# **FCC TEST REPORT**

#### for

#### 47 CFR Part 24E

**Equipment**: Broad Band Repeater

Trade Name : Coiler
Model No. : TX-1900

FCC ID : UG8C-2024-19

Uplink Frequency Range : PCS : 1850.2~1909.8MHz

Downlink Frequency Range PCS : 1930.2~1989.8MHz

Max. EIRP Power : PCS : 0.00785W

Emission Designator : 300 KGXW

Applicant : Coiler Corporation

8F-4, No. 75, Sec. 1, Hsin Tai Wu Road, Hsi-Chih City

Report No.: FG680421

(221), Taipei Hsien, Taiwan

- The test result refers exclusively to the test presented test model / sample.
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- Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsed by NVLAP or any agency of U.S. government.
- The data shown in this test report were carried out on Aug. 24, 2006 at Sporton International Inc. LAB.
- Report No.: FG680421, Report Version: Rev. 01

Roy Wu Deputy Manager

#### SPORTON International Inc.

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

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# History of this test report

Report Issue Date: Aug. 25, 2006

report 1990e Bate. Mag.	20, 2000
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# 1. General Information

## 1.1. Applicant

#### **Coiler Corporation**

8F-4, No. 75, Sec. 1, Hsin Tai Wu Road, Hsi-Chih City (221), Taipei Hsien, Taiwan

#### 1.2. Manufacturer

#### **Coiler Corporation**

8F-4, No. 75, Sec. 1, Hsin Tai Wu Road, Hsi-Chih City (221), Taipei Hsien, Taiwan

#### 1.3. Basic Description of Equipment under Test

Equipment : Broad Band Repeater

Trade Name : Coiler Model No. : TX-1900

AC Power Cord : AC 120V, 1.8 meter, 3 pin

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# 1.2 Feature of Equipment under Test

DUT Type :	Broad Band Repeater	
Trade Name :	Coiler	
Model Name :	TX-1900	
FCC ID :	UG8C-2024-19	
Support Band :	GSM 1900	
Uplink Frequency :	1850.2-1909.8 MHz.	
Downlink Frequency :	1930.2-1989.8 MHz	
Antenna Type :	Internal Panel Antenna (Gain: 2 dBi) External Panel Antenna (Gain: 9 dBi)	
Maximum Output Power to Antenna :	6.95 dBm	
Maximum EIRP :	0.00785 W ( 8.95 dBm)	
Power Rating (DC/AC Voltage) :	9V / 900mA	
Digital Modulation Emission :	GMSK	
Type of Emission :	300 KGXW	
DUT Stage :	Production Unit	

# 1.3 Report Date

EUT Received : Aug. 04, 2006 Report Date : Aug. 25, 2006

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# 2. Test Configuration of Equipment under Test

#### 2.1 Test Manner

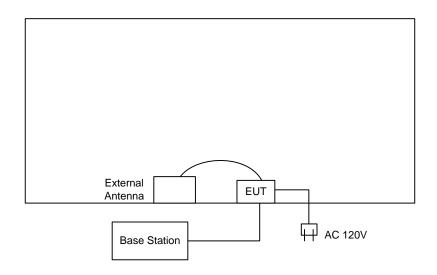
- a. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.
- b. During all testings, EUT is in link mode at maximum power level.
- c. Frequency range investigated: radiated emission 30MHz to 18000 MHz for PCS.

#### 2.2 Test Mode

Application	PCS
Radiated Emission	
	☑ Mode 2: PCS 1880MHz Uplink Mode
	☑ Mode 3: PCS 1909.8MHz Uplink Mode
Conducted Measurement	
	☑ Mode 2: PCS 1880MHz Uplink Mode

# 2.3 Connection Diagram of Test System

#### <Mode 1~3>



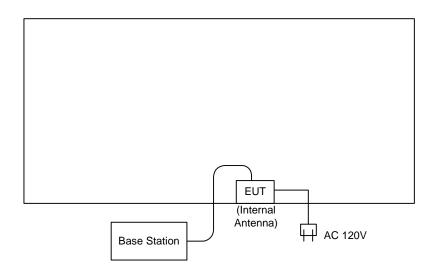
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<Mode 4~6>



# 2.4 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	Power Cord
1.	Base Station	R&S	CMU200	AC 100-240V

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#### 3. General Information of Test Site

Test Site Location: No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,

Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

TEL: 886-3-327-3456 FAX: 886-3-318-0055

Test Site No : 03CH06-HY

The chamber meets the characteristics of ANSI C63.4-2003. This site is on file with the FCC. The Industry Canada file number for this site is IC 4088.

#### 3.1 Test Voltage

120V / 60Hz

#### 3.2 Test in Compliance with

47 CFR Part 24E

### 3.3 Frequency Range Investigated

a. Radiation: from 30 MHz to 18000 MHz for PCS.

#### 3.4 Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.

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# 4. Test Data and Test Result

#### 4.1 List of Measurements and Examinations

FCC Rule	FCC Rule DESCRIPTION OF TEST		Section
§2.1046	§2.1046 RF Output Power		4.2
§2.1049, Occupied Bandwidth & Band Edge § 24.238(b) Measurement		Passed	4.4
§2.1051	Conducted Emission & Out of Band Rejection:Filter Frequency response & Intermodulation	Passed	4.5
§2.1053	Field Strength of Spurious Radiation	Passed	4.6

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#### 4.2 RF Output Power

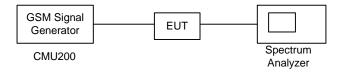
#### 4.2.1 Measurement Instruments:

As described in chapter 5 of this test report.

#### 4.2.2 Test Procedure:

- 1. The EUT was respectively connected to the specturm analyzer and the GSM signal genetator.
- 2. Set the EUT maximum gain condition.
- 3. Varied the input power from the GSM signal genetator, and the maximum output power was recorded.
- 4. Repeatedly tested the low, middle, high channels for uplink and downlink modes .

#### 4.2.3 Test Setup Layout:



#### 4.2.4 Test Result:

Bands	Frequency (MHz)	Input Power (dBm)	Conducted Power (dBm)	Conducted Power (Watts)
	1850.2 (Low)	-34.2	6.95	0.0050
	1880.0 (Mid)	-35.8	6.91	0.0049
PCS 1900	1909.8 (High)	-29.6	6.91	0.0049
1 00 1000	1930.2(Low)	-34.0	6.95	0.0050
	1960.0(Mid)	-38.9	6.96	0.0050
	1989.8(High)	-39.0	6.83	0.0048

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#### 4.3 Occupied Bandwidth and Band Edge Measurement

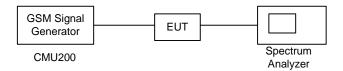
#### 4.3.1 Measurement Instruments

As described in chapter 5 of this test report.

#### 4.3.2 Test Procedure

- 1. The EUT was respectively connected to the specturm analyzer and the GSM signal genetator.
- 2. Set the EUT maximum gain condition.
- 3. Varied the input power from the GSM signal genetator, and the maximum output power reached.
- 4. The occupied bandwidth of middle channel was measured.
- 5. The bandedge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.

#### 4.3.3 Test Setup Layout



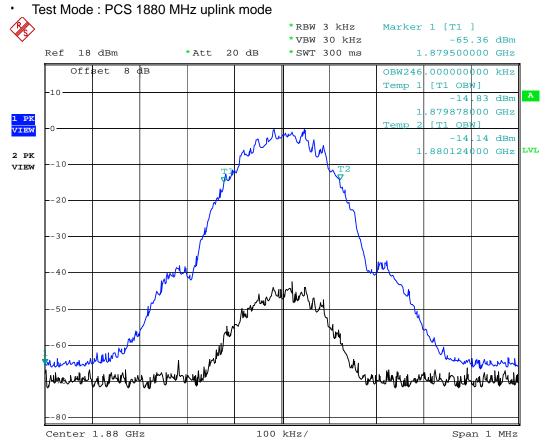
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# 4.3.4 99% Occupid Bandwidth Test Result



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## Test Mode: PCS 1960 MHz downlink mode \*RBW 3 kHz Marker 1 [T1 ] \*VBW 30 kHz -67.07 dBm \*Att 20 dB \*SWT 300 ms 1.959500000 GHz Offset OBW244.000000000 kHz [T1 OBW] -10--14.70 dBm .959880000 GHz 1 PK [T1 OBW] VIEW -15.48 dBm 1.960124000 GHz -20--40 -50

100 kHz/

Date: 25.AUG.2006 19:41:00

Center 1.96 GHz

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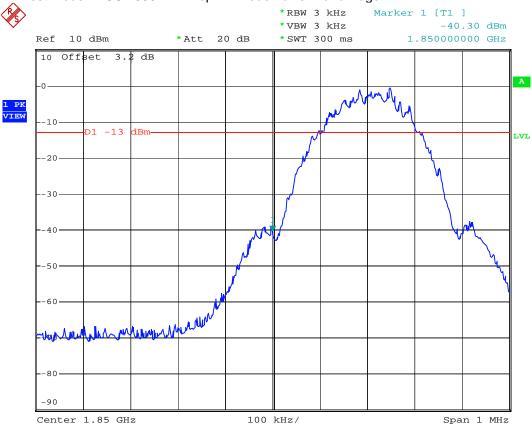
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# 4.3.5 Band Edge Test Result

Test Mode : PCS 1850.2MHz uplink mode Lower Band Edge



Date: 10.AUG.2006 19:36:53

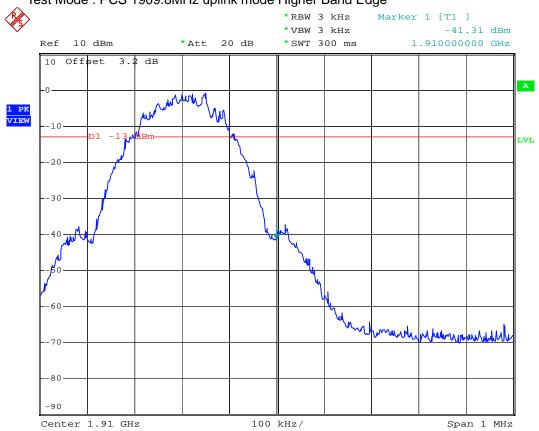
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Test Mode : PCS 1909.8MHz uplink mode Higher Band Edge

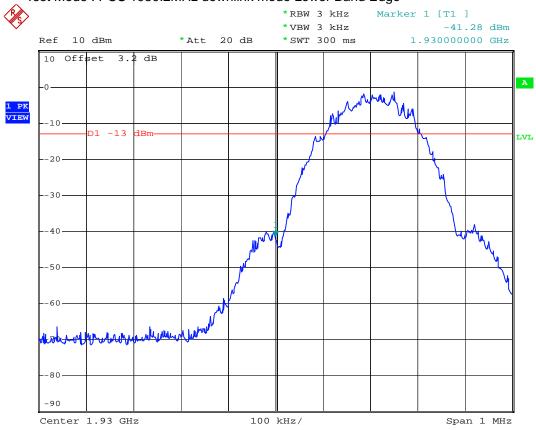


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TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

Test Mode: PCS 1930.2MHz downlink mode Lower Band Edge



Date: 10.AUG.2006 18:15:17

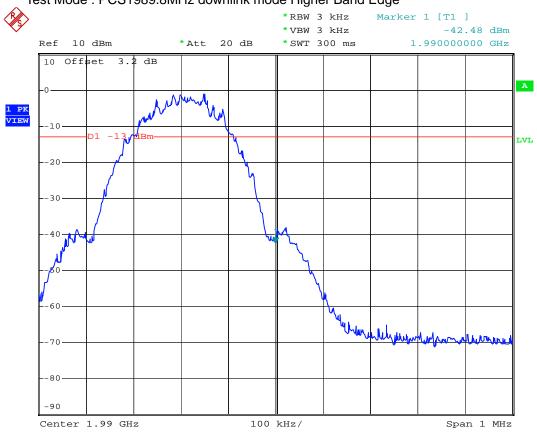
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• Test Mode: PCS1989.8MHz downlink mode Higher Band Edge



Date: 10.AUG.2006 18:17:15

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# 4.4 Conducted Emission & Out of Band Rejection: Filter Frequency response & Intermodulation

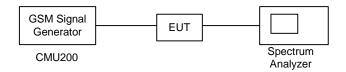
#### 4.4.1 Measurement Instruments

As described in chapter 5 of this test report.

#### 4.4.2 Test Procedure (For Conducted Emission)

- 1. The EUT was respectively connected to the specturm analyzer and the GSM signal genetator.
- 2. Set the EUT maximum gain condition.
- 3. Varied the input power from the GSM signal genetator, and the maximum output power reached.
- 4. The middle channel for the highest RF power within the transmitting frequency was measured.
- 5. The conducted spurious emission for the whole frequency range was taken.

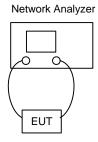
#### 4.4.3 Test Setup Layout



#### 4.4.4 Test Procedure (For Out of Band Rejection)

- 1. The EUT was respectively connected to Network Analyzer's port 1 and prot2.
- 2.Set the EUT maximum gain condition.
- 3. The Out of Band Rejection for the whole authorized frequency band was measured.

#### 4.4.5 Test Setup Layout



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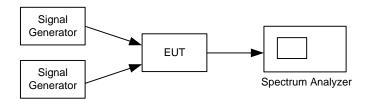
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#### 4.4.6 Test Procedure (For Intermodulation)

- 1. The EUT was connected respectively to the spectrum analyzer and the signal generator (CMU200) which generated a CW and CMDA signal.
- 2. Set the EUT maximum gain and output power.
- 3. Inputed a GSM frequency at 1850.2MHz from CMU200 and a CW frequency at 1850.8MHz (Offsets 600KHz from the 1850.2MHz) from another one.
- 4. Measured and recorded for the lower band edge at 1850MHz and spurious up to the 10<sup>th</sup> harmonics.
- 5. Measured and recorded for the upper band edge at 1910MHz and spurious up to the 10<sup>th</sup> harmonics.
- 6. Repeatedly measured above steps for GSM and CDMA.

#### 4.4.7 Test Setup Layout



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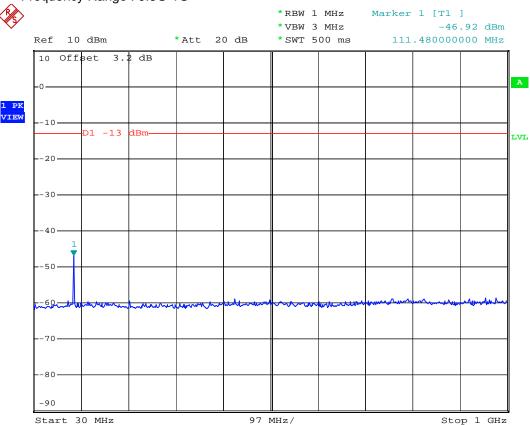
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#### 4.4.8 Test Result

#### 4.4.8.1 Conducted Emission

Test Mode : PCS 1850.2 MHz uplink mode

Frequency Range: 0.3G-1G



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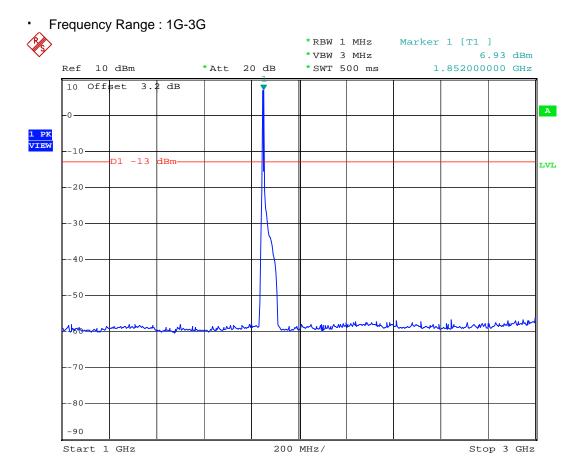
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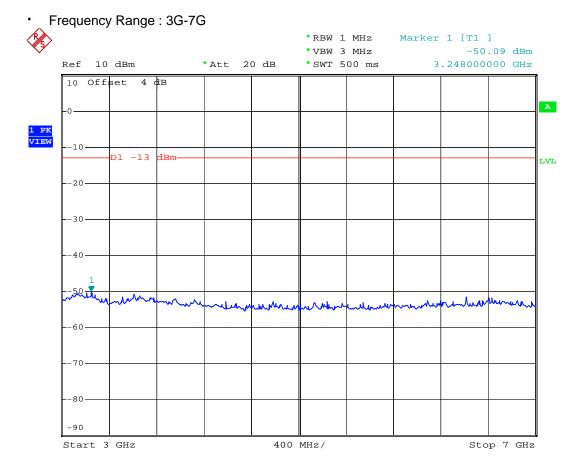
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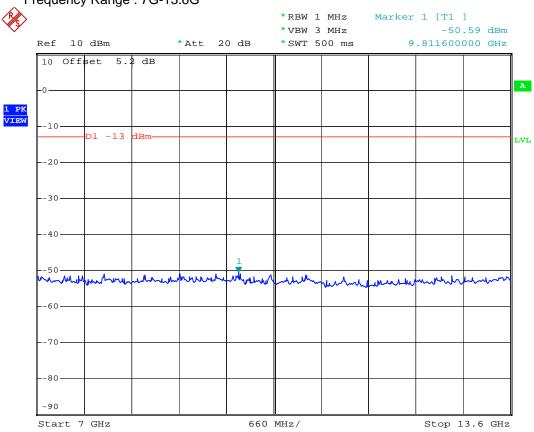
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Frequency Range : 7G-13.6G



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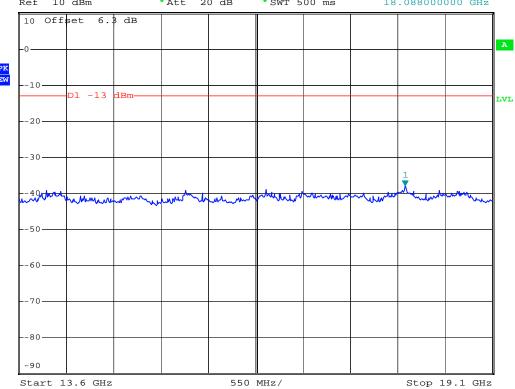
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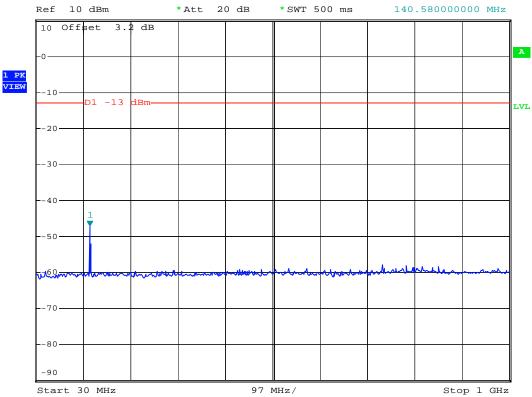
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Test Mode : PCS 1880 MHz uplink modeFrequency Range : 0.3G-1G





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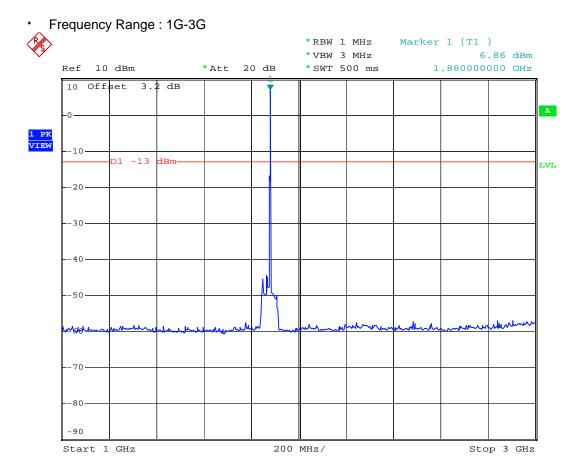
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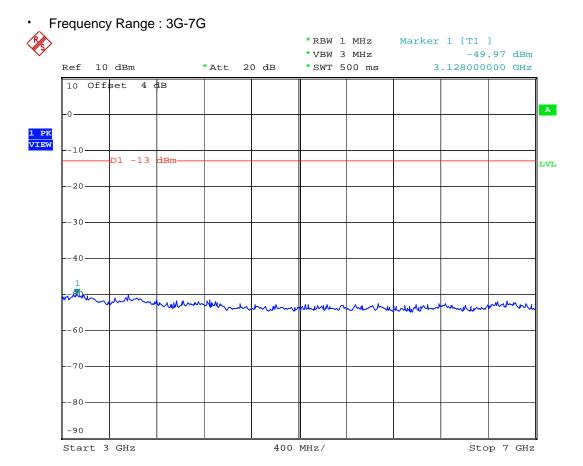
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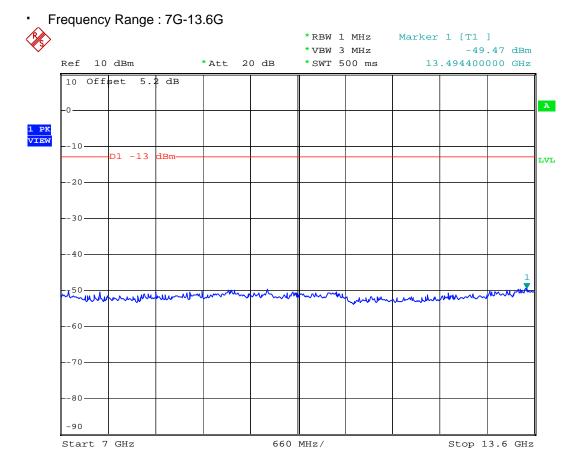
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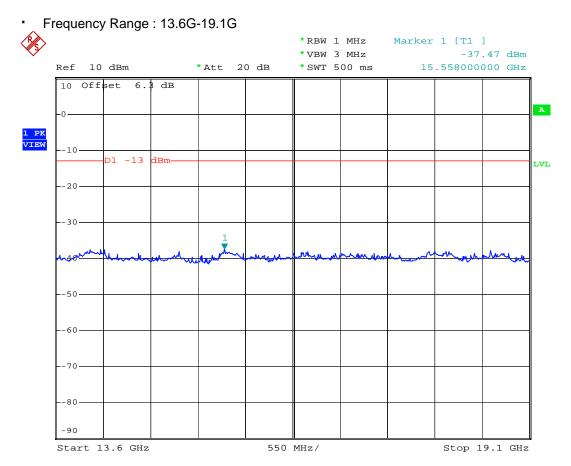
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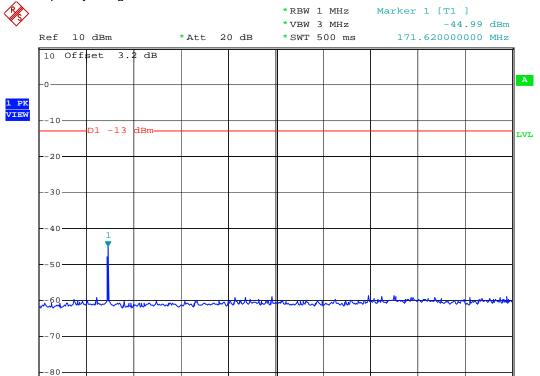
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Test Mode : PCS 1909.8 MHz uplink mode

• Frequency Range: 0.3G-1G



97 MHz/

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-90

Start 30 MHz

SPORTON International Inc.

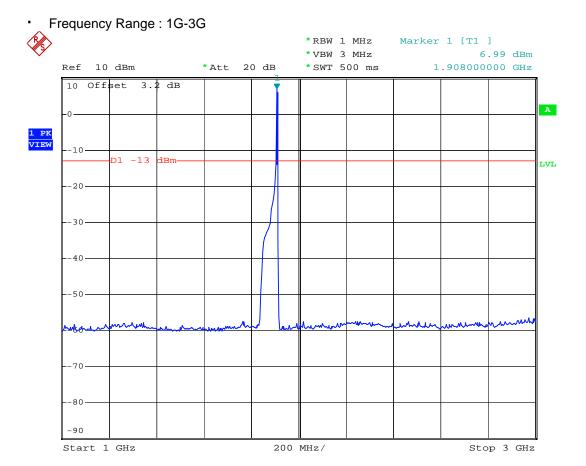
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Stop 1 GHz





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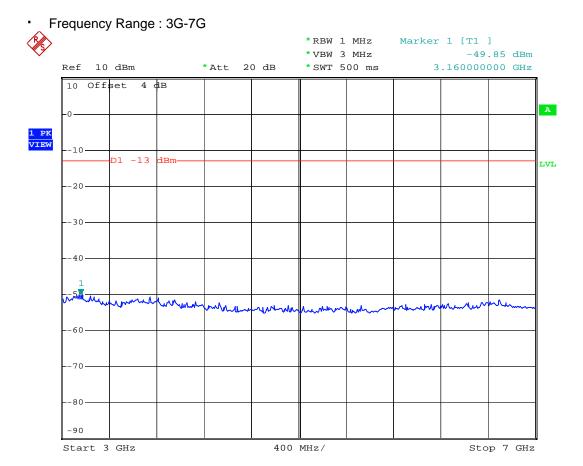
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Report No.: FG680421 FCC TEST REPORT



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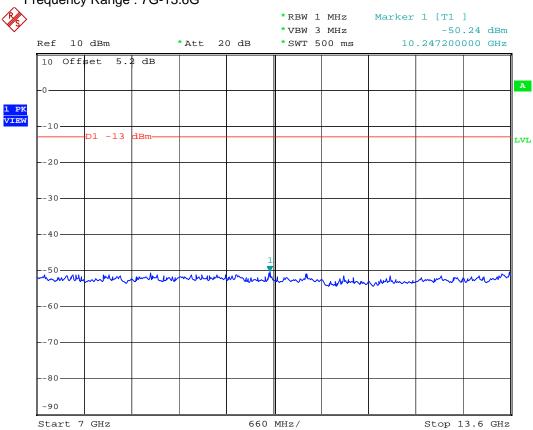
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Frequency Range : 7G-13.6G



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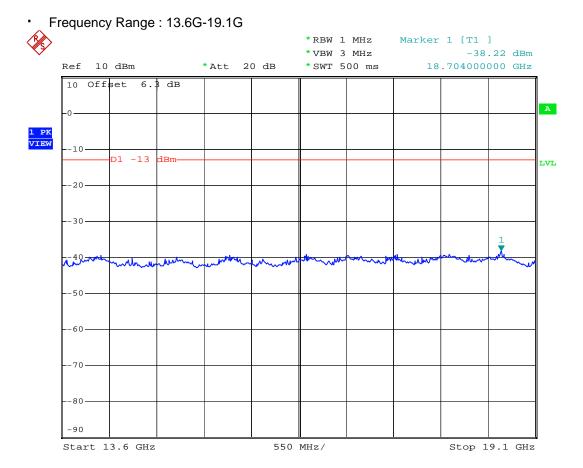
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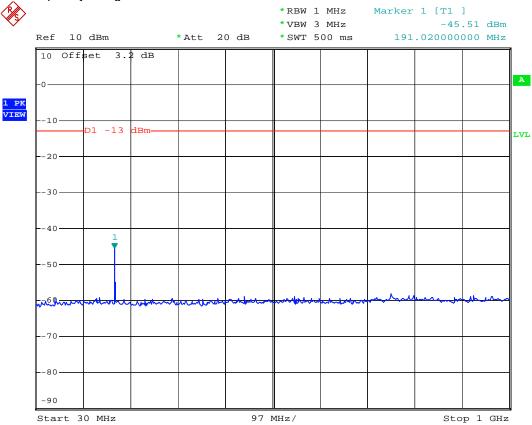
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Test Mode : PCS 1930.2 MHz downlink mode

• Frequency Range: 0.3G-1G



Date: 24.AUG.2006 16:48:20

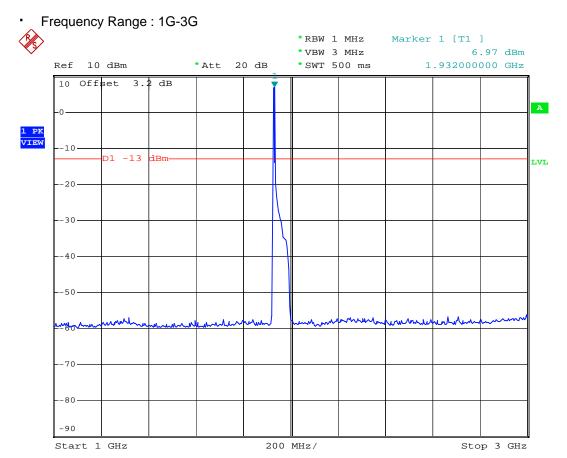
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 24.AUG.2006 16:47:47

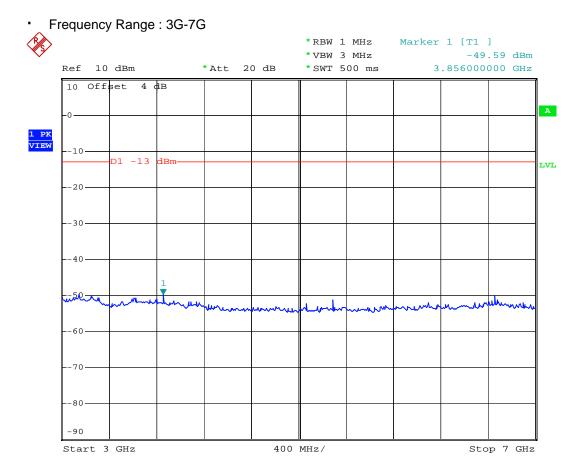
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 24.AUG.2006 16:49:43

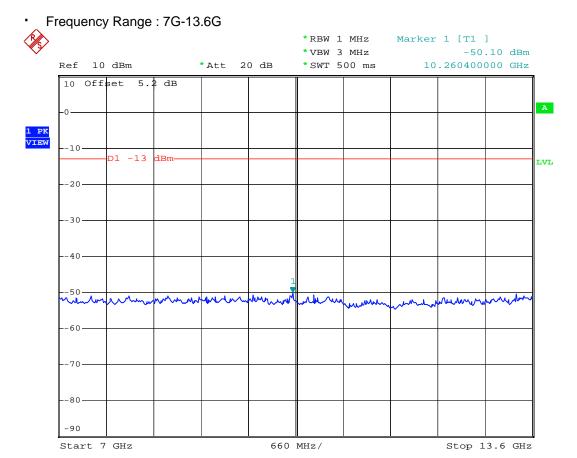
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 24.AUG.2006 16:50:36

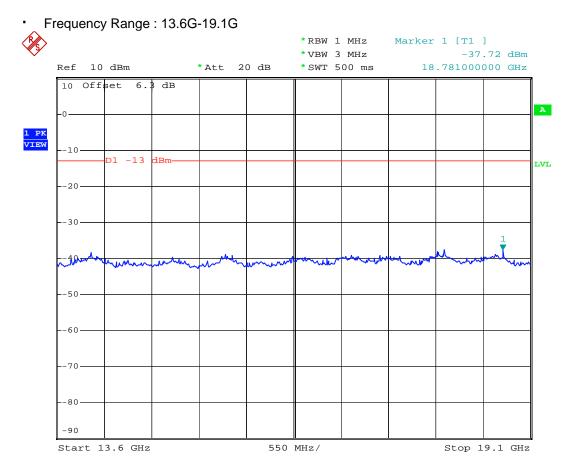
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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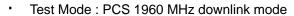
Date: 24.AUG.2006 16:51:25

SPORTON International Inc.

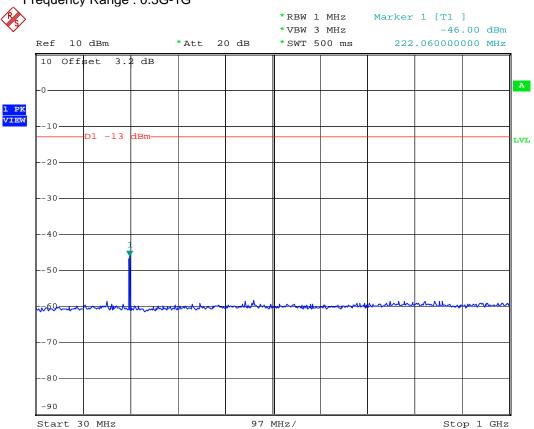
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Frequency Range: 0.3G-1G



Date: 10.AUG.2006 18:36:16

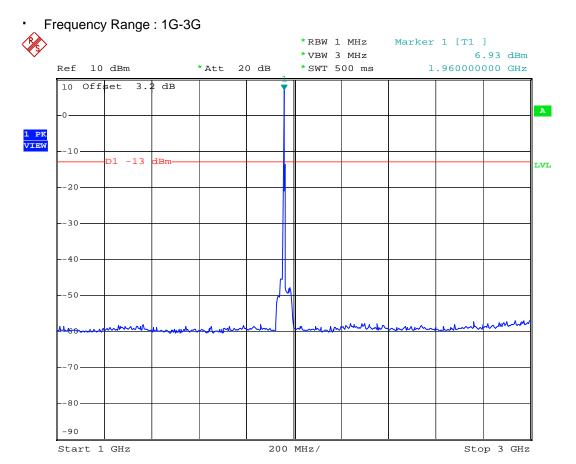
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 10.AUG.2006 18:37:08

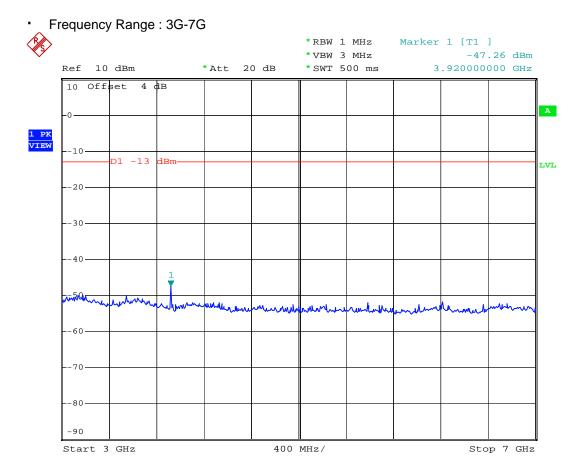
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 10.AUG.2006 18:37:52

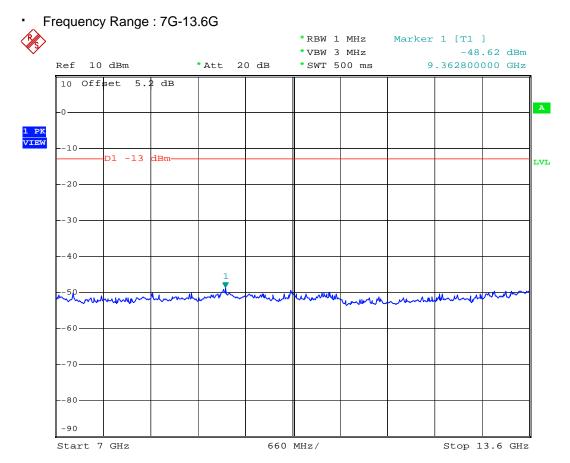
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 10.AUG.2006 18:39:18

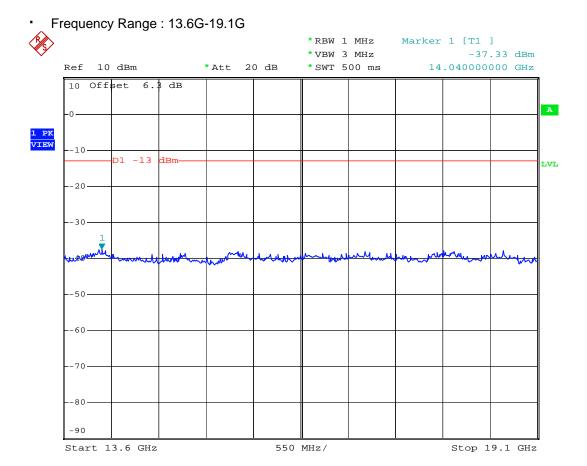
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 10.AUG.2006 18:40:13

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

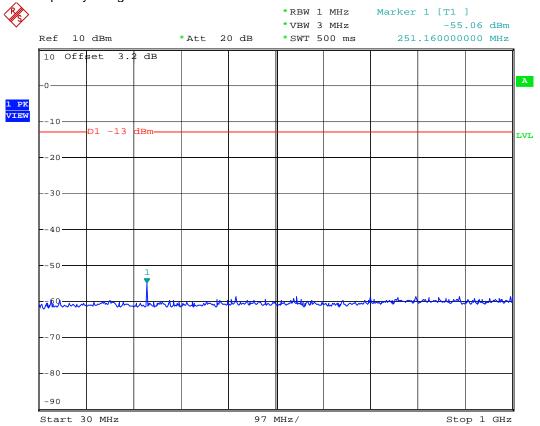
FCC ID : UG8C-2024-19

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Test Mode : PCS 1989.8 MHz downlink mode

• Frequency Range: 0.3G-1G



Date: 24.AUG.2006 16:54:17

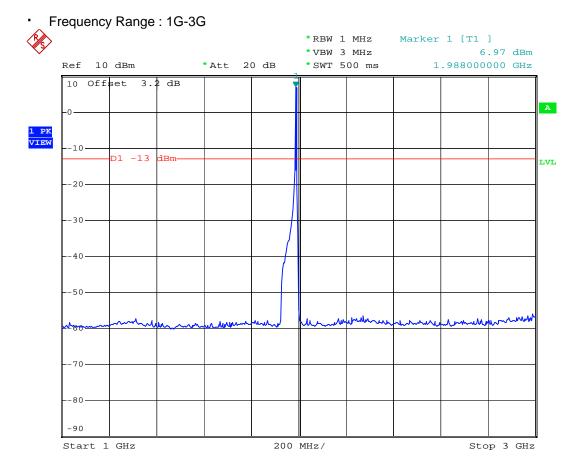
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 24.AUG.2006 16:53:44

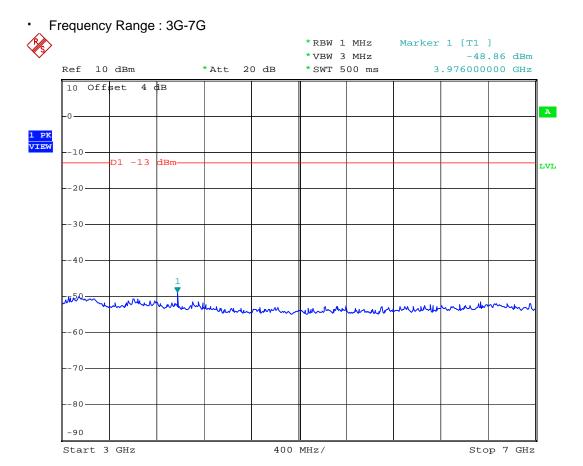
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 24.AUG.2006 17:03:18

SPORTON International Inc.

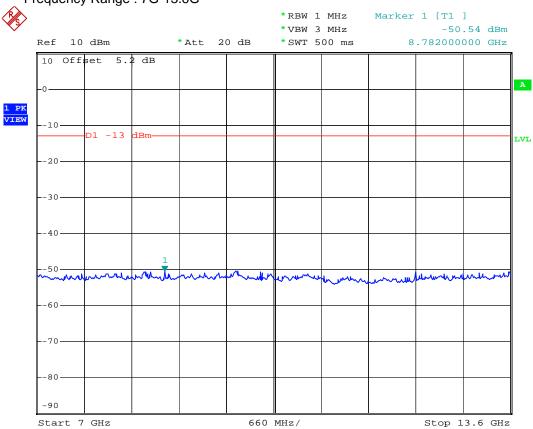
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Frequency Range: 7G-13.6G



Date: 24.AUG.2006 17:04:11

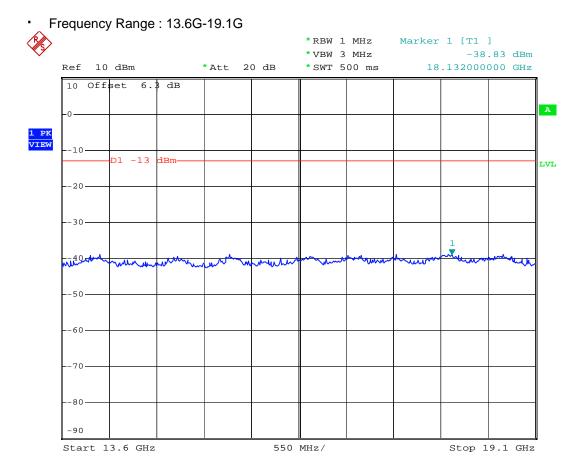
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 24.AUG.2006 16:56:58

SPORTON International Inc.

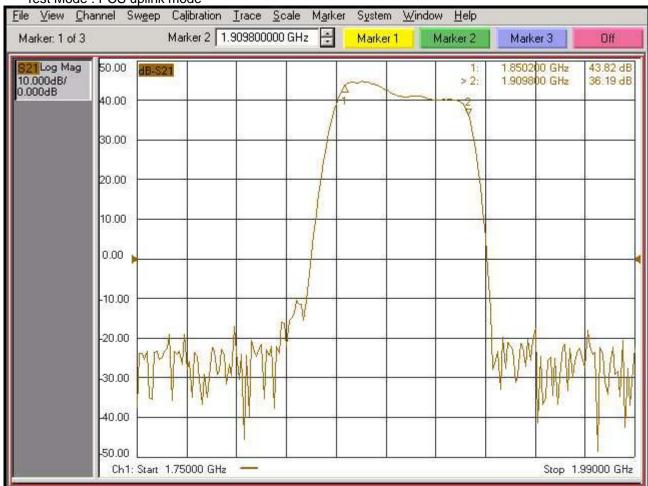
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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## 4.4.8.2 Out of Band Rejection: Filter Frequency response

Test Mode : PCS uplink mode

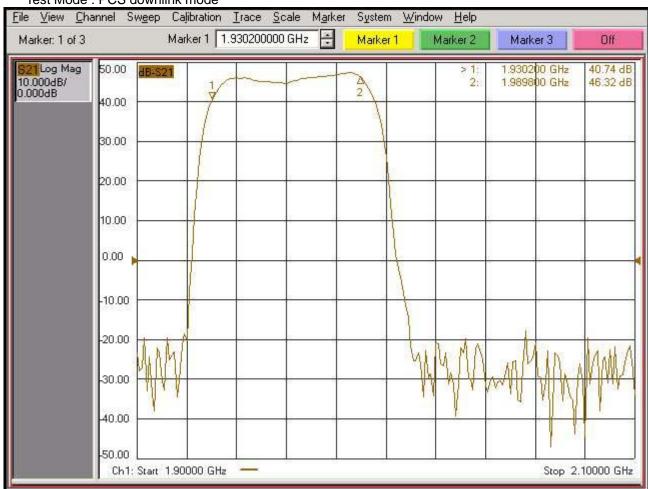


TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Test Mode : PCS downlink mode



TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

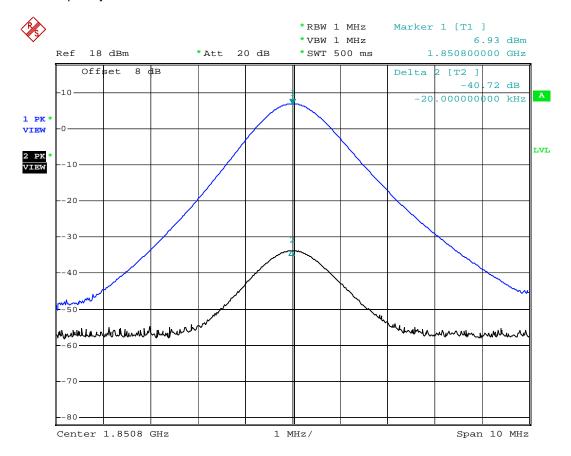
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## 4.4.8.3 Intermodulation

Maximum Output Power for CW signal from EUT.

Test Item: Peak Power

Frequency: PCS 1850.8MHz



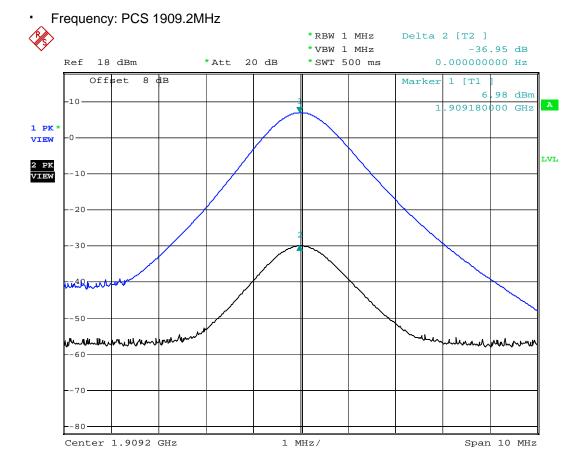
Date: 25.AUG.2006 20:00:41

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 20:02:50

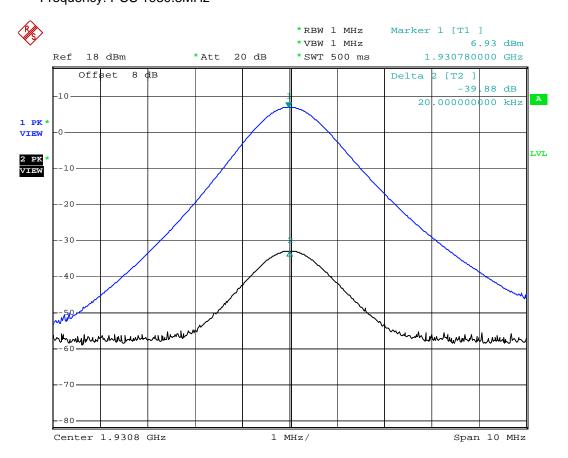
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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• Frequency: PCS 1930.8MHz



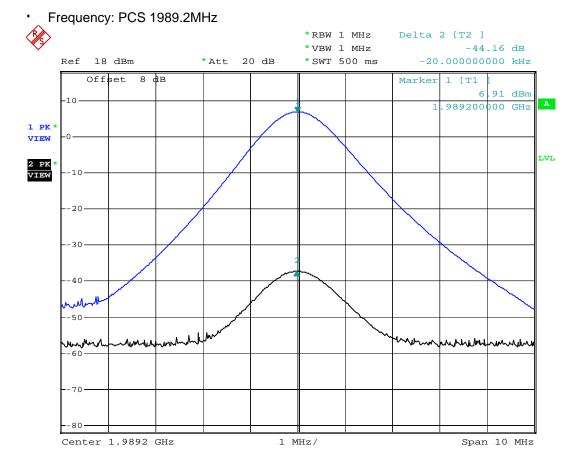
Date: 25.AUG.2006 20:04:43

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 20:07:04

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

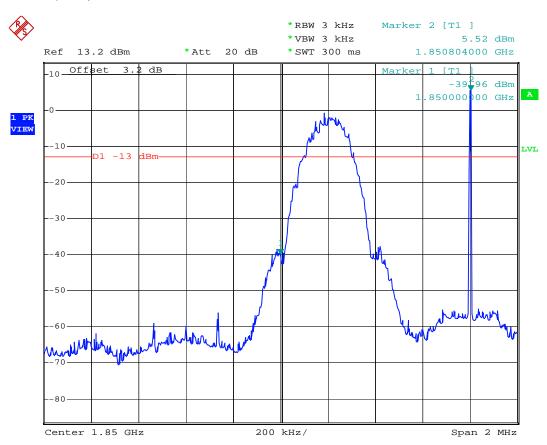
FCC ID : UG8C-2024-19

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Test Item: Band Edge

Frequency: PCS 1850.8MHz



Date: 25.AUG.2006 20:27:03

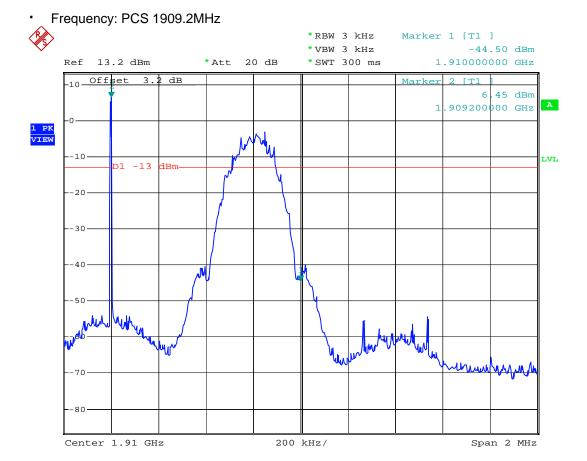
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 20:31:26

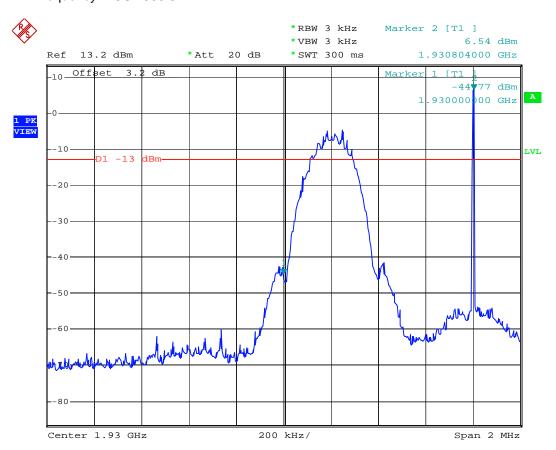
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Frequency: PCS 1930.8MHz



Date: 25.AUG.2006 20:46:47

SPORTON International Inc.

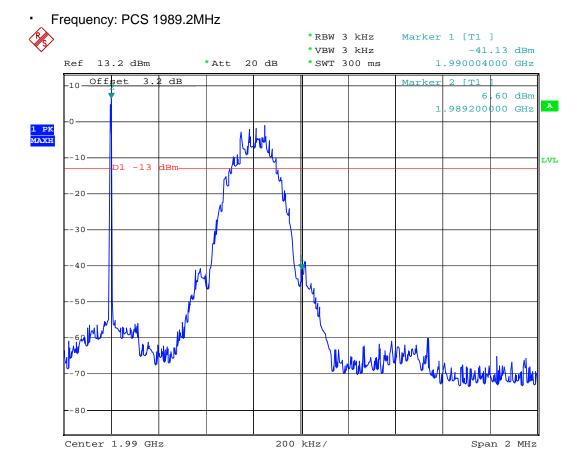
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 20:49:41

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

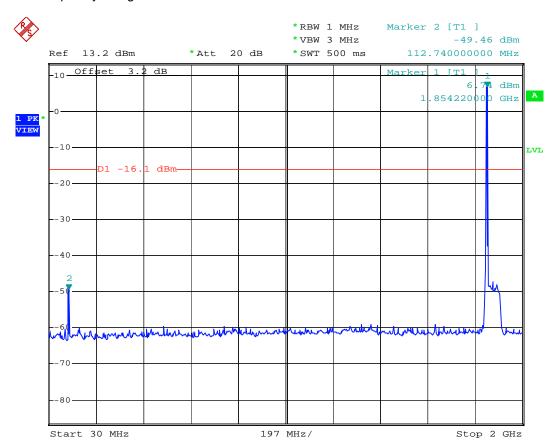
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Test Item: Conducted Spurious

Test Mode: PCS 1850.8MHz Uplink Mode

Frequency Range: 0.3G-2G



Date: 25.AUG.2006 20:39:06

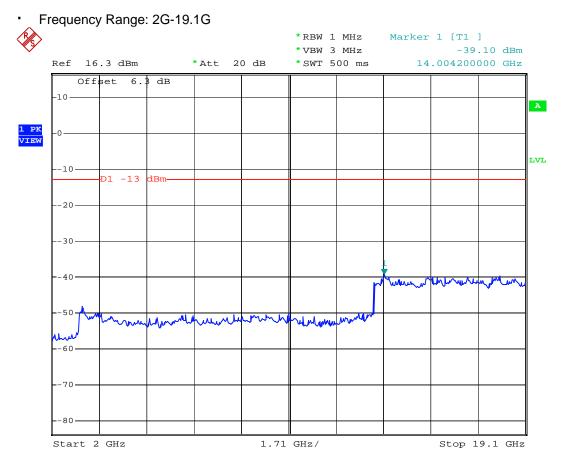
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 25.AUG.2006 20:22:05

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

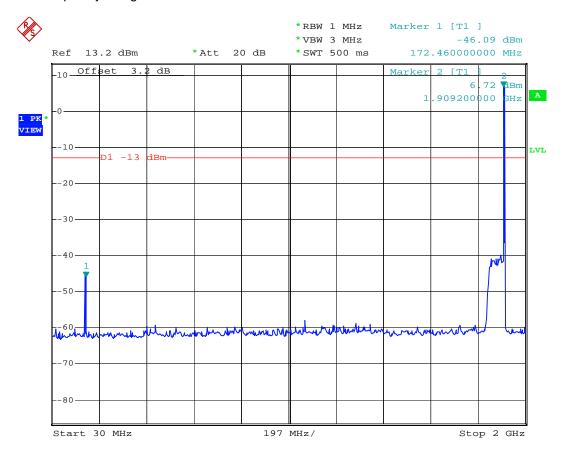
FCC ID : UG8C-2024-19

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Test Mode: PCS 1909.2MHz Uplink Mode

Frequency Range: 0.3G-2G



Date: 25.AUG.2006 20:33:34

SPORTON International Inc.

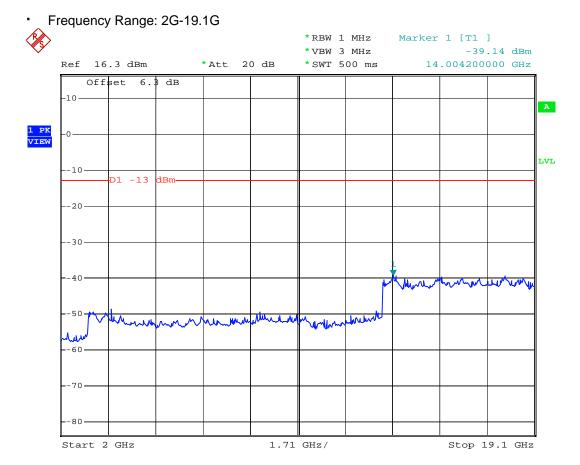
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 25.AUG.2006 20:34:35

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

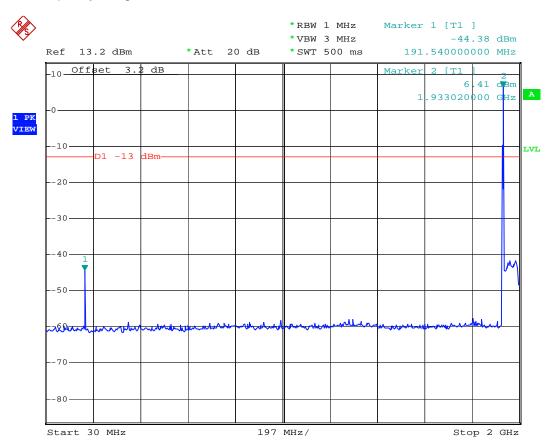
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Test Mode: PCS 1930.8MHz Downlink Mode

Frequency Range: 0.3G-2G



Date: 25.AUG.2006 20:41:27

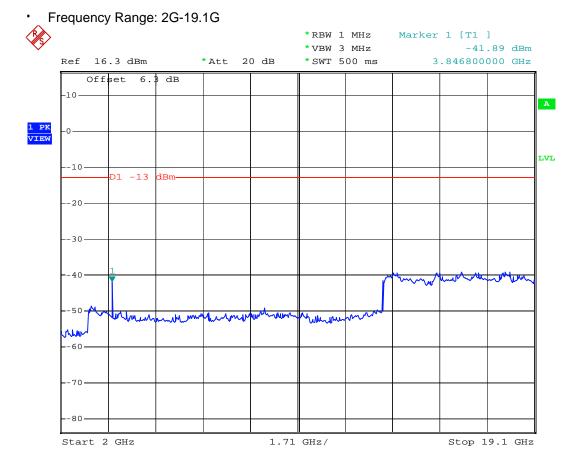
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 25.AUG.2006 20:43:04

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

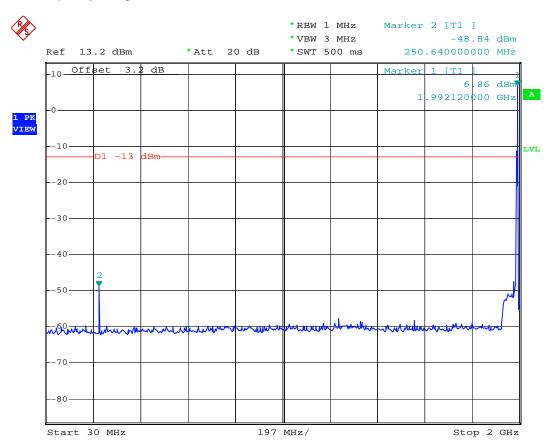
FCC ID : UG8C-2024-19

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Test Mode: PCS 1989.2MHz Downlink Mode

Frequency Range: 0.3G-2G



Date: 25.AUG.2006 20:52:04

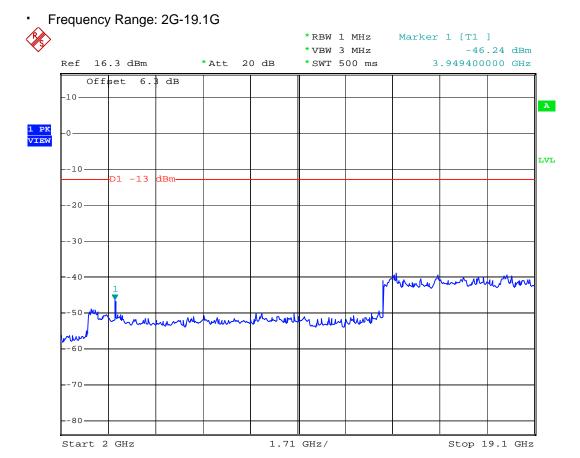
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 20:52:53

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

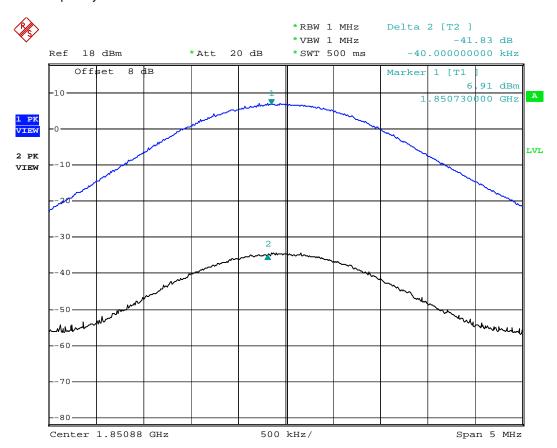
FCC ID : UG8C-2024-19

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Maximum Output Power for CDMA signal from EUT.

Test Item: Peak Power

Frequency: PCS 1850.8MHz



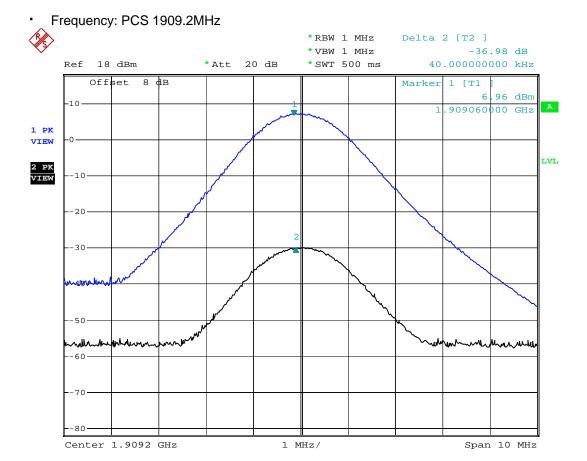
Date: 25.AUG.2006 18:42:27

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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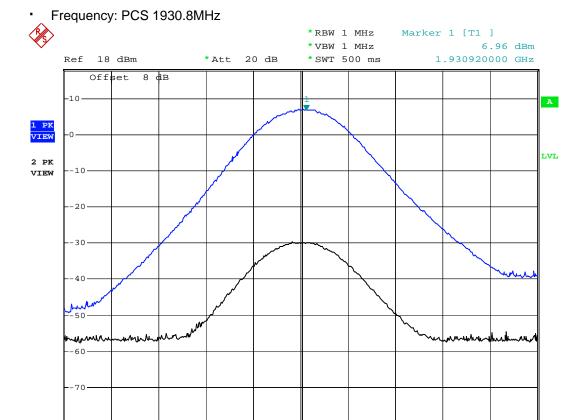
Date: 25.AUG.2006 19:48:19

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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1 MHz/

Date: 25.AUG.2006 19:51:22

Center 1.9308 GHz

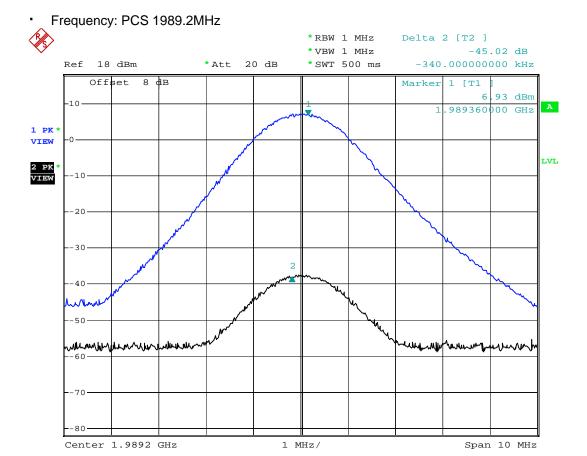
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Span 10 MHz



Date: 25.AUG.2006 19:54:40

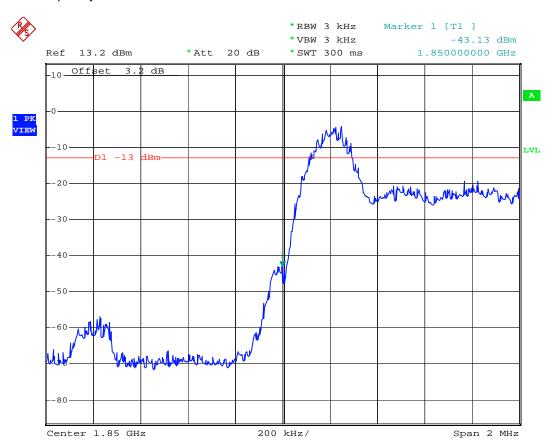
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19



Test Item: Band Edge

Frequency: PCS 1850.8MHz



Date: 25.AUG.2006 21:12:24

SPORTON International Inc.

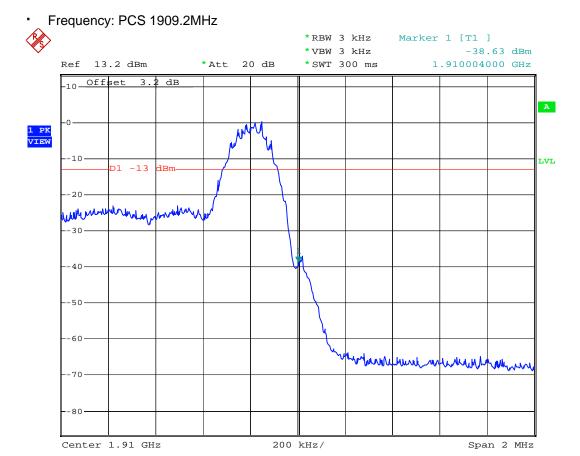
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 21:14:35

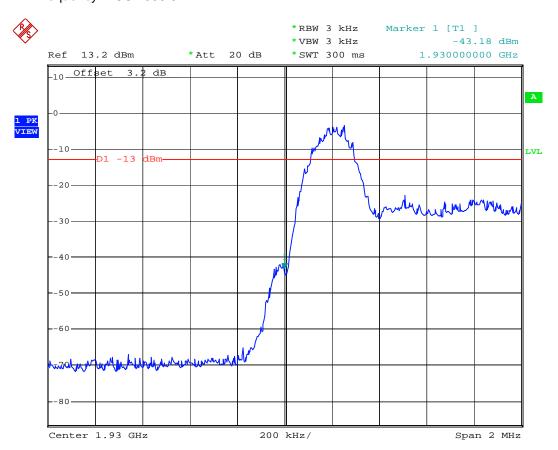
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Frequency: PCS 1930.8MHz



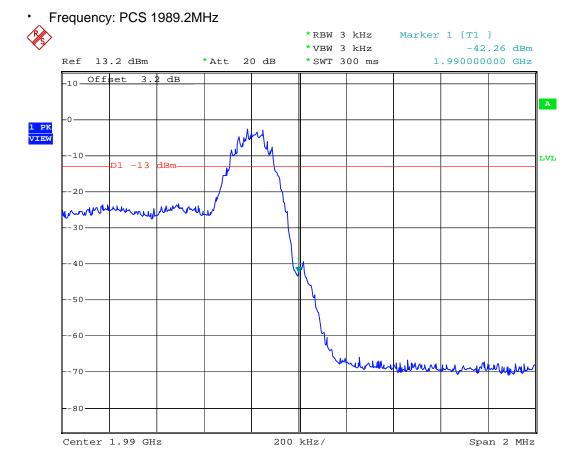
Date: 25.AUG.2006 21:20:52

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

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Date: 25.AUG.2006 21:32:02

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

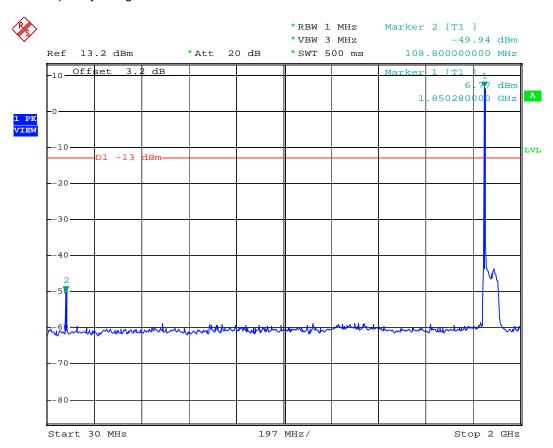
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Test Item: Conducted Spurious

Test Mode: PCS 1850.8MHz Uplink Mode

Frequency Range: 0.3G-2G



Date: 25.AUG.2006 21:09:56

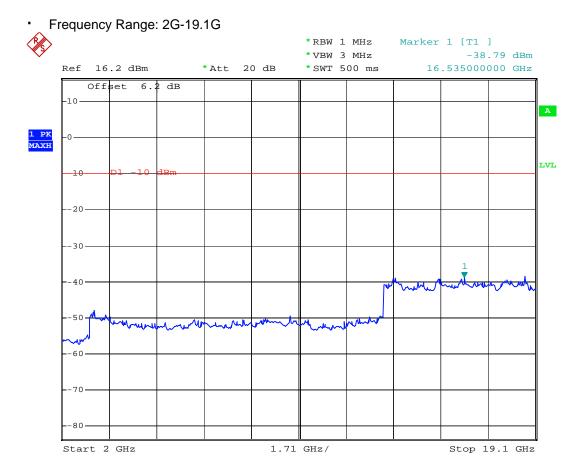
SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 21:10:37

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

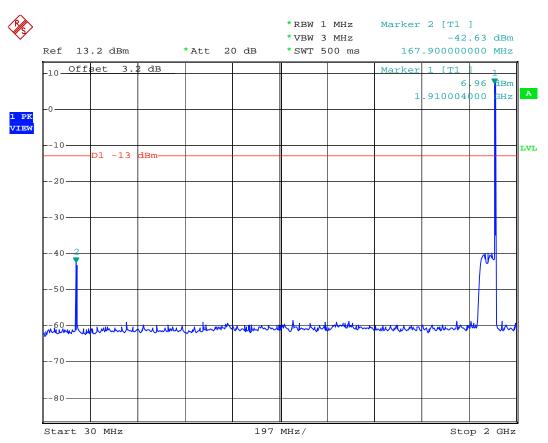
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Test Mode: PCS 1909.2MHz Uplink Mode

Frequency Range: 0.3G-2G



Date: 25.AUG.2006 21:15:54

SPORTON International Inc.

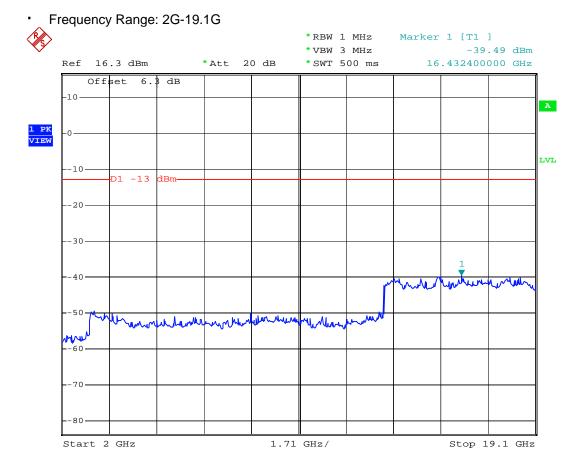
TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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Date: 25.AUG.2006 21:17:09

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

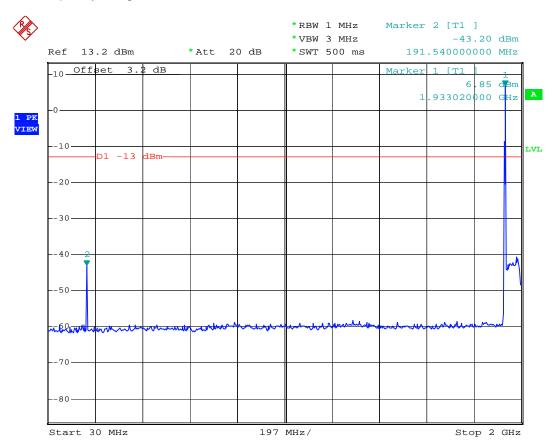
FCC ID : UG8C-2024-19

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Test Mode: PCS 1930.8MHz Downlink Mode

Frequency Range: 0.3G-2G



Date: 25.AUG.2006 21:19:52

SPORTON International Inc.

TEL: 886-2-2696-2468 FAX: 886-2-2696-2255

FCC ID : UG8C-2024-19

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