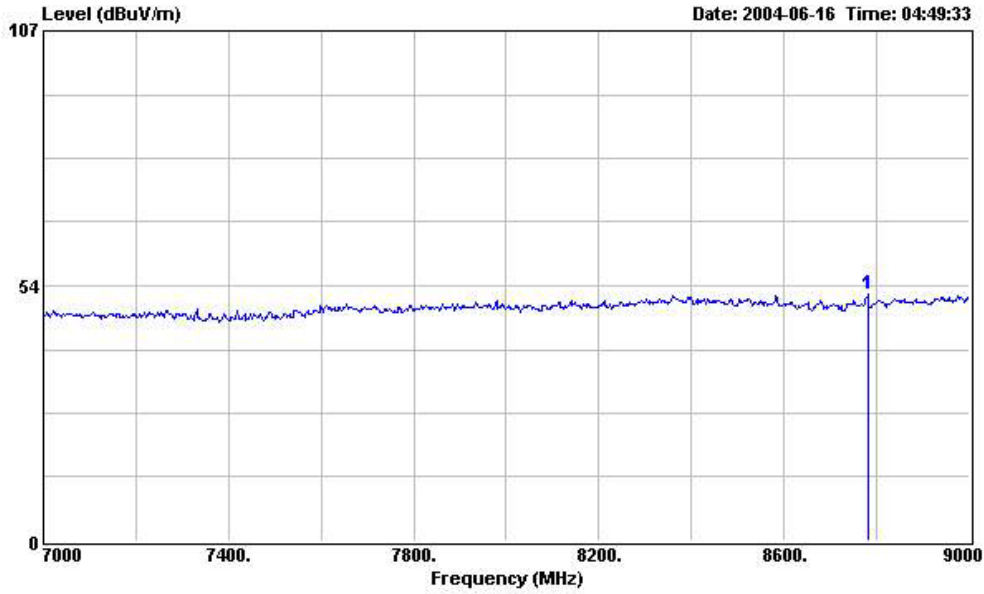


Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 HORIZONTAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	5638.000	48.66	-----	-----	50.01	34.46	2.53	38.34		---	---

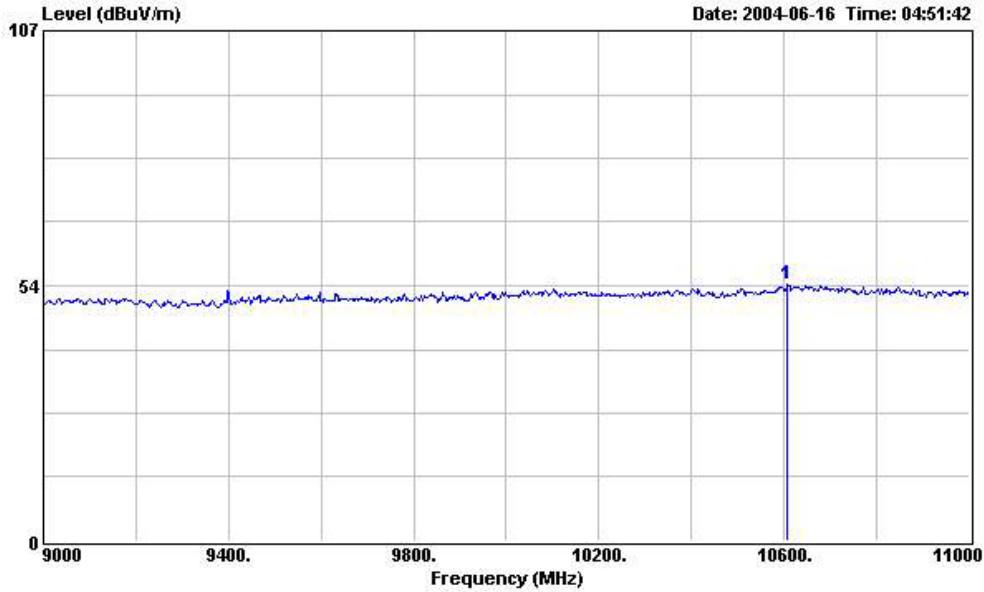
**FCC TEST REPORT**

Report No. : F461002



Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 HORIZONTAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

1	8780.000	51.61	-----	-----	46.60	38.07	3.44	36.50	---	---
1	8780.000	51.61	-----	-----	46.60	38.07	3.44	36.50	---	---
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg

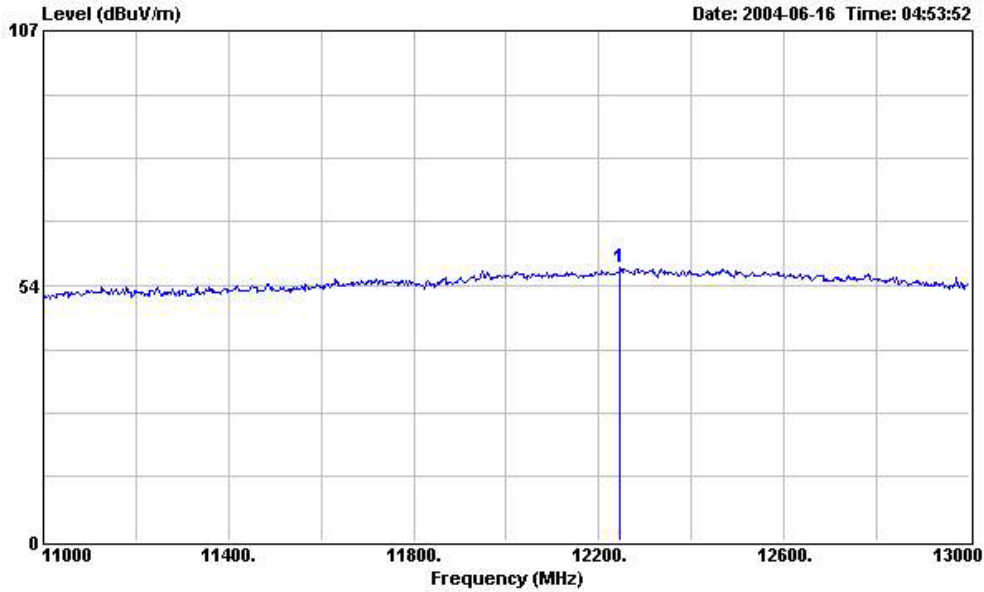


Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 HORIZONTAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	10606.000	53.71	-----	-----	44.90	39.43	3.98	34.60		---	---

**FCC TEST REPORT**

Report No. : F461002



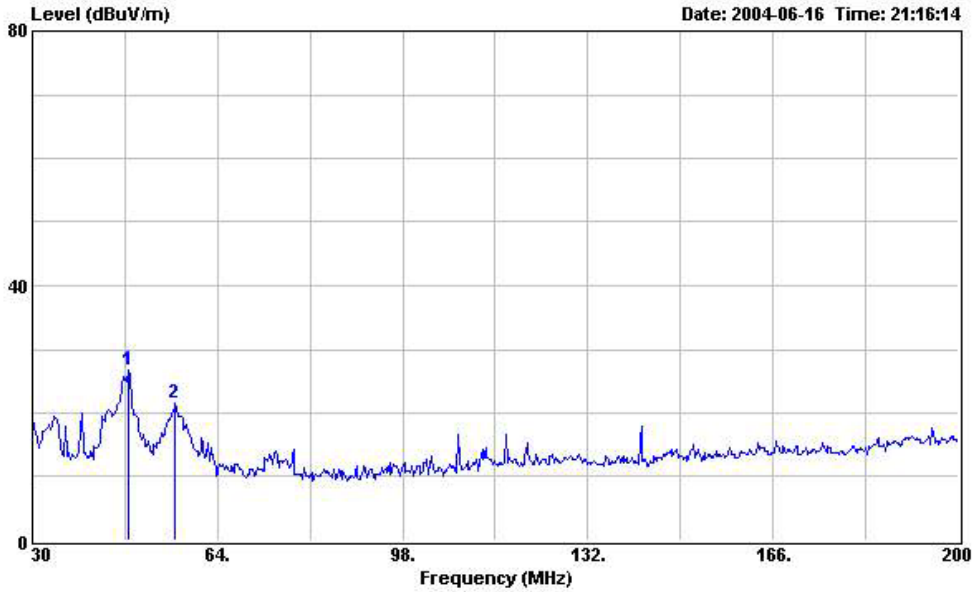
Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 HORIZONTAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	12246.000	57.32	-----	-----	46.32	39.09	4.59	32.68		---	---

**FCC TEST REPORT**

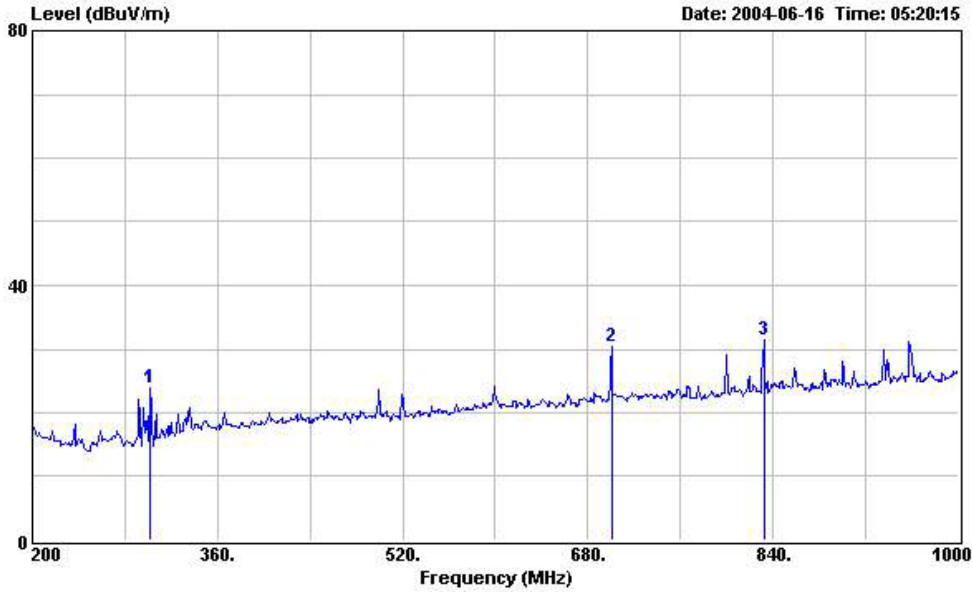
Report No. : F461002

GSM1900, Vertical Polarization



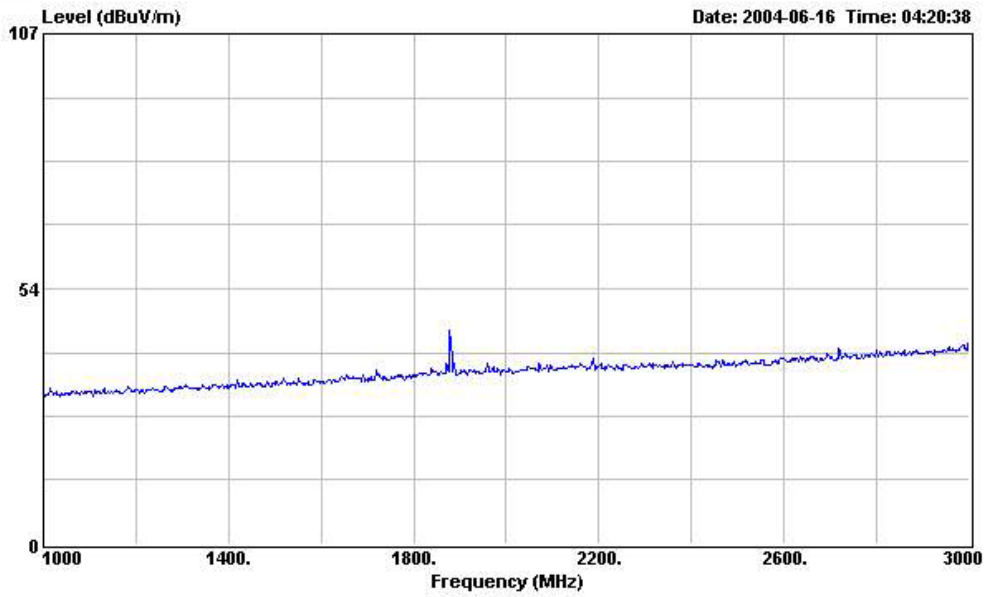
Site : 03CH03-HY  
 Condition : 3m BIC-9124--301 VERTICAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	47.510	26.72	-----	-----	43.27	10.28	1.17	28.00		---	---
2	56.180	21.52	-----	-----	37.95	10.29	1.27	27.99		---	---



Site : 03CH03-HY  
 Condition : 3m LOG-9111-221 VERTICAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

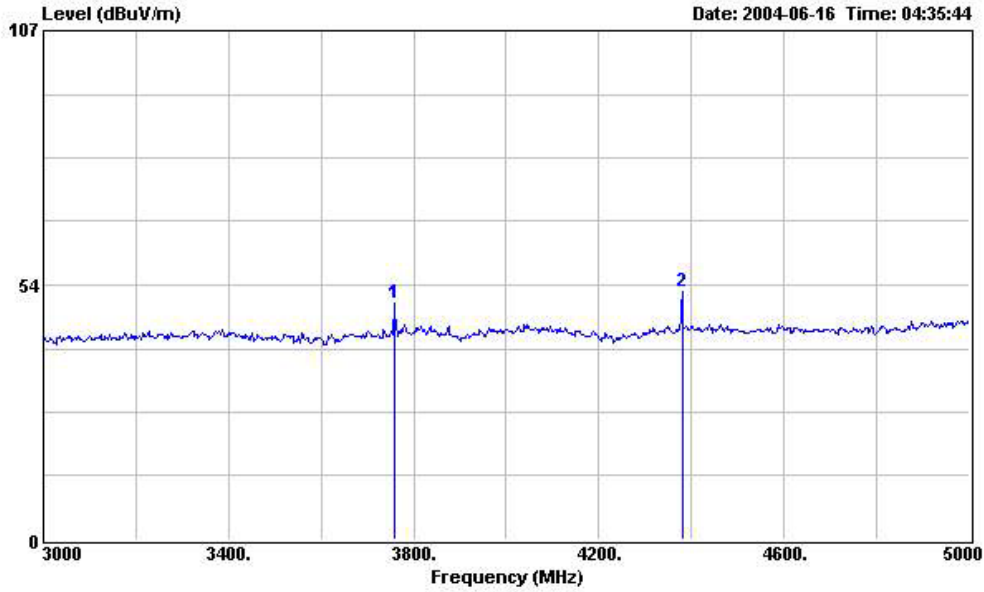
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	301.600	23.90	-----	-----	34.82	13.30	3.09	27.31		---	---
2	700.800	30.31	-----	-----	34.55	19.80	4.66	28.70		---	---
3	832.000	31.37	-----	-----	34.10	20.69	5.22	28.64		---	---



Site : 03CH03-HY  
Condition : 3m HORN-ANT-6821 VERTICAL  
EUT : Tri Band 900/1800/1900 Handset  
Model : M100  
Power : 120Vac/60Hz  
Memo : PCS 1900MHz CH661

**FCC TEST REPORT**

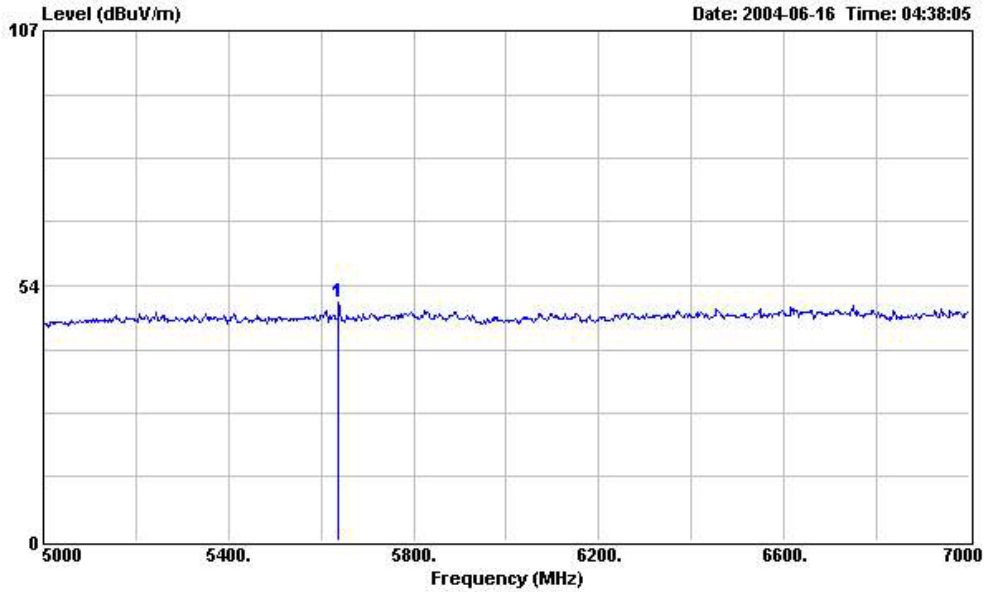
Report No. : F461002



Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 VERTICAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	3758.000	49.70	-----	-----	53.64	32.06	1.82	37.82		---	---
2	4380.000	51.95	-----	-----	55.19	32.54	2.45	38.23		---	---



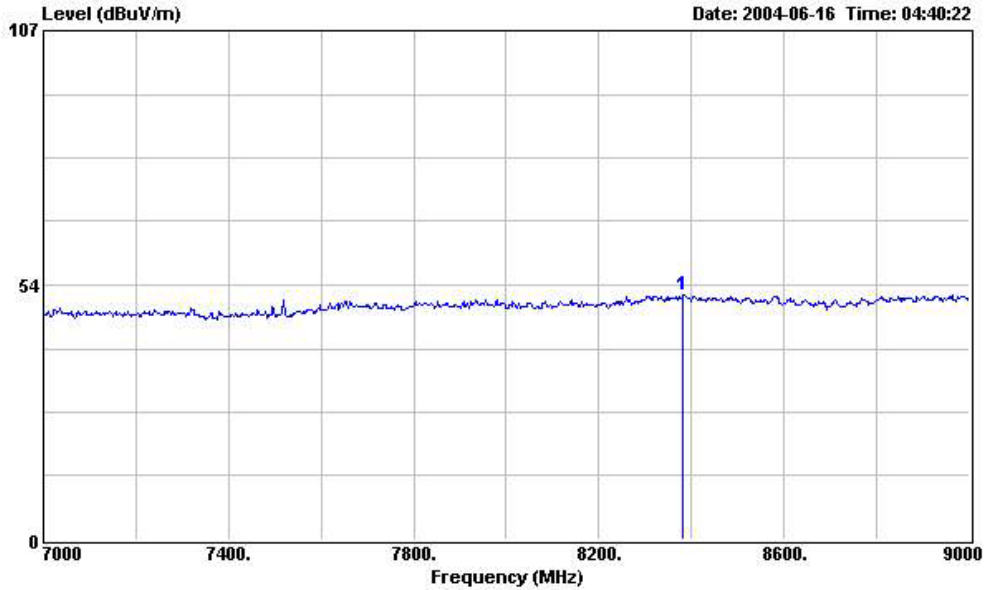


Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 VERTICAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	5638.000	50.18	-----	-----	51.53	34.46	2.53	38.34		---	---

**FCC TEST REPORT**

Report No. : F461002

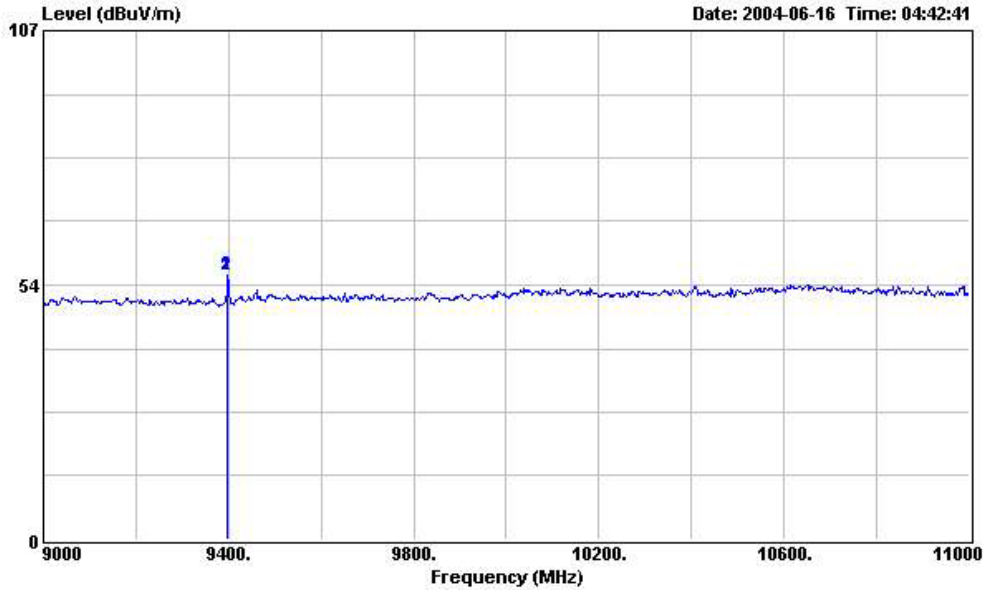


Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 VERTICAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	8382.000	51.45	-----	-----	47.26	37.70	3.37	36.88		---	---

**FCC TEST REPORT**

Report No. : F461002

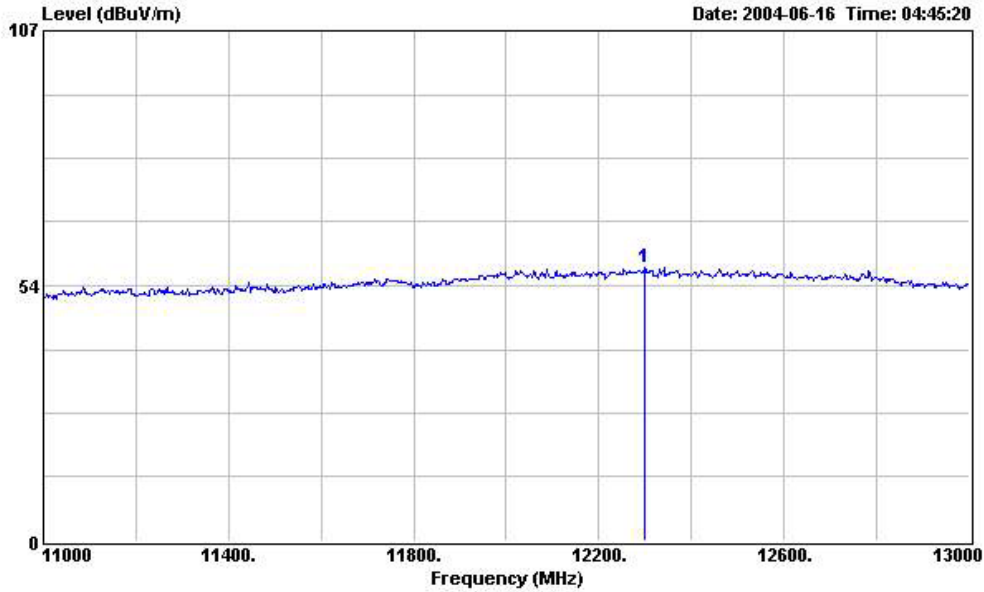


Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 VERTICAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	9398.000	55.55	-----	-----	49.15	38.20	3.75	35.55		---	---
2	9398.000	55.55	-----	-----	49.15	38.20	3.75	35.55		---	---

**FCC TEST REPORT**

Report No. : F461002



Site : 03CH03-HY  
 Condition : 3m HORN-ANT-6821 VERTICAL  
 EUT : Tri Band 900/1800/1900 Handset  
 Model : M100  
 Power : 120Vac/60Hz  
 Memo : PCS 1900MHz CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	12300.000	57.38	-----	-----	46.19	39.05	4.68	32.54		---	---

**Name of Test:** Frequency Stability (Temperature Variation)

**Specification:** 47 CFR 2.1055(a)(1)

**Test Conditions:** As Indicated

**Test Equipment:** As per previous page

#### **Measurement Procedure**

1. The EUT and test equipment were set up as shown on the following page.
2. With all power removed, the temperature was decreased to  $-30^{\circ}\text{C}$  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  $10^{\circ}\text{C}$  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. Measurement Results: Attached

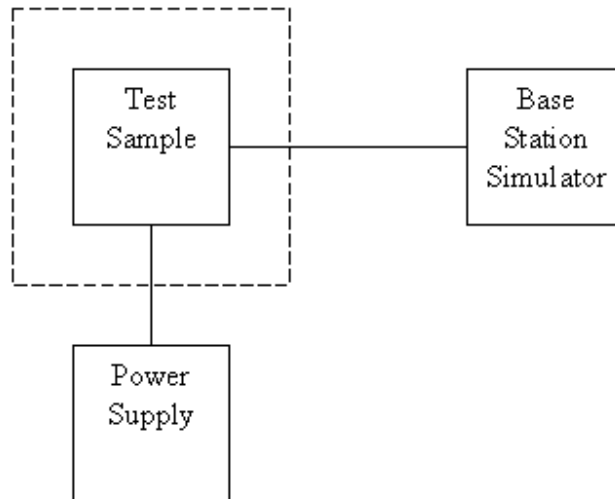


Tested By:

Tim Kao

**Transmitter Test Set-Up**

Frequency Stability: Temperature Variation  
Frequency Stability: Voltage Variation



Asset	Model Name	S/N
Temperature & Humidity Controller	P-9000	612
AC/DC Power Source	HPA-500W	HPA0100024
Base Station Simulator	CMU200	102278
Base Station Simulator	E5515C	GB43460754

**Name of Test:** Frequency Stability (Temperature Variation)

GSM 1900 (Channel 661)

Temperature(°C)	Change, Hz	Change, ppm
-30	-40	-0.02
-20	-38	-0.02
-10	-37	-0.02
0	-37	-0.02
10	-35	-0.02
20	-34	-0.02
30	-35	-0.02
40	-32	-0.02
50	-30	-0.02

**Name of Test:** Frequency Stability (Voltage Variation)

**Specification:** 47 CFR 2.1055 (b)(1)

**Test Equipment:** As per previous page

**Measurement Procedure**

1. The EUT was placed in a temperature chamber at 25±5°C and connected as for "Frequency Stability - Temperature Variation" test.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

**Results:** Frequency Stability (Voltage Variation)

GSM1900 (Channel 661)

Nominal Value (Voltage) = 3.6

Battery End Point (Voltage) = 3.25

Voltage(Volt)	Change, Hz	Change, ppm
3.7	-34	-0.02
3.3	-31	-0.02
4.3	-34	-0.02

Limit: Must remain within authorized frequency block.

*Tim Kao*

Tested By:

Tim Kao



**Antenna Factor & Cable Loss**

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	15.35	4.50	1000	24.10	3.92
35	13.63	1.13	2000	27.40	5.66
40	11.11	1.18	3000	30.00	7.20
45	10.59	1.26	4000	32.60	9.36
50	6.47	1.31	5000	33.40	9.16
55	5.83	1.34	6000	34.20	10.70
60	5.18	1.43	7000	35.30	12.16
65	4.81	1.52	8000	36.90	13.12
70	4.43	1.56	9000	38.10	13.81
75	5.10	1.57	10000	39.00	14.83
80	5.91	1.60	11000	38.60	15.83
85	7.33	1.66	12000	39.50	17.11
90	8.74	1.75	13000	39.30	17.62
95	9.05	1.76	14000	41.60	18.37
100	9.36	1.83	15000	40.60	19.10
110	9.65	1.86	16000	37.20	19.72
120	9.97	1.92	17000	40.20	21.98
130	10.51	2.00	18000	48.90	21.22
140	10.32	2.11	19000	37.60	23.90
150	9.42	2.18	20000	37.30	24.07
160	8.09	2.22	21000	37.00	25.49
170	7.43	2.26	22000	38.00	24.92
180	7.60	2.31	23000	38.70	25.60
190	7.43	2.37	24000	38.60	25.70
200	7.26	2.43	25000	24.10	3.92
220	9.11	2.56	14000	27.40	5.66
240	10.88	2.70	15000	30.00	7.20
260	11.75	2.83	16000	32.60	9.36
280	11.55	2.93	17000	33.40	9.16
300	11.36	3.03	18000	34.20	10.70
320	12.03	3.13	19000	35.30	12.16
340	12.69	3.23	20000	36.90	13.12
360	13.33	3.32	21000	38.10	13.81
380	14.00	3.41	22000	39.00	14.83
400	14.63	3.48	23000	38.60	15.83
450	15.33	3.71	24000	39.50	17.11
500	16.03	3.85	25000	39.30	17.62
550	16.65	4.03			
600	17.29	4.32			
650	17.64	4.51			
700	18.00	4.54			
750	18.39	4.90			
800	18.79	5.04			
850	19.10	5.04			
900	19.42	5.20			
950	19.58	5.28			
1000	19.75	5.58			

**List of Measuring Equipments**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2003	Radiation (03CH03-HY)
Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 23, 2003	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 2003	Radiation (03CH03-HY)
Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 24, 2003	Radiation (03CH03-HY)
Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 24, 2003	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6821	1GHz – 18GHz	Sep. 12, 2003	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 02, 2003	Radiation (03CH03-HY)
RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 05, 2003	Radiation (03CH03-HY)

- ※ Calibration Interval of instruments listed above is one year, except for Horn Antenna, BBHA9170.  
 ※ Calibration Interval of Horn Antenna, BBHA9170, is three years.

**Uncertainty of Test Site**

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz) (03CH03)

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 Receiver VSWR $\Gamma_1 = 0.20$ Antenna VSWR $\Gamma_2 = 0.23$ Uncertainty = $20\log(1-\Gamma_1*\Gamma_2)$	+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>				

$U = \sqrt{\{(1/2)^2 + (0.3/2)^2 + (2^2 + 0.5^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.2$  for 10m test distance

$U = \sqrt{\{(1/2)^2 + (0.3/2)^2 + (2^2 + 3^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.7$  for 3m test distance

END OF TEST REPORT