

FCC CERTIFICATION TEST REPORT

for

SPRINT TELECOM CO.,LTD

FM TRANSMITTER (with Aux Input & Digital Display)

Model Number : VRFM6

Prepared for : SPRINT TELECOM CO.,LTD
Address : 10TH Building, 2th industry Zhu Ken, Ping Shan, LongGang
ShenZhen, Guangdong, China

Prepared By : NS Electromagnetic Technology Co., Ltd.
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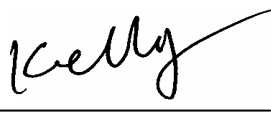
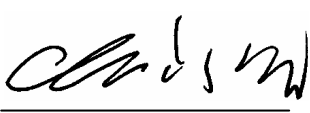

Report Number : NSE-F0606091
Date of Test : Jun. 15, 2006
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NS Electromagnetic Technology Co., Ltd.

| | | | |
|--|---|---|-------------|
| Applicant: | SPRINT TELECOM CO.,LTD | | |
| Address: | 10 TH Building, 2th industry Zhu Ken, Ping Shan, LongGang, ShenZhen, Guangdong, China | | |
| Manufacturer: | SPRINT TELECOM CO.,LTD | | |
| Address: | 10 TH Building, 2th industry Zhu Ken, Ping Shan, LongGang, ShenZhen, Guangdong, China | | |
| E.U.T: | FM TRANSMITTER (with Aux Input & Digital Display) | | |
| Model Number: | VRFM6 | | |
| Trade Name: | | Serial No.: | ----- |
| Date of Receipt: | May. 29, 2006 | Date of Test: | Jun.3, 2006 |
| Test Specification: | FCC Part 15 Subpart C, 2005 ; ANSI C63.4:2003 | | |
| Test Result: | The equipment under test was found to be compliance with the requirements of the standards applied. | | |
| | | Issue Date: Jun. 9, 2006 | |
| Tested by: | Reviewed by: | Approved by: | |
|  |  |  | |
| Kelly / Engineer | Chris Du / Supervisor | Steven Lee / Manager | |
| Other Aspects: | None. | | |
| <i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i> | | | |
| <i>This test report is based on a single evaluation of one sample of above mentioned products, It is not permitted to be duplicated in extracts without written approval of NS Electromagnetic Technology Co., Ltd..</i> | | | |

1. GENERAL PRODUCT INFORMATION

1.1. Product Function

Refer to Technical Construction Form and User Manual.

1.2. Description of Device (EUT)

| | | |
|-----------------------|---|---|
| Description | : | FM TRANSMITTER (with Aux Input & Digital Display) |
| Model No. | : | VRFM6 |
| System Input Voltage | : | DC 12V |
| Operational frequency | : | 88.1MHz-89.1MHz and 106.7-107.9MHz |

1.3. Operation Modes

1.3.1. TX: 88.1MHz

1.3.2. TX: 107.9MHz

2. TEST SITES

2.1. Test Facilities

EMC Lab : Certificated by TUV Rheinland, Germany.
Date of registration: July 28, 2003

Certificated by FCC, USA
Registration No.: 897109
Date of registration: October 10, 2003

Certificated by VCCI, Japan
Registration No.: R-1798 & C-1926
Date of registration: January 30, 2004

Certificated by CNAL, CHINA
Registration No.: L1744
Date of registration: November 25, 2004

Certificated by Intertek ETL SEMKO
Registration No.: TMP-013
Date of registration: June 11, 2005

Certificated by TUV/PS, Hong Kong
Date of registration: December 1, 2005

Certificated by Industry Canada
Registration No.: 5936
Date of registration: March 24, 2006

Name of Firm : NS Electromagnetic Technology Co., Ltd.

Site Location : Chenwu Industrial Zone, Houjie Town, Dongguan City,
Guangdong, China

2.2. List of Test and Measurement Instruments

2.2.1. For conducted emission test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|-----------------|-----------------|-----------|------------|-----------|-----------|
| Test Receiver | Rohde & Schwarz | ESCS30 | 100199 | Jun. 5,05 | Jun. 5,06 |
| L.I.S.N.#1 | Rohde & Schwarz | ESH2-Z5 | 100071 | Jun. 5,05 | Jun. 5,06 |
| L.I.S.N.#2(AUX) | Rohde & Schwarz | ESH3-Z5 | 100317 | Jun. 5,05 | Jun. 5,06 |

2.2.2. For radiated emission test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|-------------------|-----------------|-----------|------------|-----------|-----------|
| Test Receiver | Rohde & Schwarz | ESCS30 | 100340 | Jun. 5,05 | Jun. 5,06 |
| Spectrum Analyzer | HP | 8590L | 3412A00251 | Jun. 5,05 | Jun. 5,06 |
| Amplifier | Agilent | 8447D | 2944A10488 | May 2,06 | May 2,07 |
| Bilog Antenna | EMCO | 3142B | 00022050 | May 2,06 | May 2,07 |

2.2.3. For frequency range test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---------------|-----------------|-----------|------------|-----------|-----------|
| Test Receiver | Rohde & Schwarz | ESCS30 | 100340 | Jun. 5,05 | Jun. 5,06 |
| Bilog Antenna | EMCO | 3142B | 00022050 | May 2,06 | May 2,07 |

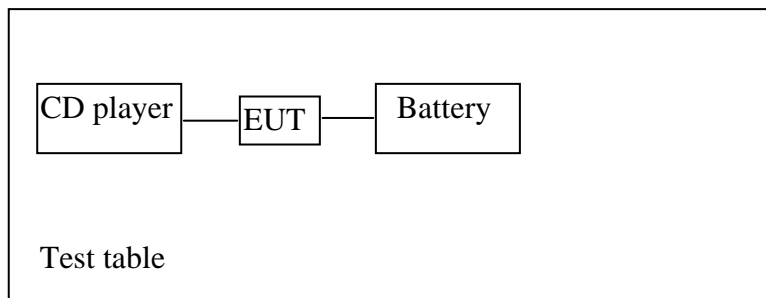
3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections Between EUT and Simulators



(EUT: FM TRANSMITTER (with Aux Input & Digital Display))

Note: 1) we test lie orientation, side orientation and stand orientation. The lie orientation is the worst mode, so only the worst mode test data was included in the report.

2) CD player input EUT an audio signal, and the CD player were turned up the highest volume.

3.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4 & 5.

3.4. Special Accessories and Auxiliary Equipment

None.

3.5. Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1. Conducted Emission Test

According to paragraph of FCC Part 15 Section 15.207, measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation, and which do not operate from the AC power lines or contain provision for operation while connected to the AC power.

4.2. Radiated Emission Test

RESULT : **Pass**
Test procedure : ANSI C63.4:2003
Frequency range : 30~1000MHz
Test Site : 966 Chamber
FCC Rules : FCC Part 15 Subpart C &15.239/&15.209/&15.35/&15.205

Test Setup

Date of testing : Jun. 3,2006
Input Voltage : DC 12V
Operation Mode : TX: 88.1MHz; 107.9MHz

Standard Limits:

The field strength of any emission within the permitted 200kHz band shall not exceed 250microvolts meter at 3meters. The emission limit in this paragraph is based on measurement instrumentation employ an average detector. The provisions in &15.35 for limiting peak emission apply.

The field strength of any emissions radiated on any frequency outside of the specified 200kHz band shall not exceed the general radiated emission limits in &15.209.

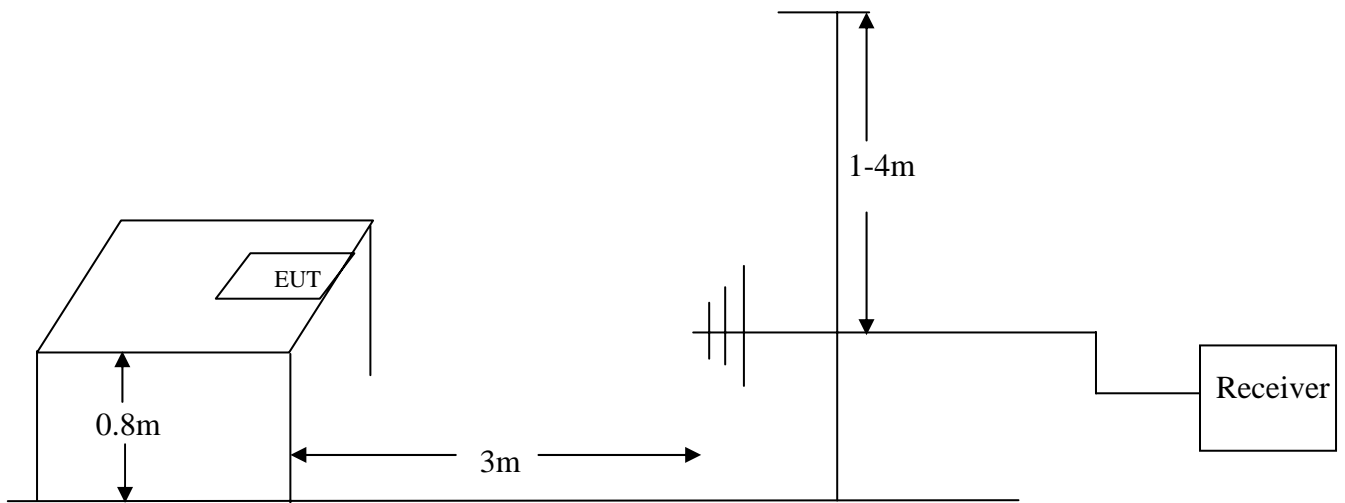
The EUT was placed on a rotatable table which was 0.8 meter above ground. The rotatable table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower, the measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations. The broadband antenna was used as a receiving antenna.

The bandwidth setting on the test receiver was 120 KHz.

The EUT was tested in Chamber Site.

The test data of the worst case condition(s) was reported on the following pages.

4.2.1. Test set-up diagram



4.2.2. Test Data

| | | | |
|------------|--|----------------|-------|
| EUT: | FM TRANSMITTER (with Aux Input & Digital Display) | Temperature: | 25°C |
| M/N: | VRFM6 | Humidity: | 55% |
| Test Mode: | TX 107.9MHz | Test Engineer: | Kelly |

| Frequency | Factor | Meter Reading | Emission Level | Over | Limits | Detector |
|---------------|--------------|--------------------------|----------------------------|--------------|--------------|-----------|
| MHz | dB | Horizontal dB μ V | Horizontal dB μ V/m | Limits dB | dB μ V/m | |
| 87.230 | 11.99 | 18.24 | 30.64 | -9.36 | 40.00 | QP |
| 107.900 | 12.40 | 24.41 | 36.81 | -11.19 | 48.00 | Average |
| 107.900 | 12.40 | 24.06 | 37.94 | -30.06 | 68.00 | Peak |
| 174.530 | 13.88 | 14.85 | 32.08 | -11.42 | 43.50 | QP |
| 281.230 | 17.23 | 12.31 | 30.14 | -15.86 | 46.00 | QP |
| 303.540 | 17.83 | 12.78 | 31.15 | -14.85 | 46.00 | QP |
| 324.880 | 18.37 | 10.78 | 32.30 | -13.70 | 46.00 | QP |
| 497.540 | 21.52 | 7.88 | 29.40 | -16.60 | 46.00 | QP |

Remark: The worst emission was detected at **87.230MHz** with corrected signal level of **30.64dB μ V/m**(Limit is **40.00 dB μ V/m**) when the antenna was at **Horizontal** polarization and at **1.55m** high and the turn table was at **120°** .

| Frequency | Factor | Meter Reading | Emission Level | Over | Limits | Detector |
|---------------|--------------|------------------------|--------------------------|--------------|--------------|-----------|
| MHz | dB | Vertical dB μ V | Vertical dB μ V/m | Limits dB | dB μ V/m | |
| 86.322 | 11.88 | 23.17 | 35.05 | -4.95 | 40.00 | QP |
| 107.900 | 12.40 | 24.90 | 37.30 | -10.70 | 48.00 | Average |
| 107.900 | 12.40 | 27.20 | 39.60 | -28.40 | 68.00 | Peak |
| 172.600 | 13.88 | 19.72 | 33.60 | -9.90 | 43.50 | QP |
| 279.100 | 17.23 | 13.37 | 30.60 | -15.40 | 46.00 | QP |
| 412.180 | 19.94 | 11.46 | 31.40 | -14.60 | 46.00 | QP |
| 496.300 | 21.52 | 11.18 | 32.70 | -13.30 | 46.00 | QP |
| 541.190 | 22.34 | 11.46 | 33.80 | -12.20 | 46.00 | QP |

Remark: The worst emission was detected at **86.322MHz** with corrected signal level of **35.05dB μ V/m** (Limit is **40.00 dB μ V/m**) when the antenna was at **Vertical** polarization and at **1.10m** high and the turn table was at **130°** .

| | | | |
|------------|---|----------------|-------|
| EUT: | FM TRANSMITTER (with Aux Input & Digital Display) | Temperature: | 25°C |
| M/N: | VRFM6 | Humidity: | 55% |
| Test Mode: | TX 88.1MHz | Test Engineer: | Kelly |

| Frequency | Factor | Meter Reading | Emission Level | Over | Limits | Detector |
|--------------|--------------|--------------------|----------------------|---------------|--------------|----------------|
| MHz | dB | Horizontal dBμV | Horizontal dBμV/m | Limits dB | dBμV/m | |
| 31.94 | 20.41 | 1.89 | 22.30 | -17.70 | 40.00 | QP |
| 88.10 | 12.10 | 24.71 | 36.81 | -11.19 | 48.00 | Average |
| 88.10 | 12.10 | 24.95 | 37.05 | -30.95 | 68.00 | Peak |
| 111.48 | 12.27 | 12.59 | 24.86 | -18.64 | 43.50 | QP |
| 176.44 | 13.96 | 11.71 | 25.67 | -17.83 | 43.50 | QP |
| 310.33 | 17.98 | 8.37 | 26.35 | -19.65 | 46.00 | QP |
| 419.94 | 20.01 | 6.98 | 26.99 | -19.01 | 46.00 | QP |
| 640.00 | 24.96 | 3.10 | 28.06 | -17.94 | 46.00 | QP |

Remark: The worst emission was detected at **88.10MHz** with corrected signal level of **36.81dBμV/m**(Limit is **48.00 dBμV/m**) when the antenna was at **Horizontal** polarization and at **1.55m** high and the turn table was at **120°** .

| Frequency | Factor | Meter Reading | Emission Level | Over | Limits | Detector |
|---------------|--------------|------------------|--------------------|---------------|--------------|-----------|
| MHz | dB | Vertical dBμV | Vertical dBμV/m | Limits dB | dBμV/m | |
| 32.61 | 19.88 | 0.29 | 20.17 | -19.83 | 40.00 | QP |
| 88.10 | 12.10 | 21.46 | 33.56 | -14.44 | 48.00 | Average |
| 88.10 | 12.10 | 23.61 | 35.71 | -32.29 | 68.00 | Peak |
| 133.79 | 11.70 | 14.64 | 26.34 | -17.16 | 43.50 | QP |
| 176.30 | 14.00 | 18.17 | 32.17 | -11.33 | 43.50 | QP |
| 310.33 | 17.98 | 6.67 | 24.65 | -21.35 | 46.00 | QP |
| 379.63 | 19.74 | 11.20 | 30.94 | -15.06 | 46.00 | QP |
| 552.83 | 22.66 | 5.67 | 28.33 | -17.67 | 46.00 | QP |

Remark: The worst emission was detected at **176.30MHz** with corrected signal level of **32.17dBμV/m** (Limit is **43.50 dBμV/m**) when the antenna was at **Vertical** polarization and at **1.05m** high and the turn table was at **130°**

- Notes:
1. Emission Level = Antenna Factor + Cable Loss + Meter Reading
 2. 0 ° was the table front facing the antenna. Degree was calculated from 0 ° clockwise facing the antenna.
 3. Test uncertainty: ±4.76dB at a level of confidence of 95%.

4.3. Frequency Range Test

4.3.1 Test Standard:

FCC Part 15: 2005, Subpart C (Section: 15.239):

(a) Emissions from the intentional radiator shall be confined within a band 200kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88-108MHz.

(c) The field strength of any emissions radiated on any frequency outside of the specified 200kHz band shall not exceed the general radiated emission limits in § 15.209.

4.3.2. Test Result:

Pass.

1) To Section: 15.239(a) requirement, See the page 15.

2) To Section: 15.239(c) requirement, see test data 4.2.2.. Because of the highest fundamental level is 39.60dB μ v, which is subject to the general radiated emission limits in § 15.209. so the field strength of any emissions radiated on any frequency outside of the specified 200kHz band is also subject to the general radiated emission limits in § 15.209.

4.4. Bandwith Test

4.4.1 Test Standard:

FCC Part 15: 2005, Subpart C (Section: 15.215(c)):

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of –band operation.

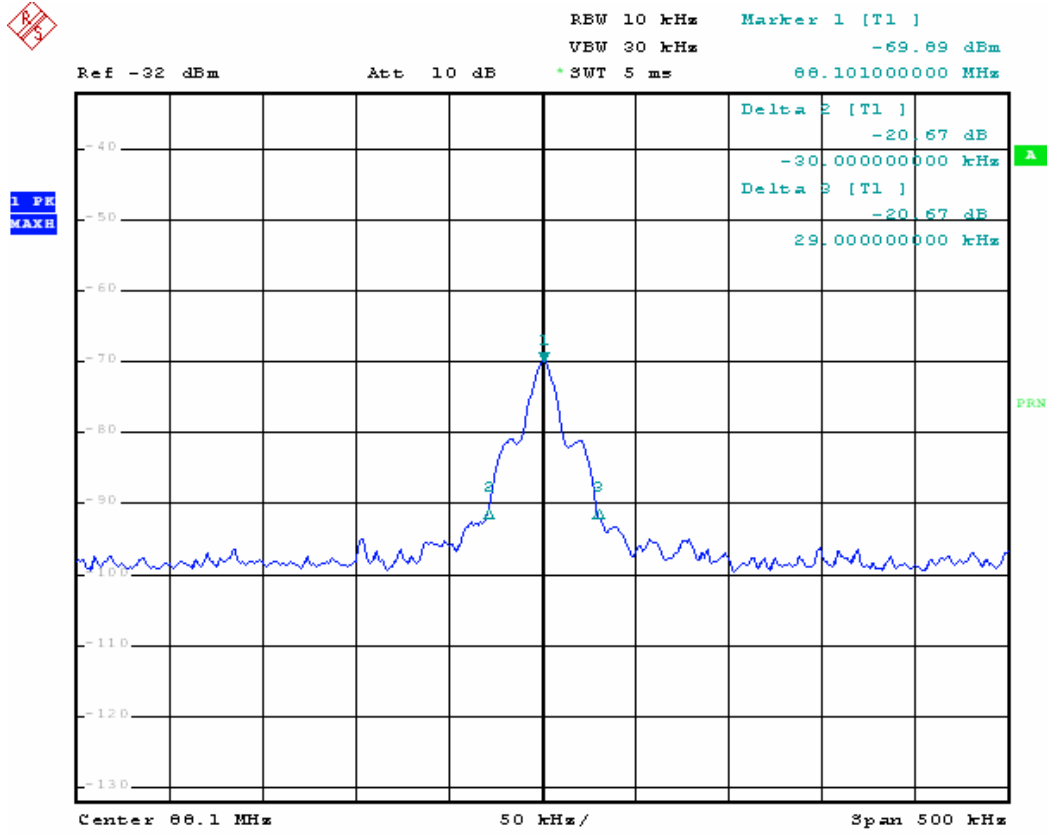
4.4.2. Test result

| Fundamental Frequency (MHz) | Frequency error Down 20dB level(KHz) | | Actual Bandwidth (KHz) | Bandwidth limit (KHz) | Result Pass/ Fail |
|-----------------------------|--------------------------------------|----|------------------------|-----------------------|-------------------|
| 88.10 | Left | 30 | 59 | 200 | Pass |
| | Right | 29 | | | |
| 107.9 | Left | 39 | 82 | 200 | Pass |
| | Right | 43 | | | |

4.4.3. The plot of test result is attached as below:

EUT input an audio signal of music, and the CD player were turned up the highest volume. Test bandwidth is 82 KHz, is subject to the 200 KHz bandwidth requirment.

4.3.3.1. Frequency: 88.1MHz



4.3.3.2. Frequency: 107.9MHz

