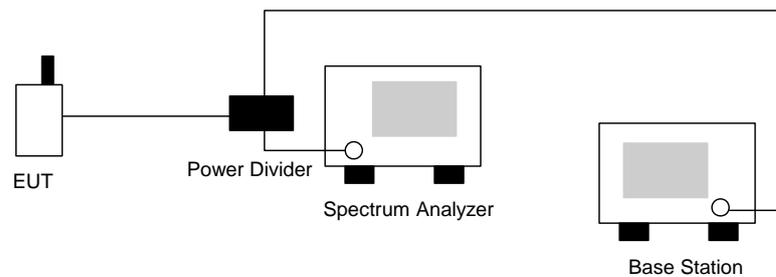
4.4.1 Measurement Instruments

As described in chapter 5 of this test report.

4.4.2 Test Procedure

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

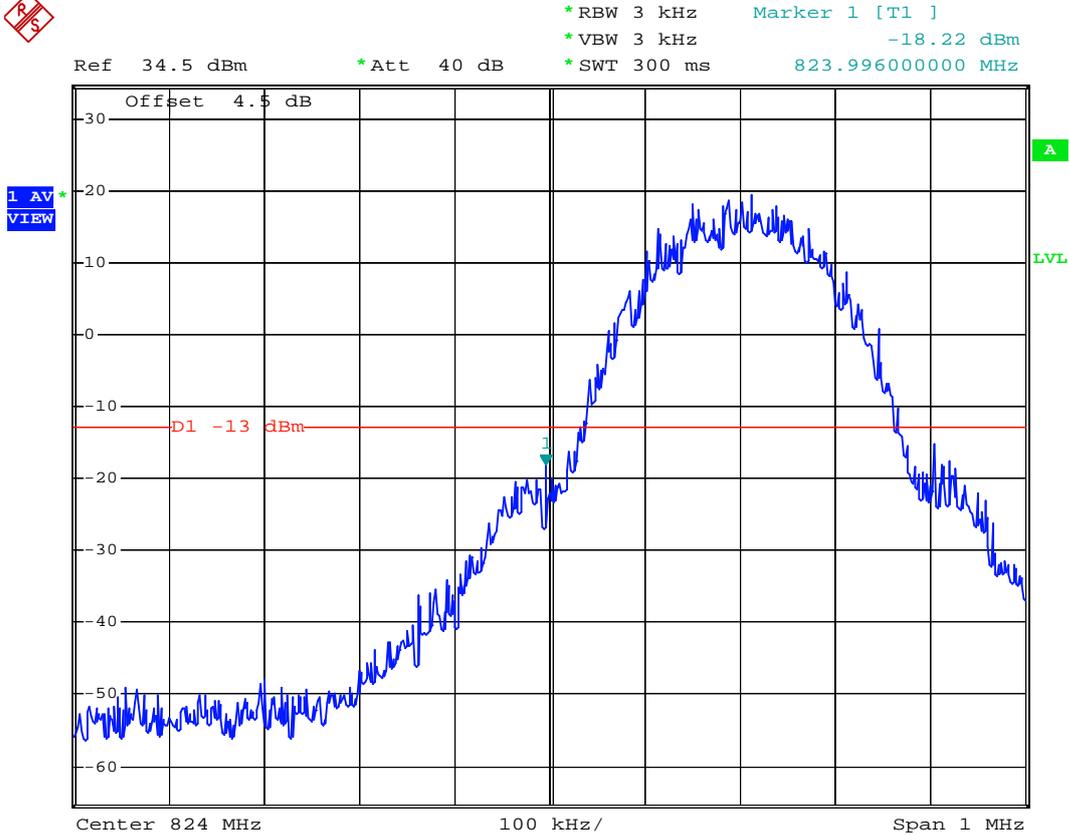
4.4.3 Test Setup Layout





4.4.4 Test Result

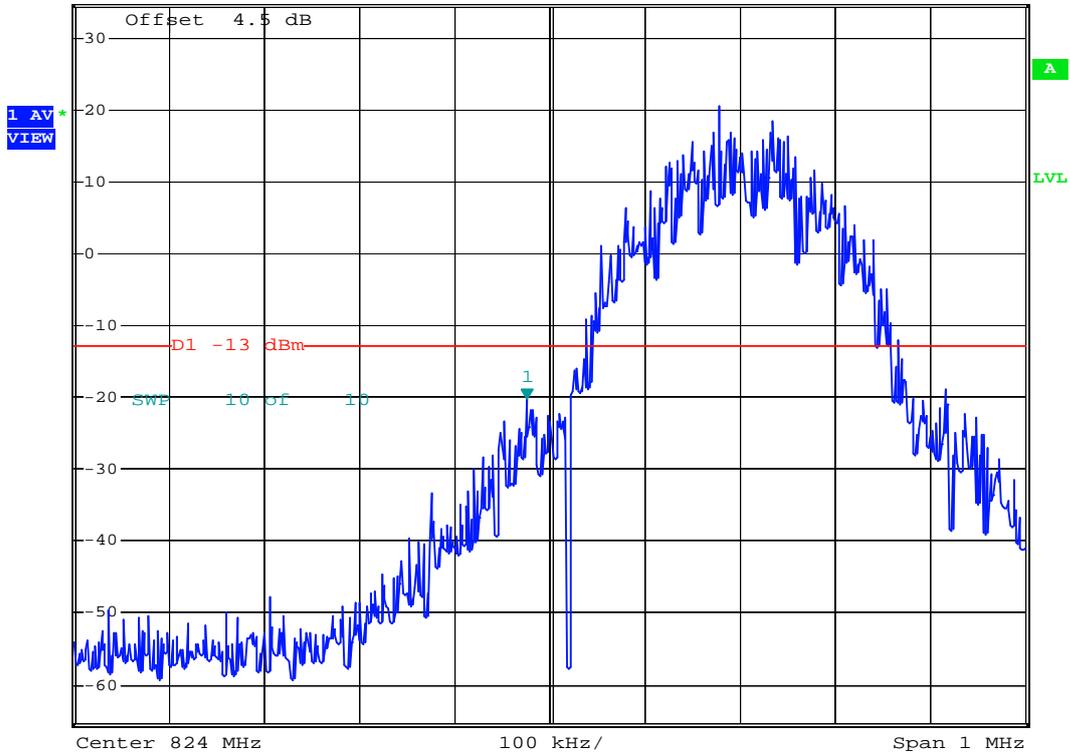
- Mode 1
- Test Mode : GSM850 CH128 Lower Band Edge
- Power State : High



Date: 5.JUL.2008 15:25:50



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -20.35 dBm
*SWT 300 ms 823.976000000 MHz



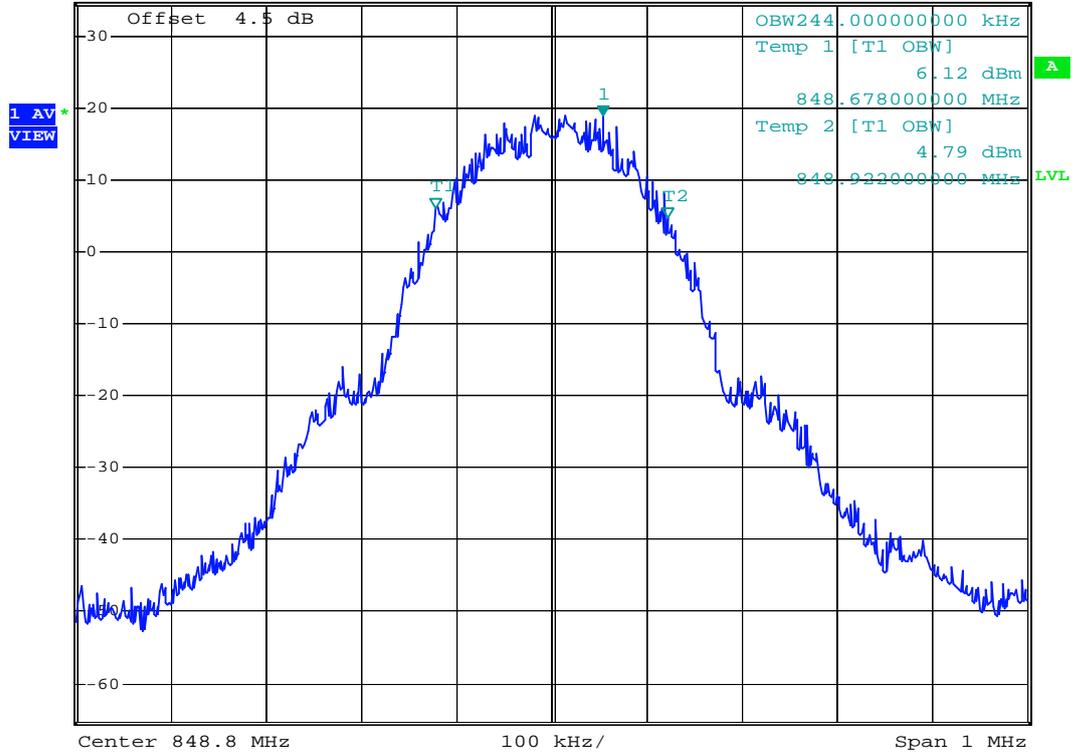
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- Test Mode : GSM850 CH 251 99% Occupied Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 18.91 dBm
 *SWT 300 ms 848.854000000 MHz



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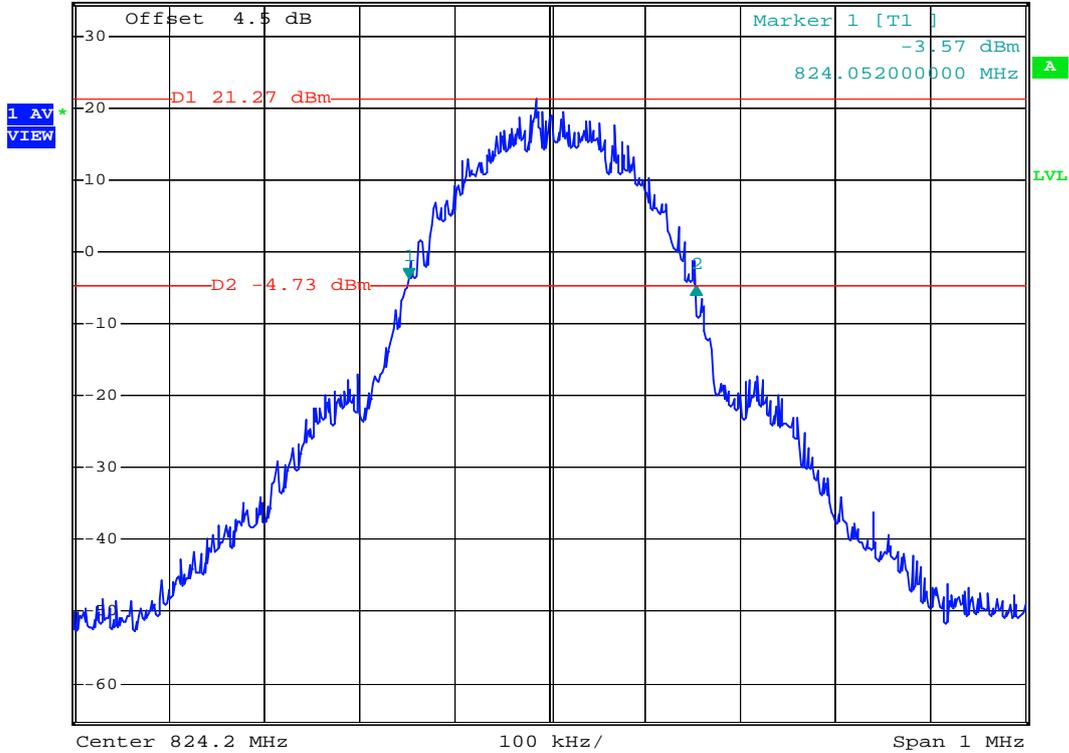


- Test Mode : GSM850 CH128 26dB Bandwidth
- Power State : High



*RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz -1.16 dB
 *SWT 300 ms 302.000000000 kHz

Ref 34.5 dBm *Att 40 dB



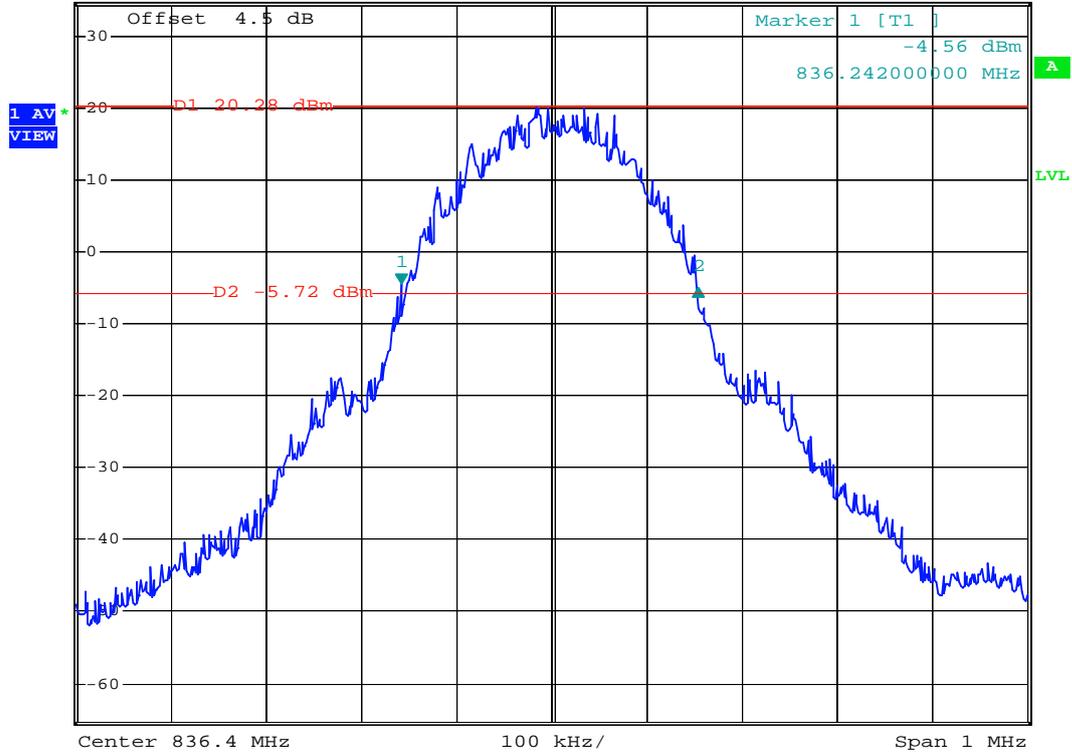
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- Test Mode : GSM850 CH189 26dB Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz -0.38 dB
 *SWT 300 ms 312.000000000 kHz



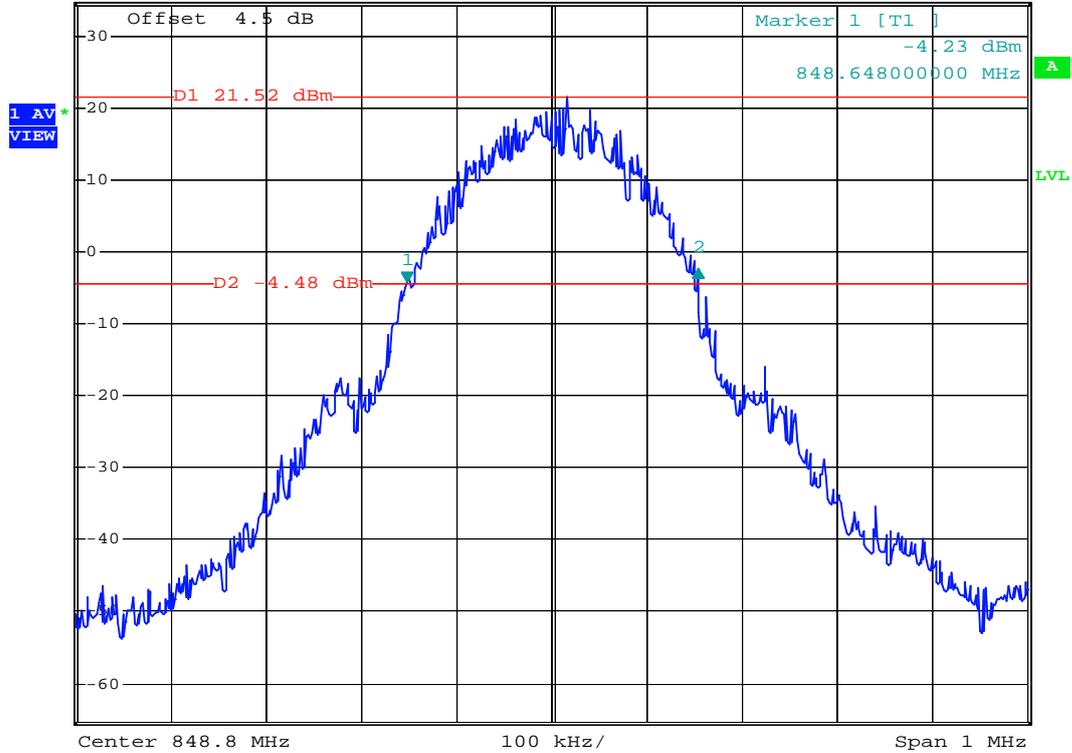
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- Test Mode : GSM850 CH 251 26dB Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz 1.86 dB
 *SWT 300 ms 306.000000000 kHz



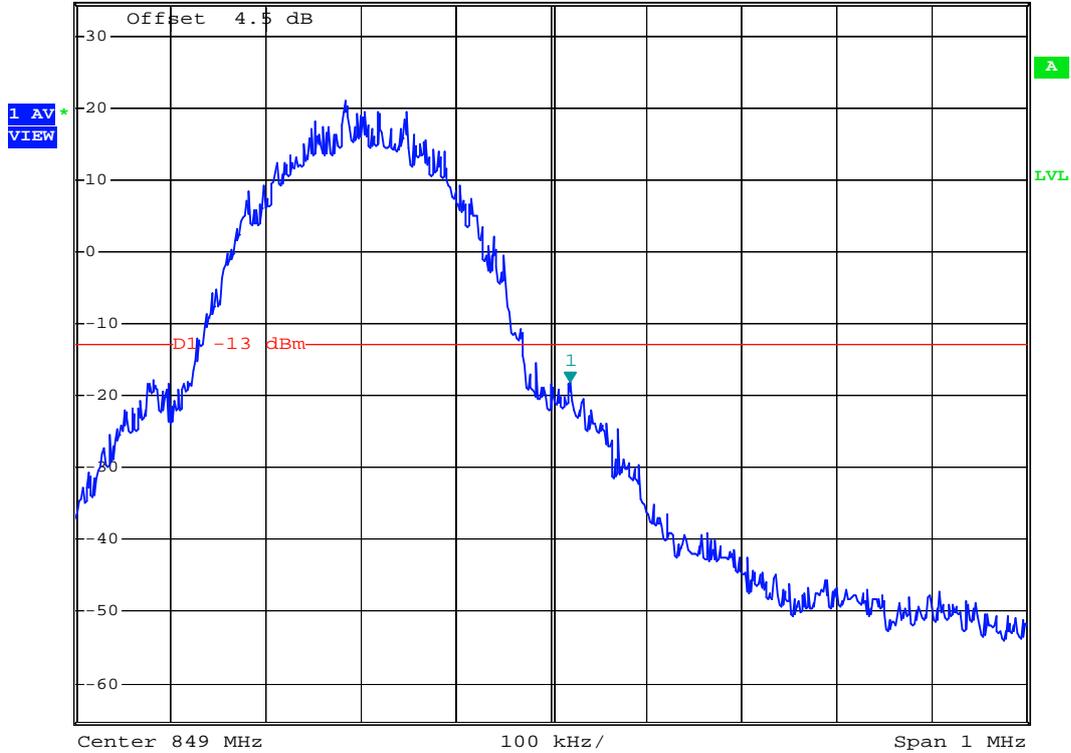
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- Test Mode : GSM850 CH251 Higher Band Edge
- Power State : High



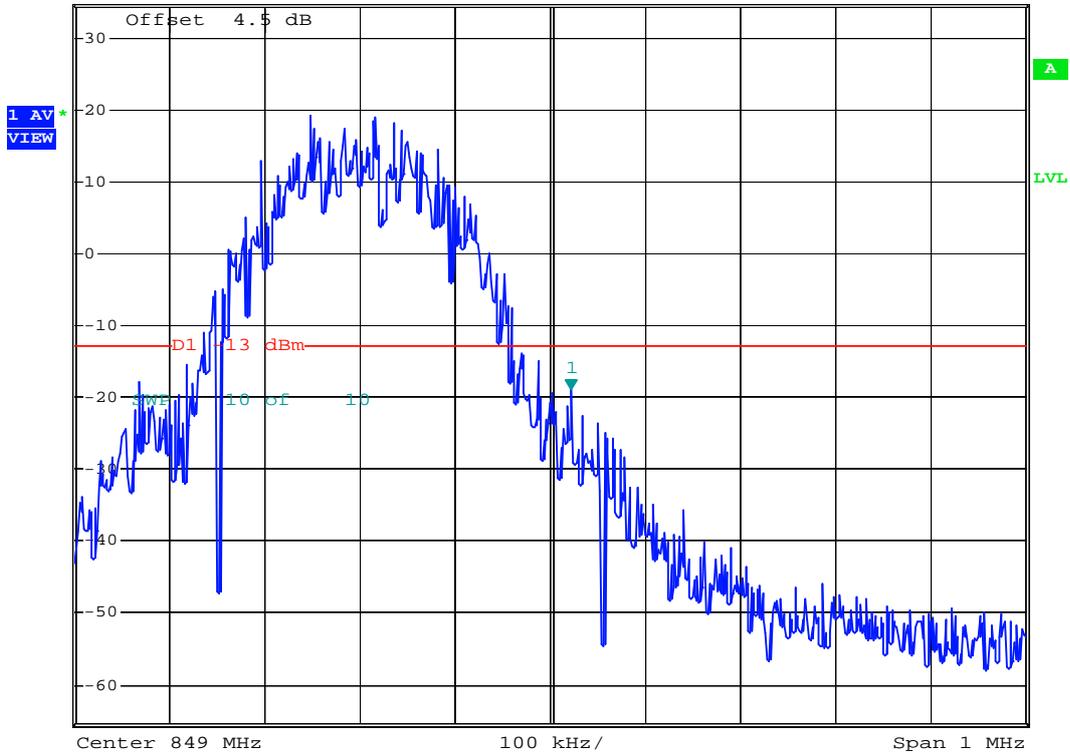
Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
*VBW 3 kHz -18.23 dBm
*SWT 300 ms 849.02000000 MHz



Date: 5.JUL.2008 15:24:52



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -18.99 dBm
*SWT 300 ms 849.02200000 MHz



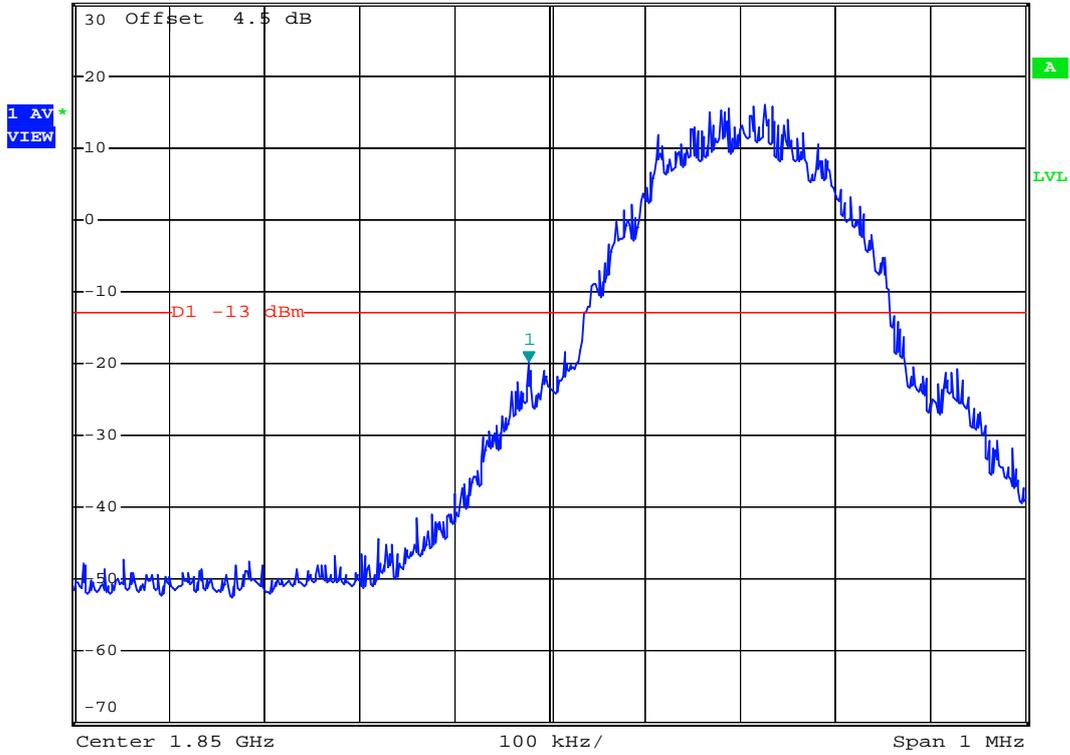
Date: 5.JUL.2008 15:27:59



- Mode 1
- Test Mode : GSM1900 CH512 Lower Band Edge
- Power State : High



Ref 30 dBm Att 60 dB *RBW 3 kHz Marker 1 [T1]
*VBW 3 kHz -19.73 dBm
*SWT 300 ms 1.849978000 GHz



Date: 5.JUL.2008 15:02:38

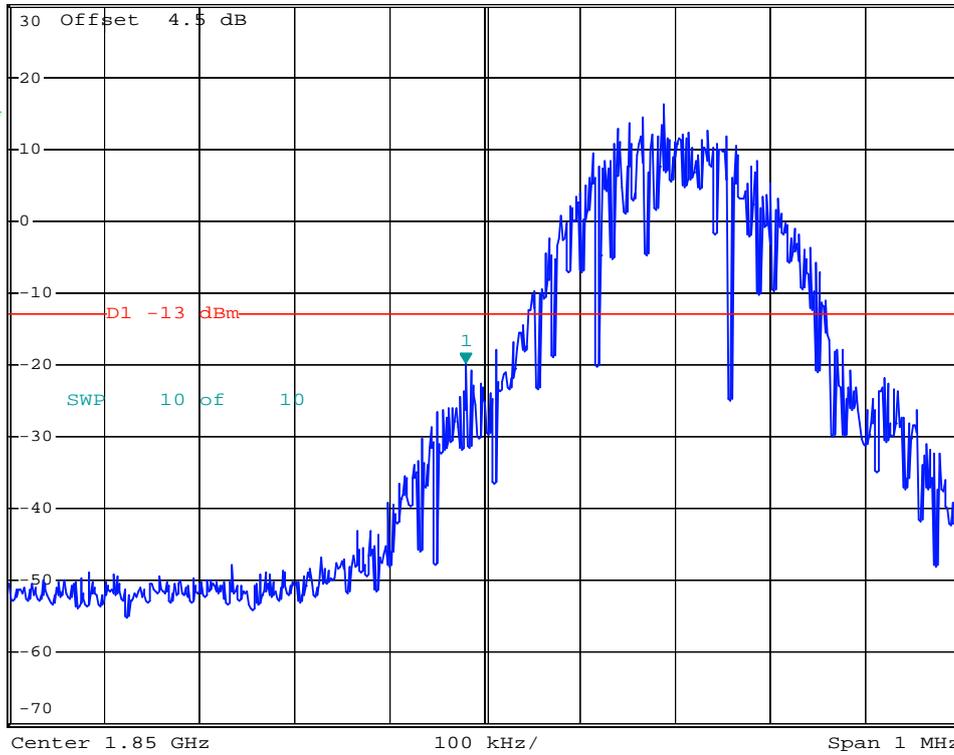


*RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -19.72 dBm
*SWT 300 ms 1.849980000 GHz

Ref 30 dBm

Att 60 dB

1 AV *
VIEW



Date: 5.JUL.2008 14:59:12



- Test Mode : GSM1900 CH661 99% Occupied Bandwidth
- Power State : High

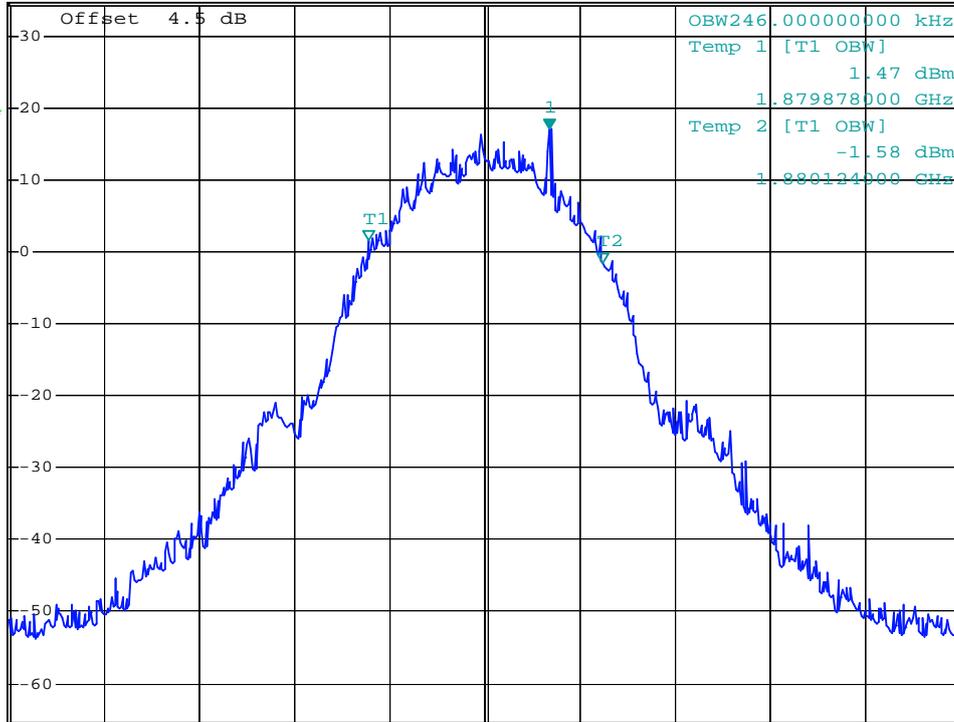


*RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 17.13 dBm
 *SWT 300 ms 1.880068000 GHz

Ref 34.5 dBm

Att 50 dB

1 AV *
MAXH



Center 1.88 GHz

100 kHz/

Span 1 MHz

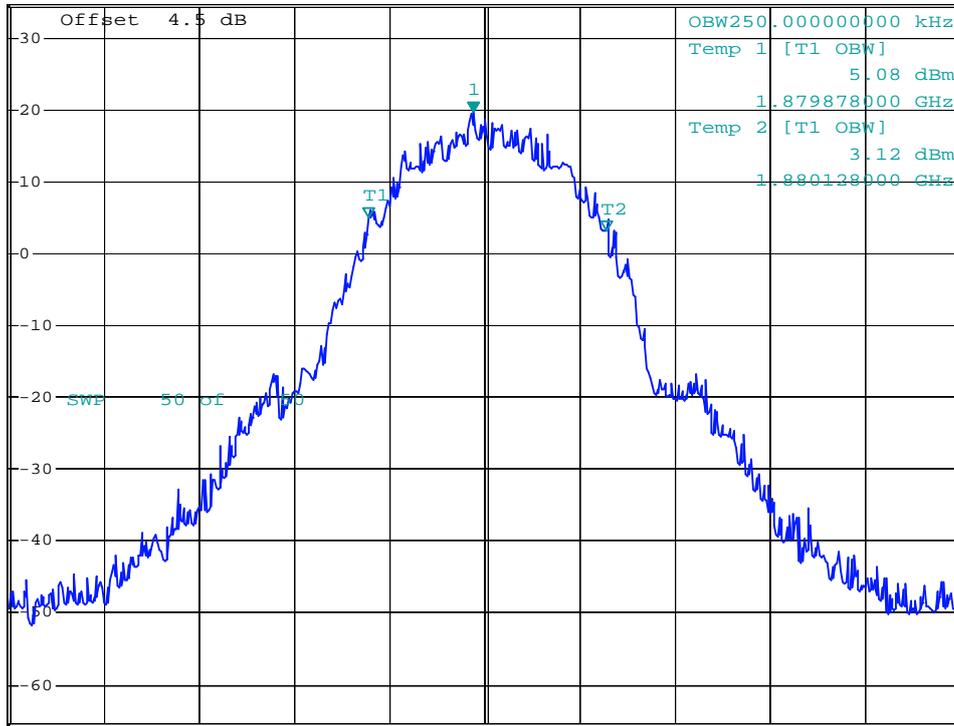
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*RBW 3 kHz Marker 1 [T1]
 *VBW 30 kHz 19.61 dBm
 *SWT 300 ms 1.879988000 GHz

Ref 34.5 dBm Att 50 dB

1 PK
VIEW



Center 1.88 GHz 100 kHz/ Span 1 MHz

Date: 5.JUL.2008 15:10:01



- Test Mode : GSM1900 CH810 99% Occupied Bandwidth
- Power State : High

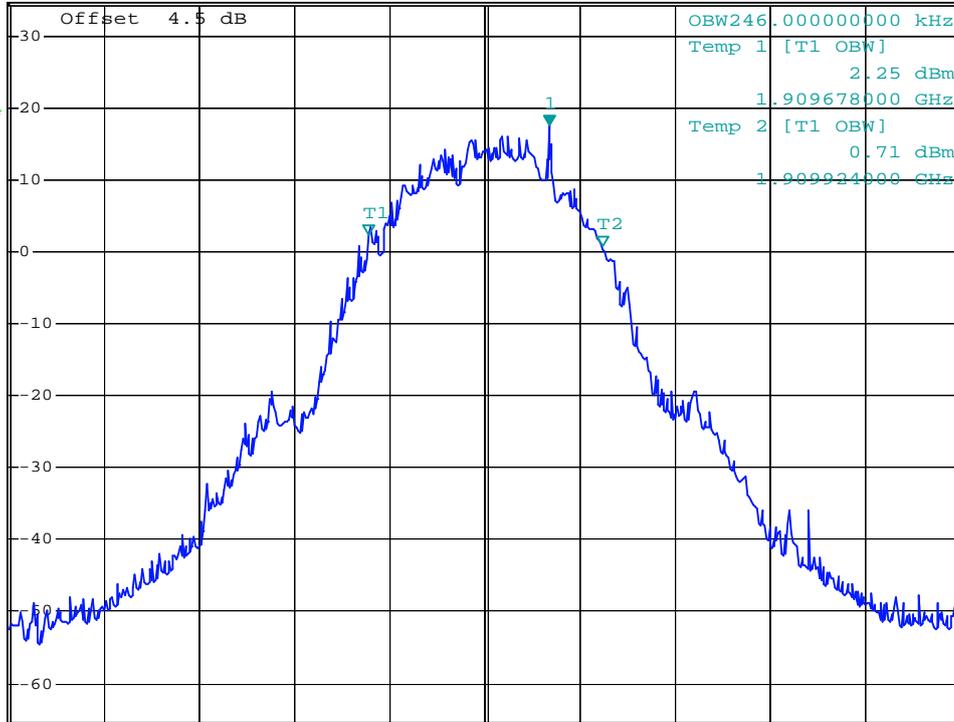


*RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 17.45 dBm
 *SWT 300 ms 1.909868000 GHz

Ref 34.5 dBm

Att 50 dB

1 AV *
MAXH



Center 1.9098 GHz

100 kHz/

Span 1 MHz

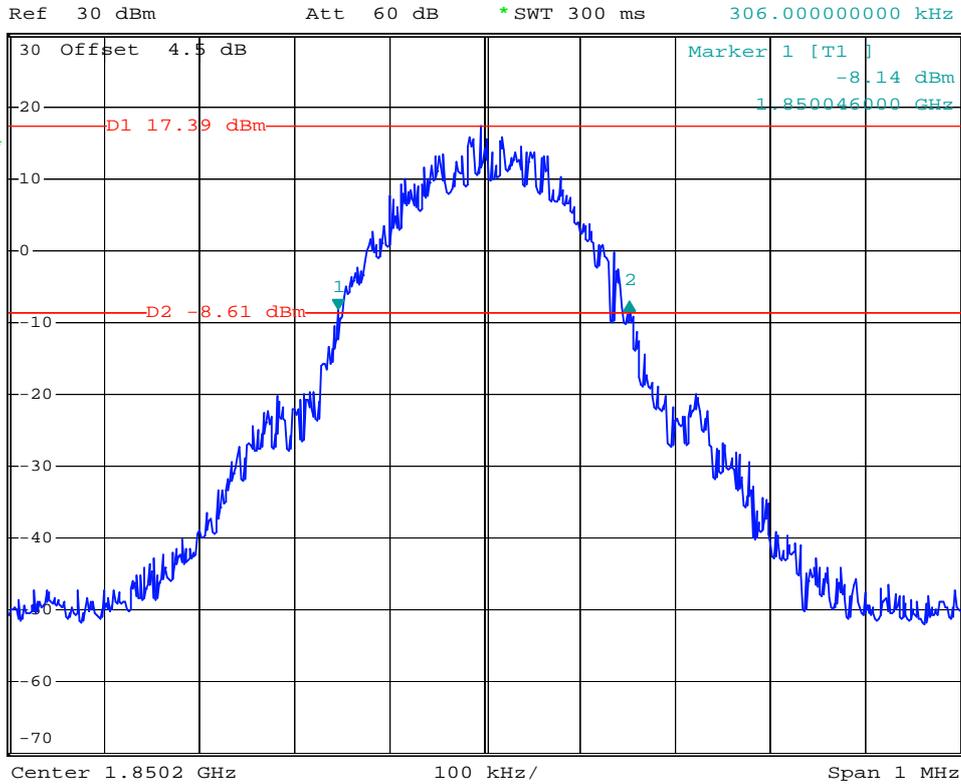
Date: 5.JUL.2008 15:08:41



- Test Mode : GSM1900 CH512 26dB Bandwidth
- Power State : High



*RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz 1.01 dB
 *SWT 300 ms 306.00000000 kHz



Date: 5.JUL.2008 14:53:53



- Test Mode : GSM1900 CH661 26dB Bandwidth
- Power State : High

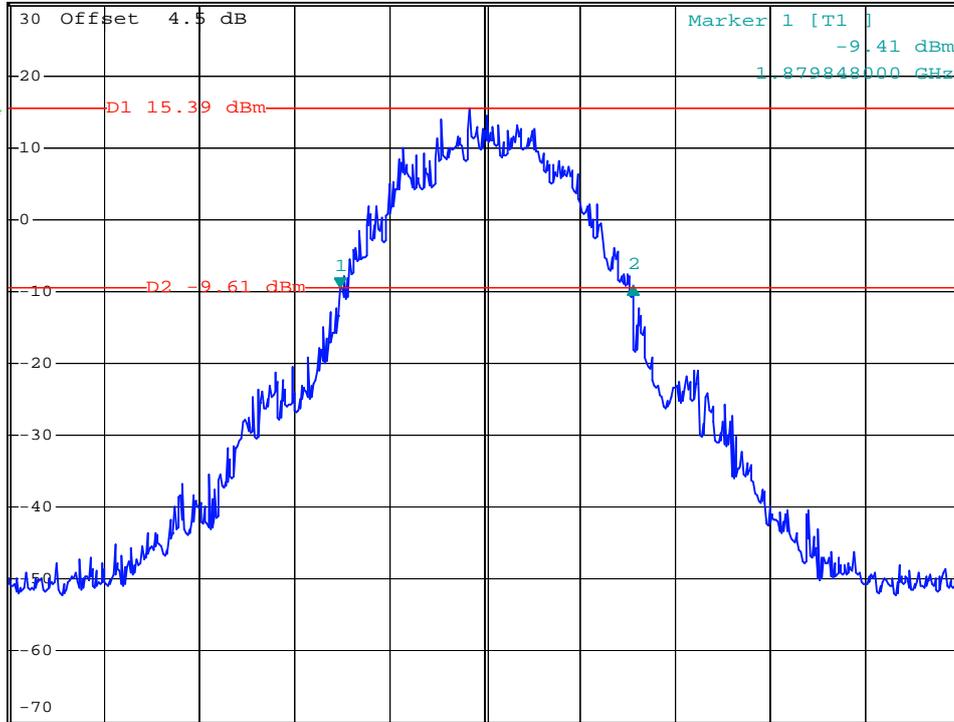


*RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz 0.13 dB
 *SWT 300 ms 308.000000000 kHz

Ref 30 dBm

Att 60 dB

1 AV
VIEW



Center 1.88 GHz

100 kHz/

Span 1 MHz

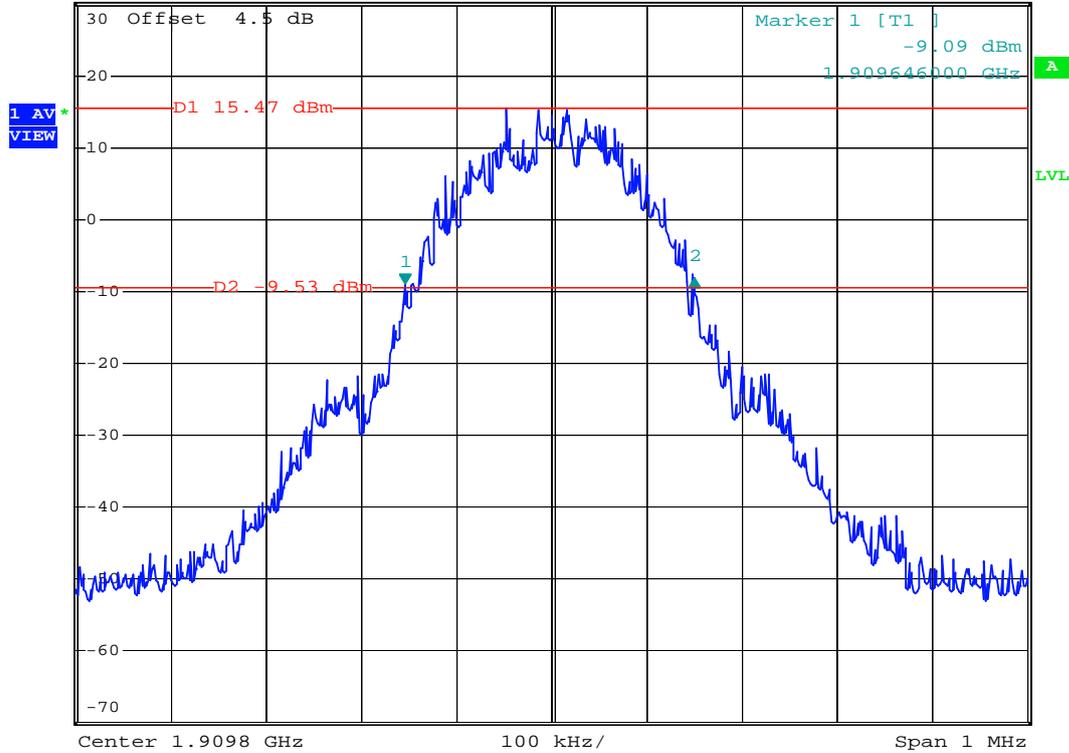
Date: 5.JUL.2008 14:55:57



- Test Mode : GSM1900 CH810 26dB Bandwidth
- Power State : High



Ref 30 dBm Att 60 dB *RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz 0.82 dB
 *SWT 300 ms 304.00000000 kHz



Date: 5.JUL.2008 14:57:26



- Test Mode : GSM1900 CH810 Higher Band Edge
- Power State : High



*RBW 3 kHz Marker 1 [T1]
*VBW 3 kHz -19.50 dBm
*SWT 300 ms 1.910004000 GHz

Ref 30 dBm

Att 60 dB

1 AV*
VIEW



Center 1.91 GHz

100 kHz/

Span 1 MHz

Date: 5.JUL.2008 15:01:40

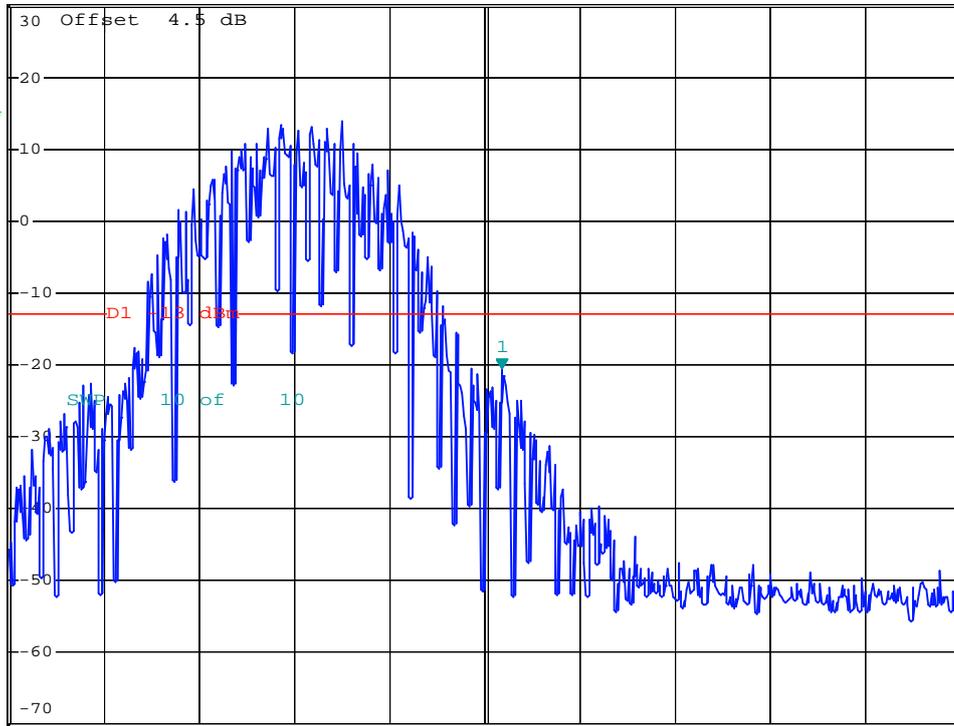


*RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz -20.65 dBm
 *SWT 300 ms 1.910018000 GHz

Ref 30 dBm

Att 60 dB

1 AV*
VIEW



Date: 5.JUL.2008 15:00:06

4.5 Conducted Emission

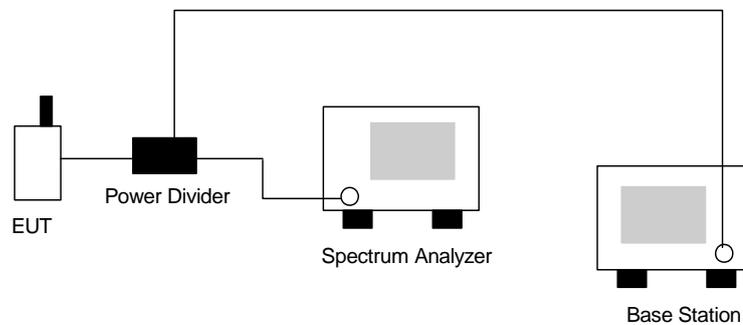
4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

4.5.2 Test Procedure

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

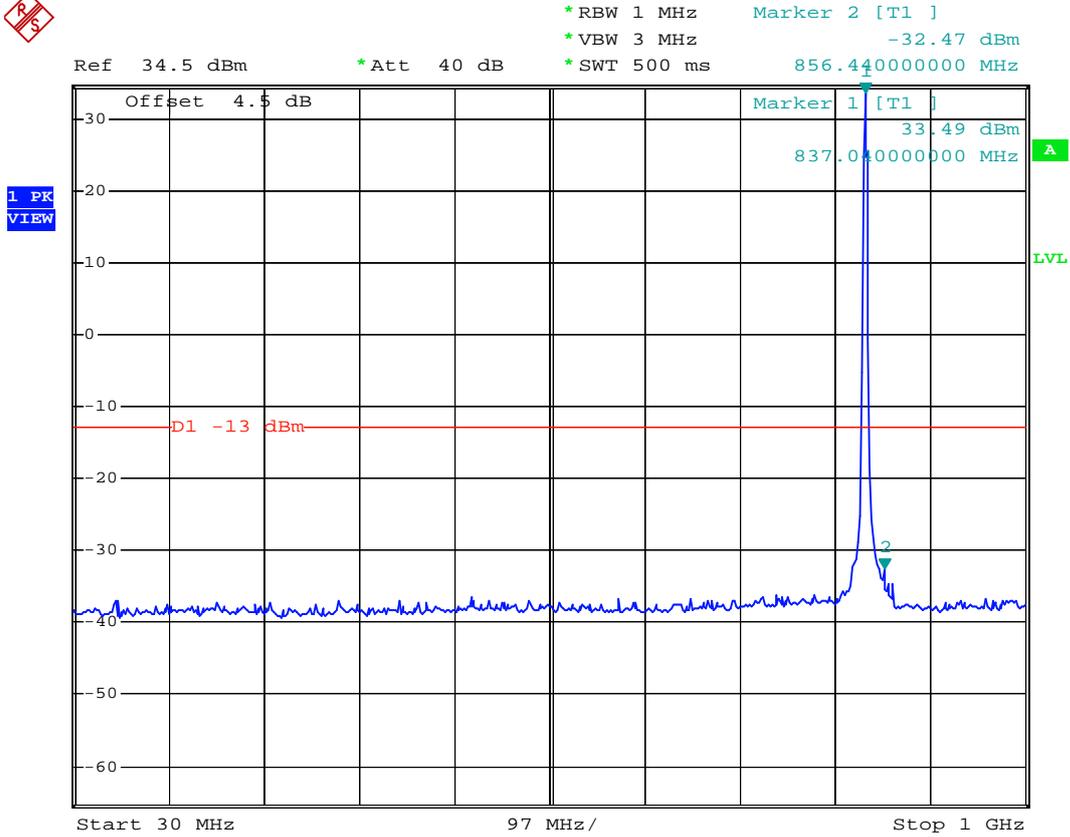
4.5.3 Test Setup Layout





4.5.4 Test Result

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



Date: 5.JUL.2008 15:53:33

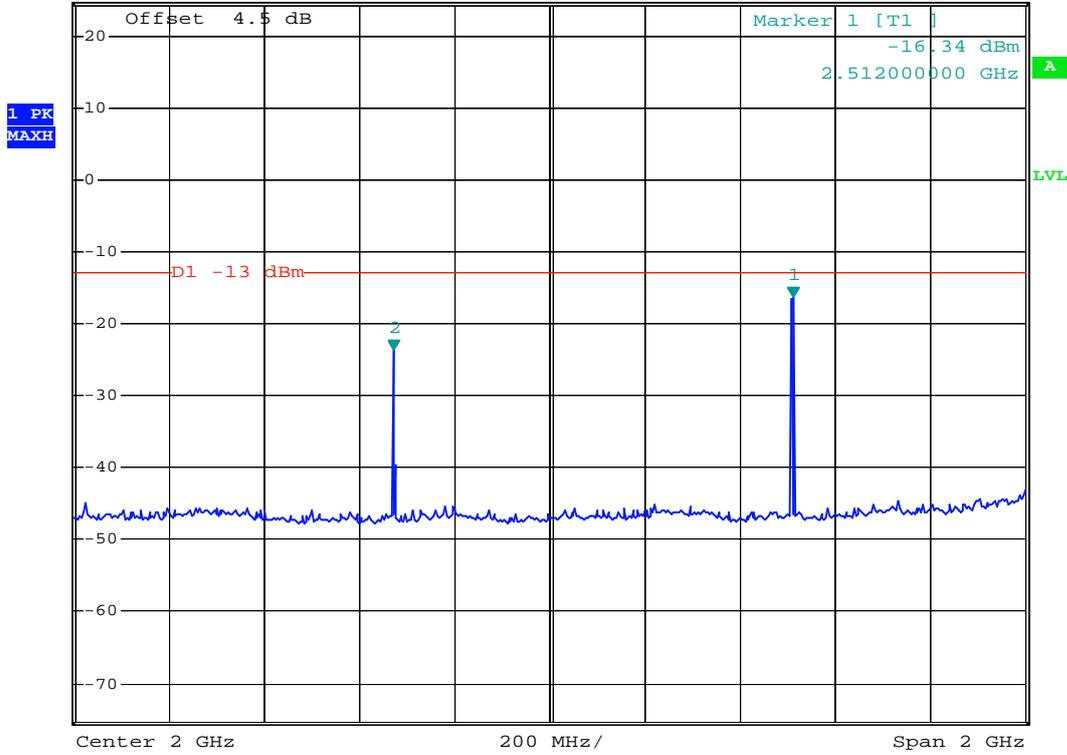


- Test Mode : GSM850 CH189
- Frequency Range : 1G-3G



*RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -23.65 dBm
 *SWT 500 ms 1.672000000 GHz

Ref 24.5 dBm *Att 30 dB



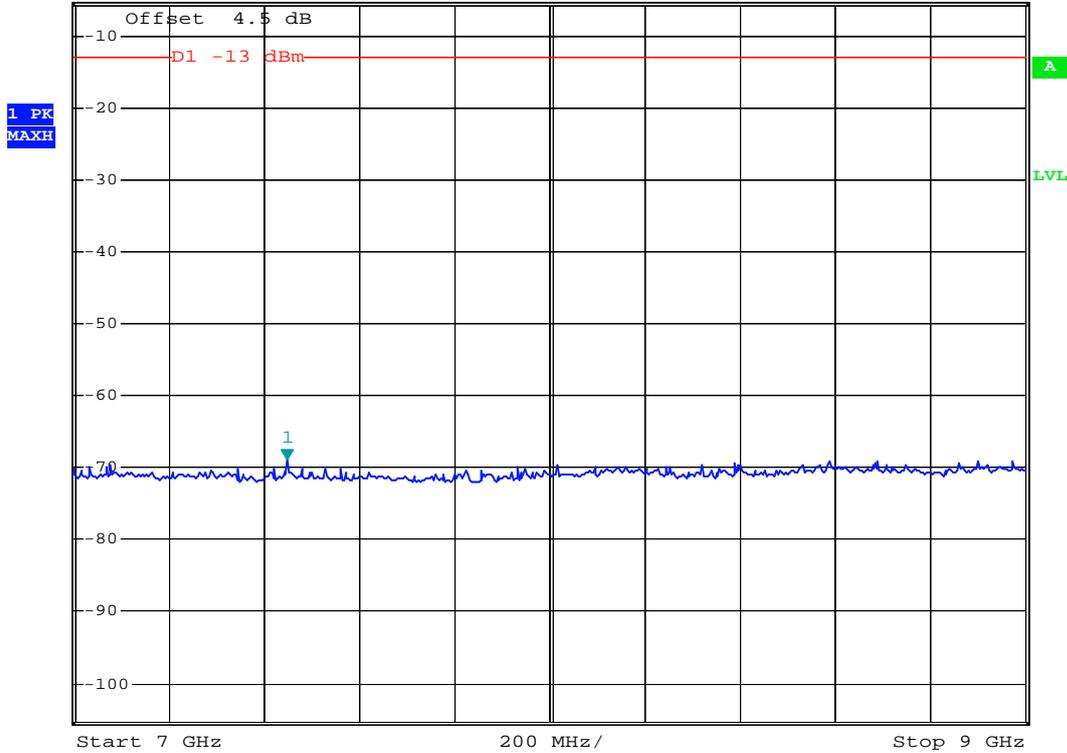
Date: 5.JUL.2008 15:43:53



- Test Mode : GSM850 CH189
- Frequency Range : 7G-9G



Ref -5.5 dBm *Att 0 dB *RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -68.91 dBm
*SWT 500 ms 7.448000000 GHz



Date: 5.JUL.2008 15:48:05



- Mode 1
- Test Mode : GSM1900 CH661
- Frequency Range : 30M-1G

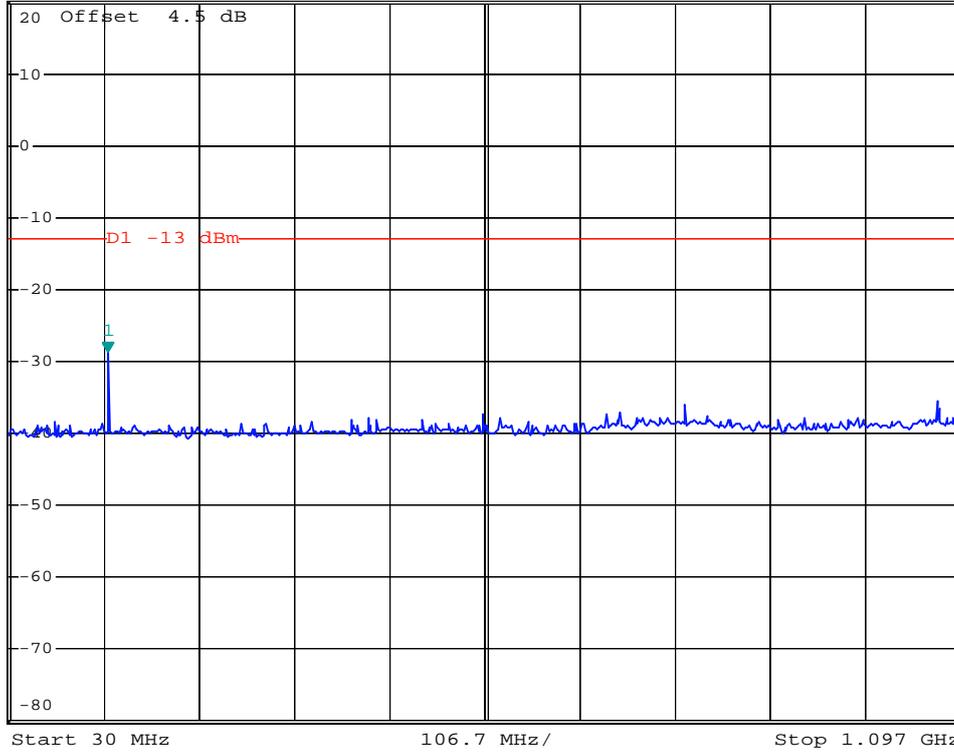


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -28.82 dBm
*SWT 500 ms 140.58000000 MHz

Ref 20 dBm

*Att 40 dB

1 PK
VIEW



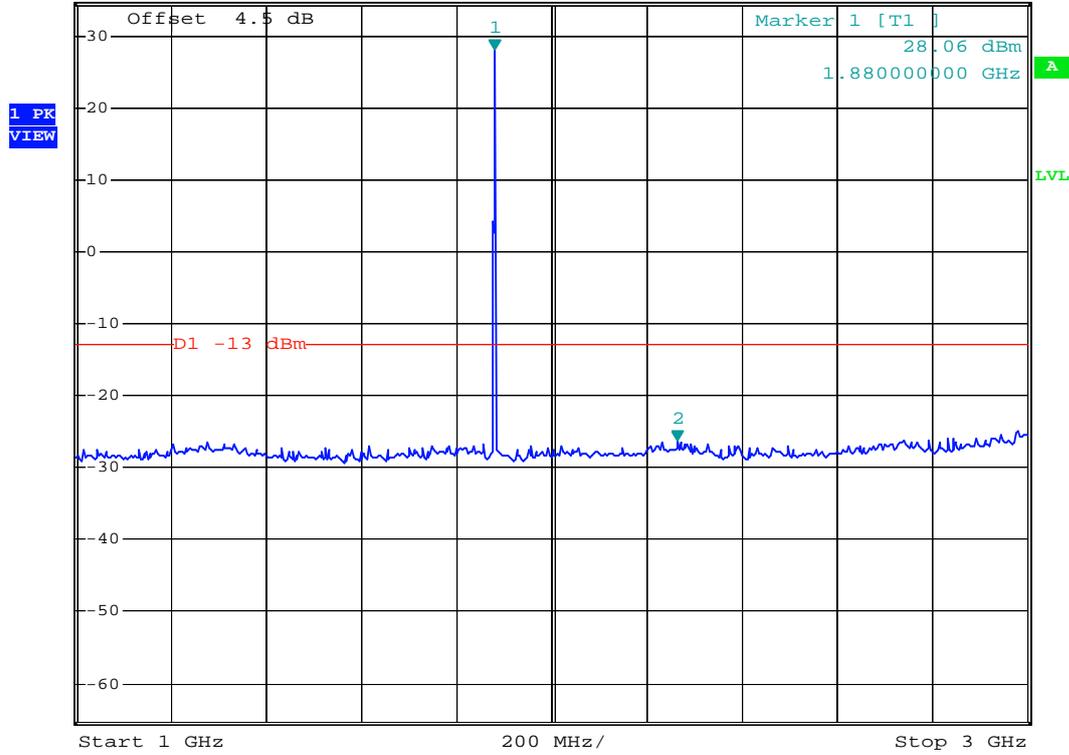
Date: 5.JUL.2008 15:12:55



- Test Mode : GSM1900 CH661
- Frequency Range : 1G-3G



Ref 34.5 dBm *Att 50 dB *RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -26.24 dBm
 *SWT 500 ms 2.264000000 GHz



Date: 5.JUL.2008 14:48:51



- Test Mode : GSM1900 CH661
- Frequency Range : 3G-7G

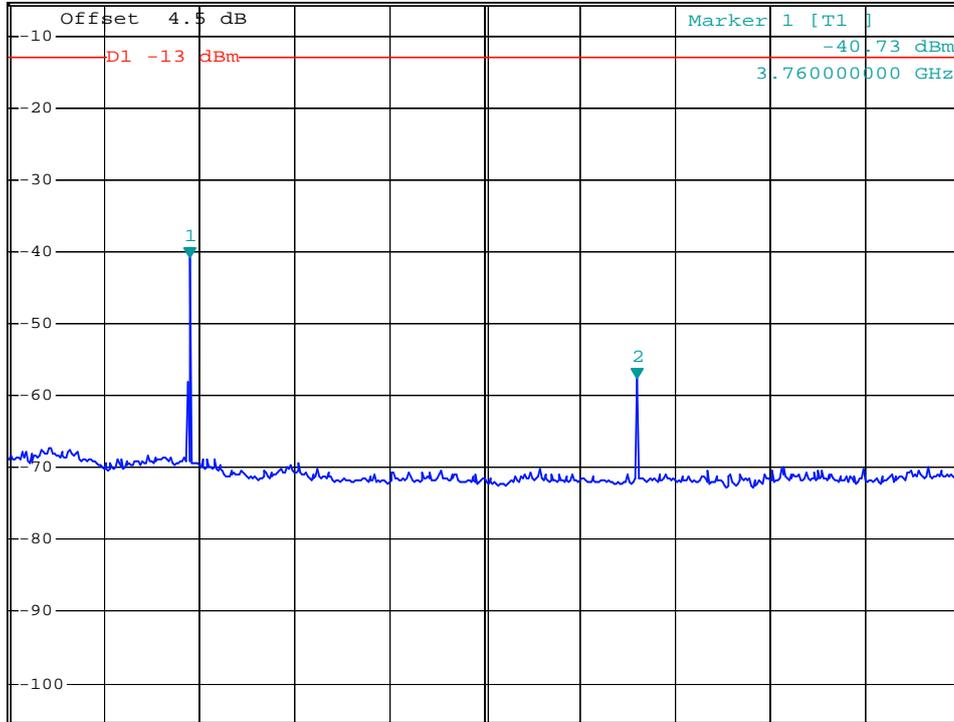


*RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -57.51 dBm
 *SWT 500 ms 5.640000000 GHz

Ref -5.5 dBm

*Att 0 dB

1 PK
VIEW



Start 3 GHz

400 MHz/

Stop 7 GHz

Date: 5.JUL.2008 14:49:53



- Test Mode : GSM1900 CH661
- Frequency Range : 7G-13.6G

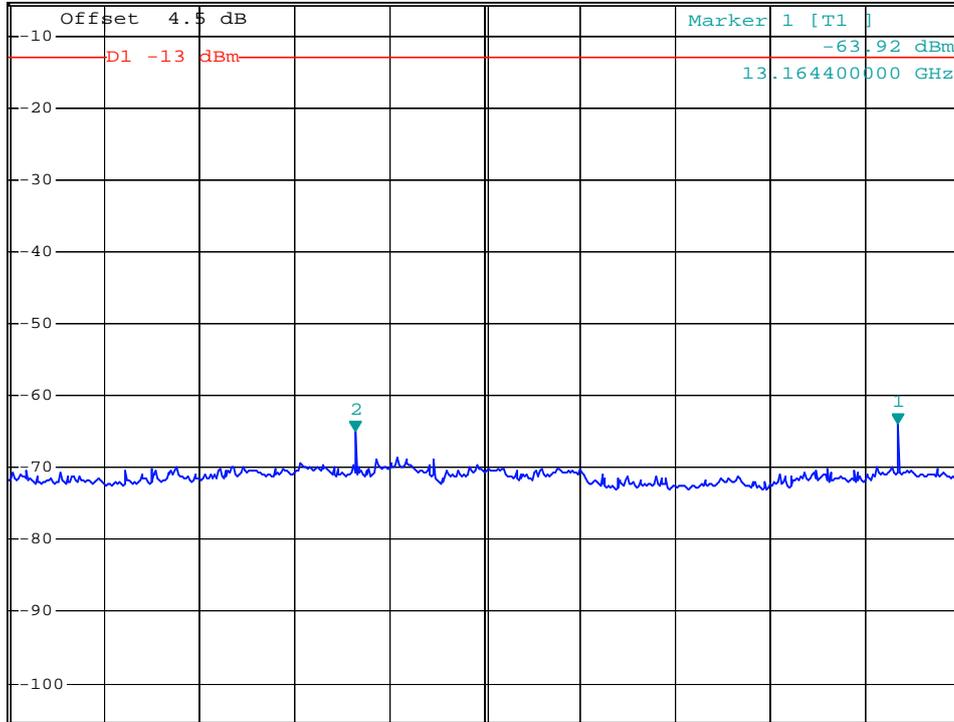


*RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -65.01 dBm
 *SWT 500 ms 9.402400000 GHz

Ref -5.5 dBm

*Att 0 dB

1 PK
VIEW



Start 7 GHz

660 MHz/

Stop 13.6 GHz

Date: 5.JUL.2008 14:50:39



- Test Mode : GSM1900 CH661
- Frequency Range : 13.6G-19.1G

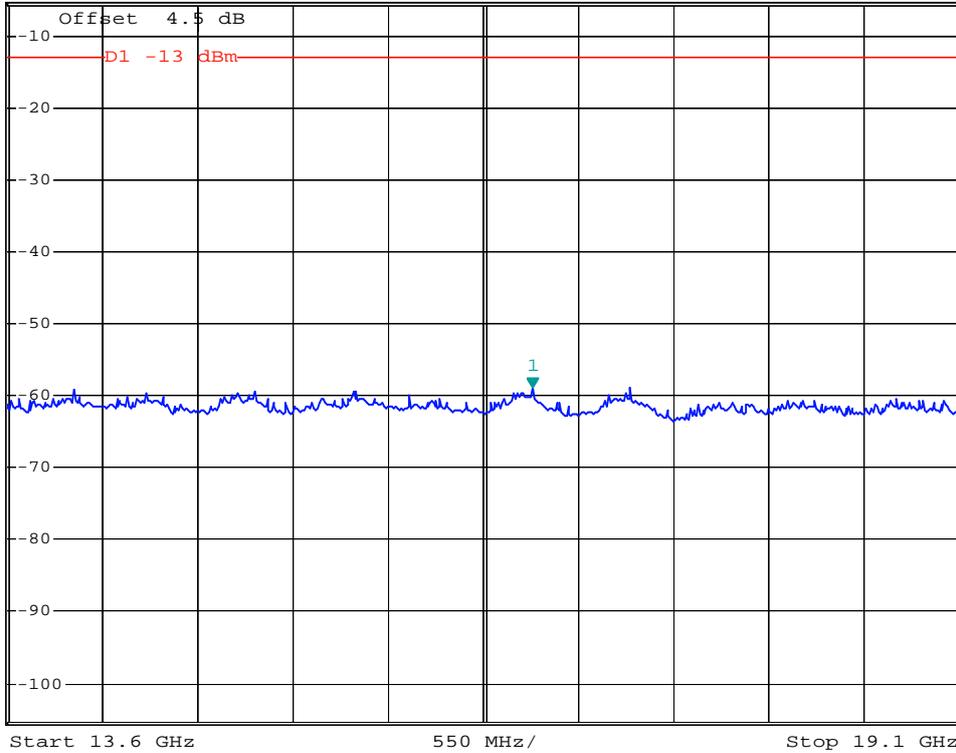


*RBW 1 MHz Marker 1 [T1]
 *VEW 3 MHz -58.96 dBm
 *SWT 500 ms 16.63600000 GHz

Ref -5.5 dBm

*Att 0 dB

1 PK VIEW



Date: 5.JUL.2008 14:51:15



4.6 Field Strength of Spurious Radiation

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

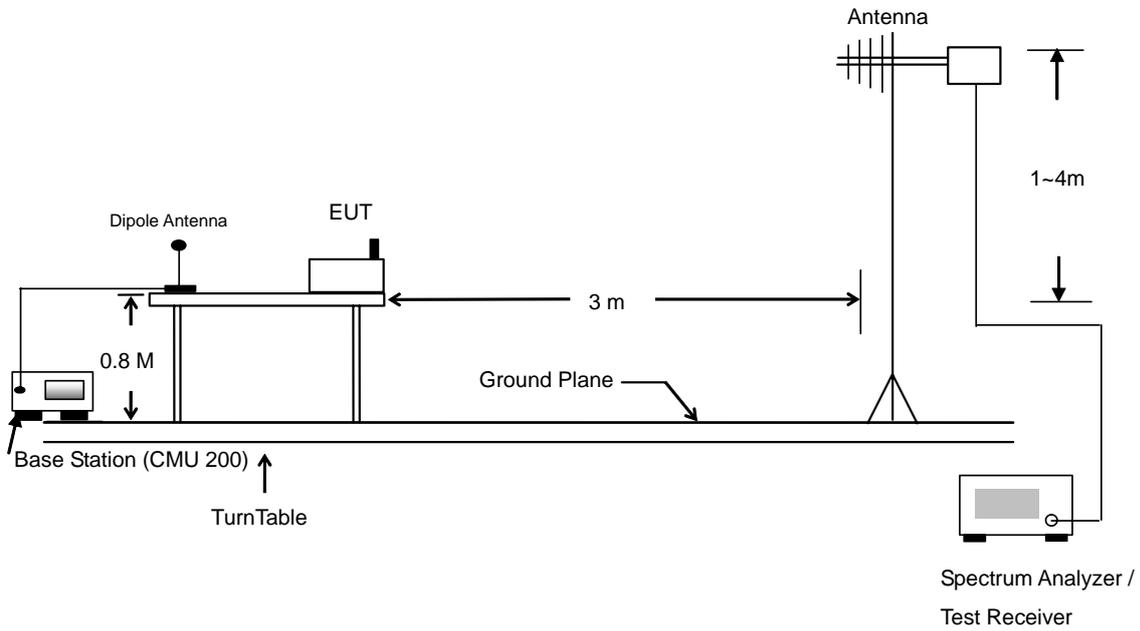
4.6.1 Measurement Instruments

As described in chapter 5 of this test report.

4.6.2 Test Procedure

- a. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
- b. The EUT was set 3 meters from the receiving antenna which was mounted on the antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- d. 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.
- e. Taking the record of maximum spurious emission.
- f. A Horn antenna was substituted in place of the EUT and was driven by a signal generator.
- g. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- h. Taking the record of output power at antenna port.
- i. Repeat step 7 to step 8 for another polarization.
- j. Emission level (dBm) = output power + substitution Gain.

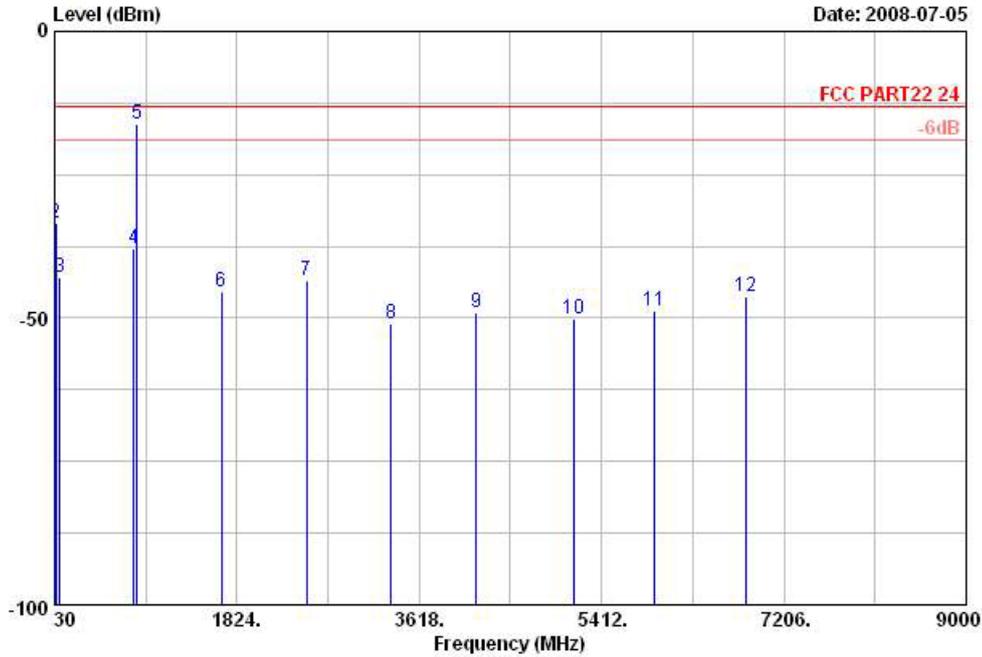
4.6.3 Test Setup Layout





4.6.4 Test Data

- Mode 1
- Horizontal Polarization



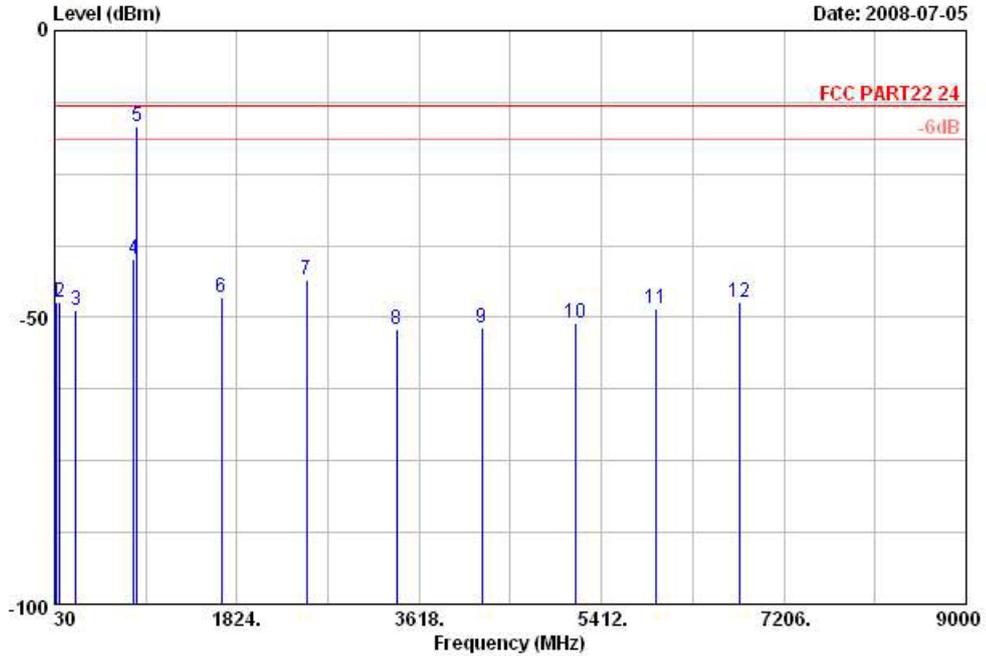
Site : 03CH01-KS
 Condition: FCC PART22 24 LF EIRP FACTOR-07091 LINE
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : F120
 Memo : GSM850 Link

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
45.93	-49.45	-13	-36.45	-54.51	-54.83	-13.61	-6.08	H	Pass
82.38	-49.64	-13	-36.64	-46.12	-46.61	2.27	1.39	H	Pass
239.79	-50.86	-13	-37.86	-53.83	-54.57	1.21	7.07	H	Pass
812.40	-41.94	-13	-28.94	-50.65	-51.91	-3.65	8.47	H	Pass
836.90	-18.72	-	-	-29.28	-30.52	-5.35	8.60	H	-
1674.00	-48.60	-13	-35.60	-50.92	-52.71	2.68	8.94	H	Pass
2510.00	-45.64	-13	-32.64	-53.92	-56.11	-2.32	10.30	H	Pass
3398.00	-54.29	-13	-41.29	-62.68	-65.17	-2.81	10.22	H	Pass
4234.00	-53.83	-13	-40.83	-64.72	-67.66	-4.75	11.23	H	Pass
5162.00	-53.12	-13	-40.12	-65.74	-69.03	-6.94	11.12	H	Pass
5952.00	-50.63	-13	-37.63	-65.57	-69.01	-8.86	11.67	H	Pass
6768.00	-49.53	-13	-36.53	-65.47	-69.35	-9.83	12.14	H	Pass

Remark: 836.90MHz is Mobile Station TCH Signal.



Vertical Polarization



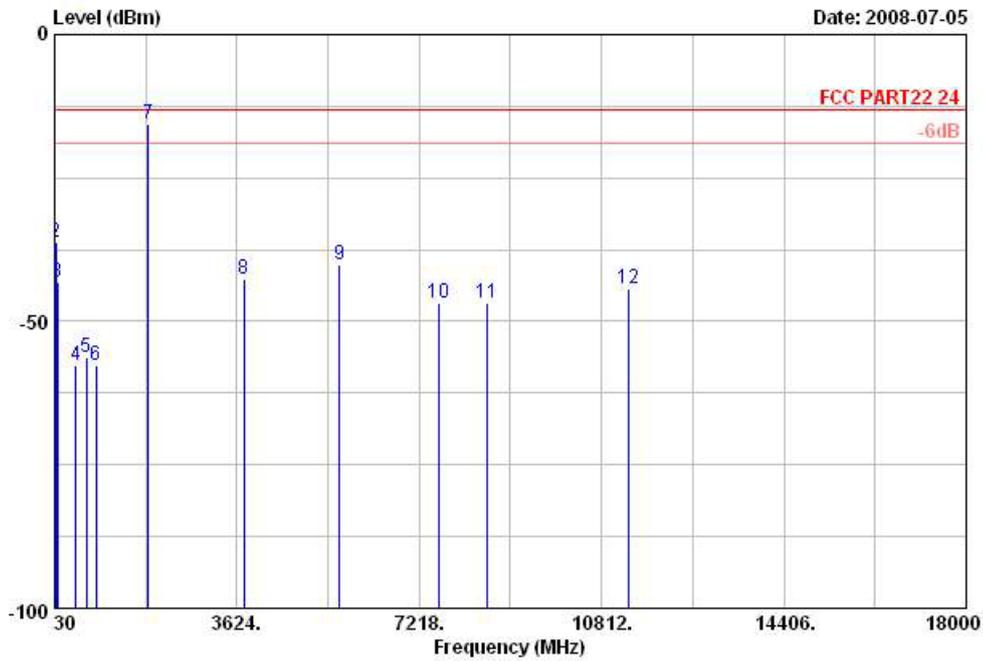
Site : 03CH01-KS
 Condition: FCC PART22 24 LF EIRP FACTOR-07091 NEUTRAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : F120
 Memo : GSM850 Link

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
33.24	-32.37	-13	-19.37	-44.36	-44.65	-30.49	-16.06	V	Pass
45.39	-35.61	-13	-22.61	-40.67	-40.99	-13.61	-6.08	V	Pass
79.14	-45.16	-13	-32.16	-41.86	-42.34	2.34	1.67	V	Pass
811.70	-40.01	-13	-27.01	-48.66	-49.92	-3.60	8.46	V	Pass
836.90	-18.37	-	-	-28.93	-30.17	-5.35	8.60	V	-
1672.00	-47.43	-13	-34.43	-49.75	-51.54	2.68	8.94	V	Pass
2510.00	-45.56	-13	-32.56	-53.84	-56.03	-2.32	10.30	V	Pass
3344.00	-53.04	-13	-40.04	-61.29	-63.76	-2.64	10.23	V	Pass
4182.00	-51.17	-13	-38.17	-61.95	-64.89	-4.71	11.16	V	Pass
5140.00	-52.26	-13	-39.26	-64.83	-68.11	-6.89	11.11	V	Pass
5938.00	-51.03	-13	-38.03	-65.93	-69.36	-8.82	11.66	V	Pass
6834.00	-48.48	-13	-35.48	-64.42	-68.34	-9.92	12.09	V	Pass

Remark: 836.90MHz is Mobile Station TCH Signal.



- Mode 2
- Horizontal Polarization



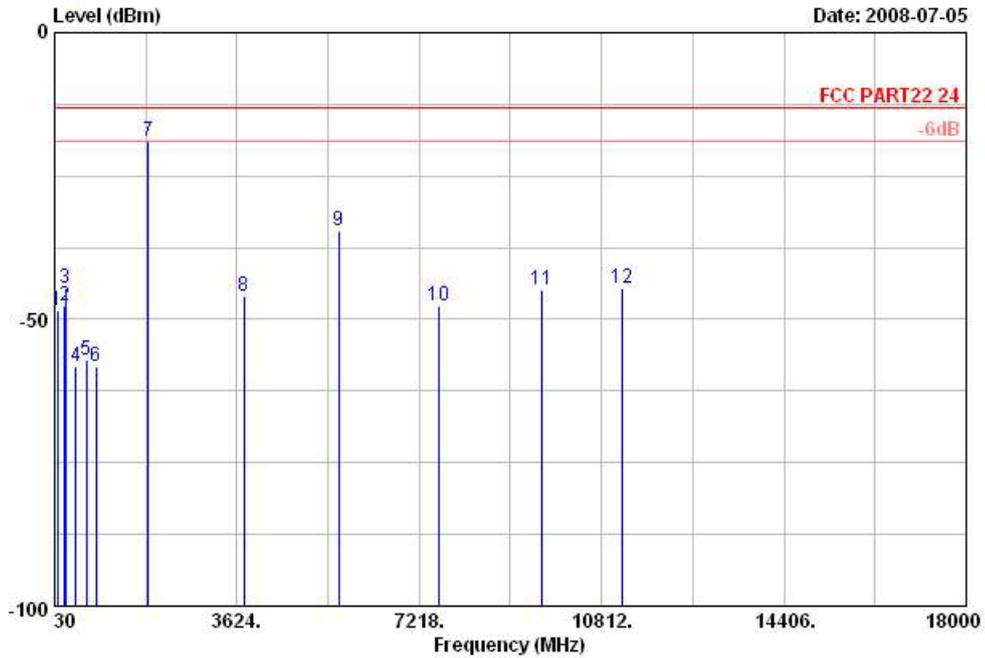
Site : 03CH01-KS
 Condition: FCC PART22 24 LF EIRP FACTOR-07091 LINE
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : F120
 Memo : GSM1900 Link

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
83.73	-48.37	-13	-35.37	-46.92	-53.12	2.25	9.15	H	Pass
227.91	-47.50	-13	-34.50	-51	-51.55	3.95	10.15	H	Pass
241.95	-44.56	-13	-31.56	-50.1	-53.05	0.51	11.15	H	Pass
455.40	-58.08	-13	-45.08	-70.62	-74.68	-6.60	12.15	H	Pass
649.30	-57.05	-13	-44.05	-70.47	-75.00	-6.95	13.15	H	Pass
850.20	-58.19	-13	-45.19	-71.51	-76.11	-5.92	14.15	H	Pass
1880.00	-18.88	-	-	-25.11	-30.77	1.11	15.15	H	-
3760.00	-45.98	-13	-32.98	-57.57	-63.82	-3.84	16.15	H	Pass
5639.00	-34.64	-13	-21.64	-50.88	-57.76	-8.12	17.15	H	Pass
7619.00	-47.59	-13	-34.59	-65.12	-73.10	-9.51	18.15	H	Pass
9620.00	-44.76	-13	-31.76	-65.14	-73.47	-11.71	19.15	H	Pass

Remark: 1880.00MHz is Mobile Station TCH Signal.



Vertical Polarization



Date: 2008-07-05

Site : 03CH01-KS
 Condition: FCC PART22 24 LF EIRP FACTOR-07091 NEUTRAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : F120
 Memo : GSM1900 Link

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
33.24	-31.14	-13	-18.14	-45.28	-43.42	-30.49	-16.06	V	Pass
47.82	-36.08	-13	-23.08	-42.01	-40.19	-11.36	-5.10	V	Pass
78.60	-43.16	-13	-30.16	-41.98	-40.30	2.42	1.71	V	Pass
450.50	-57.60	-13	-44.60	-70.71	-69.54	-7.12	6.97	V	Pass
658.40	-56.20	-13	-43.20	-69.05	-67.97	-6.35	7.57	V	Pass
842.50	-57.78	-13	-44.78	-70.74	-69.83	-5.59	8.61	V	Pass
1880.00	-15.66	-	-	-21.89	-21.66	1.11	9.26	V	-
3759.00	-42.63	-13	-29.63	-54.22	-54.79	-3.84	10.47	V	Pass
5640.00	-40.15	-13	-27.15	-56.39	-57.59	-8.12	11.47	V	Pass
7602.00	-46.89	-13	-33.89	-64.39	-66.17	-9.50	11.93	V	Pass
8543.00	-46.82	-13	-33.82	-65.42	-67.38	-9.99	12.72	V	Pass
11348.00	-44.34	-13	-31.34	-67.04	-70.35	-14.46	13.70	V	Pass

Remark: 1880.00MHz is Mobile Station TCH Signal.

4.7 Frequency Stability (Temperature Variation)

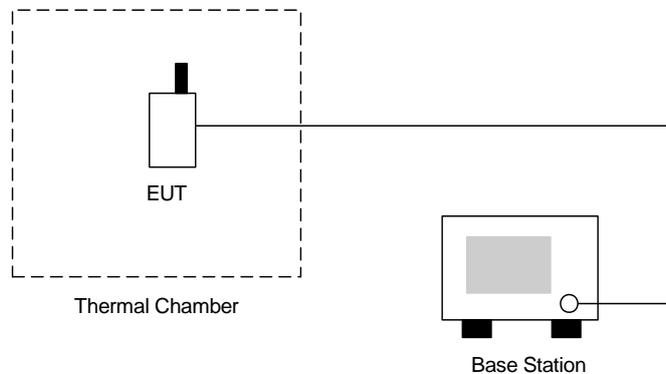
4.7.1 Measurement Instrument

As described in chapter 5 of this test report.

4.7.2 Test Procedure

- a. The EUT and test equipment were set up as shown on the following section.
- b. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
- c. With power OFF, the temperature was raised in 10°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.
- d. The temperature tests were performed for the worst case.
- e. 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	-3.2	0.00	2.5	Passed
-20	-25.12	-0.03		
-10	19.25	0.02		
0	16.61	0.02		
10	4.34	0.01		
20	1.78	0.00		
30	-13.26	-0.02		
40	-14.47	-0.02		
50	8.49	0.01		

• Test Mode : GSM1900 CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	-50.46	-0.03	2.5	Passed
-20	-99.84	-0.05		
-10	12.47	0.01		
0	21.19	0.01		
10	13.48	0.01		
20	-35.37	-0.02		
30	-37.34	-0.02		
40	-83.6	-0.04		
50	-31.21	-0.02		

4.8 Frequency Stability (Voltage Variation)

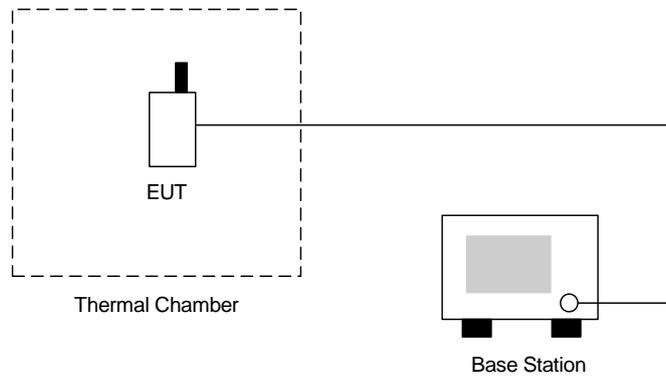
4.8.1 Measurement Instrument

As described in chapter 5 of this test report.

4.8.2 Test Procedure

- a. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ and connected as the following section.
- b. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
- c. 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	-12.9	-0.02	2.5	Passed
BEP	-80.6	-0.09		
4.2	-30.6	-0.04		

- Test Mode : GSM1900 CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-31.4	-0.02	2.5	Passed
BEP	-107.0	-0.06		
4.2	-70.3	-0.04		

Remark:

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



5. List of Measurement Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9K~40GHz	Mar. 13, 2008	Mar. 12, 2009	Radiation (03CH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9KHz~2.75GHz	Mar. 15, 2008	Mar. 14, 2009	Radiation (03CH01-KS)
Bilog Antenna	Schaffner	CBL6112D	23182	25MHz~2000MHz	May 22, 2007	May 21, 2009	Radiation (03CH01-KS)
Preamplifier	Agilent	8449B	3008A02370	1G~26.5GHz	Jun. 04, 2007	Jun. 03, 2009	Radiation (03CH01-KS)
Preamplifier	Wireless	FPA6592G	60006	30M~2000MHz	Jul. 24, 2007	Jul. 23, 2009	Radiation (03CH01-KS)
DRG Horn(Medium)	EMCO	3117	75959	1GHz ~ 18GHz	Aug. 17, 2007	Aug. 16, 2008	Radiation (03CH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Jun. 18, 2007	Jun. 17, 2009	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	50MHz~18GHz	Jun. 12, 2007	Jun. 11, 2009	Conducted (TH01-KS)
Thermal	Rten Billion	TTC-B3S	TBN-960502	-40~150C	Jun. 27, 2007	Jun. 26, 2009	Conducted (TH01-KS)
Power Divider	ARRA	A3200-2	N/A	DC~18GHz	Sep. 01, 2007	Aug. 31, 2008	Conducted (TH01-KS)
DC Power	Topward	3306D	N/A	30V6A	N/A	N/A	Conducted (TH01-KS)



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
Combined standard uncertainty Uc(y)	1.27		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.54		

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
Combined standard uncertainty Uc(y)	2.36				
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	4.72				

END OF TEST REPORT



Appendix A. Photographs of EUT

Please refer to Sporton report number EP871115 as below.