



FCC Test Report

According to

47 CFR Part 22H, 24E

Equipment : Dolphin 9900 Mobile computer
Trade Name : Honey well
Model No. : Dolphin 9900
FCC ID : HD59900LUP
Tx Frequency Range : GSM850 : 824.2 ~ 848.8MHz
PCS1900 : 1850.2 ~1909.8 MHz
Max. ERP/EIRP Power : GSM850(GSM) : 0.61 W
GSM850(EDGE) : 0.10 W
PCS1900(GSM) : 0.74 W
PCS1900(EDGE) : 0.31 W
Emission Designator : GSM : 300KGXW
EDGE : 300KG7W
Applicant : Honeywell International Inc.
700 Vision Drive, PO Box 208 Skeneateles Falls,
NY 13513

- 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.
- **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 May 03, 2008 at **Sporton International Inc. LAB.**
- Report No.: FG830601, Report Version: Rev. 01.

Roy Wu
Manager

SPORTON International Inc.

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



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History of This Test Report

Report Issue Date: May 05, 2008

Report No.	Description



1. General Information

1.1. Applicant

Honeywell International Inc.

700 Vision Drive, PO Box 208 Skeneateles Falls, NY 13513

1.2. Manufacturer

1. Universal Scientific Industrial Co., Ltd.

141, Lane 351, Taiping Road, Sec.1, Tsao Tuen, Nan-Tou, Taiwan

2. Universal Scientific Industrial (Shanghai) Co., Ltd.

No. 1558, Zhangdong Road Pudong, Shanghai China. P.O. 201203

1.3. Basic Description of Equipment under Test

Equipment		Dolphin 9900 Mobile computer
Trade Name		Honey well
Model Name		Dolphin 9900
FCC ID		HD59900LUP
AC Adapter	Brand Name	DVE
	Model Name	DSA-0421S-09 1
	Power Rating	I/P:100-240Vac, 50-60Hz, 1.2A; O/P: 9.5Vdc, 4A,
	AC Power Cord Type	1.85 meter shielded cable without ferrite core
Cradle	Brand Name	DVE
	Model Name	DSA-01510-09 5
	Power Rating	I/P:100-240Vac, 47-63Hz, 0.4A; O/P: 9.5Vdc, 1.8A
Battery	Brand Name	Honey well
	Model Name	20000591-01
	Power Rating	7.4Vdc, 2400mAh
	Type	Li-ion
Holster	Brand Name	Honey well
	Model Name	Dolphin 9900
Earphone	Brand Name	AATC
	Model Name	AEP-HA36D-01
	Signal Line Type	1.1 meter 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 :	Dolphin 9900 Mobile computer
Trade Name :	Honey well
Model Name :	Dolphin 9900
FCC ID :	HD59900LUP
Tx Frequency :	GSM850 : 824 MHz ~ 849 MHz PCS1900 : 1850 MHz ~1910 MHz
Rx Frequency :	GSM850 : 869 MHz ~ 894 MHz PCS1900 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna :	GSM850 : 32.66 dBm (GSM) / 26.25 dBm (EDGE8) PCS1900 : 29.28 dBm (GSM) / 24.91 dBm (EDGE8)
Maximum ERP/EIRP :	GSM850(GSM) : 0.61 W (27.82 dBm) GSM850(EDGE) : 0.10 W (20.02 dBm) PCS1900(GSM) : 0.74 W (28.68 dBm) PCS1900(EDGE) : 0.31 W (24.98 dBm)
Type of Antenna Connector	N/A
Antenna Type :	GSM : PIFA Antenna
Antenna Gain :	850MHz : Peak: -2.15dBi, Average: -6.33dBi 1900MHz : Peak 3.76dBi, Average: -2.18dBi
HW Version :	B2.12
SW Version :	Revision 04.001 (SV19)
GPRS / EGPRS Multislot class :	12
Type of Modulation :	GSM / GPRS : GMSK EDGE : 8PSK
Type of Emission :	GSM : 300KGXW EDGE : 300KG7W
DUT Stage :	Identical Prototype

1.5. Report Date

EUT Received : Mar. 06, 2008

Report Date : May 05, 2008

2. Test Configuration of Equipment under Test

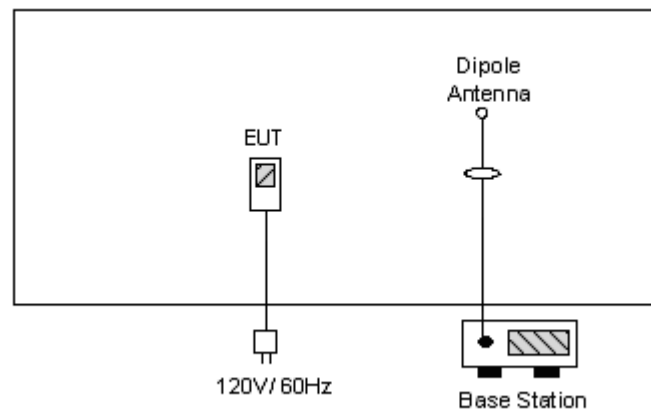
2.1 Test Manner

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; 30MHz to 19000 MHz for PCS1900.

2.2 Test Mode

Application	GSM850	PCS1900
Radiated Emission	☒ Mode 1: GSM Link	☒ Mode 3: GSM Link
	☒ Mode 2: EDGE Link	☒ Mode 4: EDGE Link
	☒ Mode 5: GSM Link + BT Link_Tx Ch00	
	☒ Mode 6: GSM Link + WLAN Link_Tx Ch06	
Conducted Measurement	☒ Mode 1: GSM Link	☒ Mode 3: GSM Link
	☒ Mode 2: EDGE Link	☒ Mode 4: EDGE 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. 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 : 886-3-328-4978
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

4.2 RF Output Power

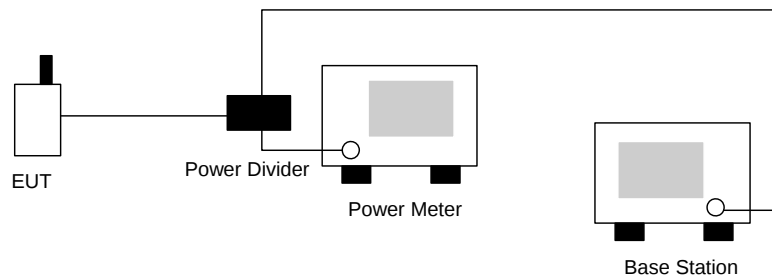
4.2.1 Measurement Instruments

As described in chapter 5 of this test report.

4.2.2 Test Procedure

- The transmitter output was connected to power meter and base station through power divider.
- Set EUT at PCL=5 for GSM850 and/or PCL=0 for PCS1900 maximum power through base station.
- 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)	32.44	1.754
	189	836.4 (Mid)	32.56	1.803
	251	848.8 (High)	32.66	1.845
GSM850 (EDGE)	128	824.2 (Low)	26.25	0.422
	189	836.4 (Mid)	26.21	0.418
	251	848.8 (High)	26.09	0.406
PCS1900 (GSM)	512	1850.2 (Low)	29.28	0.847
	661	1880.0 (Mid)	29.12	0.817
	810	1909.8 (High)	29.00	0.794
PCS1900 (EDGE)	512	1850.2 (Low)	24.91	0.310
	661	1880.0 (Mid)	24.80	0.302
	810	1909.8 (High)	24.72	0.296

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.

$E_t = R_t + AF$

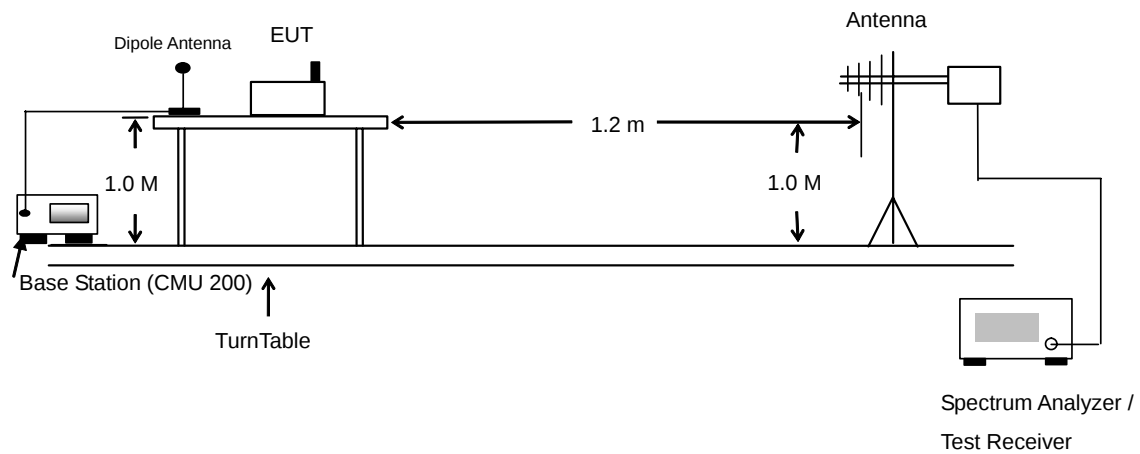
$E_s = R_s + AF$

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	-21.02	-48.12	0.00	-1.08	26.02	0.40
836.40	-21.25	-48.28	0.00	-0.93	26.10	0.41
848.80	-23.70	-48.35	0.00	-0.76	23.89	0.24
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-19.31	-47.97	0.00	-1.08	27.58	0.57
836.40	-19.26	-48.01	0.00	-0.93	27.82	0.61
848.80	-21.55	-48.05	0.00	-0.76	25.74	0.37

GSM850 (EDGE) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-27.71	-48.12	0.00	-1.08	19.33	0.09
836.40	-28.69	-48.28	0.00	-0.93	18.66	0.07
848.80	-30.05	-48.35	0.00	-0.76	17.54	0.06
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-26.87	-47.97	0.00	-1.08	20.02	0.10
836.40	-27.52	-48.01	0.00	-0.93	19.56	0.09
848.80	-28.45	-48.05	0.00	-0.76	18.84	0.08



PCS1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.16	-51.88	0.00	1.96	28.68	0.74
1880.00	-26.73	-52.99	0.00	2.00	28.26	0.67
1909.80	-27.86	-54.28	0.00	1.98	28.40	0.69
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-30.29	-52.13	0.00	1.96	23.80	0.24
1880.00	-31.32	-53.17	0.00	2.00	23.85	0.24
1909.80	-31.82	-54.13	0.00	1.98	24.29	0.27

PCS1900 (EDGE) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-28.86	-51.88	0.00	1.96	24.98	0.31
1880.00	-30.71	-52.99	0.00	2.00	24.28	0.27
1909.80	-31.91	-54.28	0.00	1.98	24.35	0.27
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-33.98	-52.13	0.00	1.96	20.11	0.10
1880.00	-35.28	-53.17	0.00	2.00	19.89	0.10
1909.80	-36.91	-54.13	0.00	1.98	19.20	0.08

4.4 Occupied Bandwidth and Band Edge Measurement

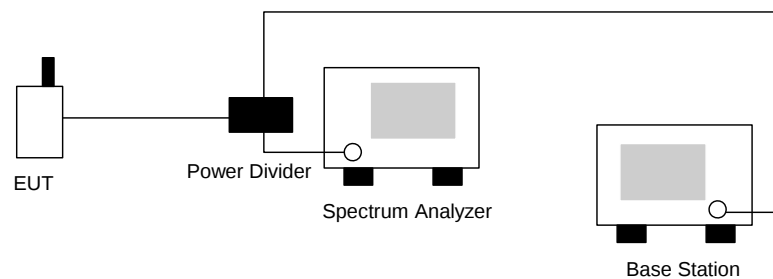
4.4.1 Measurement Instruments

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.

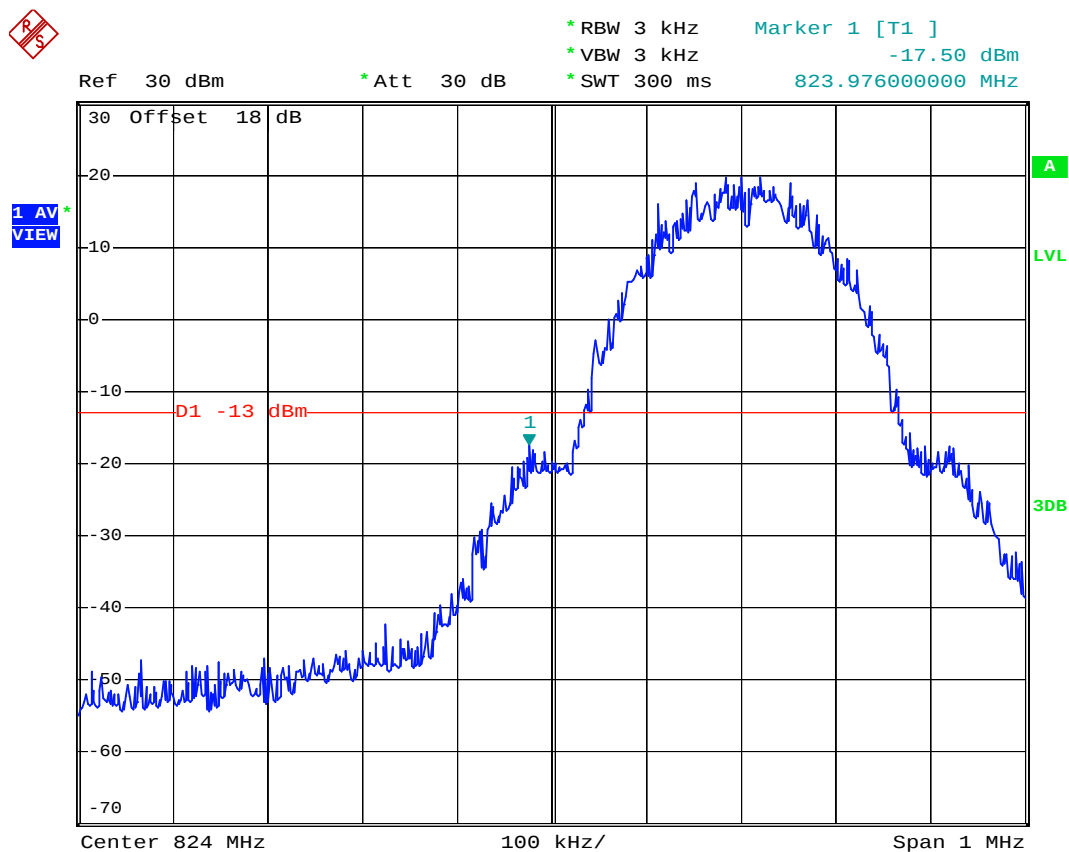
4.4.3 Test Setup Layout





4.4.4 Test Result

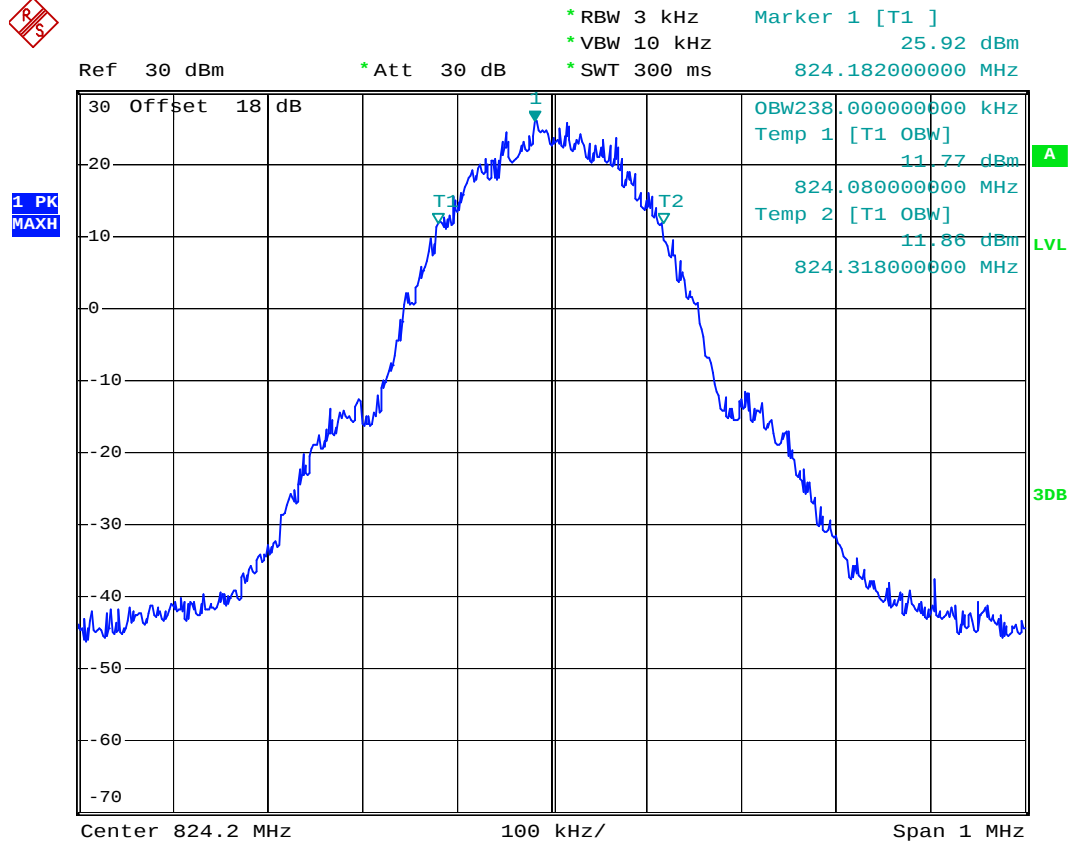
- Mode 1
- Test Mode : GSM850 (GSM) CH128 Lower Band Edge
- Power State : High



Date: 12.MAR.2008 01:35:19



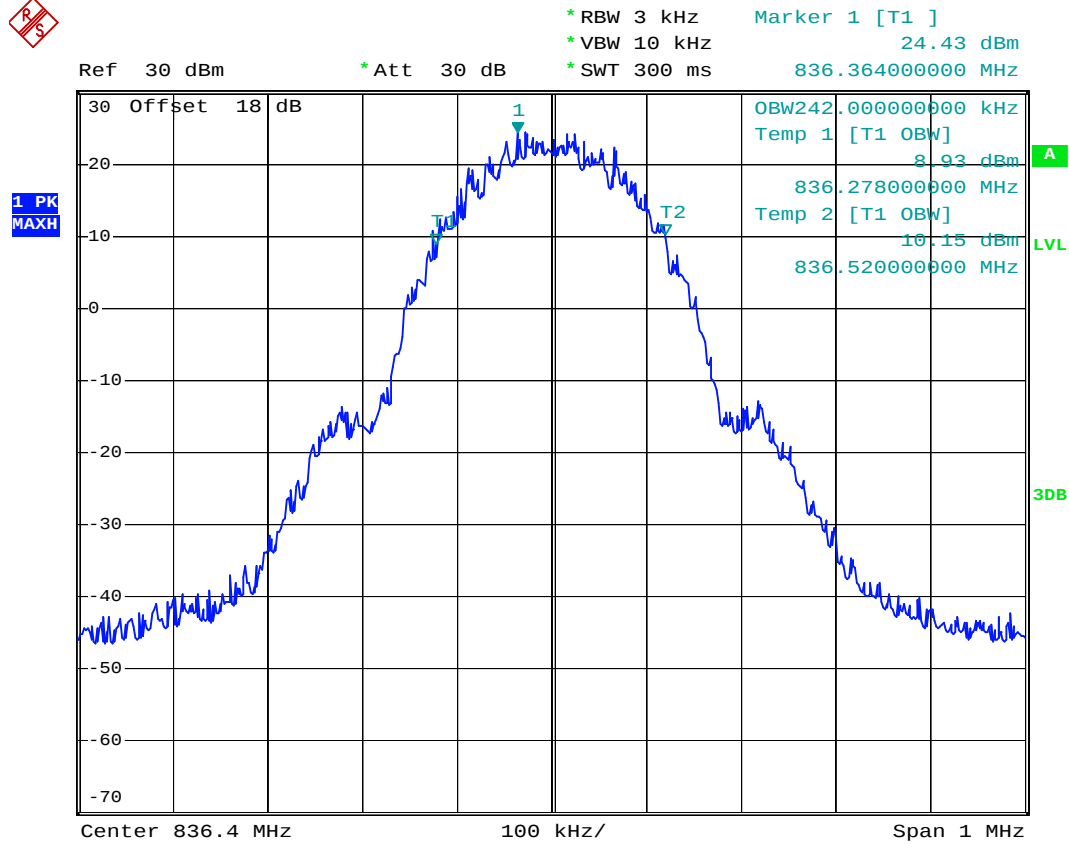
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- Power State : High



Date: 12.MAR.2008 01:32:35



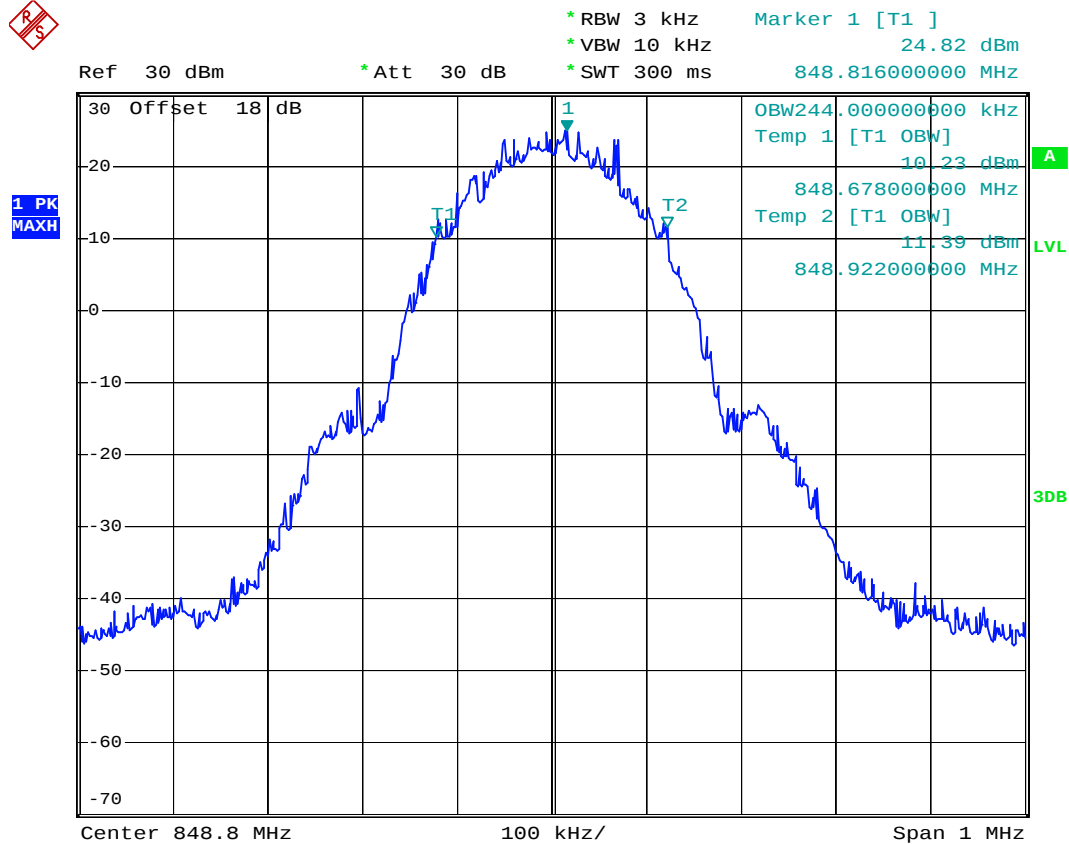
- Test Mode : GSM850 (GSM) CH189 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 01:33:04



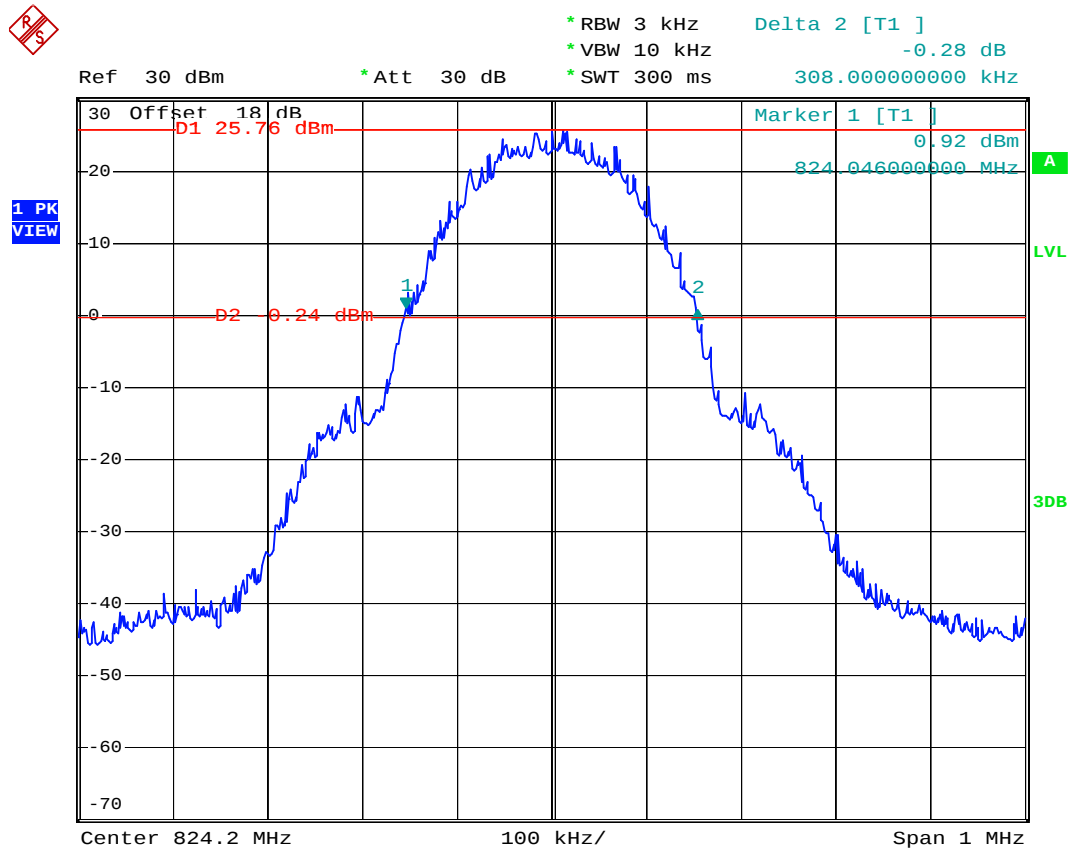
- Test Mode : GSM850 (GSM) CH 251 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 01:31:40



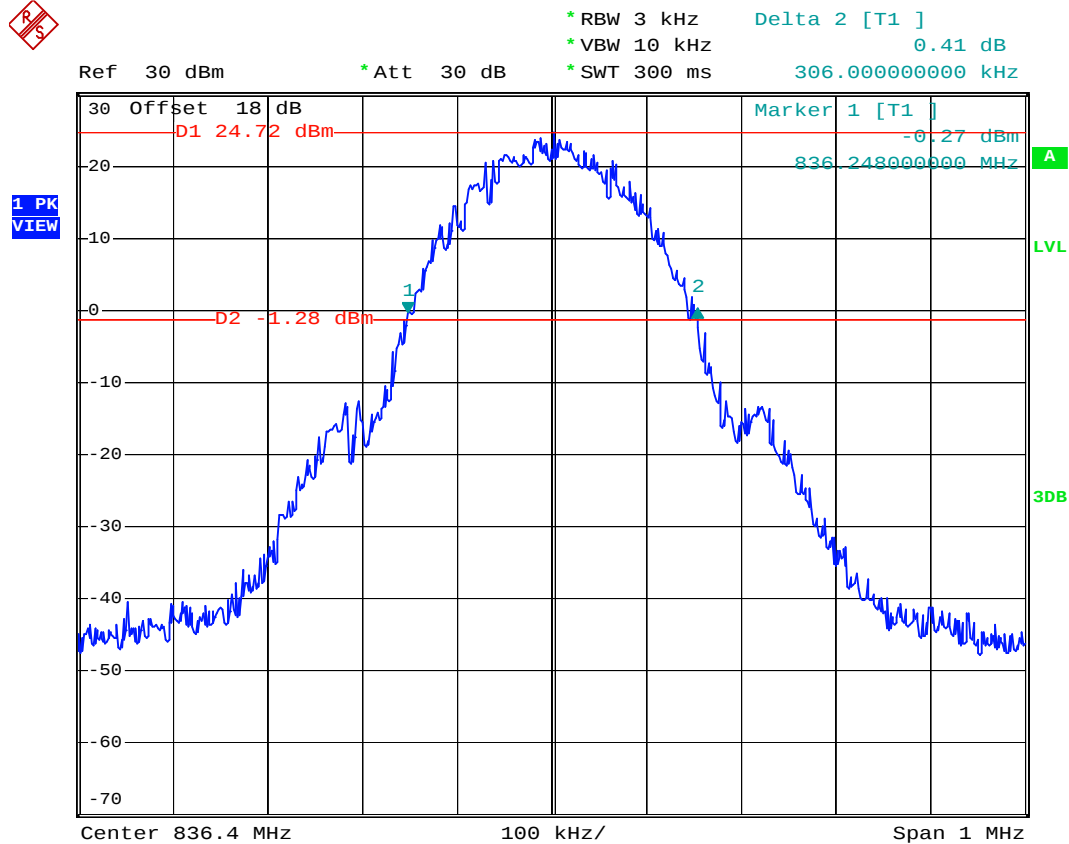
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- Power State : High



Date: 12.MAR.2008 01:28:10



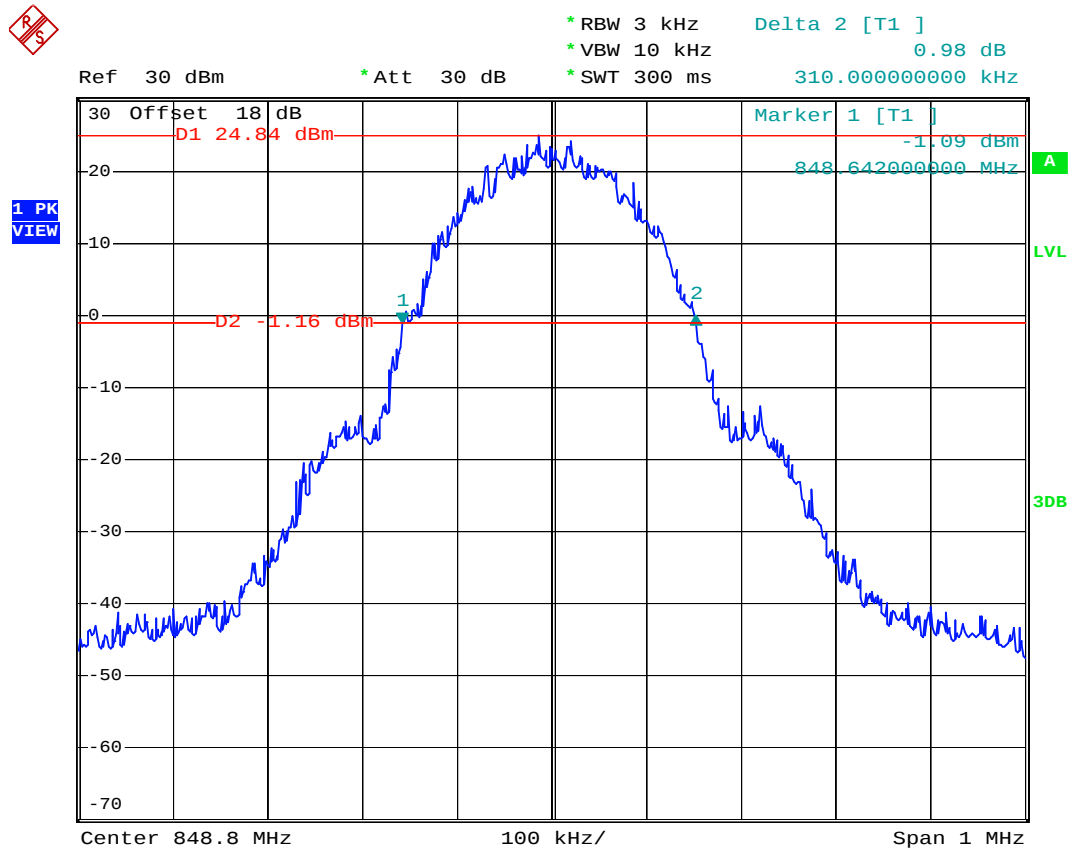
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- Power State : High



Date: 12.MAR.2008 01:29:26



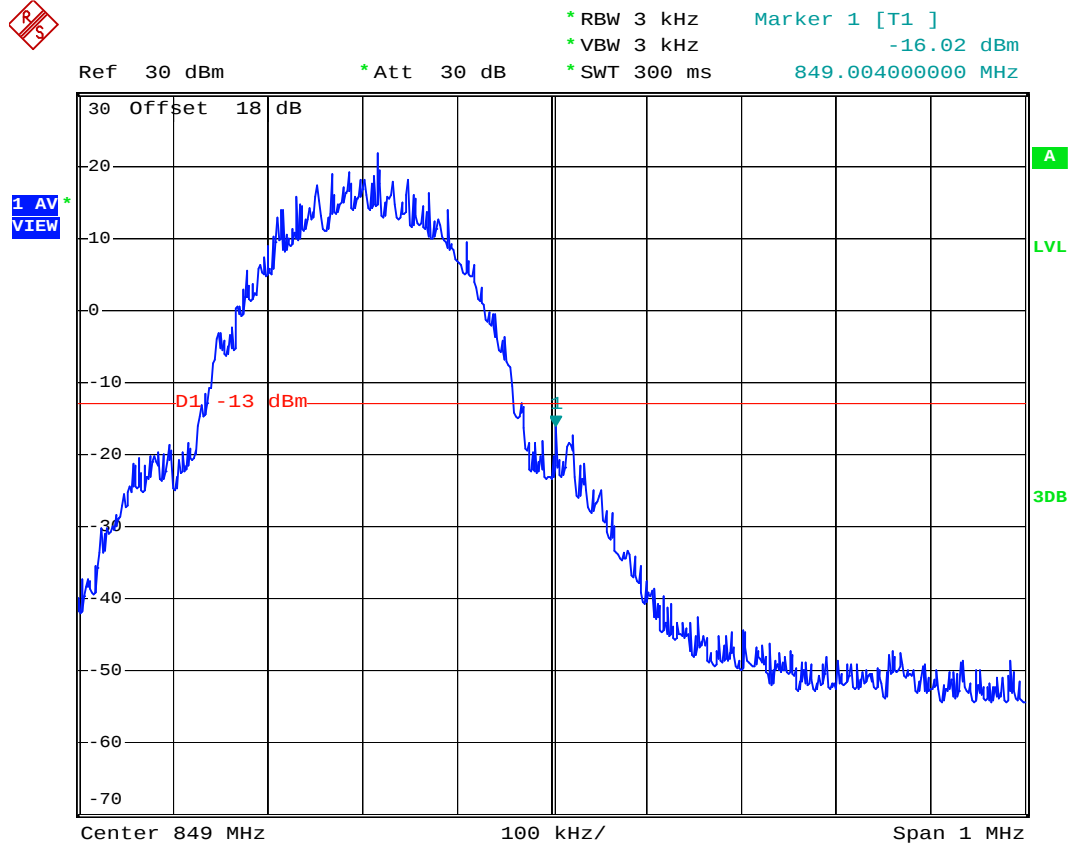
- Test Mode : GSM850 (GSM) CH 251 26dB Bandwidth
- Power State : High



Date: 12.MAR.2008 01:30:45



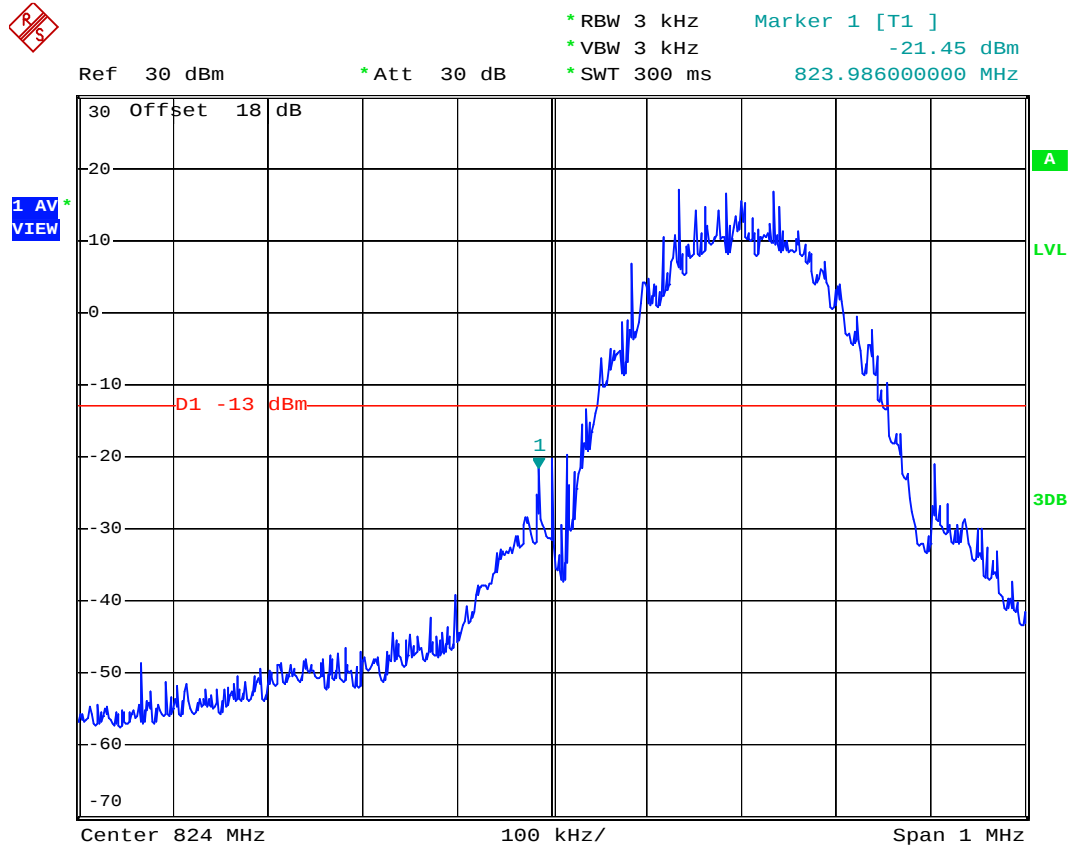
- Test Mode : GSM850 (GSM) CH251 Higher Band Edge
- Power State : High



Date: 12.MAR.2008 01:36:11



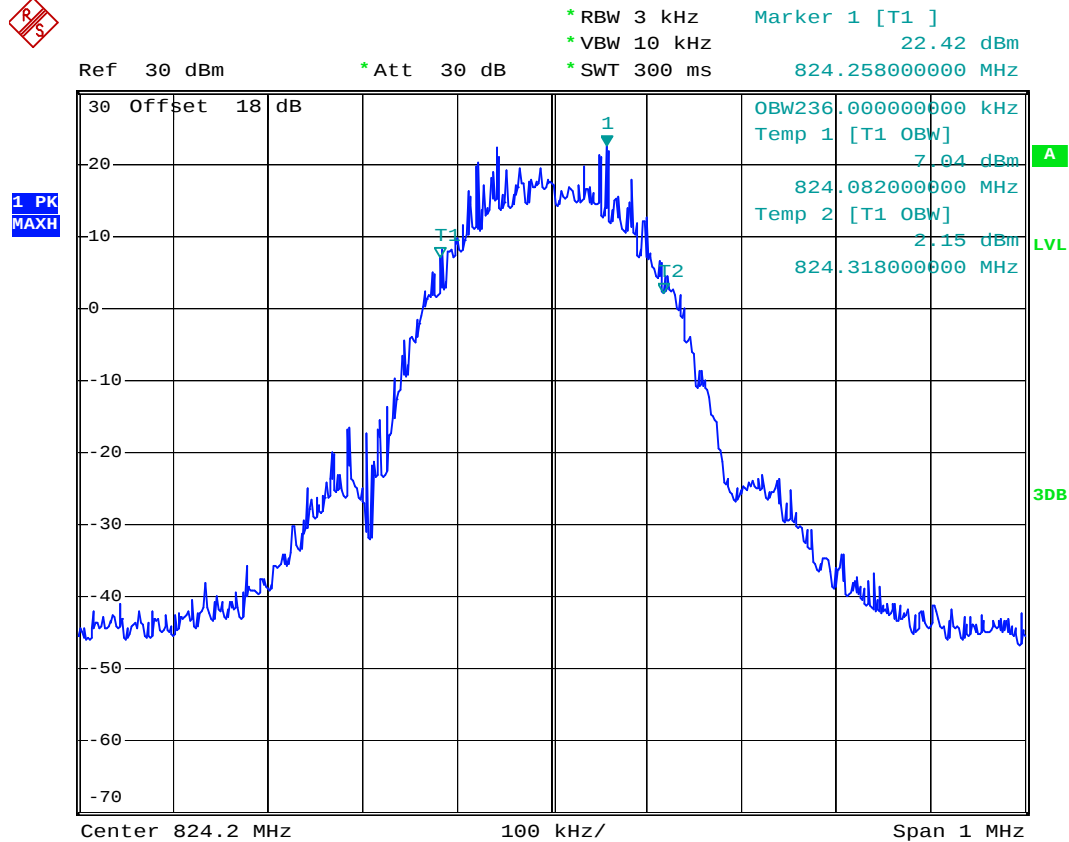
- Mode 2
- Test Mode : GSM850 (EDGE) CH128 Lower Band Edge
- Power State : High



Date: 12.MAR.2008 02:37:27



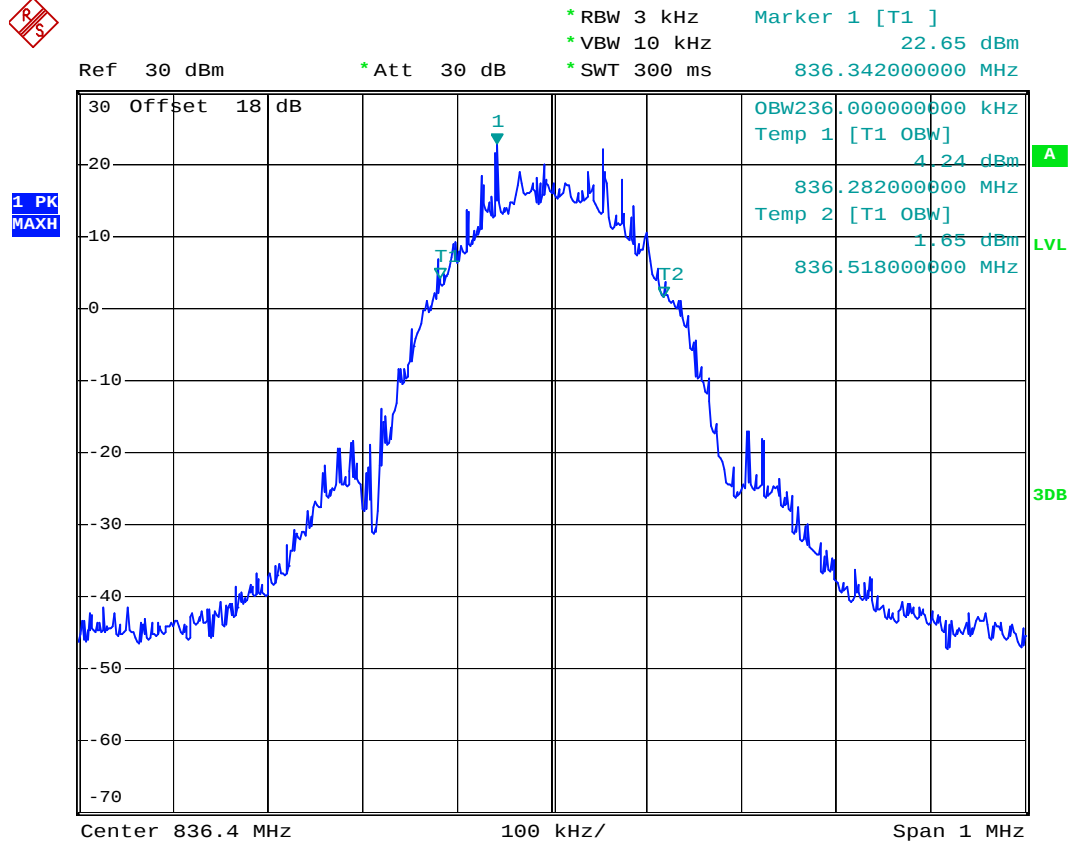
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- Power State : High



Date: 12.MAR.2008 02:28:18



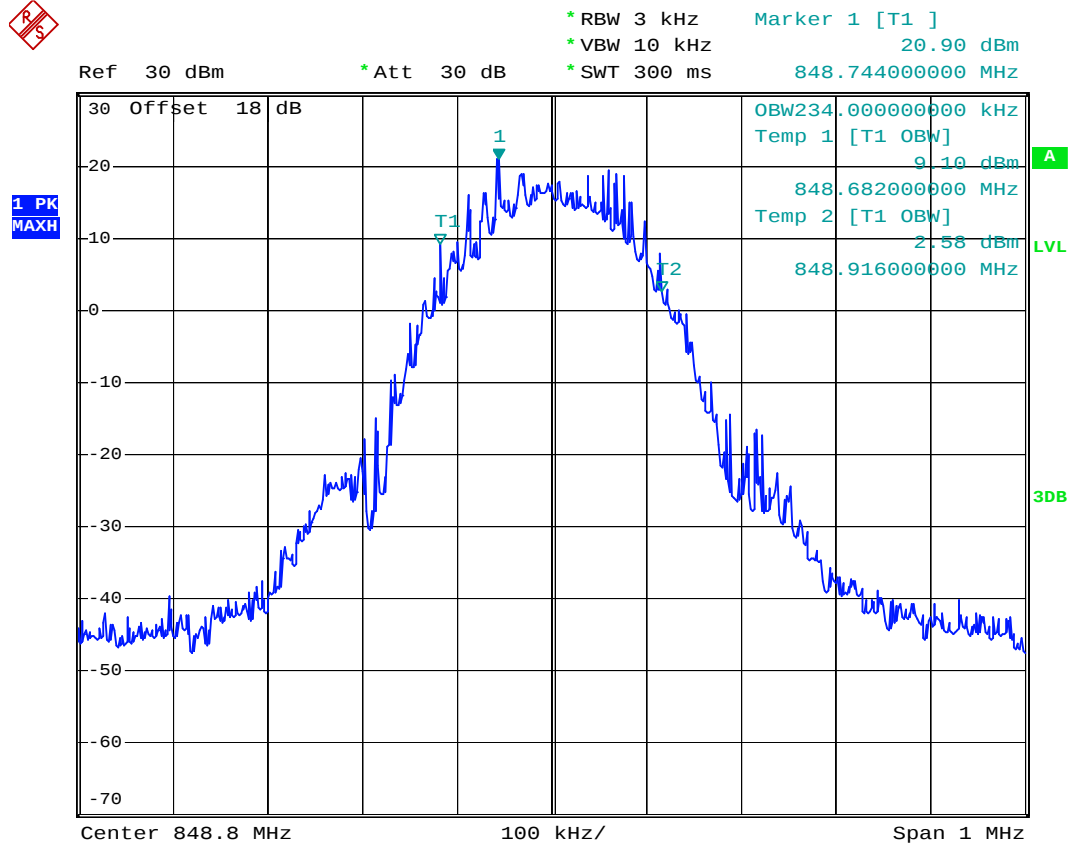
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- Power State : High



Date: 12.MAR.2008 02:29:04



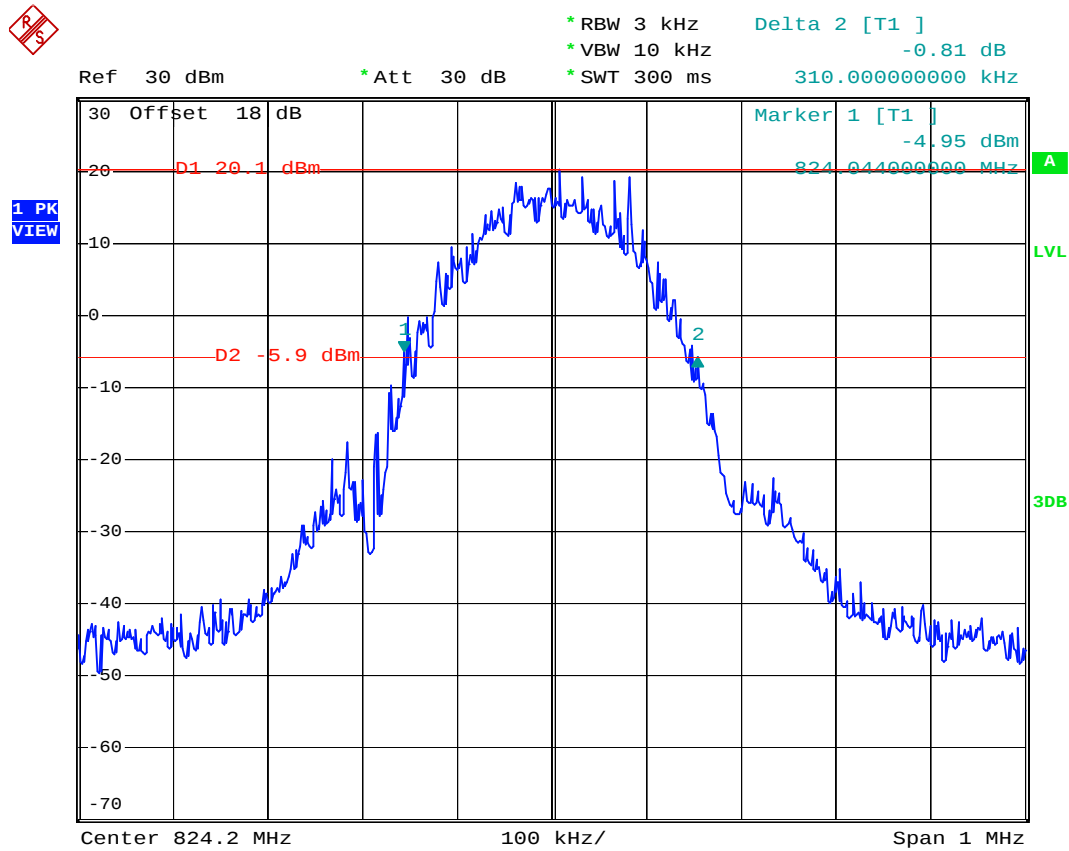
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- Power State : High



Date: 12.MAR.2008 02:27:29



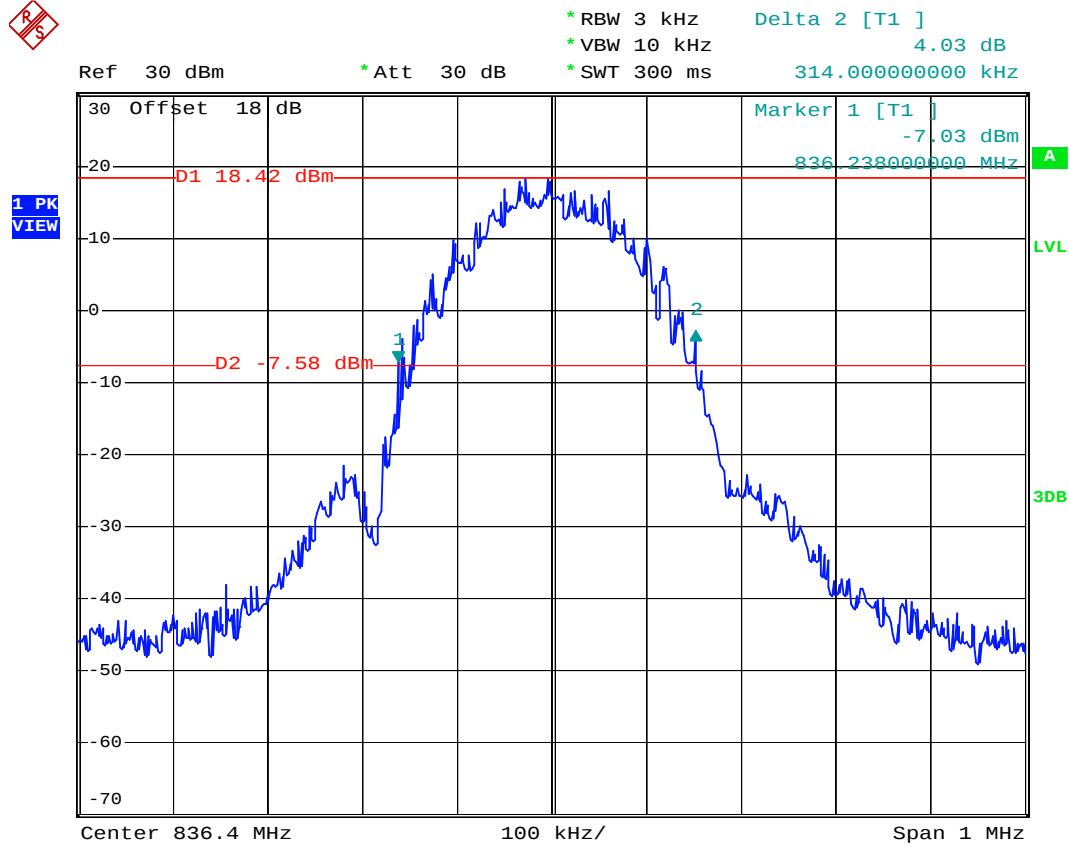
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- Power State : High



Date: 12.MAR.2008 02:10:17



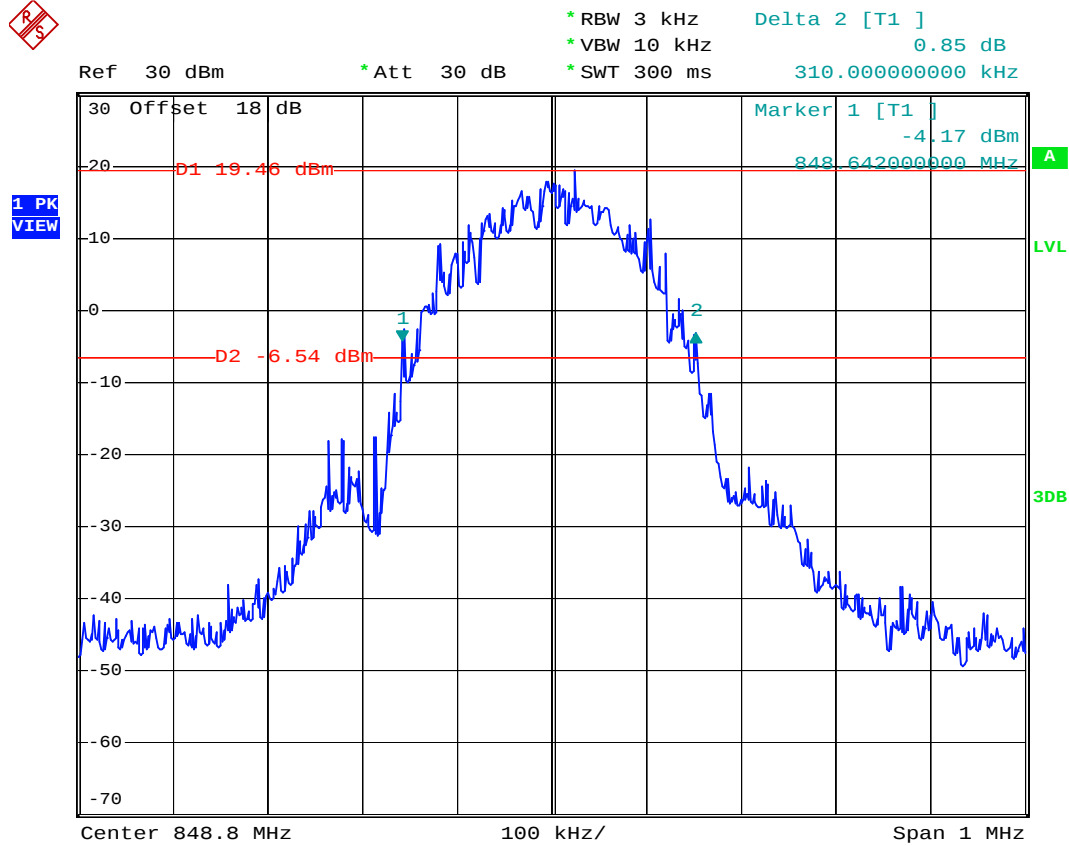
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- Power State : High



Date: 12.MAR.2008 02:23:54



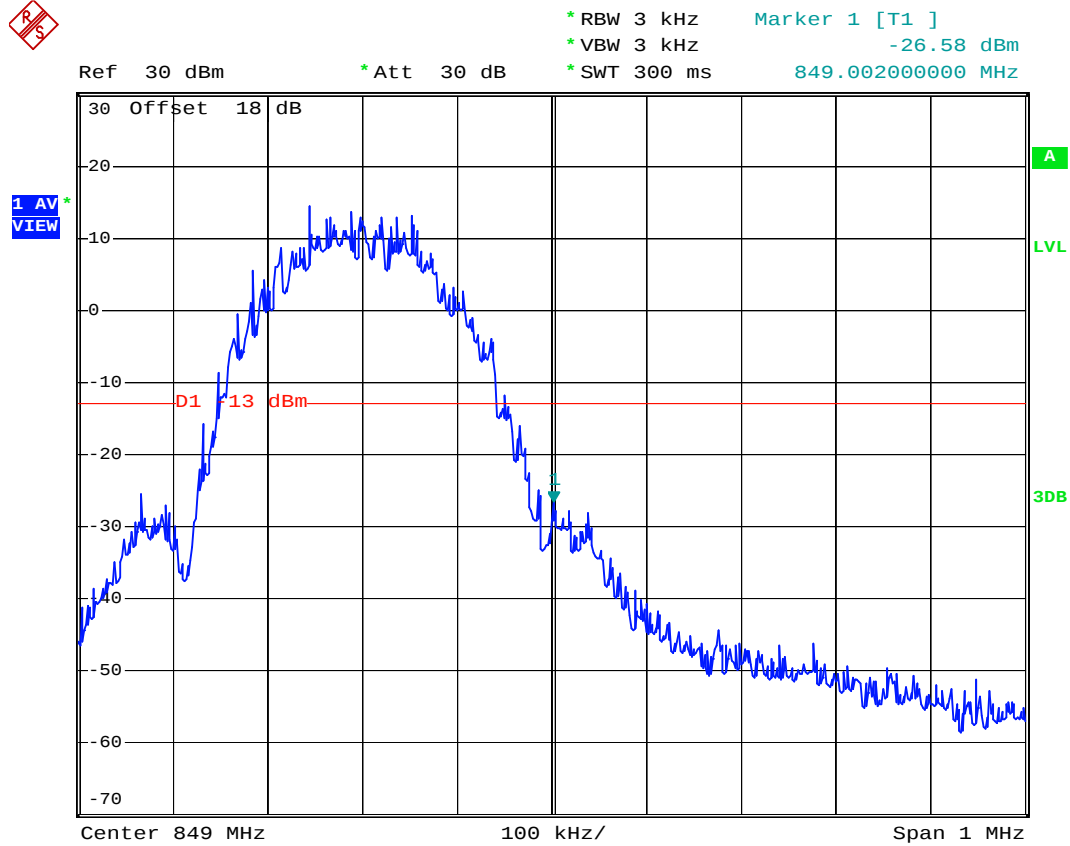
- Test Mode : GSM850 (EDGE) CH 251 26dB Bandwidth
- Power State : High



Date: 12.MAR.2008 02:25:58



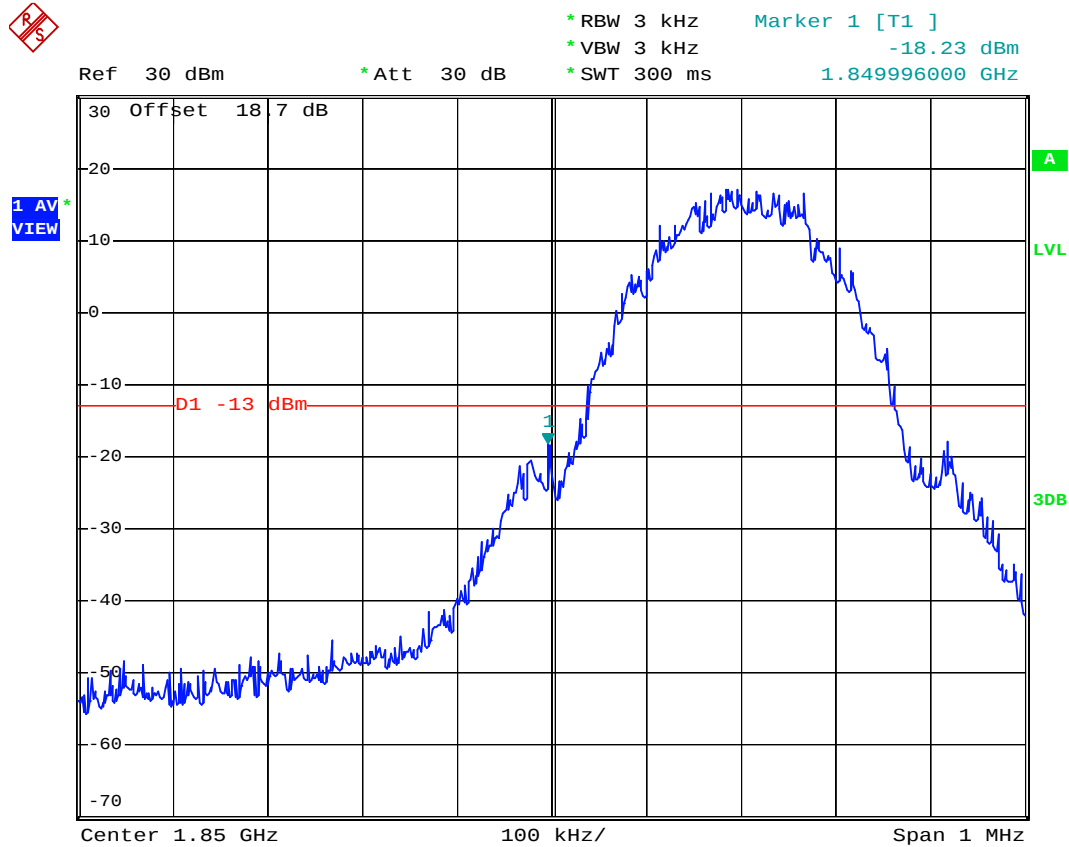
- Test Mode : GSM850 (EDGE) CH251 Higher Band Edge
- Power State : High



Date: 12.MAR.2008 02:33:17



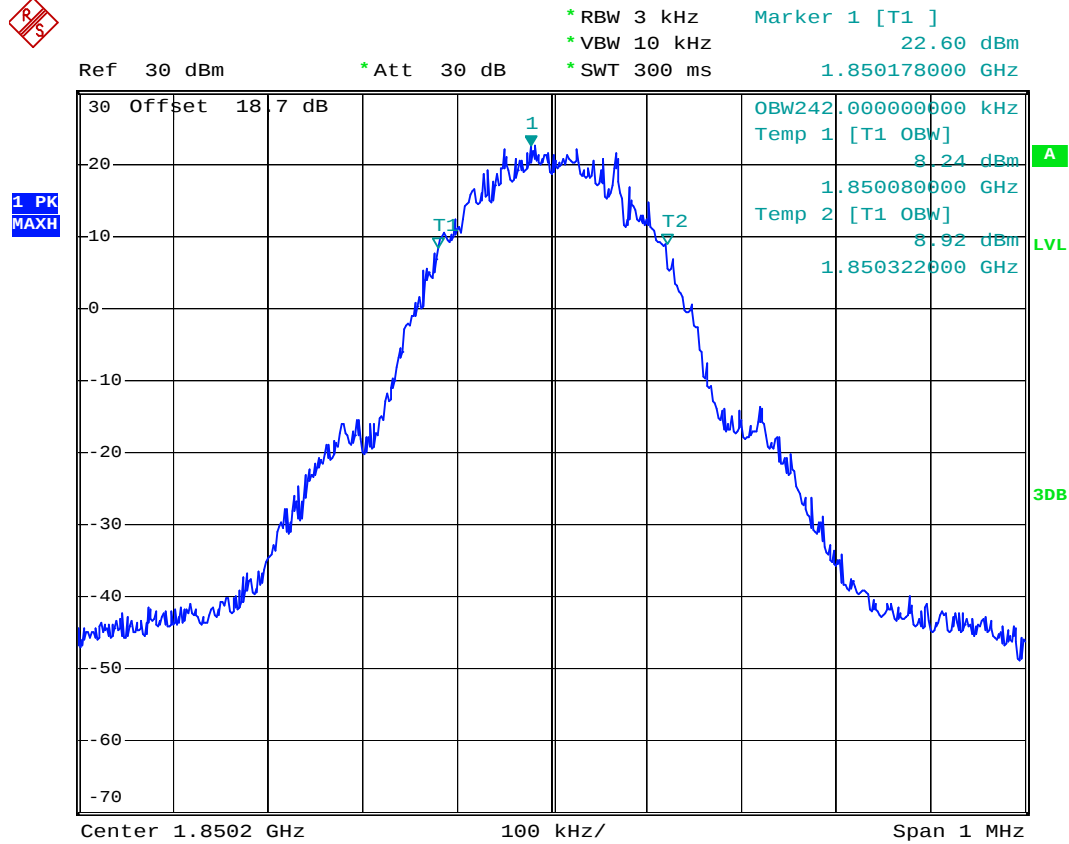
- Mode 3
- Test Mode : PCS1900 (GSM) CH512 Lower Band Edge
- Power State : High



Date: 12.MAR.2008 03:03:41



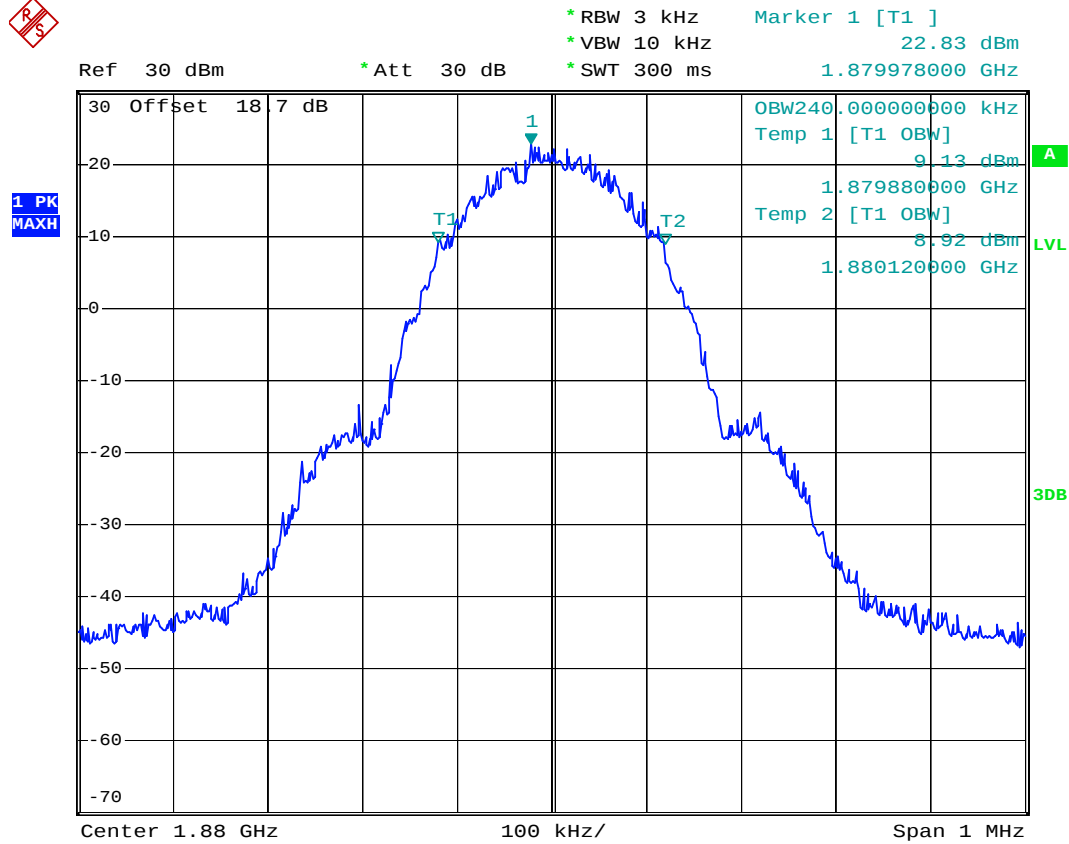
- Test Mode : PCS1900 (GSM) CH512 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 03:02:06



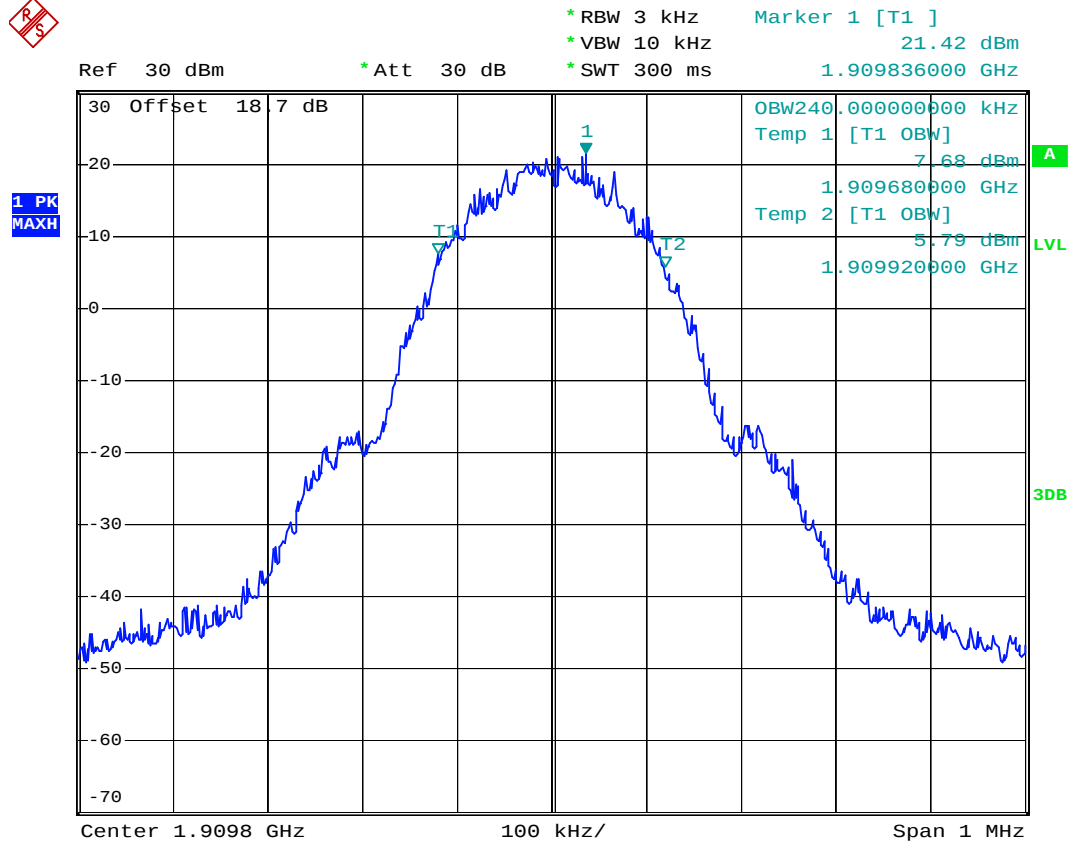
- Test Mode : PCS1900 (GSM) CH661 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 02:56:42



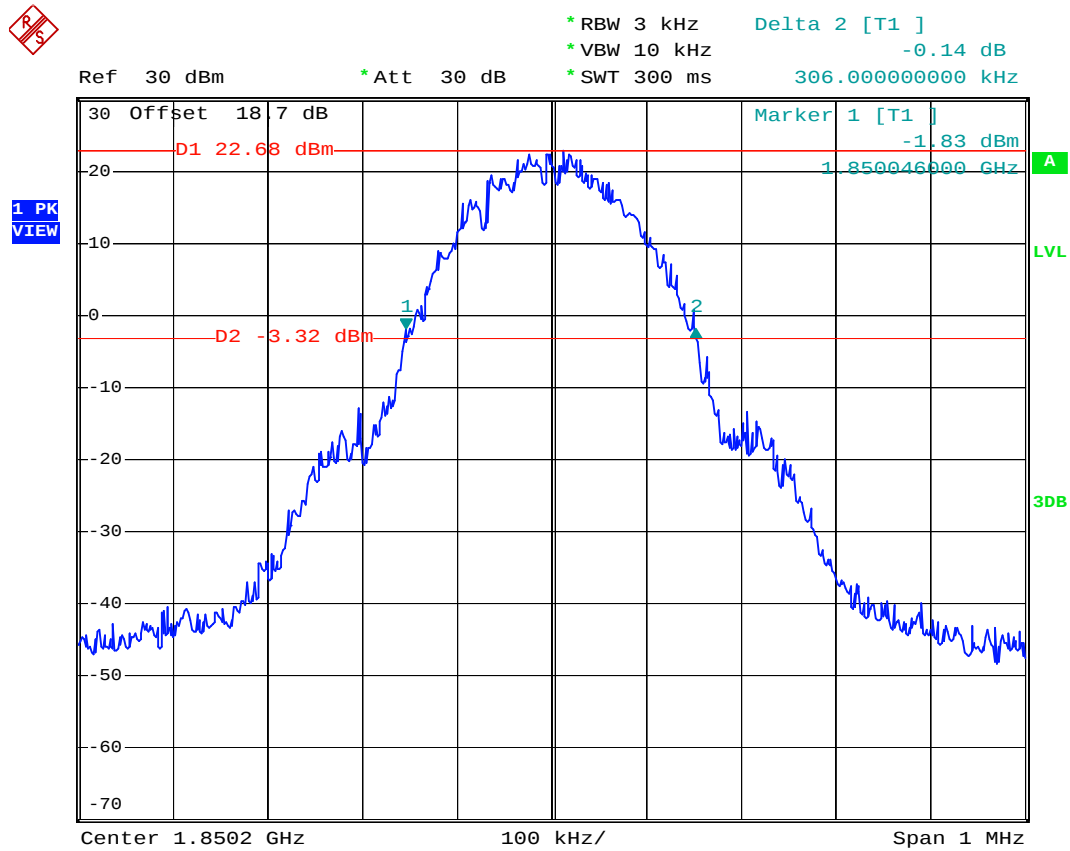
- Test Mode : PCS1900 (GSM) CH810 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 02:55:36



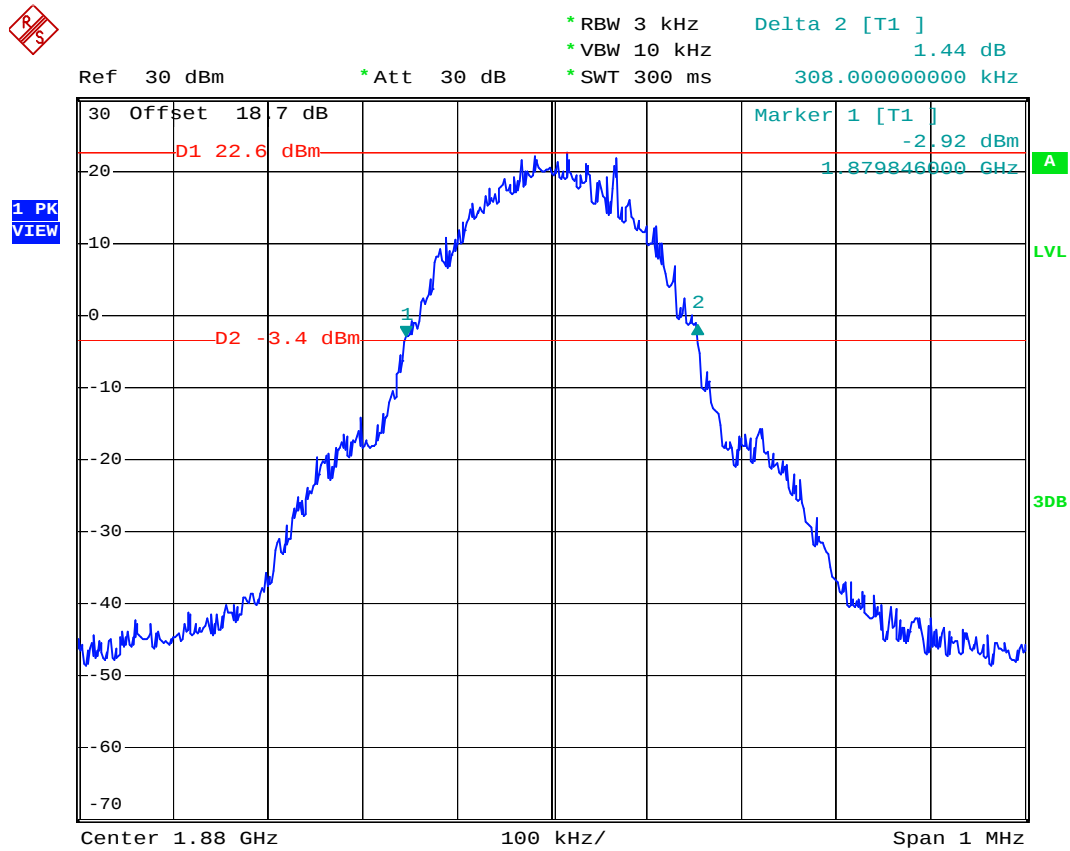
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- Power State : High



Date: 12.MAR.2008 02:52:31



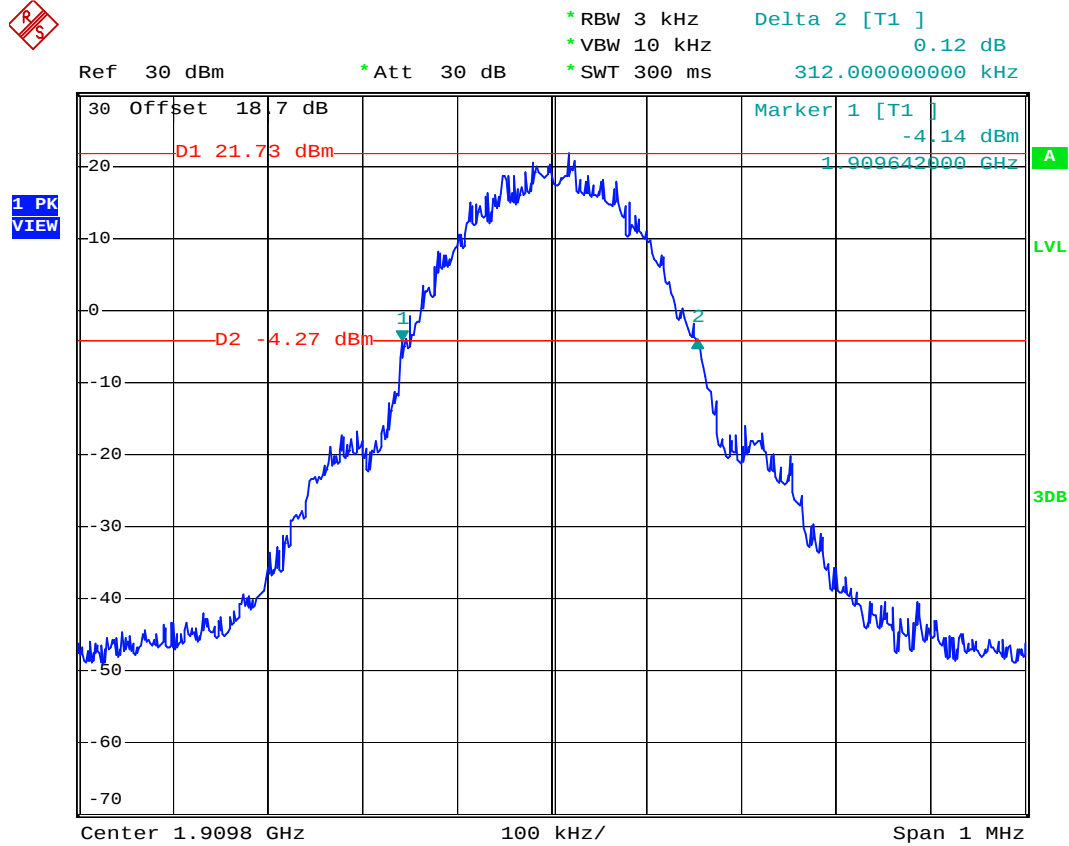
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- Power State : High



Date: 12.MAR.2008 02:53:30



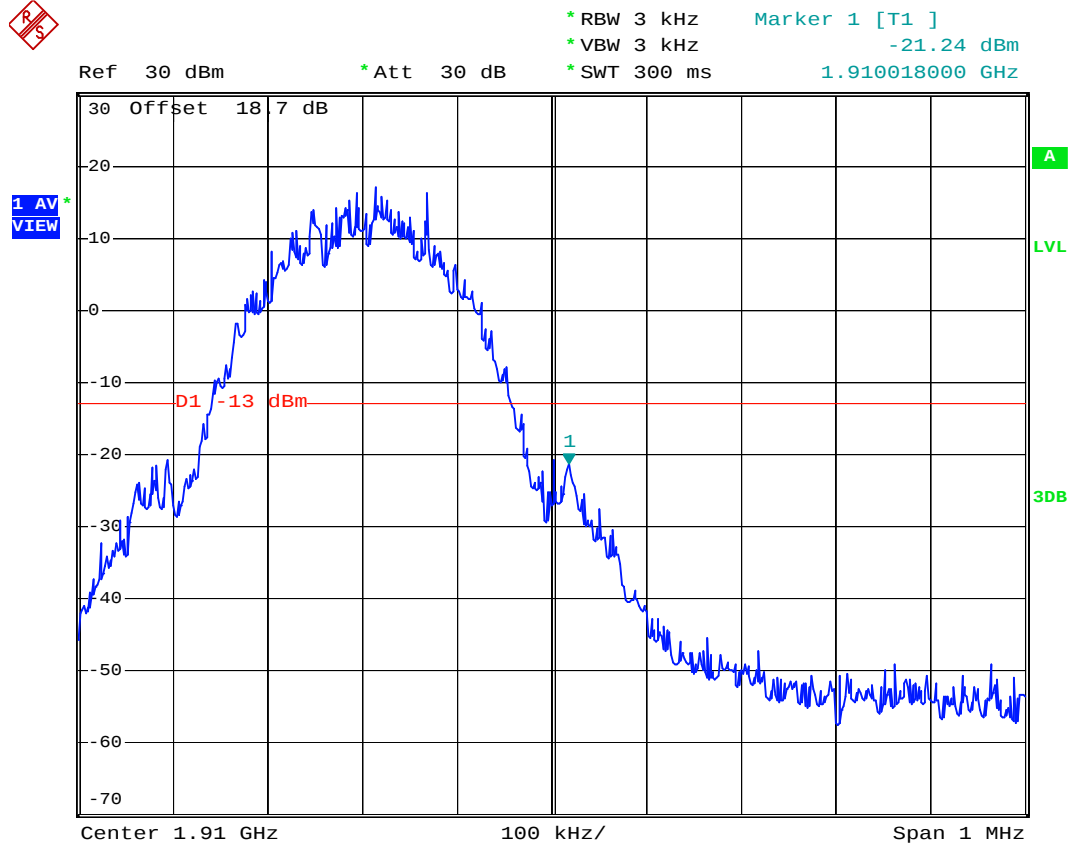
- Test Mode : PCS1900 (GSM) CH810 26dB Bandwidth
- Power State : High



Date: 12.MAR.2008 02:54:50



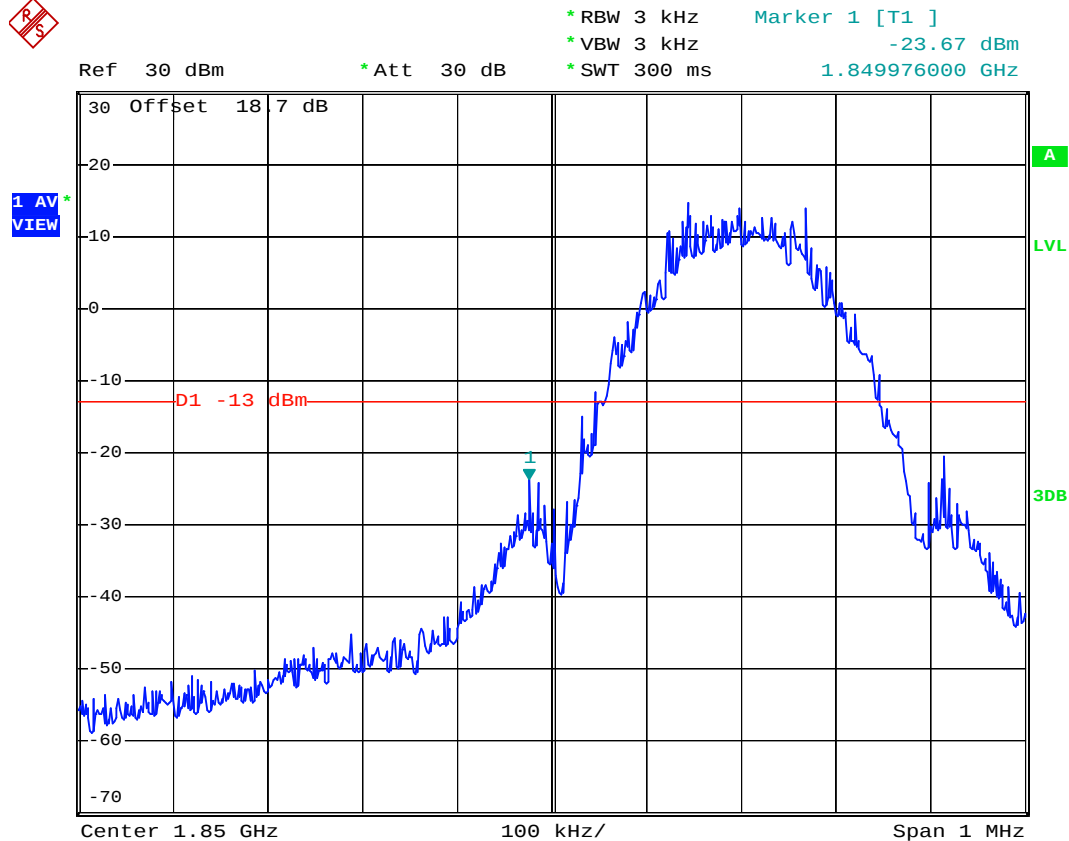
- Test Mode : PCS1900 (GSM) CH810 Higher Band Edge
- Power State : High



Date: 12.MAR.2008 03:04:31



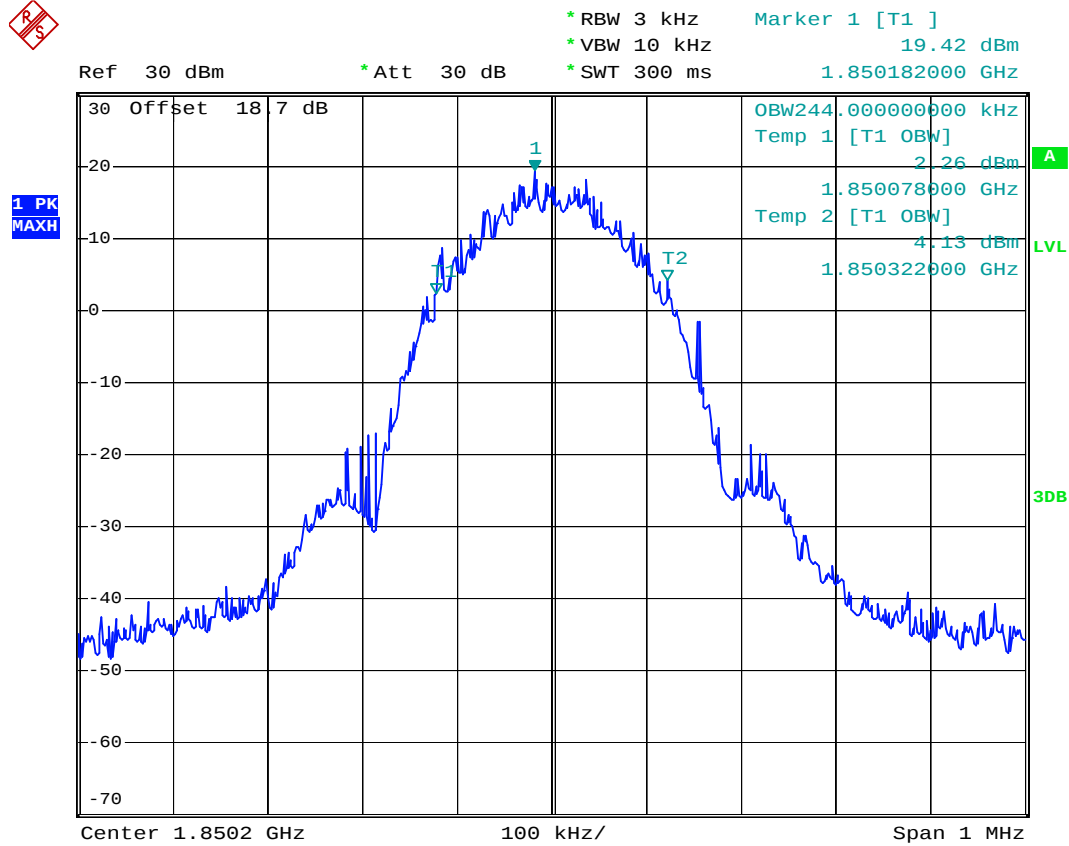
- Mode 4
- Test Mode : PCS1900 (EDGE) CH512 Lower Band Edge
- Power State : High



Date: 12.MAR.2008 03:26:03



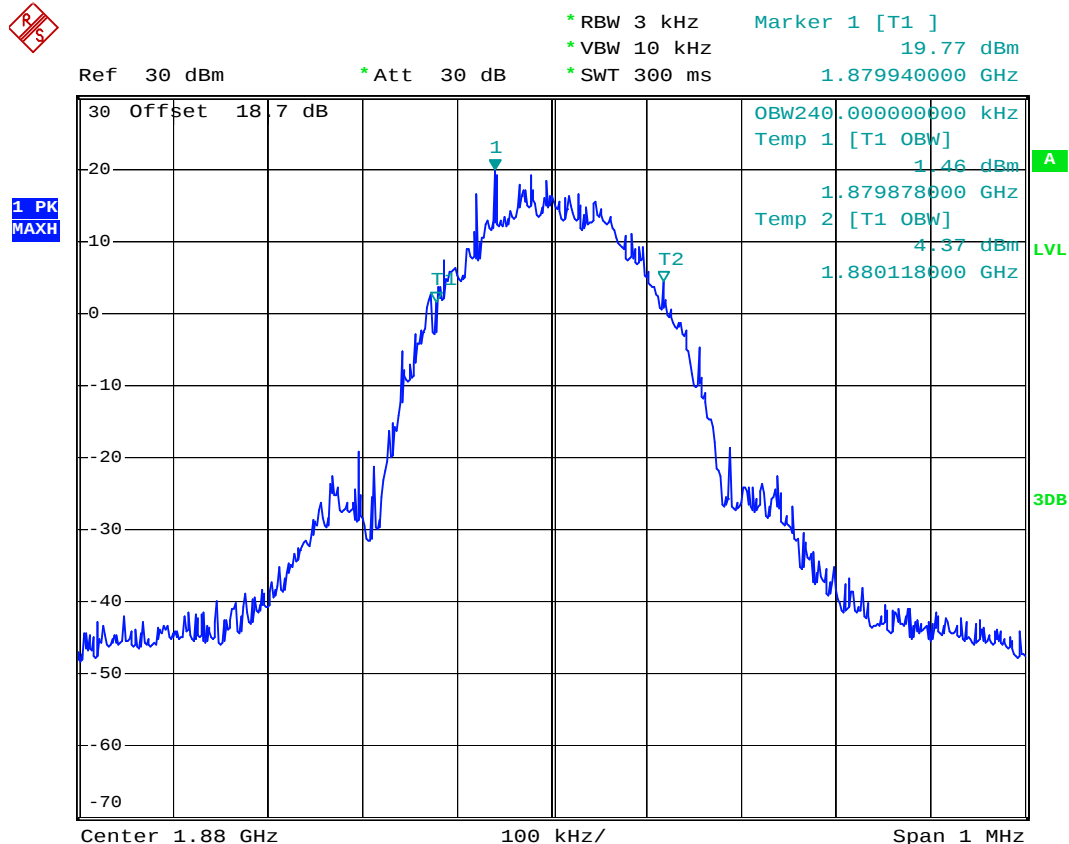
- Test Mode : PCS1900 (EDGE) CH512 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 03:36:33



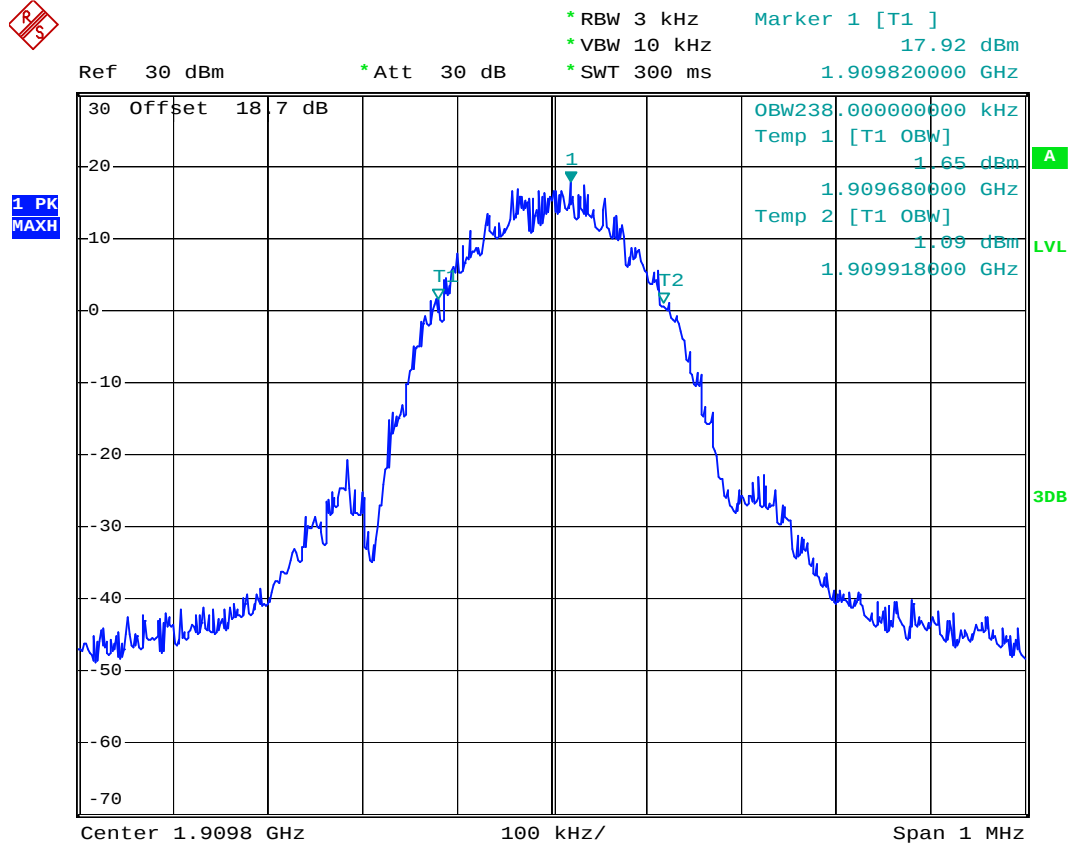
- Test Mode : PCS1900 (EDGE) CH661 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 03:37:02



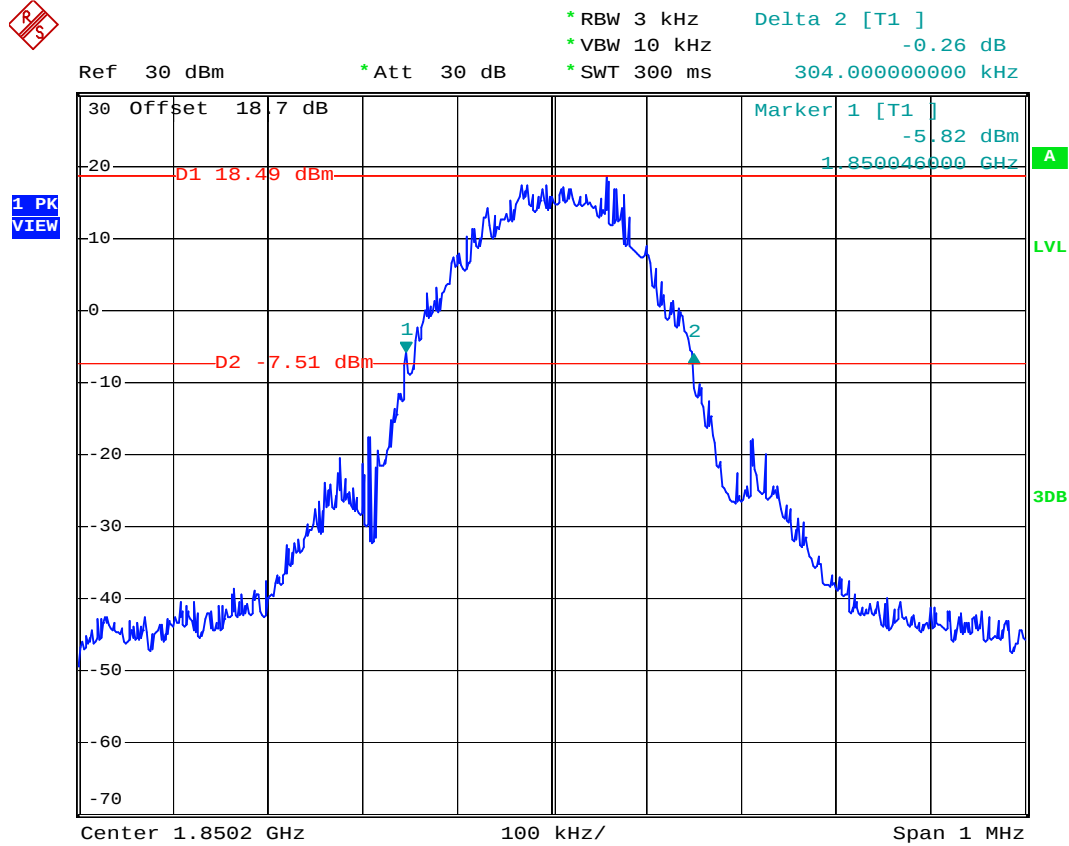
- Test Mode : PCS1900 (EDGE) CH810 99% Occupied Bandwidth
- Power State : High



Date: 12.MAR.2008 03:35:56



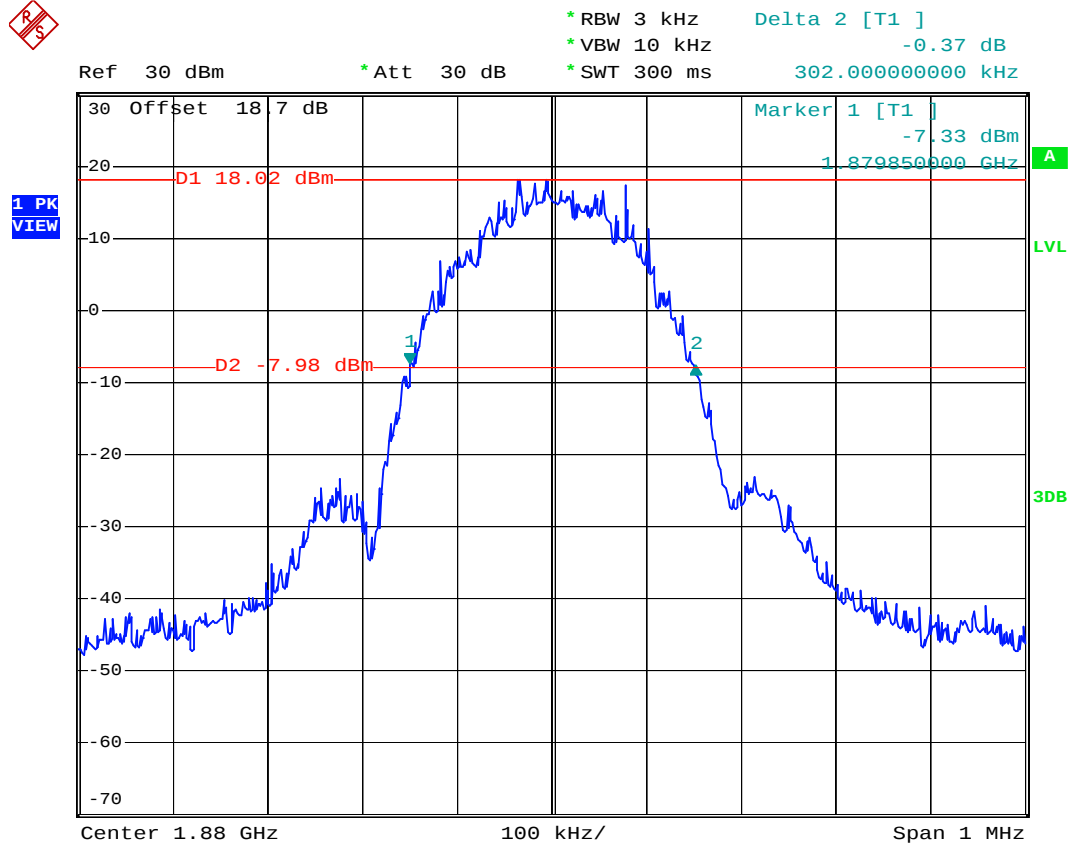
- Test Mode : PCS1900 (EDGE) CH512 26dB Bandwidth
- Power State : High



Date: 12.MAR.2008 03:32:19



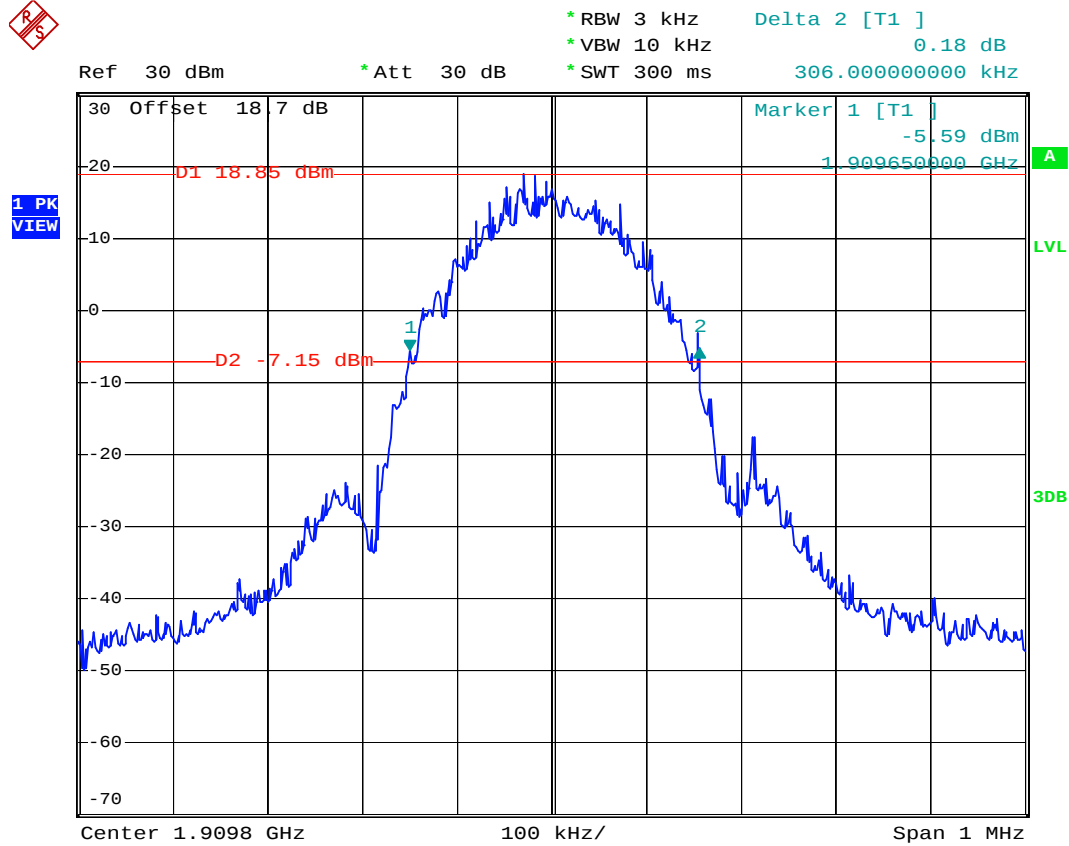
- Test Mode : PCS1900 (EDGE) CH661 26dB Bandwidth
- Power State : High



Date: 12.MAR.2008 03:33:18



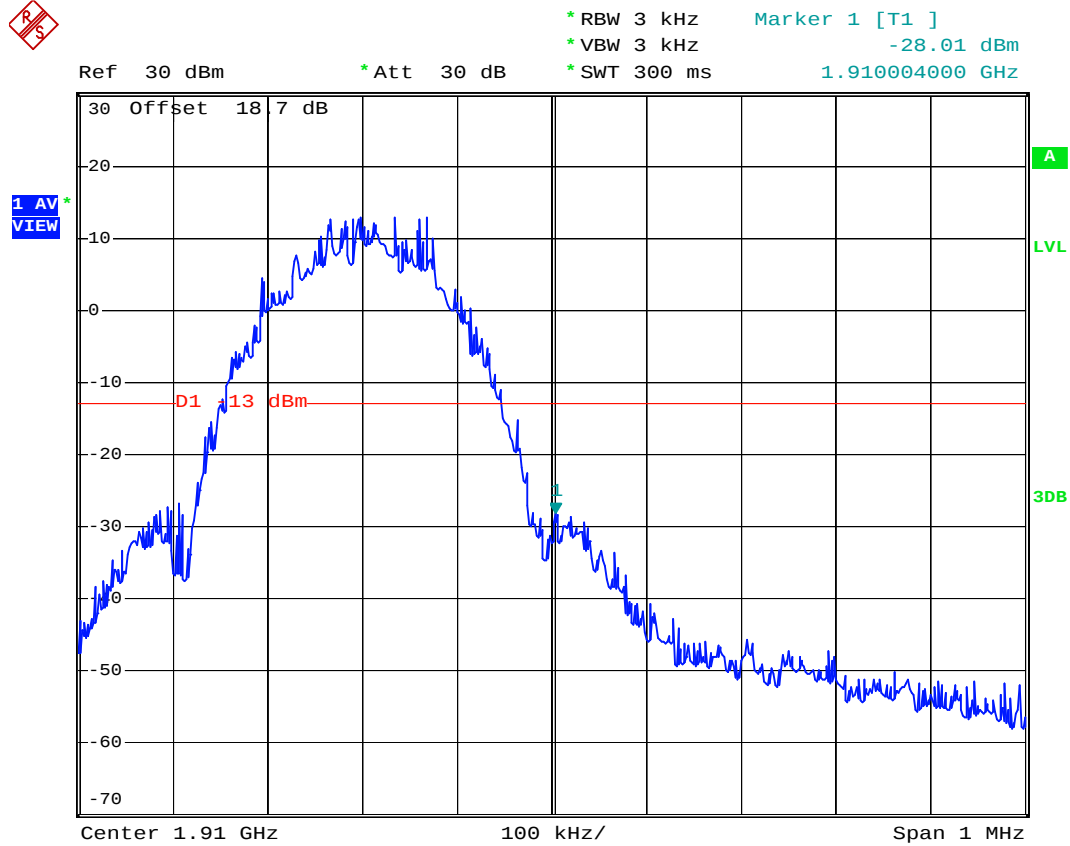
- Test Mode : PCS1900 (EDGE) CH810 26dB Bandwidth
- Power State : High



Date: 12.MAR.2008 03:35:22



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



Date: 12.MAR.2008 03:30:25

4.5 Conducted Emission

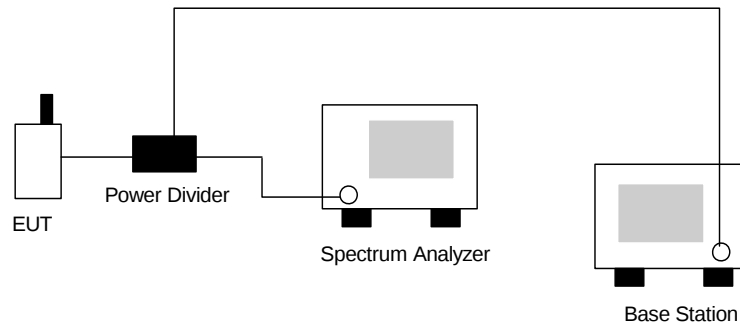
4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

4.5.2 Test Procedure

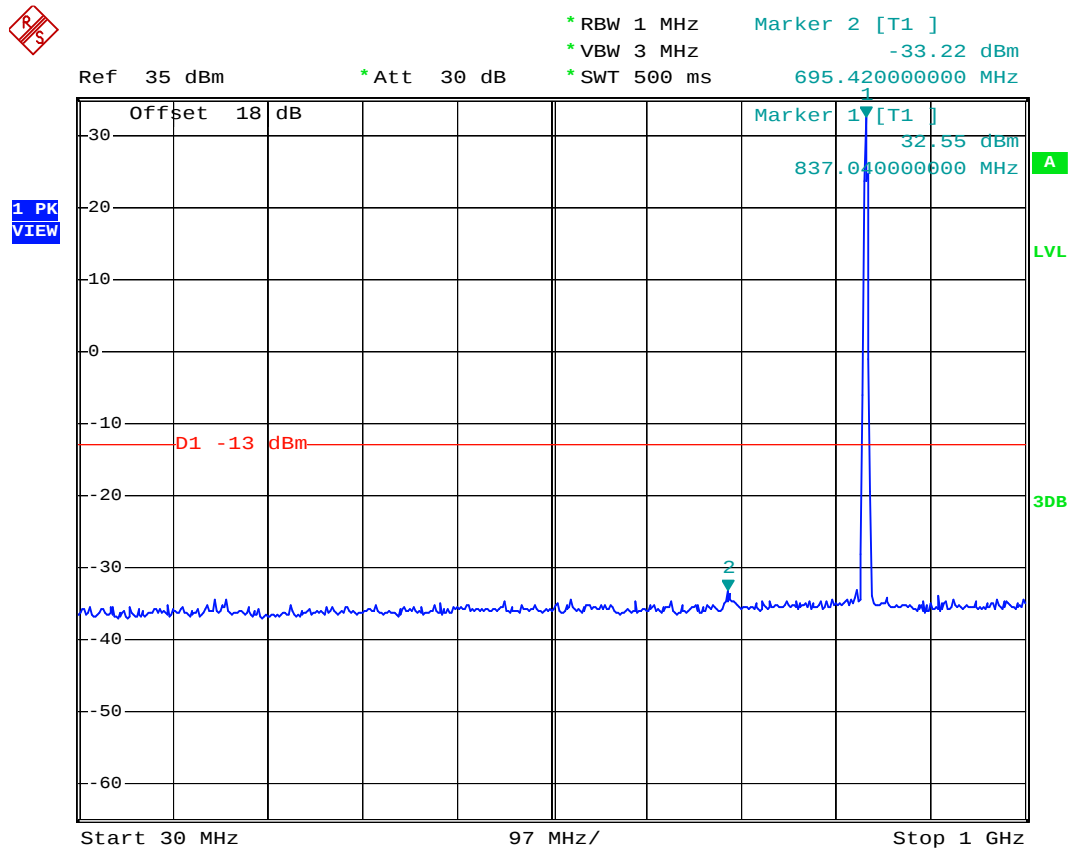
- a. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
- b. The middle channel for the highest RF power within the transmitting frequency was measured.
- c. The conducted spurious emission for the whole frequency range was taken.

4.5.3 Test Setup Layout



**4.5.4 Test Result**

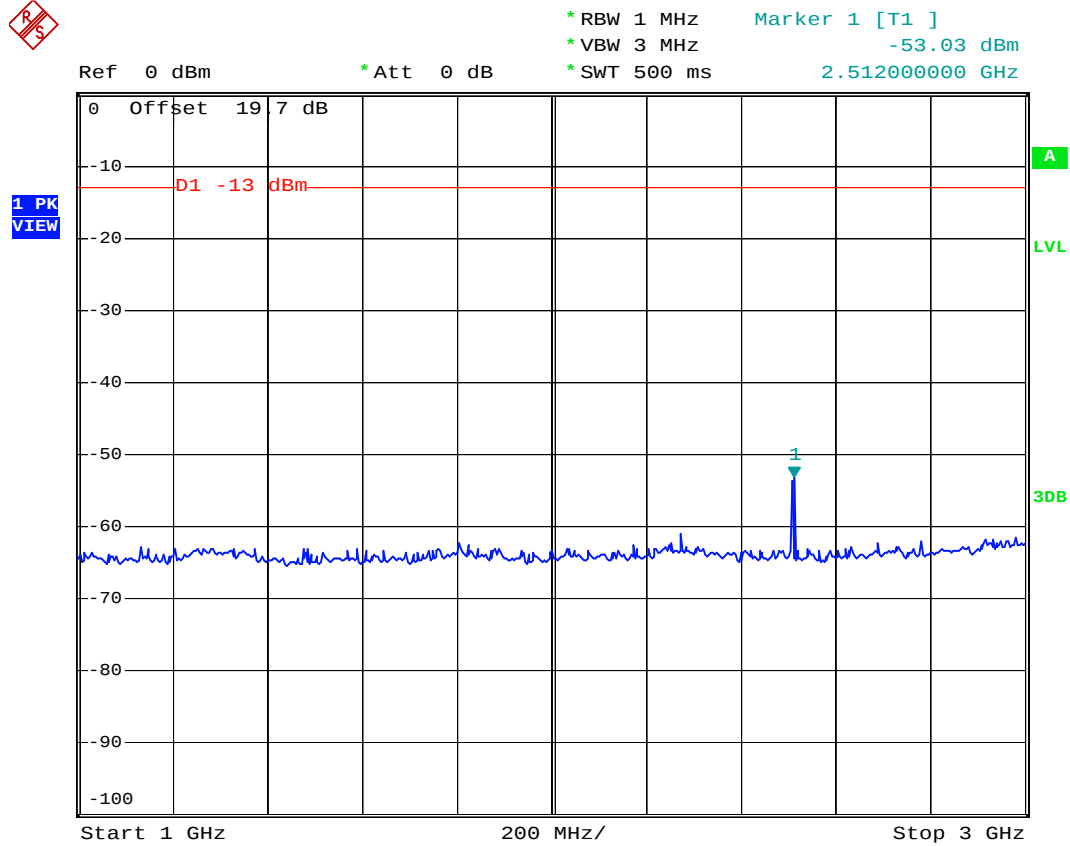
- Mode 1
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 30M-1G



Date: 12.MAR.2008 03:48:24



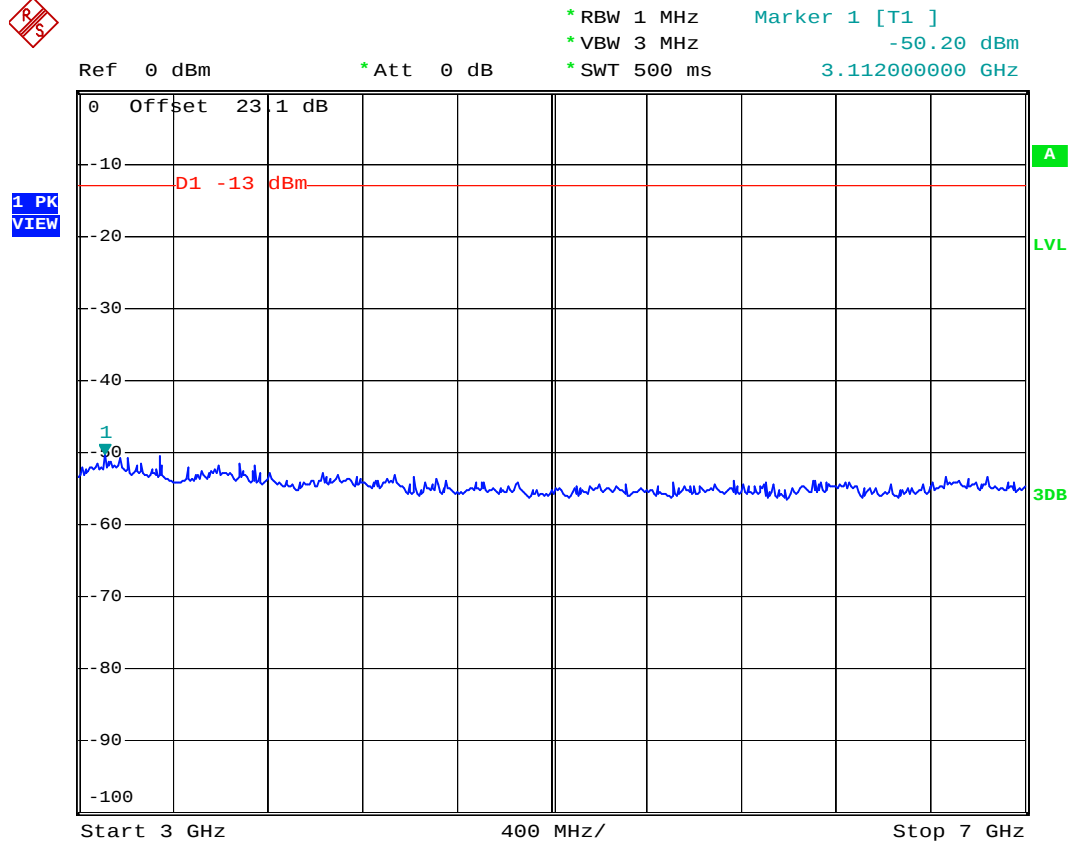
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 1G-3G



Date: 12.MAR.2008 03:58:29



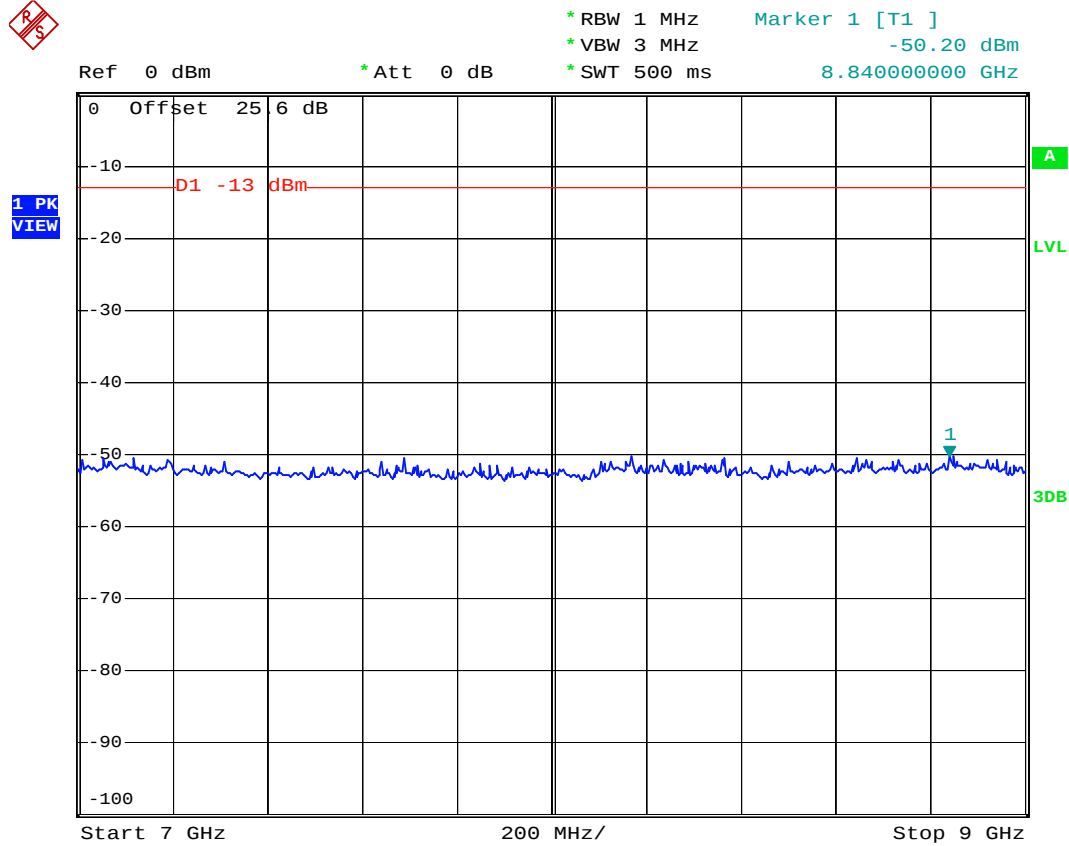
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 3G-7G



Date: 12.MAR.2008 03:59:27



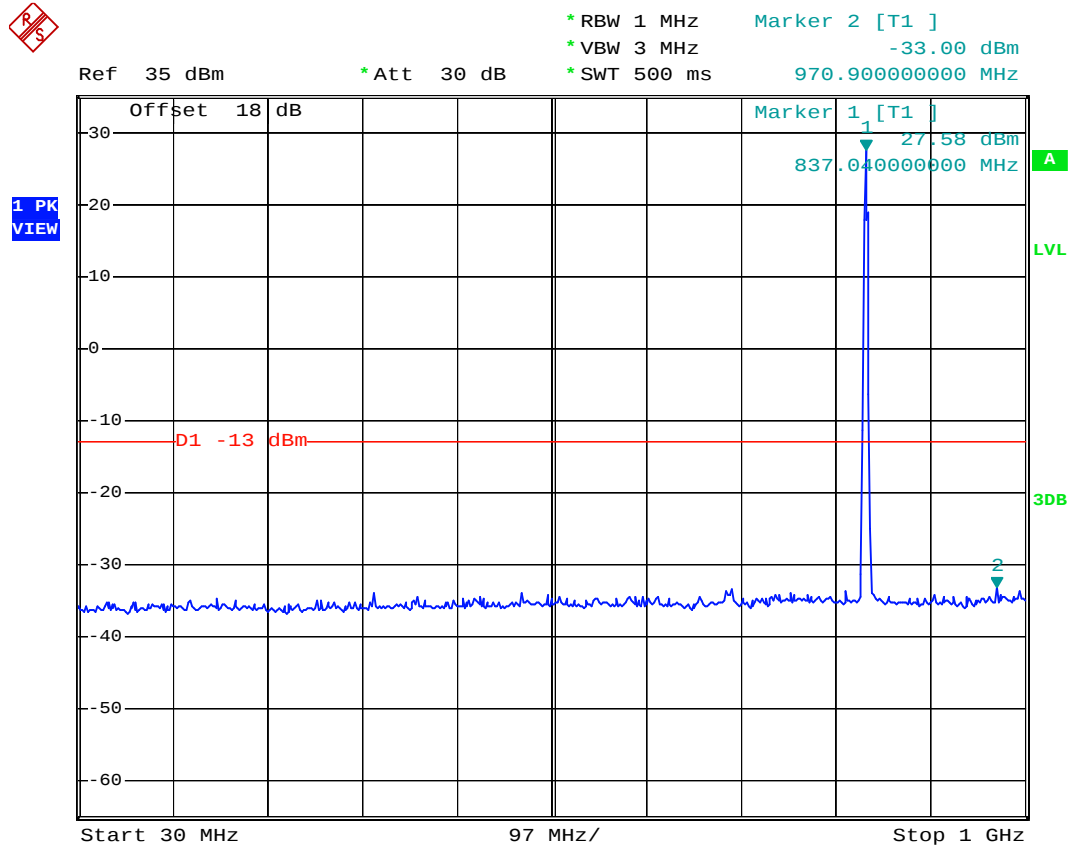
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 7G-9G



Date: 12.MAR.2008 04:03:25



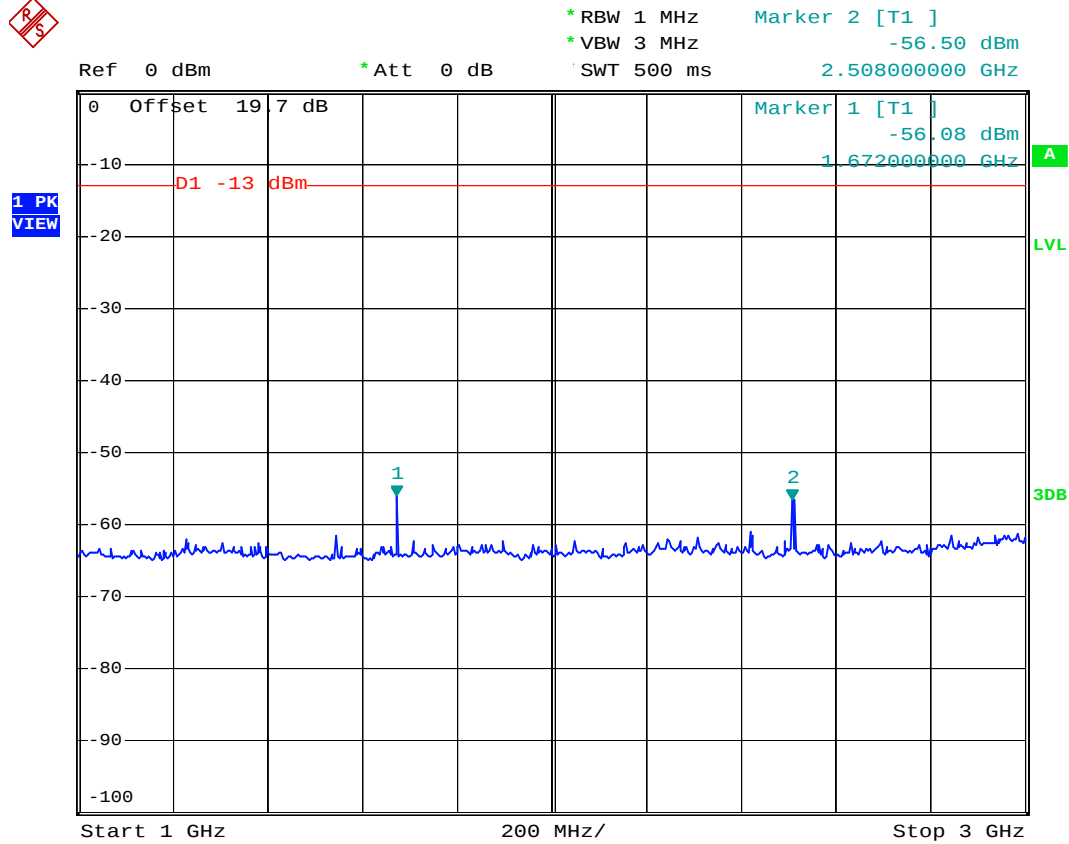
- Mode 2
- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 30M-1G



Date: 12.MAR.2008 03:45:54



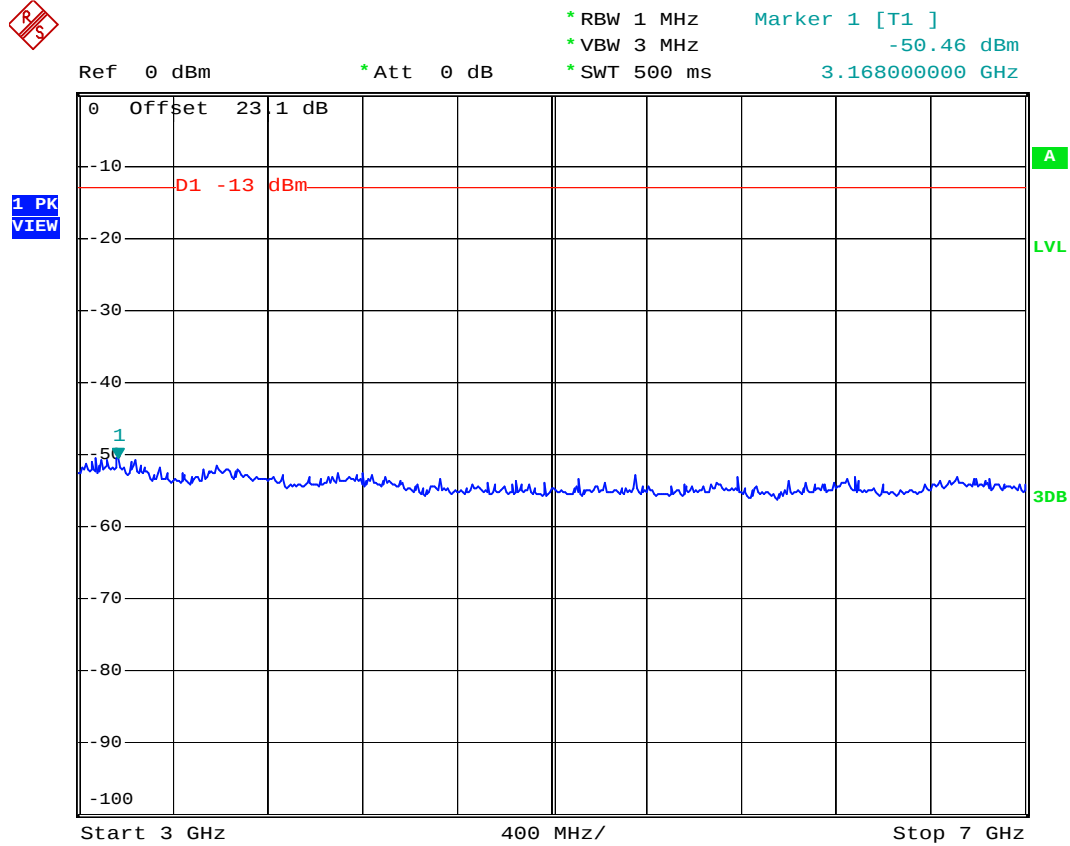
- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 1G-3G



Date: 12.MAR.2008 03:57:29



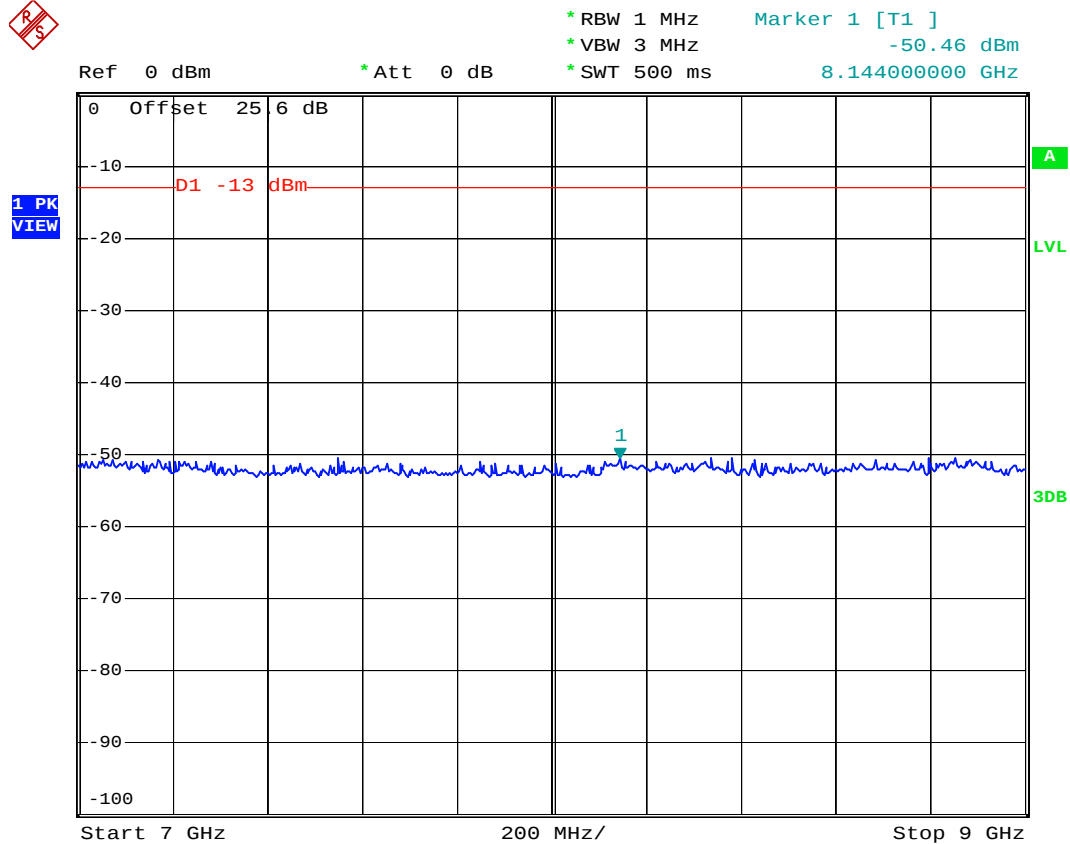
- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 3G-7G



Date: 12.MAR.2008 04:01:18



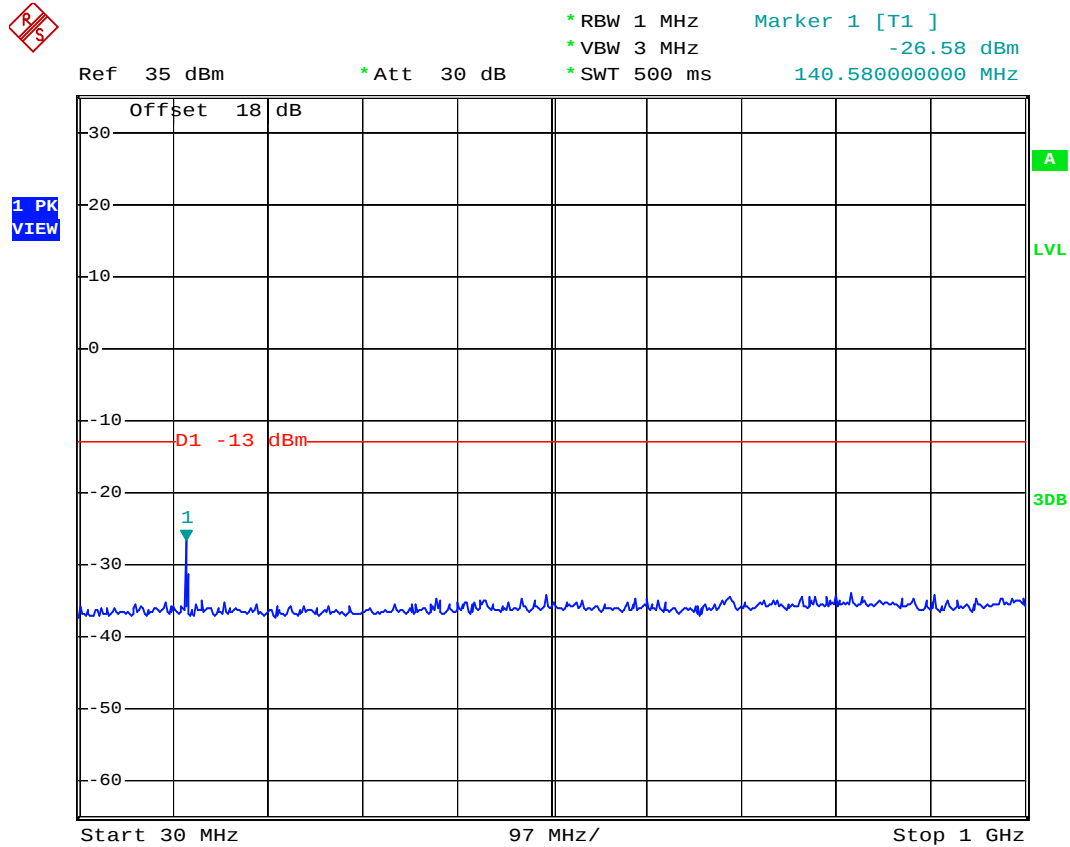
- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 7G-9G



Date: 12.MAR.2008 04:02:51



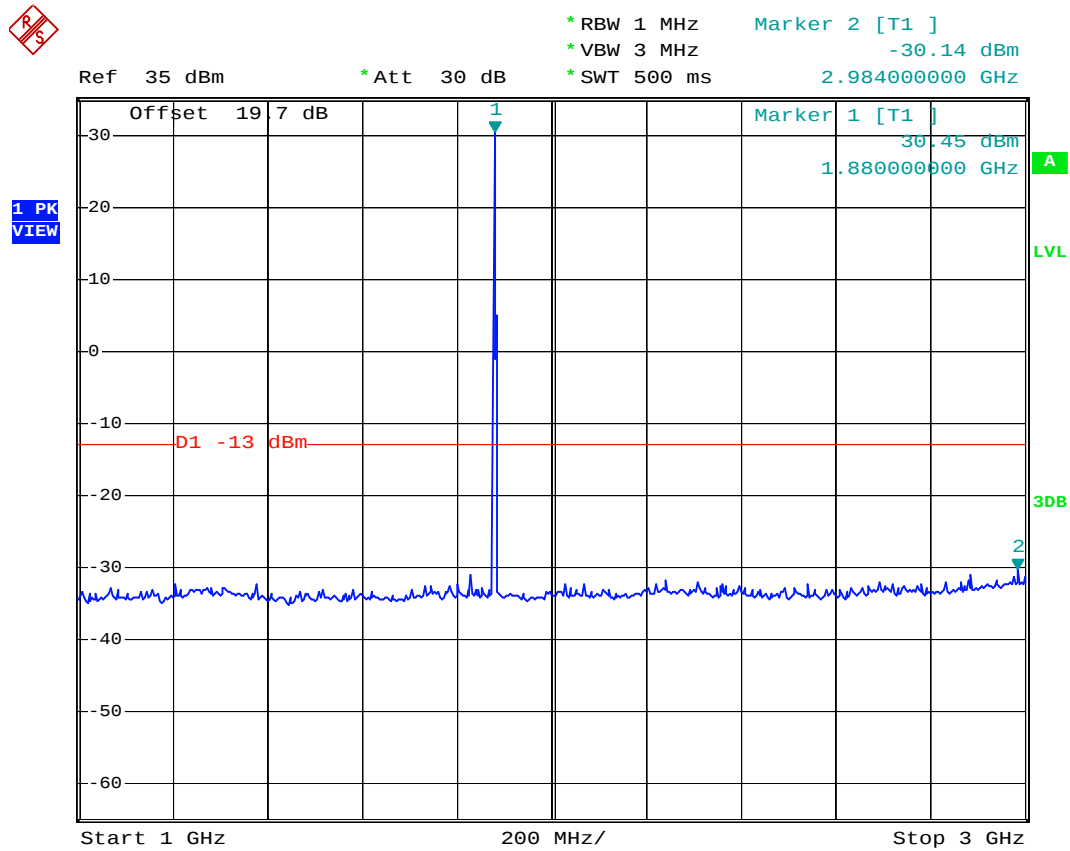
- Mode 3
- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 30M-1G



Date: 12.MAR.2008 03:49:09



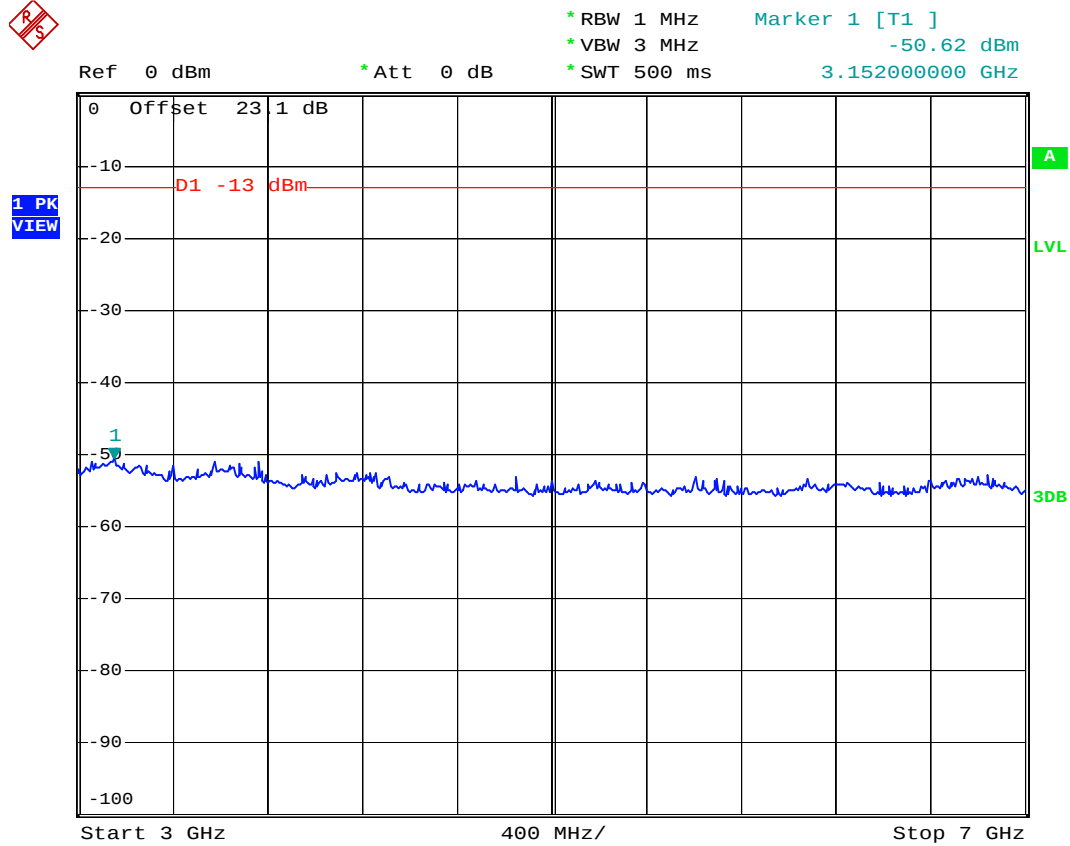
- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 1G-3G



Date: 12.MAR.2008 05:24:27



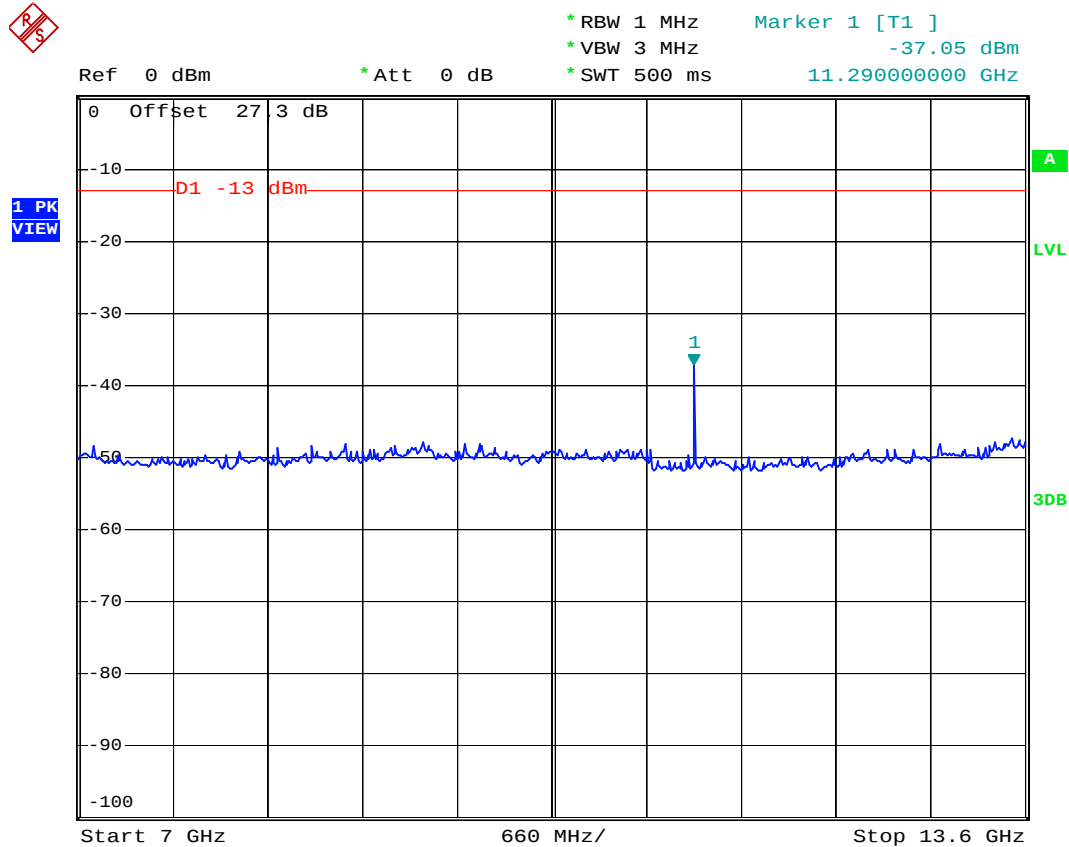
- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 3G-7G



Date: 12.MAR.2008 04:00:08



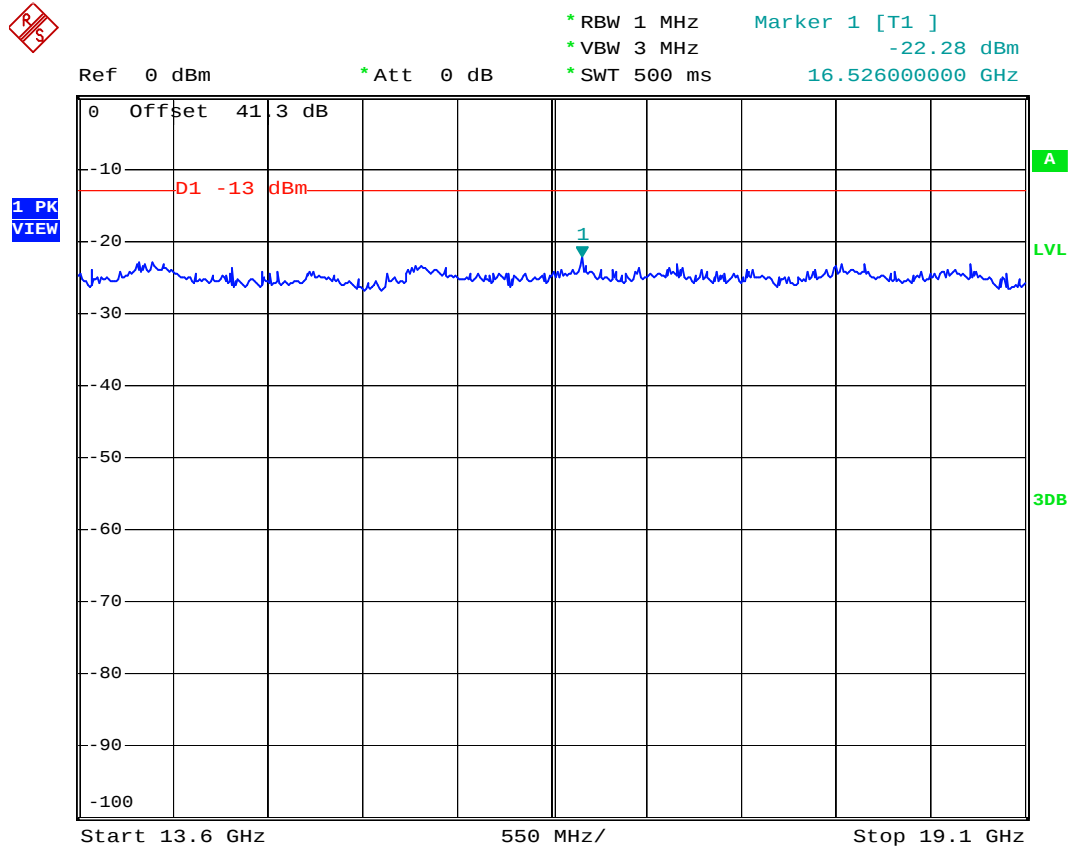
- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 7G-13.6G



Date: 12.MAR.2008 04:04:46

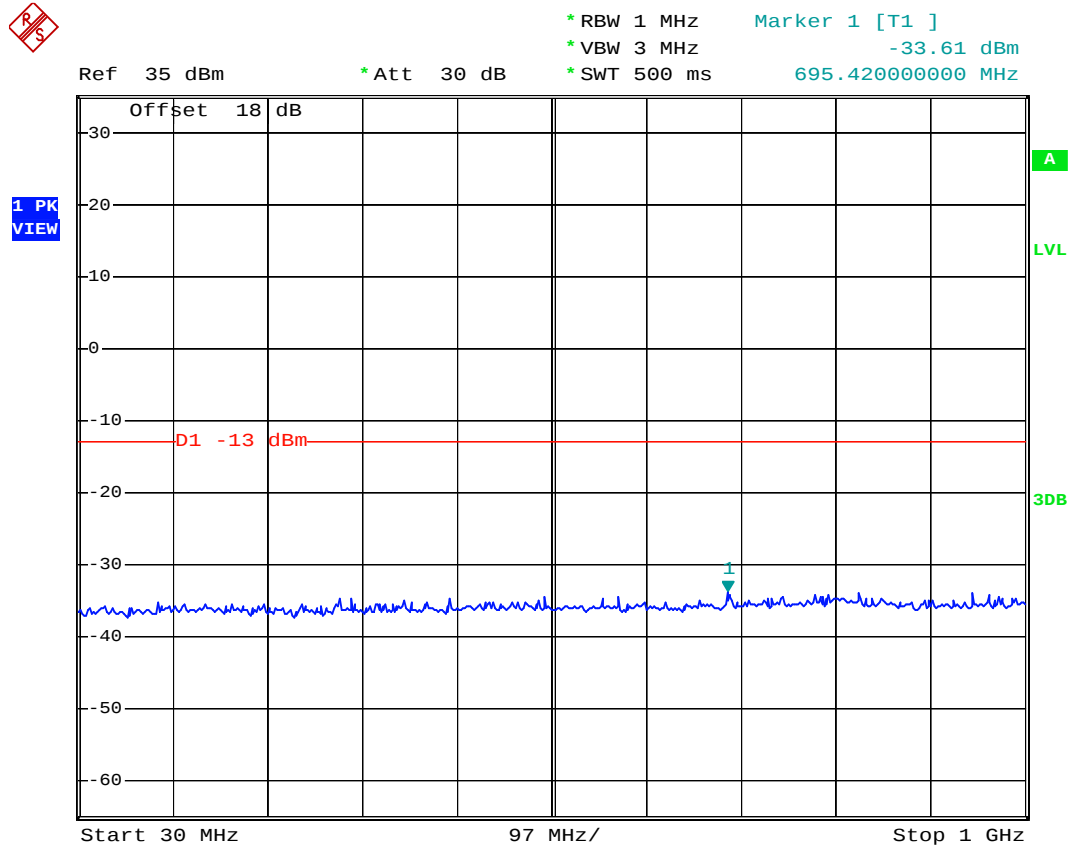


- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 13.6G-19.1G



Date: 12.MAR.2008 04:06:58

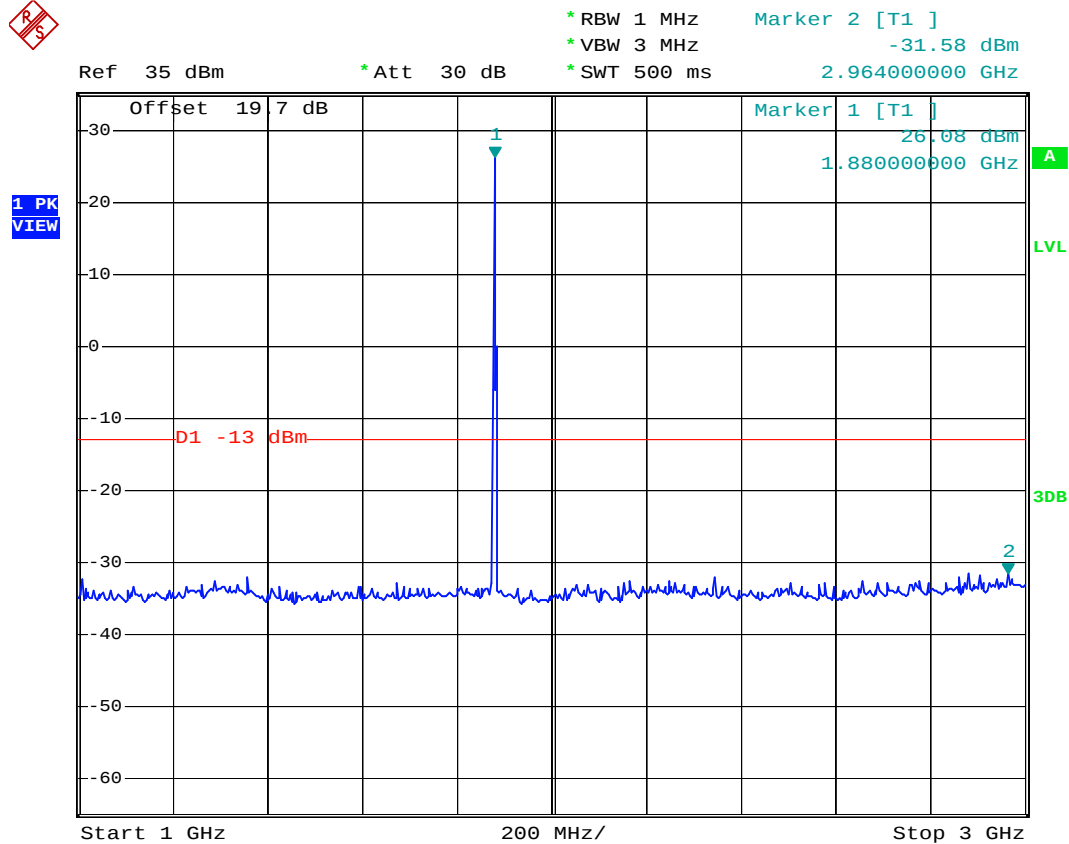
- Mode 4
- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 30M-1G



Date: 12.MAR.2008 03:46:41



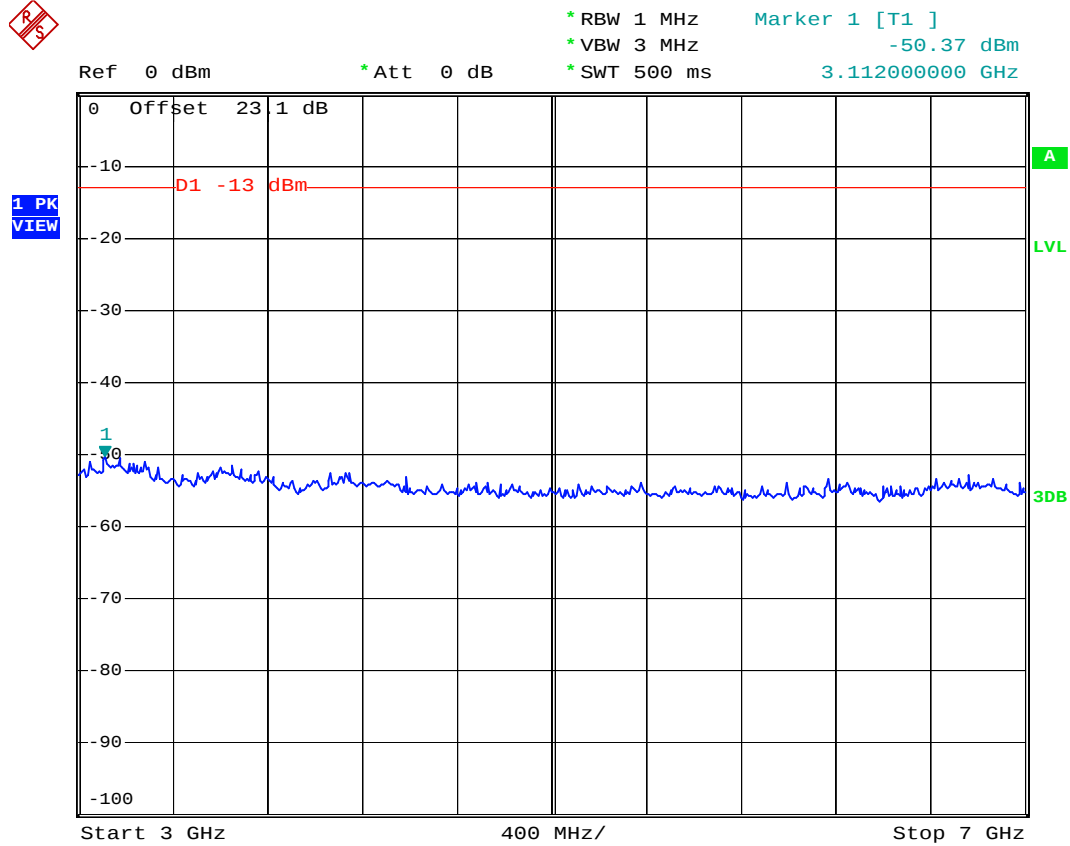
- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 1G-3G



Date: 12.MAR.2008 05:27:48



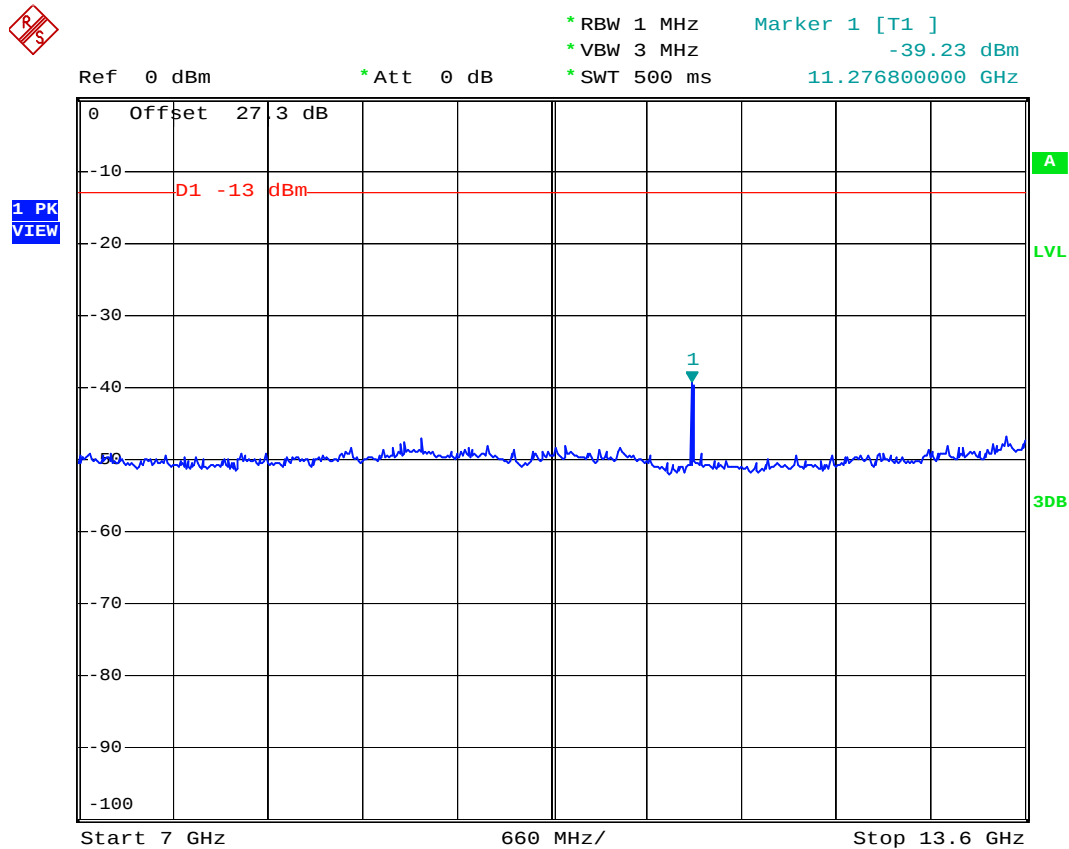
- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 3G-7G



Date: 12.MAR.2008 04:01:44



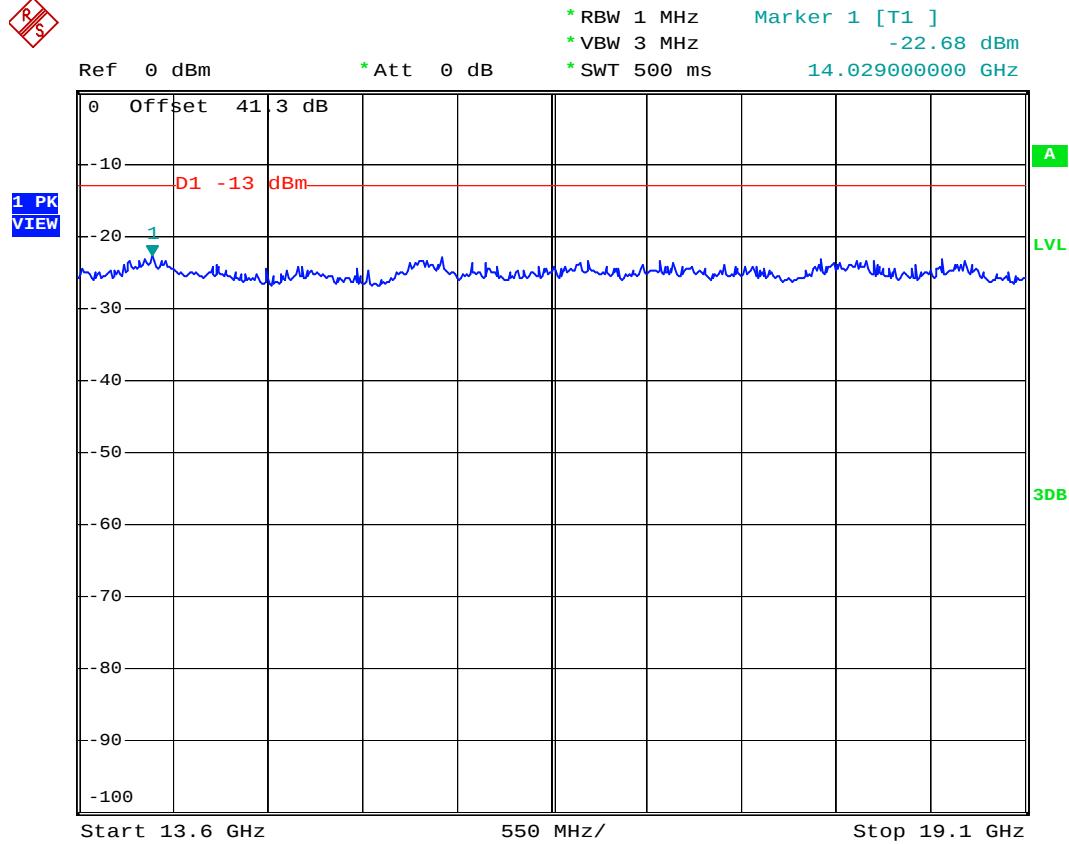
- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 7G-13.6G



Date: 12.MAR.2008 04:05:22



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



Date: 12.MAR.2008 04:06:25

4.6 Field Strength of Spurious Radiation

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

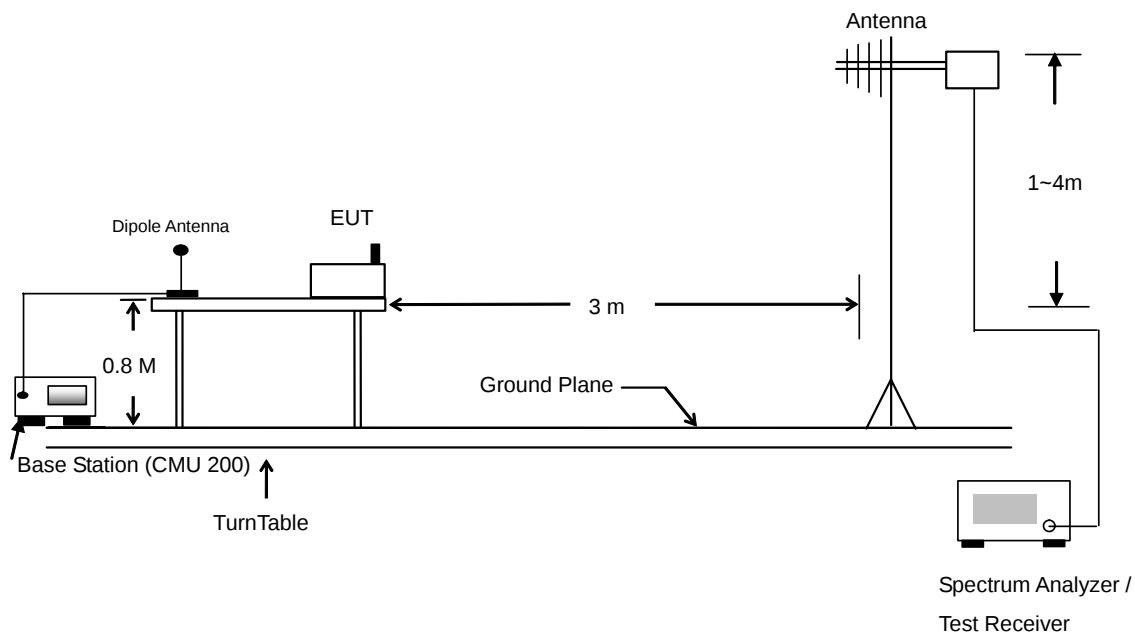
4.6.1 Measurement Instruments

As described in chapter 5 of this test report.

4.6.2 Test Procedure

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

4.6.3 Test Setup Layout

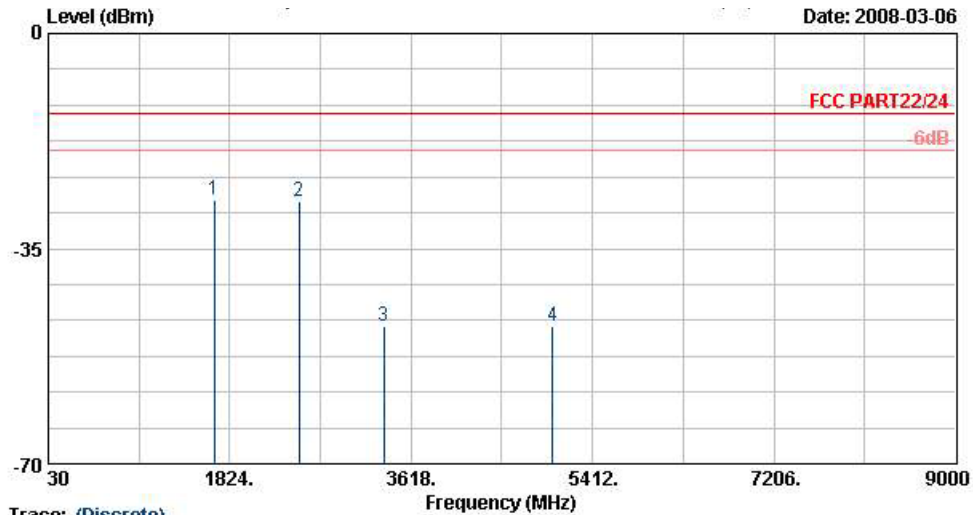




4.6.4 Test Data

4.6.4.1 Mode 1

Horizontal Polarization

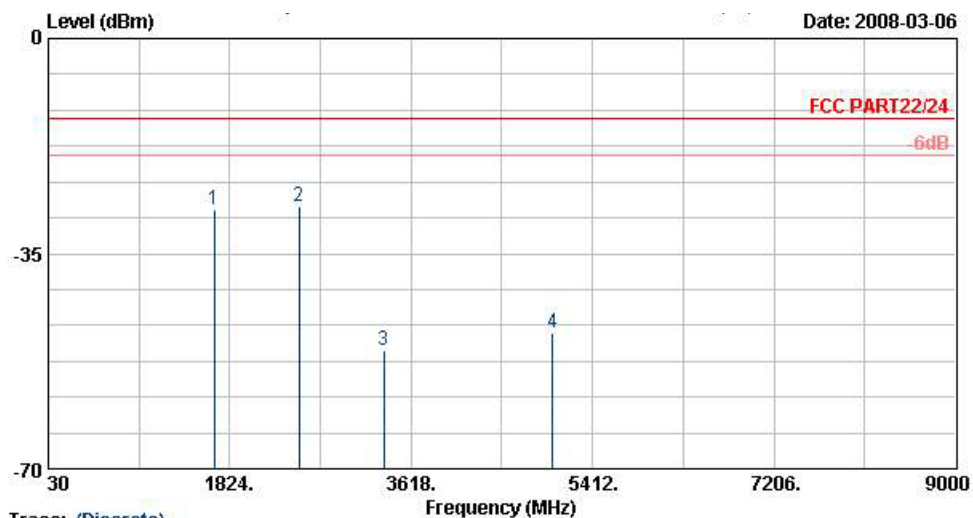


Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP-071107 HORIZONTAL
 EUT : PDA
 Power : 120Vac/60Hz
 Model : FG 830601
 Mode : GSM 850 Link + Cradle
 IMET : 08050D0003
 Pinac : H

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
1672	-27.15	-13	-30.97	-26.3	5.05	6.35	H	Pass
2506	-27.35	-13	-32.99	-27.4	5.93	8.13	H	Pass
3346	-47.63	-13	-53.05	-48.5	6.88	9.9	H	Pass
5020	-47.51	-13	-56.7	-46.4	8.49	9.53	H	Pass



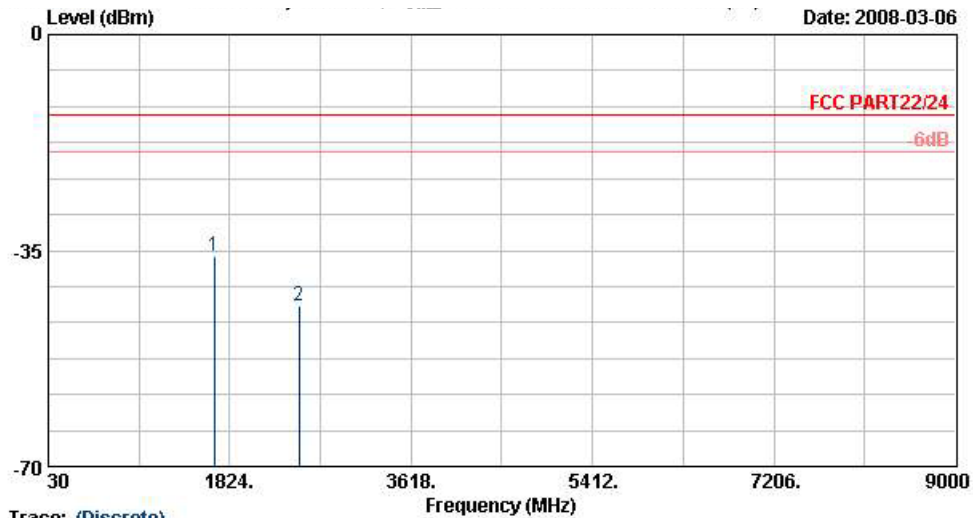
Vertical Polarization



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC PART22/24 ETRP-071107 VERTICAL
EUT : PDA
Power : 120Vac/60Hz
Model : FC 830601
Mode : GSM 850 Link + Cradle
TMEI : 08050D0003
Pinac : H

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
1672	-27.75	-13	-31.44	-26.9	5.05	6.35	V	Pass
2506	-27.35	-13	-38.2	-27.4	5.93	8.13	V	Pass
3346	-50.73	-13	-58.19	-51.6	6.88	9.9	V	Pass
5020	-48.01	-13	-57.54	-46.9	8.49	9.53	V	Pass

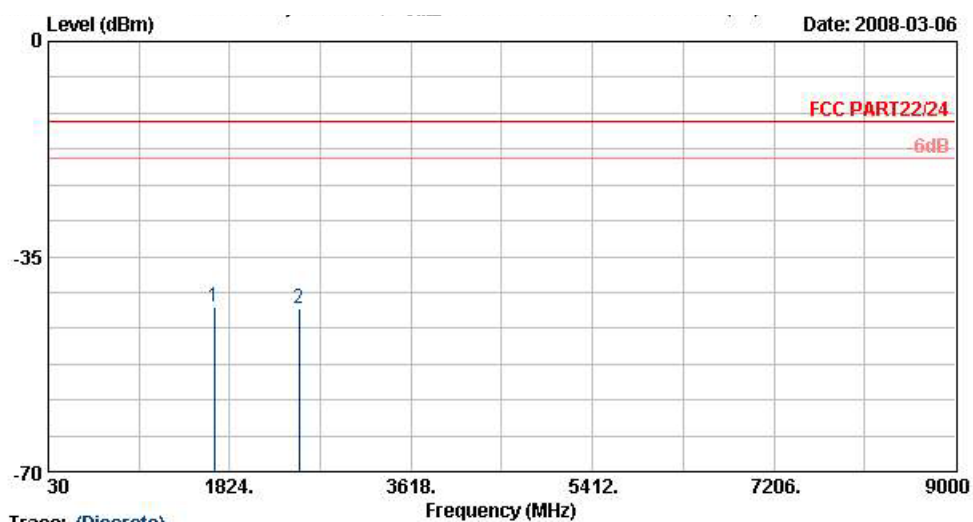
**4.6.4.2 Mode 2****Horizontal Polarization**

Trace: (Discrete)
Site : 03CH06-HY
Condition : FCC PART22/24 ETRP-071107 HORIZONTAL
EUT : PDA
Power : 120Vac/60Hz
Model : FC 830601
Mode : EDGE 850 Link + Cradle
TMEI : 08050D0003
Pinap : H

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
1672	-35.95	-13	-39.3	-35.1	5.05	6.35	H	Pass
2506	-44.05	-13	-48.37	-44.1	5.93	8.13	H	Pass

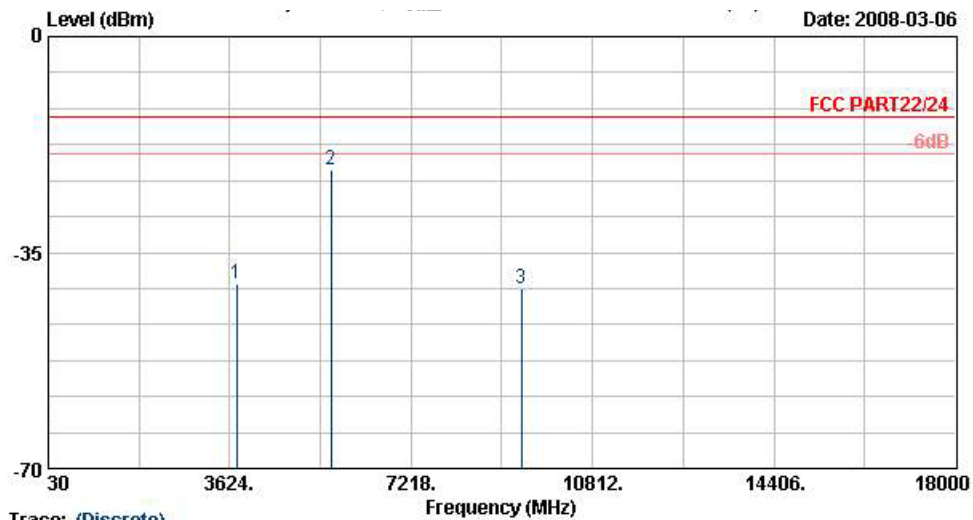


Vertical Polarization



Site : 03CH06-HY
Condition : FCC PART22/24 ETRP-071107 VERTICAL
EUT : PDA
Power : 120Vac/60Hz
Model : FC 830601
Mode : EDGE 850 Link + Cradle
IMEI : 06050D0003
Pinac : H

Frequency	ERP	Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1672	-43.15	-13	-45.85	-42.3	5.05	6.35	V	Pass
2506	-43.55	-13	-52.22	-43.6	5.93	8.13	V	Pass

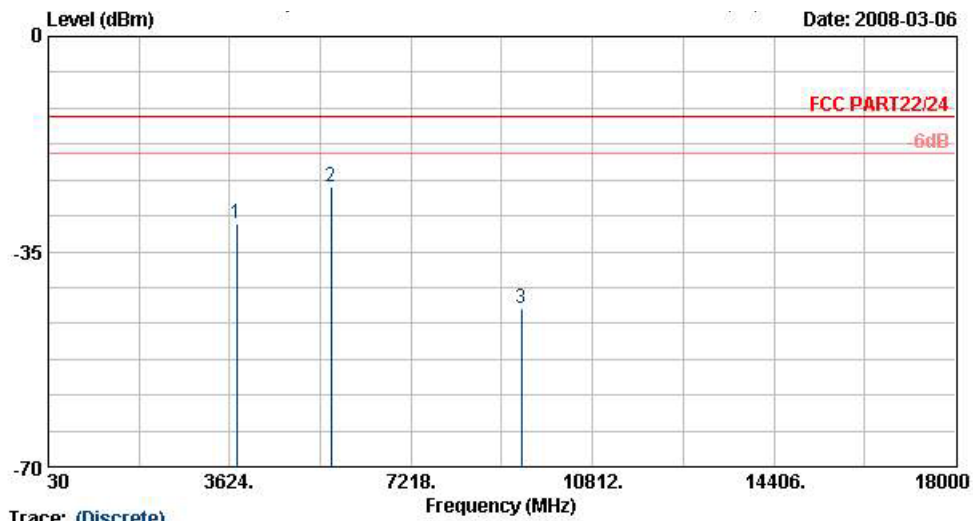
**4.6.4.3 Mode 3****Horizontal Polarization**

Site : 03CH06-HY
Condition : FCC PART22/24 ETRP-071107 HORIZONTAL
EUT : PDA
Power : 120Vac/60Hz
Model : FC 830601
Mode : PCS1900 Link + Cradle
TMEI : 08050D0003
Pinap : H

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
3756	-40.07	-13	-50.2	-44	7.17	11.1	H	Pass
5636	-21.71	-13	-37.51	-23.5	8.77	10.56	H	Pass
9396	-40.85	-13	-57.75	-39	11.61	9.76	H	Pass



Vertical Polarization



Trace: (Discrete)

Site : 03CH06-HY

Condition : FCC PART22/24 ETRP-071107 VERTICAL

EUT : PDA

Power : 120Vac/60Hz

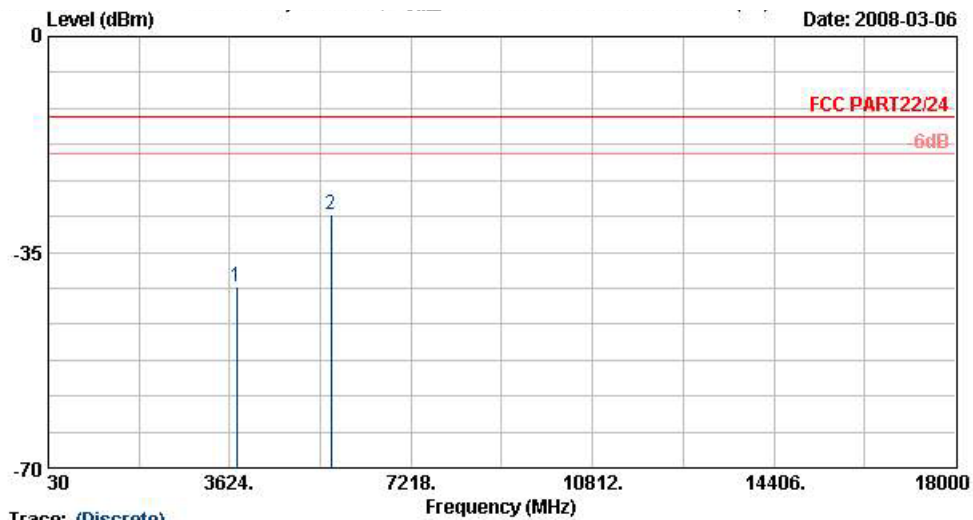
Model : FC 830601

Mode : PCS1900 Link + Cradle

TMET : 08050D0003

Pinac : H

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
3756	-30.57	-13	-44.35	-34.5	7.17	11.1	V	Pass
5636	-24.41	-13	-39.52	-26.2	8.77	10.56	V	Pass
9396	-44.25	-13	-59.2	-42.4	11.61	9.76	V	Pass

**4.6.4.4 Mode 4****Horizontal Polarization**

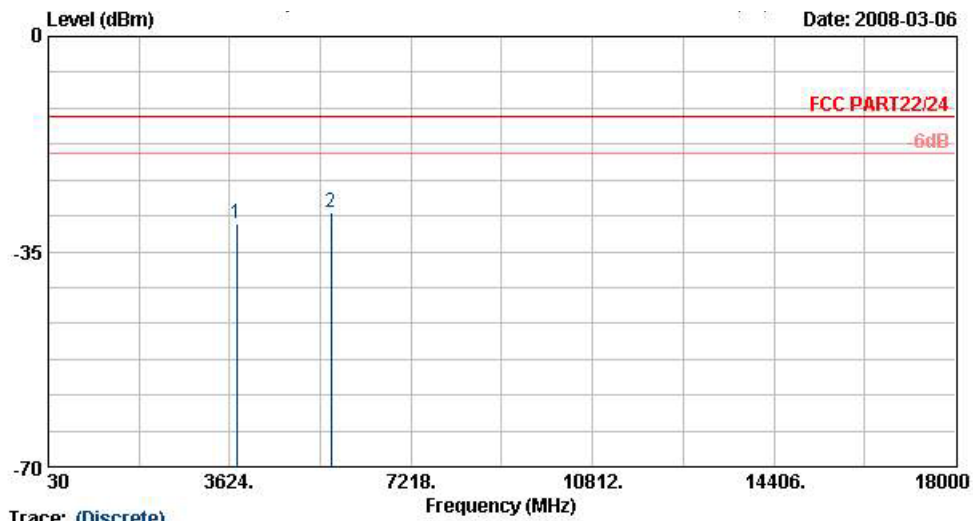
Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC PART22/24 ETRP-071107 HORIZONTAL
EUT : PDA
Power : 120Vac/60Hz
Model : FC 830601
Mode : EDGE1900 Link + Cradle
TNET : 08050D0003
Pinac : H

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
3756	-40.57	-13	-50.47	-44.5	7.17	11.1	H	Pass
5636	-28.81	-13	-44.21	-30.6	8.77	10.56	H	Pass

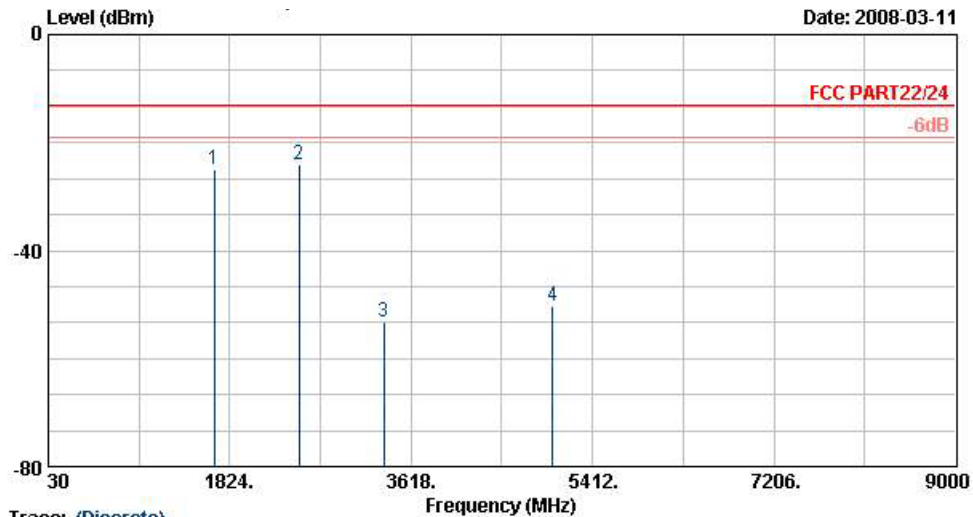


Vertical Polarization



Site : 03CH06-HY
Condition : FCC PART22/24 ETRP-071107 VERTICAL
EUT : PDA
Power : 120Vac/60Hz
Model : FC 830601
Mode : EDGE1900 Link + Cradle
TMEI : 08050D0003
Pinac : H

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
3756	-30.47	-13	-44.25	-34.4	7.17	11.1	V	Pass
5636	-28.51	-13	-43.31	-30.3	8.77	10.56	V	Pass

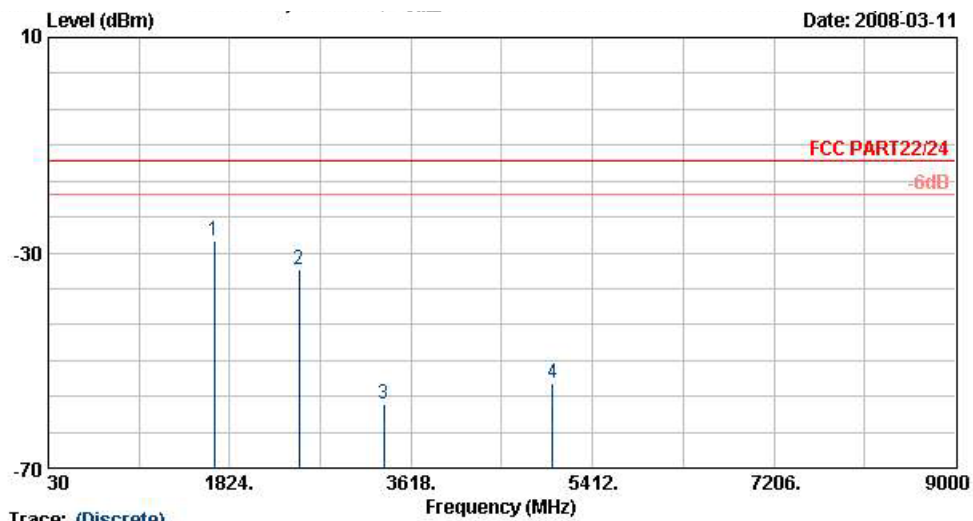
**4.6.4.5 Mode 5****Horizontal Polarization****Trace: (Discrete)**

Site : 03CH06-HY
Condition : FCC PART22/24 HF-SPURIOUS HORIZONTAL
EUT : PDA
Power : 120Vac/60Hz
Model : FG 830601
Mode : GSM 850 Link + BT Tx_Ch00:2402M
TMEI : 0605000003
Plane : H
DataRate : 3DH5

Frequency	ERP	Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1672	-24.95	-13	-29.48	-24.1	5.05	6.35	H	Pass
2506	-24.15	-13	-32.53	-24.2	5.93	8.13	H	Pass
3346	-53.23	-13	-55.14	-54.1	6.88	9.9	H	Pass
5020	-50.31	-13	-57.24	-49.2	8.49	9.53	H	Pass



Vertical Polarization



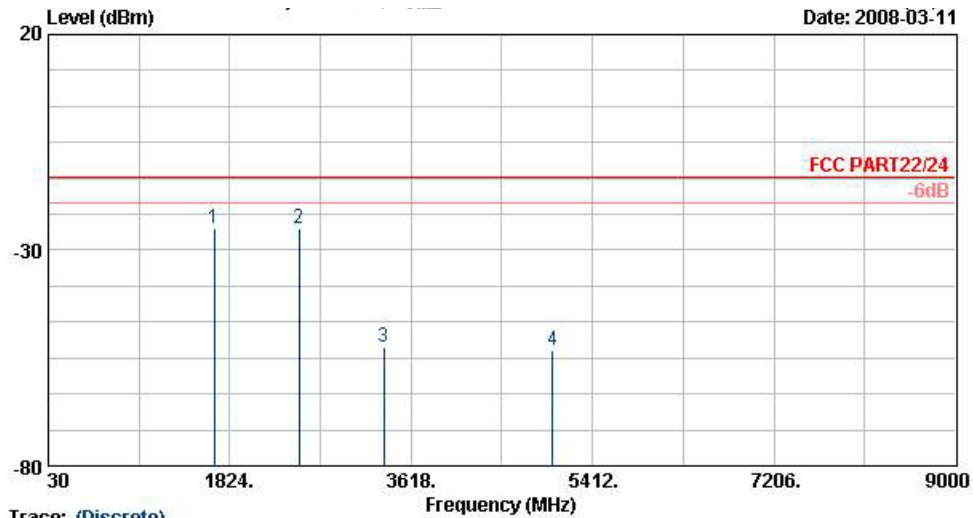
Site : 03CH06-HY
Condition : FCC PART22/24 HF-SPURIOUS VERTICAL
EUT : PDA
Power : 120Vac/60Hz
Model : FG 830601
Mode : GSM 850 Link + BT Tx_Ch00:2402M
IMEI : 06050D0003
Pinac : H
DataRate : 3DH5

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
1672	-27.75	-13	-30.75	-26.9	5.05	6.35	V	Pass
2506	-33.25	-13	-40.41	-33.3	5.93	8.13	V	Pass
3346	-58.23	-13	-57.96	-59.1	6.88	9.9	V	Pass
5020	-54.21	-13	-57.42	-53.1	8.49	9.53	V	Pass



4.6.4.6 Mode 6

Horizontal Polarization

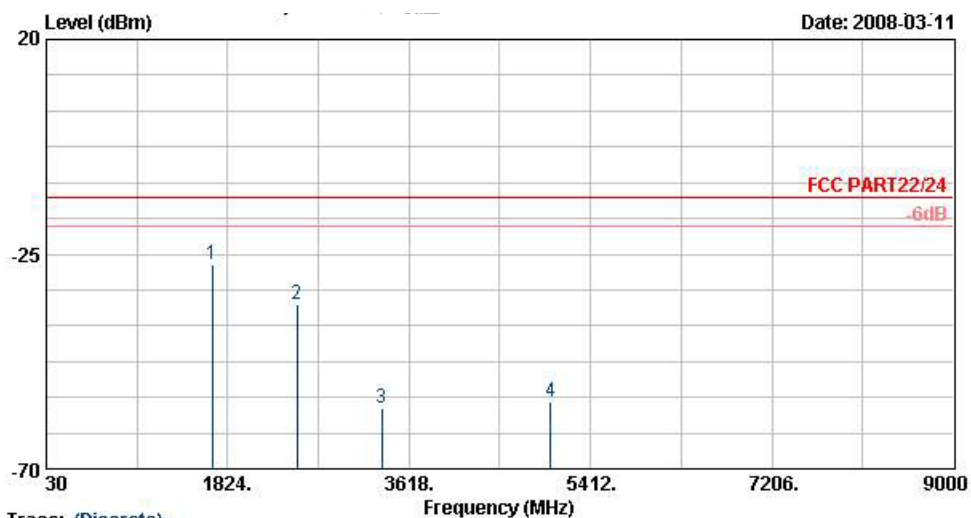


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 HF-SPURIOUS HORIZONTAL
 EUT : PDA
 Power : 120Vac/80Hz
 Model : FC 830601
 Mode : GSM 850 Link + 11b Tx_Ch06:2437M
 TMEI : 08050D0003
 Plnae : H
 DataRate : 11

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
1672	-25.05	-13	-29.79	-24.2	5.05	6.35	H	Pass
2506	-25.15	-13	-33.43	-25.2	5.93	8.13	H	Pass
3346	-52.43	-13	-54.49	-53.3	6.88	9.9	H	Pass
5020	-53.21	-13	-57.66	-52.1	8.49	9.53	H	Pass



Vertical Polarization



Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC PART22/24 HF-SPURIOUS VERTICAL
 EUT : PDA
 Power : 120Vac/60Hz
 Model : FC 830601
 Mode : GSM 850 Link + 11b Tx_Ch06:2437M
 TMET : 08050D0003
 PInae : H
 DataRate : 11

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
1672	-27.15	-13	-30.72	-26.3	5.05	6.35	V	Pass
2506	-35.55	-13	-40.93	-35.6	5.93	8.13	V	Pass
3346	-57.33	-13	-56.43	-58.2	6.88	9.9	V	Pass
5020	-55.91	-13	-57.71	-54.8	8.49	9.53	V	Pass

4.7 Frequency Stability (Temperature Variation)

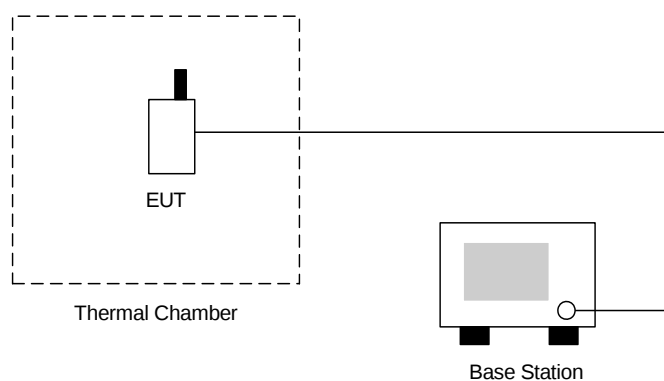
4.7.1 Measurement Instrument

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 (GSM) CH189

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	-12	-0.01	2.5	Passed
-20	-10	-0.01		
-10	-18	-0.02		
0	-14	-0.02		
10	-16	-0.02		
20	-15	-0.02		
30	-19	-0.02		
40	-8	-0.01		
50	-10	-0.01		

• Test Mode : GSM850 (EDGE) CH189

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	18	0.01	2.5	Passed
-20	24	0.03		
-10	17	0.02		
0	25	0.03		
10	17	0.02		
20	13	0.02		
30	21	0.02		
40	11	0.01		
50	13	0.02		



▪ Test Mode : PCS1900 (GSM) CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	14	0.01	2.5	Passed
-20	28	0.01		
-10	33	0.02		
0	25	0.01		
10	30	0.02		
20	22	0.01		
30	38	0.02		
40	15	0.01		
50	36	0.02		

▪ Test Mode : PCS1900 (EDGE) CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	36	0.02	2.5	Passed
-20	24	0.01		
-10	25	0.01		
0	19	0.01		
10	23	0.01		
20	27	0.01		
30	21	0.01		
40	27	0.01		
50	22	0.01		

4.8 Frequency Stability (Voltage Variation)

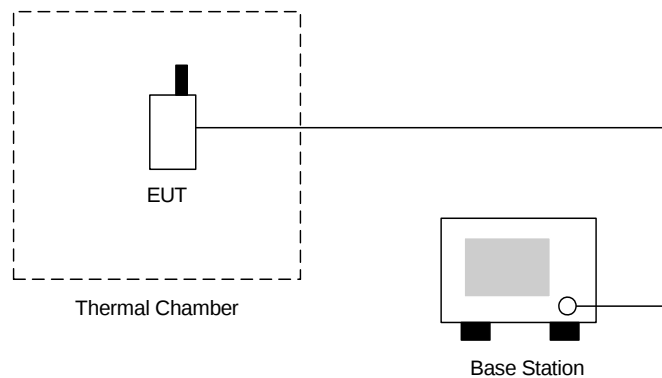
4.8.1 Measurement Instrument

As described in chapter 5 of this test report.

4.8.2 Test Procedure

- The EUT was placed in a temperature chamber at $25\pm5^{\circ}\text{C}$ and connected as the following section.
- The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
- 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
7.4	-11.0	-0.01	2.5	Passed
BEP	12.0	0.01		
8.5	14.0	0.02		

- Test Mode : GSM850 (EDGE) CH189

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
7.4	18.0	0.02	2.5	Passed
BEP	16.0	0.02		
8.5	9.0	0.01		



- Test Mode : PCS1900 (GSM) CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
7.4	-25.0	-0.01	2.5	Passed
BEP	16.0	0.01		
8.5	15.0	0.01		

- Test Mode : PCS1900 (EDGE) CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
7.4	-13.0	-0.01	2.5	Passed
BEP	15.0	0.01		
8.5	36.0	0.02		

Remark:

1. Normal Voltage= 7.4V.
2. Battery End Point (BEP)= 6.3 V.

5. List of Measurement Equipments

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	Dec. 01, 2007	Nov. 30, 2008	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	9170-251	14G - 40G	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 22, 2007	Nov. 21, 2008	Radiation (03CH06-HY)
Pre Amplifier	EMEC	PA303	PA303-SMA-	100K~3GHz	Nov. 26, 2007	Nov. 25, 2008	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	103937	Third-Band	Oct. 19, 2007	Oct. 18, 2008	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	Sep. 30, 2008	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. 21, 2008	Feb. 20, 2009	Conduction (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 21, 2008	Feb. 20, 2009	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
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