683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080
Tel: +82-31-321-2664 Fax: +82-31-321-1664
http://www.digitalemc.com

CERTIFICATE OF COMPLIANCE
FCC Part 22, 24 Certification

Dates of Tests: February 02 ~ 09, 2009
Test Report S/N: DR50110903G
Test Site : DIGITAL EMC CO., LTD.

Model No. **R2NSUC-2000**

APPLICANT **EpiValley Co., Ltd.**

Classification	:	**Licensed Portable Transmitter (PCB)**
FCC Rule Part(s)	:	**§22(H), §24(E), §2**
EUT Type	:	**HSUPA USB Modem**
Model name	:	**SUC-2000**
Serial number	:	**Identical prototype**
TX Frequency Range	:	**GSM Cellular Band: 824.2 ~ 848.8 MHz** **GSM PCS Band: 1850.2 ~ 1909.8 MHz** **WCDMA Cellular Band: 826.4 ~ 846.6MHz** **WCDMA PCS Band: 1852.4 ~ 1907.6MHz**
Max. RF Output Power	:	**GSM Cellular Band: 21.61dBm ERP(0.145W)** **GSM PCS Band: 25.20dBm EIRP(0.331W)** **WCDMA Cellular Band: 16.04dBm ERP(0.040W)** **WCDMA PCS Band: 20.24dBm EIRP(0.106W)**
Emission Designators:	:	**GSM Cellular Band: 249KGXW** **GSM PCS Band: 247KGXW** **WCDMA Cellular Band: 4M23F9W** **WCDMA PCS Band: 4M22F9W**
Date of Issue	:	**March 02, 2009**

TABLE OF CONTENTS

MEASUREMENT REPORT

1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

§2.1033 General Information

Applicant: EpiValley Co., Ltd.
Address: Roadland EZ Tower #511, 513, Gumi-dong, Bundang-Gu,
Sungnam-City, Kyunggi-Do, Korea
Attention: Woo Won Choung

- FCC ID: R2NSUC-2000
- Quantity: Quantity production is planned
- Emission Designators: GSM Cellular Band: 249KGXW
  GSM PCS Band: 247KGXW
  WCDMA Cellular Band: 4M23F9W
  WCDMA PCS Band: 4M22F9W
- Freq. Range: GSM Cellular Band: 824.2 ~ 848.8MHz(TX) / 869.2 ~ 893.8MHz(RX)
  GSM PCS Band: 1850.2 ~ 1909.8MHz(TX) / 1930.2 ~ 1989.8MHz(RX)
  WCDMA Cellular Band: 826.4 ~ 846.6MHz(TX) / 871.4 ~ 891.6MHz(RX)
  WCDMA PCS Band: 1852.4 ~ 1907.6MHz(TX) / 1932.4 ~ 1987.6MHz(RX)
- Max. Power Rating: GSM Cellular Band: 21.61dBm
  GSM PCS Band: 25.20dBm
  WCDMA Cellular Band: 16.04dBm
  WCDMA PCS Band: 20.24dBm
- FCC Classification(s): Licensed Portable Transmitter (PCB)
- Equipment (EUT) Type: HSUPA USB Modem
- Mode: GSM / WCDMA
- Frequency Tolerance: ± 0.00025 % (2.5ppm)
- FCC Rule Part(s): §22(H), §24(E), §2
- Dates of Tests: February 02 ~ 09, 2009
- Place of Tests: DIGITAL EMC
- Test Report S/N: DR50110903G

2.1. General Information

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.
Address : 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080
http://www.digitalemc.com E-mail: harveysung@digitalemc.com
Tel: +82-31-321-2664 Fax: +82-31-321-1664

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

Test operator: Engineer

Data	Name	Signature
October 02, 2008	Dong -Chul CHA	

Report Reviewed By: Director

Data	Name	Signature
October 02, 2008	Harvey Sung	

Ordering party:

Company name	:	EpiValley Co., Ltd.
Address	:	Roadland EZ Tower #511, 513, Gumi-dong, Bundang-Gu,
Zipcode	:	463-500
City/town	:	Sungnam-City, Kyunggi-Do
Country	:	Korea
Date of order	:	January 01, 2009

3.1 DESCRIPTION OF TESTS

3.1.1 Occupied Bandwidth Emission Limits

(a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

(b) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(c) The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

3.1.2 Occupied Bandwidth

The 99% power bandwidth was measured with a calibrated spectrum analyzer.

3.1.3 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10^{th} harmonic.

3.1.5 Radiation Spurious and Harmonic Emissions

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna.
The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

3.1 DESCRIPTION OF TESTS (Continued…)

3.1.6 Frequency Stability/Temperature Variation.

The frequency stability of the transmitter is measured by:

a) **Temperature**: The temperature is varied from -30°C to +50°C increments using an environmental chamber.

b) **Primary Supply Voltage**: The primary supply voltage is varied from 85% to 115% of the normal voltage for non hand-carried battery equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification - *The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025(±2.5ppm) of the center frequency.*

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (25°C to 27 °C to provide a reference)

2. The equipment is tuned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10°C intervals ranging from -30°C up to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

3.1 DESCRIPTION OF TESTS (Continued…)

3.1.7 Radiated Emission

Final test was performed according to ANSI C63.4-2003 at the open field test site. There are no deviations from the standard.
The EUT was placed in a 0.8m high table along with the peripherals. The turn table was separated from the antenna distance 3meters. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for maximum.
The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Reported are maximized emission levels.
These tests were performed at 120kHz of 6dB bandwidth.

3.1.8 Conducted Emission

The power line conducted interference measurements were performed according to ANSI C63.4-2003 in a shielded enclosure with peripherals placed on a table, 0.8m high over a metal floor. It was located more than required distance away from the shielded enclosure wall. There are no deviations from the standard.
The EUT was plugged into the LISN and the frequency range of interest scanned.
Reported are maximized emission levels.
These tests were performed at 9kHz of 6dB bandwidth.

3.2 Summary of tests

FCC Part Section(s)	Parameter	Status (note 1)
22.913(a) / 24.232(b), 2.1046	Power Output	C
22.917 / 24.238, 2.1049(h)(i)	Occupied Bandwidth	C
22.917(b) / 24.238(b)	Emission Bandwidth	C
22.917 / 24.238 2.1051	Emission Limits Transmitter	C
2.1053 (a)	Field Strength of Spurious Radiation	C
2.1055	Frequency Stability	C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: **The JBP (Computing device peripheral) portion of this device was tested and approved by FCC DOC procedure.**

The sample was tested according to the following specification:

FCC Parts §22(H), §24(E), §2; ANSI C-63.4-2003

4.1 TEST DATA

4.1.1 Conducted Output Power

A base station simulator(R&S, M/N: CMU200) was used to establish communication with **HSUPA USB Modem.** The base station simulator parameters were set to produce the maximum power from the EUT. The EUT was tested under all configurations and the highest power is reported in WCDMA modes and GSM modes. The GSM and WCDMA conducted powers are reported below respectively.

Band	Mode	GSM Conducted Output Power(dBm)		
		Low Channel	Middle Channel	High Channel
Cellular	GSM	29.9	30.0	30.1
	GPRS 8	29.8	29.9	29.9
	GPRS 10	29.6	29.8	29.8
	GPRS 11	29.6	29.7	29.7
	GPRS 12	29.4	29.6	29.7
PCS	GSM	29.2	29.2	29.1
	GPRS 8	29.1	29.0	28.9
	GPRS 10	28.8	28.8	28.7
	GPRS 11	28.7	28.7	28.5
	GPRS 12	28.6	28.5	28.4

RF Conducted Power Table					
EDGE Data					
Band	Channel	EDGE 8 [dBm]	EDGE 10 [dBm]	EDGE 11 [dBm]	EDGE 12 [dBm]
Cellular	128	25.7	25.6	25.4	25.3
	190	25.7	25.6	25.4	25.3
	251	25.6	25.5	25.2	25.1
PCS	512	25.0	24.9	24.8	24.9
	661	25.2	25.1	25.0	25.0
	810	25.2	25.2	25.1	25.1

3GPP Release Version	Mode	Power (dBm)			MPR	Bc	βd	Bc/βd	Sub-Test
	Channel	4132	4182	4233					
99	*WCDMA*	23.6	22.3	23.6	-	-	-	-	-
6	*HSDPA (Cellular)*	23.4	22.0	23.4	0	2/15	15/15	2/15	1
6		23.3	22.0	23.4	0	12/15	15/15	12/15	2
6		23.4	22.0	23.3	0.5	15/15	8/15	15/8	3
6		23.2	21.9	23.3	0.5	15/15	4/15	15/4	4
-	**Channel**	**9262**	**9400**	**9538**	-	-	-	-	-
99	*WCDMA*	23.0	23.4	23.0	-	-	-	-	-
6	*HSDPA (PCS)*	22.9	23.3	22.8	0	2/15	15/15	2/15	1
6		22.9	23.4	22.9	0	12/15	15/15	12/15	2
6		22.9	23.4	22.9	0.5	15/15	8/15	15/8	3
6		22.9	23.3	22.8	0.5	15/15	4/15	15/4	4

3GPP Release Version	Mode	Power (dBm)			MPR	Bc	βd	Bc/βd	Sub-Test
	Channel	4132	4182	4233					
6	*HSUPA (Cellular)*	22.8	21.8	22.9	0	11/15	15/15	11/15	1
6		20.6	19.3	20.7	2	6/15	15/15	6/15	2
6		21.7	20.4	21.6	1	15/15	9/15	15/9	3
6		20.9	19.7	21.0	2	2/15	15/15	2/15	4
6		22.8	21.7	23.0	0	15/15	15/15	15/15	5
-	**Channel**	**9262**	**9400**	**9538**	-	-	-	-	-
6	*HSUPA (PCS)*	22.8	22.8	22.7	0	11/15	15/15	11/15	1
6		20.7	20.9	20.8	2	6/15	15/15	6/15	2
6		21.8	22.0	21.9	1	15/15	9/15	15/9	3
6		21.1	21.3	21.2	2	2/15	15/15	2/15	4
6		22.8	23.0	22.9	0	15/15	15/15	15/15	5

According to above power table, this device was tested following worst case mode.

-Worst case: **GSM Cellular Band - GSM mode**

GSM PCS Band - GSM mode

WCDMA Cellular Band - 12.2Kbps RMC Inactive mode

WCDMA PCS Band - 12.2Kbps RMC Inactive mode

4.1.2 Effective Radiated Power Output

A. POWER: **High (Cellular Band)**

Mode	Freq. Tuned (MHz)	REF. LEVEL (dBm)	POL (H/V)	ERP (dBm)	ERP (W)	Supplied Power	Note
GSM	**824.20**	**-16.45**	**HOR**	**21.61**	**0.145**	**DC 5V**	
	836.60	-17.12	HOR	21.32	0.136	DC 5V	-
	848.80	-18.08	HOR	20.76	0.119	DC 5V	-
WCDMA	**826.40**	**-21.54**	**HOR**	**16.04**	**0.040**	**DC 5V**	-
	836.40	-24.73	HOR	14.75	0.029	DC 5V	-
	846.60	-23.00	HOR	15.41	0.035	DC 5V	-

B. POWER: **High (PCS Band)**

Mode	Freq. Tuned (MHz)	REF. LEVEL (dBm)	POL (H/V)	EIRP (dBm)	EIRP (W)	Supplied Power	Note
GSM	1850.20	-16.70	HOR	24.02	0.252	DC 5V	-
	1880.00	**-16.37**	**HOR**	**25.20**	**0.331**	**DC 5V**	-
	1909.80	-16.49	HOR	24.97	0.314	DC 5V	-
WCDMA	1852.40	-22.81	HOR	18.98	0.079	DC 5V	-
	1880.00	**-21.51**	**HOR**	**20.24**	**0.106**	**DC 5V**	-
	1907.60	-21.60	HOR	19.60	0.091	DC 5V	-

NOTES:

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole antenna or horn antenna was substituted in place of the EUT. This antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole antenna or horn antenna is measured. The ERP or EIRP is recorded.

4.1.3 Radiated Measurements

Field Strength of SPURIOUS Radiation

TEST MODE : GSM
OPERATING FREQUENCY : 824.2 MHz
CHANNEL : 128(Low)
MEASURED OUTPUT POWER : 21.61 dBm = 0.145 W
MODULATION SIGNAL : GSM (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 34.61 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
1648.40	-45.03	5.88	-39.15	H	60.76
1648.40	-45.39	5.88	-39.51	V	61.12
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : GSM
OPERATING FREQUENCY : 836.6 MHz
CHANNEL : 190(Mid)
MEASURED OUTPUT POWER : 21.32 dBm = 0.136 W
MODULATION SIGNAL : GSM (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 34.32 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1673.20	-48.10	5.95	-42.15	H	63.47
1673.20	-49.06	5.95	-43.11	V	64.43
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : GSM
OPERATING FREQUENCY : 848.8 MHz
CHANNEL : 251(High)
MEASURED OUTPUT POWER : 20.76 dBm = 0.119 W
MODULATION SIGNAL : GSM (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 33.76 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1697.60	-47.87	6.02	-41.85	H	62.61
1697.60	-50.01	6.02	-43.99	V	64.75
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : WCDMA

OPERATING FREQUENCY : 826.4 MHz

CHANNEL : 4132(Low)

MEASURED OUTPUT POWER : 16.04 dBm = 0.040 W

MODULATION SIGNAL : WCDMA (Internal)

DISTANCE : 3 meters

LIMIT : 43 + 10 $\log_{10}$ (W) = 29.04 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
1652.80	-48.42	5.89	-42.53	H	58.57
1652.80	-47.23	5.89	-41.34	V	57.38
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : WCDMA
OPERATING FREQUENCY : 836.4 MHz
CHANNEL : 4182(Mid)
MEASURED OUTPUT POWER : 14.75 dBm = 0.030 W
MODULATION SIGNAL : WCDMA (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 27.75 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
1672.80	-51.59	5.95	-45.64	H	60.39
1672.80	-51.33	5.95	-45.38	V	60.13
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : WCDMA
OPERATING FREQUENCY : 846.6 MHz
CHANNEL : 4233(High)
MEASURED OUTPUT POWER : 15.41 dBm = 0.035 W
MODULATION SIGNAL : WCDMA (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 28.41 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
1693.20	-50.33	6.01	-44.32	H	59.73
1693.20	-51.22	6.01	-45.21	V	60.62
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : GSM
OPERATING FREQUENCY : 1850.2 MHz
CHANNEL : 512(Low)
MEASURED OUTPUT POWER : 24.02 dBm = 0.252 W
MODULATION SIGNAL : GSM (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 37.02 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3700.40	-49.23	9.54	-39.69	H	63.71
3700.40	-48.07	9.54	-38.53	V	62.55
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : GSM
OPERATING FREQUENCY : 1880.0 MHz
CHANNEL : 661(Mid)
MEASURED OUTPUT POWER : 25.20 dBm = 0.331 W
MODULATION SIGNAL : GSM (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 38.20 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-49.02	9.54	-39.48	H	64.68
3760.00	-48.12	9.54	-38.58	V	63.78
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : GSM
OPERATING FREQUENCY : 1909.8 MHz
CHANNEL : 810(High)
MEASURED OUTPUT POWER : 24.97 dBm = 0.314 W
MODULATION SIGNAL : GSM (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 37.97 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBi)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
3819.60	-48.93	9.54	-39.39	H	64.36
3819.60	-49.04	9.54	-39.50	V	64.47
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : WCDMA

OPERATING FREQUENCY : 1852.4 MHz

CHANNEL : 9262(Low)

MEASURED OUTPUT POWER : 18.98 dBm = 0.079 W

MODULATION SIGNAL : WCDMA (Internal)

DISTANCE : 3 meters

LIMIT : 43 + 10 $\log_{10}$ (W) = 31.98 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBi)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
3704.80	-49.08	9.54	-39.54	H	58.52
3704.80	-48.22	9.54	-38.68	V	57.66
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : WCDMA

OPERATING FREQUENCY : 1880.00 MHz

CHANNEL : 9400(Mid)

MEASURED OUTPUT POWER : 20.24 dBm = 0.106 W

MODULATION SIGNAL : WCDMA (Internal)

DISTANCE : 3 meters

LIMIT : 43 + 10 $\log_{10}$ (W) = 33.24 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBi)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
3760.00	-48.44	9.54	-38.90	H	59.14
3760.00	-48.55	9.54	-39.01	V	59.25
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Radiated Measurements (Continued…)

Field Strength of SPURIOUS Radiation

TEST MODE : WCDMA
OPERATING FREQUENCY : 1907.6 MHz
CHANNEL : 9538(High)
MEASURED OUTPUT POWER : 19.60 dBm = 0.091 W
MODULATION SIGNAL : WCDMA (Internal)
DISTANCE : 3 meters
LIMIT : 43 + 10 $\log_{10}$ (W) = 32.60 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3815.20	-49.17	9.54	-39.63	H	59.23
3815.20	-48.28	9.54	-38.74	V	58.34
-	-	-	-	-	-

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.4 Frequency Stability (GSM Cellular Band)

OPERATING FREQUENCY : 836,599,963 Hz

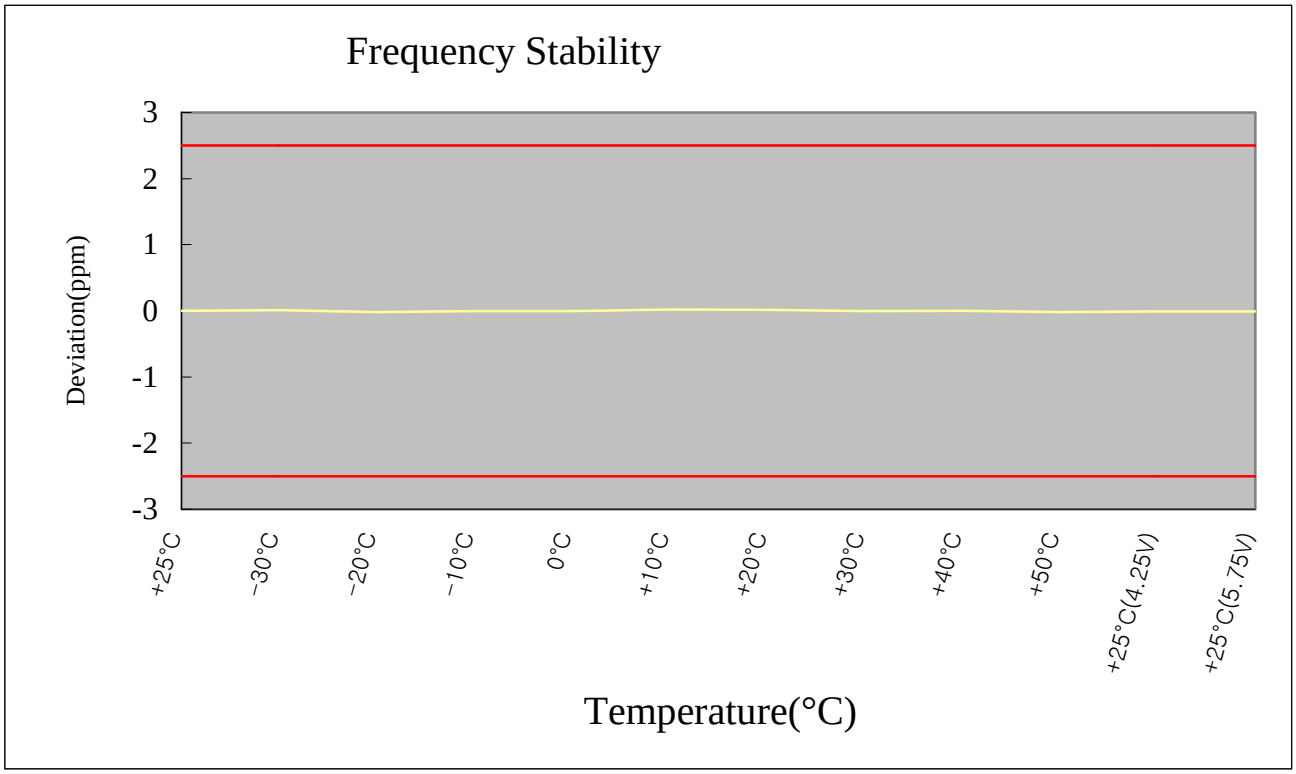
CHANNEL : 0190(Mid)

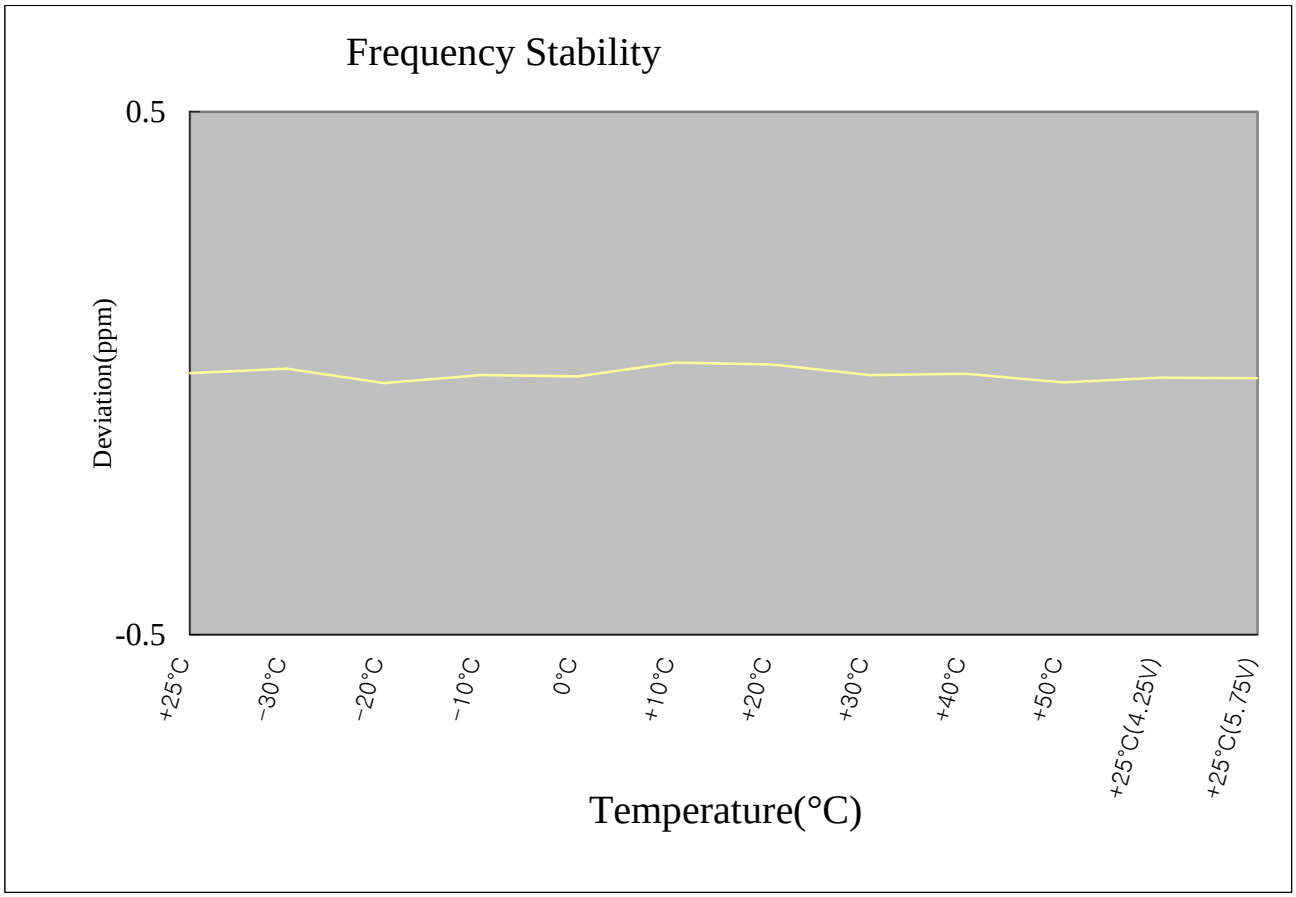
REFERENCE VOLTAGE : 5 VDC

DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	5	+25(Ref)	836,599,963	0.000000
100%		-30	836,599,970	0.000001
100%		-20	836,599,947	-0.000002
100%		-10	836,599,960	0.000000
100%		0	836,599,958	-0.000001
100%		+10	836,599,980	0.000002
100%		+20	836,599,977	0.000002
100%		+30	836,599,960	0.000000
100%		+40	836,599,962	0.000000
100%		+50	836,599,948	-0.000002
85%	4.25	+25	836,599,956	-0.000001
115%	5.75	+25	836,599,955	-0.000001
BATT.ENDPOINT	-	-	-	-

4.1.4 Frequency Stability (GSM Cellular Band) (Continued…)





4.1.4 Frequency Stability (GSM PCS Band) (Continued…)

OPERATING FREQUENCY : 1,879,999,898 Hz

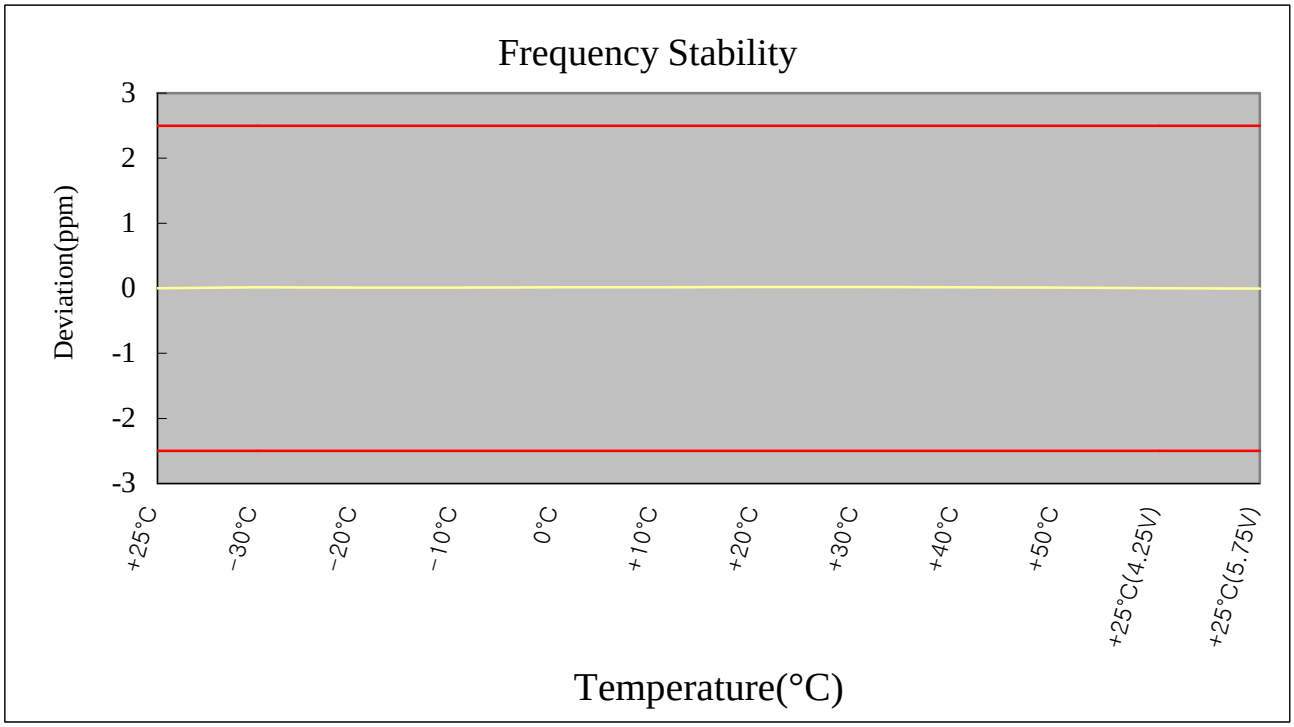
CHANNEL : 661(Mid)

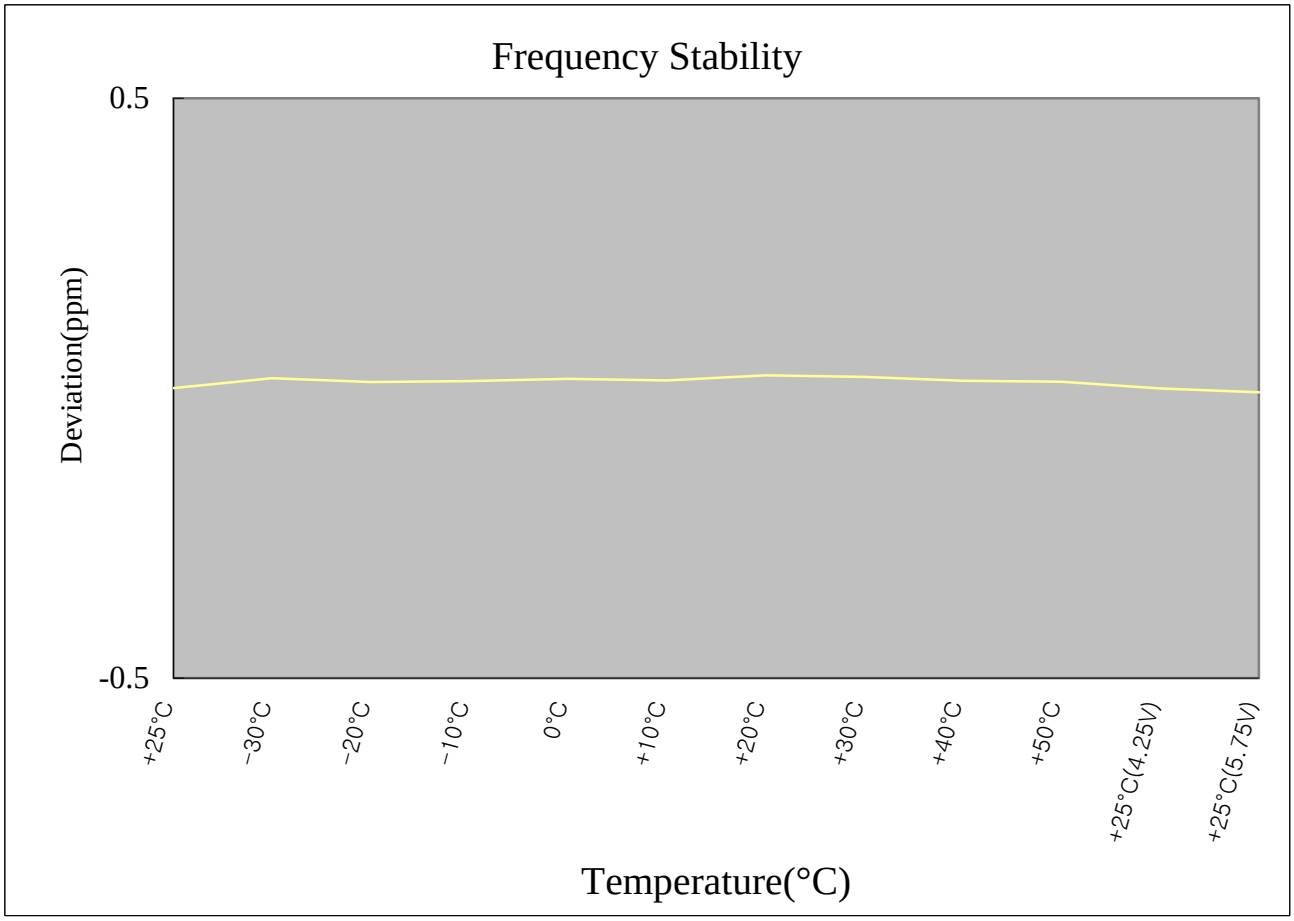
REFERENCE VOLTAGE : 5 VDC

DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	5	+25(Ref)	1,879,999,898	0.000000
100%		-30	1,879,999,930	0.000002
100%		-20	1,879,999,918	0.000001
100%		-10	1,879,999,921	0.000001
100%		0	1,879,999,928	0.000002
100%		+10	1,879,999,923	0.000001
100%		+20	1,879,999,939	0.000002
100%		+30	1,879,999,934	0.000002
100%		+40	1,879,999,922	0.000001
100%		+50	1,879,999,919	0.000001
85%	4.25	+25	1,879,999,897	0.000000
115%	5.75	+25	1,879,999,885	-0.000001
BATT.ENDPOINT	-	-	-	-

4.1.4 Frequency Stability (GSM PCS Band) (Continued…)





4.1.4 Frequency Stability (WCDMA Cellular Band) (Continued…)

OPERATING FREQUENCY : 836,399,983 Hz

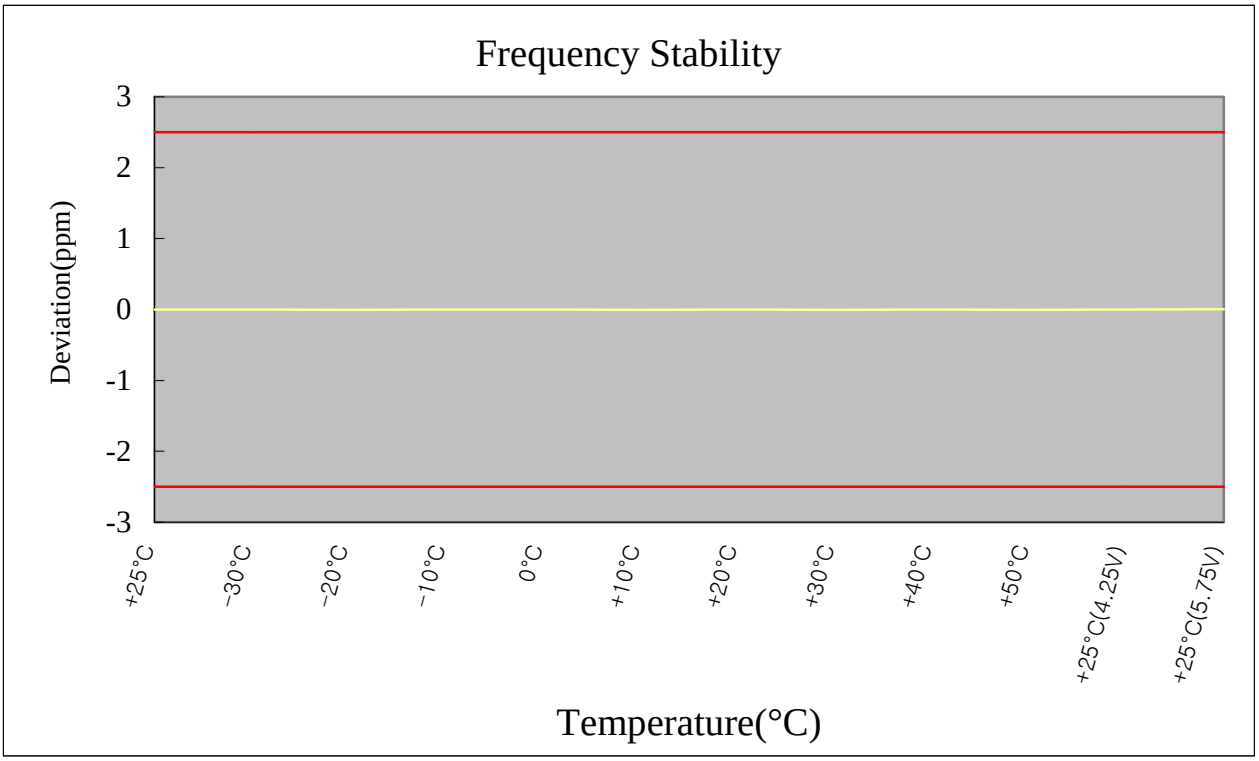
CHANNEL : 4182(Mid)

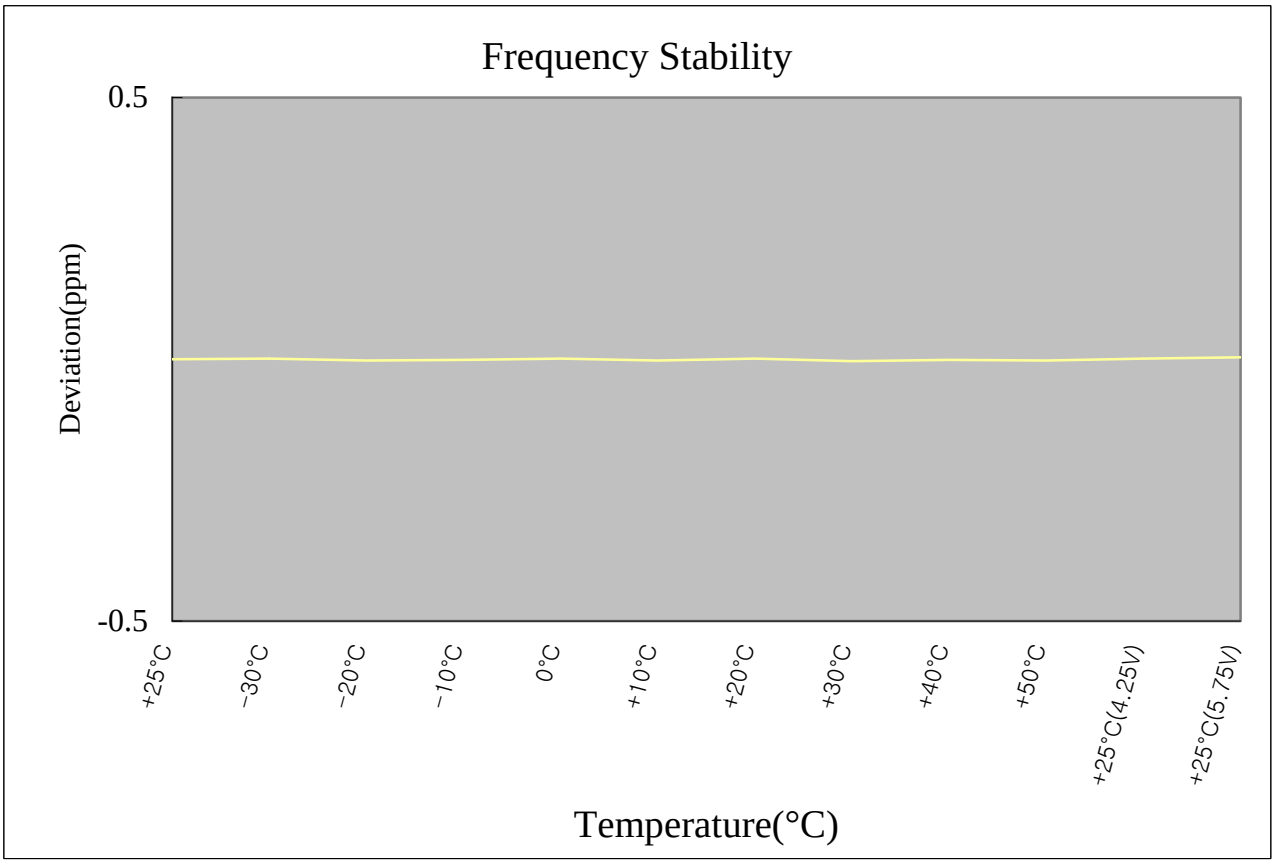
REFERENCE VOLTAGE : 5 VDC

DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	5	+25(Ref)	836,399,983	0.000000
100%		-30	836,399,984	0.000000
100%		-20	836,399,981	0.000000
100%		-10	836,399,982	0.000000
100%		0	836,399,984	0.000000
100%		+10	836,399,981	0.000000
100%		+20	836,399,984	0.000000
100%		+30	836,399,980	0.000000
100%		+40	836,399,982	0.000000
100%		+50	836,399,981	0.000000
85%	4.25	+25	836,399,984	0.000000
115%	5.75	+25	836,399,986	0.000000
BATT.ENDPOINT	-	-	-	-

4.1.4 Frequency Stability (WCDMA Cellular Band) (Continued…)





4.1.4 Frequency Stability (WCDMA PCS Band) (Continued…)

OPERATING FREQUENCY : 1,879,999,973 Hz

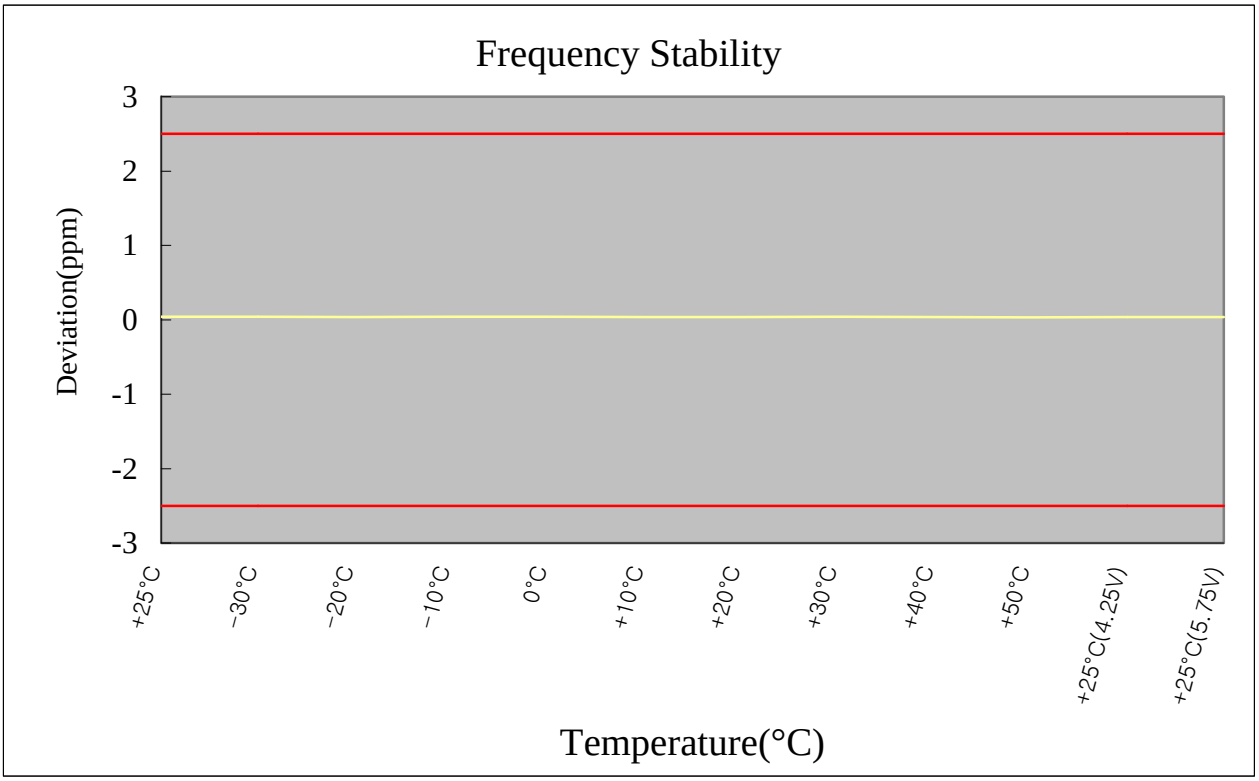
CHANNEL : 9400(Mid)

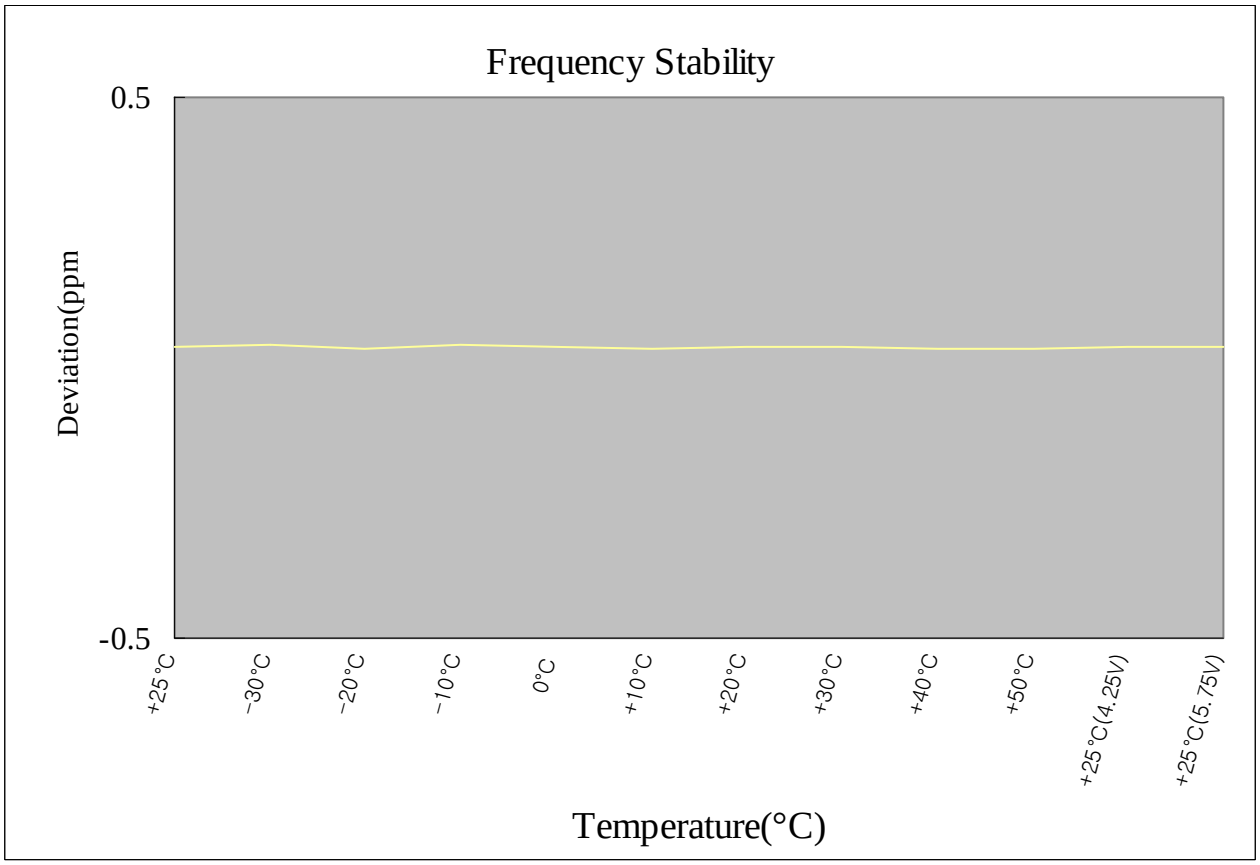
REFERENCE VOLTAGE : 5 VDC

DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	5	+25(Ref)	1,879,999,973	0.000004
100%		-30	1,879,999,975	0.000004
100%		-20	1,879,999,966	0.000004
100%		-10	1,879,999,975	0.000004
100%		0	1,879,999,973	0.000004
100%		+10	1,879,999,967	0.000004
100%		+20	1,879,999,969	0.000004
100%		+30	1,879,999,972	0.000004
100%		+40	1,879,999,966	0.000004
100%		+50	1,879,999,962	0.000003
85%	4.25	+25	1,879,999,968	0.000004
115%	5.75	+25	1,879,999,969	0.000004
BATT.ENDPOINT	-	-	-	-

4.1.4 Frequency Stability (WCDMA PCS Band) (Continued…)





5.1 PLOTS OF EMISSIONS

(SEE ATTACHMENT “Test Plots”)

6.1 LIST OF TEST EQUIPMENT

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☒	Spectrum Analyzer	Agilent	E4440A	06/11/08	06/11/09	MY45304199
☐	Spectrum Analyzer(RE)	H.P	8563E	13/10/08	13/10/09	3551A04634
☐	Spectrum Analyzer	Rohde Schwarz	FSP	09/09/08	09/09/09	100385
☒	Power Meter	H.P	EMP-442A	10/07/08	10/07/09	GB37170413
☒	Power Sensor	H.P	8481A	14/07/08	14/07/09	3318A96332
☐	Power Divider	Agilent	11636B	04/12/08	04/12/09	56471
☒	Power Splitter	Anritsu	K241B	14/10/08	14/10/09	020611
☐	Frequency Counter	H.P	5342A	16/09/08	16/09/09	2119A04450
☒	TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	10/10/08	10/10/09	30604493/021031
☒	Digital Multimeter	H.P	34401A	20/03/08	20/03/09	3146A13475
☐	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-3
☒	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-2
☐	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-4
☐	Multifuction Synthesizer	HP	8904A	06/10/08	06/10/09	3633A08404
☒	Signal Generator	Rohde Schwarz	SMR20	02/04/08	02/04/09	101251
☒	Signal Generator	H.P	ESG-3000A	09/07/08	09/07/09	US37230529
☒	Amplifier	EMPOWER	BBS3Q7ELU	02/02/09	02/02/10	1020
☐	Vector Signal Generator	Rohde Schwarz	SMJ100A	02/02/09	02/02/10	100148
☐	Audio Analyzer	H.P	8903B	09/07/08	09/07/09	3011A09448
☐	Modulation Analyzer	H.P	8901B	18/07/08	18/07/09	3028A03029
☒	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	31/07/08	31/07/09	GB43461134
☐	Universal Radio communication Tester	Rohde Schwarz	CMU 200	02/04/08	02/04/09	107631
☐	Bluetooth Tester	TESCOM	TC-3000A	16/12/08	16/12/09	3000A4A0121
☐	BAND Reject Filter	Microwave Circuits	N0308372	06/10/08	06/10/09	3125-01DC0352
☐	BAND Reject Filter	Wainwright	WRCG1750	06/10/08	06/10/09	2
☐	High-Pass Filter	ANRITSU	MP526D	06/10/08	06/10/09	MP27756
☒	High-pass filter	Wainwright	WHKX2.1	N/A	N/A	1
☐	High-Pass Filter	Wainwright	WHKX3.0	N/A	N/A	9
☐	Tunable Notch Filter	Wainwright	WRCT800.0 /960.0-0.2/40-8SSK	N/A	N/A	10
☐	Tunable Notch Filter	Wainwright	WRCD1700.0 /2000.0-0.2/40-10SSK	N/A	N/A	27
☐	Tunable Notch Filter	Wainwright	WRCT1900.0/ 2200.0-5/40-10SSK	N/A	N/A	7
☐	AC Power supply	DAEKWANG	5KVA	20/03/08	20/03/09	20060321-1
☒	DC Power Supply	HP	6622A	20/03/08	20/03/09	3448A03760
☒	DC Power Supply	HP	6633A	20/03/08	20/03/09	3524A06634
☒	HORN ANT	ETS	3115	13/06/08	13/06/09	6419
☒	HORN ANT	ETS	3115	10/09/08	10/09/09	21097
☐	HORN ANT	A.H.Systems	SAS-574	13/06/08	13/06/09	154
☐	HORN ANT	A.H.Systems	SAS-574	13/06/08	13/06/09	155

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☒	Dipole Antenna	Schwarzbeck	VHA9103	25/11/08	25/11/09	2116
☒	Dipole Antenna	Schwarzbeck	VHA9103	25/11/08	25/11/09	2117
☐	Dipole Antenna	Schwarzbeck	UHA9105	25/11/08	25/11/09	2261
☐	Dipole Antenna	Schwarzbeck	UHA9105	25/11/08	25/11/09	2262
☐	Coaxial Fixed Attenuators	Agilent	8491B	01/08/08	01/08/09	MY39260700
☒	Coaxial Fixed Attenuators	Agilent	8491B	15/07/08	15/07/09	MY39260699
☒	Attenuator (10dB)	WEINSCHEL	23-10-34	01/10/08	01/10/09	BP4386
☐	Attenuator (20dB)	WEINSCHEL	86-20-11	06/10/08	06/10/09	432
☐	Attenuator (10dB)	WEINSCHEL	86-10-11	06/10/08	06/10/09	446
☐	Attenuator (10dB)	WEINSCHEL	86-10-11	06/10/08	06/10/09	408
☐	Attenuator (40dB)	WEINSCHEL	57-40-33	01/10/08	01/10/09	NN837
☐	Attenuator (30dB)	JFW	50FH-030-300	24/03/08	24/03/09	060320-1
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	11/07/08	11/07/09	788
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	11/07/08	11/07/09	790
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0215CAN	11/07/08	11/07/09	112
☐	Amplifier (30dB)	Agilent	8449B	13/10/08	13/10/09	3008A01590
☐	RF Power Amplifier	OPHIRRF	5069F	09/07/08	09/07/09	1006
☐	Software	Agilent	Benchlink	N/A	N/A	A.01.09 021211
☐	EMI TEST RECEIVER	R&S	ESU	02/02/09	02/02/10	100014
☐	BILOG ANTENNA	SCHAFFNER	CBL6112B	13/06/08	13/06/09	2737
☐	Amplifier (22dB)	H.P	8447E	05/02/09	05/02/10	2945A02865
☒	Position Controller	TOKIN	5905A	N/A	N/A	N/A
☐	Software	ToYo EMI	EP5/RE	N/A	N/A	Ver 2.0.800
☐	EMI TEST RECEIVER	R&S	ESCI	13/05/08	13/05/09	100364
☐	Log Periodic Antenna	Schwarzbeck	UHALP9108A1	30/09/08	30/09/09	1098
☐	Biconical Antenna	Schwarzbeck	VHA9103	13/06/08	13/06/09	2233
☐	Amplifier (25dB)	Agilent	8447D	18/08/08	18/08/09	2648A04922
☐	Position Controller	TOKIN	5901T	N/A	N/A	14173
☐	Software	AUDIX	e3	N/A	N/A	Ver 3.0
☐	Driver	TOKIN	5902T2	N/A	N/A	14174
☐	Spectrum Analyzer(CE)	H.P	8591E	26/04/08	26/04/09	3649A05889
☐	LISN	Kyorits	KNW-407	04/08/08	04/08/09	8-317-8
☐	LISN	Kyorits	KNW-242	11/09/08	11/09/09	8-654-15
☐	CVCF	NF Electronic	4420	21/03/08	21/03/09	304935/337980
☐	Software	ToYo EMI	EP5/CE	N/A	N/A	Ver 2.0.801
☐	DC BLOCK	Hyuplip	KEL-007	N/A	N/A	7-1581-5
☐	50 ohm Terminator	HME	CT-01	22/01/09	22/01/10	N/A
☐	RFI/FIELD Intensity Meter	Kyorits	KNW-2402	11/09/08	11/09/09	4N-170-3

7.1 SAMPLE CALCULATIONS

A. Emission Designator

- Cellular Band -

Emission Designator = 249KGXW

GSM BW = 248.7307 KHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

Emission Designator = 4M23F9W

WCDMA BW = 4.2262 MHz
F = Frequency Modulation
9 = Composite Digital Information
W = Combination (Audio/Data)

- PCS Band -

Emission Designator = 247KGXW

GSM BW = 247.4007 KHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

Emission Designator = 4M22F9W

WCDMA BW = 4.2239 MHz
F = Frequency Modulation
9 = Composite Digital Information
W = Combination (Audio/Data)

8.1 CONCLUSION

The data collected shows that the **EpiValley Co., Ltd.** HSUPA USB Modem (**FCC ID: R2NSUC-2000)** complies with all the requirements of Parts 2 and 22, 24 of the FCC rules.

