



# FCC TEST REPORT

for  
47 CFR Part 24E

Equipment : Neo 1973  
Trade Name : FIC  
Model No. : GTA01BV4  
FCC ID : EUNGTA01BV4  
Tx Frequency Range : 1850.2~1909.8MHz  
Max. ERP/EIRP Power : 0.87 W  
Emission Designator : 300KGXW  
Applicant : FIC (First International Computer, Inc.)  
No. 300, Yang Guang, NeiHu, Taipei, Taiwan, 114

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- The data shown in this test report were carried out during May 30, 2007 at **Sporton International Inc. LAB.**
- Report No.: FG721310, Report Version: Rev. 01.

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## **1. General Information**

### **1.1 Applicant**

**FIC (First International Computer, Inc.)**

No. 300, Yang Guang, NeiHu, Taipei, Taiwan, 114

### **1.2 Manufacturer**

**FIC (First International Computer, Inc.)**

No. 300, Yang Guang, NeiHu, Taipei, Taiwan, 114

### **1.3 Basic Description of Equipment under Test**

Equipment : Neo 1973  
Trade Name : FIC  
Model No. : GTA01BV4  
FCC ID : EUNGTA01BV4  
Power Supply Type : Switching, From battery 3.7V  
AC Power Cord : AC 120V, Wall-mount, 1 meter, 2 pin  
Adapter : SEMDICAR, TC-FU-USB  
Battery : FIC, GTC-01 / GTA-01  
Earphone : SEMDITECH, HP-GTA01-MP3JS-G



#### 1.4 Feature of Equipment under Test

DUT Type :	Neo 1973
Trade Name :	FIC
Model Name :	GTA01BV4
FCC ID :	EUNGTAA01BV4
Tx Frequency :	PCS1900 : 1850 ~1910 MHz Bluetooth : 2400~2483.5 MHz
Rx Frequency :	PCS1900 : 1930 ~ 1990 MHz Bluetooth : 2400~2483.5 MHz
Number of Channels :	Bluetooth : 79
Carrier Frequency of Each Channel :	Bluetooth : 2402+n*1 MHz; n=0~78
Maximum ERP/EIRP :	0.87 W (29.41 dBm)
HW Version :	A4
SW Version :	OpenMoko.GTA01.e.w.v.00.21
Antenna Type :	Fixed Internal
Type of Antenna Connector :	N/A
Antenna Gain :	0.1 dBi
Maximum Output Power to Antenna :	PCS1900 : 30.93 dBm Bluetooth : 1.85 dBm
Type of Modulation :	GSM : GMSK Bluetooth : GFSK
Type of Emission :	300KGXW
Device Power Class :	1
DUT Stage :	Production Unit
Power Rating :	DC 3.4V

#### 1.5 Report Date

EUT Received : Feb. 13, 2007

Report Date : Jun. 29, 2007

## 2. Test Configuration of Equipment under Test

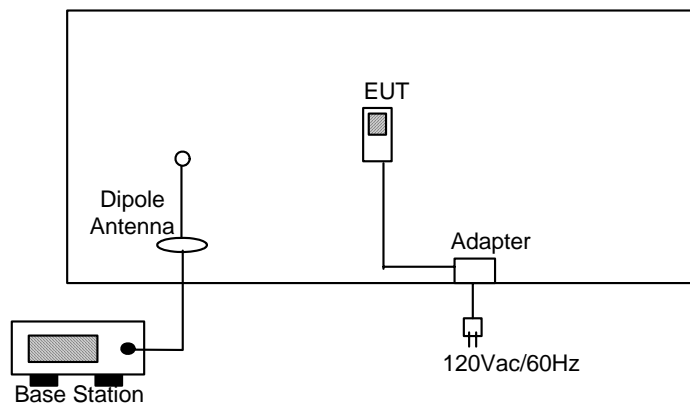
### 2.1 Test Manner

- a. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.
- b. During all testings, EUT is in link mode with base station emulator at maximum power level. (PCL=0 for PCS1900)
- c. Frequency range investigated: radiated emission 30MHz to 19000 MHz for PCS1900.

### 2.2 Test Mode

<b>Application</b>	<b>PCS 1900</b>
Radiated Emission	<input checked="" type="checkbox"/> Mode 1: PCS1900 Link Mode <input checked="" type="checkbox"/> Mode 2: PCS1900 Link Mode + BT Link
Conducted Measurement	<input checked="" type="checkbox"/> Mode 1: PCS1900 Link Mode

### 2.3 Connection Diagram of Test System



### 2.4 Ancillary Equipment List

Item	Asset	Model Name	FCC ID	Power Cord
1.	Base Station (R&S)	CMU 200	N/A	N/A



### **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**

AC120V/ 60Hz

#### **3.2 Test in Compliance with**

47 CFR Part 24E, and Part 2

#### **3.3 Frequency Range Investigated**

a. 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
§24.232	ERP / EIRP	Passed	4.3
§2.1049, § 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, §24.235	Frequency Stability vs. Temperature	Passed	4.7
§2.1055, §24.235	Frequency Stability vs. Voltage	Passed	4.8



## 4.2 RF Output Power

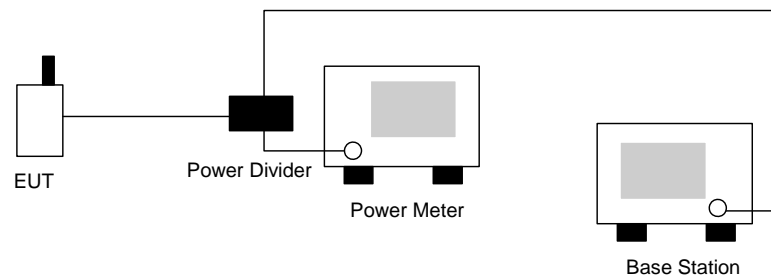
### 4.2.1 Measurement Instruments :

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 PCS1900 maximum power through base station,.
3. Select lowest, middle, and highest channels for each band.

### 4.2.3 Test Setup Layout :



### 4.2.4 Test Result :

Bands	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
PCS1900	512	1850.2 (Low)	30.23	1.05
	661	1880.0 (Mid)	30.65	1.16
	810	1909.8 (High)	30.93	1.24



### 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 rotatable 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.

$E_t = R_t + AF$

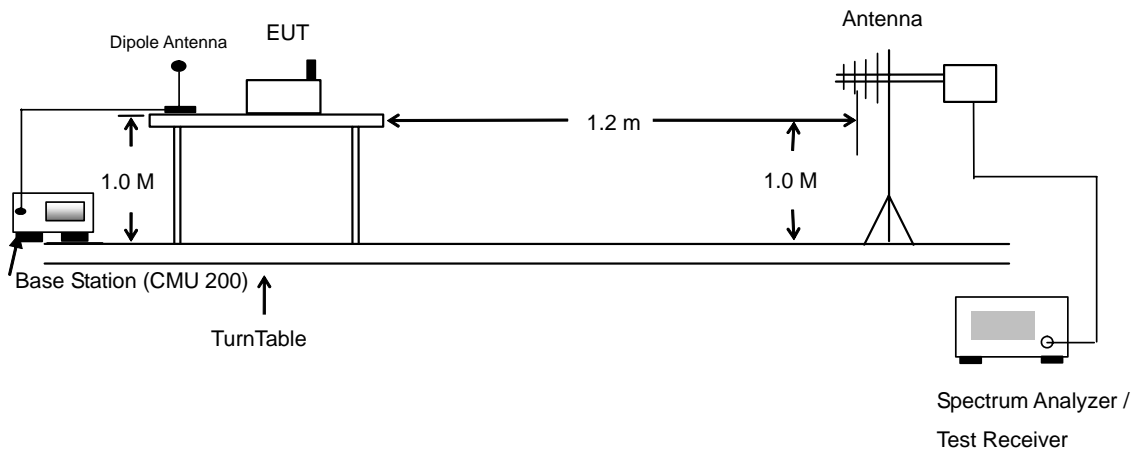
$E_s = R_s + AF$

$AF$  (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 Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
<b>1850.20</b>	<b>-24.43</b>	<b>-51.88</b>	<b>0.00</b>	<b>1.96</b>	<b>29.41</b>	<b>0.87</b>
1880.00	-26.91	-52.99	0.00	2.00	28.08	0.64
1909.80	-28.72	-54.28	0.00	1.98	27.54	0.57
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.40	-52.13	0.00	1.96	28.69	0.74
1880.00	-27.21	-53.17	0.00	2.00	27.96	0.63
1909.80	-28.57	-54.13	0.00	1.98	27.54	0.57

## 4.4 Occupied Bandwidth and Band Edge Measurement

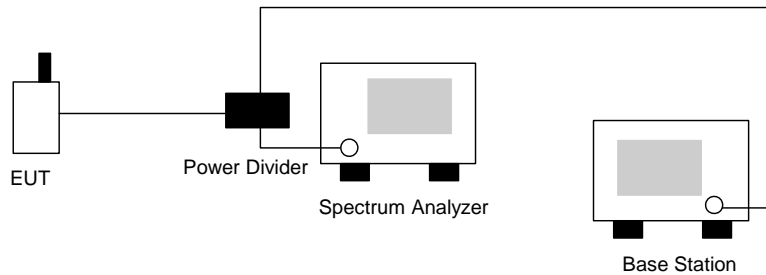
### 4.4.1 Measurement Instruments

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 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  $BW/100$ .

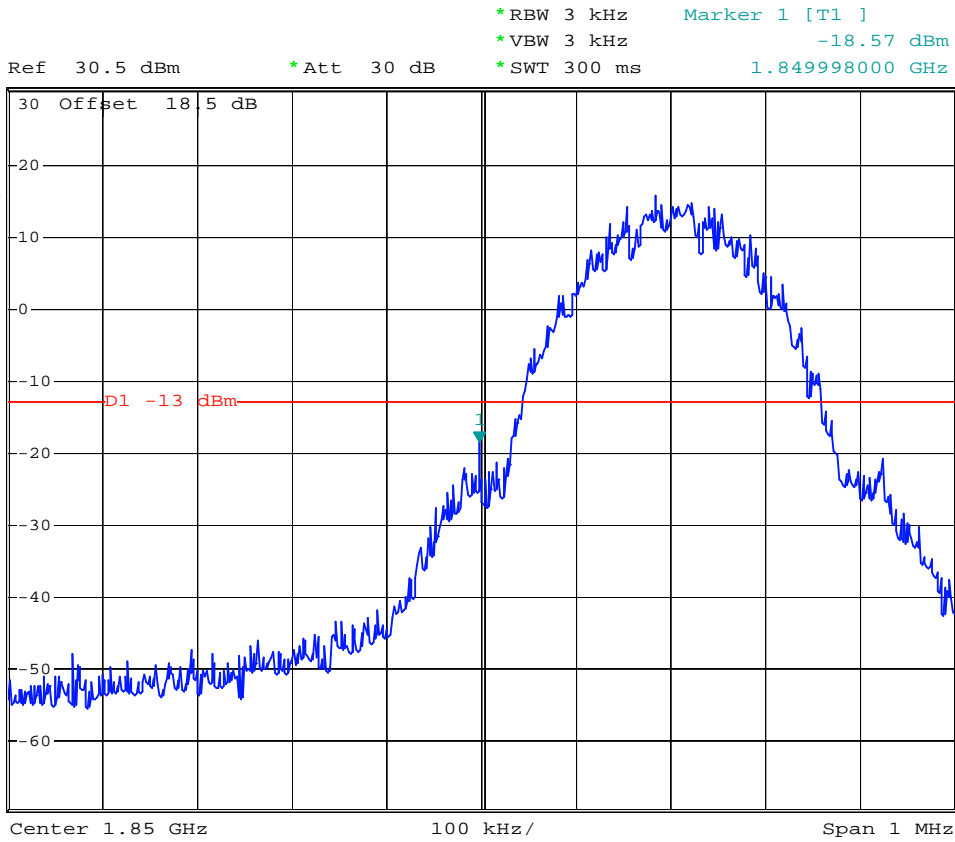
### 4.4.3 Test Setup Layout





4.4.4 Test Result

- Test Mode : PCS 1900 CH512 Lower Band Edge
- Power State : High

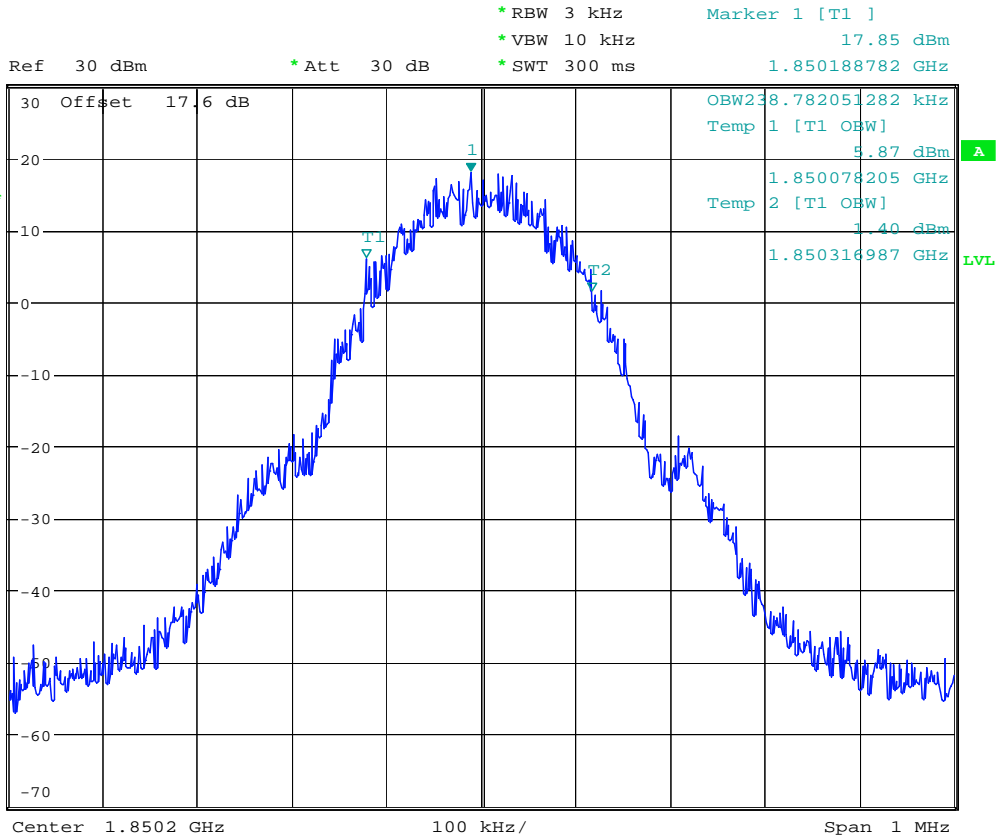


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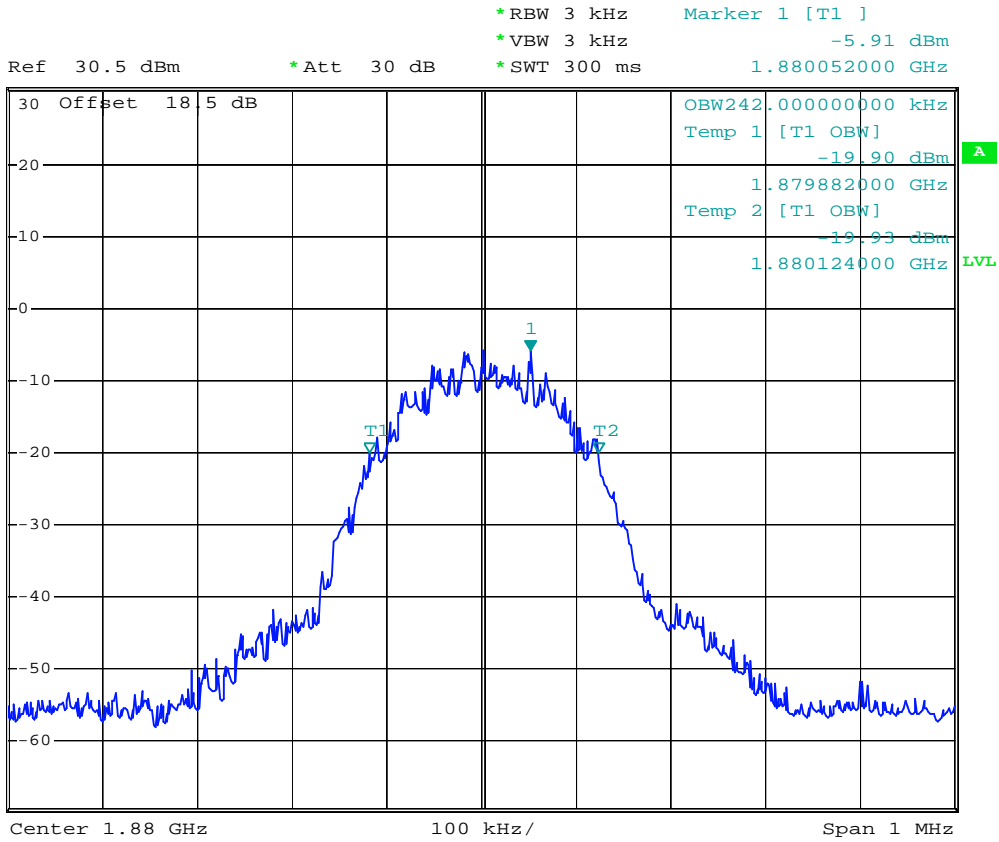
- Test Mode : PCS 1900 CH512 99% Occupied Bandwidth
- Power State : High



Date: 23.JUN.2007 03:11:14



- Test Mode : PCS 1900 CH661 99% Occupied Bandwidth
- Power State : Low

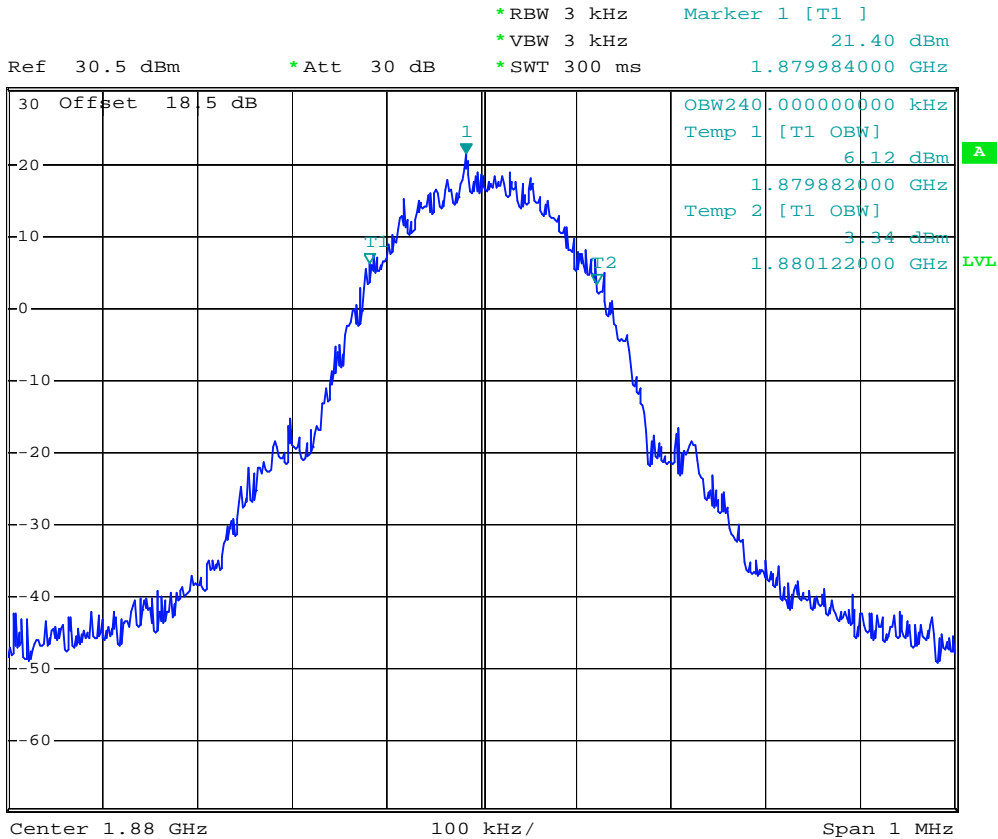


Date: 24.FEB.2007 19:25:08





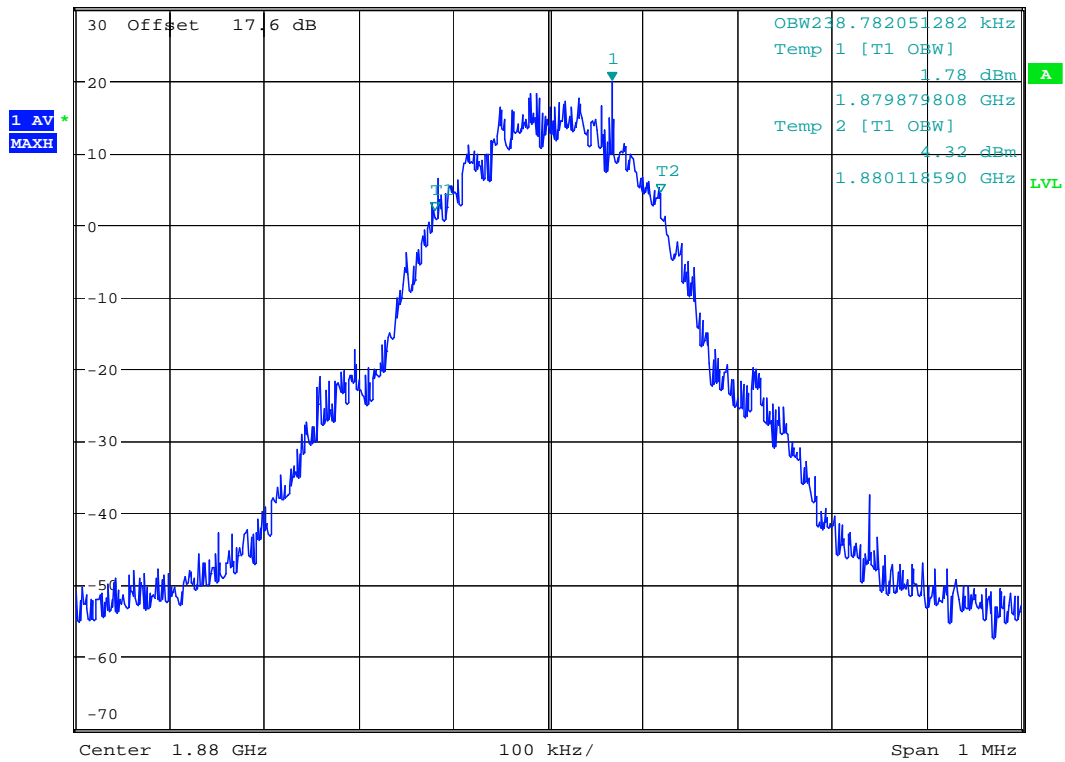
- Test Mode : PCS 1900 CH661 99% Occupied Bandwidth
- Power State : High



Date: 24.FEB.2007 19:24:21



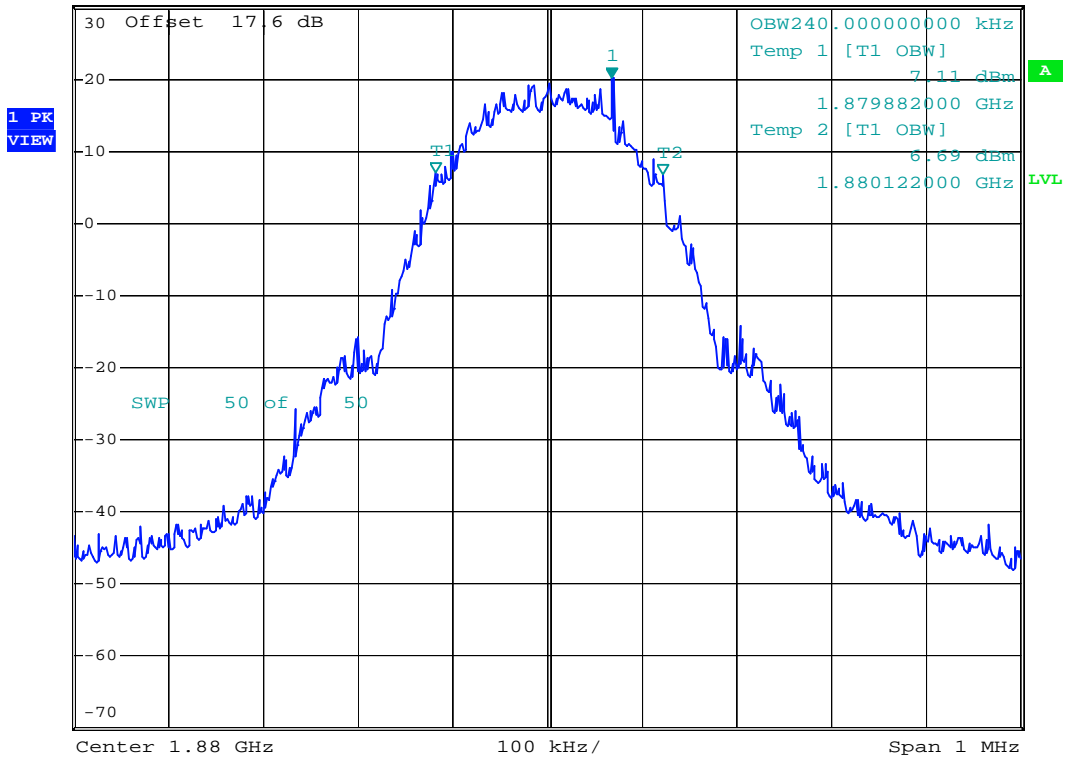
Ref 30 dBm      \* Att 30 dB      \* RBW 3 kHz      Marker 1 [T1 ]  
 \* VBW 10 kHz      19.85 dBm  
 \* SWT 300 ms      1.880067308 GHz



Date: 23.JUN.2007 03:10:38



Ref 30 dBm      \*Att 30 dB      \*RBW 3 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      20.09 dBm  
 \*SWT 300 ms      1.880068000 GHz



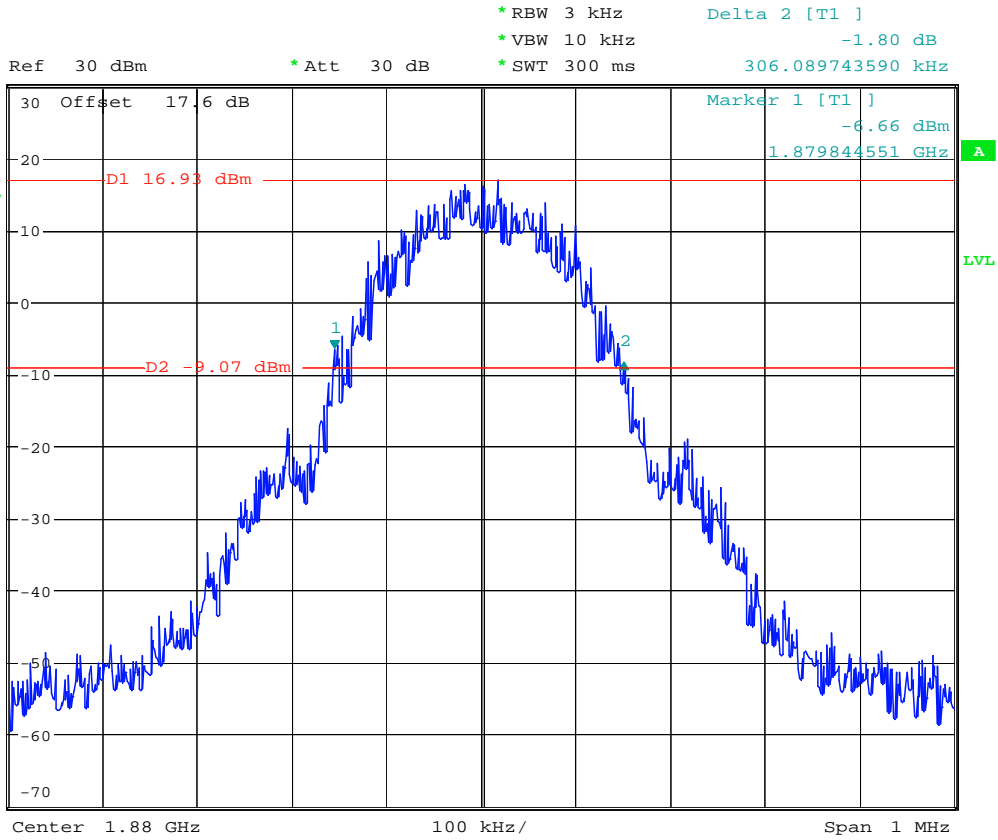
Date: 24.FEB.2007 19:49:23







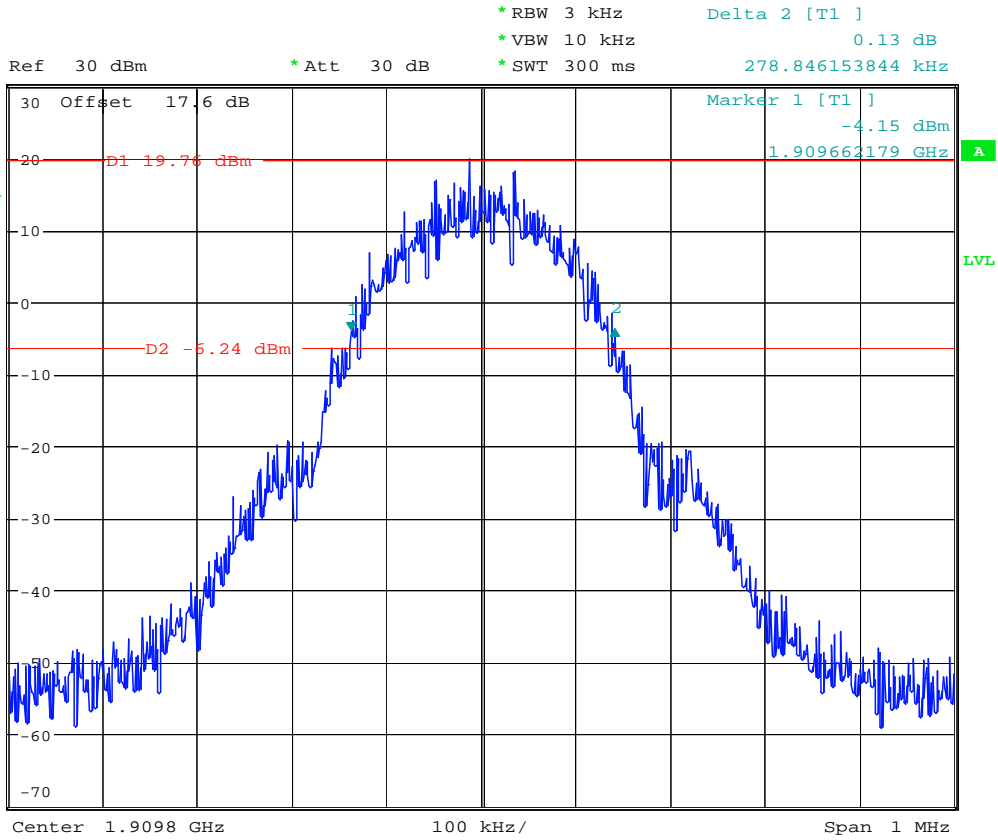
- Test Mode : PCS1900 CH661 26dB Bandwidth
- Power State : High



Date: 23.JUN.2007 03:07:26



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



Date: 23.JUN.2007 03:09:18







## 4.5 Conducted Emission

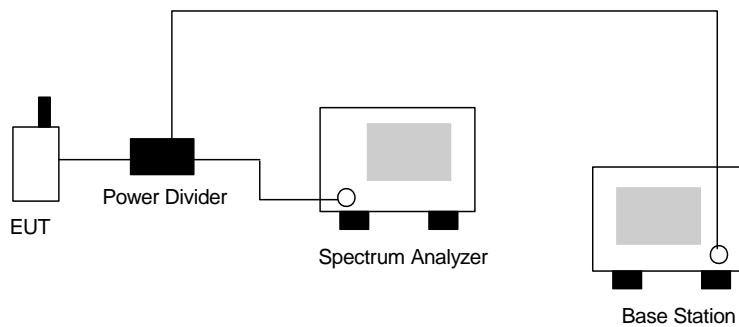
### 4.5.1 Measurement Instruments

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

- Test Mode : PCS 1900 CH661
- Frequency Range : 30M-1G

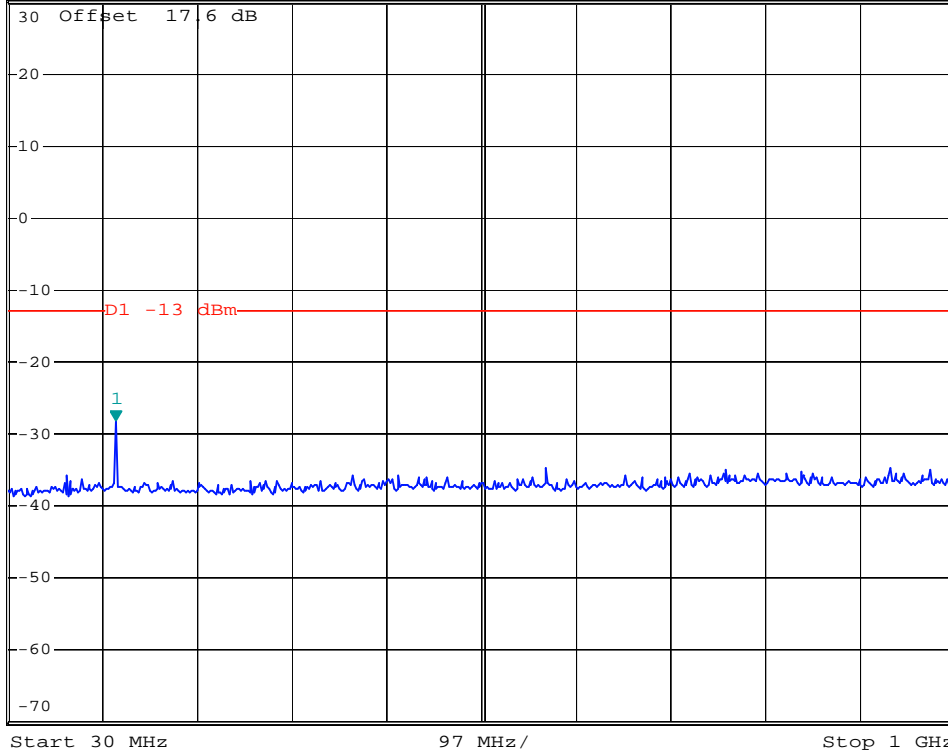


\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -28.20 dBm  
 \*SWT 500 ms      140.58000000 MHz

Ref 30 dBm

\*Att 30 dB

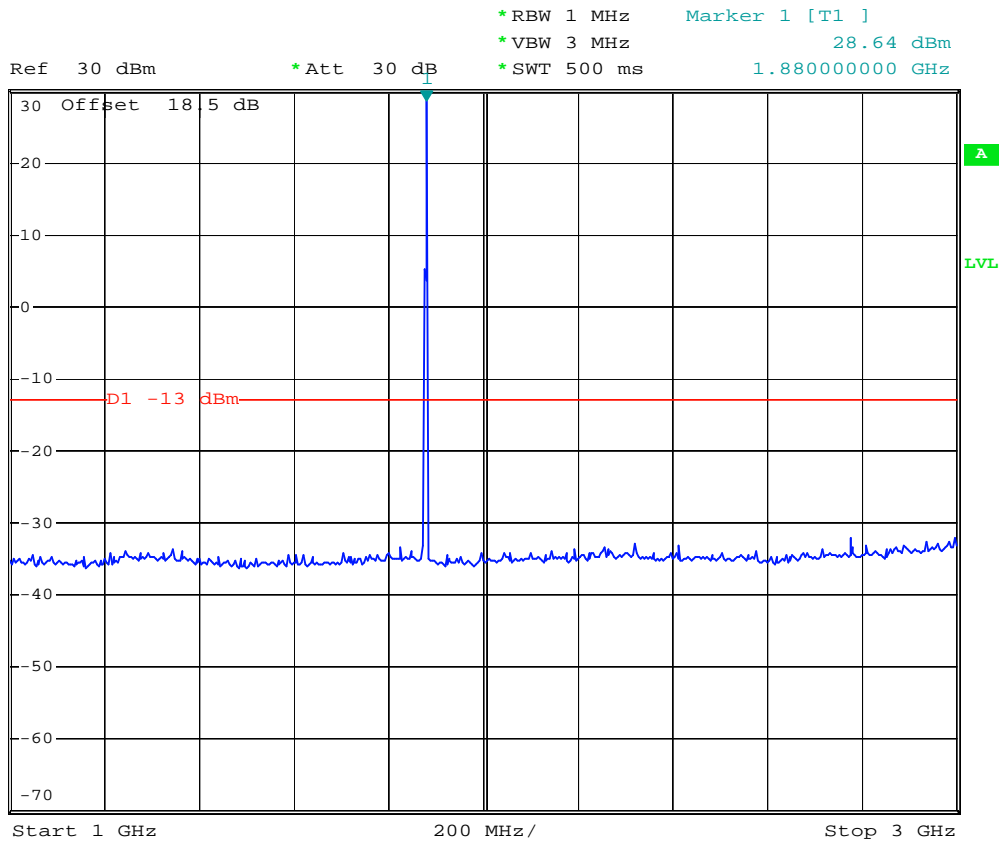
1 PK VIEW



Date: 24.FEB.2007 19:43:03



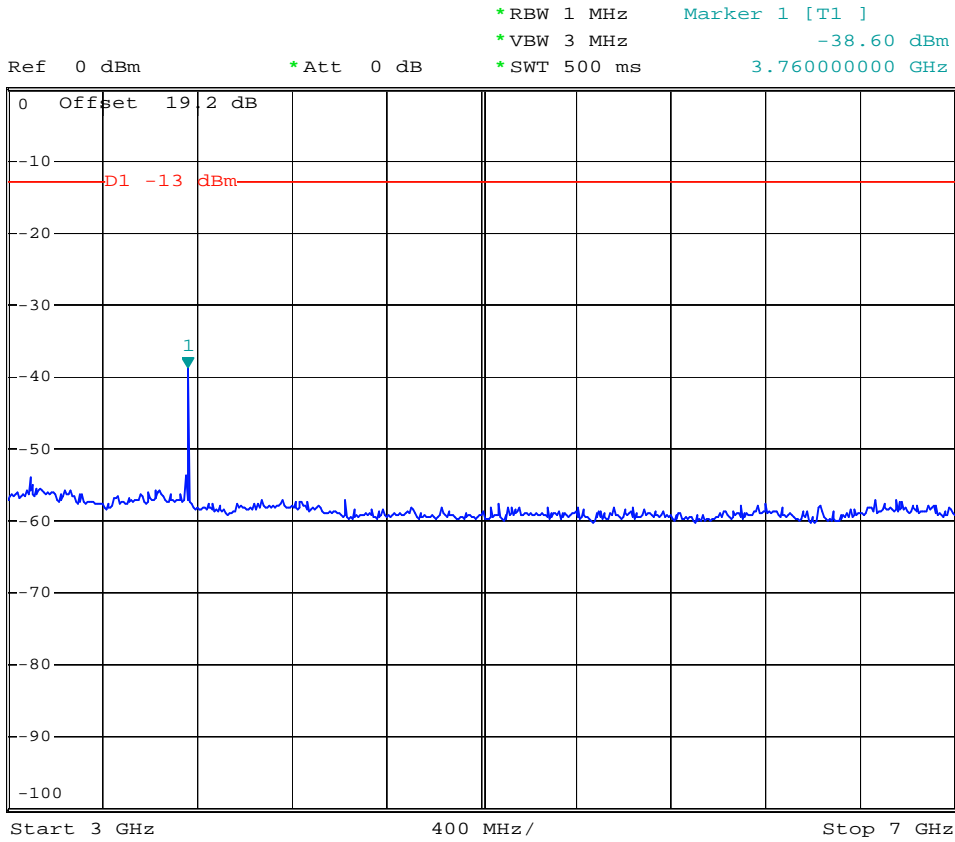
- Test Mode : PCS 1900 CH661
- Frequency Range : 1G-3G



Date: 24.FEB.2007 19:41:52



- Test Mode : PCS 1900 CH661
- Frequency Range : 3G-7G



Date: 24.FEB.2007 19:40:17



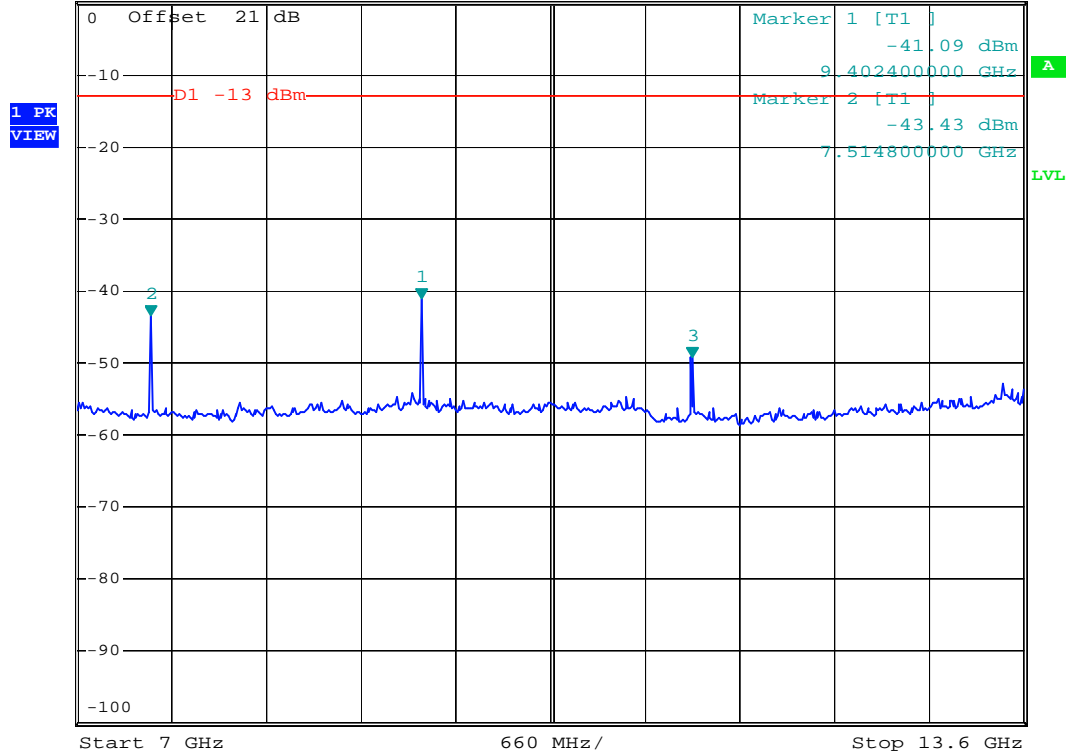
- Test Mode : PCS 1900 CH661
- Frequency Range : 7G-13.6G



\*RBW 1 MHz      Marker 3 [T1 ]  
 \*VBW 3 MHz      -49.26 dBm  
 \*SWT 500 ms      11.290000000 GHz

Ref 0 dBm

\*Att 0 dB



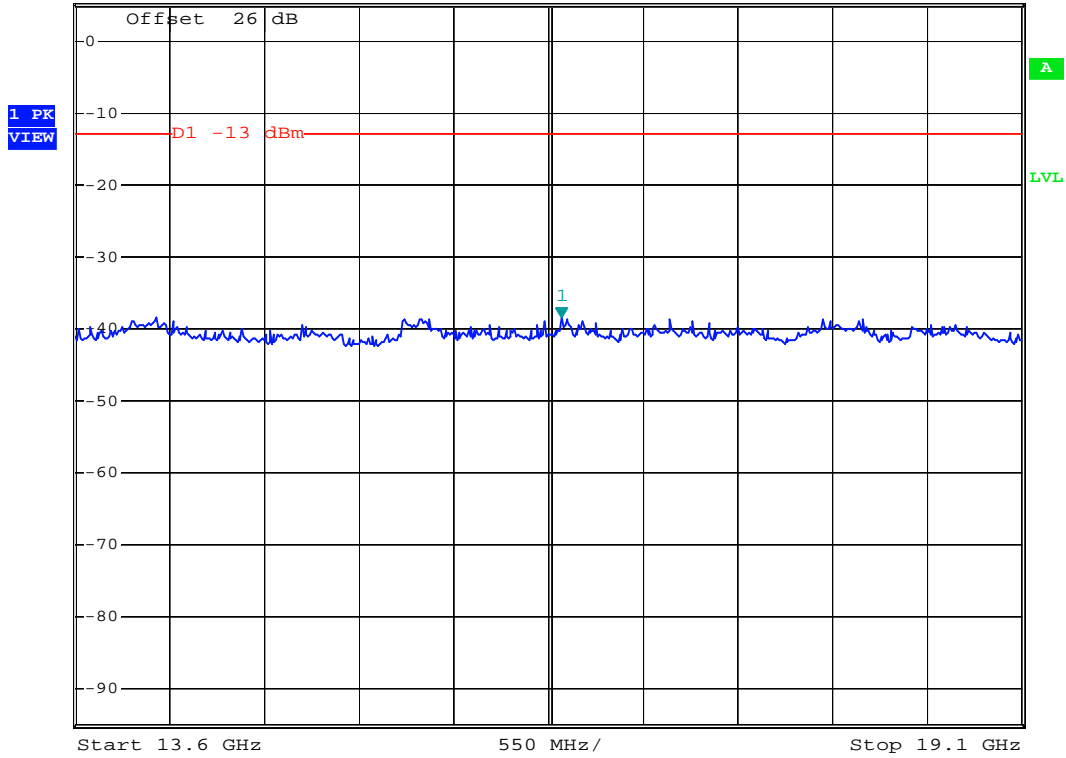
Date: 24.FEB.2007 19:37:49



- Test Mode : PCS 1900 CH661
- Frequency Range : 13.6G-19.1G



Ref 5 dBm      \*Att 0 dB      \*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -38.44 dBm  
\*SWT 500 ms      16.427000000 GHz



Date: 24.FEB.2007 19:38:57



## 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

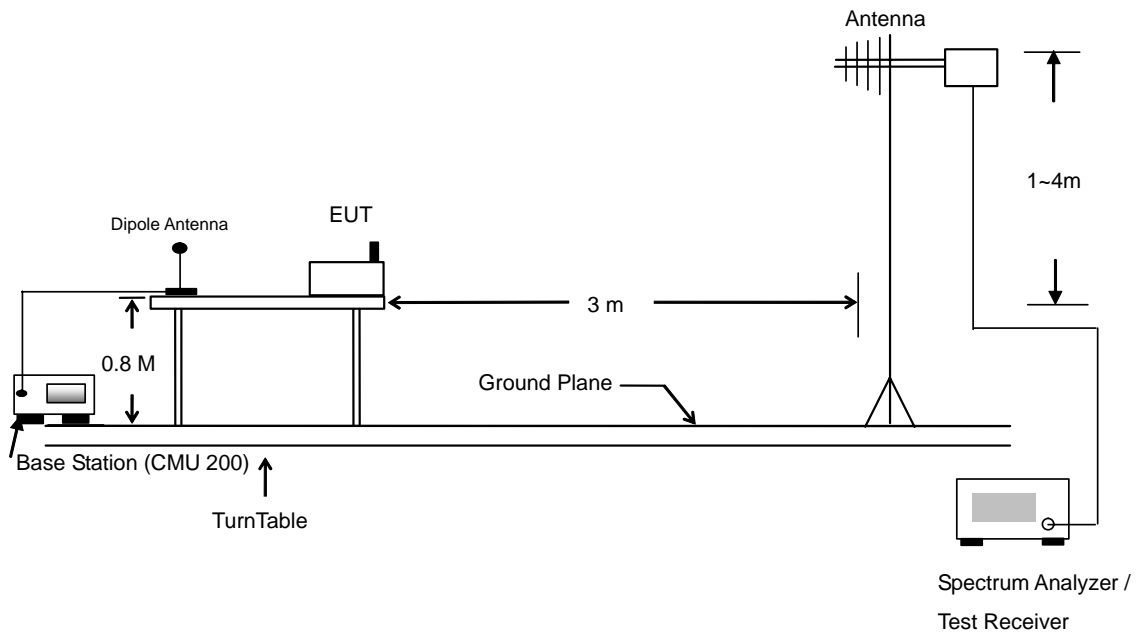
As described in chapter 5 of this test report.

### 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

GSM 1900 Radiated Spurious ERP							
H Polarization				V Polarization			
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)
141.780	-54.540	-13	-41.54	73.740	-50.940	-13	-37.94
168.240	-54.540	-13	-41.54	162.840	-50.300	-13	-37.30
194.430	-52.460	-13	-39.46	193.890	-56.280	-13	-43.28
306.300	-65.520	-13	-52.52	453.300	-64.710	-13	-51.71
365.800	-65.500	-13	-52.50	887.300	-61.840	-13	-48.84
997.900	-63.710	-13	-50.71	995.800	-61.040	-13	-48.04
1728.000	-51.880	-13	-38.88	1728.000	-58.140	-13	-45.14
3758.000	-38.220	-13	-25.22	3758.000	-26.420	-13	-13.42
5638.000	-47.330	-13	-34.33	5638.000	-42.350	-13	-29.35
9398.000	-37.410	-13	-24.41	7518.000	-39.500	-13	-26.50
11278.000	-35.990	-13	-22.99	9398.000	-35.700	-13	-22.70
				11278.000	-40.710	-13	-27.71
				13158.000	-43.280	-13	-30.28



- Test Mode : Mode 2

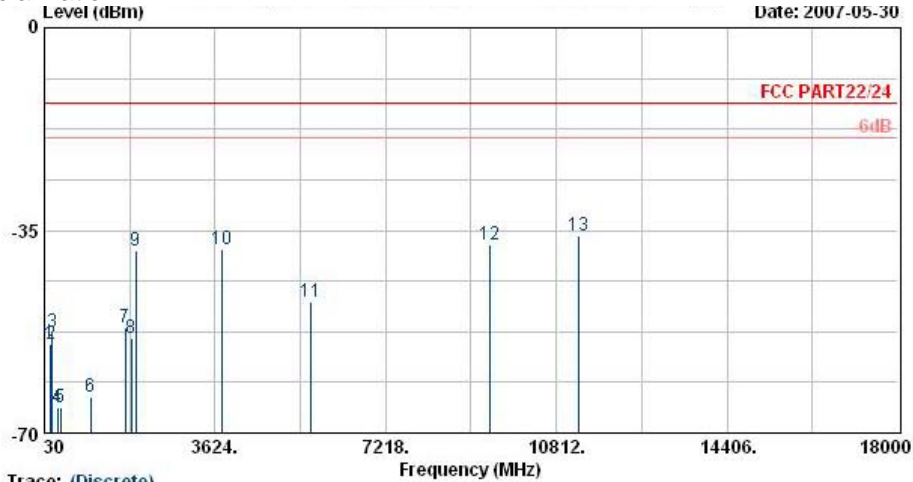
PCS1900 with Bluetooth Radiated Spurious EIRP							
H Polarization				V Polarization			
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)
31.620	-61.050	-13	-48.05	52.140	-53.940	-13	-40.94
92.640	-60.940	-13	-47.94	114.240	-43.900	-13	-30.90
167.430	-57.340	-13	-44.34	159.330	-49.170	-13	-36.17
332.900	-58.560	-13	-45.56	724.900	-62.030	-13	-49.03
413.400	-61.700	-13	-48.70	799.800	-61.690	-13	-48.69
637.400	-60.890	-13	-47.89	967.800	-61.290	-13	-48.29
1098.000	-55.500	-13	-42.50	1498.000	-52.580	-13	-39.58
1508.000	-55.590	-13	-42.59	1598.000	-57.170	-13	-44.17
1638.000	-55.830	-13	-42.83	1638.000	-54.590	-13	-41.59
3758.000	-44.690	-13	-31.69	1798.000	-56.410	-13	-43.41
4958.000	-50.540	-13	-37.54	3758.000	-42.820	-13	-29.82
				4958.000	-48.970	-13	-35.97
				5638.000	-52.670	-13	-39.67
				9398.000	-44.250	-13	-31.25



4.6.5 Test Data

4.6.5.1 Mode 1

Horizontal Polarization



Trace: (Discrete)  
 Site : 03CH06-RY  
 Condition : HF-SPURIOUS HORIZONTAL  
 EUT : Tri band Mobile Phone with GPS  
 Power : 120Vac/60Hz  
 Model : FG 721310  
 Memo : PCS 1900 Link;CH661+Adaptor+Earphone  
 Plane : E2

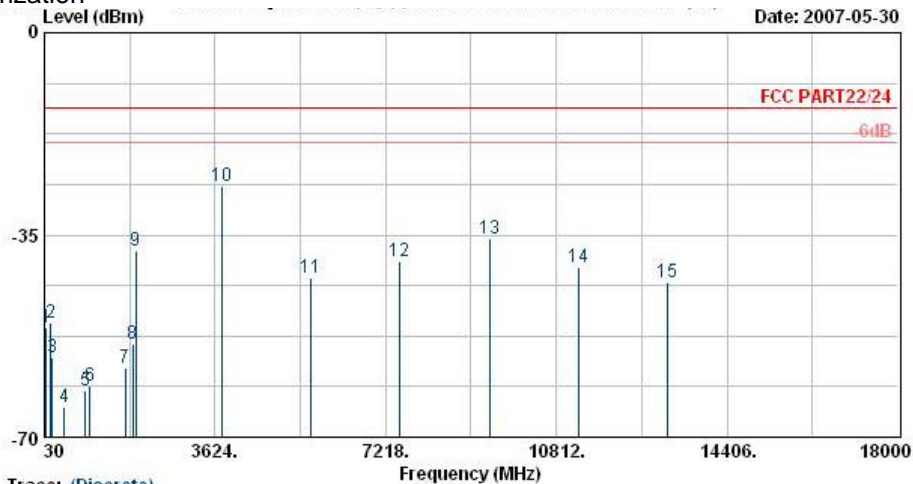
	Freq	Level	Over	Limit	Read		Remark	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB		
1	141.78	-54.54	-41.54	-13.00	-41.82	-12.72	Peak	HORIZONTAL
2	168.24	-54.54	-41.54	-13.00	-41.50	-13.03	Peak	HORIZONTAL
3	194.43	-52.46	-39.46	-13.00	-39.13	-13.33	Peak	HORIZONTAL
4	306.30	-65.52	-52.52	-13.00	-55.81	-9.71	Peak	HORIZONTAL
5	365.80	-65.50	-52.50	-13.00	-57.83	-7.67	Peak	HORIZONTAL
6	997.90	-63.71	-50.71	-13.00	-63.93	0.22	Peak	HORIZONTAL
7	1728.00	-51.88	-38.88	-13.00	-51.90	0.02	Peak	HORIZONTAL
8	1864.00	-53.62			-53.11	-0.51	Peak	HORIZONTAL
9	1958.00	-38.61			-37.50	-1.11	Peak	HORIZONTAL
10	3758.00	-38.22	-25.22	-13.00	-46.14	7.92	Peak	HORIZONTAL
11	5638.00	-47.33	-34.33	-13.00	-57.30	9.97	Peak	HORIZONTAL
12	9398.00	-37.41	-24.41	-13.00	-55.63	18.22	Peak	HORIZONTAL
13	11278.00	-35.99	-22.99	-13.00	-56.29	20.30	Peak	HORIZONTAL

Remark:

- #8: MS TCH Signal
- #9: BS TCH Signal



Vertical Polarization



Trace: (Discrete)  
 Site : 03CH06-HY  
 Condition : HF-SPURIOUS VERTICAL  
 EUT : Tri band Mobile Phone with GPS  
 Power : 120Vac/60Hz  
 Model : FG 721310  
 Memo : PCS 1900 Link;CH661+Adaptor+Earphone  
 Plane : E2

	Freq	Level	Over	Limit	Read	Factor	Remark	PoI/Phase
	MHz	dBm	dB	dBm	dBm	dB		
1	73.74	-50.94	-37.94	-13.00	-39.48	-11.46	Peak	VERTICAL
2	162.84	-50.30	-37.30	-13.00	-42.04	-8.26	Peak	VERTICAL
3	193.89	-56.28	-43.28	-13.00	-47.74	-8.54	Peak	VERTICAL
4	453.30	-64.71	-51.71	-13.00	-61.01	-3.69	Peak	VERTICAL
5	887.30	-61.84	-48.84	-13.00	-63.61	1.76	Peak	VERTICAL
6	995.80	-61.04	-48.04	-13.00	-63.67	2.63	Peak	VERTICAL
7	1728.00	-58.14	-45.14	-13.00	-57.80	-0.34	Peak	VERTICAL
8	1888.00	-53.94			-53.44	-0.50	Peak	VERTICAL
9	1958.00	-37.64			-37.05	-0.60	Peak	VERTICAL
10 @	3758.00	-26.42	-13.42	-13.00	-33.06	6.64	Peak	VERTICAL
11	5638.00	-42.35	-29.35	-13.00	-51.00	8.65	Peak	VERTICAL
12	7518.00	-39.50	-26.50	-13.00	-52.86	13.37	Peak	VERTICAL
13	9398.00	-35.70	-22.70	-13.00	-52.90	17.20	Peak	VERTICAL
14	11278.00	-40.71	-27.71	-13.00	-59.58	18.87	Peak	VERTICAL
15	13158.00	-43.28	-30.28	-13.00	-59.07	15.79	Peak	VERTICAL

Remark:

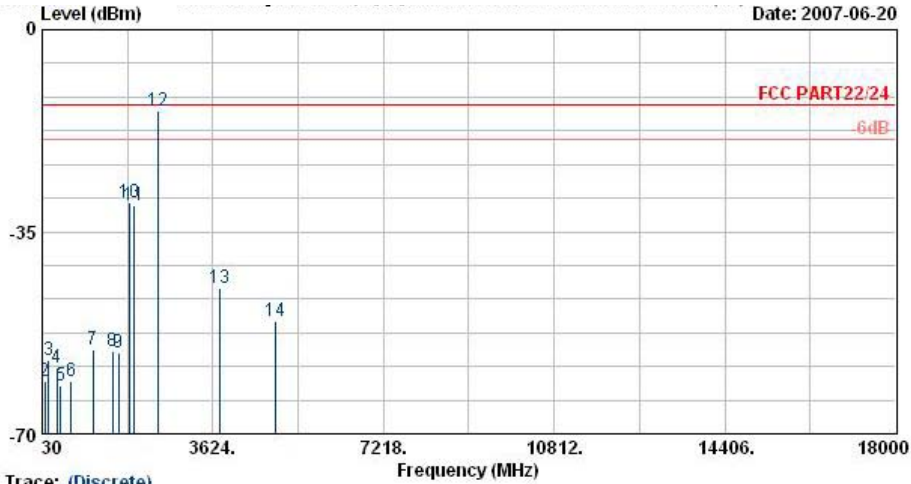
- #8: MS TCH Signal
- #9: BS TCH Signal

Remark : There is no more obvious emission except the listings above.



4.6.5.2 Mode 2

Horizontal Polarization



Trace: (Discrete)

Site : 03CH06-HY  
 Condition : HF-SPURIOUS HORIZONTAL  
 EUT : Tri band Mobile Phone with GPS  
 Power : 120Vac/60Hz  
 Model : FG 721310  
 Memo : PCS 1900 Link;CH661+Adaptor+BT Tx Ch78  
 Plane : E2

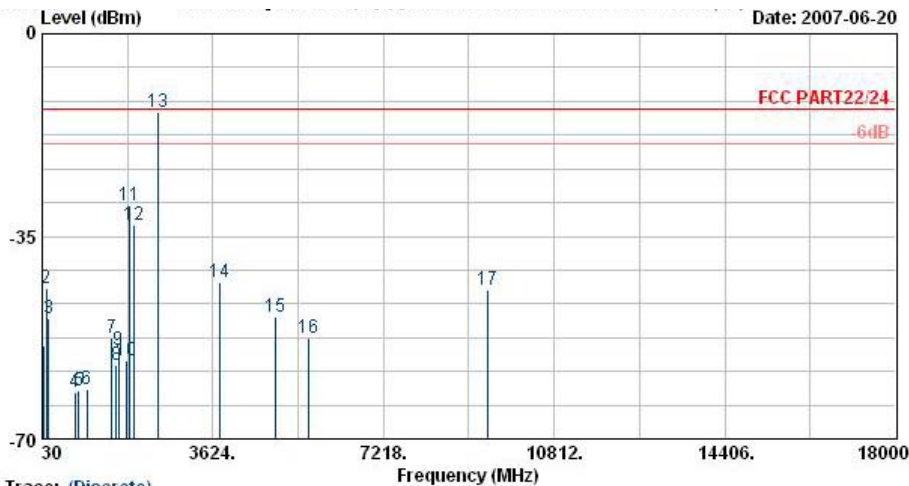
	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBm	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBm	dBm	dB	dB	dB	cm	deg	
1 @	31.62	-61.05	-48.05	-13.00	-60.19	-0.86	0.00	0.00	---	---	Peak
2 @	92.64	-60.94	-47.94	-13.00	-48.67	-12.27	0.00	0.00	---	---	Peak
3 @	167.43	-57.34	-44.34	-13.00	-44.32	-13.02	0.00	0.00	---	---	Peak
4 @	332.90	-58.56	-45.56	-13.00	-49.75	-8.81	0.00	0.00	---	---	Peak
5 @	413.40	-61.70	-48.70	-13.00	-55.39	-6.31	0.00	0.00	---	---	Peak
6 @	637.40	-60.89	-47.89	-13.00	-57.53	-3.36	0.00	0.00	---	---	Peak
7 @	1098.00	-55.50	-42.50	-13.00	-57.11	1.61	0.00	0.00	---	---	Peak
8 @	1508.00	-55.59	-42.59	-13.00	-56.04	0.45	0.00	0.00	---	---	Peak
9 @	1638.00	-55.83	-42.83	-13.00	-56.14	0.31	0.00	0.00	---	---	Peak
10 @	1878.00	-29.80			-29.29	-0.51	0.00	0.00	---	---	Peak
11 @	1958.00	-30.55			-29.44	-1.11	0.00	0.00	---	---	Peak
12 @	2478.00	-14.10			-15.25	1.16	0.00	0.00	---	---	Peak
13 @	3758.00	-44.69	-31.69	-13.00	-52.62	7.92	0.00	0.00	---	---	Peak
14 @	4958.00	-50.54	-37.54	-13.00	-61.17	10.63	0.00	0.00	---	---	Peak

Remark:

- #10: MS TCH Signal
- #11: BS TCH Signal
- #12: BT Signal



Vertical Polarization



Trace: (Discrete)

Site : 03CH06-HY  
 Condition : HP-SPURIOUS VERTICAL  
 EUT : Tri band Mobile Phone with GPS  
 Power : 120Vac/60Hz  
 Model : FC 721310  
 Memo : PCS 1900 Link;CH661+Adaptor+BT Tx Ch78  
 Plane : E2

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBm	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBm	dBm	dB	dB	dB	cm	deg	
1 @	52.14	-53.94	-40.94	-13.00	-39.40	-14.54	0.00	0.00	---	---	Peak
2 @	114.24	-43.90	-30.90	-13.00	-36.08	-7.82	0.00	0.00	---	---	Peak
3 @	159.33	-49.17	-36.17	-13.00	-40.94	-8.22	0.00	0.00	---	---	Peak
4 @	724.90	-62.03	-49.03	-13.00	-61.96	-0.07	0.00	0.00	---	---	Peak
5 @	799.80	-61.69	-48.69	-13.00	-62.76	1.07	0.00	0.00	---	---	Peak
6 @	967.80	-61.29	-48.29	-13.00	-63.70	2.41	0.00	0.00	---	---	Peak
7 @	1498.00	-52.58	-39.58	-13.00	-51.72	-0.86	0.00	0.00	---	---	Peak
8 @	1598.00	-57.17	-44.17	-13.00	-56.50	-0.67	0.00	0.00	---	---	Peak
9 @	1638.00	-54.59	-41.59	-13.00	-54.13	-0.46	0.00	0.00	---	---	Peak
10 @	1798.00	-56.41	-43.41	-13.00	-56.02	-0.39	0.00	0.00	---	---	Peak
11 @	1878.00	-29.58			-29.18	-0.40	0.00	0.00	---	---	Peak
12 @	1958.00	-33.03			-32.44	-0.60	0.00	0.00	---	---	Peak
13 @	2478.00	-13.50			-15.71	2.21	0.00	0.00	---	---	Peak
14 @	3758.00	-42.82	-29.82	-13.00	-49.45	6.64	0.00	0.00	---	---	Peak
15 @	4958.00	-48.97	-35.97	-13.00	-58.22	9.25	0.00	0.00	---	---	Peak
16 @	5638.00	-52.67	-39.67	-13.00	-61.32	8.65	0.00	0.00	---	---	Peak
17 @	9398.00	-44.25	-31.25	-13.00	-61.45	17.20	0.00	0.00	---	---	Peak

Remark:

- 1.#11: MS TCH Signal
- 2.#12: BS TCH Signal
- 3.#13: BT Signal

Remark: There is no more obvious emission except the listings above.

## 4.7 Frequency Stability (Temperature Variation)

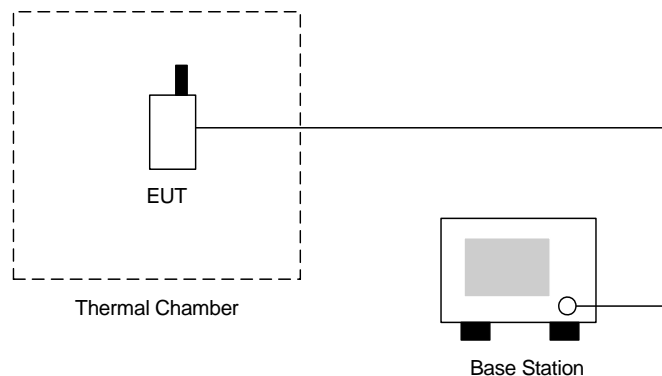
### 4.7.1 Measurement Instrument

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 -20°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 CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	-29	-0.02	2.5	Passed
-20	-34	-0.02		
-10	33	0.02		
0	-24	-0.01		
10	-26	-0.01		
20	-33	-0.02		
30	-46	-0.02		
40	-34	-0.02		
50	-43	-0.02		

### 4.8 Frequency Stability (Voltage Variation)

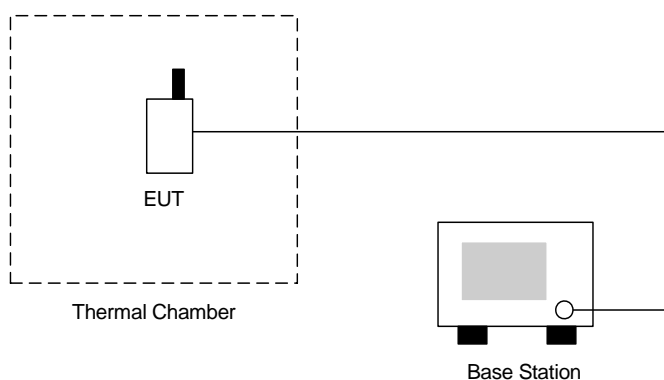
#### 4.8.1 Measurement Instrument

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 : PCS (GSM) CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-43.0	-0.02	2.5	Passed
BEP	-32.0	-0.02		
4.2	-44.0	-0.02		

Remark:

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



#### 4 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. 13, 2006	Jul. 12, 2007	Radiation (03CH06-HY)
Controller	INN-CO	CO2000	N/A	N/A	N/A	N/A	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	10094	1G~18G	Dec. 26, 2006	Dec. 25, 2007	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)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	INN-CO	MM3000	114/8000604/L	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	106656	WCDMA	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 22, 2007	Jan. 22, 2008	Radiation (03CH06-HY)



## 5 Uncertainty Evaluation

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

Contribution	Uncertainty of $x_i$		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
<b>combined standard uncertainty Uc(y)</b>	<b>1.27</b>		
<b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b>	<b>2.54</b>		

### Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of $x_i$		$u(x_i)$	$C_i$	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 * \Gamma_2 * \Gamma_3)$	+0.34/-0.35	U-shaped	0.244	1	0.244
<b>Combined standard uncertainty Uc(y)</b>	<b>2.36</b>				
<b>Measuring uncertainty for a level of confidence of 95% U=2Ue(y)</b>	<b>4.72</b>				

END OF TEST REPORT