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FEDERAL COMMUNICATIONS COMMISSION

Registration number: 282399

Report No.: GLEMR080100055TXT

Page: 1 of 24 FCC ID: VYSSW1802

# TEST REPORT

**Application No.:** GLEMR080100055TX

Applicant: Servicell Wireless Technologies,Inc

FCC ID: VYSSW1802

**Fundamental Carrier** 

Frequency: 1850MHz ~ 1910MHz

**Equipment Under Test (EUT):** 

Name: CDMA-FIXED WIRELESS TERMINAL

Model: SW1802

Standards: FCC part 2:2007 &FCC part 24:2007& FCC part 15:2007

Date of Receipt: 7 January 2008

Date of Test: 7 to 23 January 2008

Date of Issue: 25 January 2008

Test Result : PASS \*

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details.

Authorized Signature:

Stephen Guo

Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.



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## 2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
RF Power Output	FCC PART 2:2007	Section 2.1046	PASS
Occupied Bandwidth	FCC PART 2 :2007	Section 2.1049	PASS
Effective Isotropic Radiated Power	FCC PART 24:2007	Section 24.232	PASS
Spurious Emissions at antenna terminals	FCC PART 2 :2007	Section 2.1051	PASS
Out of Band Emissions	FCC PART 24:2007	Section 24.238	PASS
Radiated Spurious Emissions	FCC PART 24:2007	Section 24.238	PASS
Conducted Emissions	FCC PART 15 :2007	Section 15.207	PASS
Frequency Stability	FCC PART 2 :2007 FCC PART 24:2007	Section 2.1055 Section 24.235	PASS

### ♣Remark:

This report was an additional one copied from the original report GLEMR080100054TXT, W1802 in this report and the item S1801EC in the original report were identical, only difference being the applicant name and address.



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## 4 General Information

### 4.1 Client Information

Applicant: Servicell Wireless Technologies,Inc

Address of Applicant: 10845 SW 75<sup>th</sup> Street Miami, Florida 33173

### 4.2 General Description of E.U.T.

Product Name: CDMA-Fixed Wireless Terminal

Model: SW1802

Frequency: Tx:1850MHz ~ 1910MHz

Rx:1930MHz ~ 1990MHz

Type of Modulation CDMA
Duplex Mode: FDD
Duplex spacing: 80MHz

Antenna: External 50ohm, Max 3dBi

Power supply: Batteries supplied: 7.2 DC( Ni-MH 1200mAh rechargeable battery) or

AC/DC adapter

Adapter information Model no.:GM-120100;

Input :AC 100V~240V, 50-60Hz; Output: DC 12,1A;

Adapter DC output cable: 1.5m x 2 wires unscreened cable.

## 4.3 Description of Support Units

The EUT has been tested independently.

## 4.4 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 2:2007 & PART 24:2007, Part 15:2007

### 4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

### 4.6 Other Information Requested by the Customer

None.



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## 4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

NVLAP – Lab Code: 200611-0

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

FCC – Registration No.: 282399

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorized test laboratory for the DoC process.



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## 5 Equipments Used during Test

	RE in Chamber/OAT	S				
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0525	Compact Semi- Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	06-03-2007	06-03-2008
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	05-12-2006	05-12-2007
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2006	04-12-2007
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	12-08-2007	12-08-2008
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	12-08-2007	12-08-2008
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	12-08-2007	12-08-2008
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2006	05-12-2007
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A0625 2	28-03-2007	28-03-2008
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A0164 9	28-03-2007	28-03-2008
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	22-08-2006	22-08-2007

	Conducted Emission					
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m <sup>3</sup>	N/A	N/A	N/A
EMC0102	LISN	Schaffner Chase	MNZ050D/1	1421	05-12-2006	05-12-2007
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	05-12-2006	05-12-2007
EMC0107	Coaxial Cable	SGS	2m	N/A	25-11-2006	25-11-2007
EMC0106	Voltage Probe	SGS	N/A	N/A	N/A	N/A



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6	Test Results	
6.1	E.U.T. test conditions	
	Power supply:	AC adapter and Battery.
	Type of antenna:	external
	Operating Environment:	
	Temperature:	20.0 -25.0 °C
	Humidity:	38-48 % RH
	Atmospheric Pressure:	992 -1006 mbar

Test frequency is the lowest channel: 25 channel(1851.25MHz), middle channel: 600 channel(1880MHz) and highest channel: 1175 channel(1908.75MHz)



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## 6.2 RF Power Output

Test Requirement: FCC Part 2.1046
Test Method: FCC Part 2.1046
Test Date: January 21 2008

Test Status: Test lowest, middle, highest channel.

Test Procedure:

- 1. Establish call communication between EUT and Tester;
- 2. Adjust the Test transmitter signal to make the EUT RF power output at Maximum;
- Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
- 4. Observe the power output at least 10s, consider the cable loss between the EUT and Tester, record the maximum RF power output value.

### Test result:

Test Channel	Carrier Frequency (MHz)	RF Power Output (dBm)	Max Antenna Gain (dBi)	EIRP Limit (dBm)
25	1851.25	4.2		
600	1880.0	5.1	3dBi	33
1175	1908.75	5.9		

#### Remark:

The external antenna max gain is 3 dBi, calculate the EIRP base the formula (1) and compare it with the limit. And Radiated test result is in the other section.

Formula (1): EIRP = P \* G; P = Power(dBm), G= Gain (dBi)

Test Result does meet the FCC requirement.



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## 6.3 Occupied Bandwidth

Test Requirement: FCC Part 2.1049
Test Method: FCC Part 2.1049
Test Date: January 21 2008

Test Status: Test lowest, middle, highest channel.

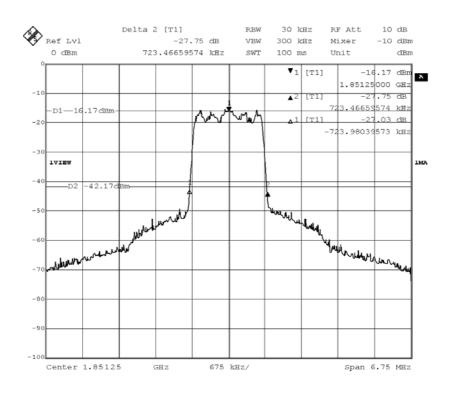
Test Procedure:

- 1. Establish call communication between EUT and Tester;
- 2. Adjust the Test transmitter signal to make the EUT RF power output at Maximum
- 3. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
- 4. Measure the 99% Channel Power Occupied Bandwidth without considering the cable loss.

#### Test result:

Test Channel	Carrier Frequency(MHz)	99% Channel Power Occupied Bandwidth (MHz)
25	1851.25	1.447
600	1880.0	1.447
1175	1908.75	1.443

### Channel 25:



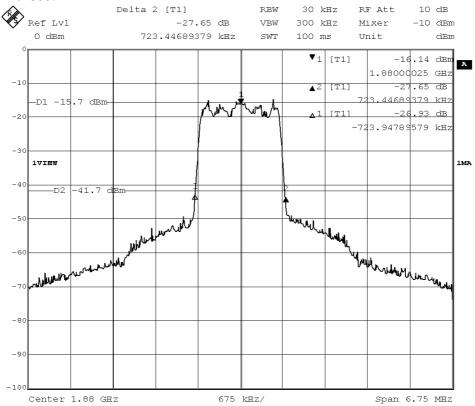


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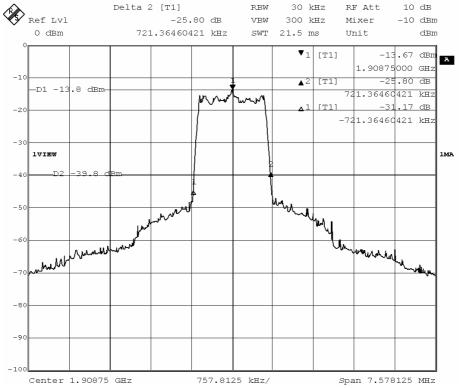
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### Channel 600:



### Channel 1175:





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## 6.4 Spurious Emissions at antenna terminals

Test Requirement: FCC Part 2.1051
Test Method: FCC Part 2.1051
Test Date: January 21 2008

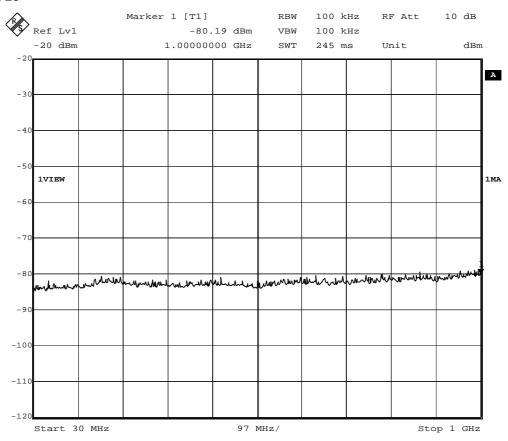
Test Status: Test lowest, middle, highest channel.

Test Procedure:

- 1. Establish call communication between EUT and Tester;
- 2. Adjust the Test transmitter signal to make the EUT RF power output at Maximum;
- 3. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
- 4. Scan from 30MHz to 20GHz( higher than the 10<sup>th</sup> harmonic of the carrier) in the spectrum analyzer, Peak detector used;
- 5. record the spurious emission frequencies and level;

#### Test result:

### Channel 25

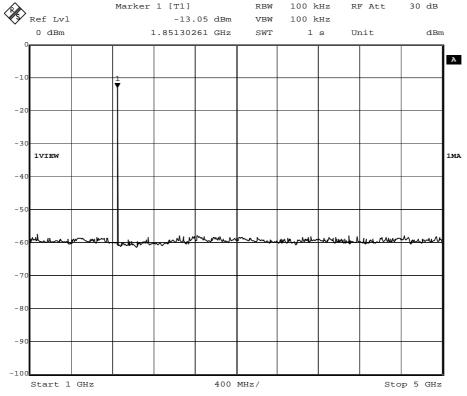


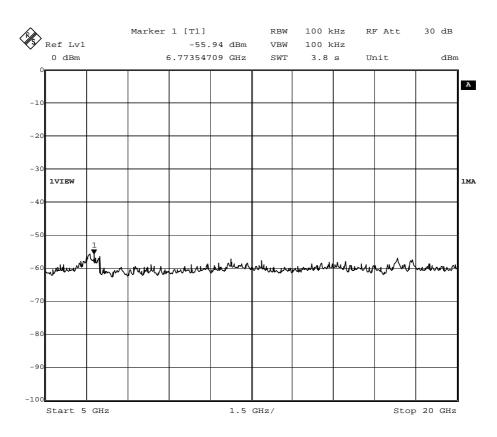


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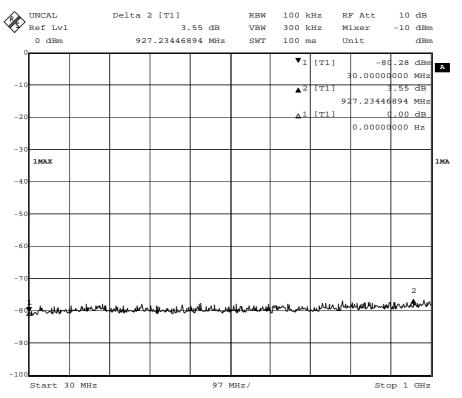


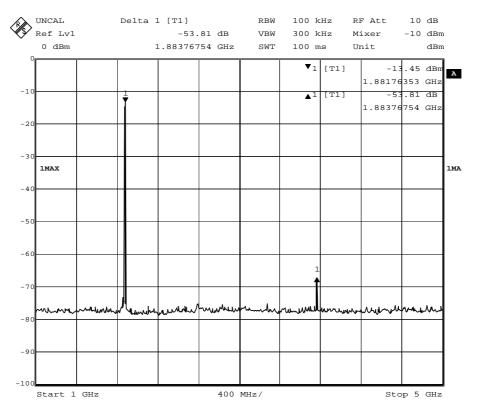


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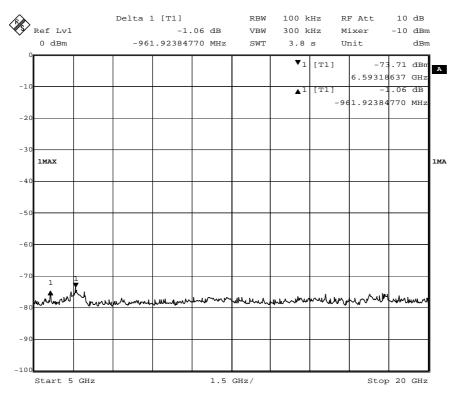




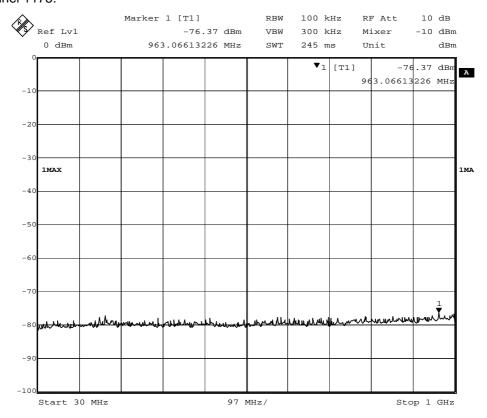
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### Channel 1175:

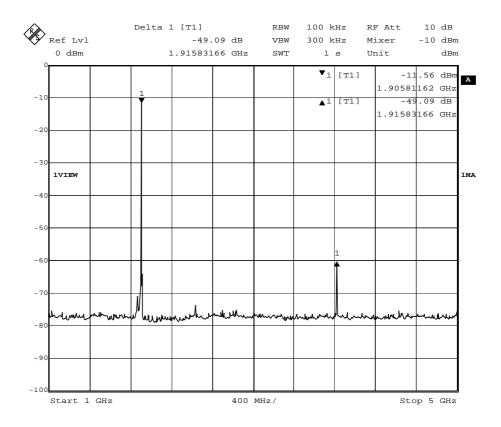


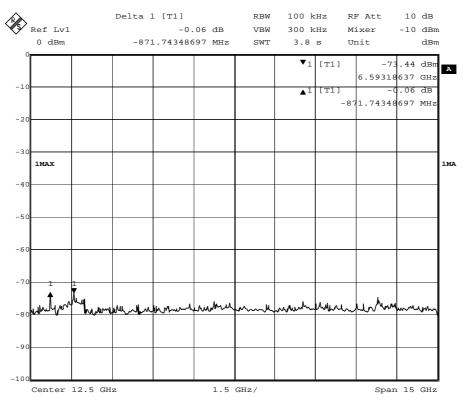


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### 6.5 Effective Isotropic Radiated Power

Test Requirement: FCC Part 24.232
Test Method: TIA-603-C:2004
Test Date: 21 January 2008

Test Status: Test lowest, middle, highest channel.

Test Procedure:

1. Establish call communication between EUT and Tester:

- 2. Adjust the Test transmitter signal to make the EUT RF power output at Maximum;
- test the EUT ERP with the external antenna connected and put in vertical polarity;

The technique used to find the output power of the transmitter was the antenna substitution method.

Substitution method was performed to determine the actual ERP emission levels of the EUT.

The following test procedure as below:

- a) The EUT was powered ON and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length.
- b) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering the receive antenna and by rotating the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- c) Steps 1 and 2 were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- d) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- e) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable.

  With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2 is obtained for this set of conditions.
- f) The output power into the substitution antenna was then measured.
- g) Steps 5 and 6 were repeated with both antennas polarized.
- 4. Repeat the test in vertical and horizontal polarity and report the Max EIRP value(EIRP=ERP+2.15).

#### Test result:

Test Channel	Carrier Frequency(MHz)	EIRP(dBm)	Limit
25	1851.25	3.6	
600	1880.0	3.5	2W or 33dBm
1175	1908.75	3.6	

### Test Result does meet the FCC requirement.



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### 6.6 Out of band emissions

## 6.6.1 Band edges emissions

Test Requirement: FCC Part 24.238
Test Method: TIA-603-C:2004
Test Date: 21 January 2008

Test Status: Test lowest, middle, highest channel.

Test Procedure:

- 1. Establish call communication between EUT and Tester:
- 2. Adjust the Test transmitter signal to make the EUT RF power output at Maximum;
- 3. test the EUT ERP with the external antenna connected and put in vertical polarity;

The technique used to find the output power of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP emission levels of the EUT.

The following test procedure as below:

- a) The EUT was powered ON and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length.
- b) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering the receive antenna and by rotating the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- c) Steps 1 and 2 were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- d) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- e) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2 is obtained for this set of conditions.
- f) The output power into the substitution antenna was then measured.
- g) Steps 5 and 6 were repeated with both antennas polarized.
  - 4. scan the lower edge and upper edge to find the worst emissions to compare with the requirement.



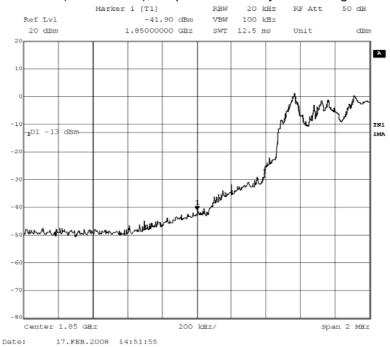
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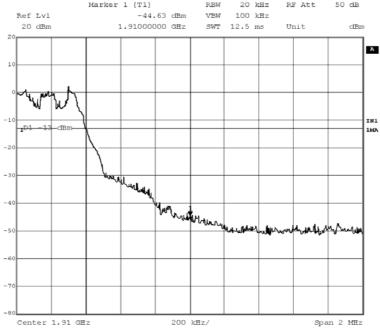
Test result: Lower edge:

1. Test in Channel 25 (1851.25MHz), keep in continuously transmitting status.



### Upper edge:

2. Test in Channel 1175 (1908.75MHz), keep in continuously transmitting status.



### Test Result does meet the FCC requirement.



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### 6.6.2 Radiated Spurious Emissions

Test Requirement: FCC Part 24.238
Test Method: TIA-603-C:2004
Test Date: 21 January 2008

Test Status: Test lowest channel, middle, highest channel.

### Test procedure:

- 1. Establish call communication between EUT and Tester;
- 2. Adjust the Test transmitter signal to make the EUT RF power output at Maximum;
- 3. Add the notch-filter before the receiver antenna;
- 4. test the EUT ERP with the external antenna connected and put in vertical polarity;

The technique used to find the output power of the transmitter was the antenna substitution method.

Substitution method was performed to determine the actual ERP emission levels of the EUT.

The following test procedure as below:

- a) The EUT was powered ON and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length.
- b) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering the receive antenna and by rotating the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- c) Steps 1 and 2 were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- d) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- e) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2 is obtained for this set of conditions.
- f) The output power into the substitution antenna was then measured.
- g) Steps 5 and 6 were repeated with both antennas polarized.
  - 5. Repeat the test in vertical and horizontal polarity and report the Max value.
  - 6. scan from 30MHz to 20GHz, read the observed unwanted emissions and report the emission level limit less than 6dB.



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### CH 25:

Tx in operation mode				
Maximum Frequency	Spurious Emission polarization and Level		Limit	Over Limit
MHz	polarization	dBm	dBm	dB
3697.39	Vertical	-55.9	-13.0	-42.9
5689.48	V	-58.6	-13.0	-45.6
3697.39	Horizontal	-57.7	-13.0	-44.7

### Remark:

- -70dBm was the minimum level which could be detected by measuring facility when below 1GHz, -60dBm at over 1GHz.
- No other emission can be observed and be reported from 30MHz to 20GHz.

### CH 600:

Tx in operation mode				
Maximum Frequency	Spurious Emission polarization and Level		Limit	Over Limit
MHz	polarization	dBm	dBm	dB
3761.52	Vertical	-55.2	-13.0	-42.2
3761.52	Horizontal	-60.0	-13.0	-47.0

### Remark:

- -70dBm was the minimum level which could be detected by measuring facility when below 1GHz, -60dBm at over 1GHz.
- No other emission can be observed and be reported from 30MHz to 20GHz.

### CH 1175:

Tx in operation mode				
Maximum Frequency	Spurious Emission polarization and Level		Limit	Over Limit
MHz	polarization	dBm	dBm	dB
3817.64	Vertical	-47.8	-13.0	-34.8
3817.64	Horizontal	-56.3	-13.0	-43.3

### Remark:

- -70dBm was the minimum level which could be detected by measuring facility when below 1GHz, -60dBm at over 1GHz.
- No other emission can be observed and be reported from 30MHz to 20GHz.

### Test Result does meet the FCC requirement.



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### 6.7 Frequency Stability

Test Requirement: FCC Part 2.1055& Part 24.235
Test Method: Part 2.1055& TIA-603-C:2004

Test Date: 16 January 2008

Test Status: Test lowest channel, middle, highest channel.

Test procedure:

1. Establish call communication between EUT and Tester;

2. Make the EUT RF power output at Maximum;

3. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

4.  $-30^{\circ}$  C to  $+50^{\circ}$  C;

5. 6.1V DC to 8.3V DC; ,

	Test Results (Hz)					
Temperature(° C)	Channel 25:	Channel 600:	Channel 1175:			
	1851.25MHz	1880MHz	1908.75MHz			
-30	200	-180	-230			
-20	220	-150	-240			
-10	250	-160	-220			
0	290	-150	-250			
+10	300	-120	-260			
+20	330	-100	-290			
+30	340	-100	-300			
+40	350	-80	-320			
+50	370	-50	-330			
l inst	1851.25MHz±2.5ppm	1880MHz±2.5ppm	1908.75MHz±2.5ppm			
Limit	1851.25MHz ±4628.125Hz	1880MHz $\pm$ 4700Hz	1908.75MHz±4771.875Hz			
	Test Results(Hz)					
Voltage(V)	Channel 25:	Channel 600:	Channel 1175:			
	1851.25MHz	1880MHz	1908.75MHz			
6.1	-300	100	220			
7.2	-140	180	250			
8.3	-250	230	350			
Limit	1851.25MHz±2.5ppm	1880MHz±2.5ppm	1908.75MHz±2.5ppm			
	1851.25MHz±4628.125Hz	1880MHz ± 4700Hz	1908.75MHz±4771.875Hz			



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### 6.8 Conducted Emissions Mains Terminals, 150 kHz to 30MHz

Test Requirement: Part 15.207
Test Method: ANSI C63.4.
Test Date: 28 January 2008
Frequency Range: 150KHz to 30MHz

Detector: Peak for pre-scan (9kHz Resolution Bandwidth)

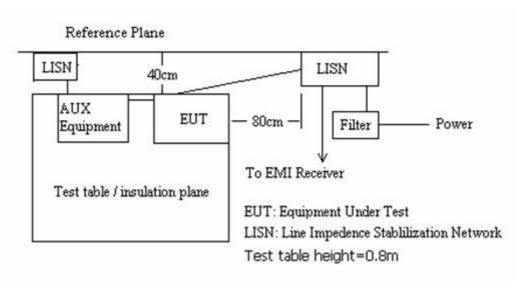
Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit

### **EUT Operation:**

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Plan View of Test Setup



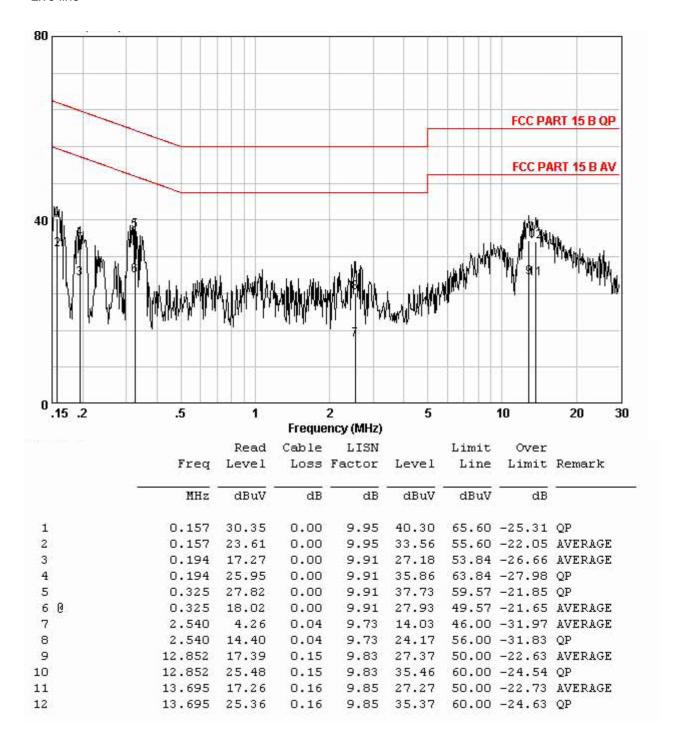


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Live line





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