FCC TEST REPORT

for

47 CFR Part 24E

Equipment	**: Tri-band GPRS Mobile Phone**
Trade Name	**: Asmobile**
Model No.	**: Gemini**
FCC ID	**: SNFG10**
Tx Frequency Range	**: 1850.2~1909.8MHz**
Max. RF Output Power	**: 0.54W**
Emission Designator	**: 300 KGXW**
Applicant	**: Asmobile Communication Inc.** No. 11, Lane 120, Li-Te Rd., Peitou, Taipei 112, Taiwan, R.O.C.

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- The data shown in this test report were carried out on Mar.17, 2005 at **Sporton International Inc. LAB.**

Daniel Lee 4/1/2005

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History of this test report

Original Report Issue Date: Mar. 28, 2005

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. General Information

1.1. Applicant

Asmobile Communication Inc.
No. 11, Lane 120, Li-Te Rd., Peitou, Taipei 112, Taiwan, R.O.C.

1.2 Manufacturer

Asmobile Communication Inc.
No. 11, Lane 120, Li-Te Rd., Peitou, Taipei 112, Taiwan, R.O.C.

1.3 Basic Description of Equipment under Test

Equipment	:	Tri-band GPRS Mobile Phone
Trade Name	:	Asmobile
Model No.	:	Gemini
FCC ID	:	SNFG10
Power Supply Type	:	Switching
AC Power Cord	:	AC 120V, Non-shielded, Wall-mount, 1.8 meter, 2 pin
Earpiece	:	Merry, EMC133-X093
Charger	:	TAMURA, MP20
Battery	:	ASUS, V65

1.4 Feature of Equipment under Test

DUT Type :	Tri-band GPRS Mobile Phone
Trade Name :	Asmobile
Model Name :	Gemini
FCC ID :	SNFG10
Tx Frequency :	1850.2-1909.8MHz
Rx Frequency :	1930.2-1989.8MHz
Antenna Type :	Fixed Internal
Maximum Output Power :	0.813 W (29.1 dBm)
Maximum EIRP	0.54 W (27.329 dBm)
HW Version :	CE1
SW Version :	Unknown.NONE.GEM50226N10.00/0.01C.Q.ER1
Power Rating (DC/AC, Voltage) :	DC 3.7V
Digital Modulation Emission :	GMSK
Type of Emission :	300 KGXW
DUT Stage :	Identical Prototype

1.5 Report Date

EUT Received : Feb. 25, 2005

Report Date : Mar. 28, 2005

2 Test Configuration of Equipment under Test

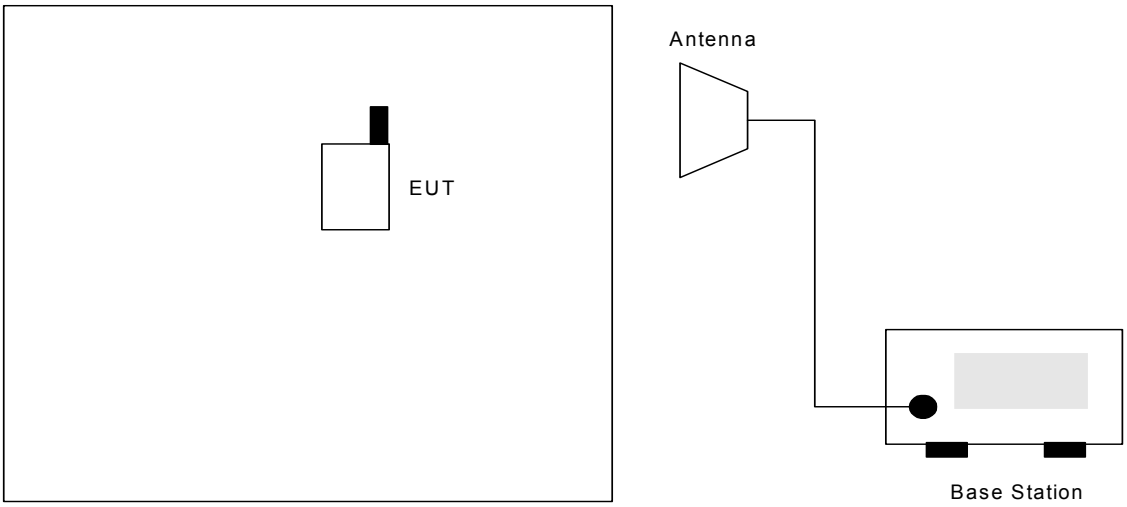
2.1 Test Manner

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 PCS 1900)
c. Frequency range investigated: radiated emission 30 MHz to 19000MHz.

2.2 Test Mode

Application	**PCS 1900**
Radiated Emission	☒ Mode 1: CH 661
Conducted Measurement	☒ Mode 1: CH 661

2.3 Connection Diagram of Test System



2.4 Ancillary Equipment List

Item	Equipment	Model No.	Serial No.
1.	Base Station	CMU200	105934

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. The Industry Canada file number for this site is IC 4088.

3.1 Test Voltage

120V/ 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 PCS 1900

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	IC RULE	DESCRIPTION OF TEST	Result	Section
§2.1046	RSS-133 §6.2	RF Output Power	Passed	4.2
§24.232	RSS-133 §6.2	EIRP	Passed	4.3
§2.1049, §24.238(b)	RSS-133 §6.3	Occupied Bandwidth & Band Edge Measurement	Passed	4.4
§2.1051	RSS-133 §6.3	Conducted Emission	Passed	4.5
§2.1053	RSS-133 §6.3	Field Strength of Spurious Radiation	Passed	4.6
§2.1055, §24.235	RSS-133 §7	Frequency Stability vs. Temperature	Passed	4.7
§2.1055, §24.235	RSS-133 §7	Frequency Stability vs. Voltage	Passed	4.8

4.2 RF Output Power

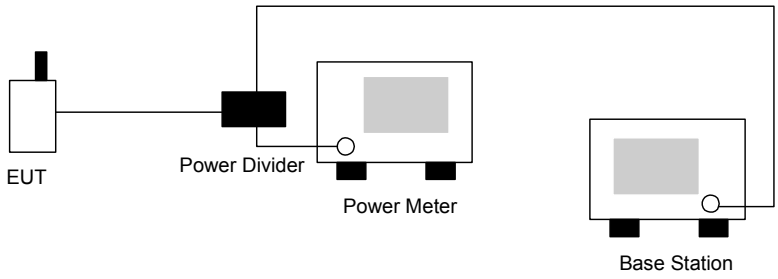
4.2.1 Measurement Instruments：

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 1900 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)
GSM 1900	512	1850.2 (Low)	29.1	0.813
	661	1880.0 (Mid)	29	0.794
	810	1909.8 (High)	29	0.794

4.3 ERP / EIRP Measurement

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

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 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 radiated power.
4. The height of the receiving antenna is varied between one meter and four meters to reach the maximum radiated power for both horizontal and vertical polarizations.
5. Taking the record of maximum ERP/EIRP.
6. A Horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the Horn antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

   Ps (dBm): Input power to substitution antenna.

   Gs (dBi): Substitution antenna Gain.

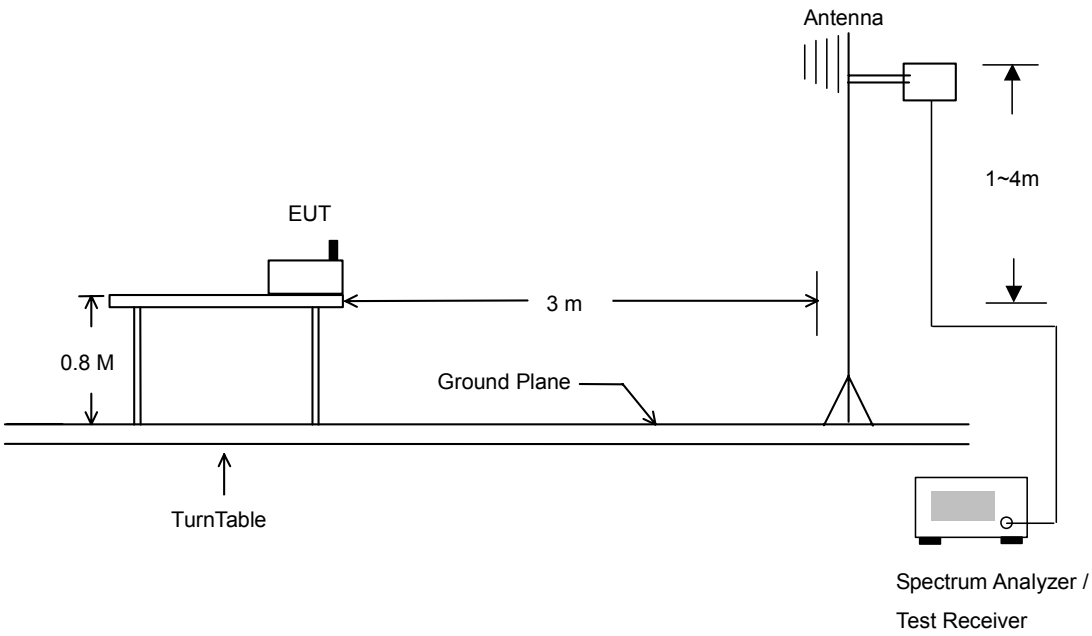
   Et = Rt + AF

   Es + Rs + AF

   AF (dB/m): Receive antenna factor

   Rt: the highest received signal in Spectrum Analyzer for EUT.

4.3.3 Test Setup Layout of ERP/EIRP



4.3.4 Test Result

PCS1900 Radiated Power EIRP					
H Polarization			V Polarization		
Frequency (MHz)	EIRP (dBm)	EIRP (Watts)	Frequency (MHz)	EIRP (dBm)	EIRP (Watts)
1850.290	20.477	0.11	1850.190	26.314	0.43
1880.000	22.141	0.16	1880.190	27.211	0.53
1909.840	21.416	0.14	**1909.870**	**27.329**	**0.54**

4.4 Occupied Bandwidth and Band Edge Measurement

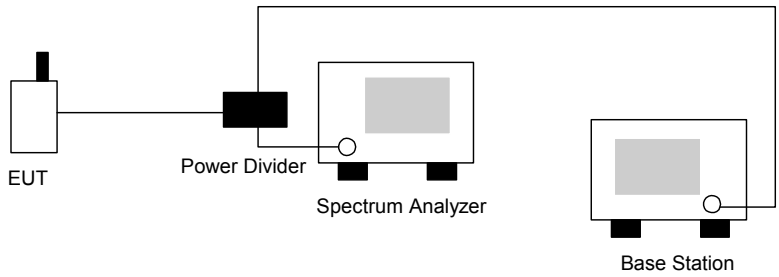
4.4.1 Measurement Instruments

As described in chapter 5 of this test report.

4.4.2 Test Procedure

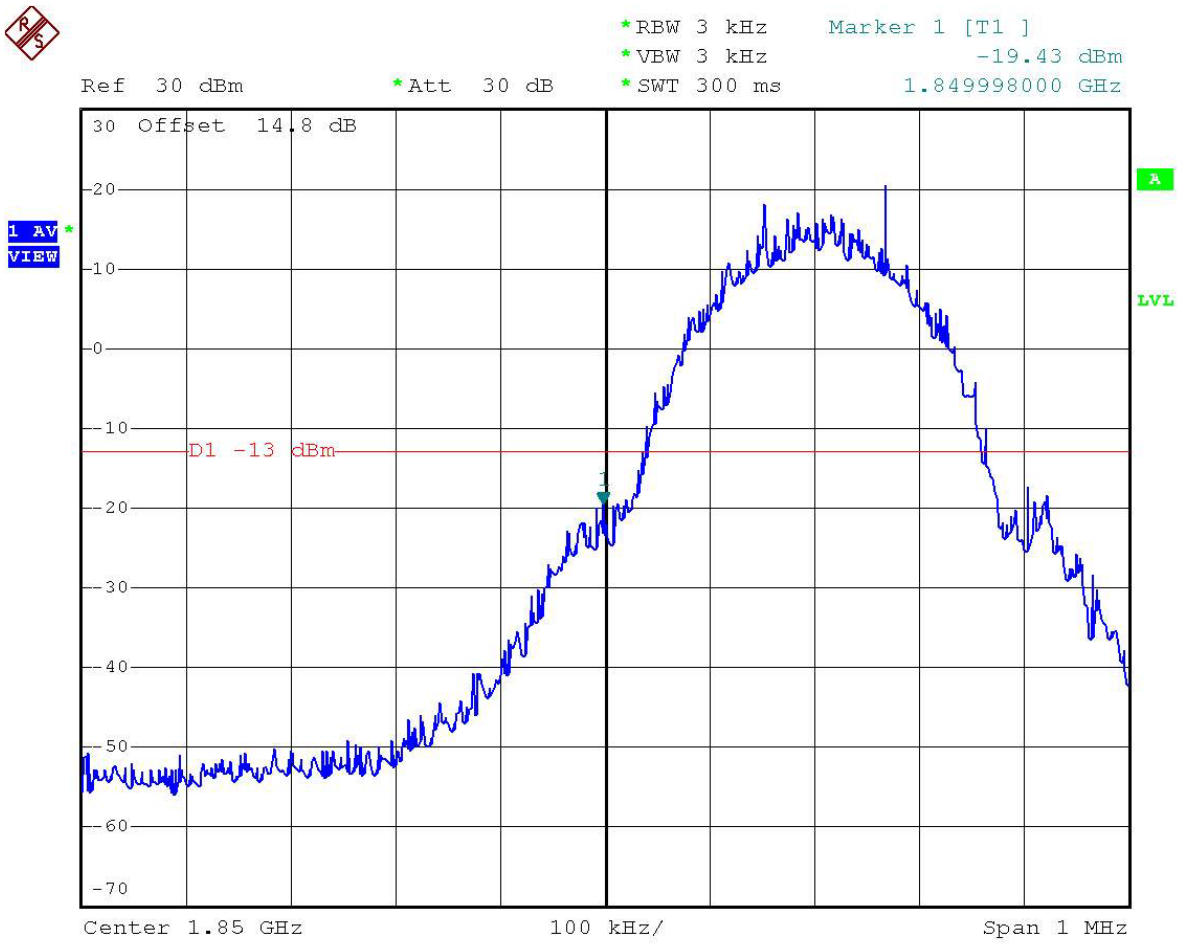
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers were measured.
3. The bandedge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/10.

4.4.3 Test Setup Layout



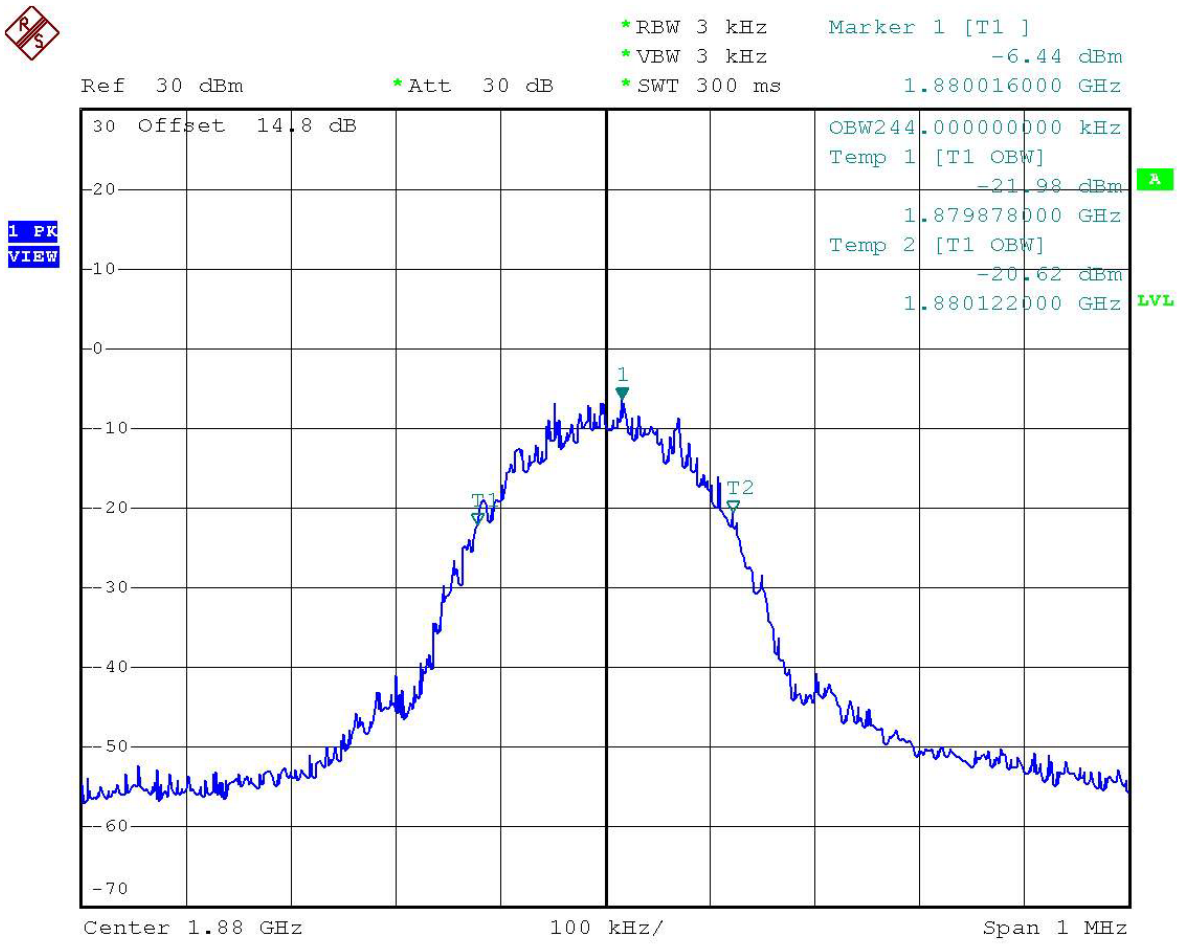
4.4.4 Test Result

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



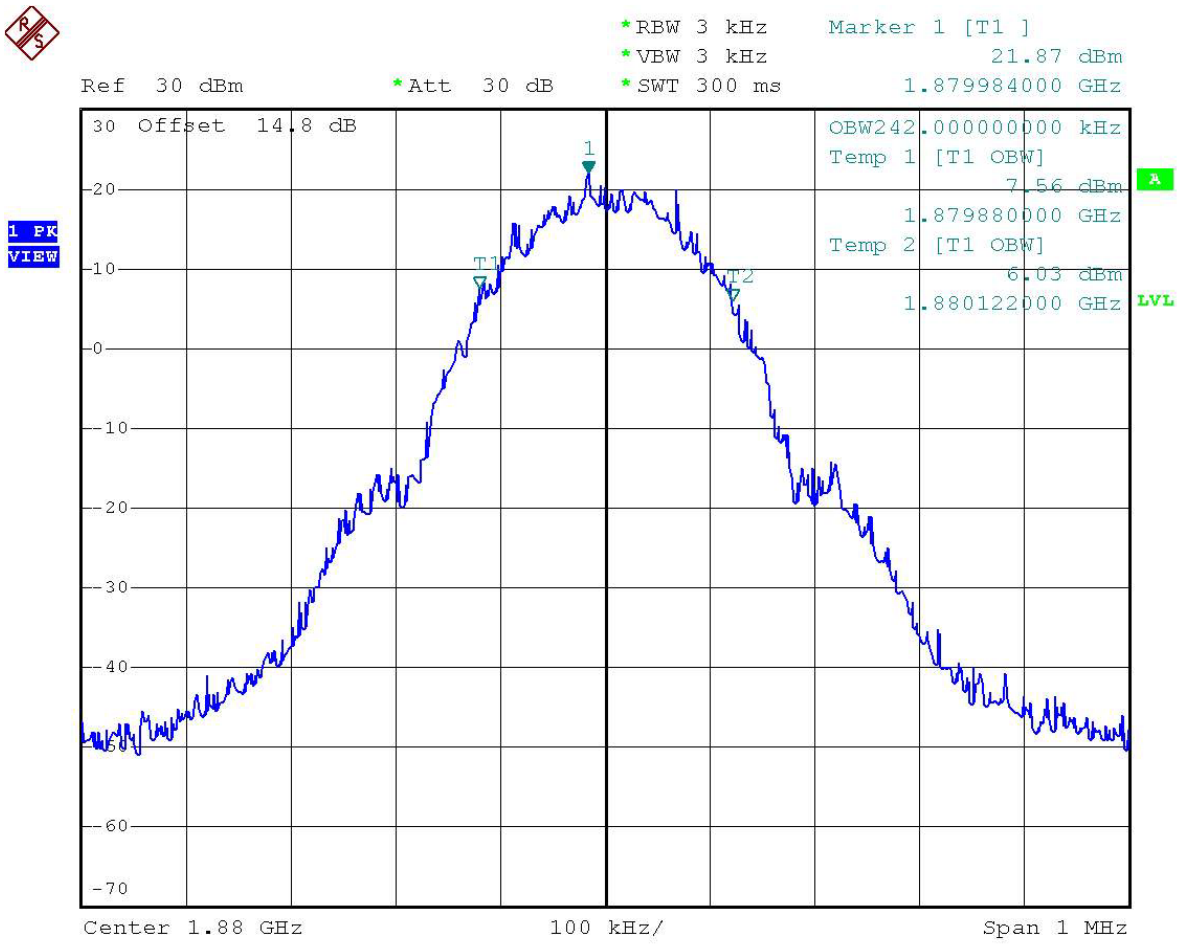
Date: 15.MAR.2005 22:12:38

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



Date: 15.MAR.2005 22:10:55

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



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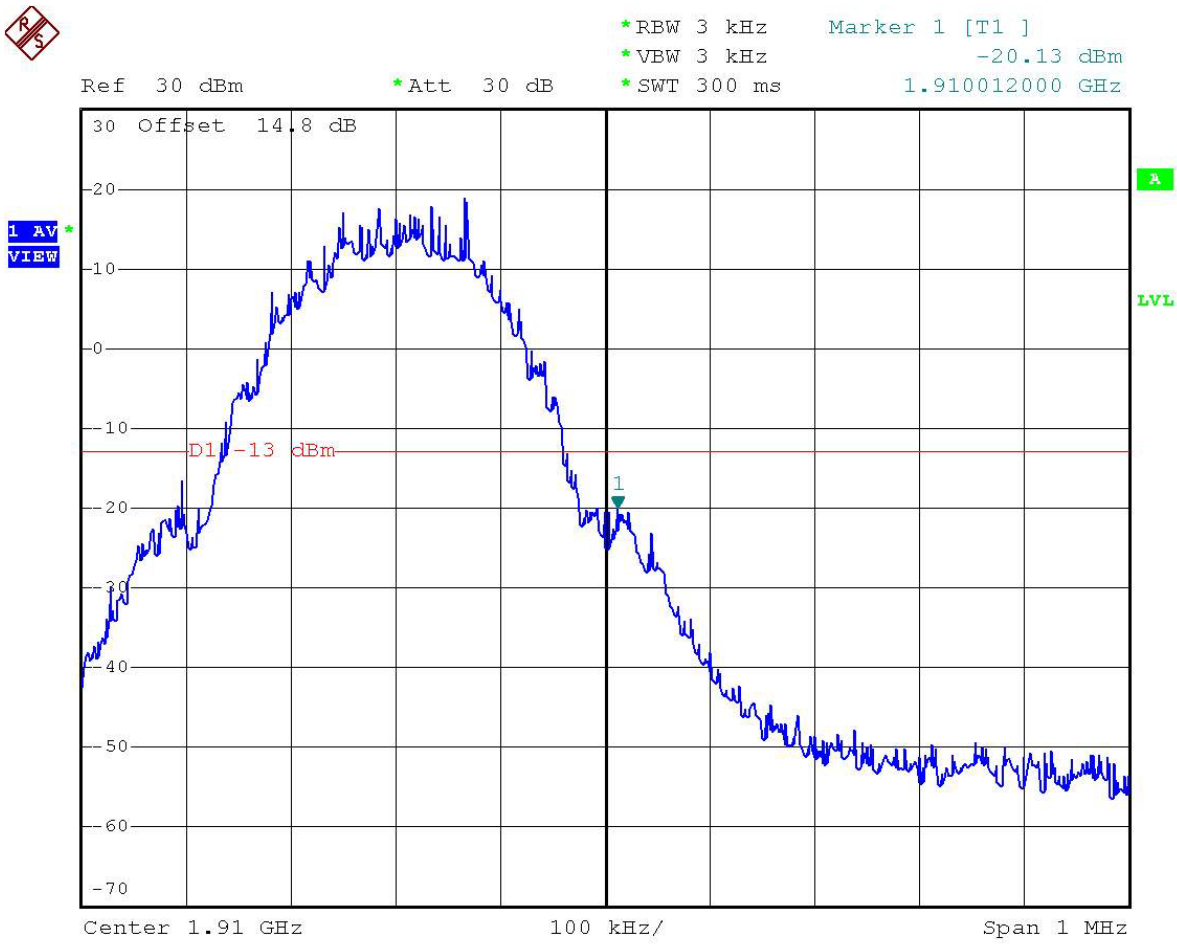
- Test Mode : PCS 1900 CH810 Higher Band Edge
- Power State : High



Date: 15.MAR.2005 22:13:47

4.5 Conducted Emission

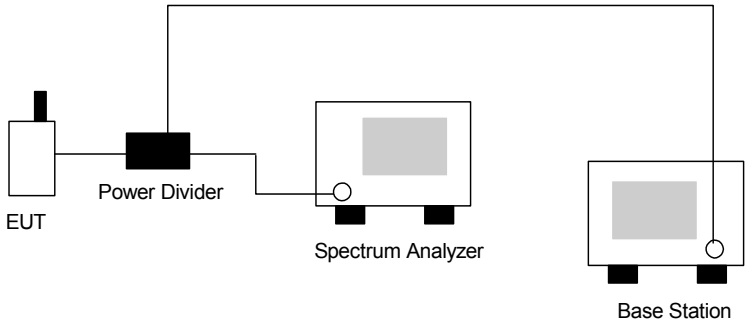
4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

4.5.2 Test Procedure

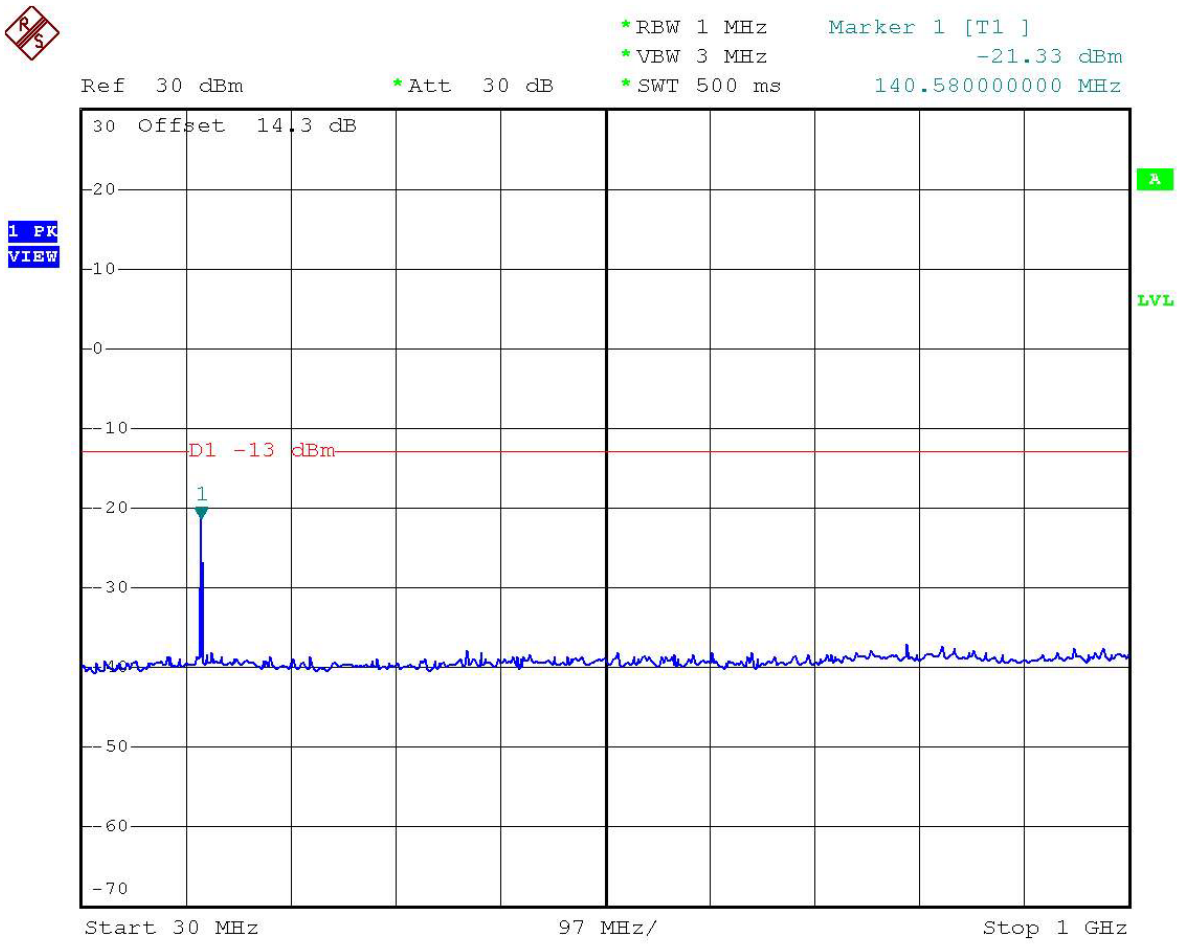
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

4.5.3 Test Setup Layout



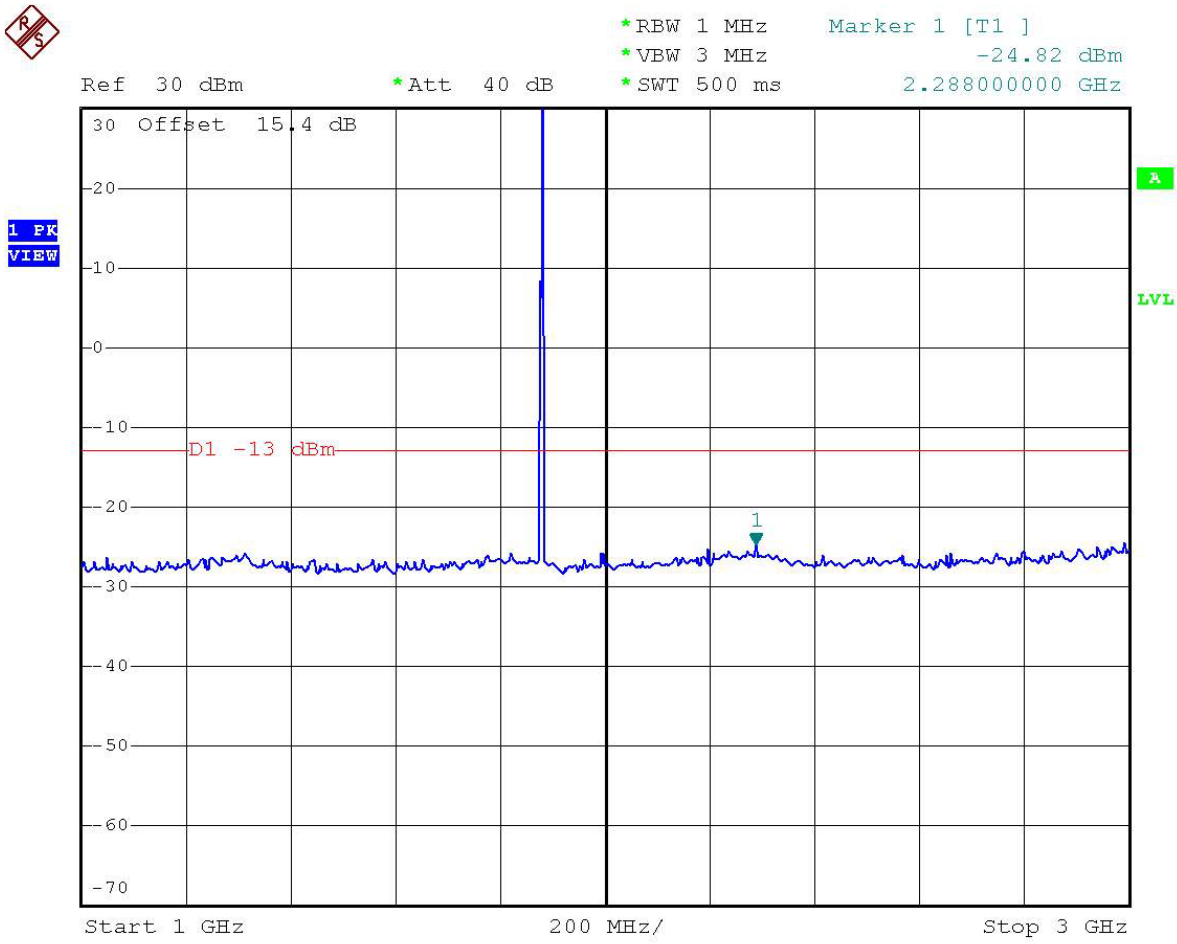
4.5.4 Test Result

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



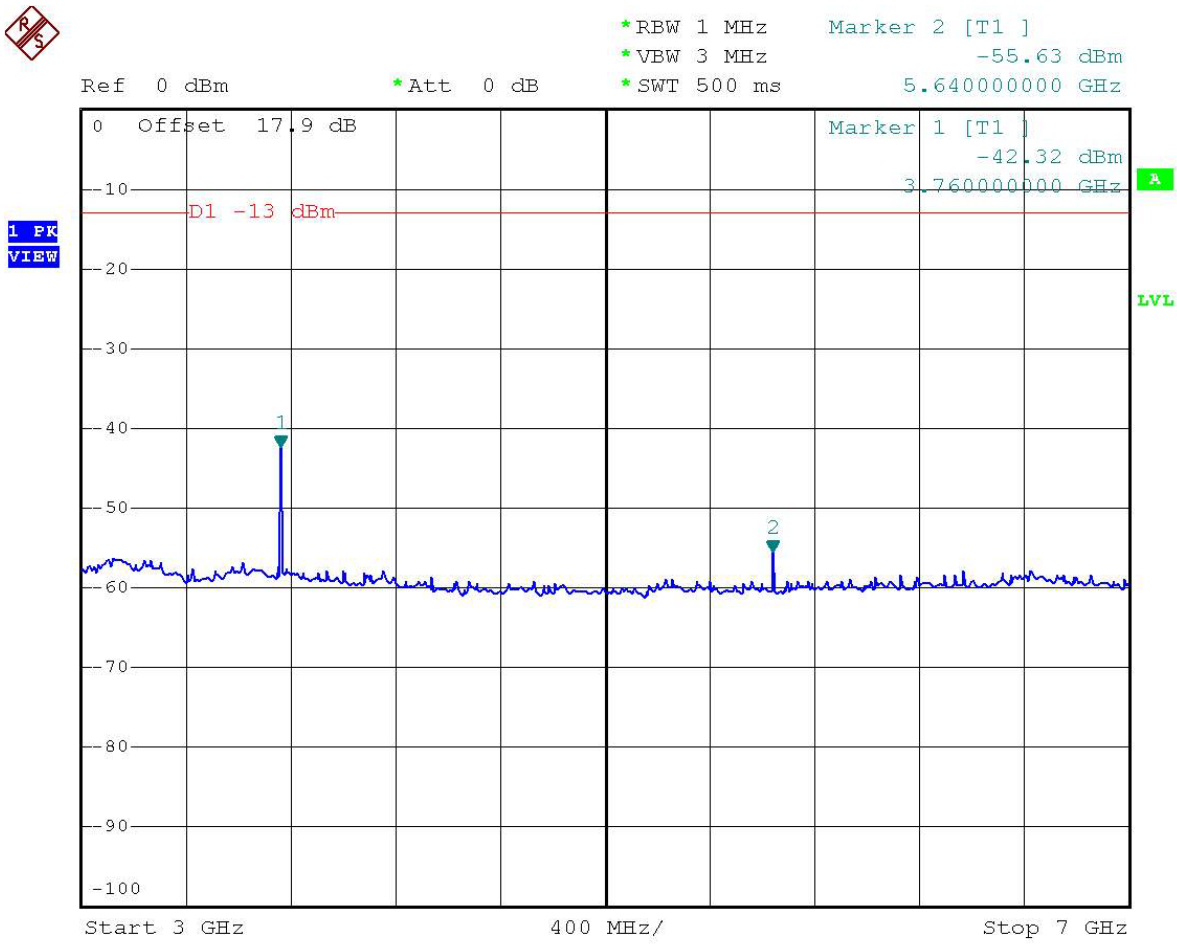
Date: 15.MAR.2005 22:15:57

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



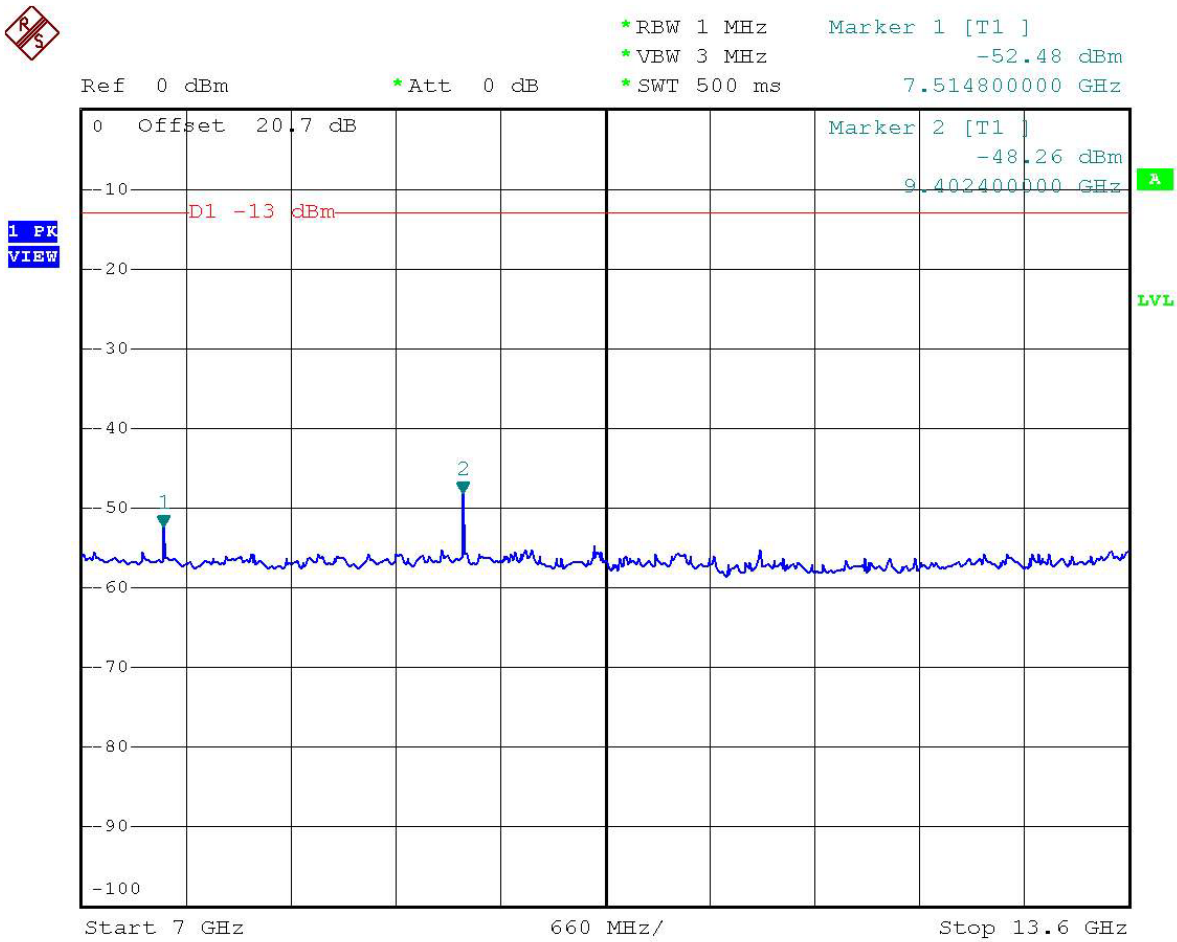
Date: 15.MAR.2005 22:17:37

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



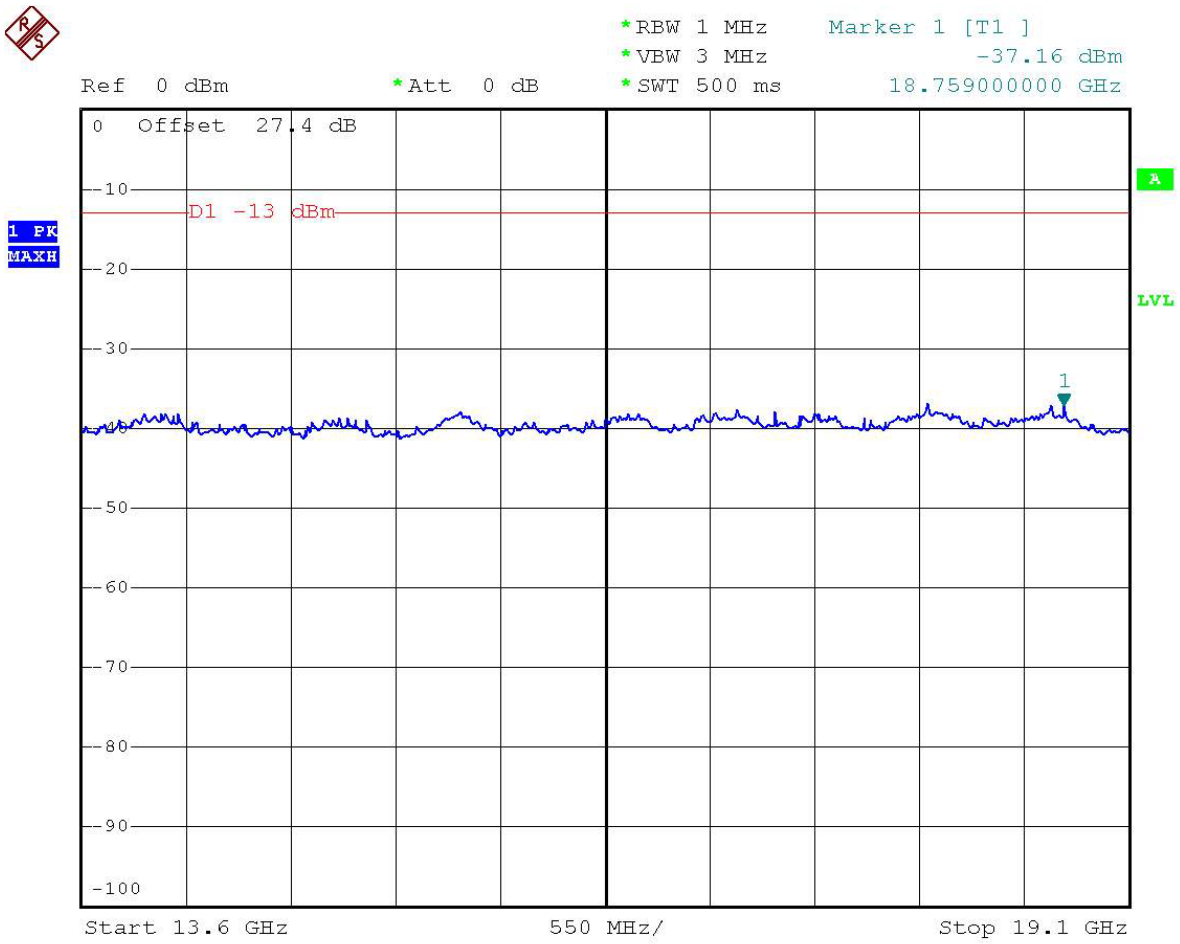
Date: 15.MAR.2005 22:20:03

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



Date: 15.MAR.2005 22:21:59

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



Date: 15.MAR.2005 22:23:34

4.6 Field Strength of Spurious Radiation

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

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 recored of output power at antenna port.
9. Repeat step 7 to step 8 for another polariztion.
10. Emission level (dBm) = output power + substituion Gain.

4.6.3 Test Setup Layout

As the setup in section 4.3.3.

4.6.4 Test Result

- Test Mode : PCS 1900 CH 661

PCS1900 Radiated Spurious EIRP							
H Polarization				V Polarization			
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)
60.780	-69.710	-13	-56.71	62.940	-56.850	-13	-43.85
134.490	-65.890	-13	-52.89	77.790	-62.530	-13	-49.53
272.730	-72.880	-13	-59.88	122.340	-71.430	-13	-58.43
427.400	-75.110	-13	-62.11	407.800	-74.670	-13	-61.67
435.800	-75.270	-13	-62.27	427.400	-72.870	-13	-59.87
911.800	-72.060	-13	-59.06	992.300	-69.780	-13	-56.78
3758.000	-44.700	-13	-31.70	2814.000	-52.400	-13	-39.40
5638.000	-44.550	-13	-31.55	3758.000	-44.750	-13	-31.75
9398.000	**-40.900**	**-13**	**-27.90**	5638.000	-51.210	-13	-38.21

4.6.5 Test Data

Horizontal Polarization

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	60.78	-69.71	-56.71	-13.00	-57.32	-12.39	0.00	0.00	Peak	---	---
2 @	134.49	-65.89	-52.89	-13.00	-53.25	-12.64	0.00	0.00	Peak	---	---
3	272.73	-72.88	-59.88	-13.00	-62.00	-10.88	0.00	0.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1	427.40	-75.11	-62.11	-13.00	-68.99	-6.11	0.00	0.00	Peak	---	---
2	435.80	-75.27	-62.27	-13.00	-69.27	-6.01	0.00	0.00	Peak	---	---
3	911.80	-72.06	-59.06	-13.00	-71.45	-0.61	0.00	0.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	1878.00	-54.24			-53.73	-0.51	0.00	0.00	Peak	---	---
2 @	1958.00	-37.93			-36.82	-1.11	0.00	0.00	Peak	---	---

Remark：

1. #1：MS TCH signal
2. #2：BS TCH signal

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	3758.00	-44.70	-31.70	-13.00	-52.62	7.92	0.00	0.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	5638.00	-44.55	-31.55	-13.00	-54.52	9.97	0.00	0.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	9398.00	-40.90	-27.90	-13.00	-59.12	18.22	0.00	0.00	Peak	---	---

Vertical Polarization

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	62.94	-56.85	-43.85	-13.00	-43.84	-13.00	0.00	0.00	Peak	---	---
2 @	77.79	-62.53	-49.53	-13.00	-51.62	-10.91	0.00	0.00	Peak	---	---
3	122.34	-71.43	-58.43	-13.00	-63.54	-7.89	0.00	0.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1	407.80	-74.67	-61.67	-13.00	-70.43	-4.24	0.00	0.00	Peak	---	---
2	427.40	-72.87	-59.87	-13.00	-68.87	-3.99	0.00	0.00	Peak	---	---
3 @	992.30	-69.78	-56.78	-13.00	-72.38	2.60	0.00	0.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	1878.00	-53.52			-53.12	-0.40	0.00	0.00	Peak	---	---
2 @	1958.00	-35.70			-35.10	-0.60	0.00	0.00	Peak	---	---
3 @	2814.00	-52.40	-39.40	-13.00	-55.56	3.16	0.00	0.00	Peak	---	---

Remark：

1. #1：MS TCH signal.
2. #2：BS TCH signal.

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	3758.00	-44.75	-31.75	-13.00	-51.38	6.64	0.00	0.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBm	dB	dBm	dBm	dB	dB	dB		cm	deg
1 @	5638.00	-51.21	-38.21	-13.00	-59.86	8.65	0.00	0.00	Peak	---	---

4.7 Frequency Stability (Temperature Variation)

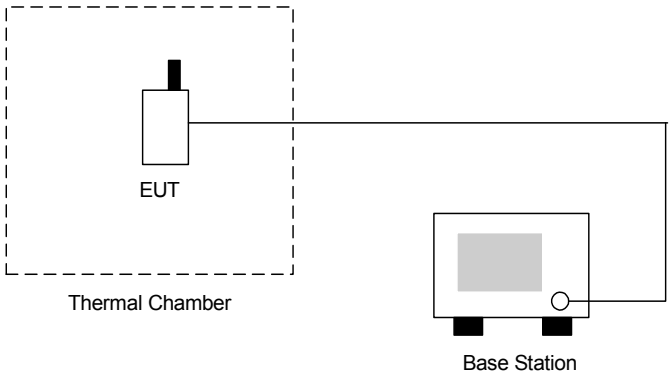
4.7.1 Measurement Instrument

As decribed 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 note 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 ws 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 : PCS 1900 CH661

Temperature(°C)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
-30	-122	-0.06	2.5	Passed
-20	-62	-0.03		
-10	-47	-0.02		
0	-24	-0.01		
10	-29	-0.02		
20	-27	-0.01		
30	-52	-0.03		
40	-32	-0.02		
50	-42	-0.02		

4.8 Frequency Stability (Voltage Variation)

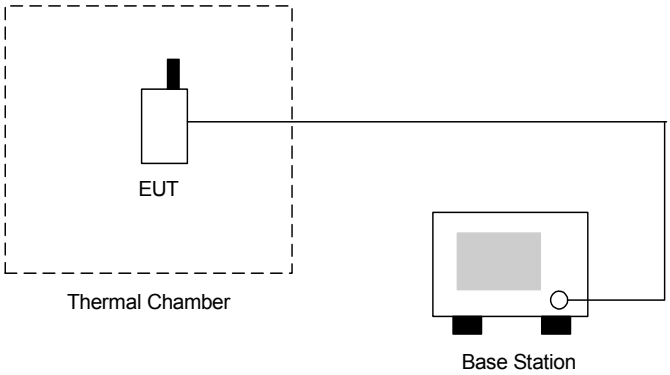
4.8.1 Measurement Instrument

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±5 °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 1900 CH661

Voltage(Volt)	Change (Hz)	Change (ppm)	Limit (ppm)	Result
3.7	-27	-0.01	2.5	Passed
BEP	17	0.01		
4.1	40	0.02		

Remark:
1. Normal Voltage=3.7V
2. Battery End Point (BEP)=3.1V

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	Jul. 27, 2004	Jul. 26, 2005	Radiation (03CH06-HY)
Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul,09,2004	Jul, 10,2005	Radiation (03CH06-HY)
Controller	CT	SC100	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 22, 2004	Nov. 21, 2005	Radiation (03CH06-HY)
Horn Antenna	Com-Power	AH118	071025	1G-18G	Feb. 22, 2005	Feb. 22, 2006	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Jun. 22, 2004	Jun. 22, 2005	Radiation (03CH06-HY)
PreAmplifier	Com-Power	PA-103	161055	1MHz - 1000MHz	Apr. 26, 2004	Apr. 26, 2005	Radiation (03CH06-HY)
HF Amplifier	MITEQ	AFS44	973248	0.1G - 26.5G	May 20, 2004	May 20, 2005	Radiation (03CH06-HY)
Amplifier	MITEQ	AMF-6F	997165	26G - 40G	Jun. 24, 2004	Jun. 24, 2005	Radiation (03CH06-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)
Base Station Emulator	Agilent	E5515C	GB43460754	Qual-band	Jan. 12, 2004	Jan. 12, 2006	Base Station
Radio Communication Tester	R&S	CMU200	105934	Qual-band	Aug. 24, 2004	Aug. 24, 2005	Base Station
Thermal Chamber	Ten Billion	TTH-D35P	N/A	N/A	NCR	NCR	EMS Chamber

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		$u(x_i)$	Ci	$Ci*u(x_i)$
	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 Γ1= 0.197 Antenna VSWR Γ2= 0.194 Uncertainty=20log(1-Γ1*Γ2*Γ3)	+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=2Ue(y)	**4.72**				

END OF TEST REPORT