FCC TEST REPORT

for

47 CFR Part 22H and 24E

Equipment : **GSM850/PCS1900 Dual Band Mobile Phone**

Model No. : **2208**

FCC ID : **PJO2208**

Filing Type : **Certification**

Applicant : **Arima Communication Corp.**
No. 16, Lane 658, Ying Tao Road, Yingko, Taipei Hsien, Taiwan

SPORTON International Inc.

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

The applicant has been cautioned as to the following:

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Table of Contents

Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report**

b) Laboratory: Sporton International Inc.
No.52, Hwa-Ya 1st RD., Hwa Ya Technology Park, Kwei-Shan Hsiang,
TaoYuan Hsien, Taiwan, R.O.C.

c) Report Number: FG491608

d) Client: **Arima Communication Corp.**
No. 16, Lane 658, Ying Tao Road, Yingko, Taipei Hsien, Taiwan

e) Identification: Model Name: 2208
FCC ID : PJO2208
Description: GSM/GPRS 850/1900 Radio

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: Sep. 24, 2004
EUT Received: Sep. 16, 2004

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with Sporton internal quality manual.

m) Supervised by: Hendry Yang 9/24/2004
Hendry Yang

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Accessories Used During Testing:

Type	**Model**
EUT	2208
RJ-11	N/A
RJ-232	N/A
Base Station Simulator	CMU200
Base Station Simulator	E5515C

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and
22H, 24E, Confidentiality

Sub-Part 2.1033

(c)(1): **Name and Address of Applicant**:

Arima Communication Corp.
No. 16, Lane 658, Ying Tao Road, Yingko, Taipei
Hsien, Taiwan

Manufacturer

As above

(c)(2): **FCC ID**: PJO2208

Model Number: 2208

(c)(3): **Instruction Manual(s)**:

Please See Attached Exhibits

(c)(4): **Type of Emission**: 300KGXW

(c)(5): **FREQUENCY RANGE, MHz**: 824.2 to 848.8 GSM/GPRS 850
1850.2 to 1909.8 GSM/GPRS 1900

(c)(6): **Power Rating, Watts**:

GSM 850:	1.698	(conducted)	/	0.796	(ERP)
PCS 1900:	1.000	(conducted)	/	0.958	(EIRP)

Switchable		Variable	N/A
	x		

(c)(7): **Maximum Power Rating, Watts**: 2 (GSM 850)
1 (PCS 1900)

Subpart 2.1033 (continued)
(c)(8): Voltages & Currents in All Elements in Final RF Stage, Including Final Transistor or Solid State Device:

Collector Current, A =	0.5
Collector Voltage, Vdc =	3.7
Supply Voltage, Vdc =	3.7

(c)(9): **Tune-Up Procedure**:

Please See Attached Exhibits

(c)(10): **Circuit Diagram/Circuit Description**:

Please See Attached Exhibits

(c)(11): **Label Information**:

Please See Attached Exhibits

(c)(12): **Photographs**:

Please See Attached Exhibits

(c)(13): **Digital Modulation Description**:

___ Attached Exhibits
_x_ N/A

(c)(14): **Test and Measurement Data**:

Follows

Testimonial
and
Statement of Certification

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certified by: Joe Yang Sep. 24, 2004

Certificate of NVLAP Accreditation

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC 17025:1999
ISO 9002:1994

Certificate of Accreditation

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

SPORTON INTERNATIONAL, INC.
TAIPEI HSIEN 221
TAIWAN

is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria set forth in NIST Handbook 150:2001, all requirements of ISO/IEC 17025:1999, and relevant requirements of ISO 9002:1994. Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

December 31, 2004
Effective through

For the National Institute of Standards and Technology
NVLAP Lab Code: 200079-0

NVLAP-01C (06-01)

Sub-part
2.1033(c)(14): **Test and Measurement Data**

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

	22 – Public Mobile Services
x	22 Subpart H - Cellular Radiotelephone Service
	22.901(d) - Alternative technologies and auxiliary services
x	24 – Personal Communications Services

General Information

Product Feature & Specification	
DUT Type	GSM850/PCS1900 Dual Band Mobile Phone
Model Name	2208
Tx Frequency	GSM 850: 824 MHz~849 MHz GSM 1900: 1850 MHz~1910 MHz
Rx Frequency	GSM 850: 869 MHz~894 MHz GSM 1900: 1930 MHz~1990 MHz
Channel Spacing	200 kHz
Antenna Type	Fixed Internal
Maximum Output Power to Antenna	GSM850: 32.3 dBm GSM1900: 30 dBm
Type of Modulation	GMSK
DUT Stage	Identical Prototype
Application Type	Certification

Standard Test Conditions

and

Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with TIA603, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

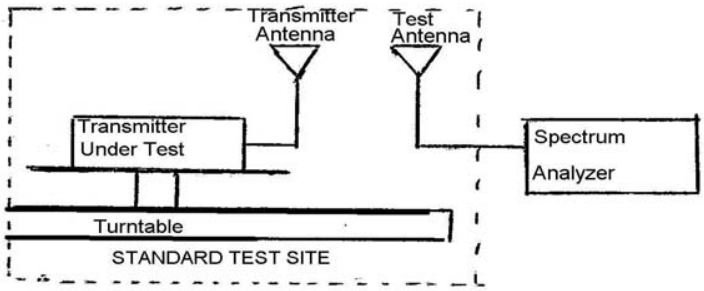
Name of Test: EIRP Carrier Power (Radiated)

Specification: TIA/EIA 603A (Substitution Method)

Definition: The average radiated power of device is the equivalent power required, when delivered to a substitution antenna, to produce at a distant point the same average received power as produced by the licensed device.

Method Of Measurement:

a) Connect the equipment as illustrated. Place the transmitter to be tested on the turntable in the standard test site.



b) Raise and lower the test antenna from 1m to 4m and rotate turntable from 0° to 360°. Record the highest received signal showed in spectrum analyzer as Rt . Calculate electric field strength in receive antenna as Et.

Et = Rt + AF

AF (dB/m): Receive Antenna Factor

c) Replace the transmitter under test with a substitution antenna. The center of the antenna should be at the same location as the transmitter under test. Connect the antenna to a signal generator with a known output power level Ps. Raise and lower the test antenna like in step b) and record the highest received signal showed in spectrum analyzer as R_S. Calculate electric field strength in receive antenna as Es.

Es = Rs + AF

AF (dB/m): Receive Antenna Factor

d) Calculate radiated power as following:

EIRP = Ps + Et – Es + Gs

Ps (dBm): Input Power to Substitution Antenna
Gs (dBi) : Substitution Antenna Gain

Results Attached

Tested By: Tim Kao

Test Results For: ERP/EIRP Carrier Power (Radiated)

Conducted Power

GSM 850

Bands	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
GSM 850	128	824.2 (Low)	32.0	1.585
	189	836.4 (Mid)	32.2	1.660
	251	848.8 (High)	32.3	1.698

PCS 1900

Bands	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)
PCS 1900	512	1850.2 (Low)	30.0	1.000
	661	1880.0 (Mid)	29.6	0.912
	810	1909.8 (High)	28.9	0.776

ERP/EIRP

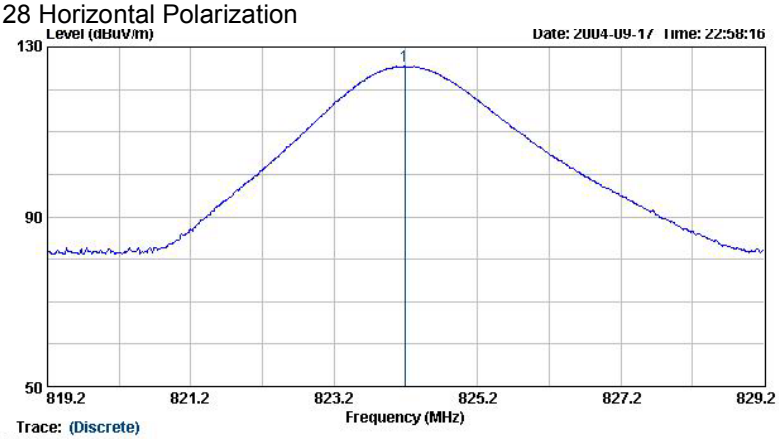
GSM 850 ERP

Freq MHz	Pol	Substitution Antenna Input Power (dBm)	Substitution Antenna Gain (dBd)	Et (dBuV/m)	Es (dBuV/m)	Et - Es (dB)	Radiated Power (dBm)	Radiated Power (Watts)
824.19	H	-2.49	-1.62	125.57	93.63	31.94	27.84	0.608
836.49	H	-2.49	-1.54	126.89	93.86	33.03	29.01	0.796
848.87	H	-2.48	-1.46	124.70	94.09	30.61	26.67	0.465
824.17	V	-2.49	-1.62	122.87	93.63	29.24	25.14	0.327
836.32	V	-2.49	-1.54	125.51	93.85	31.66	27.63	0.580
848.74	V	-2.48	-1.46	125.12	94.09	31.03	27.09	0.512

PCS 1900 EIRP

Freq MHz	Pol	Substitution Antenna Input Power (dBm)	Substitution Antenna Gain (dBi)	Et (dBuV/m)	Es (dBuV/m)	Et - Es (dB)	Radiated Power (dBm)	Radiated Power (Watts)
1850.17	H	-3.76	6.64	121.60	98.65	22.95	25.83	0.383
1880.02	H	-3.78	6.65	122.64	98.59	24.05	26.92	0.492
1909.79	H	-3.81	6.66	123.07	98.52	24.55	27.41	0.551
1850.00	V	-3.76	6.64	124.27	98.66	25.62	28.50	0.708
1880.02	V	-3.78	6.65	125.53	98.59	26.94	29.81	0.958
1909.79	V	-3.81	6.66	125.22	98.52	26.70	29.56	0.903

GSM 850 CH128 Horizontal Polarization

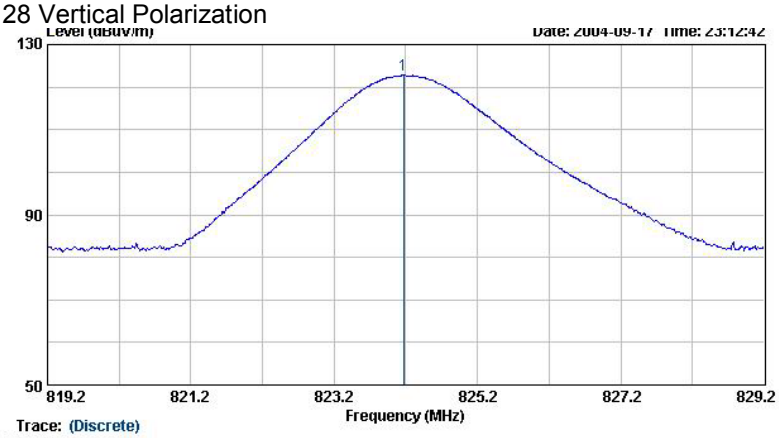


Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m BI LOG 2004 0629 HORIZONTAL 114cm 106deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : GSM850 Link mode;CH128

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	824.19	125.57	------	------	102.31	20.30	0.00	2.96	114	106

GSM 850 CH128 Vertical Polarization

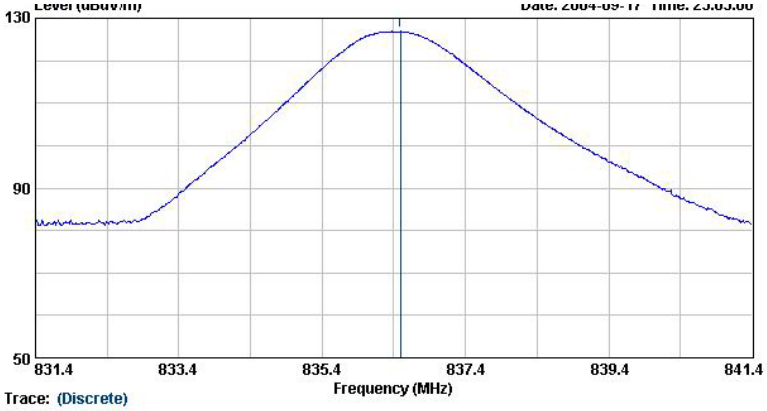


Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m BI LOG 2004 0629 VERTICAL 131cm 144deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : GSM850 Link mode;CH128

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	824.17	122.87	------	------	99.61	20.30	0.00	2.96	131	144

GSM 850 CH189 Horizontal Polarization

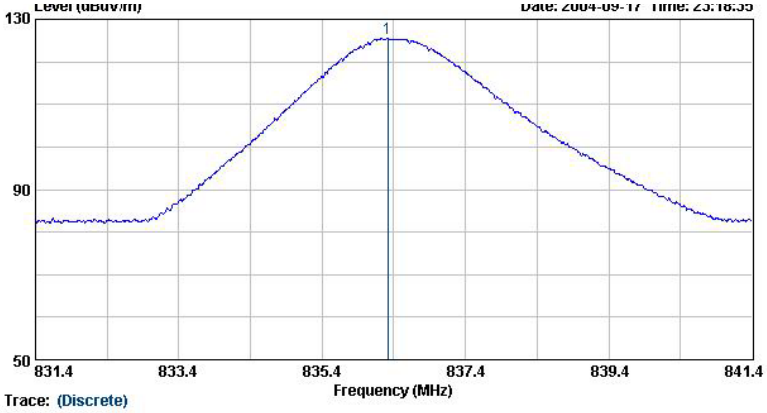


Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m BI LOG 2004 0629 HORIZONTAL 0cm 0deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : GSM850 Link mode;CH189

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	836.49	126.89	------	------	103.55	20.35	0.00	3.00	0	0

GSM 850 CH189 Vertical Polarization



Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m BI LOG 2004 0629 VERTICAL 126cm 145deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : GSM850 Link mode;CH189

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	836.32	125.51	------	------	102.17	20.35	0.00	3.00	126	145

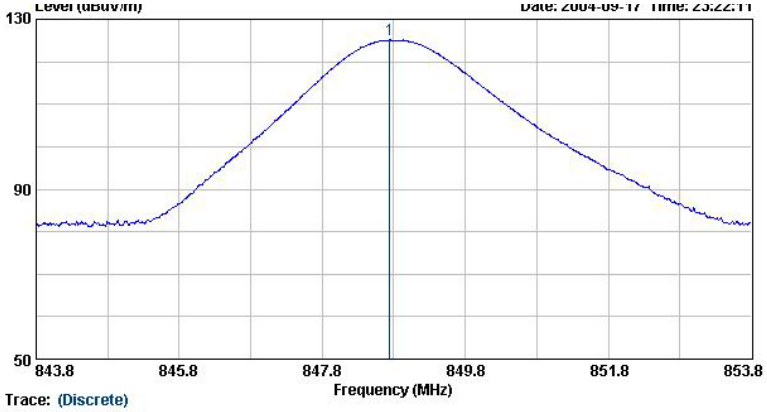
GSM 850 CH251 Horizontal Polarization

Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m BI LOG 2004 0629 HORIZONTAL 114cm 100deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : GSM850 Link mode;CH251

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	848.87	124.70	------	------	101.26	20.40	0.00	3.04	114	100

GSM 850 CH251 Vertical Polarization



Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m BI LOG 2004 0629 VERTICAL 130cm 205deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : GSM850 Link mode;CH251

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	848.74	125.12	------	------	101.69	20.40	0.00	3.04	130	205

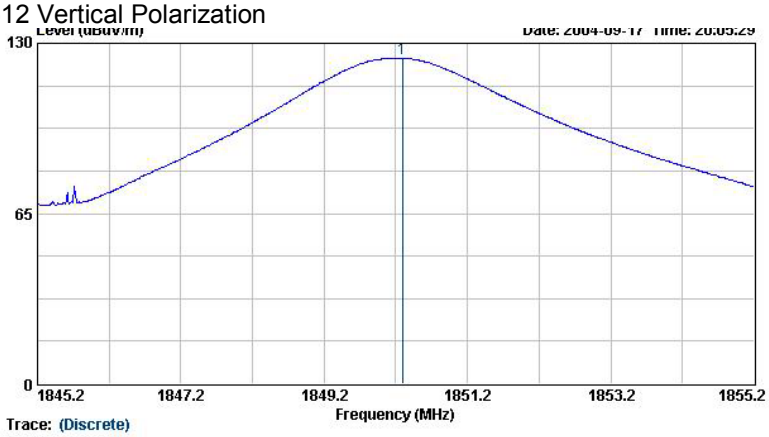
PCS 1900 CH512 Horizontal Polarization

Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m HF-HORN AH-118 HORIZONTAL 114cm 269deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : PCS Link mode;CH512

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	1850.17	121.60	------	------	91.44	27.25	0.00	2.91	114	269

PCS 1900 CH512 Vertical Polarization

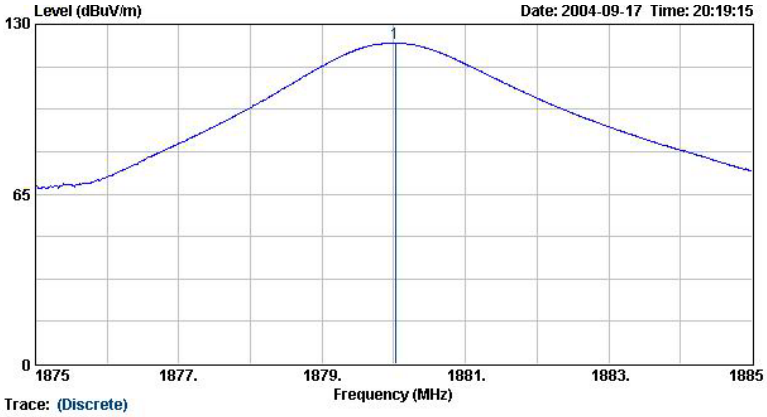


Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m HF-HORN AH-118 VERTICAL 114cm 242deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : PCS Link mode;CH512

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	1850.29	124.27	------	------	94.11	27.25	0.00	2.91	114	242

PCS 1900 CH661 Horizontal Polarization



Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m HF-HORN AH-118 HORIZONTAL 0cm 0deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : PCS Link mode;CH661

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	1880.02	122.64	------	------	92.26	27.42	0.00	2.95	0	0

PCS 1900 CH661 Vertical Polarization

Trace: (Discrete)

Site : 03CH06-HY
Condition : 3m HF-HORN AH-118 VERTICAL 114cm 171deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : PCS Link mode;CH661

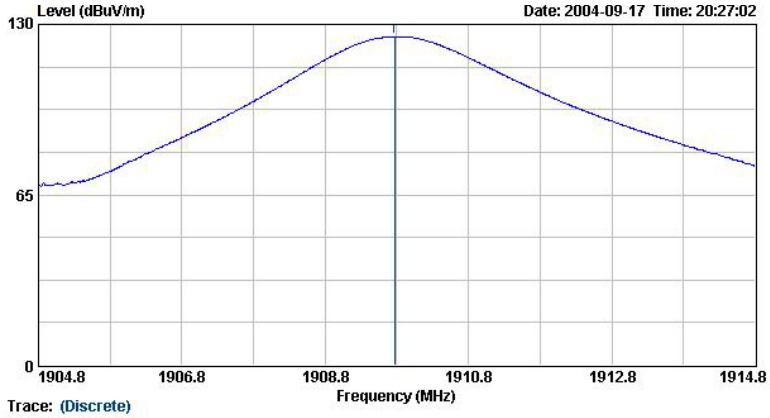
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	1880.04	125.53	------	------	95.15	27.42	0.00	2.95	114	171

PCS 1900 CH810 Horizontal Polarization

Site : 03CH06-HY
Condition : 3m HF-HORN AH-118 HORIZONTAL 114cm 270deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : PCS Link mode;CH810

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	1909.79	123.07	------	------	92.51	27.58	0.00	2.98	114	270

PCS 1900 CH810 Vertical Polarization



Site : 03CH06-HY
Condition : 3m HF-HORN AH-118 VERTICAL 114cm 172deg
EUT : GSM Dual Band Handset
Power : 120Vac/60Hz
Model : 2208
Memo : PCS Link mode;CH810

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	1909.77	125.22	------	------	94.66	27.58	0.00	2.98	114	172

Name of Test: Emission Masks (Occupied Bandwidth)

Specification: 47 CFR 2.1049(c)(1), 22

Test Equipment: As per attached page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page with the Spectrum Analyzer connected.

2. For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.

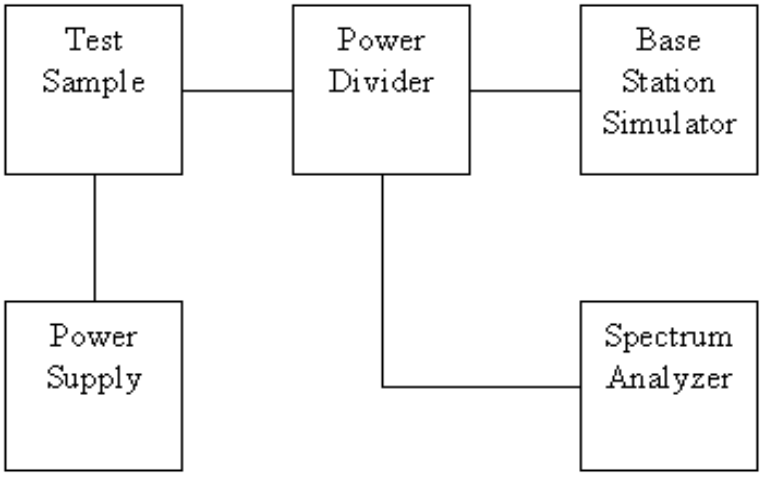
3. The occupied bandwidth was measured with the Spetrum Analyzer controls set as shown on the test results.

4. Measurement Results: Attached

Tested By: Tim Kao

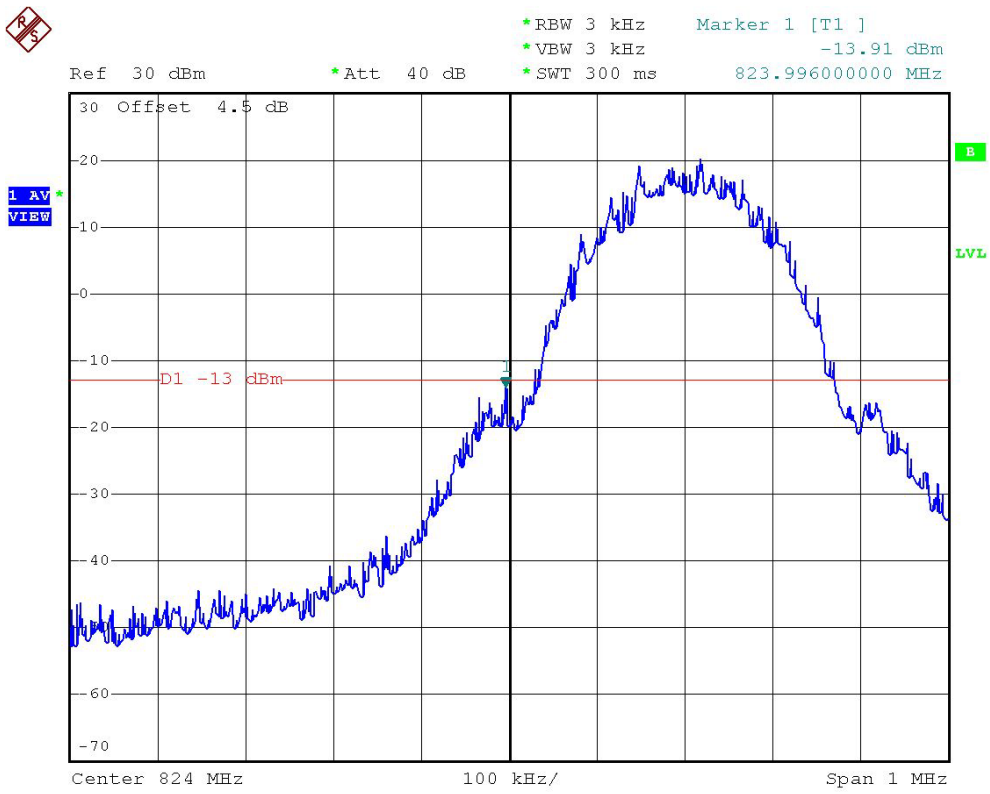
Transmitter Spurious Emission

Test A. Occupied Bandwidth (In-Band Spurious)
Test B. Out-of-Band Spurious



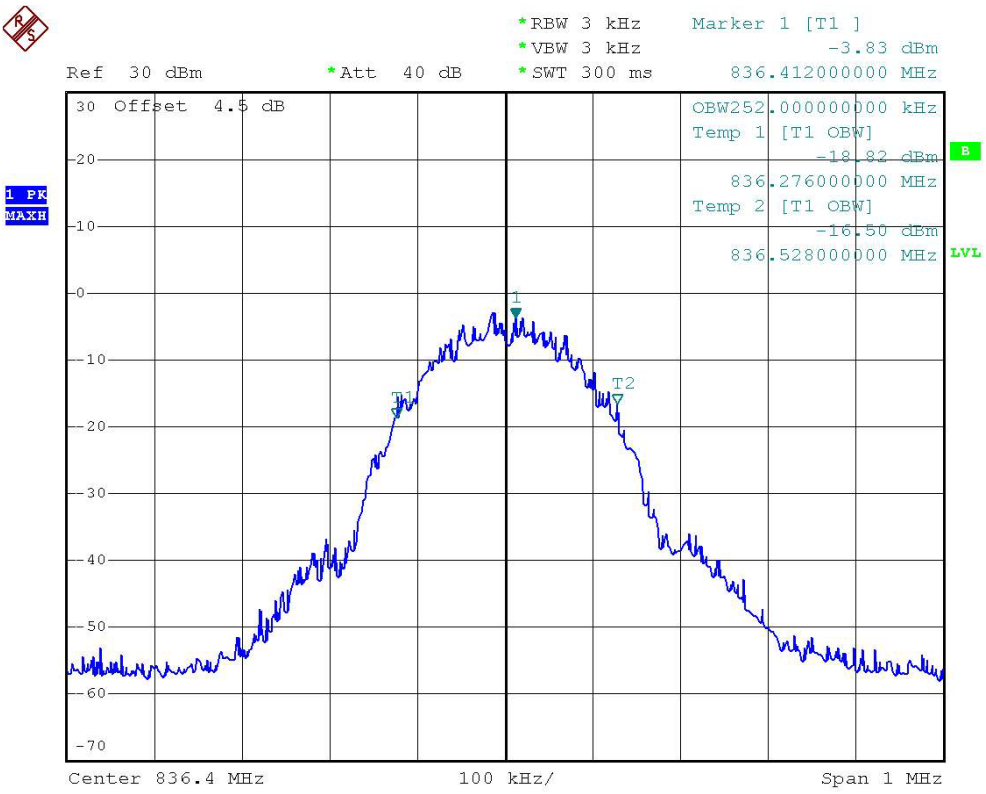
Asset	Model Name	S/N
Base Station Simulator	CMU200	102278
Base Station Simulator	E5515C	GB43460754
Spectrum Analyzer	FSP30	838858/014
AC/DC Power Source	HPA-500W	HPA0100024

Name of Test: Emission Masks (Occupied Bandwidth)
State 2:High Power



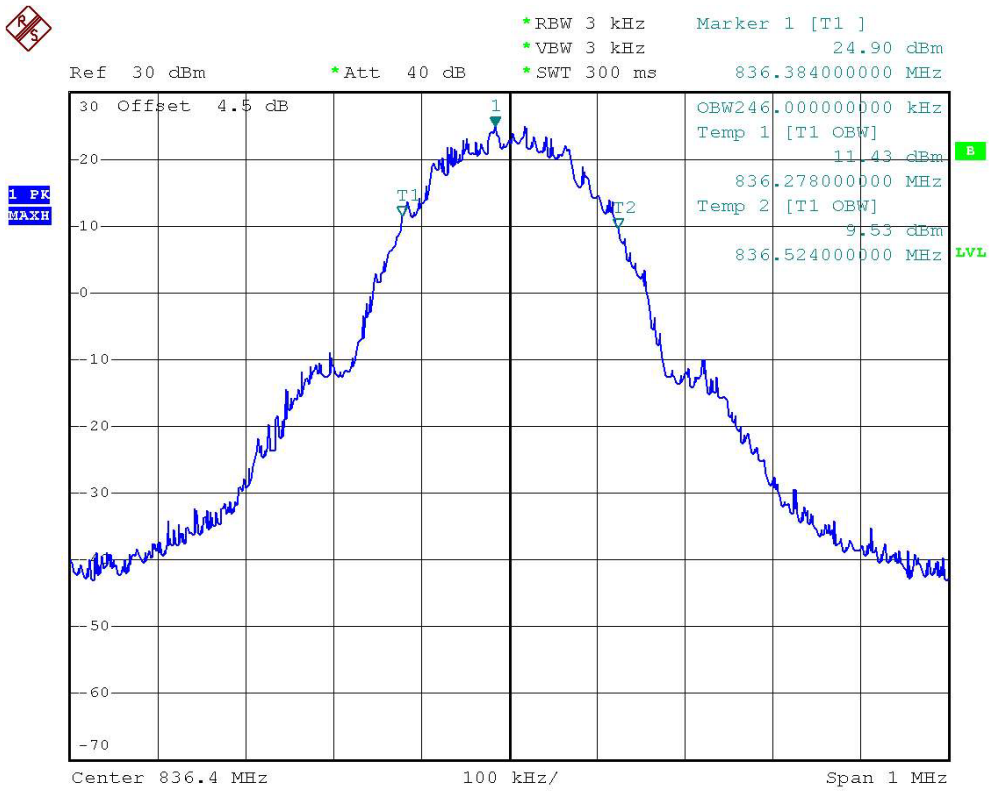
Power: HIGH
Modulation: GSM 850
LOWER BAND EDGE

Name of Test: Emission Masks (Occupied Bandwidth)
State 1:Low Power



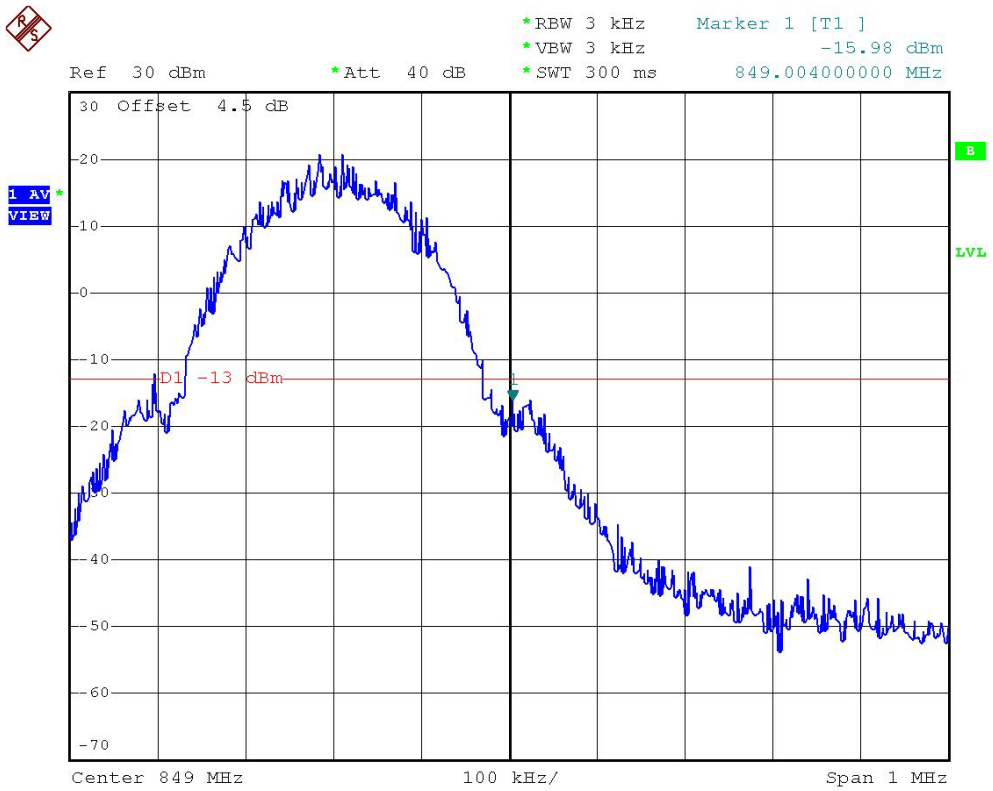
Power: LOW
Modulation: GSM 850
99% BANDWIDTH

Name of Test: Emission Masks (Occupied Bandwidth)
State 2:High Power



Power: HIGH
Modulation: GSM 850
99% BANDWIDTH

Name of Test: Emission Masks (Occupied Bandwidth)
State 2:High Power



Power: HIGH
Modulation: GSM 850
UPPER BAND EDGE

Name of Test: Transmitter Conducted Measurements

Specification: 47 CFR 2.1051: Unwanted (spurious) Emissions
2.1049(c), 24.238(b): Occupied Bandwidth
24: Emissions at Band Edges

Test Equipment: As per attached page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page with the Spectrum Analyzer connected.

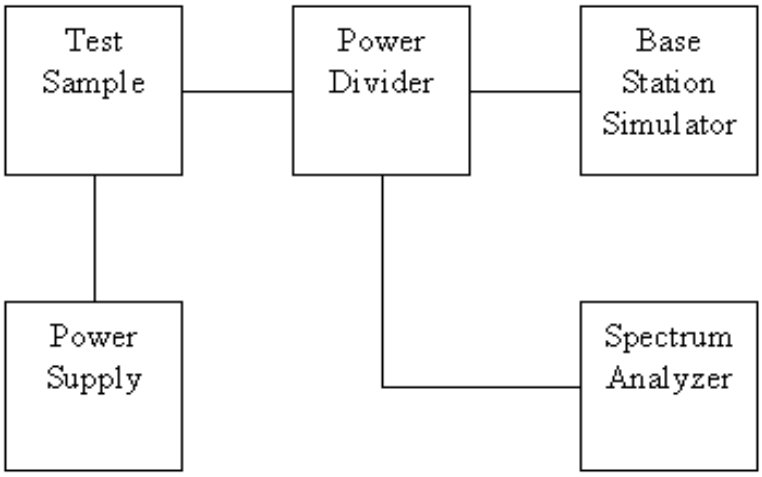
2. The low and high channels for all RF powers within the Transmitting frequency band were measured.

3. Measurement Results: Attached

Tested By: Tim Kao

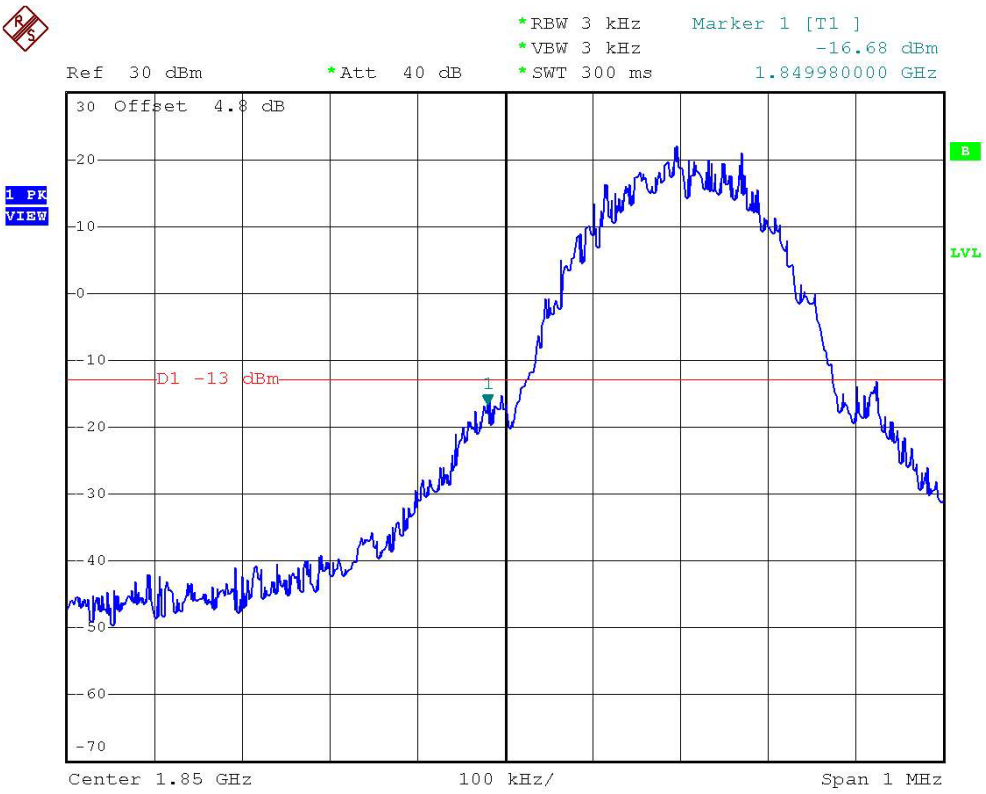
Transmitter Spurious Emission

Test A. Occupied Bandwidth (In-Band Spurious)
Test B. Out-of-Band Spurious



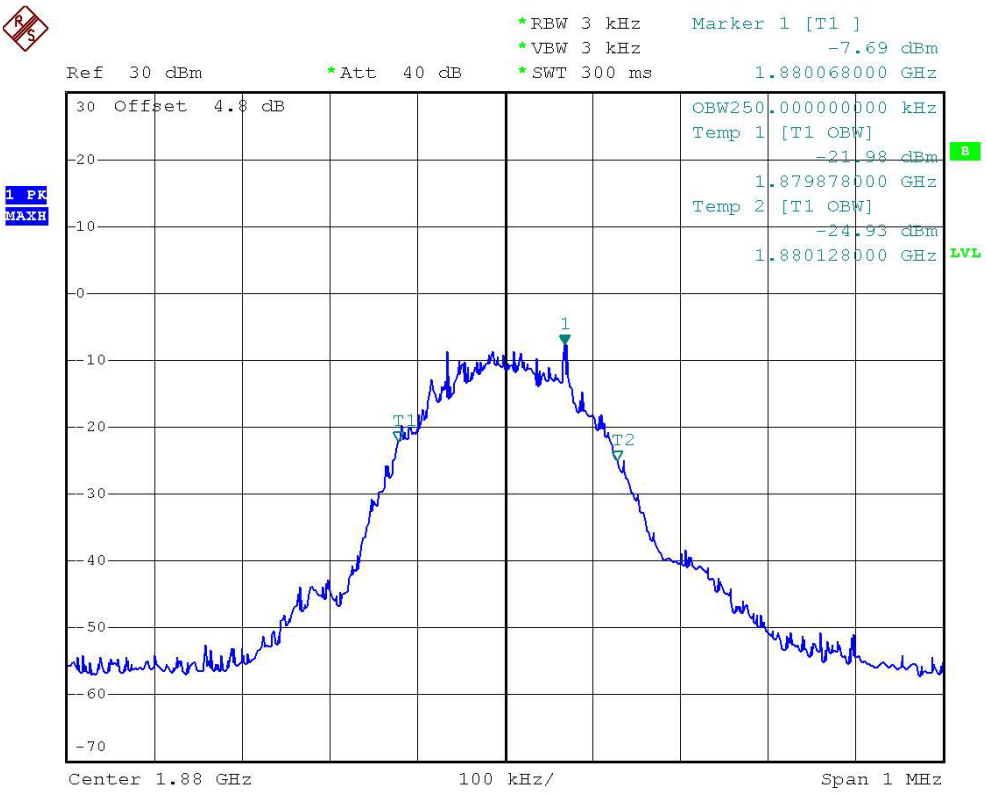
Asset	Model Name	S/N
Base Station Simulator	CMU200	102278
Base Station Simulator	E5515C	GB43460754
Spectrum Analyzer	FSP30	838858/014
AC/DC Power Source	HPA-500W	HPA0100024

Name of Test: Emission Masks (Occupied Bandwidth)
State 2:High Power



Power: HIGH
Modulation: PCS 1900
LOWER BAND EDGE

Name of Test: Emission Masks (Occupied Bandwidth)
State 1:Low Power



Power: LOW
Modulation: PCS 1900
99% BANDWIDTH