



FCC TEST REPORT

for

47 CFR Part 24E

Equipment : 3G GPS PDA Phone

Trade Name : 1. ASUS
2. Vodafone

Model No. : 1. P550
2. 1520

FCC ID : MSQ-1520

Tx Frequency Range : 1850.2~1909.8 MHz

Max. ERP/EIRP Power : 1.97 W

Emission Designator : 300KGXW

Applicant : ASUSTek COMPUTER INC.
4F., No. 150, Li-Te Rd., Peitou. Taipei. Taiwan

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- The data shown in this test report were carried out on Sep. 07, 2007 at **Sporton International Inc. LAB.**
- Report No.: FG780803B, Report Version: Rev. 01.

Jones Tsai
Manager

SPORTON International Inc.

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



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History of this test report

Report Issue Date: Sep. 07, 2007

Report No.	Description



1. General Information

1.1. Applicant

ASUSTek COMPUTER INC.

4F., No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

1.2 Manufacturer

1. ASUSTek COMPUTER INC.

4F., No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

2. ASUS SHANGHAI PARK Protek (ShangHai) Limited

NO. 3668 Xiu Yan Rd., Kang Qiao Town, Nan Hui Dist, Shang Hai P.C.: 201319

1.3 Basic Description of Equipment under Test

Equipment		3G GPS PDA Phone
Trade Name		1. ASUS 2. Vodafone
Model Name		1. P550 2. 1520
AC Adapter 1	Brand Name	TPT
	Model Name	JSP050090UU
	Power Rating	I/P:100-240Vac, 50-60Hz, 0.3A; O/P: 5Vdc, 0.9mA, 4.5W
	AC Power Cord Type	1.6 meter non-shielded cable without ferrite core
AC Adapter 2	Brand Name	PI
	Model Name	P005WA05OW
	Power Rating	I/P:100-240Vac, 50-60Hz, 0.15A; O/P: 5Vdc, 0.9mA, 4.5W
	AC Power Cord Type	1.6 meter non-shielded cable without ferrite core
Car Charger	Brand Name	ASUS
	P/N	04G267011910
	Power Rating	I/P: 12V/24V; O/P: 5V, 900mA
	Power Cord Type	1.7 meter non-shielded cable without ferrite core
Battery	Brand Name	ASUS
	Model Name	SBP-14
	Rating	3.7Vdc, 1530mA
	Type	Li-ion
Earphone	Brand Name	COTRON
	P/N	04G170022100
	Signal line Type	1.7 meter non-shielded cable without ferrite core
USB Cable	Brand Name	FOXCONN
	P/N	14G000506200
	Signal line Type	1 meter shielded cable without ferrite core
Holster	Brand Name	ASUS
	P/N	15G180904600

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**

DUT Type :	3G GPS PDA Phone
Trade Name :	ASUS
Model Name :	P550
FCC ID :	MSQ-1520
Tx Frequency :	PCS1900 : 1850 ~1910 MHz Bluetooth : 2400~2483.5 MHz WLAN : 2400 ~ 2483.5 MHz
Rx Frequency :	PCS1900 : 1930 ~ 1990 MHz Bluetooth : 2400~2483.5 MHz WLAN : 2400 ~ 2483.5 MHz
Number of Channels :	Bluetooth : 79 WLAN : 11
Carrier Frequency of Each Channel :	Bluetooth : $2402 + n * 1 \text{ MHz}$; $n=0\sim78$ WLAN : $2412 + (n - 1) * 5 \text{ MHz}$; $n=1\sim11$
Maximum Output Power to Antenna :	PCS1900 : 29.54 dBm Bluetooth : 2.08 dBm WLAN : 802.11b : 13.66 dBm 802.11g : 17.69 dBm
Digital Modulation Emission :	GSM/GPRS : GMSK Bluetooth : GFSK WLAN : DSSS / OFDM
Maximum ERP/EIRP :	PCS1900: 1.97 W (32.94 dBm)
Type of Emission :	300KGXW
Device Power Class :	1
Antenna Type :	PCS1900 : Fixed Internal Bluetooth: PIFA Antenna WLAN: PIFA Antenna
Antenna Gain :	Bluetooth : -5 dBi WLAN : -5 dBi
HW Version :	1.1
SW Version :	V3.0.0
Power Rating (DC/AC , Voltage and Current of RF element or PA) :	DC 3.8V / 1.5A
DUT Stage :	Production Unit

1.5 Report Date

EUT Received : Aug. 08, 2007

Report Date : Sep. 07, 2007

2. Test Configuration of Equipment under Test

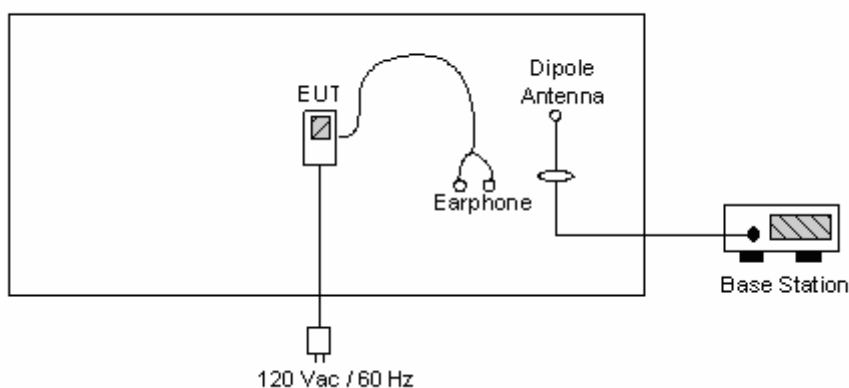
2.1 Test Manner

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

2.2 Test Mode

Application	PCS 1900
Radiated Emission	☒ Mode 1: PCS1900 Link Mode + Adapter + Earphone ☒ Mode 2: PCS1900 Link Mode + Adapter + Earphone + 802.11g Tx_Ch01 Link
Conducted Measurement	☒ Mode 1: PCS1900 Link Mode

2.3 Connection Diagram of Test System



2.4 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Serial No.
1.	Base Station	R&S	CMU200	N/A	106656



3. General Information of Test Site

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

Test Site No : 03CH06-HY

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 24E

3.3 Frequency Range

a. Radiation: from 30 MHz to 19000 MHz for PCS

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

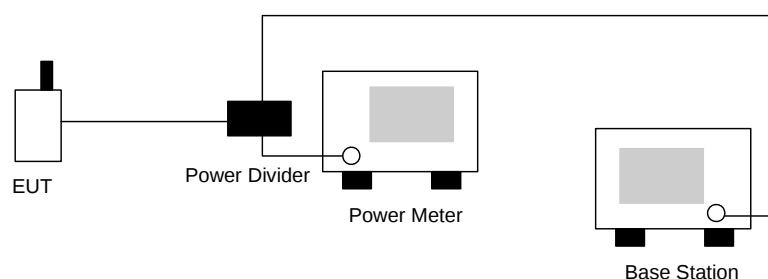
4.2.1 Measurement Instruments :

As described in chapter 5 of this test report.

4.2.2 Test Procedure :

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

4.2.3 Test Setup Layout :



4.2.4 Test Result :

Bands	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
PCS1900	512	1850.2 (Low)	29.51	0.893
	661	1880.0 (Mid)	29.46	0.883
	810	1909.8 (High)	29.54	0.899

4.3 ERP / EIRP Measurement

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

4.3.1 Measurement Instruments

As described in chapter 5 of this test report.

4.3.2 Test Procedure

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

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

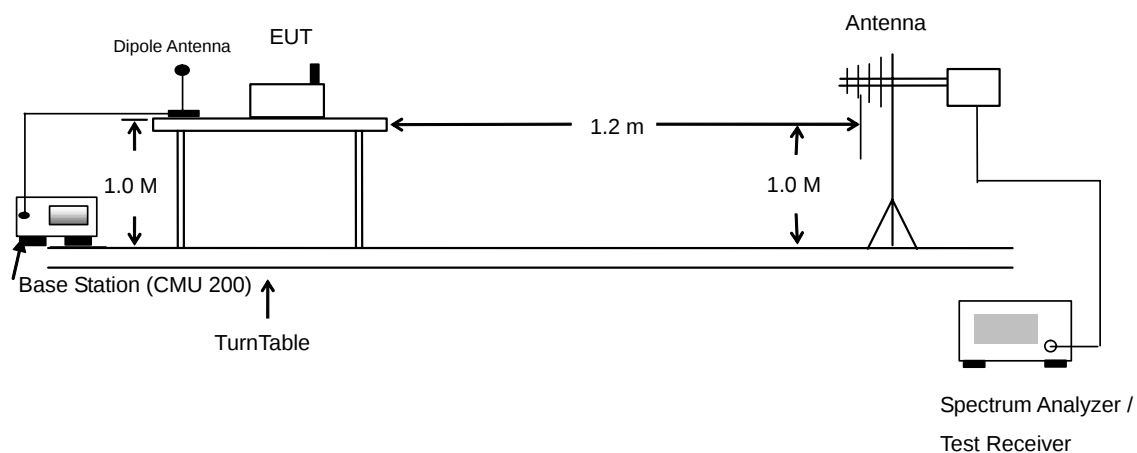
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

R_t : The highest received signal in Spectrum Analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

4.3.3 Test Setup Layout of ERP/EIRP



**4.3.4 Test Result**

PCS1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
1850.20	-23.88	-51.88	0.00	1.96	30.54	1.13
1880.00	-24.68	-52.99	0.00	2.00	31.35	1.36
1909.80	-24.58	-54.28	0.00	1.98	32.94	1.97
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
1850.20	-23.09	-52.13	0.00	1.96	30.30	1.07
1880.00	-21.27	-53.17	0.00	2.00	30.62	1.15
1909.80	-22.10	-54.13	0.00	1.98	30.44	1.11

4.4 Occupied Bandwidth and Band Edge Measurement

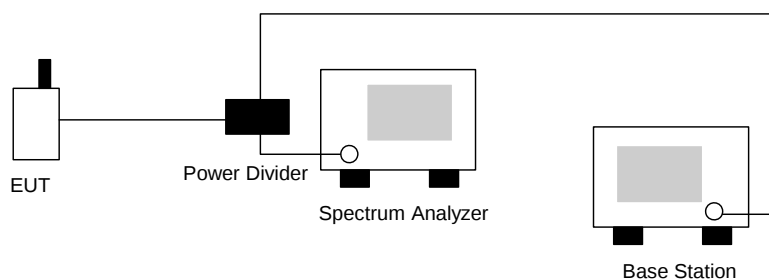
4.4.1 Measurement Instruments

As described in chapter 5 of this test report.

4.4.2 Test Procedure

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

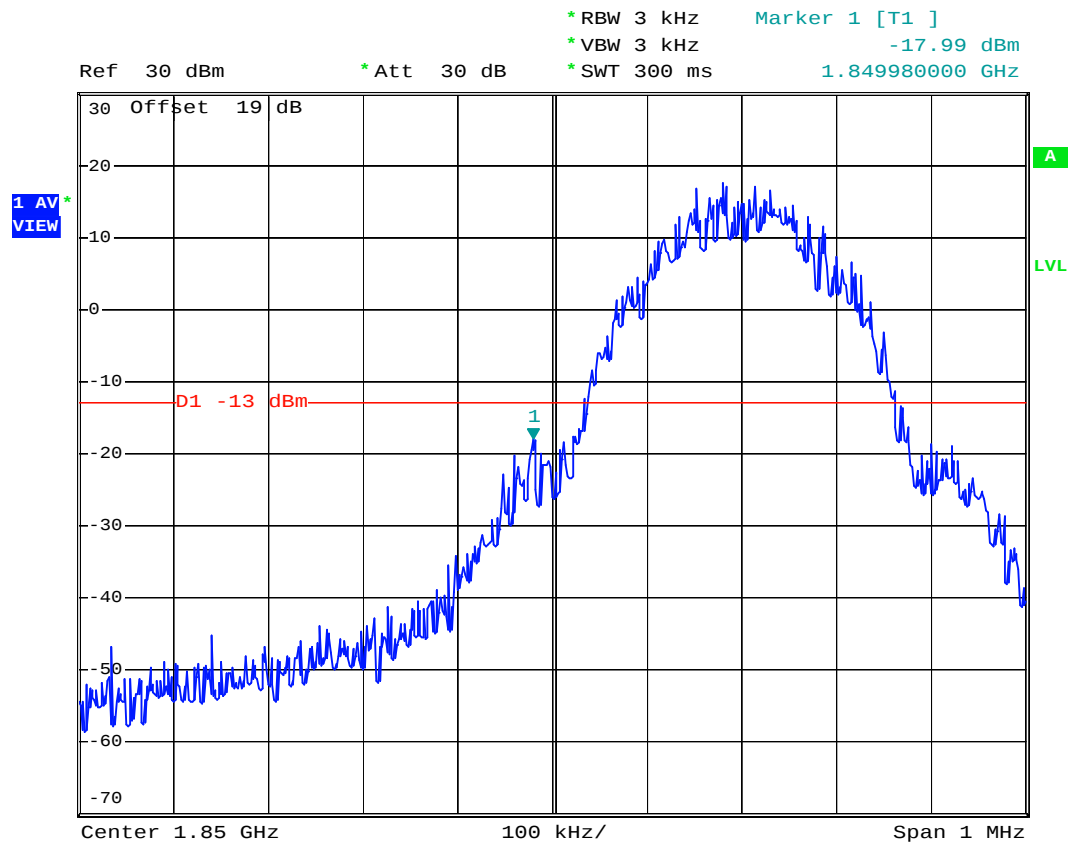
4.4.3 Test Setup Layout



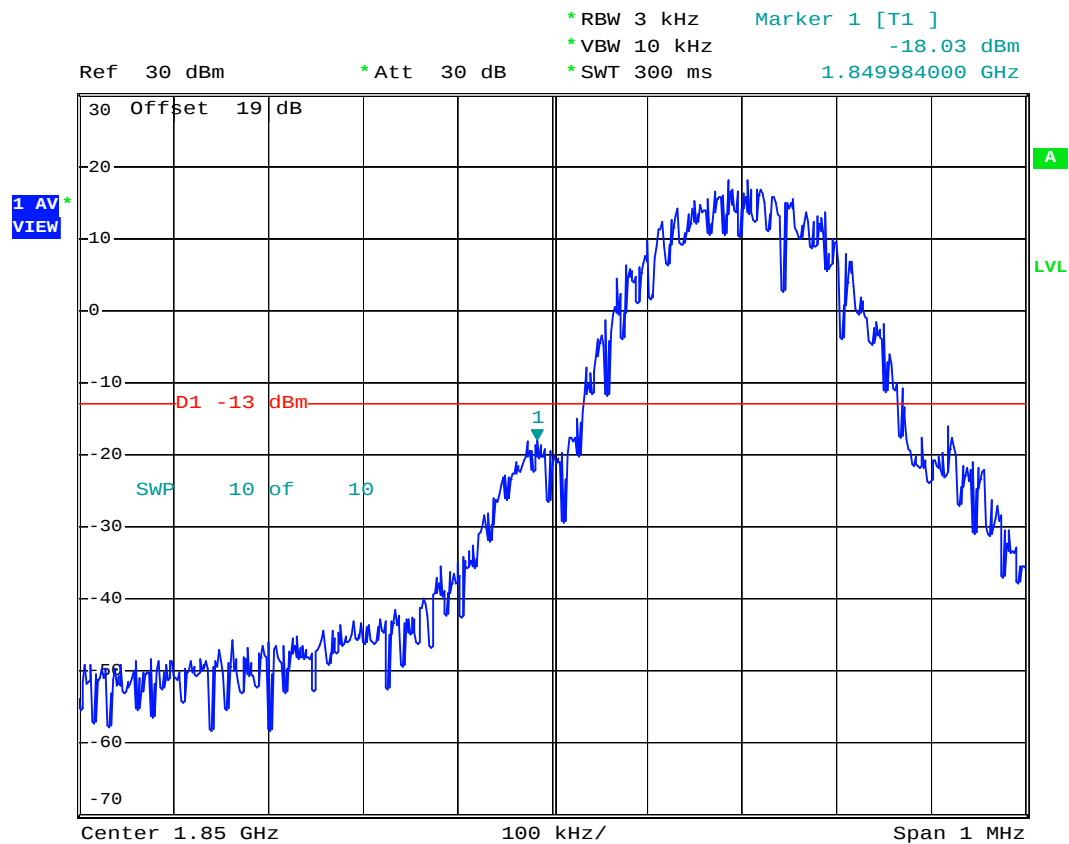


4.4.4 Test Result

- Mode 1
- Test Mode : PCS1900 (GSM) CH512 Lower Band Edge
- Power State : High

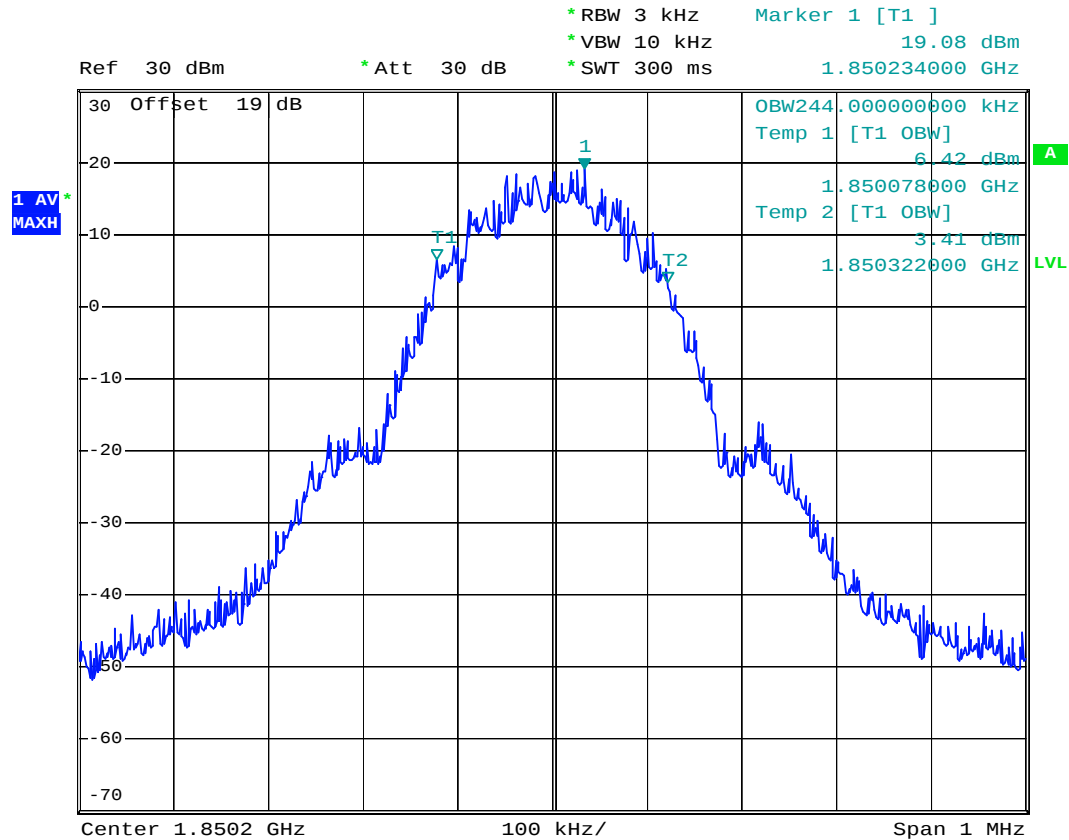


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Date: 13.AUG.2007 16:32:36

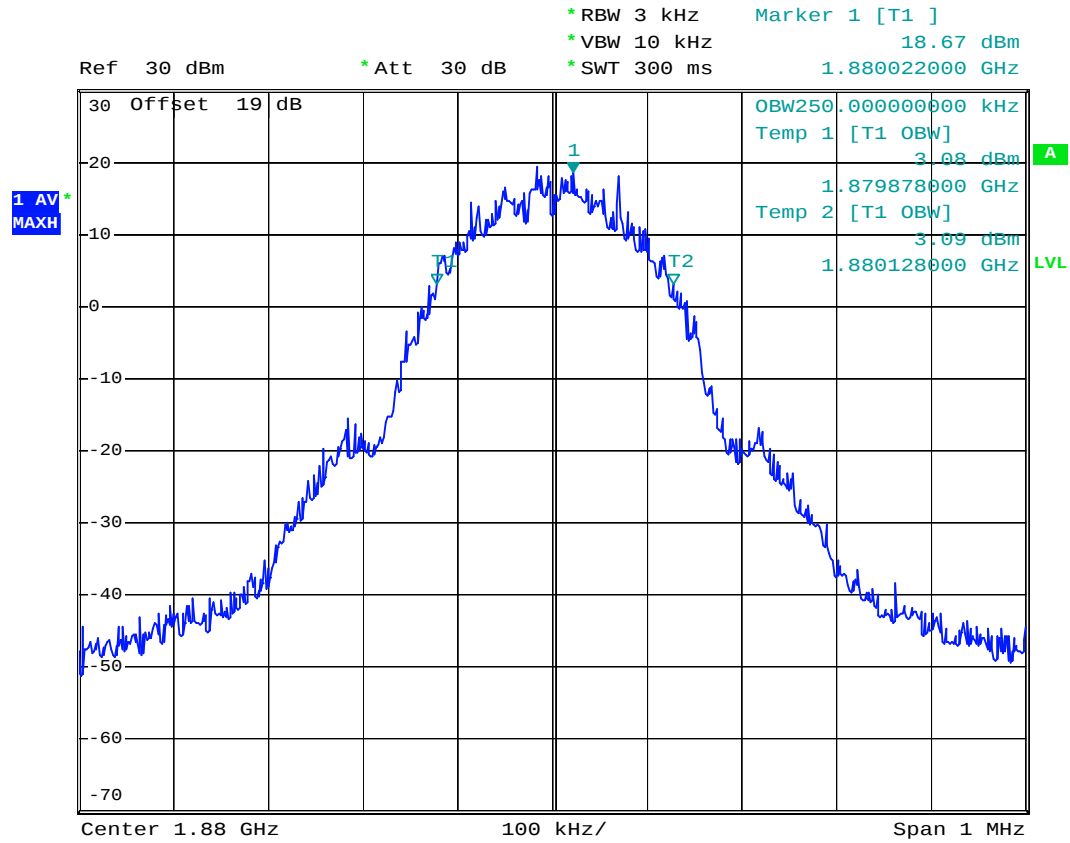
- Test Mode : PCS1900 (GSM) CH512 99% Occupied Bandwidth
- Power State : High



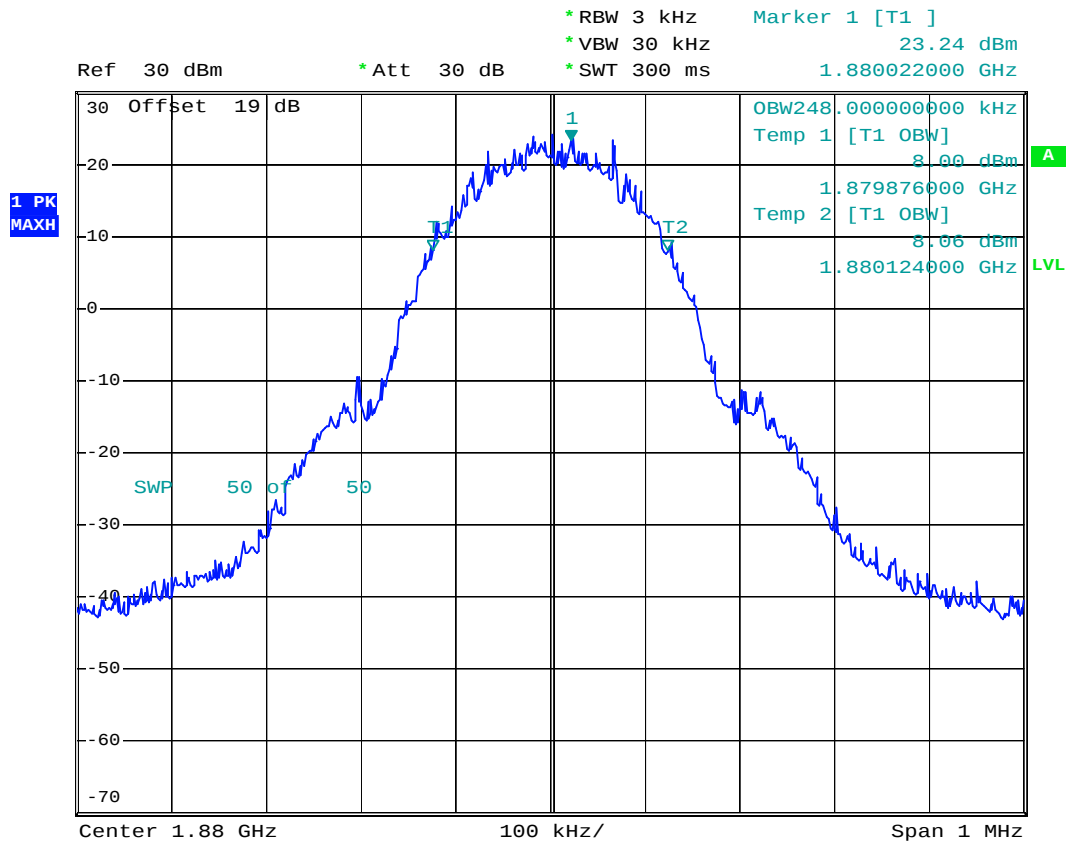
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- Test Mode : PCS1900 (GSM) CH661 99% Occupied Bandwidth
- Power State : High



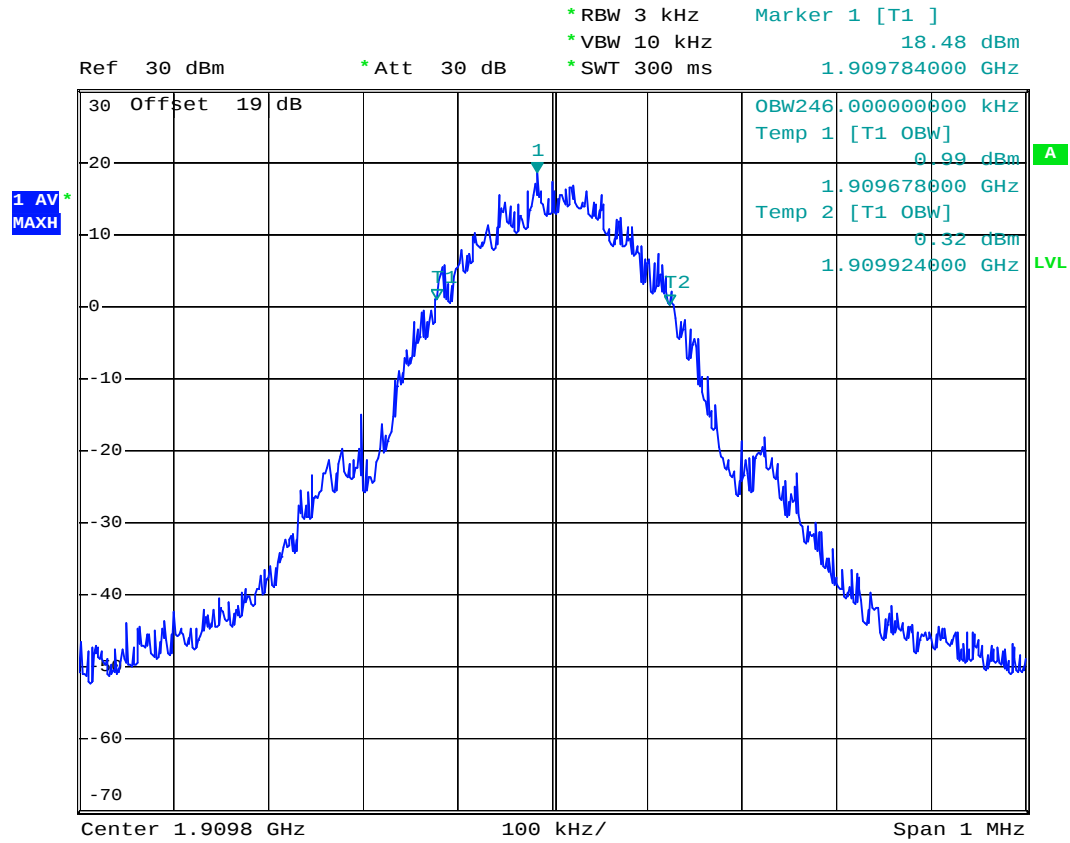
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Date: 13.AUG.2007 16:39:53



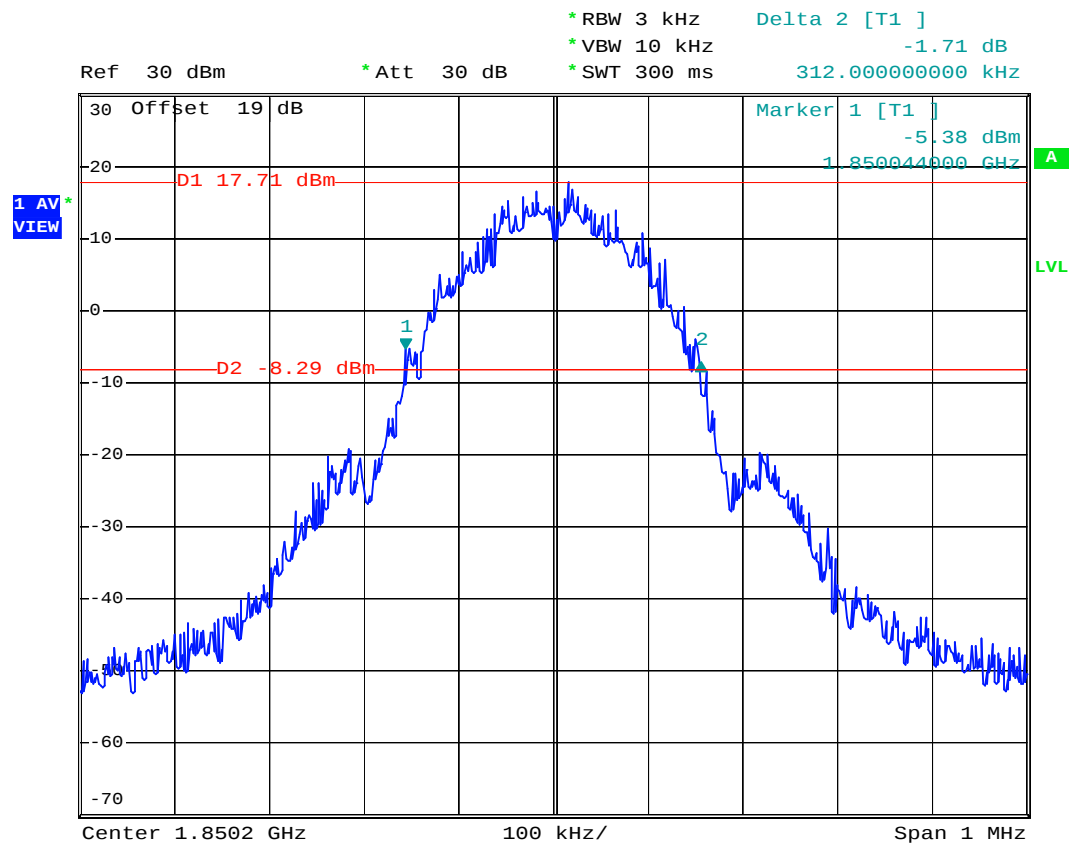
- Test Mode : PCS1900 (GSM) CH810 99% Occupied Bandwidth
- Power State : High



Date: 13.AUG.2007 16:42:13



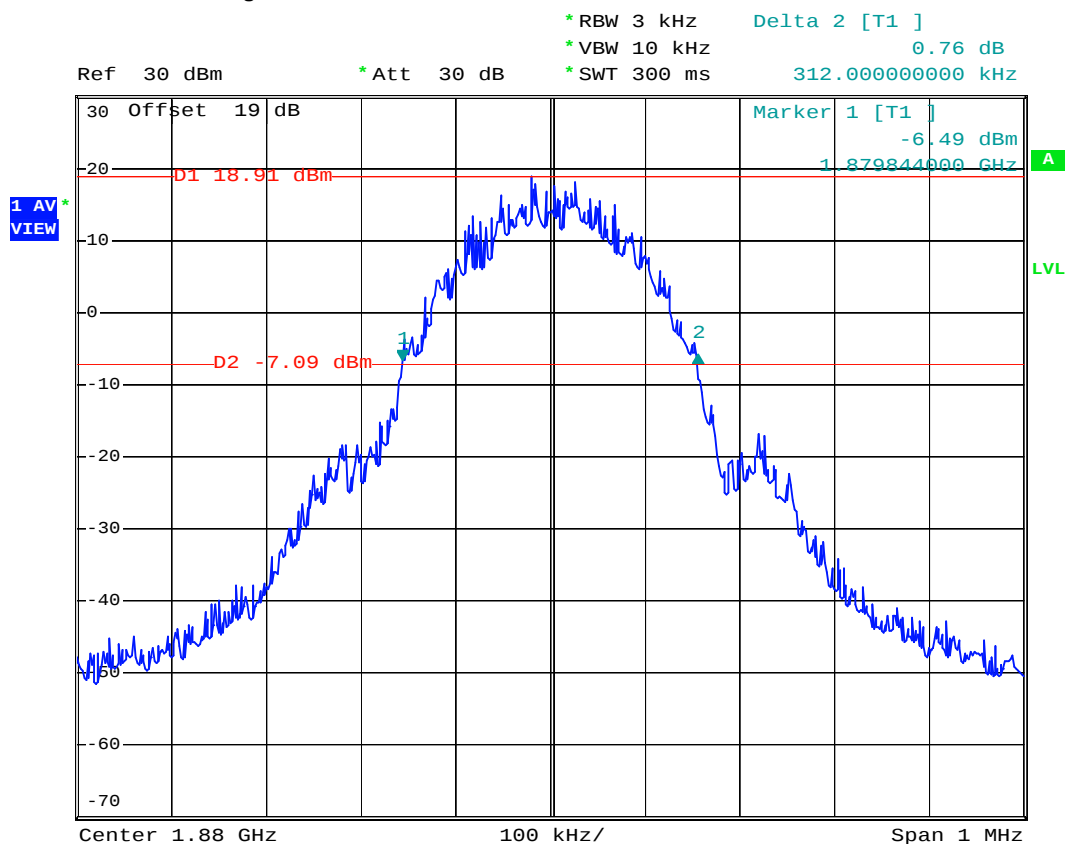
- Test Mode : PCS1900 (GSM) CH512 26dB Bandwidth
- Power State : High



Date: 1.SEP.2007 11:32:03



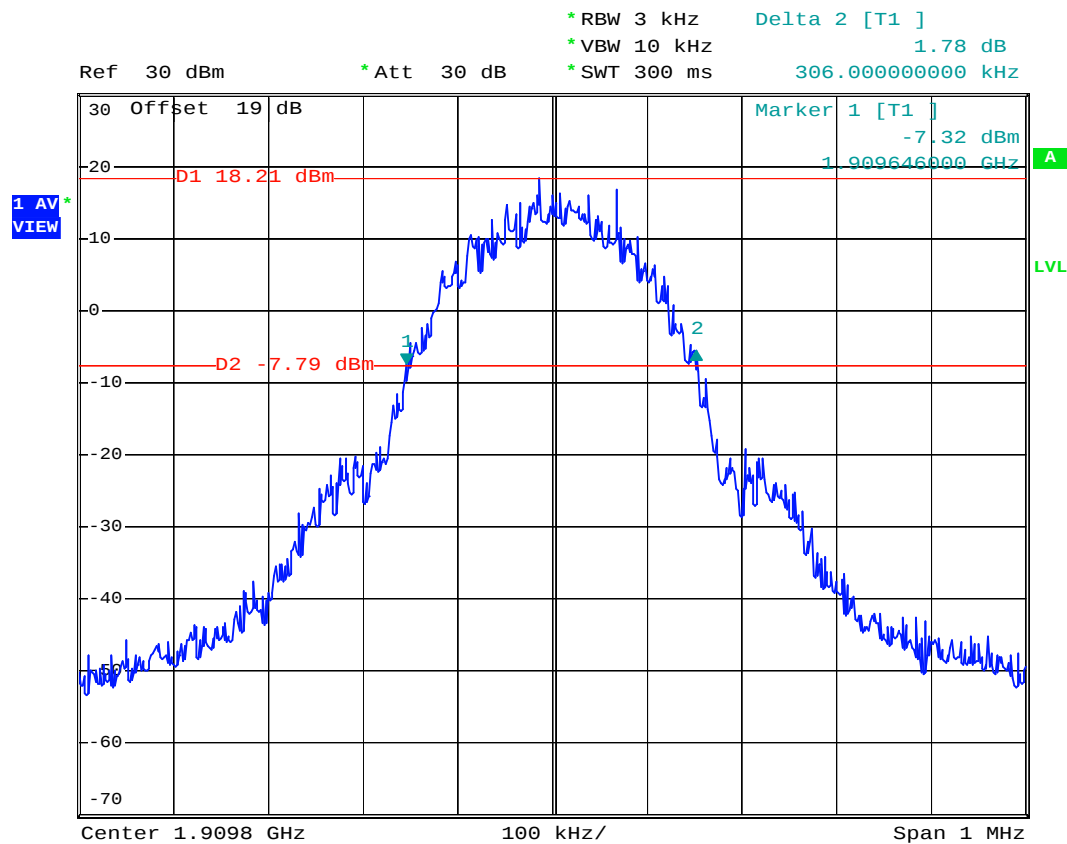
- Test Mode : PCS1900 (GSM) CH661 26dB Bandwidth
- Power State : High



Date: 13.AUG.2007 17:21:13



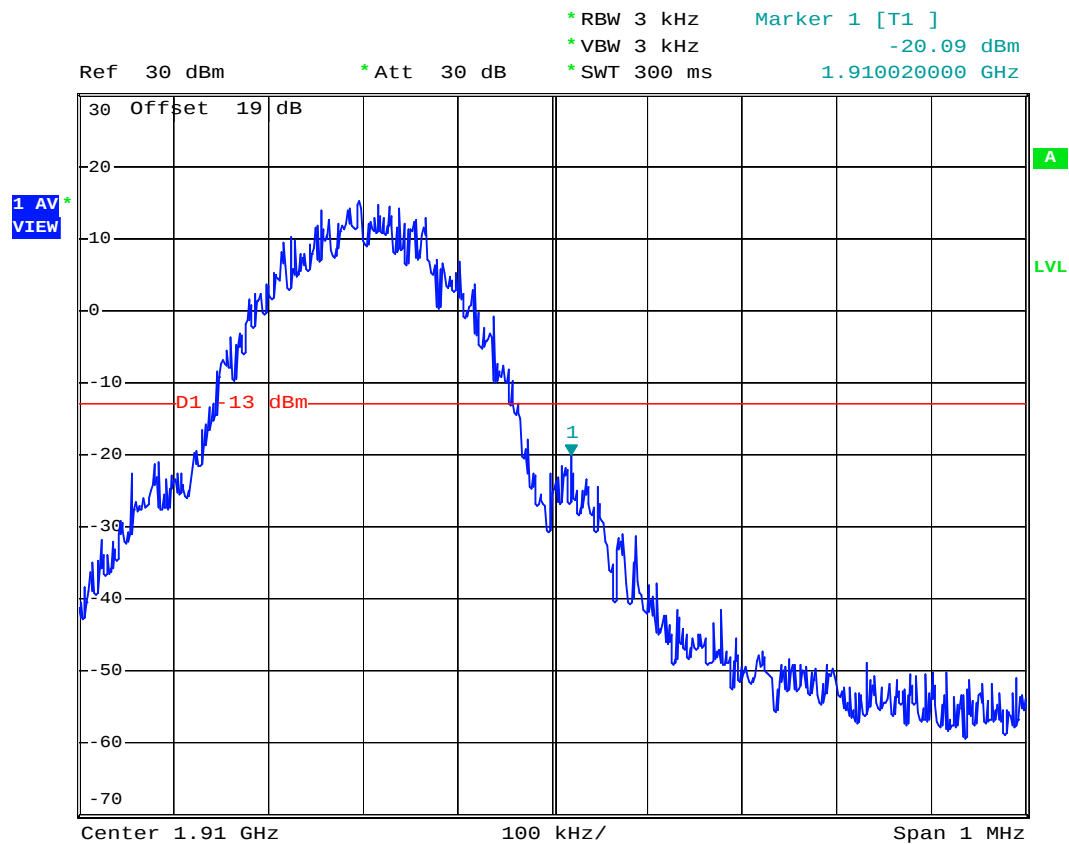
- Test Mode : PCS1900 (GSM) CH810 26dB Bandwidth
- Power State : High



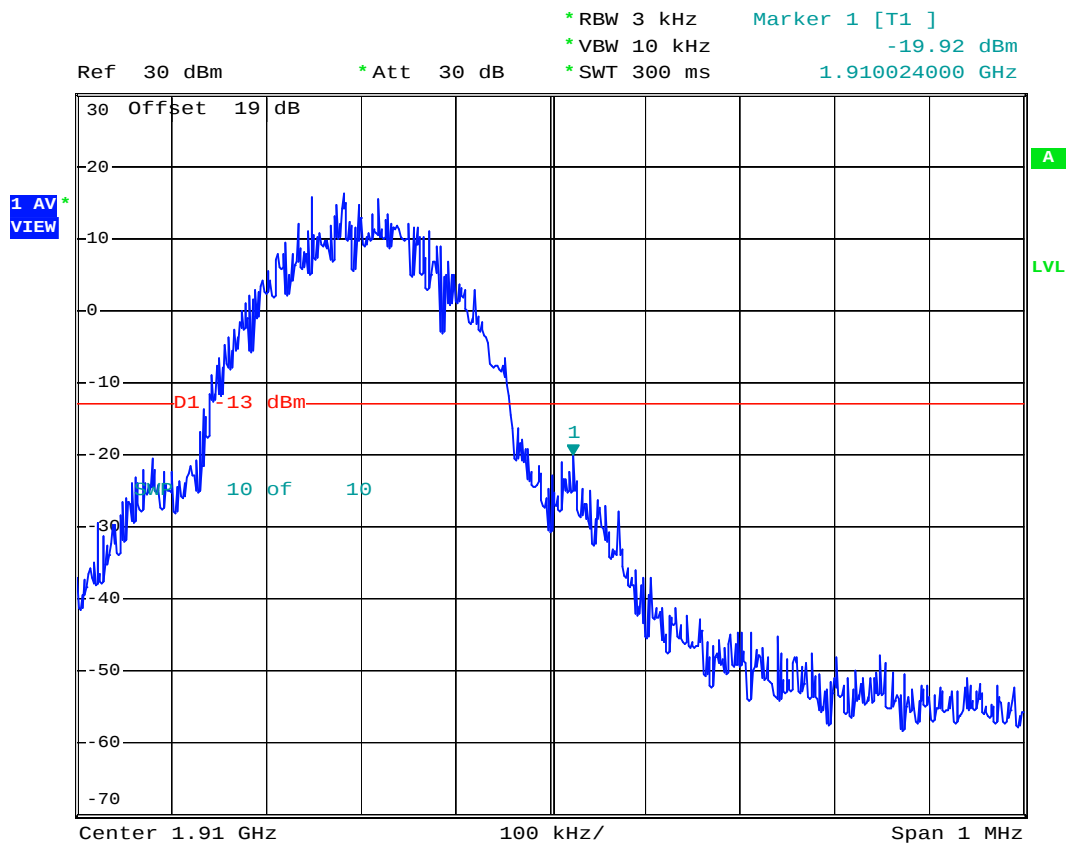
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- Test Mode : PCS1900 (GSM) CH810 Higher Band Edge
- Power State : High



Date: 13.AUG.2007 16:33:24



Date: 13.AUG.2007 16:33:03

4.5 Conducted Emission

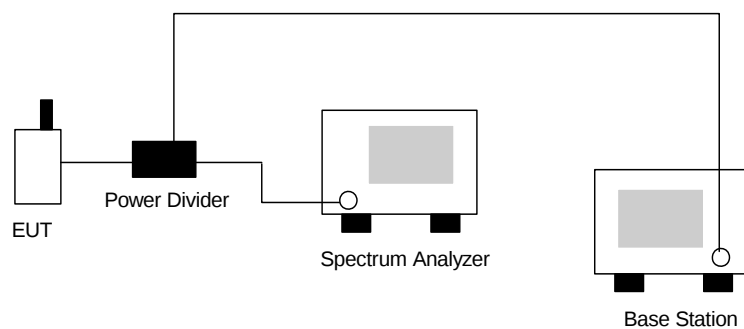
4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

4.5.2 Test Procedure

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

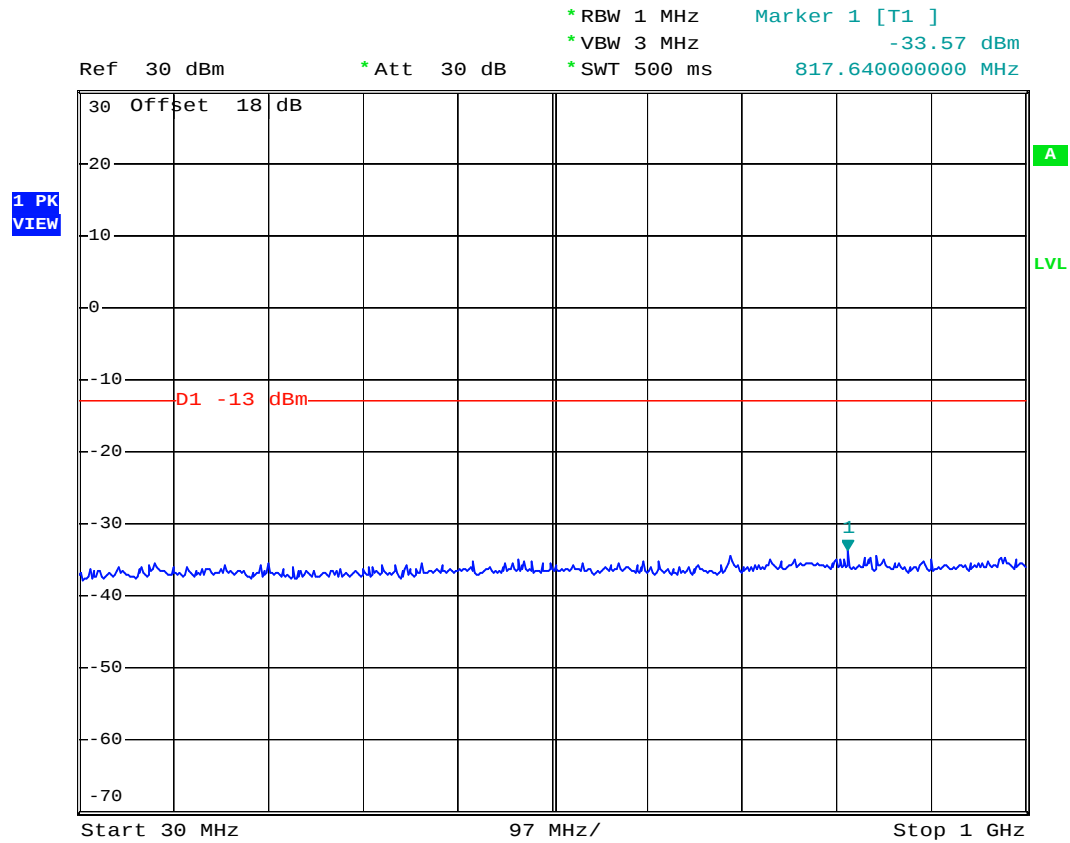
4.5.3 Test Setup Layout





4.5.4 Test Result

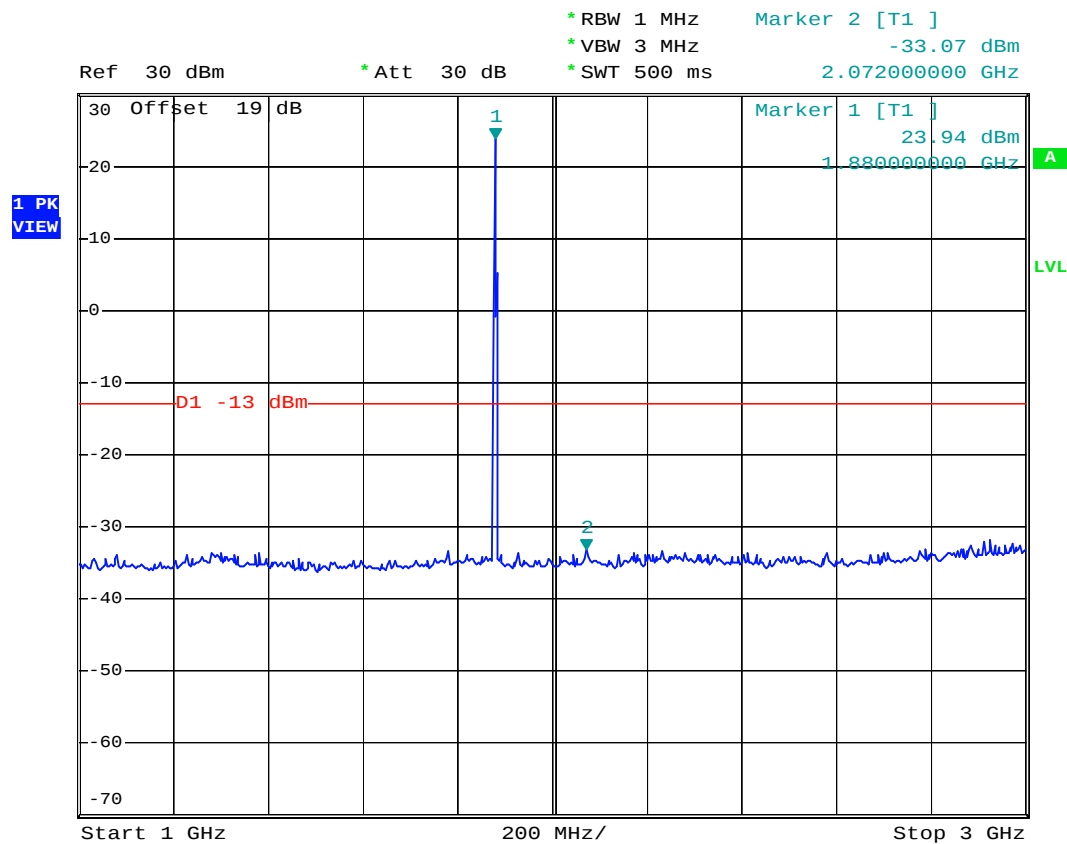
- Mode 1
- Test Mode : PCS1900 CH661
- Frequency Range : 30M-1G



Date: 13.AUG.2007 16:56:39



- Test Mode : PCS1900 CH661
- Frequency Range : 1G-3G

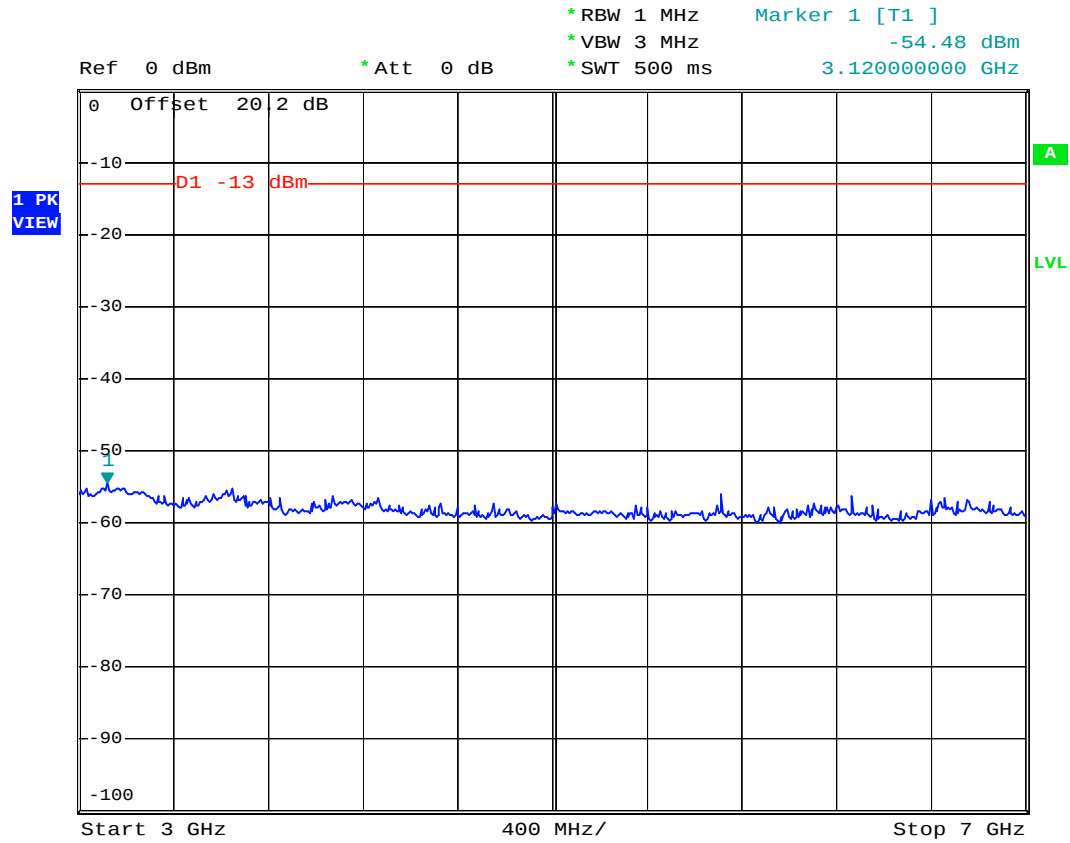


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Remark: #1 is Fundamental Signal.



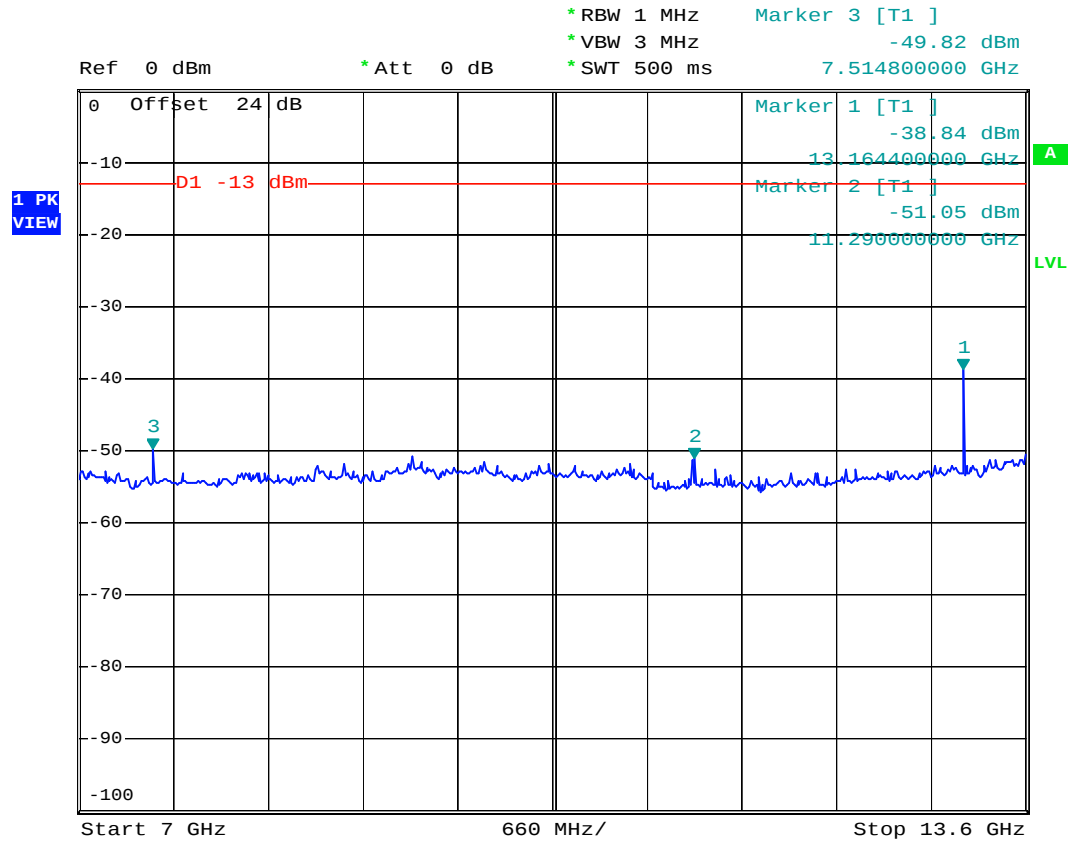
- Test Mode : PCS1900 CH661
- Frequency Range : 3G-7G



Date: 13.AUG.2007 17:01:18



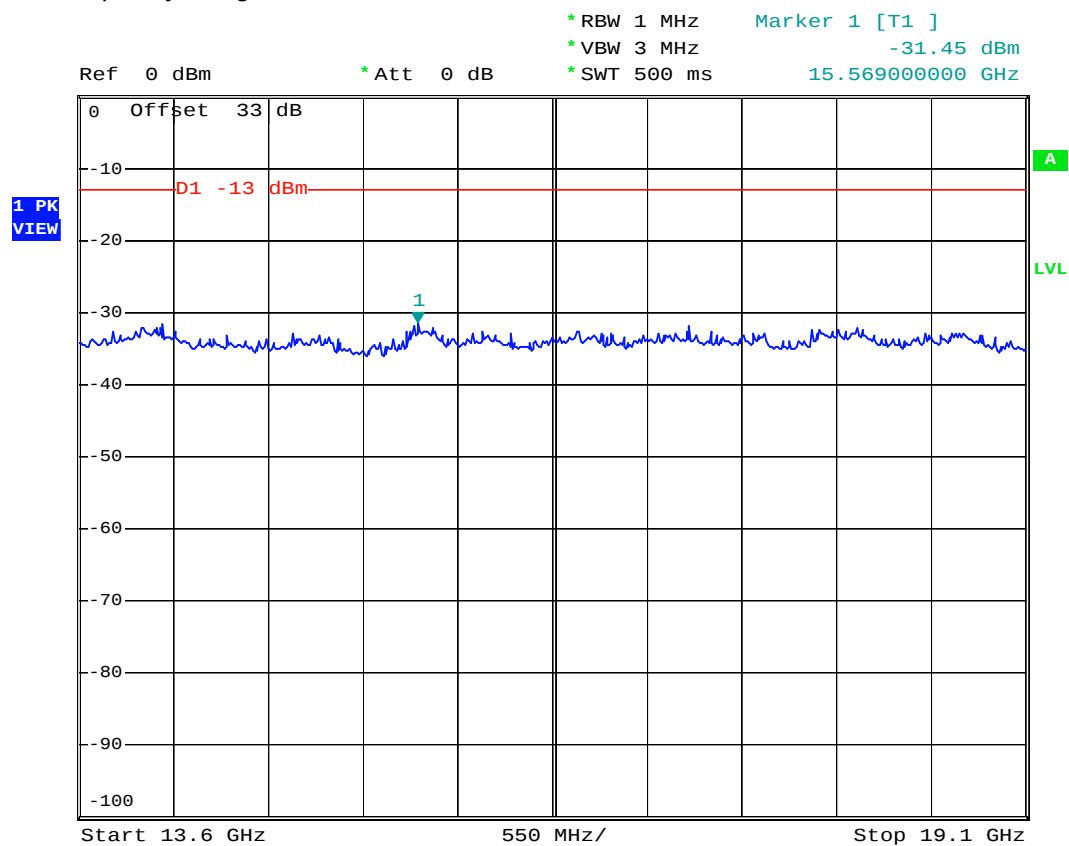
- Test Mode : PCS1900 CH661
- Frequency Range : 7G-13.6G



Date: 13.AUG.2007 17:03:19



- Test Mode : PCS1900 CH661
- Frequency Range : 13.6G-19.1G



Date: 13.AUG.2007 17:04:37

4.6 Field Strength of Spurious Radiation

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

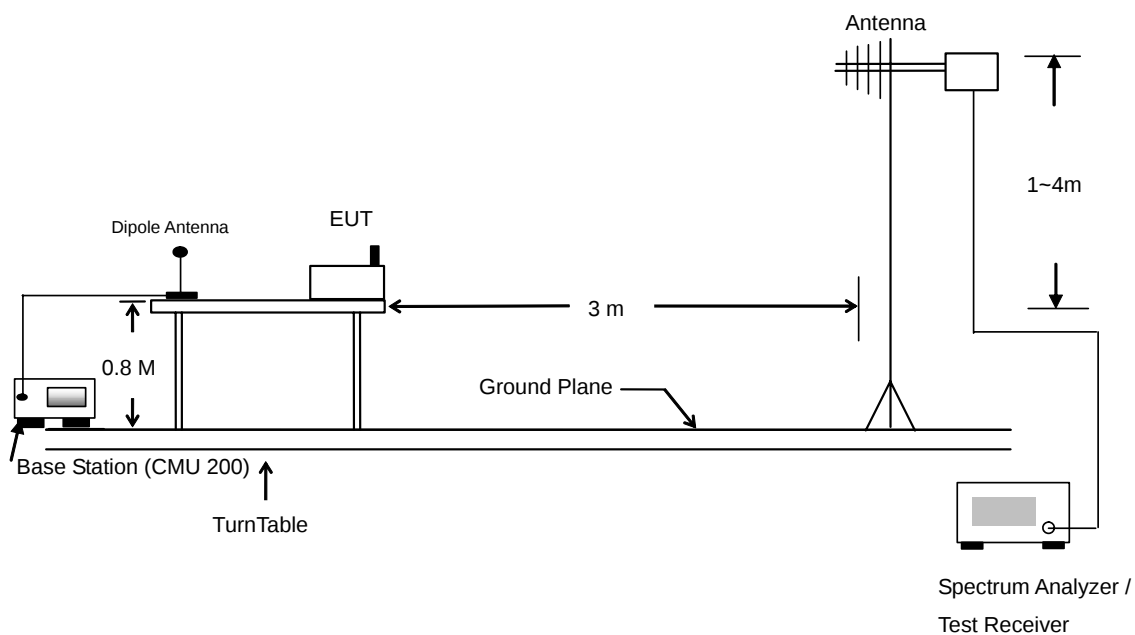
4.6.1 Measurement Instruments

As described in chapter 5 of this test report.

4.6.2 Test Procedure

1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to reach the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A Horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Emission level (dBm) = output power + substitution Gain.

4.6.3 Test Setup Layout



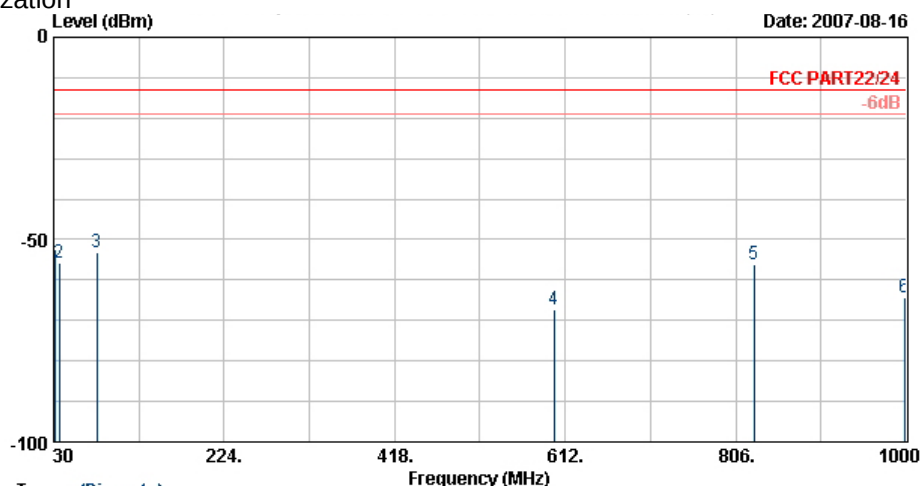
4.6.4 Test Result

- Test Mode : Mode 1

PCS1900 (GSM) Radiated Spurious EIRP							
H Polarization				V Polarization			
Frequency	ERP (dBm)	Limit	Margin	Frequency	ERP (dBm)	Limit	Margin
(MHz)		(dBm)	(dB)	(MHz)		(dBm)	(dB)
31.080	-52.570	-13	-39.57	31.890	-53.690	-13	-40.69
36.480	-55.750	-13	-42.75	79.140	-52.720	-13	-39.72
79.140	-52.980	-13	-39.98	83.190	-52.110	-13	-39.11
598.900	-67.250	-13	-54.25	854.400	-62.870	-13	-49.87
826.400	-56.030	-13	-43.03	915.300	-61.960	-13	-48.96
997.900	-64.460	-13	-51.46	976.900	-61.690	-13	-48.69
1158.000	-55.690	-13	-42.69	1254.000	-57.960	-13	-44.96
3758.000	-52.830	-13	-39.83	3758.000	-47.680	-13	-34.68
5638.000	-49.530	-13	-36.53	5639.000	-47.530	-13	-34.53
13158.000	-41.480	-13	-28.48	13158.00	-46.880	-13	-33.88

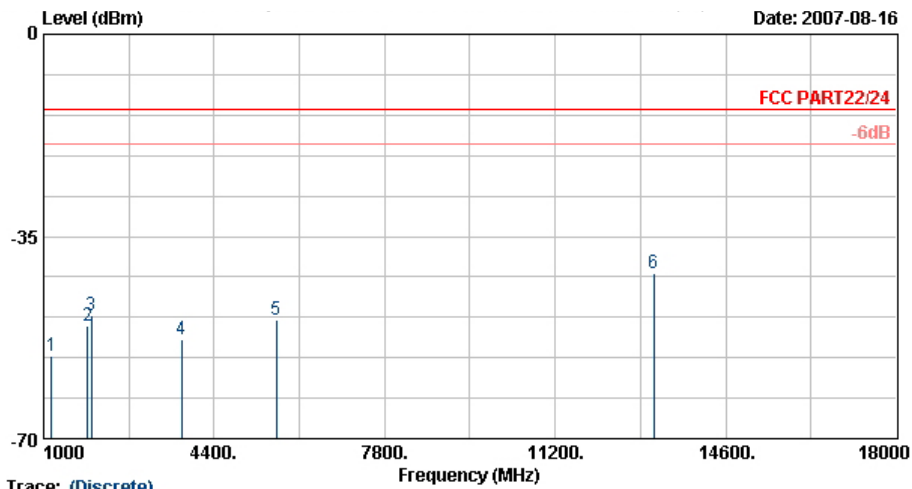
- Test Mode : Mode 2

PCS1900 (GSM) with WLAN Radiated Spurious EIRP							
H Polarization				V Polarization			
Frequency	ERP (dBm)	Limit	Margin	Frequency	ERP (dBm)	Limit	Margin
(MHz)		(dBm)	(dB)	(MHz)		(dBm)	(dB)
30.000	-54.530	-13	-41.53	30.000	-54.200	-13	-41.20
74.280	-47.410	-13	-34.41	74.280	-46.090	-13	-33.09
95.340	-60.650	-13	-47.65	197.940	-61.930	-13	-48.93
721.400	-66.700	-13	-53.70	771.800	-63.370	-13	-50.37
817.300	-65.580	-13	-52.58	880.300	-62.210	-13	-49.21
953.800	-64.050	-13	-51.05	964.300	-62.000	-13	-49.00
3758.000	-46.210	-13	-33.21	3758.000	-46.860	-13	-33.86

**4.6.5 Test Data****4.6.5.1 Mode 1****Horizontal Polarization****Trace: (Discrete)**

Site : 08CH06-HY
Condition : LF-SPURIOUS HORIZONTAL
EUT : GSM/GPRS 850/900/1800/1900/WCDMA 2100
Smart Phone
Power : 120V_{ac}/60Hz
Model : FG 780803
Memo : PCS1900 Link;Ch661+Adaptor 1+Exophone
Plane : E1

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	31.1	-52.57	-39.57	-13.00	-52.32	-0.25	Peak
2	36.5	-55.75	-42.75	-13.00	-51.85	-3.90	Peak
3	79.1	-52.98	-39.98	-13.00	-40.66	-12.32	Peak
4	598.9	-67.25	-54.25	-13.00	-63.49	-3.77	Peak
5	826.4	-56.03	-43.03	-13.00	-54.60	-1.44	Peak
6	997.9	-64.46	-51.46	-13.00	-64.69	0.22	Peak

**Trace: (Discrete)**

Site : 08CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : GSM/GPRS 850/900/1800/1900/WCDMA 2100
Smart Phone
Power : 120Vac/60Hz
Model : FG 780803
Memo : PCS1900 Link;Ch661+Adaptor 1+Earphone
Plane : E1

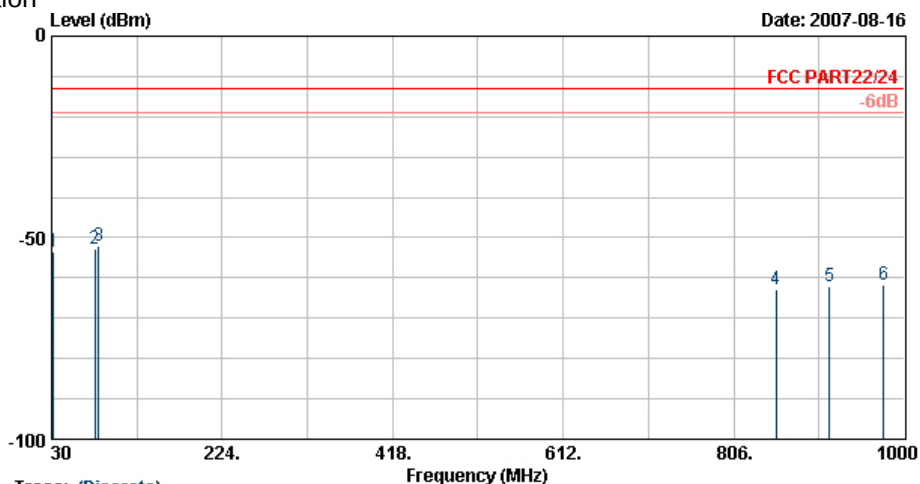
	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	1158.0	-55.69	-42.69	-13.00	-57.20	1.51	Peak
2	1878.0	-50.57			-50.06	-0.51	Peak
3	1958.0	-48.65			-47.54	-1.11	Peak
4	3758.0	-52.83	-39.83	-13.00	-60.75	7.92	Peak
5	5638.0	-49.53	-36.53	-13.00	-59.50	9.97	Peak
6 @	13158.0	-41.48	-28.48	-13.00	-60.19	18.71	Peak

Remark:

1. #2: MS TCH Signal
2. #3: BS TCH Signal

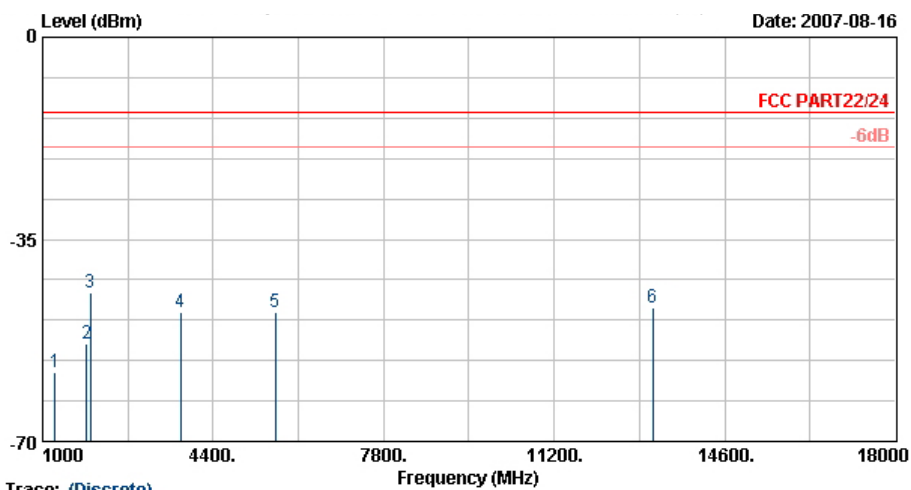


Vertical Polarization



Site : 08CH06-HY
Condition : LF-SPURIOUS VERTICAL
EUT : GSM/GPRS 850/900/1800/1900/WCDMA 2100
Smart Phone
Power : 120Vac/60Hz
Model : FG 780803
Memo : PCS1900 Link;Ch661+Adaptor 1+Earphone
Plane : E1

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
	MHz	dBm	dB	dBm	dBm	dB	
1	31.9	-53.69	-40.69	-13.00	-44.07	-9.62	Peak
2	79.1	-52.72	-39.72	-13.00	-42.09	-10.63	Peak
3	83.2	-52.11	-39.11	-13.00	-42.04	-10.07	Peak
4	854.4	-62.87	-49.87	-13.00	-64.37	1.50	Peak
5	915.3	-61.96	-48.96	-13.00	-63.95	1.99	Peak
6	976.9	-61.69	-48.69	-13.00	-64.16	2.47	Peak



Trace: (Discrete)

Site : 08CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : GSM/GPRS 850/900/1800/1900/WCDMA 2100
Smart Phone
Power : 120Vac/60Hz
Model : FG 780803
Memo : PCS1900 Link;Ch661+Adaptor 1+Earphone
Plane : E1

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	1254.0	-57.96	-44.96	-13.00	-57.19	-0.77	Peak
2	1878.0	-53.03			-52.63	-0.40	Peak
3 @	1958.0	-44.31			-43.71	-0.60	Peak
4	3758.0	-47.68	-34.68	-13.00	-54.32	6.64	Peak
5	5638.0	-47.53	-34.53	-13.00	-56.19	8.65	Peak
6	13158.0	-46.88	-33.88	-13.00	-62.67	15.79	Peak

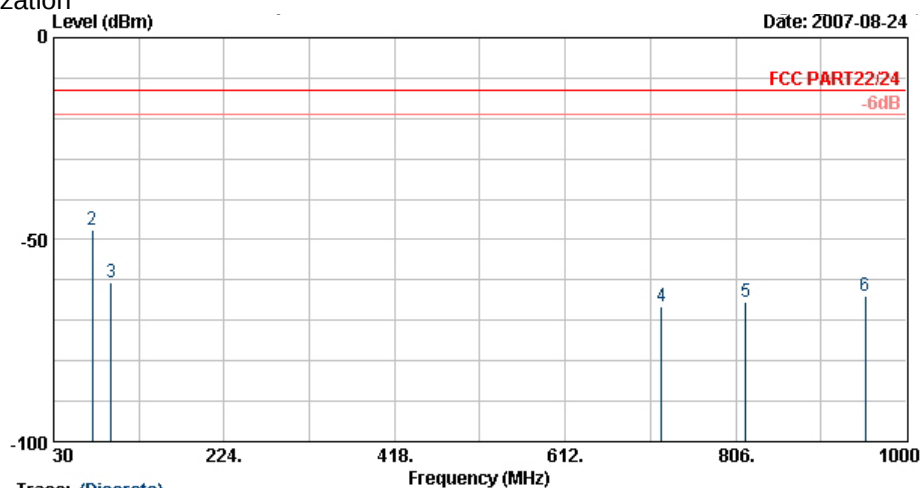
Remark:

1. #2: MS TCH Signal
2. #3: BS TCH Signal
3. There is no more obvious emission except the listings above.



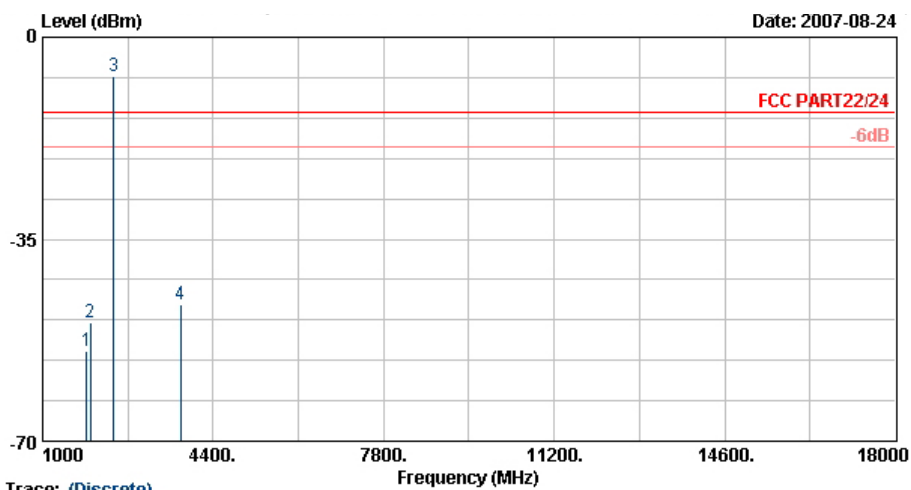
4.6.5.2 Mode 2

Horizontal Polarization



Site : 08CH06-HY
Condition : LF-SPURIOUS HORIZONTAL
EUT : GSM/GPRS 850/900/1800/1900
: WCDMA 2100 smart phone
Power : 120V_{ac} 60Hz
Model : FG780803
Mode : PCS 1900 Link;Ch661 + 11g TX_CH01
Plane : +Adaptox + Earphone
: E1

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	30.0	-54.53	-41.53	-13.00	-54.89	0.36	Peak
2 @	74.3	-47.41	-34.41	-13.00	-35.08	-12.34	Peak
3	95.3	-60.65	-47.65	-13.00	-48.39	-12.26	Peak
4	721.4	-66.70	-53.70	-13.00	-64.21	-2.50	Peak
5	817.3	-65.58	-52.58	-13.00	-64.06	-1.52	Peak
6	953.8	-64.05	-51.05	-13.00	-63.84	-0.21	Peak



Trace: (Discrete)

Site : 08CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : GSM/GPRS 850/900/1800/1900
: WCDMA 2100 smart phone
Power : 120Wac 60Hz
Model : FG780803
Mode : PCS 1900 Link;Ch661 + 11g TX_CH01
Plane : +Adaptor + Earphone
: EI

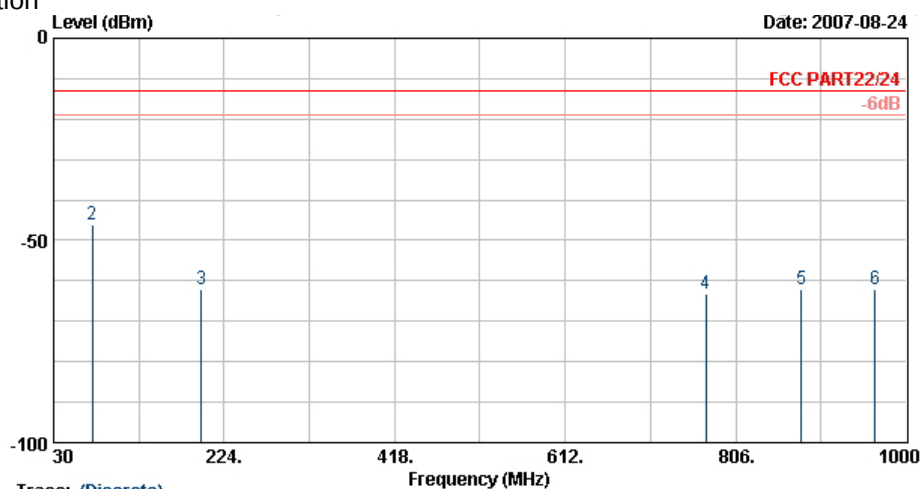
	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	1878.0	-54.43			-53.92	-0.51	Peak
2	1958.0	-49.56			-48.45	-1.11	Peak
3 @	2414.0	-6.81			-7.70	0.89	Peak
4 @	3758.0	-46.21	-33.21	-13.00	-54.14	7.92	Peak

Remark:

1. #1: MS TCH Signal
2. #2: BS TCH Signal
3. #3: WLAN Signal

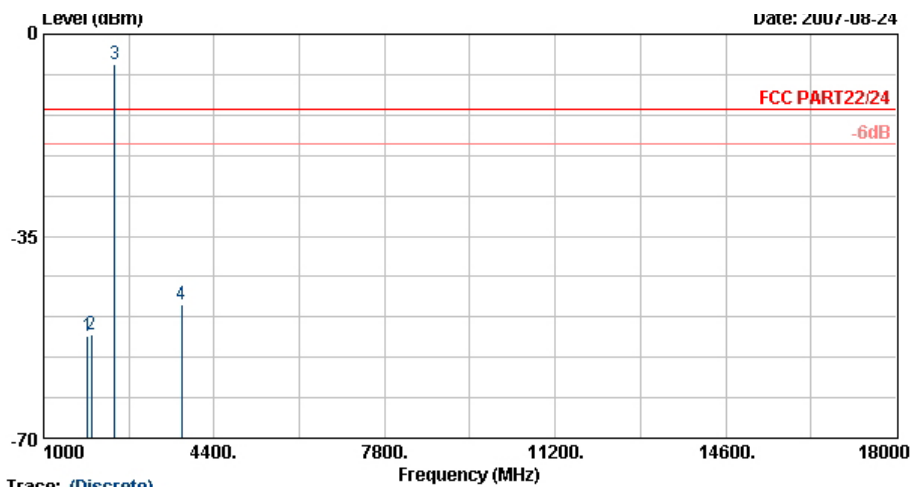


Vertical Polarization



Site : 08CH06-HY
Condition : LF-SPURIOUS VERTICAL
EUT : GSM/GPRS 850/900/1800/1900
: WCDMA 2100 smart phone
Power : 120Vac 60Hz
Model : FG780803
Mode : PCS 1900 Link;Ch661 + 11g TX_CH01
Plane : +Adaptor + Earphone
: E1

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	30.0	-54.20	-41.20	-13.00	-45.13	-9.07	Peak
2 @	74.3	-46.09	-33.09	-13.00	-34.76	-11.32	Peak
3	197.9	-61.93	-48.93	-13.00	-53.36	-8.57	Peak
4	771.8	-63.37	-50.37	-13.00	-64.01	0.65	Peak
5	880.3	-62.21	-49.21	-13.00	-63.92	1.71	Peak
6	964.3	-62.00	-49.00	-13.00	-64.38	2.37	Peak



Site : 08CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : GSM/GPRS 850/900/1800/1900
: WCDMA 2100 smart phone
Power : 120V_{ac} 60Hz
Model : FG780803
Mode : PCS 1900 Link;Ch661 + 11g TX_CH01
Plane : +Adaptor + Earphone
: E1

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	1878.0	-52.32			-51.92	-0.40	Peak
2	1958.0	-52.14			-51.55	-0.60	Peak
3 @	2414.0	-5.15			-7.03	1.87	Peak
4 @	3758.0	-46.86	-33.86	-13.00	-53.50	6.64	Peak

Remark:

1. #1: MS TCH Signal
2. #2: BS TCH Signal
3. #3: WLAN Signal
4. There is no more obvious emission except the listings above.

4.7 Frequency Stability (Temperature Variation)

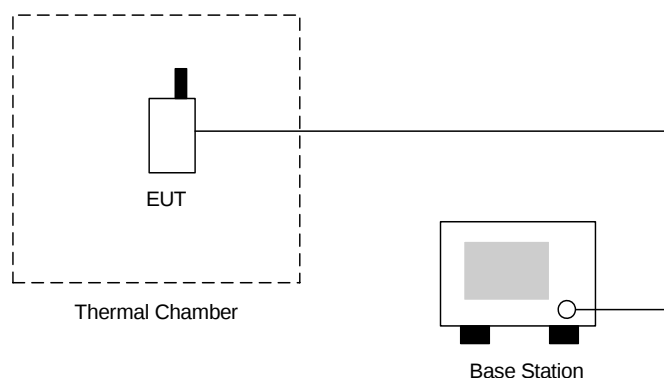
4.7.1 Measurement Instrument

As described in chapter 5 of this test report.

4.7.2 Test Procedure

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

4.7.3 Test Setup Layout



4.7.4 Test Result

▪ Test Mode : PCS1900 (GSM) CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	113	0.06	2.5	Passed
-20	82	0.04		
-10	68	0.04		
0	44	0.02		
10	28	0.01		
20	16	0.01		
30	17	0.01		
40	26	0.01		
50	34	0.02		

4.8 Frequency Stability (Voltage Variation)

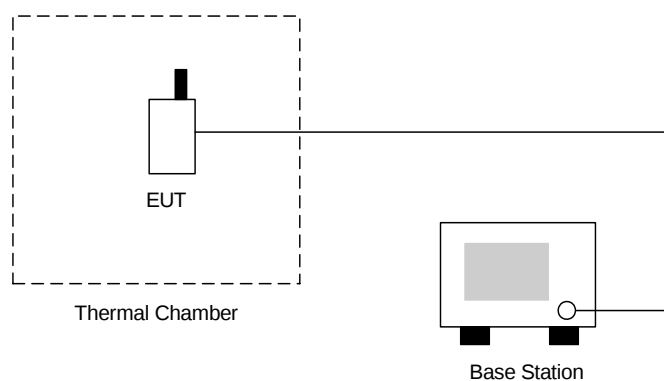
4.8.1 Measurement Instrument

As described in chapter 5 of this test report.

4.8.2 Test Procedure

1. The EUT was placed in a temperature chamber at $25 \pm 5^\circ\text{C}$ and connected as the following section.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

4.8.3 Test Setup Layout



4.8.4 Test Result

- Test Mode : PCS1900 (GSM) CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	18.0	0.01	2.5	Passed
BEP	24.0	0.01		
4.2	29.0	0.02		

Remark:

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

5. List of Measurement Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Oct. 05, 2006	Oct. 04, 2007	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 26, 200	Jul. 25, 2008	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Com-Power	AH118	071025	1G~18G	Jun. 04, 2007	Jun. 03, 2008	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Nov. 20, 2006	Nov. 19, 2008	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Pre Amplifier	Mini Circuits	ZKL-2	D092004-1	10~2500MHz	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	106656	WCDMA	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Thermal Chamber	Tenyi 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. 07, 2006	Oct. 06, 2007	Conduction (TH02-HY)
DC Power Supply	TOPWARD	3303D	740889	N/A	May 25, 2005	May 24, 2009	Conduction (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 08, 2007	Feb. 07, 2008	Conduction (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 08, 2007	Feb. 07, 2008	Conduction (TH02-HY)

6. Uncertainty Evaluation

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

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
Combined standard uncertainty $U_c(y)$	1.27		
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$	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 = $20 \log(1 - \Gamma_1 \Gamma_2)$	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$	4.72				

END OF TEST REPORT