



# Variant FCC Test Report

According to

47 CFR Part 22H, 24E

Equipment : Point of Sales Payment Terminal  
Trade Name : VeriFone  
Model No. : VX610  
FCC ID : B32VX610C-M200  
Uplink Frequency Range : CDMA2000 Cellular : 824.7 ~ 848.31 MHz  
CDMA2000 PCS : 1851.25 ~ 1908.75 MHz  
Max. ERP/EIRP Power : CDMA2000 Cellular : 0.17 W  
CDMA2000 PCS : 0.35 W  
Emission Designator : 1M25F9W  
Applicant : VeriFone Inc.  
3755 ATHERTON RD, ROCKLIN, CA 95765, USA

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- The data shown in this test report were carried out on Jun. 03, 2008 at **Sporton International Inc. LAB.**
- Report No.: FG852931, Report Version: Rev. 01.

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Report Version: Rev. 01



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## History of This Test Report

Report Issue Date: Jun. 11, 2008

Report No.	Description
852931	Update report no. FG830510 by retesting ERP/EIRP and field strength of spurious radiation for changing the PCB board of jump-line part.



# 1. General Information

## 1.1. Applicant

VeriFone Inc.  
3755 ATHERTON RD, ROCKLIN, CA 95765, USA

## 1.2 Manufacturer

Sanmina-SCI Systems (Kunshan) Co.,Ltd.  
312, Qing Yang South Road, Economics and Technical Development Zone, Kunshan, Jiangsu Province,  
China 215300

## 1.3 Basic Description of Equipment under Test

<b>Equipment</b>		Point of Sales Payment Terminal
<b>Trade Name</b>		VeriFone
<b>Model Name</b>		VX610
<b>FCC ID</b>		B32VX610C-M200
<b>AC Adapter 1</b>	<b>Brand Name</b>	VeriFone
	<b>Model Name</b>	Au-7992n
	<b>Power Rating</b>	I/P:100-240Vac, 50-60Hz, 2A; O/P: 9Vdc, 4A
	<b>AC Power Cord Type</b>	1.9 meter shielded cable with ferrite core
<b>AC Adapter 2</b>	<b>Brand Name</b>	VeriFone
	<b>Model Name</b>	NU40-3090400-I1
	<b>Power Rating</b>	I/P:100-240Vac, 50-60Hz, 1.2A; O/P: 9Vdc, 4A
	<b>AC Power Cord Type</b>	1.8 meter shielded cable with ferrite core
<b>Battery</b>	<b>Brand Name</b>	VeriFone
	<b>Model Name</b>	23326-04-R (Rev:E)
	<b>Power Rating</b>	7.2Vdc, 1800mAh
	<b>Type</b>	Li-ion

Remark:

1. Above EUT's information was declared by manufacturer. Please refer to the specifications of manufacturer or User's Manual for more detailed features description.
2. The purpose of the variant report is for changing the PCB board of jump-line part base on the compliant product.



1.4 Feature of Equipment under Test

Product Feature & Specification	
DUT Type :	Point of Sales Payment Terminal
Model Name :	VX610
FCC ID :	B32VX610C-M200
Tx Frequency :	CDMA2000 Cellular : 824 MHz ~ 849 MHz CDMA2000 PCS : 1850 MHz ~1910 MHz
Rx Frequency :	CDMA2000 Cellular : 869 MHz ~ 894 MHz CDMA2000 PCS : 1930 MHz ~ 1990 MHz
Maximum Output Power :	<b>CDMA2000 Cellular</b> FCH_RC1 : 24.42 dBm FCH_RC3 : 24.39 dBm FCH+SCH_RC3 : 24.33 dBm <b>CDMA2000 PCS</b> FCH_RC1 : 23.52 dBm FCH_RC3 : 23.54 dBm FCH+SCH_RC3 : 23.51 dBm
Maximum ERP/EIRP :	CDMA2000 Cellular : 0.17 W (22.38 dBm) CDMA2000 PCS : 0.35 W (25.49 dBm)
Antenna Type :	Fixed Internal
Power Rating (DC/AC, Voltage and Current of RF element or PA) :	DC 7.2V / 1800mA
Digital Modulation Emission :	QPSK
Type of Emission :	1M25F9W
Device Power Class :	CDMA2000 Cellular : 3 CDMA2000 PCS : 2
DUT Stage :	Identical Prototype

1.5 Report Date

EUT Received : May 29, 2008

Report Date : Jun. 11, 2008

## 2 Test Configuration of Equipment under Test

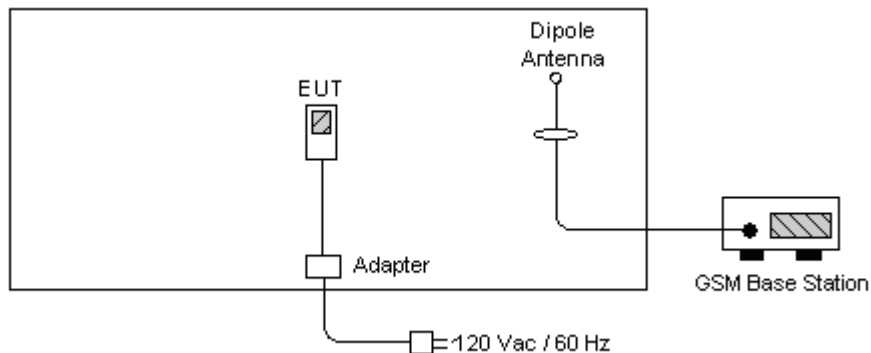
### 2.1 Test Manner

- 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.
- c. Frequency range investigated: radiated emission 30 MHz to 9000 MHz for CDMA2000 Cellular; 30MHz to 19000 MHz for CDMA2000 PCS.

### 2.2 Test Mode

Application	CDMA2000 Cellular	CDMA2000 PCS
Radiated Emission	<input checked="" type="checkbox"/> Mode 1: CDMA2000 Link Mode	<input checked="" type="checkbox"/> Mode 2: CDMA2000 Link Mode
Conducted Measurement	<input checked="" type="checkbox"/> Mode 1: CDMA2000 Link Mode	<input checked="" type="checkbox"/> Mode 2: CDMA2000 Link Mode

### 2.3 Connection Diagram of Test System



### 2.4 Ancillary Equipmnt List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Code
1.	GSM Base Station	R&S	CMU200	N/A	N/A	Unshielded, 1.8m



### 3. General Information of Test Site

Test Site Location : No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park,  
Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.  
TEL : 886-3-327-3456  
FAX : 886-3-328-4978

Test Site No : 03CH07-HY, TH02-HY

FCC Designation No : TW1022

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 22H, 24E, Part 2

#### 3.3 Frequency Range

- a. Radiation: from 30MHz to 9000MHz for CDMA2000 Cellular.
- b. Radiation: from 30 MHz to 19000 MHz for CDMA2000 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
§ 22.913 §24.232	ERP / EIRP	Passed	4.2
§2.1053	Field Strength of Spurious Radiation	Passed	4.3

Remark : The compliance is based on this report and the original report shown in appendix D.





## 4.2 ERP / EIRP Measurement

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

### 4.2.1 Measurement Instruments

As described in chapter 5 of this test report.

### 4.2.2 Test Procedure

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

$P_s$  (dBm) : Input power to substitution antenna.

$G_s$  (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

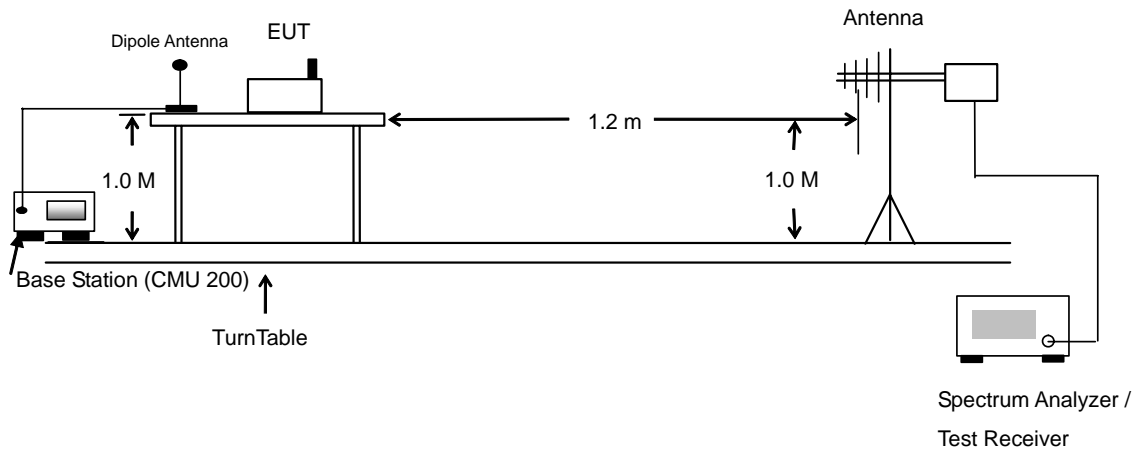
$E_s = R_s + AF$

$AF$  (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.

4.2.3 Test Setup Layout of ERP/EIRP





4.2.4 Test Result

CDMA2000 Cellular Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-25.07	-48.12	0.00	-1.08	21.97	0.16
836.40	-27.04	-48.28	0.00	-0.93	20.31	0.11
848.80	-26.89	-48.35	0.00	-0.76	20.70	0.12
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-24.51	-47.97	0.00	-1.08	22.38	0.17
836.40	-25.95	-48.01	0.00	-0.93	21.13	0.13
848.80	-25.58	-48.05	0.00	-0.76	21.71	0.15

CDMA2000 PCS Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-30.61	-51.88	0.00	1.96	23.23	0.21
1880.00	-29.84	-52.99	0.00	2.00	25.15	0.33
1909.80	-31.93	-54.28	0.00	1.98	24.33	0.27
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-30.84	-52.13	0.00	1.96	23.25	0.21
1880.00	-29.68	-53.17	0.00	2.00	25.49	0.35
1909.80	-31.55	-54.13	0.00	1.98	24.56	0.29



### **4.3 Field Strength of Spurious Radiation**

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

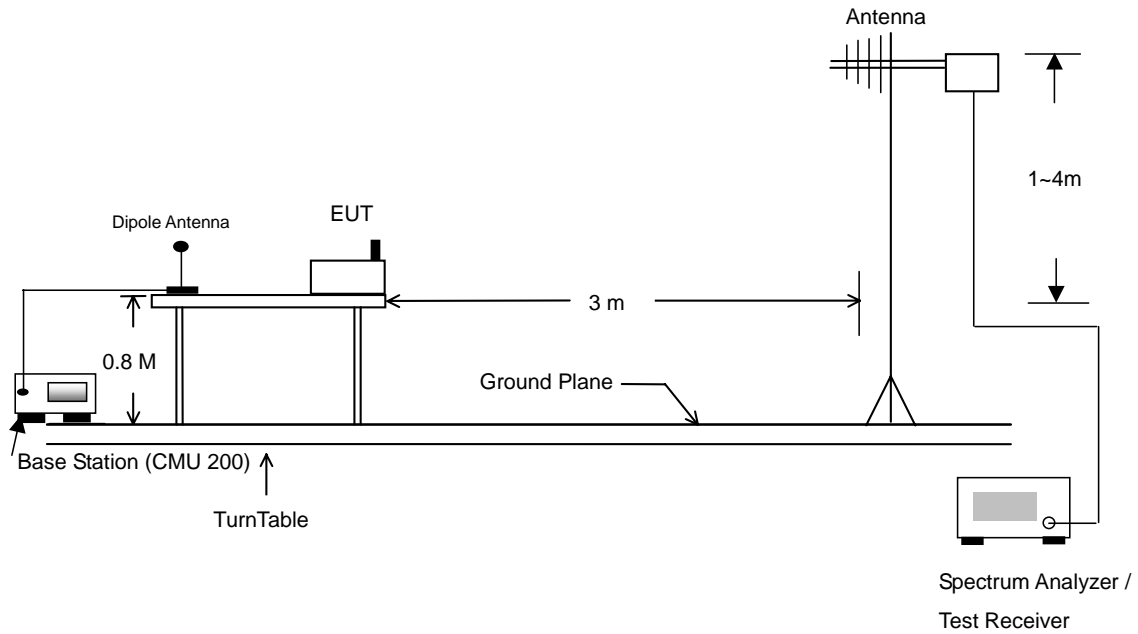
#### **4.3.1 Measurement Instruments**

As described in chapter 5 of this test report.

#### **4.3.2 Test Procedure**

- a. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
- b. The EUT was set 3 meters from the receiving antenna which was mounted on the antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- d. 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.
- e. Taking the record of maximum spurious emission.
- f. A Horn antenna was substituted in place of the EUT and was driven by a signal generator.
- g. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- h. Taking the record of output power at antenna port.
- i. Repeat step 7 to step 8 for another polarization.
- j. Emission level (dBm) = output power + substitution Gain.

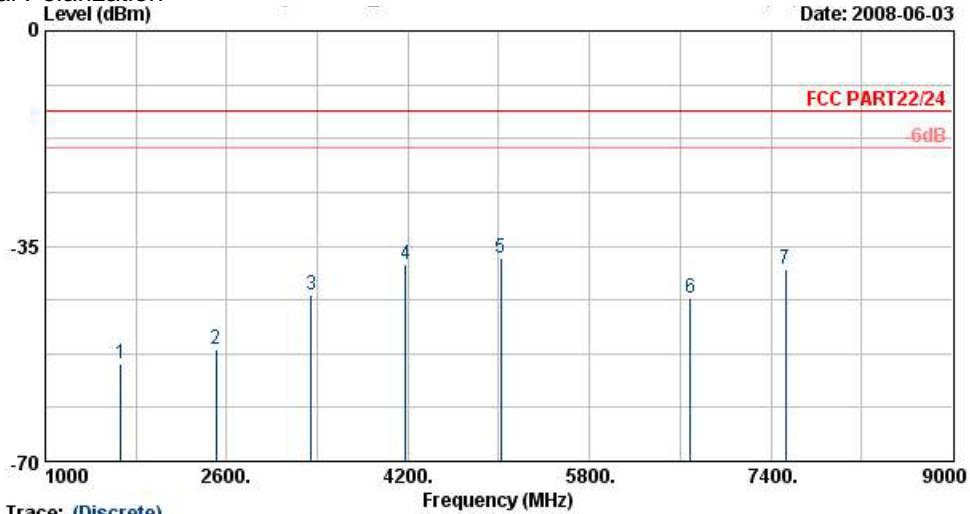
4.3.3 Test Setup Layout





4.3.4 Test Data

- Mode 1
- Horizontal Polarization



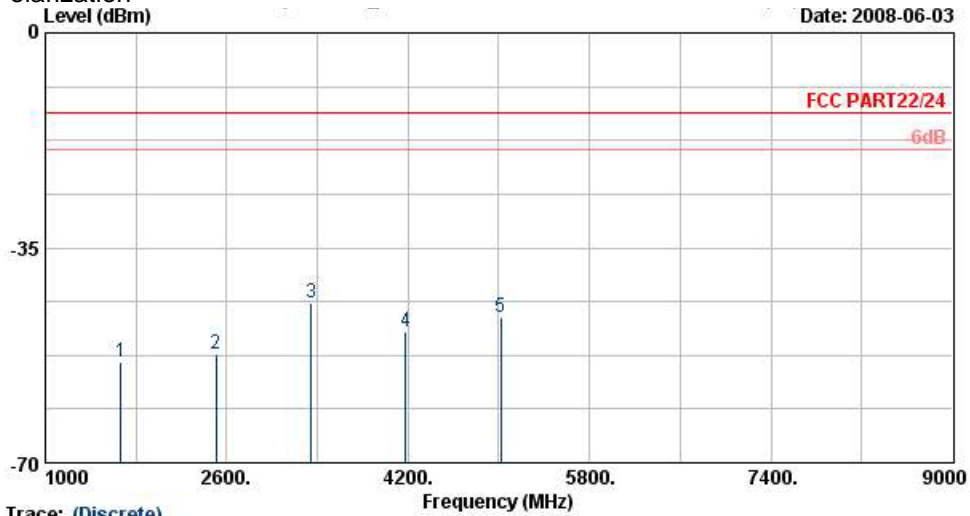
Site : 03CH07-HY  
 Condition : HF-EIRP(080306) HORIZONTAL  
 EUT : Card Reader  
 Power : 120Vac/60Hz  
 Model : FG852931  
 Mode : CDMA Cellular Link; Ch384 + Adaptor  
 Plane : E1

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1669	-54.00	-13	-41.00	-59.02	-53.01	3.39	4.55	H	Pass
2509	-51.85	-13	-38.85	-61.99	-51.91	3.71	5.92	H	Pass
3346	-43.00	-13	-30.00	-51.3	-44.93	3.13	7.21	H	Pass
4175	-38.00	-13	-25.00	-50.27	-40.41	3.01	7.57	H	Pass
5015	-37.00	-13	-24.00	-51.91	-40.75	2.61	8.51	H	Pass
6690	-43.56	-13	-30.56	-65.37	-45.75	5.22	9.56	H	Pass
7530	-38.76	-13	-25.76	-62.88	-40.1	6.22	9.71	H	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



Vertical Polarization



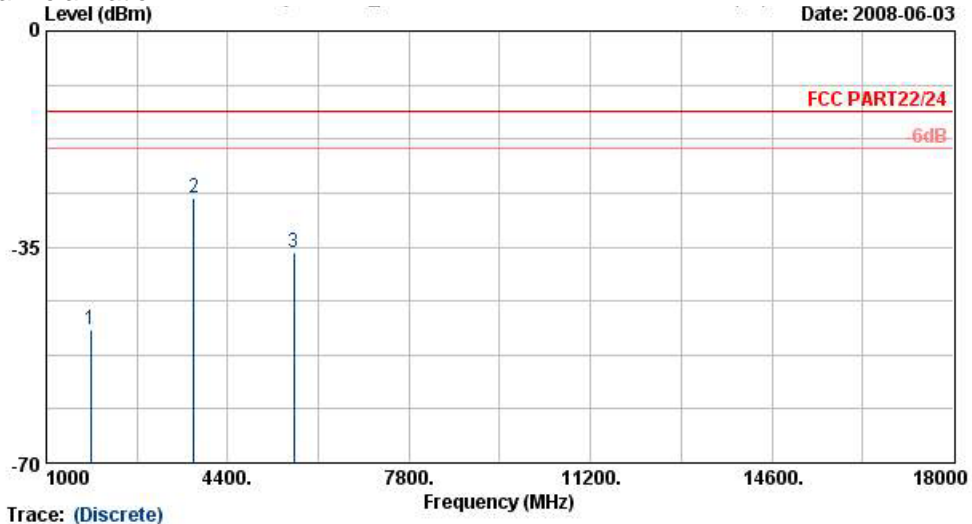
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : HF-EIRP(080306) VERTICAL  
 EUT : Card Reader  
 Power : 120Vac/60Hz  
 Model : FG852931  
 Mode : CDMA Cellular Link; Ch384 + Adaptor  
 Plane : E1

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1669	-53.54	-13	-40.54	-61.46	-52.16	3.39	4.16	V	Pass
2509	-52.21	-13	-39.21	-62.8	-52.07	3.71	5.72	V	Pass
3346	-44.00	-13	-31.00	-55.5	-46.2	3.13	7.48	V	Pass
4175	-48.79	-13	-35.79	-62.72	-51.91	3.01	8.28	V	Pass
5015	-46.44	-13	-33.44	-61.36	-50.8	2.61	9.12	V	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



- Mode 2
- Horizontal Polarization



Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : HF-EIRP(080306) HORIZONTAL  
 EUT : Card Reader  
 Power : 120Vac/60Hz  
 Model : FG852931  
 Mode : CDMA PCS Link; Ch600 + Adaptor  
 Plane : E1

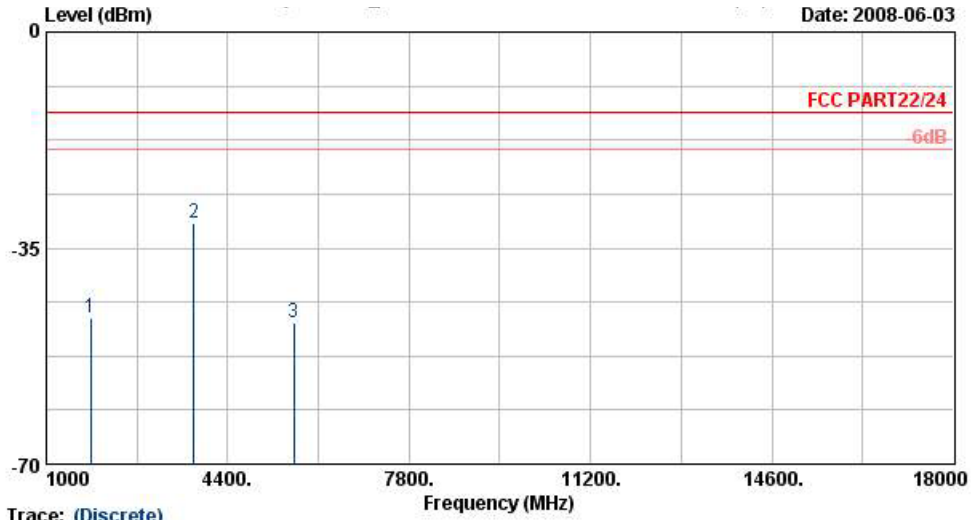
Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1836	-48.38	-13	-35.38	-57.08	-48.45	4.16	4.23	H	Pass
3760	-27.00	-13	-14.00	-42.44	-30.37	4.03	7.40	H	Pass
5636	-36.00	-13	-23.00	-57.38	-40.94	3.87	8.81	H	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.





Vertical Polarization



Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : HF-EIRP(080306) VERTICAL  
 EUT : Card Reader  
 Power : 120Vac/60Hz  
 Model : FG852931  
 Mode : CDMA PCS Link; Ch600 + Adaptor  
 Plane : E1

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1830	-46.26	-13	-33.26	-57.26	-46.03	4.16	3.93	V	Pass
3760	-31.00	-13	-18.00	-49.71	-34.88	4.03	7.91	V	Pass
5636	-47.00	-13	-34.00	-66.12	-52.9	3.87	9.77	V	Pass

Remark : Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



## 5. List of Measurement Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY44211028	9KHz-26.5GHz	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH07-HY)
EMI Test Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 26, 2007	Jul. 25, 2008	Radiation (03CH07-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Dec. 01, 2007	Nov. 30, 2008	Radiation (03CH07-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1G~18G	Aug. 29, 2007	Aug. 28, 2008	Radiation (03CH07-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-251	14G - 40G	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 22, 2007	Nov. 21, 2008	Radiation (03CH07-HY)
Pre Amplifier	EMEC	PA303	PA303-SMA-059	100K~3GHz	Nov. 26, 2007	Nov. 25, 2008	Radiation (03CH07-HY)
Base Station Simulator	R & S	CMU200	103937	Third-Band	Oct. 19, 2007	Oct. 18, 2008	Radiation (03CH07-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
<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=2Uc(y)</b>	<b>4.72</b>				

END OF TEST REPORT



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP852931 as below.