



FCC Test Report

According to

47 CFR Part 22H, 24E

Equipment : GSM 850/1900 Mobile Phone
Trade Name : HUAWEI
Model No. : HUAWEI T161L
FCC ID : QIST161L
Tx Frequency Range : GSM850 : 824.2 ~ 848.8MHz
GSM1900 : 1850.2 ~1909.8 MHz
Max. ERP/EIRP Power : GSM850 : 0.80 W
GSM1900 : 0.80 W
Emission Designator : 300KGXW
Applicant : Huawei Technologies Co., Ltd.
P.O. Box 518129, Huawei base, bantian,
Longgang District, Shenzhen, China

- 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 April 09, 2008 at **Sporton International Inc. LAB.**
- Report No.: FG840205, Report Version: Rev. 01.

Roy Wu
Manager

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



Table of Contents

History of This Test Report ii

1. General Information 1

1.1 Applicant..... 1

1.2 Manufacturer 1

1.3 Basic Description of Equipment under Test..... 1

1.4 Feature of Equipment under Test..... 2

1.5 Report Date 2

2. Test Configuration of Equipment under Test 3

2.1 Test Manner 3

2.2 Test Mode 3

2.3 Connection Diagram of Test System 3

2.4 Ancillary Equipment List 3

3. General Information of Test Site..... 4

3.1 Test Voltage 4

3.2 Test Compliance..... 4

3.3 Frequency Range 4

3.4 Test Distance..... 4

4. Test Data and Test Result 5

4.1 List of Measurements and Examinations 5

4.2 RF Output Power 6

4.3 ERP / EIRP Measurement 8

4.4 Occupied Bandwidth and Band Edge Measurement 11

4.5 Conducted Emission..... 33

4.6 Field Strength of Spurious Radiation 43

4.7 Frequency Stability (Temperature Variation) 49

4.8 Frequency Stability (Voltage Variation) 51

5. List of Measurement Equipments 52

6. Uncertainty Evaluation 53

Appendix A - External Photographs of EUT

Appendix B - Internal Photographs of EUT

Appendix C - Setup Photographs



1. General Information

1.1 Applicant

Huawei Technologies Co., Ltd.

P.O. Box 518129, Huawei base, bantian, Longgang District, Shenzhen, China

1.2 Manufacturer

Huawei Technologies Co., Ltd.

P.O. Box 518129, Huawei base, bantian, Longgang District, Shenzhen, China

1.3 Basic Description of Equipment under Test

Equipment		GSM 850/1900 Mobile Phone
Trade Name		HUAWEI
Model Name		HUAWEI T161L
FCC ID		QIST161L
AC Adapter	Brand Name	DVE
	Model Name	DSA-5W-05 FUS
	Power Rating	I/P:100-240Vac, 50-60Hz, 0.2A; O/P: 6Vdc, 3A
	AC Power Cord Type	1.8 meter shielded cable without ferrite core
Battery	Brand Name	HUAWEI
	Model Name	HB5A2H
	Power Rating	3.7Vdc, 1050mAh
	Type	Li-ion

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 850/1900 Mobile Phone
Trade Name :	HUAWEI
Model Name :	HUAWEI T161L
FCC ID :	QIST161L
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 : 31.90 dBm (GSM) / GSM1900 : 30.16 dBm (GSM) /
Maximum ERP/EIRP :	GSM850(GSM) : 0.80 W (29.02 dBm) GSM1900(GSM) : 0.80 W (29.02 dBm)
Type of Antenna Connector :	N/A
Antenna Type :	Fixed Internal
Power Rating (DC/AC , Voltage and Current of RF element or PA) :	DC 5.5V
HW Verison :	Ver B
SW Version :	B531U1.P00.I34.01.00
Type of Modulation :	GMSK
Type of Emission :	300KGXW
DUT Stage :	Identical Prototype

1.5 Report Date

EUT Received : Apr. 02, 2008

Report Date : Apr. 17, 2008

2. Test Configuration of Equipment under Test

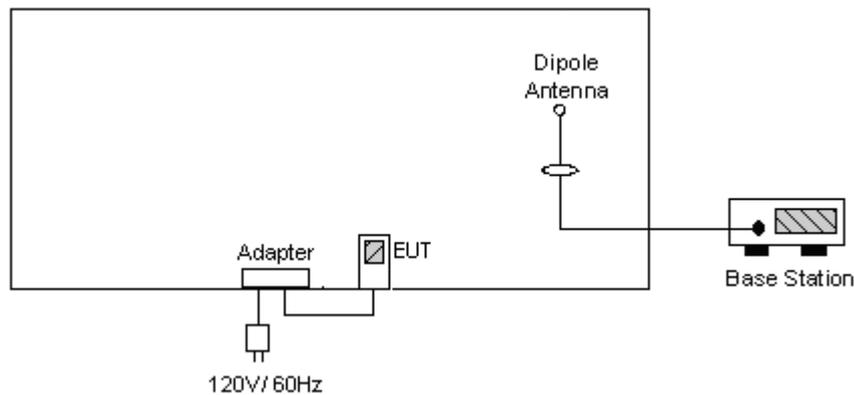
2.1 Test Manner

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 GSM1900.

2.2 Test Mode

Application	GSM850	GSM1900
Radiated Emission	<input checked="" type="checkbox"/> Mode 1: GSM Link	<input checked="" type="checkbox"/> Mode 2: GSM 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



2.4 Ancillary Equipment List

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



3. General Information of Test Site

Test Site Location : No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, R.P.C.
TEL : 86-0512-5790-0158
FAX : 86-0512-5790-0958
Test Site No : 03CH01-KS, 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 30MHz to 19000MHz 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

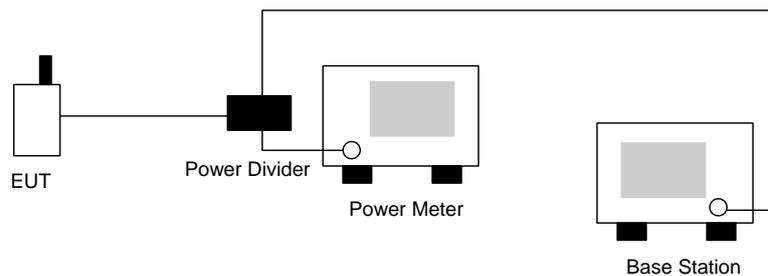
4.2.1 Measurement Instruments

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 through power divider.
- 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	128	824.2 (Low)	31.90	1.549
	189	836.4 (Mid)	31.80	1.514
	251	848.8 (High)	31.50	1.413
GSM1900	512	1850.2 (Low)	29.88	0.973
	661	1880.0 (Mid)	30.16	1.038
	810	1909.8 (High)	29.80	0.955



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 tutable 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.

$E_t = R_t + AF$

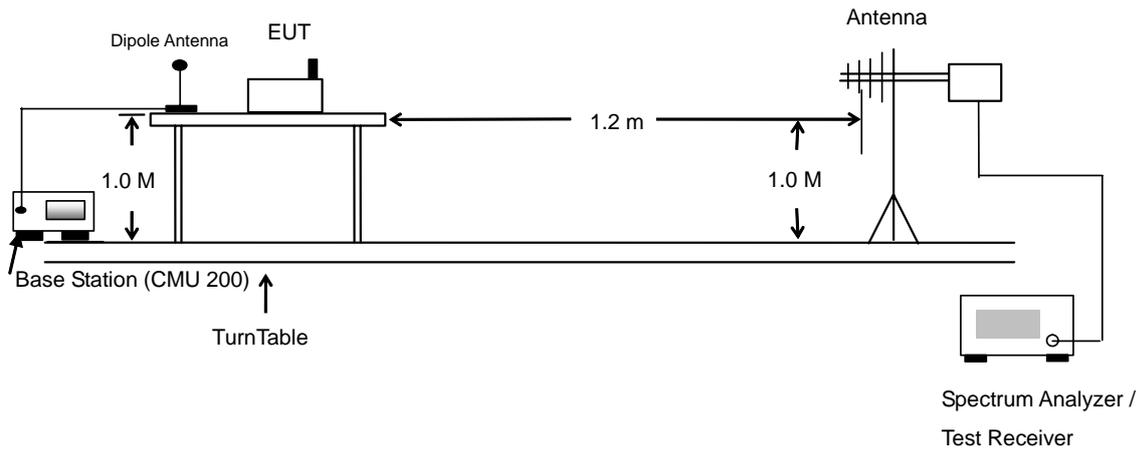
$E_s = R_s + AF$

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 Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-19.45	-48.12	0.00	-1.08	27.59	0.57
836.40	-19.20	-48.28	0.00	-0.93	28.15	0.65
848.80	-18.57	-48.35	0.00	-0.76	29.02	0.80
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-33.14	-47.97	0.00	-1.08	13.75	0.02
836.40	-32.58	-48.01	0.00	-0.93	14.50	0.03
848.80	-31.60	-48.05	0.00	-0.76	15.69	0.04

GSM1900 Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-24.82	-51.88	0.00	1.96	29.02	0.80
1880.00	-27.43	-52.99	0.00	2.00	27.56	0.57
1909.80	-29.42	-54.28	0.00	1.98	26.84	0.48
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-37.33	-52.13	0.00	1.96	16.76	0.05
1880.00	-39.79	-53.17	0.00	2.00	15.38	0.03
1909.80	-40.64	-54.13	0.00	1.98	15.47	0.04

4.4 Occupied Bandwidth and Band Edge Measurement

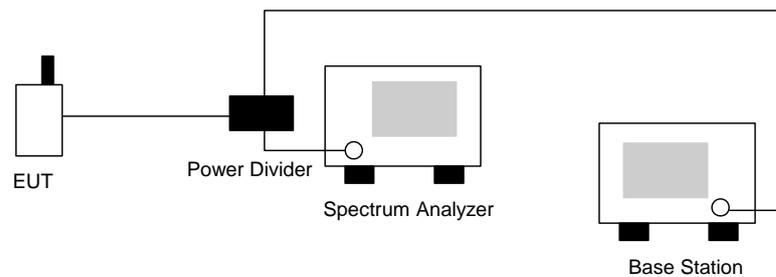
4.4.1 Measurement Instruments

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



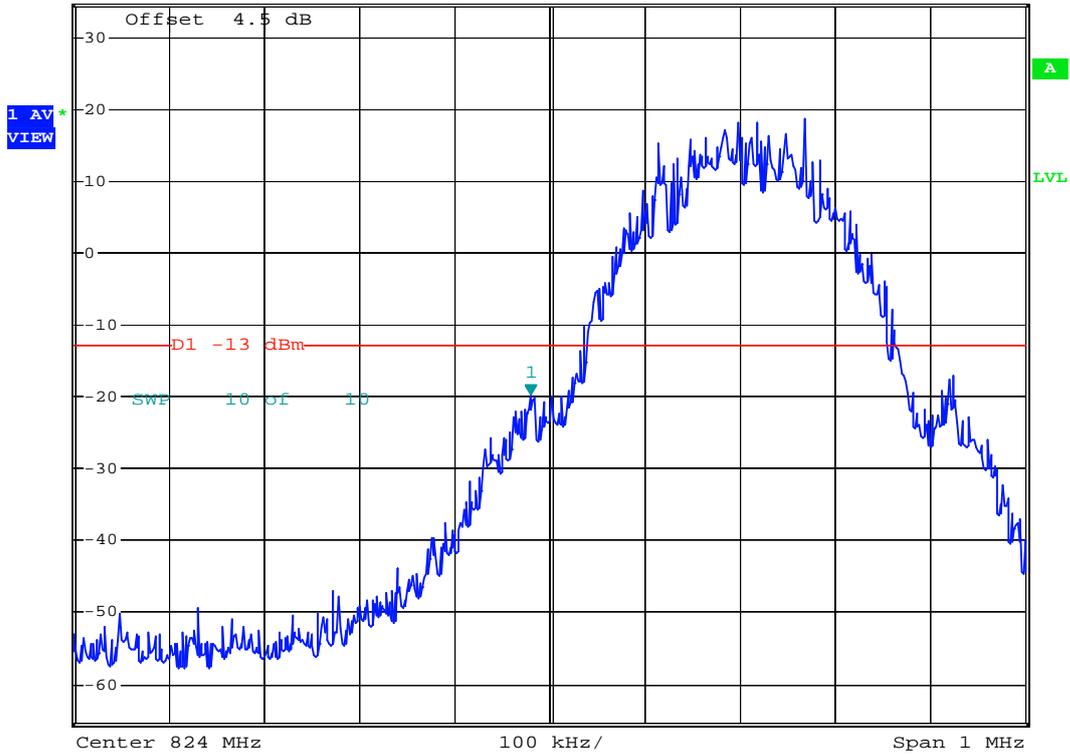


4.4.4 Test Result

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



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz -19.83 dBm
 *SWT 300 ms 823.98000000 MHz



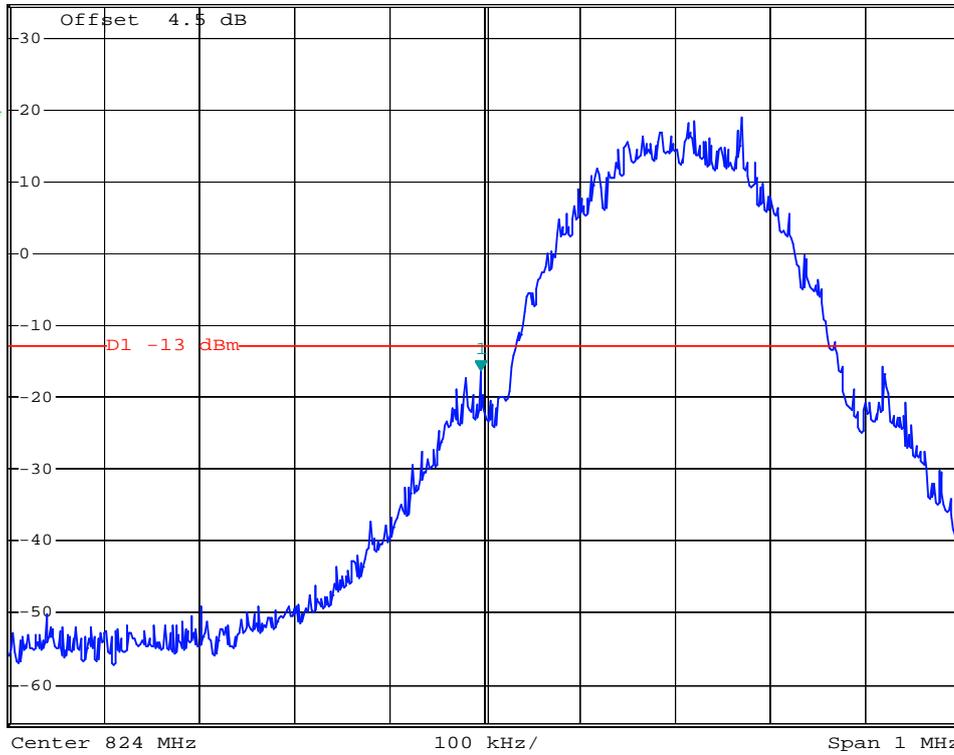
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*RBW 3 kHz Marker 1 [T1]
*VBW 3 kHz -16.39 dBm
*SWT 300 ms 823.996000000 MHz

Ref 34.5 dBm *Att 40 dB

1 AV *
VIEW



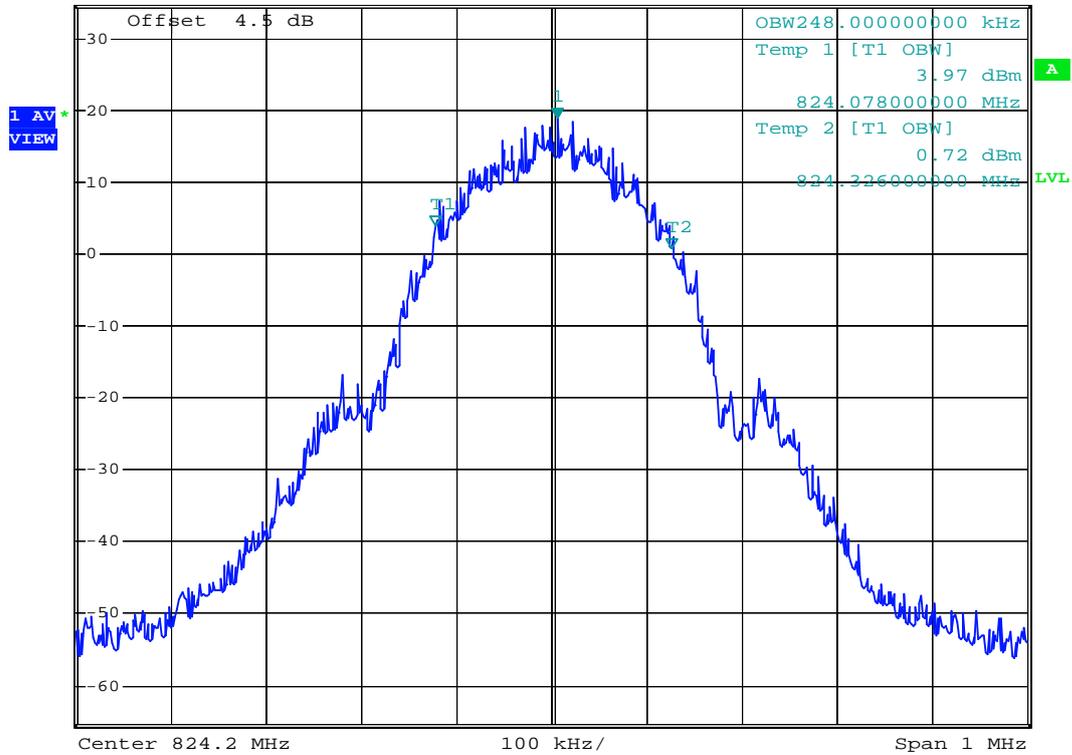
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- Test Mode : GSM850 (GSM) CH128 99% Occupied Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 18.84 dBm
 *SWT 300 ms 824.206000000 MHz



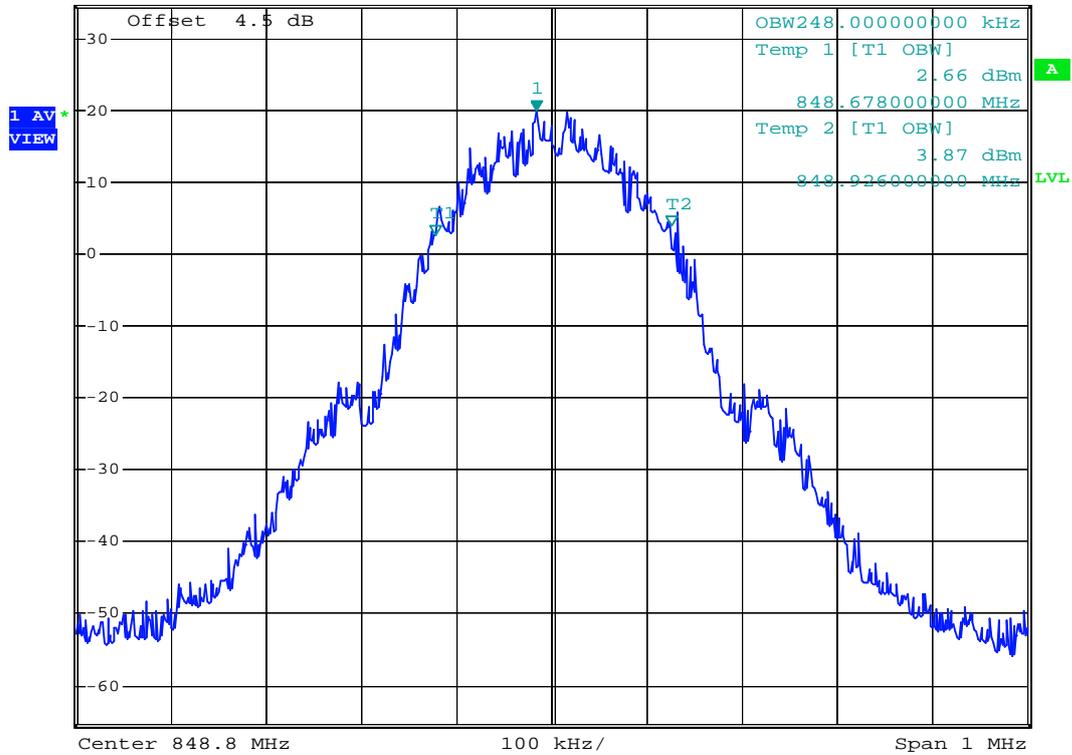
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- Test Mode : GSM850 (GSM) CH 251 99% Occupid Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 20.02 dBm
 *SWT 300 ms 848.784000000 MHz



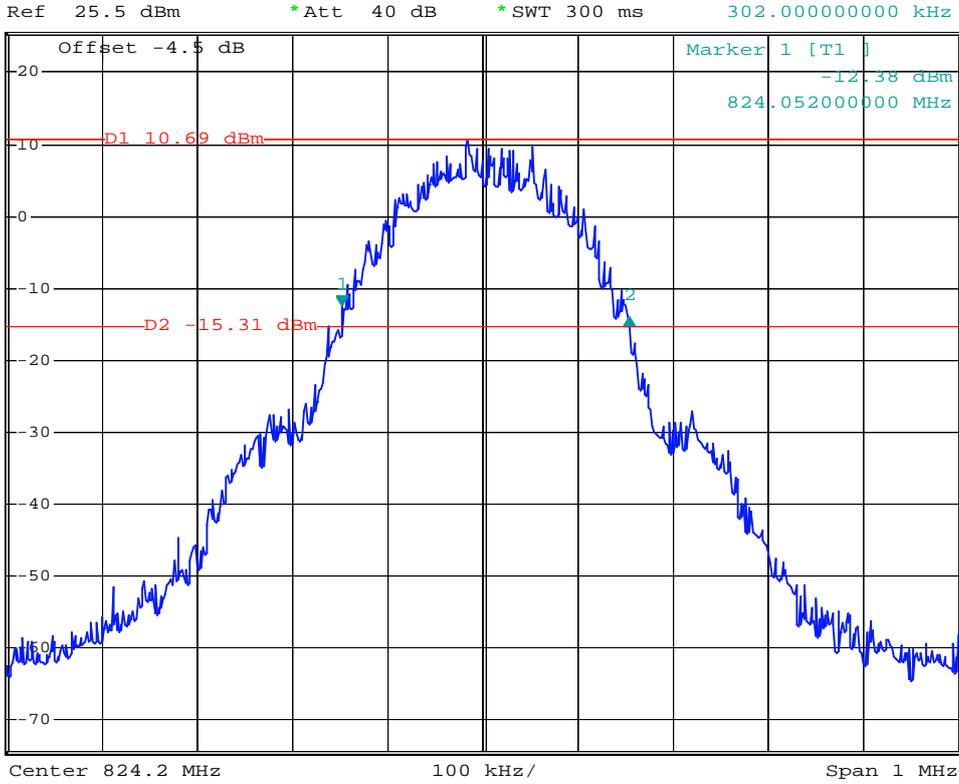
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- Test Mode : GSM850 (GSM) CH128 26dB Bandwidth
- Power State : High



*RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz -1.49 dB
 *SWT 300 ms 302.000000000 kHz



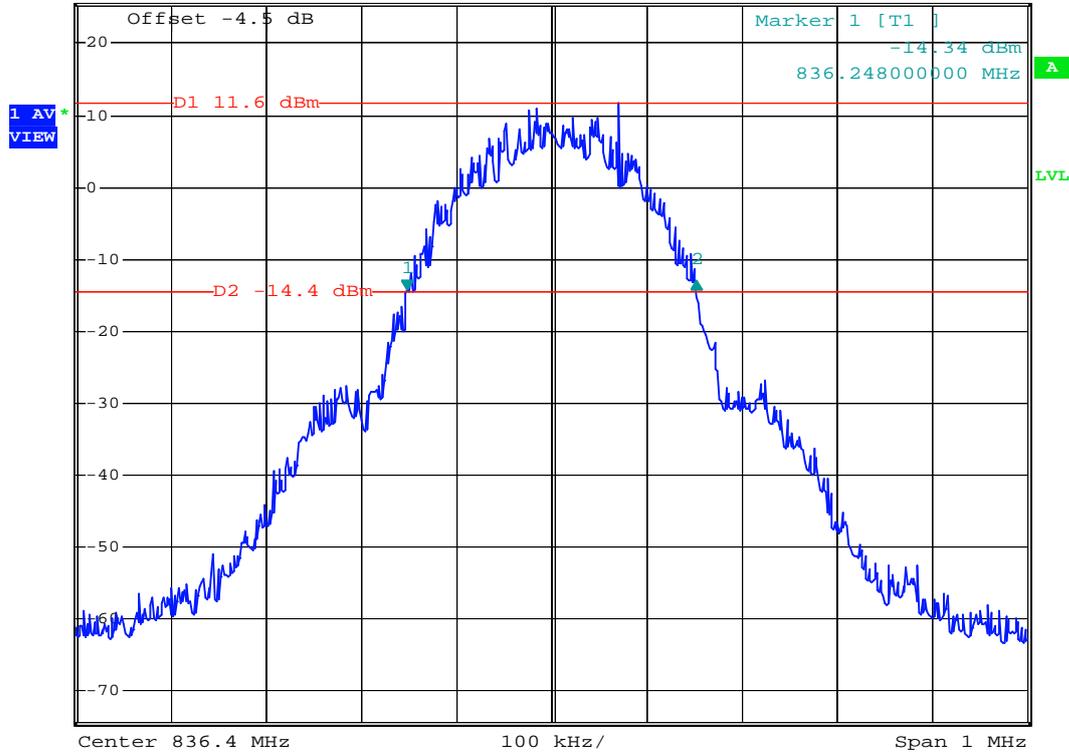
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- Test Mode : GSM850 (GSM) CH189 26dB Bandwidth
- Power State : High



Ref 25.5 dBm *Att 40 dB *RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz 1.29 dB
 *SWT 300 ms 304.000000000 kHz



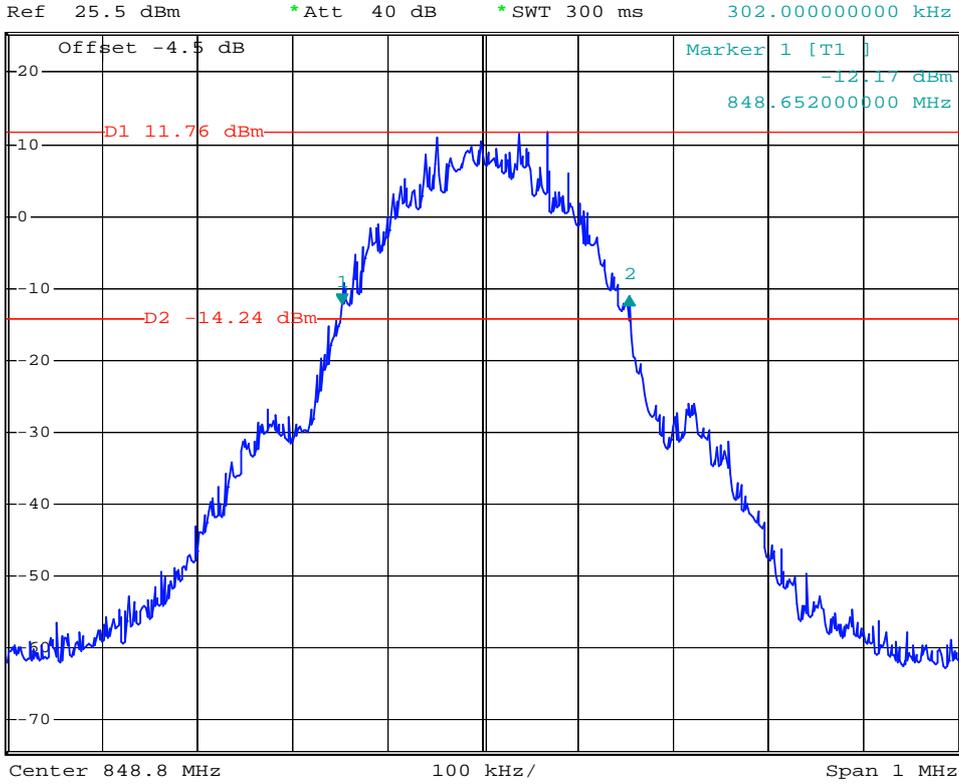
Date: 8.APR.2008 18:29:17



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



*RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz 1.04 dB
 *SWT 300 ms 302.000000000 kHz



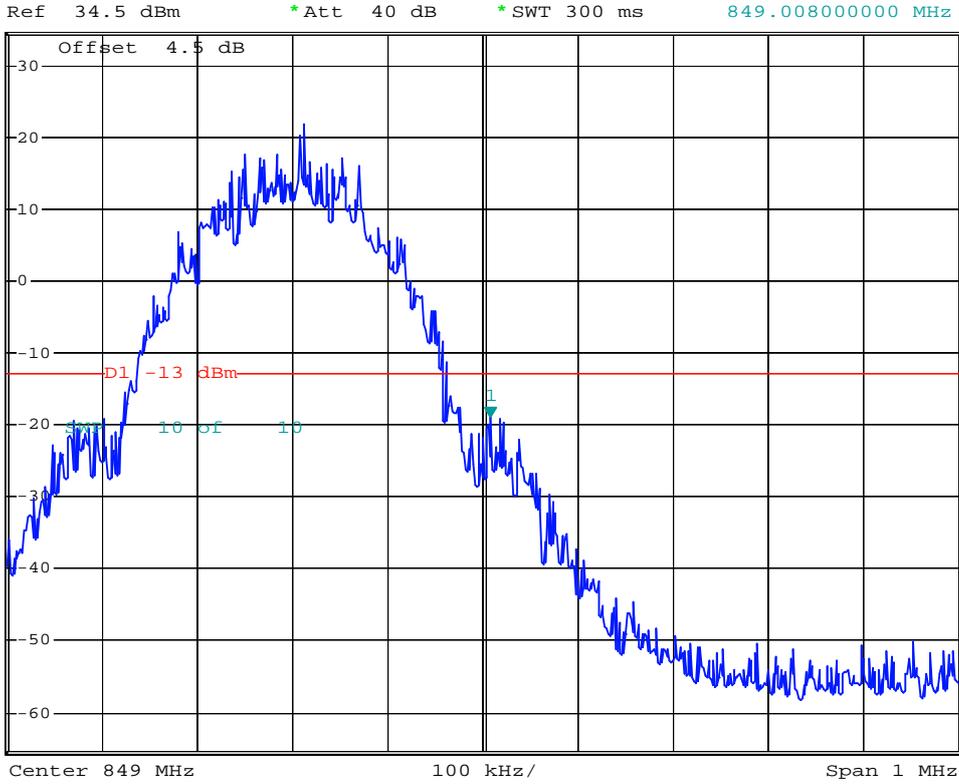
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- Test Mode : GSM850 (GSM) CH251 Higher Band Edge
- Power State : High



*RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz -18.85 dBm
 *SWT 300 ms 849.008000000 MHz



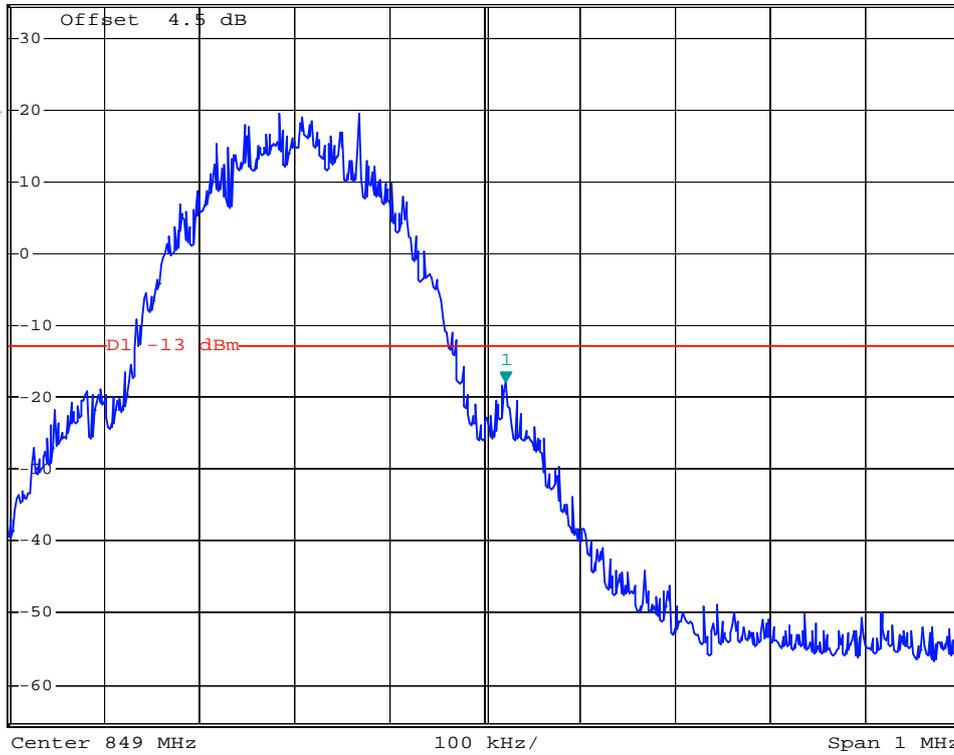
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*RBW 3 kHz Marker 1 [T1]
 *VBW 3 kHz -17.86 dBm
 *SWT 300 ms 849.022000000 MHz

Ref 34.5 dBm *Att 40 dB

1 AV *
 VIEW



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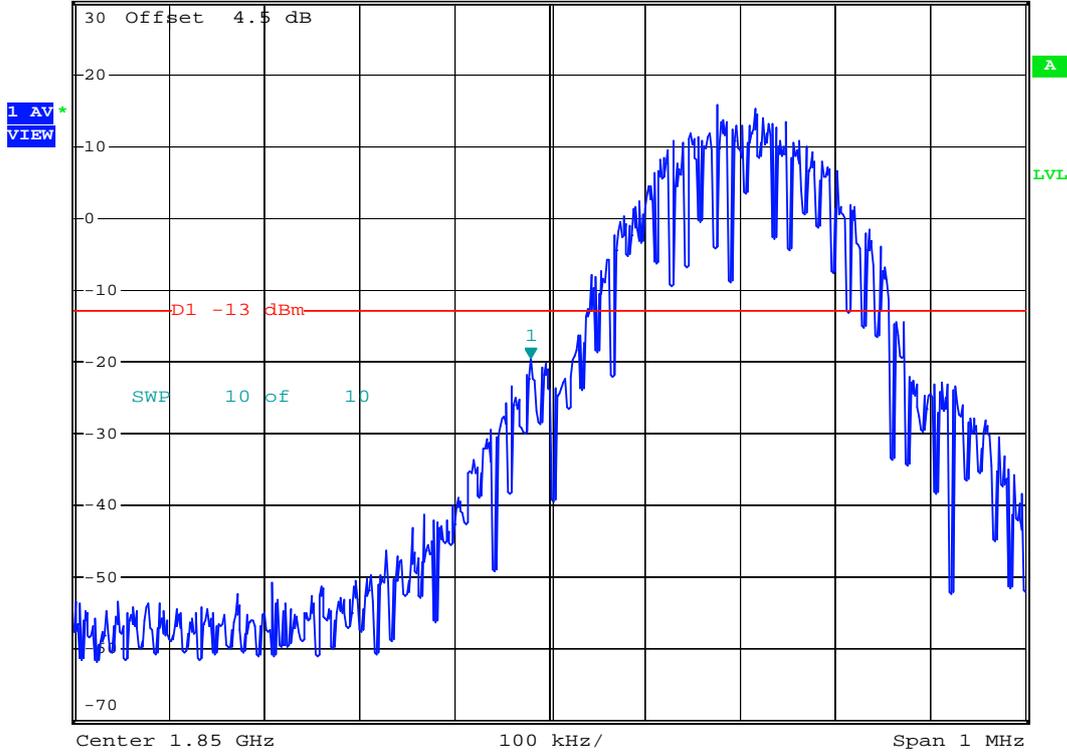
- Mode 2
- Test Mode : GSM1900 (GSM) CH512 Lower Band Edge
- Power State : High



*RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz -19.59 dBm
 *SWT 300 ms 1.849980000 GHz

Ref 30 dBm

*Att 40 dB



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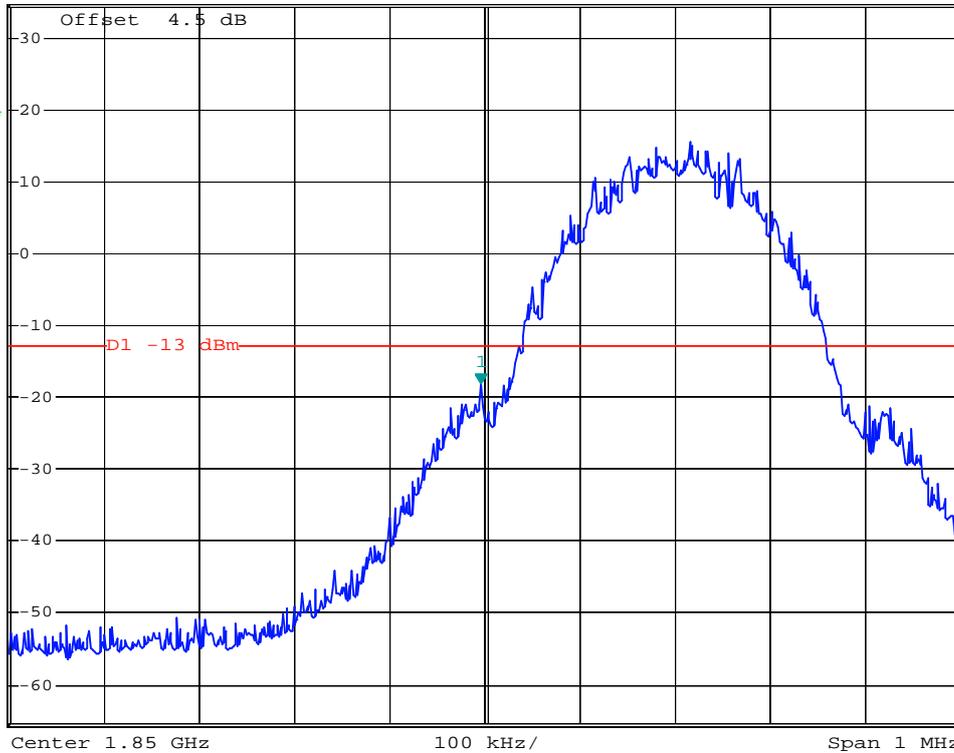


*RBW 3 kHz Marker 1 [T1]
*VBW 3 kHz -18.24 dBm
*SWT 300 ms 1.849996000 GHz

Ref 34.5 dBm

*Att 40 dB

1 AV *
VIEW



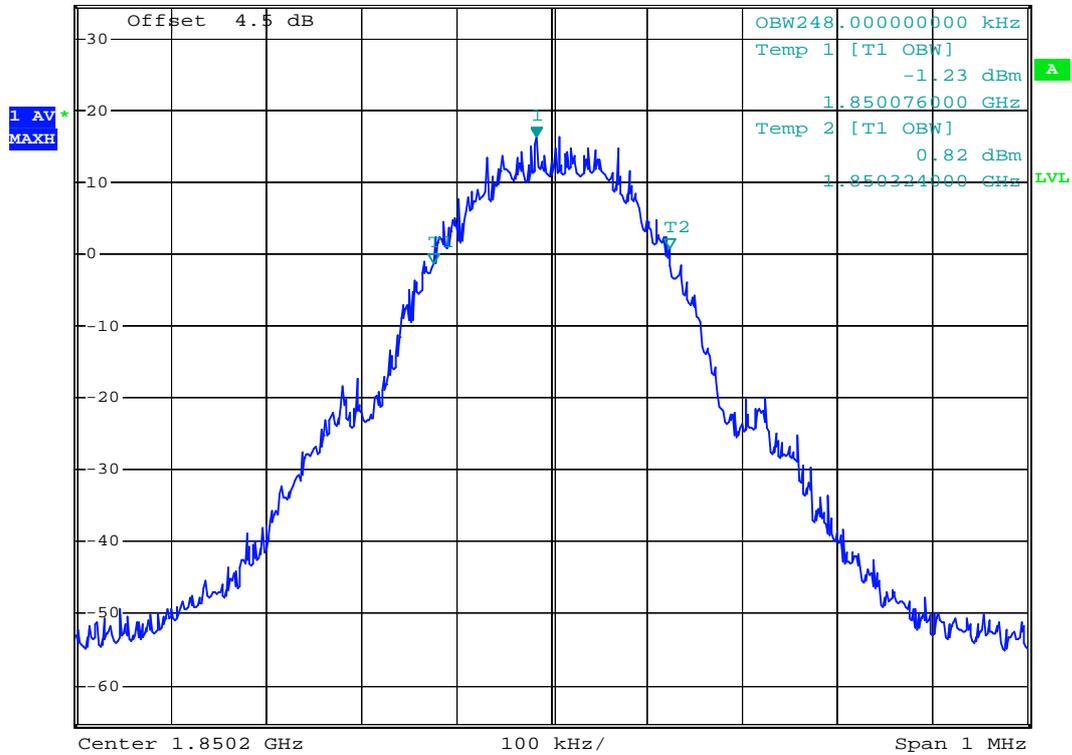
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- Test Mode : GSM1900 (GSM) CH512 99% Occupied Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 16.37 dBm
 *SWT 300 ms 1.850184000 GHz



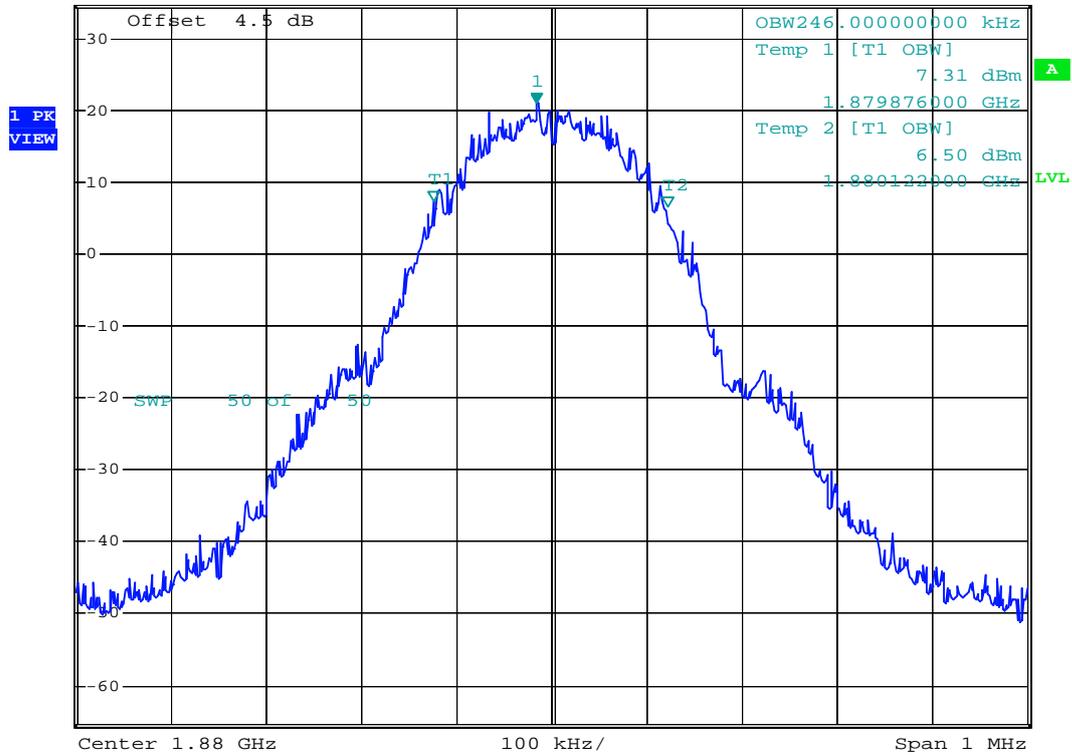
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- Test Mode : GSM1900 (GSM) CH661 99% Occupied Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
 *VBW 30 kHz 21.03 dBm
 *SWT 300 ms 1.879984000 GHz



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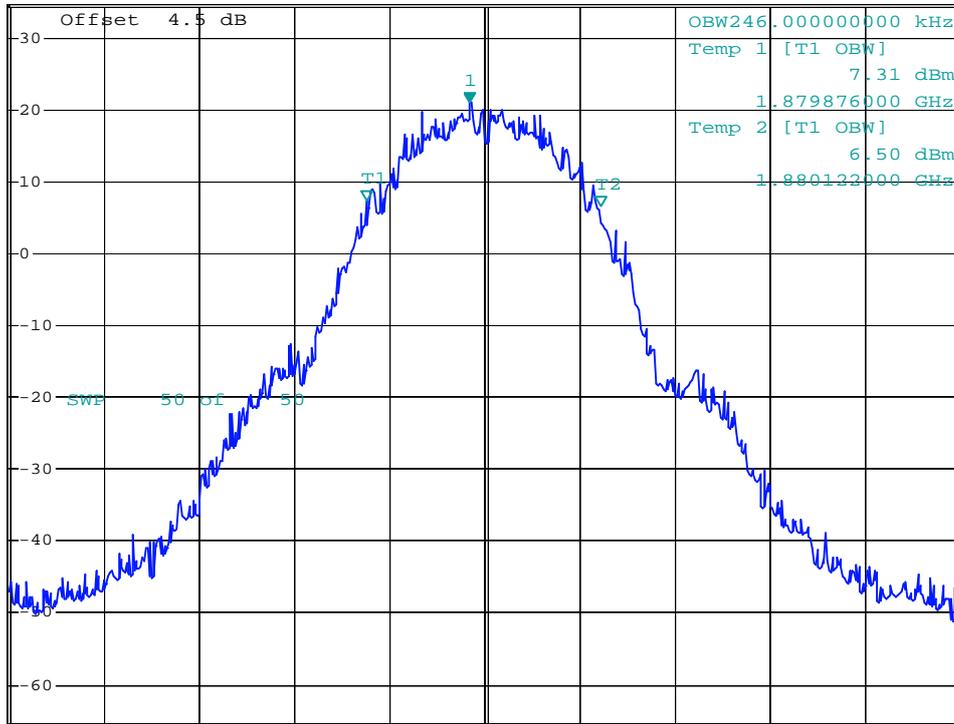


*RBW 3 kHz Marker 1 [T1]
 *VBW 30 kHz 21.03 dBm
 *SWT 300 ms 1.879984000 GHz

Ref 34.5 dBm

*Att 40 dB

1 PK
VIEW



Center 1.88 GHz

100 kHz/

Span 1 MHz

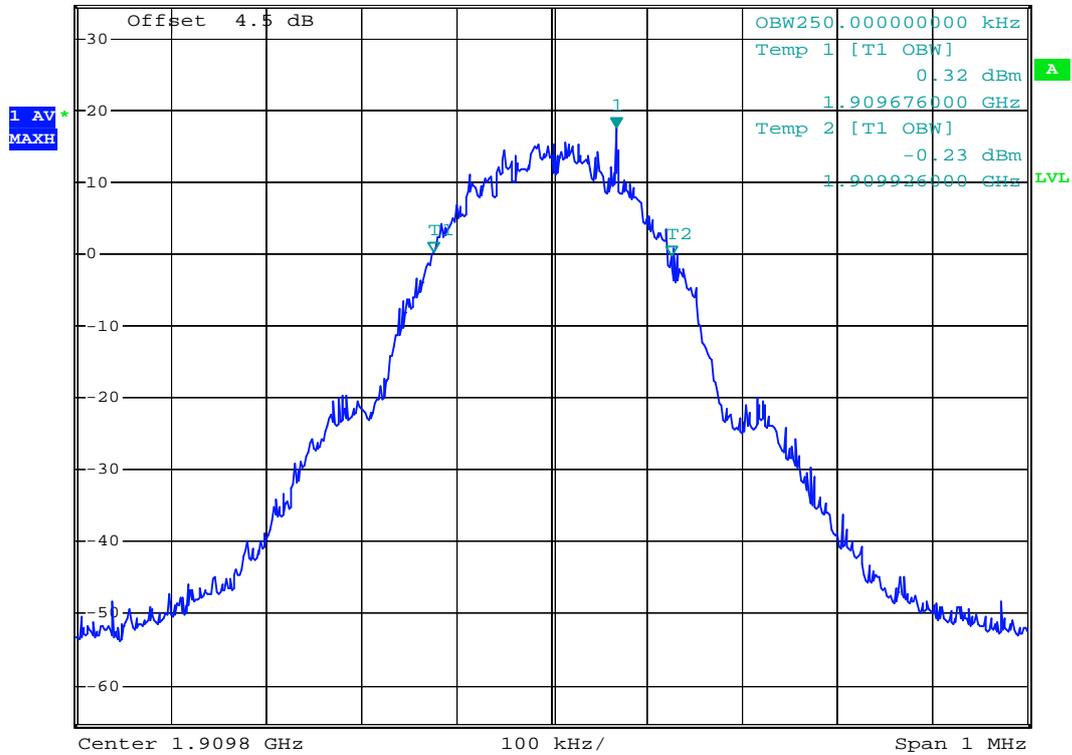
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- Test Mode : GSM1900 (GSM) CH810 99% Occupied Bandwidth
- Power State : High



Ref 34.5 dBm *Att 40 dB *RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 17.58 dBm
 *SWT 300 ms 1.909868000 GHz



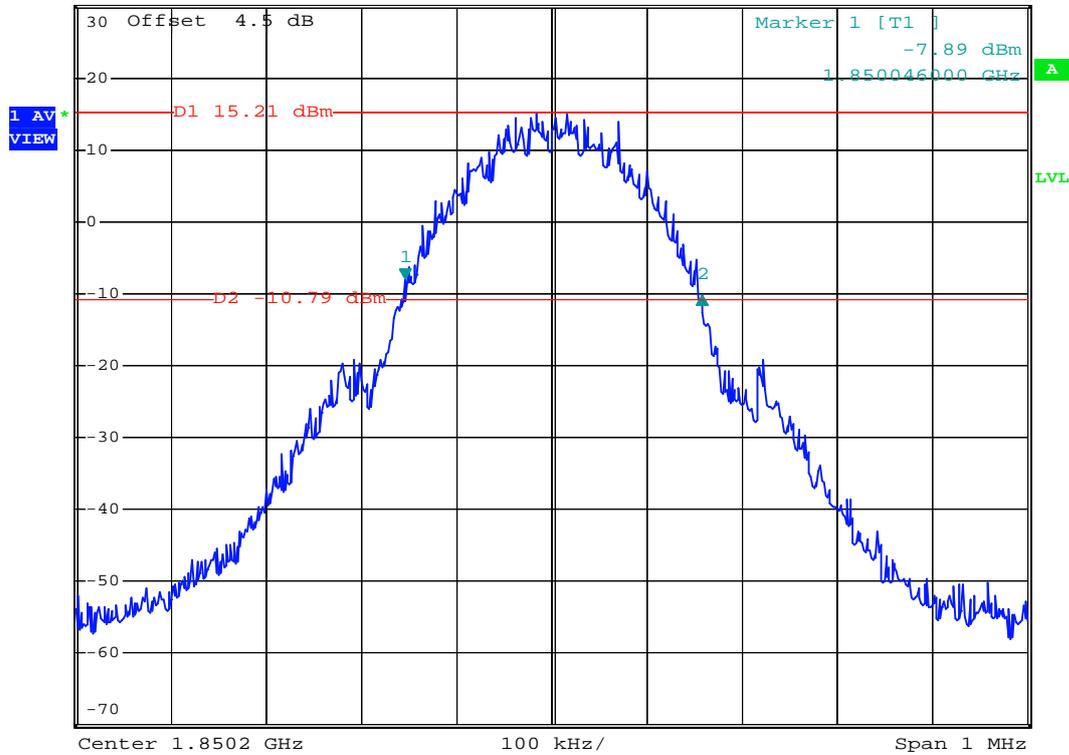
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- Test Mode : GSM1900 (GSM) CH512 26dB Bandwidth
- Power State : High



Ref 30 dBm *Att 40 dB *RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz -2.32 dB
 *SWT 300 ms 312.000000000 kHz



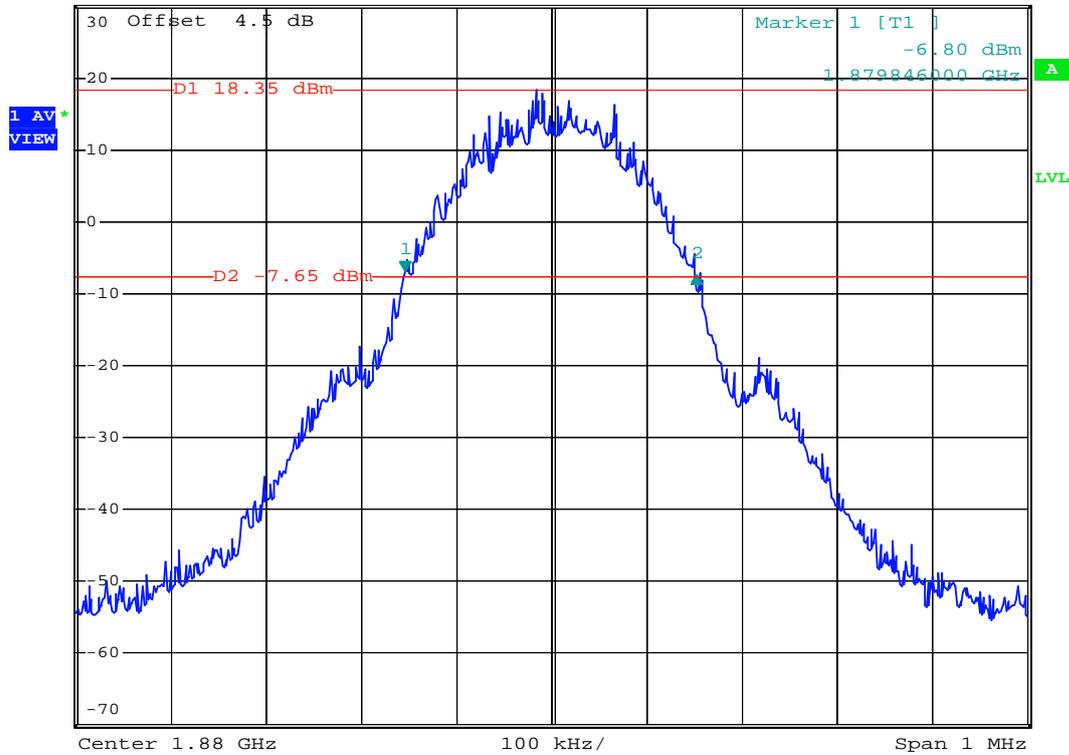
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- Test Mode : GSM1900 (GSM) CH661 26dB Bandwidth
- Power State : High



Ref 30 dBm *Att 40 dB *RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz -0.50 dB
 *SWT 300 ms 306.000000000 kHz



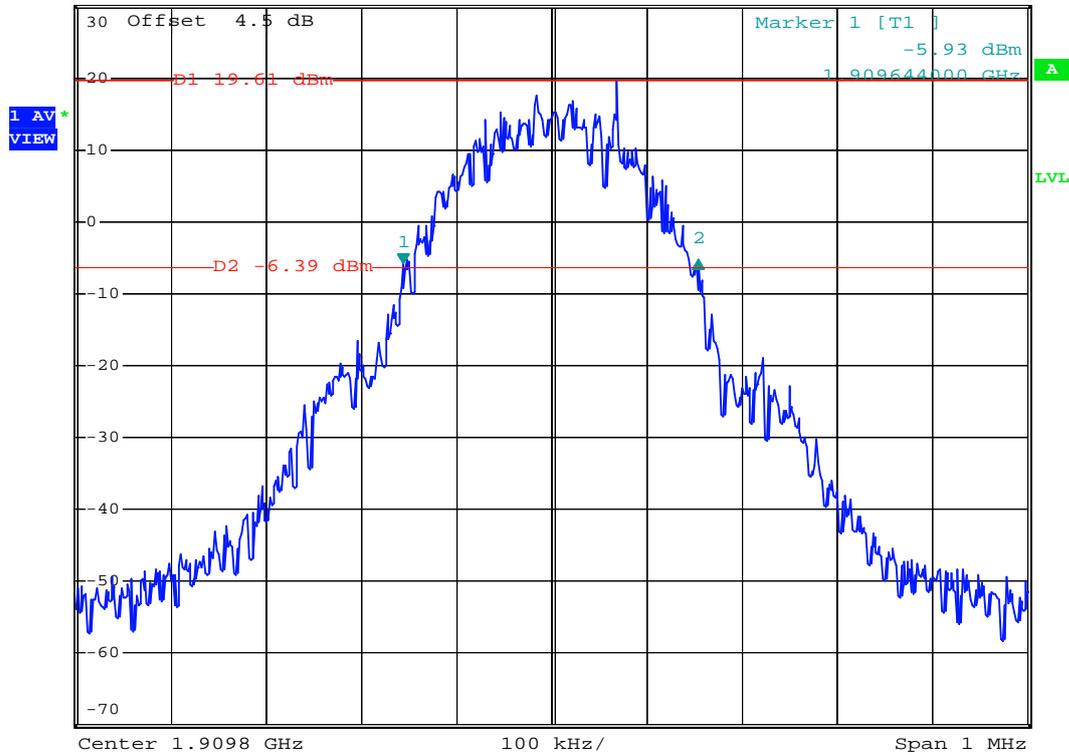
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- Test Mode : GSM1900 (GSM) CH810 26dB Bandwidth
- Power State : High



Ref 30 dBm *Att 40 dB *RBW 3 kHz Delta 2 [T1]
 *VBW 10 kHz 0.50 dB
 *SWT 300 ms 310.000000000 kHz



Date: 9.APR.2008 12:27:37



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

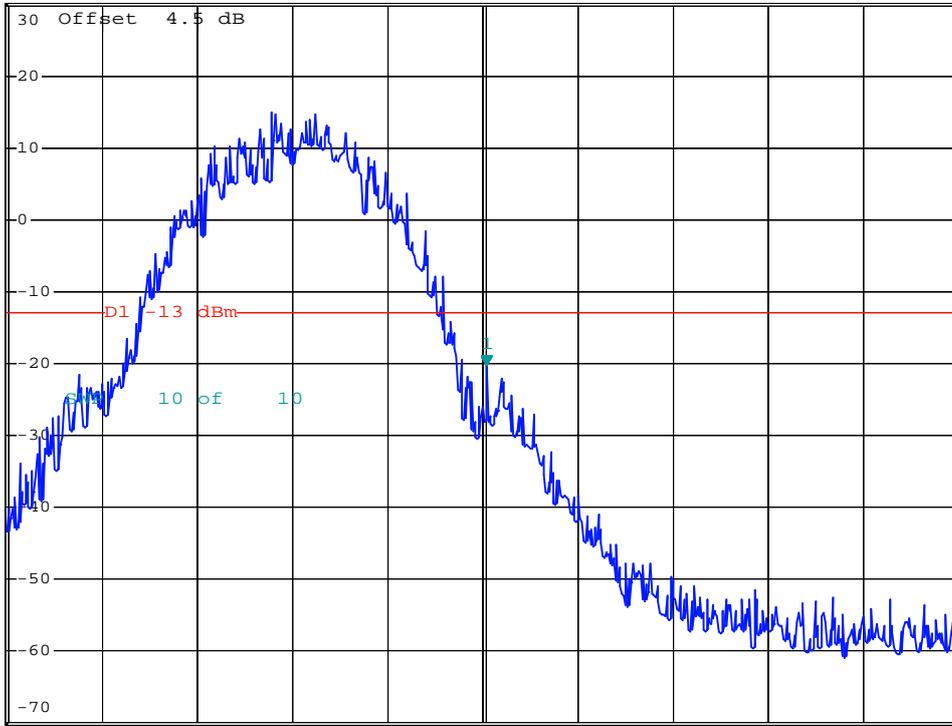


*RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz -20.18 dBm
 *SWT 300 ms 1.910004000 GHz

Ref 30 dBm

*Att 40 dB

1 AV*
VIEW



Center 1.91 GHz

100 kHz/

Span 1 MHz

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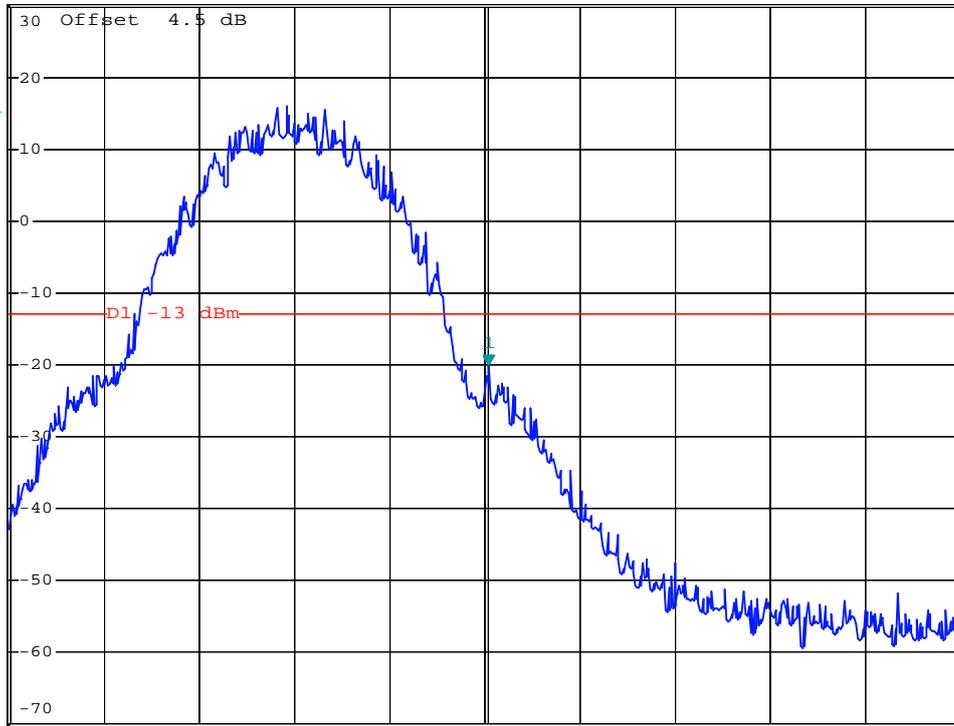


*RBW 3 kHz Marker 1 [T1]
 *VBW 3 kHz -19.96 dBm
 *SWT 300 ms 1.910004000 GHz

Ref 30 dBm

*Att 40 dB

1 AV*
VIEW



A
LVL

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4.5 Conducted Emission

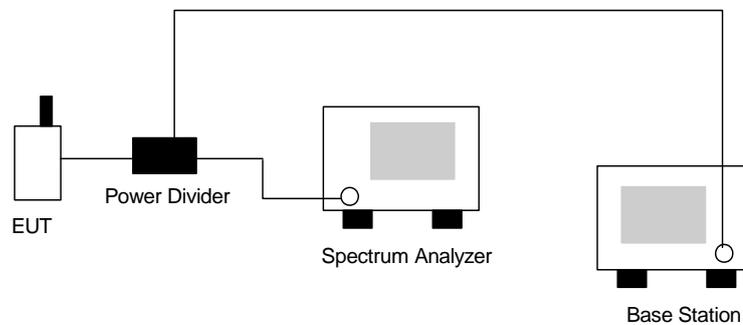
4.5.1 Measurement Instruments

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.

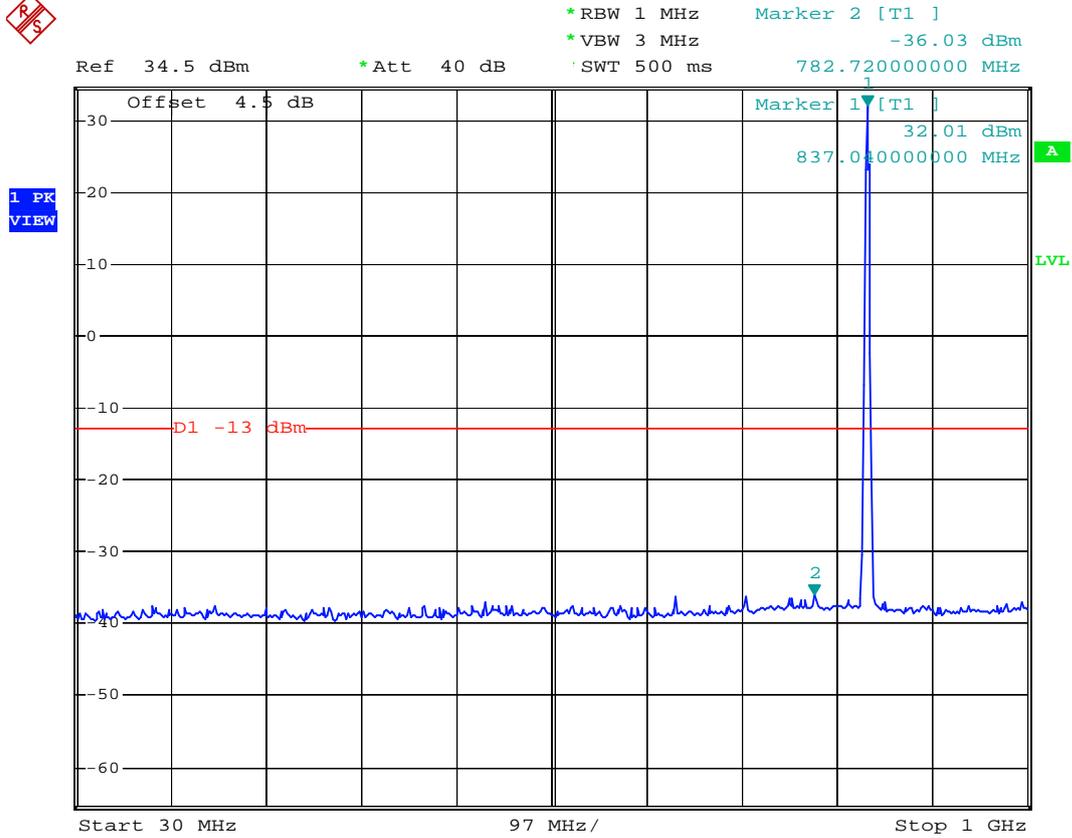
4.5.3 Test Setup Layout





4.5.4 Test Result

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



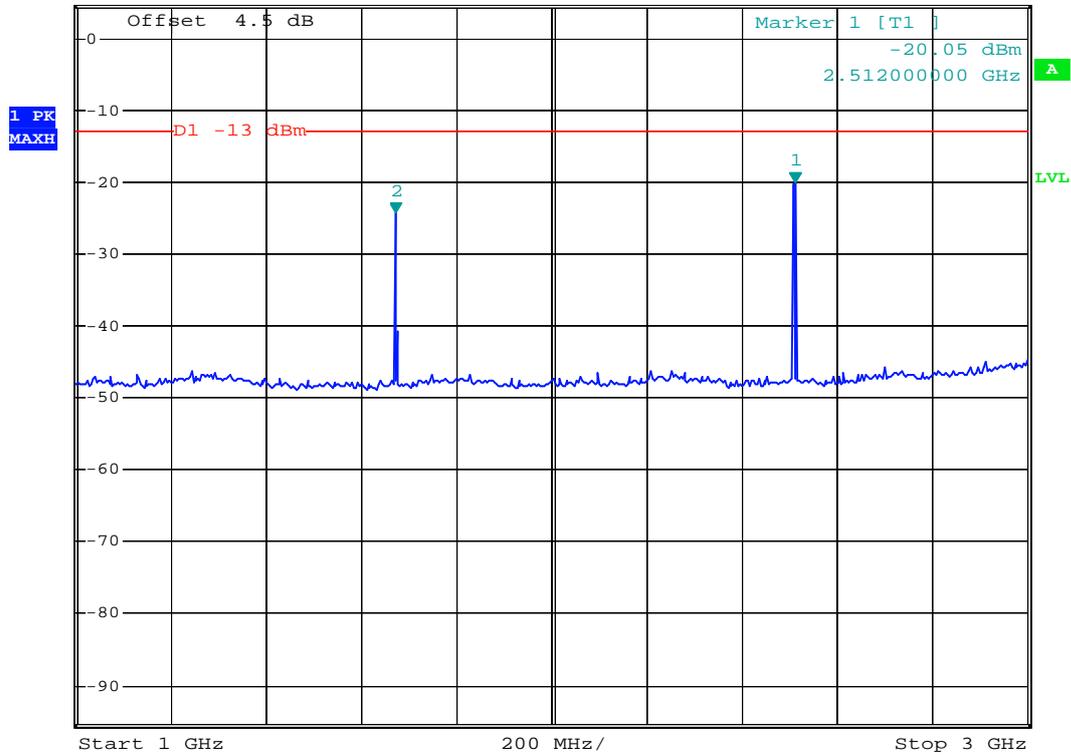
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- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 1G-3G



Ref 4.5 dBm Att 30 dB *RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -24.30 dBm
 *SWT 500 ms 1.672000000 GHz



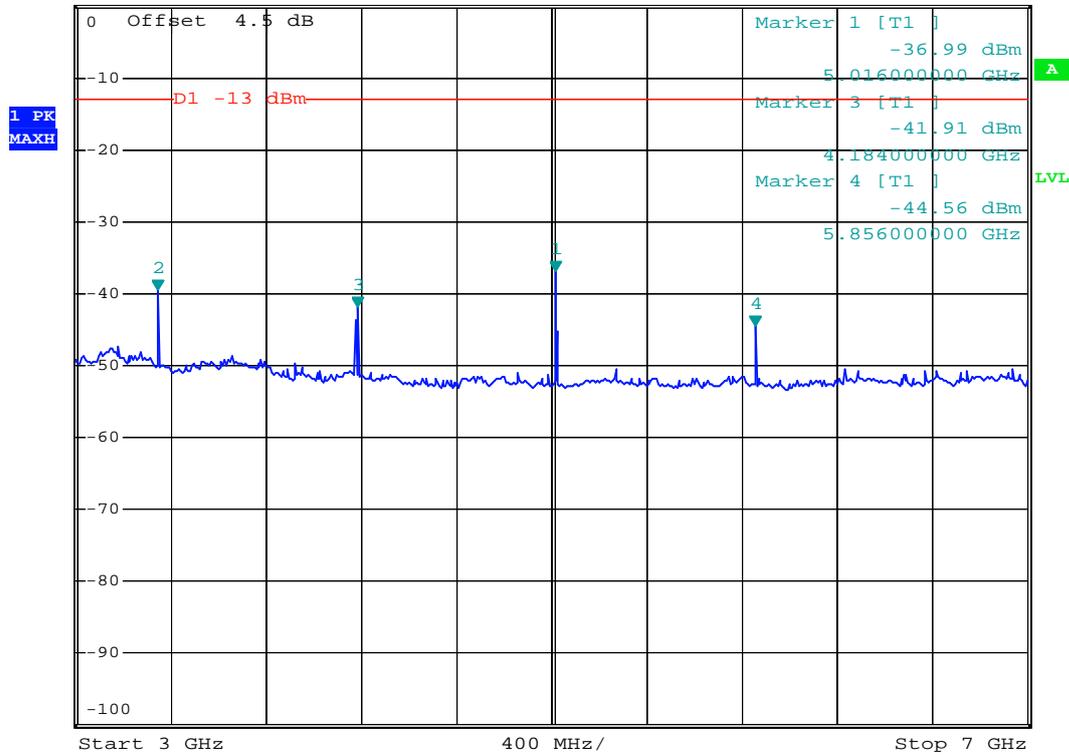
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- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 3G-7G



Ref 0 dBm *Att 20 dB *RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -39.50 dBm
 *SWT 500 ms 3.344000000 GHz



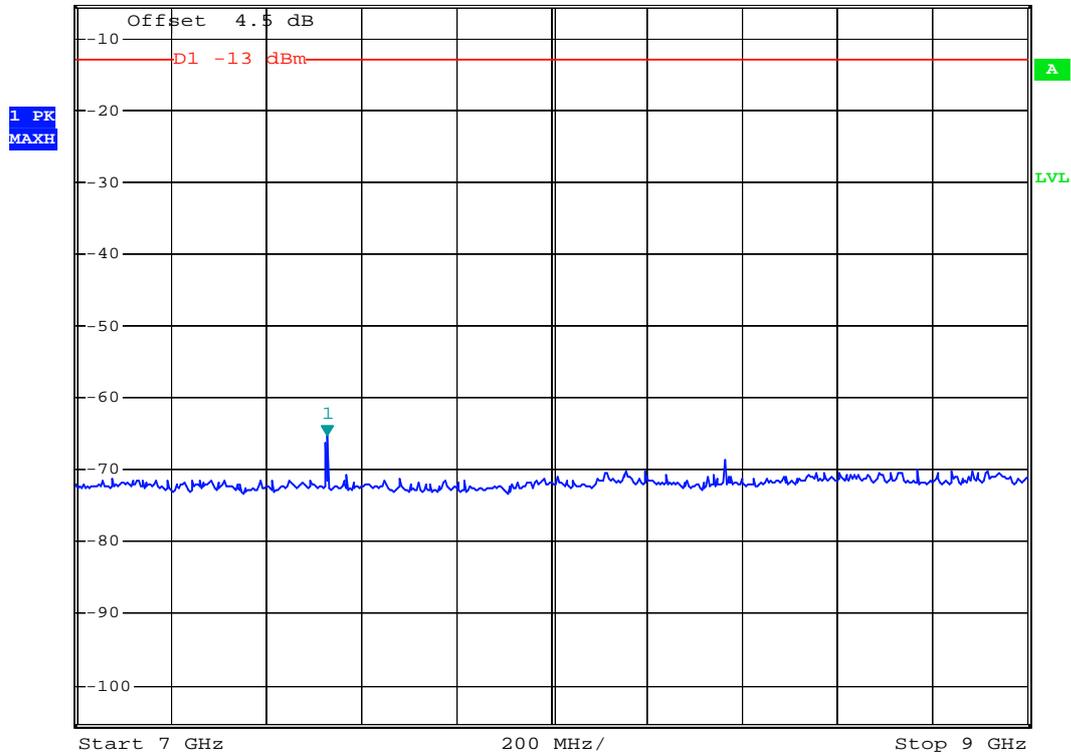
Date: 9.APR.2008 11:37:35



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



Ref -5.5 dBm *Att 0 dB *RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -65.19 dBm
SWT 500 ms 7.528000000 GHz



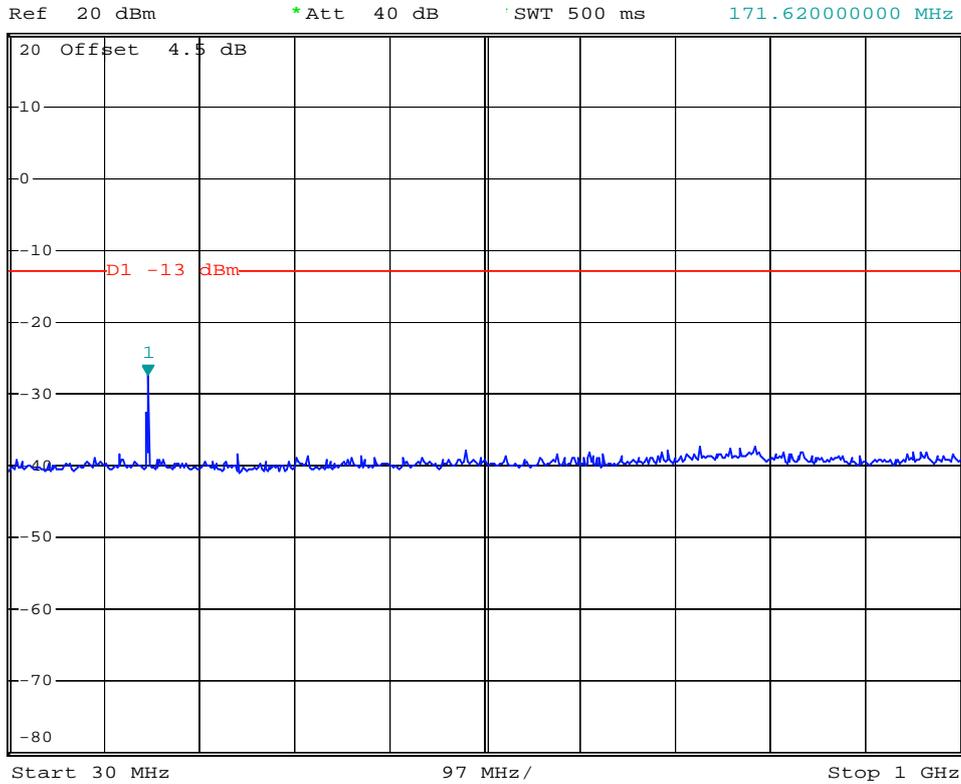
Date: 9.APR.2008 11:39:05



- Mode 3
- Test Mode : GSM1900 (GSM) CH661
- Frequency Range : 30M-1G



*RBW 1 MHz Marker 1 [T1]
 *VBW 3 MHz -27.35 dBm
 *SWT 500 ms 171.62000000 MHz



Date: 9.APR.2008 12:32:08

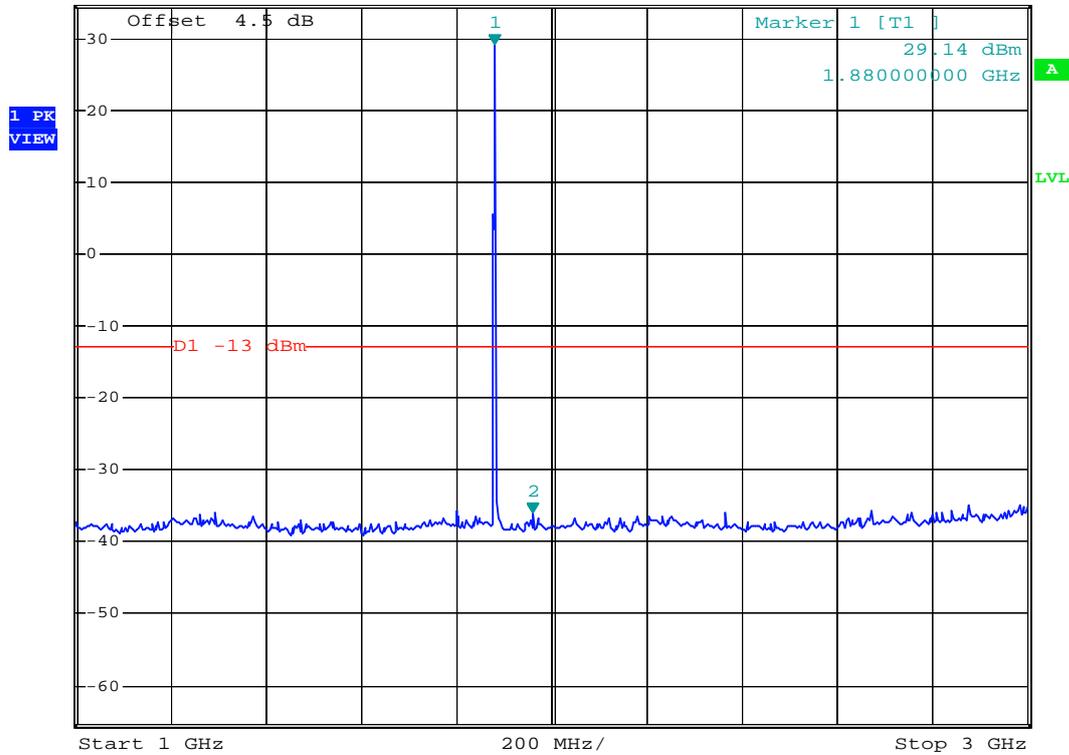


- Test Mode : GSM1900 (GSM) CH661
- Frequency Range : 1G-3G



*RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -36.08 dBm
 *SWT 500 ms 1.960000000 GHz

Ref 34.5 dBm *Att 40 dB



Date: 9.APR.2008 12:08:43

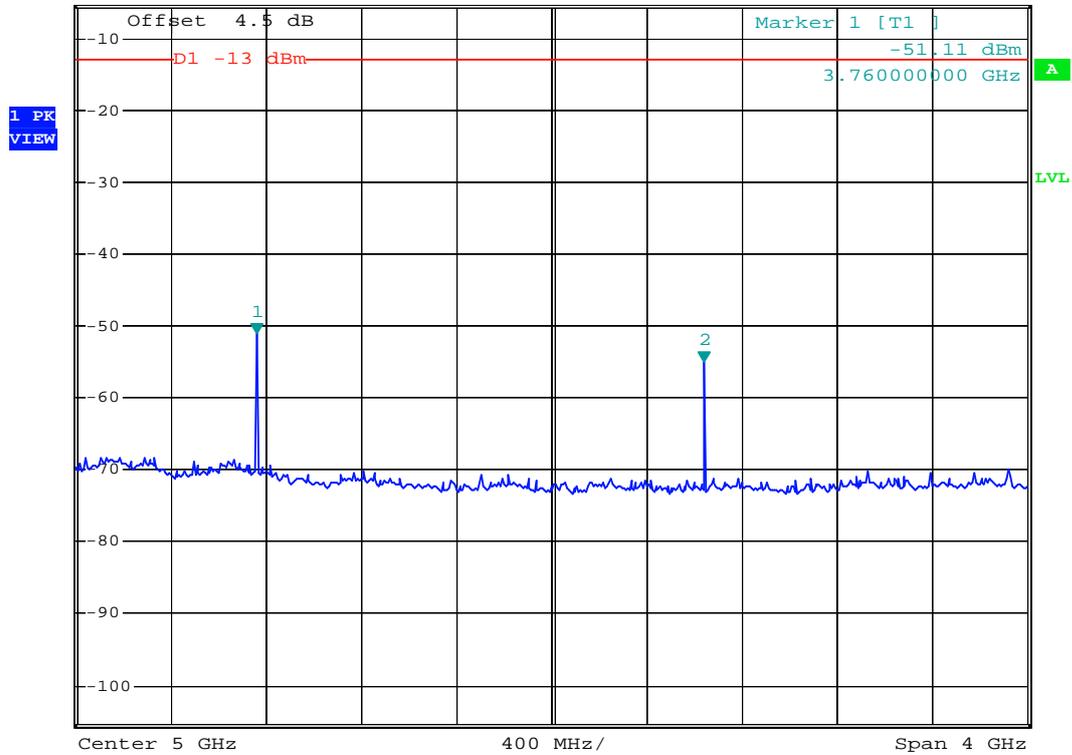


- Test Mode : GSM1900 (GSM) CH661
- Frequency Range : 3G-7G



*RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -54.98 dBm
 *SWT 500 ms 5.640000000 GHz

Ref -5.5 dBm *Att 0 dB



Date: 9.APR.2008 12:15:19



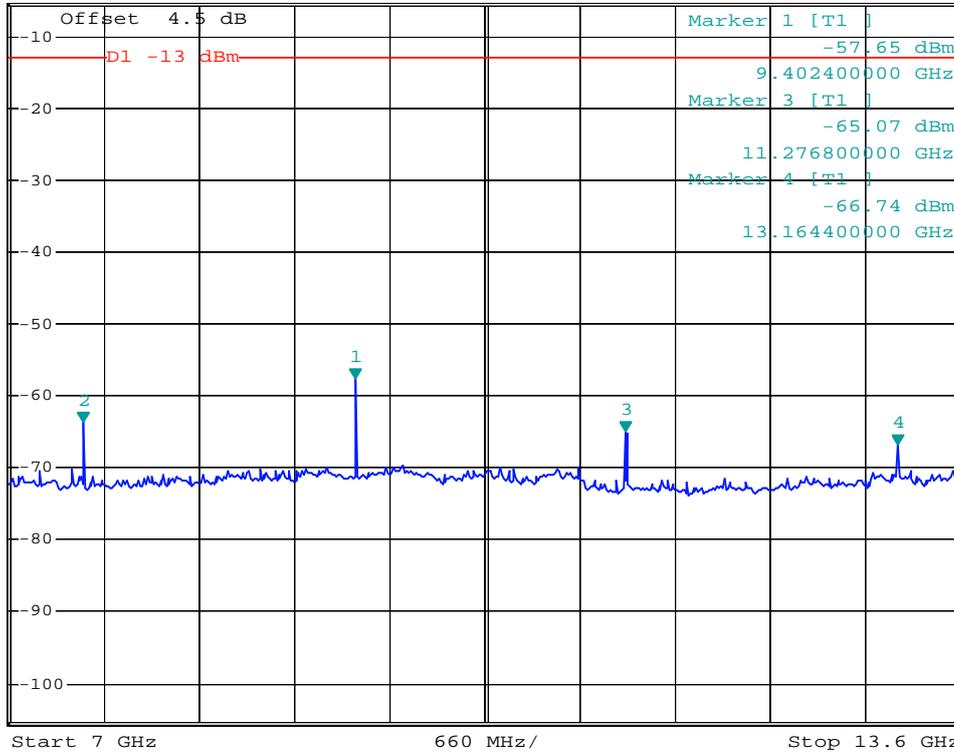
- Test Mode : GSM1900 (GSM) CH661
- Frequency Range : 7G-13.6G



*RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -63.75 dBm
 *SWT 500 ms 7.514800000 GHz

Ref -5.5 dBm *Att 0 dB

1 PK
VIEW



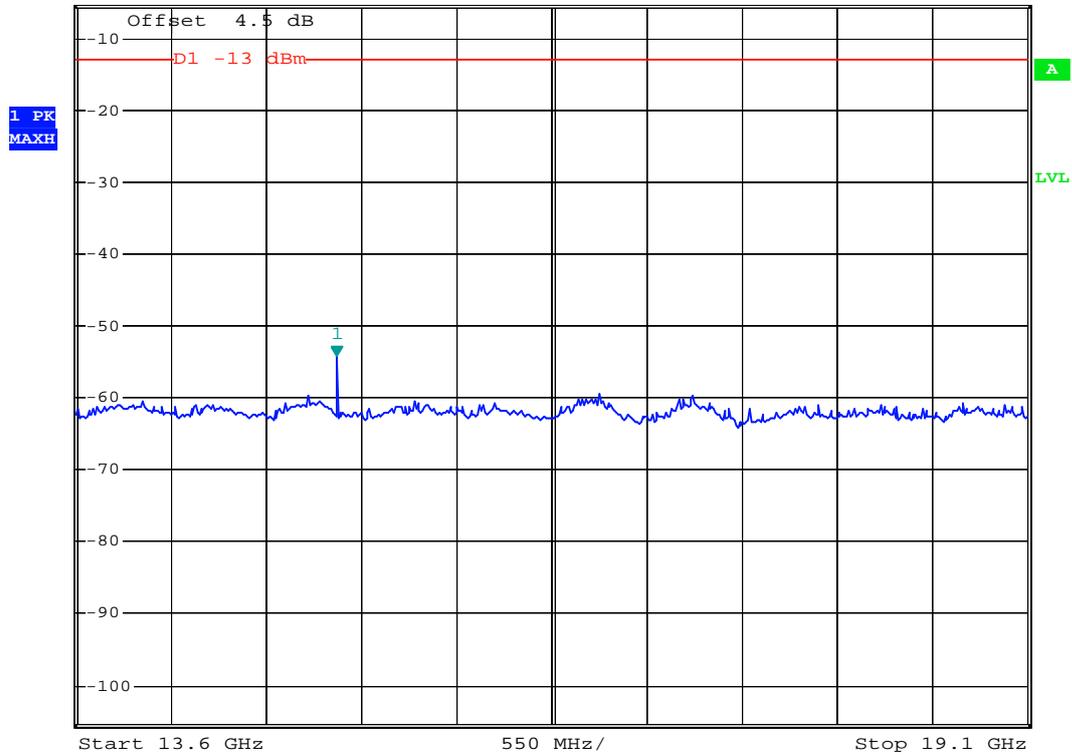
Date: 9.APR.2008 12:17:10



- Test Mode : GSM1900 (GSM) CH661
- Frequency Range : 13.6G-19.1G



Ref -5.5 dBm *Att 0 dB *RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -54.18 dBm
SWT 500 ms 15.107000000 GHz



Date: 9.APR.2008 12:30:52

4.6 Field Strength of Spurious Radiation

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

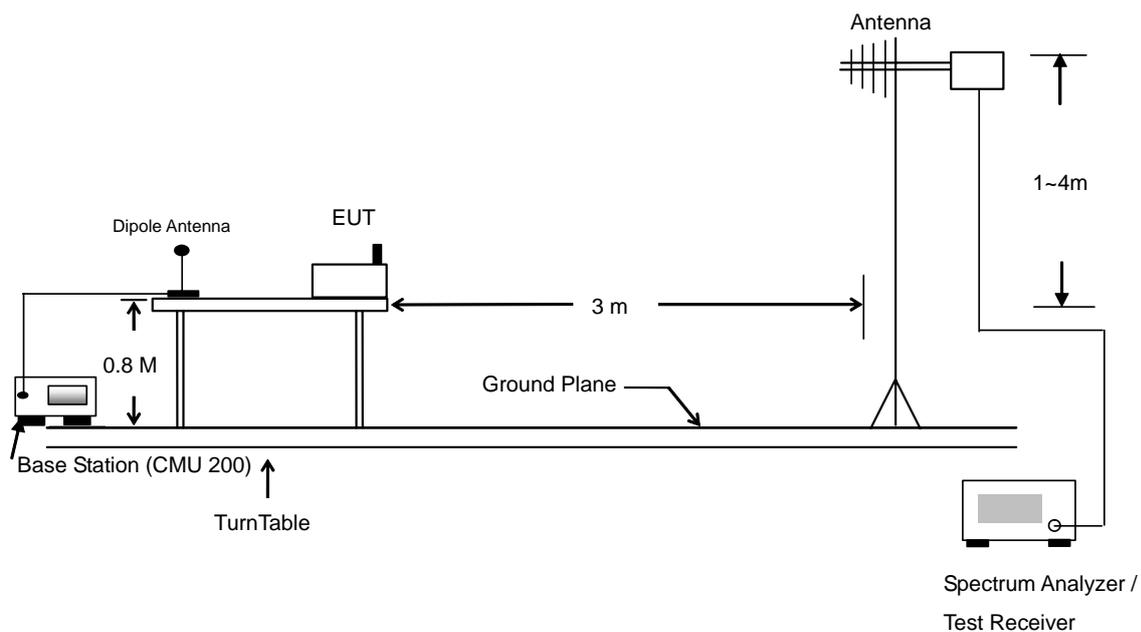
4.6.1 Measurement Instruments

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.

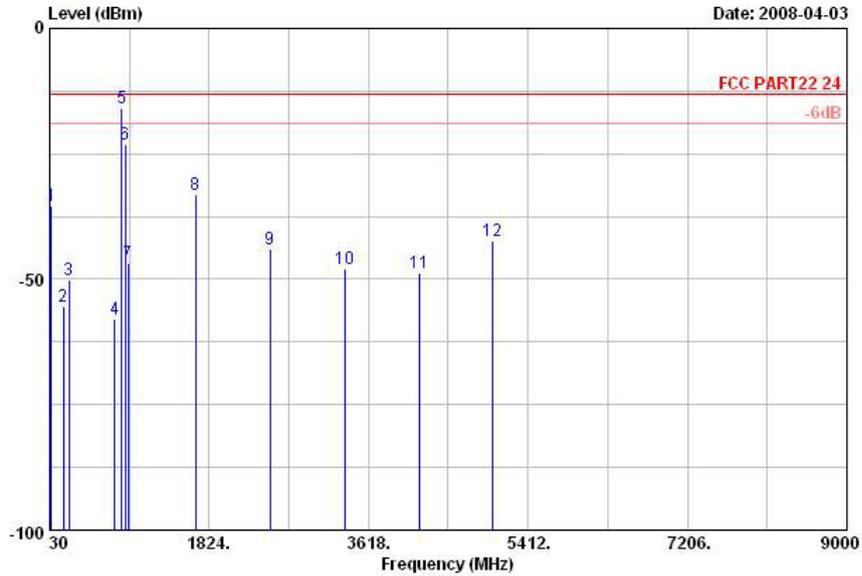
4.6.3 Test Setup Layout





4.6.4 Test Result Mode 1

Horizontal Polarization



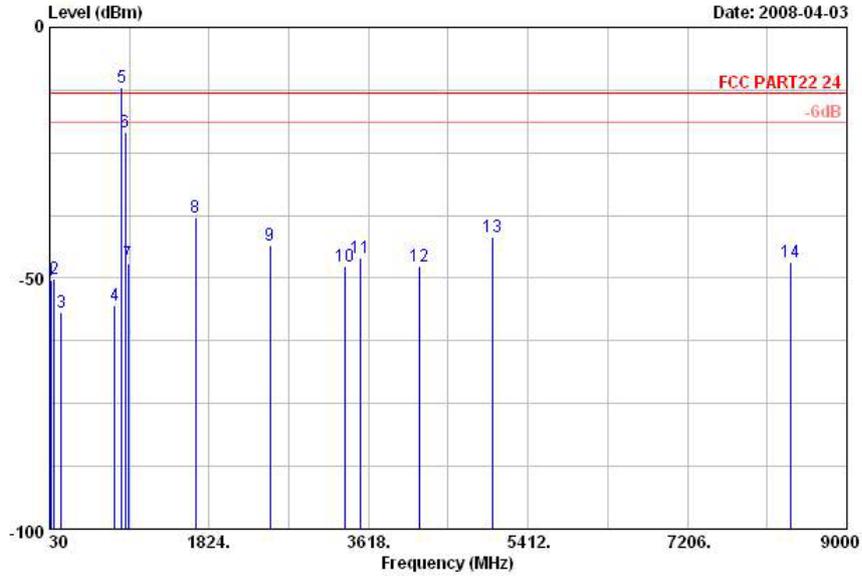
Site : 03CH01-KS
 Condition: FCC PART22 24 HF EIRP ANT-070911 LINE
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : T161L
 Memo : GSM850 Link+Adaptor

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
52.95	-37.60	-13	-4.61	-33.79	-0.37	-2.03	H	Pass
186.60	-57.58	-13	-64.01	-68.22	-0.64	12.15	H	Pass
250.05	-52.32	-13	-63.01	-64.06	-0.74	13.15	H	Pass
758.50	-60.11	-13	-62.01	-73.36	-1.25	14.15	H	Pass
836.90	-18.02	-13	-61.01	-32.26	-1.24	15.15	H	Pass
882.40	-25.19	-13	-60.01	-40.44	-1.25	16.15	H	Pass
914.60	-49.02	-13	-59.01	-65.29	-1.27	17.15	H	Pass
1672.00	-35.33	-13	-58.01	-53.12	-1.79	18.15	H	Pass
2510.00	-46.22	-13	-57.01	-65.41	-2.19	19.15	H	Pass
3346.00	-50.09	-13	-56.01	-70.56	-2.47	20.15	H	Pass
4184.00	-50.92	-13	-55.01	-72.86	-2.94	21.15	H	Pass
5018.00	-44.48	-13	-54.01	-67.75	-3.27	22.15	H	Pass

Remark : 836.90MHz is MS signal and 882.40MHz is BS signal.



Vertical Polarization



Site : 03CH01-KS
 Condition: FCC PART22 24 HF EIRP ANT-070911 NEUTRAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : T161L
 Memo : GSM850 Link+Adaptor

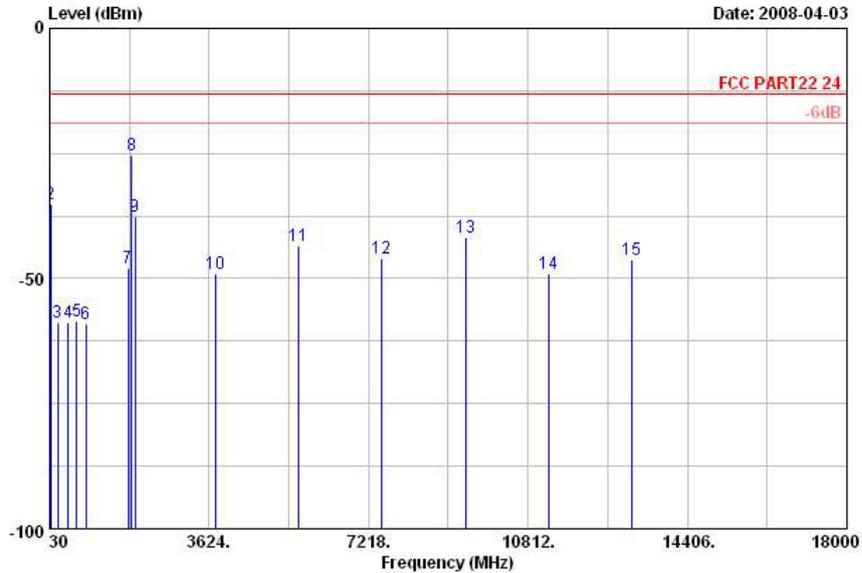
Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
51.06	-52.47	-13	-53.19	-47.95	-0.36	-2.73	V	Pass
78.06	-52.34	-13	-48.96	-52.41	-0.47	1.75	V	Pass
157.71	-58.91	-13	-54.69	-61.97	-0.59	4.62	V	Pass
758.50	-57.48	-13	-63.14	-64.49	-1.25	7.91	V	Pass
836.90	-14.22	-13	-24.78	-21.91	-1.24	8.60	V	Pass
881.70	-23.10	-13	-31.93	-30.98	-1.25	8.78	V	Pass
914.60	-49.10	-13	-56.94	-57.14	-1.27	8.92	V	Pass
1674.00	-40.14	-13	-42.46	-48.72	-1.79	8.94	V	Pass
2510.00	-45.60	-13	-53.88	-55.94	-2.19	10.30	V	Pass
3346.00	-49.80	-13	-58.05	-60.35	-2.47	10.23	V	Pass
3526.00	-48.18	-13	-56.88	-58.81	-2.55	10.23	V	Pass
4184.00	-49.66	-13	-60.44	-61.61	-2.94	11.16	V	Pass
5020.00	-44.03	-13	-56.19	-56.16	-3.27	11.01	V	Pass
8366.00	-48.81	-13	-65.07	-63.43	-4.09	12.68	V	Pass

Remark : 836.90MHz is MS signal and 881.70MHz is BS signal.



4.6.4.1 Mode 2

Horizontal Polarization



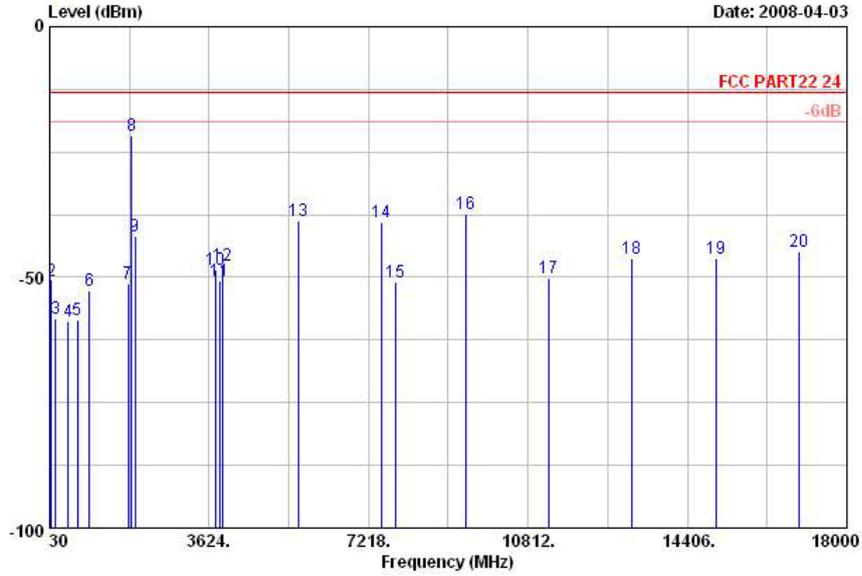
Site : 03CH01-KS
 Condition: FCC PART22 24 HF EIRP ANT-070911 LINE
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : T161L
 Memo : PCS1900 Link +Adaptor

Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
30.00	-29.87	-13	-44.56	-9.85	-0.28	-18.15	H	Pass
49.17	-34.96	-13	-39.2	-29.35	-0.34	-3.80	H	Pass
212.79	-58.70	-13	-60.19	-65.17	-0.70	7.92	H	Pass
456.10	-58.79	-13	-71.2	-64.53	-0.98	6.91	H	Pass
647.20	-58.45	-13	-71.71	-64.86	-1.05	7.51	H	Pass
853.00	-59.01	-13	-72.19	-66.75	-1.24	8.65	H	Pass
1802.00	-47.87	-13	-53.44	-56.73	-1.87	9.14	H	Pass
1880.00	-25.34	-13	-31.57	-34.37	-1.92	9.26	H	Pass
1960.00	-37.69	-13	-44.38	-46.83	-1.95	9.34	H	Pass
3760.00	-48.96	-13	-60.55	-60.00	-2.72	10.47	H	Pass
5639.00	-43.50	-13	-59.74	-56.17	-3.35	11.47	H	Pass
7520.00	-46.05	-13	-63.47	-59.65	-3.91	11.84	H	Pass
9401.00	-41.81	-13	-61.82	-57.01	-4.37	12.98	H	Pass
11279.00	-49.14	-13	-71.94	-66.11	-5.42	13.70	H	Pass
13160.00	-46.19	-13	-69.55	-63.45	-6.03	13.38	H	Pass

Remark : 1880.00MHz is MS signal and 1960.00MHz is BS signal.



Vertical Polarization



Site : 03CH01-KS
Condition: FCC PART22 24 HF EIRP ANT-070911 NEUTRAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : T161L
Memo : PCS1900 Link +Adaptor



Frequency (MHz)	ERP (dBm)	Limit (dBm)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
51.87	-50.40	-13	-64.01	-60.76	-0.36	12.15	V	Pass
77.52	-50.76	-13	-63.01	-62.23	-0.47	13.15	V	Pass
160.95	-58.08	-13	-62.01	-70.68	-0.60	14.15	V	Pass
450.50	-58.73	-13	-61.01	-72.71	-0.98	15.15	V	Pass
648.60	-58.57	-13	-60.01	-73.62	-1.05	16.15	V	Pass
931.40	-52.55	-13	-59.01	-68.84	-1.29	17.15	V	Pass
1802.00	-51.21	-13	-58.01	-69.08	-1.87	18.15	V	Pass
1880.00	-21.70		-57.01	-40.62	-1.92	19.15	V	Pass
1960.00	-41.65		-56.01	-61.60	-1.95	20.15	V	Pass
3760.00	-48.40	-13	-55.01	-70.12	-2.72	21.15	V	Pass
3860.00	-50.60	-13	-54.01	-73.42	-2.82	22.15	V	Pass
3920.00	-47.62	-13	-53.01	-71.49	-2.87	23.15	V	Pass
5639.00	-38.72	-13	-52.01	-64.07	-3.35	24.15	V	Pass
7520.00	-39.13	-13	-51.01	-66.04	-3.91	25.15	V	Pass
7841.00	-50.98	-13	-50.01	-79.01	-4.03	26.15	V	Pass
9401.00	-37.33	-13	-49.01	-66.70	-4.37	27.15	V	Pass
11279.00	-50.21	-13	-48.01	-81.63	-5.42	28.15	V	Pass
13160.00	-46.20	-13	-47.01	-79.23	-6.03	29.15	V	Pass
15040.00	-46.13	-13	-46.01	-79.40	-5.27	30.15	V	Pass
16920.00	-44.95	-13	-45.01	-79.34	-5.39	31.15	V	Pass

Remark : 1880.00MHz is MS signal and 1960.00MHz is BS signal.

4.7 Frequency Stability (Temperature Variation)

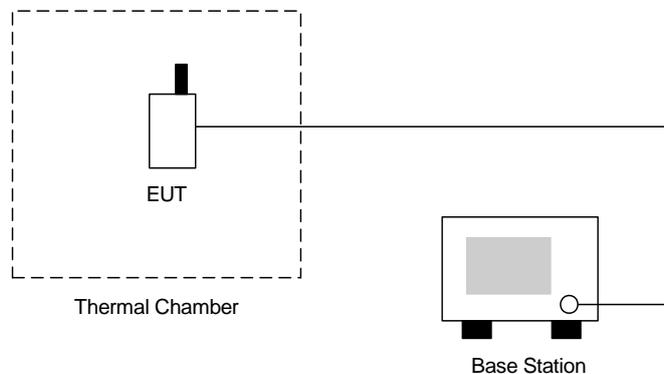
4.7.1 Measurement Instrument

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	-39	-0.05	2.5	Passed
-20	-27	-0.03		
-10	-19	-0.02		
0	11	0.01		
10	-8	-0.01		
20	4	0.00		
30	10	0.01		
40	14	0.02		
50	16	0.02		

• Test Mode : GSM1900 CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	23	0.01	2.5	Passed
-20	-18	-0.01		
-10	4	0.00		
0	37	0.02		
10	18	0.01		
20	-44	-0.02		
30	21	0.01		
40	32	0.02		
50	9	0.00		

4.8 Frequency Stability (Voltage Variation)

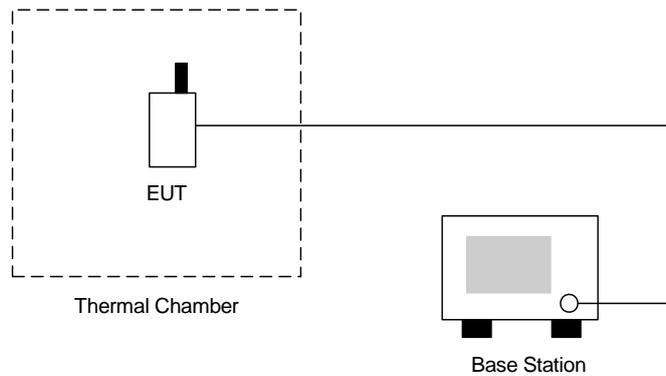
4.8.1 Measurement Instrument

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 (GSM) CH189

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-8.0	-0.01	2.5	Passed
BEP	-32.0	-0.04		
4.2	-6.0	-0.01		

- Test Mode : GSM1900 (GSM) CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-17.0	-0.01	2.5	Passed
BEP	22.0	0.01		
4.2	18.0	0.01		

Remark:

- 1. Normal Voltage = 3.7V.
- 2. Battery End Point (BEP) = 3.2V.



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, 2007	Mar. 12, 2009	Radiation (03CH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9KHz~2.75GHz	Mar. 15, 2007	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, 2008	Conduction (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	50MHz~18GHz	Jun. 12, 2007	Jun. 11, 2008	Conduction (TH01-KS)
Thermal Chamber	Rten Billion	TTC-B3S	TBN-960502	-40~150C	Jun. 27, 2007	Jun. 26, 2008	Conduction (TH01-KS)
Power Divider	ARRA	A3200-2	N/A	DC~18GHz	Sep. 01, 2007	Aug. 31, 2008	Conduction (TH01-KS)
DC Power Supply	Topward	3306D	N/A	30V6A	N/A	N/A	Conduction (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