DIGITAL EMC CO., LTD.

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 24,22 & 15 Certification

High Tech Computer Corp.
9F,6-3,Bau-Chian Rd., Hsin Tien
Taipei,Taiwan,R.O.C.
Attn:Dalton Chuang(Manager)

Dates of Tests: November 19~25,2002
Test Report S/N:DR50110211J
Test Site : DIGITAL EMC CO., LTD.

FCC ID	**NM8FALCON**
APPLICANT	**High Tech Computer Corp.**

Classification:	**Licensed Portable Transmitter Held to Ear (PCE)**
FCC Rule Part(s):	**§24(E), §22.901(d), §15(B), §2**
EUT Type:	**Dual-Band CDMA Wireless PDA with GPS (CDMA/PCS CDMA)**
Model(s):	**PW10C3**
TX Frequency Range:	**824.70 ~848.31 MHz (CDMA)/1851.25 ~ 1908.75MHz(PCS CDMA)**
RX Frequency Range:	**869.70 ~893.31 MHz (CDMA)/1931.25 ~ 1988.75MHz(PCS CDMA)**
Max. RF Output Power:	**0.265W ERP CDMA (24.23dBm)/0.225W EIRP PCSCDMA (23.52 dBm)**
Max. SAR Measurement:	**1.41W/kg CDMA Head SAR; 1.46W/kg CDMA Body SAR**
	1.43W/kg PCS Head SAR; 1.45W/kg PCS Body SAR
Emission Designators:	**1M25F9W(CDMA)**
Test Device Serial No.:	**Identical prototype**

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the Measurement procedures specified in §2,947.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

D.M.JUNG (Manager)

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: High Tech Computer Corp.
Address : 9F,6-3,Bau-Chian Rd., Hsin Tien Taipei,Taiwan,R.O.C.
Attention: Dalton Chuang(Manager/EMC Group)

FCC ID:	NM8FALCON
Quantity:	Quantity production is planned
Emission Designators:	1M25F9W (CDMA)
Tx Freq. Range:	824.70 ~848.31 MHz (CDMA) 1851.25 ~ 1908.75MHz(PCS CDMA)
Rx Freq. Range:	869.70 - 893.31 MHz (CDMA) 1931.25 ~ 1988.75MHz(PCS CDMA)
Max. Power Rating:	0.265W ERP CDMA (24.23 dBm) 0.225W EIRP PCS CDMA (23.52 dBm)
FCC Classification(s):	Licensed Portable Transmitter Held to Ear (PCE)
Equipment (EUT) Type:	Dual-Band CDMA Wireless PDA with GPS
Modulation(s):	CDMA
Frequency Tolerance:	± 0.00025 % (2.5ppm)
FCC Rule Part(s):	§24(E), §22.901(d), §15(B), §2
Dates of Tests:	Nov. 19 – Nov. 25, 2002
Place of Tests:	DIGITAL EMC
Test Report S/N:	DR50110211J

2.1 INTRODUCTION

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".
This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200559-0.

DIGITAL EMC CO., LTD.
Address : 683-2, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080
http://www.digitalemc.com
E-mail : demc@unitel.co.kr
Tel: +82-31-321-2664 Fax: +82-31-321-1664

2.2 SUPPORT EQUIPMENT USED

1. LG-IBM PC	FCC DoC 1.8m unshielded cable	S/N: 210KI14800
2. COMTEC Monitor	FCC ID: PNMCT-150 1.8m unshielded cable 1.0m shielded cable	S/N: P201100018
3. HP Printer	FCC ID: DSI6XU2225 1.8m unshielded cable 1.0m shielded cable	S/N: 3245S12493
4. SAMSUNG PS/2 Keyboard	FCC DoC 1.6m shielded cable	S/N: K2199157
5. SAMSUNG PS/2 Mouse	FCC ID: FSUGMZFT 1.6m shielded cable	S/N: 02167741
6. SAMSUNG Speaker	FCC DoC 1.8m unshielded cable 1.0m unshielded cable	S/N: N/A
7. LOGITECH Joystick	FCC DoC 1.0m shielded cable	S/N: 02167741

3.1 INSERTS PER §2.1033(d)

Function of Active Devices (Confidential)

The Function of active devices are shown in Attachment K.

Block & Schematic Diagrams (Confidential)

The block diagrams are shown in Attachment I, and the schematic diagrams are shown in Attachment J.

Operating Instructions

The instruction manual is shown in Attachment M.

Parts List & Tune-Up Procedure (Confidential)

The parts list & tune-up procedure is shown in Attachment L.

Description of Freq. Stabilization Circuit (Confidential)

The description of frequency stabilization circuit is shown in Attachment K.

Description for Suppression of Spurious Radiation, for Limiting Modulation, and Harmonic Suppresion Circuits (Confidential)

The description of suppression stabilization circuits is shown in Attachment K.

4.2 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) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

(c) 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.

(d) 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.

BLOCK	I req. Range (MHz) Transmitter (Tx)	F eq. Range (MHz) Receiver (Rx)
A	1850 - 1865	1930 - 1945
B	1870 - 1885	1950 - 1965
C	1895 - 1910	1975 - 1990
D	1865 - 1870	1945 - 1950
E	1885 - 1890	1965 - 1970
F	1890 - 1895	1970 - 1975

Table 1. Broadband PCS Service Frequency Blocks.

4.3 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 10 GHz The transmitter is modulated with a 2500?Hz tone at a level of 16dB greater than that required to provided 50% modulation.

At the input terminals of the spectrum analyzer, an isolator(RF circulator with on port terminated with 50ohms) and an 870 MHz to 890 MHz bandpass filter is connected between the test transceiver(for conducted tests)or the receive antenna(for radiated tests) and the analyzer . The rejection of the bandpass filter to signals in the 825-845 MHz range is adequate to limit the transmit energy from the test transceiver which appears to a level which will allow the analyzer to measure signals less than-90dBm. Calibration of the test receiver is performed in the 870-890 MHz range to insure accuracy to allow variation in the passband filter insertion loss to be calibrated.

4.4 Frequencies

At the input terminals of the spectrum analyzer, an isolator (RF pad) and a high-pass filter are connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The high-pass filter (signals below 1.6 GHz) is to limit the fundamental frequency from interfering with the measurement of low-level spurious and harmonic emissions and to ensure that the preamplifier is not saturated.

4.5 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.

4.6 Radiated Emission

Final test was performed according to ANSI C63.4-1992 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.

4.7 Conducted Emission

The power line conducted interference measurements were performed according to ANSI C63.4-1992 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.

5.0 Frequency Stability/Temperature Variation.

The frequency stability of the transmitter is measured by:

a) **Temperature** :The temperature is varied from -30°C to + 60°C using an environmental chamber.
b) **Primary Supply Voltage** :The primary supply voltage is varied from 85% to 115% of the voltage Normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification –The minimum frequency stability shall be +/- 0.00025% at any time during normal operation.

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 and the individual oscillators is measured at room temperature (25°C to 27 °C to provide a reference)
2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at 30°C(usually 14-16 hours),the equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency to the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements is made at 10°C interval up to room temperature. At least a period of one and one half hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency were made at 10intervals starting at 30°C up to +50°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

NOTE : The EUT is tested down to the battery endpoint.

5.1 Test Data

5.2 Effective Radiated Power Output

A. POWER: **High (CDMA Mode)**

Freq. Tuned (MHz)	**REF. LEVEL** (dBm)	**POL** (H/V)	**ERP** (W)	**ERP** (dBm)	**BATTERY**
824.70	-23.7	H	0.253	24.03	Main
836.52	-24.0	H	0.246	23.91	Main
848.31	-24.1	H	0.265	24.23	Main
848.31	-24.0	H	0.258	24.12	External

Note: Measurement data of Main batteries are higher than it of External batteries. The main battery is housed permanently inside this phone. And The External battery is options for this phone.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

6.1 Test Data

6.2 Equivalent Isotropic Radiated Power (E.I.R.P.)

Radiated measurements at 3 meters

Supply Voltage: 3.7 VDC

Modulation: PCS CDMA

FREQ. (MHz)	REF. LEVEL (dBm)	POL (H/V)	Azimuth (o angle)	EIRP (dBm)	EIRP (W)	Battery
1851.25	-19.14	H	80	23.23	0.210	Main
1880.00	-18.30	H	80	23.52	0.225	Main
1908.75	-19.84	H	80	23.14	0.206	Main
1880.00	-18.50	H	80	23.47	0.222	External

Note: Measurement data of Main batteries are higher than it of External batteries. The main battery is housed permanently inside this phone. And The External battery is options for this phone.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

7.1 Test Data

7.2 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 824.7 MHz

CHANNEL: 1013(Low)

MEASURED OUTPUT POWER: 24.23 dBm = 0.265 W

MODULATION SIGNAL: CDMA (Internal)

DISTANCE: 3 meters

LIMIT: 43 + 10 $\log_{10}$ (W) = 37.23 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
1649.40	-41.00	6.1	-34.9	H	59.13
2474.10	-33.10	7.3	-25.8	H	50.03
3298.80	-35.00	7.2	-27.8	H	52.03
4123.50	-53.50	7.4	-46.1	H	70.33
	-130				

NOTE

Radiated Spurious Emission Measurements by Substitution Method
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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.

7.1 Test Data

7.3 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 836.52 MHz

CHANNEL: 0384(Mid)

MEASURED OUTPUT POWER: 24.23 dBm = 0.265 W

MODULATION SIGNAL: CDMA (Internal)

DISTANCE: 3 meters

LIMIT: 43 + 10 $\log_{10}$ (W) = 37.23 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
1673.04	-36.0	6.1	-29.9	H	54.130
2509.56	-32.5	7.3	-25.2	H	49.430
3346.08	-29.0	7.2	-21.8	H	46.030
4182.6	-33.5	7.4	-26.1	H	50.330
5019.12	-47.5	8.2	-39.3	H	63.530
5855.64	-49.5	8.5	-41.0	H	65.230
	-130				

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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.

7.1 Test Data

7.4 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 848.31 MHz

CHANNEL: 0777(High)

MEASURED OUTPUT POWER: 24.23 dBm = 0.265 W

MODULATION SIGNAL: CDMA (Internal)

DISTANCE: 3 meters

LIMIT: 43 + 10 $\log_{10}$ (W) = 37.23 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
1696.62	-41.00	6.1	-34.9	H	59.13
2544.93	-33.10	7.3	-25.8	H	50.03
3393.24	-35.00	7.2	-27.8	H	52.03
4241.55	-53.50	7.4	-46.1	H	70.33
	-130				

NOTE

Radiated Spurious Emission Measurements by Substitution Method
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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.

7.1 Test Data

7.5 PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1851.25 MHz

CHANNEL: 0025(Low)

MEASURED OUTPUT POWER: 23.52 dBm = 0.225 W

MODULATION SIGNAL: CDMA (Internal)

DISTANCE: 3 meters

LIMIT: 43 + 10 $\log_{10}$ (W) = 36.52 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
3702.50	-44.00	7.2	-36.8	H	60.320
5553.75	-51.00	8.4	-42.6	H	66.120
7405.00	-60.43	8.2	-52.23	H	75.750
9256.25	-67.43	8.7	-58.73	H	82.250
	-130				

NOTE

Radiated Spurious Emission Measurements by Substitution Method
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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.

7.1 Test Data

7.6 PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1880.00 MHz

CHANNEL: 0600(Mid)

MEASURED OUTPUT POWER: 23.52 dBm = 0.225 W

MODULATION SIGNAL: CDMA (Internal)

DISTANCE: 3 meters

LIMIT: 43 + 10 $\log_{10}$ (W) = 36.52 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
3760.00	-45.50	7.2	-38.3	H	61.820
5640.00	-46.50	8.4	-38.1	H	61.620
7520.00	-49.13	8.2	-40.93	H	64.450
9400.00	-66.03	8.7	-57.33	H	80.850
	-130				

NOTE

Radiated Spurious Emission Measurements by Substitution Method
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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.

7.1 Test Data

7.7 PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1851.25 MHz

CHANNEL: 1175(High)

MEASURED OUTPUT POWER: 23.52 dBm = 0.225 W

MODULATION SIGNAL: CDMA (Internal)

DISTANCE: 3 meters

LIMIT: 43 + 10 $\log_{10}$ (W) = 36.52 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBd)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	(dBc)
3817.50	-46.5	7.2	-39.3	H	62.820
5726.25	-58.0	8.4	-49.6	H	73.120
7635.00	-64.0	8.2	-55.8	H	79.320
9543.75	-70.9	8.7	-62.2	H	85.720
	-130				

NOTE

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

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.

7.1 Test Data

7.8 Conducted Measurements Data

(SERIAL)

Frequency (MHz)	LISN Pol.	Q,P. Result [dBμV]	AV Result [dBμV]	Q.P. Limit [dBμV]	Margin [dB]
0.450	N	46.0	-	48.0	2.0
0.676	N	40.1	-	48.0	7.9
0.799	N	36.8	-	48.0	11.2
1.124	N	35.7	-	48.0	12.3
1.341	N	30.8	-	48.0	17.2
0.450	L1	45.3	-	48.0	2.7
0.673	L1	38.8	-	48.0	9.2
0.871	L1	35.0	-	48.0	13.0
1.120	L1	34.5	-	48.0	13.5
22.710	L1	34.1	-	48.0	13.9

NOTES:

1. All modes of operation were investigated and the worst-case emissions are reported.
2. L1 = Phase; N = Neutral
3. Margin = Limit – Result
4. Result = Cable loss + insertion loss + Reading level
5. Measurement Data's kept in DIGITAL EMC

7.1 Test Data

7.9 Conducted Measurements Data

(Credle)

Frequency (㎒)	LISN Pol.	Q,P. Result [dB㎶]	AV Result [dB㎶]	Q.P. Limit [dB㎶]	Margin [dB]
0.833	N	39.0	-	48.0	9.0
0.897	N	31.6	-	48.0	16.4
1.246	N	33.4	-	48.0	14.6
18.717	N	24.7	-	48.0	23.3
23.192	N	31.9	-	48.0	16.1
0.747	L1	38.1	-	48.0	9.9
0.978	L1	34.4	-	48.0	13.6
1.215	L1	36.0	-	48.0	12.0
23.407	L1	32.7	-	48.0	15.3
18.625	L1	27.8	-	48.0	20.2

NOTE

1. All modes of operation were investigated and the worst-case emissions are reported.
2. L1 = Phase; N = Neutral
3. Margin = Limit – Result
4. Result = Cable loss + insertion loss + Reading level
5. Measurement Data's kept in DIGITAL EMC

7.1 Test Data

7.10 Conducted Measurements Data

(USB)

Frequency (MHz)	LISN Pol.	Q,P. Result [dBμV]	AV Result [dBμV]	Q.P. Limit [dBμV]	Margin [dB]
0.849	N	39.8	-	48.0	8.2
1.163	N	38.1	-	48.0	9.9
17.379	N	26.5	-	48.0	21.5
23.240	N	27.1	-	48.0	20.9
0.884	L1	40.8	-	48.0	7.2
1.102	L1	39.7	-	48.0	8.3
1.844	L1	31.1	-	48.0	16.9
17.319	L1	28.1	-	48.0	19.9
22.674	L1	30.6	-	48.0	17.4

NOTE

1. All modes of operation were investigated and the worst-case emissions are reported.
2. L1 = Phase; N = Neutral
3. Margin = Limit – Result
4. Result = Cable loss + insertion loss + Reading level
5. Measurement Data's kept in DIGITAL EMC

7.1 Test Data

7.11 Radiated Measurements Data

(Credle)

Frequency [㎒]	ANT Pol.	Reading [dB㎶]	T.F [dB]	Results [dB㎶/m]	Limits [dB㎶/m]	Margin [dB]
534.40	V	14.8	21.7	36.5	46.0	9.5
667.78	V	15.3	24.0	39.3	46.0	6.7
672.63	V	12.9	24.1	37.0	46.0	9.0
672.63	H	11.5	24.1	35.6	46.0	10.4

NOTE

1. There is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated.
2. Measurements above 1GHz is performed using a minimum resolution bandwidth of 1MHz.
3. The EUT was tested up to the 19.1GHz and no significant emission was found.

7.1 Test Data

7.12 Radiated Measurements Data

(USB)

Frequency [㎒]	ANT Pol.	Reading [dB㎶]	T.F [dB]	Results [dB㎶/m]	Limits [dB㎶/m]	Margin [dB]
534.40	V	14.8	21.7	36.5	46.0	9.5
667.78	V	15.3	24.0	39.3	46.0	6.7
672.63	V	12.9	24.1	37.0	46.0	9.0
672.63	H	11.5	24.1	35.6	46.0	10.4

NOTE

1. There is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated.
2. Measurements above 1GHz is performed using a minimum resolution bandwidth of 1MHz.
3. The EUT was tested up to the 19.1GHz and no significant emission was found.

7.1 Test Data

7.13 Radiated Measurements Data

(SERIAL)

Frequency [㎒]	ANT Pol.	Reading [dB㎶]	T.F [dB]	Results [dB㎶/m]	Limits [dB㎶/m]	Margin [dB]
49.40	V	18.5	8.9	27.4	40.0	12.6
83.35	V	21.2	8.5	29.7	40.0	10.3

NOTE

1. There is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated.
2. Measurements above 1GHz is performed using a minimum resolution bandwidth of 1MHz.
3. The EUT was tested up to the 19.1GHz and no significant emission was found.

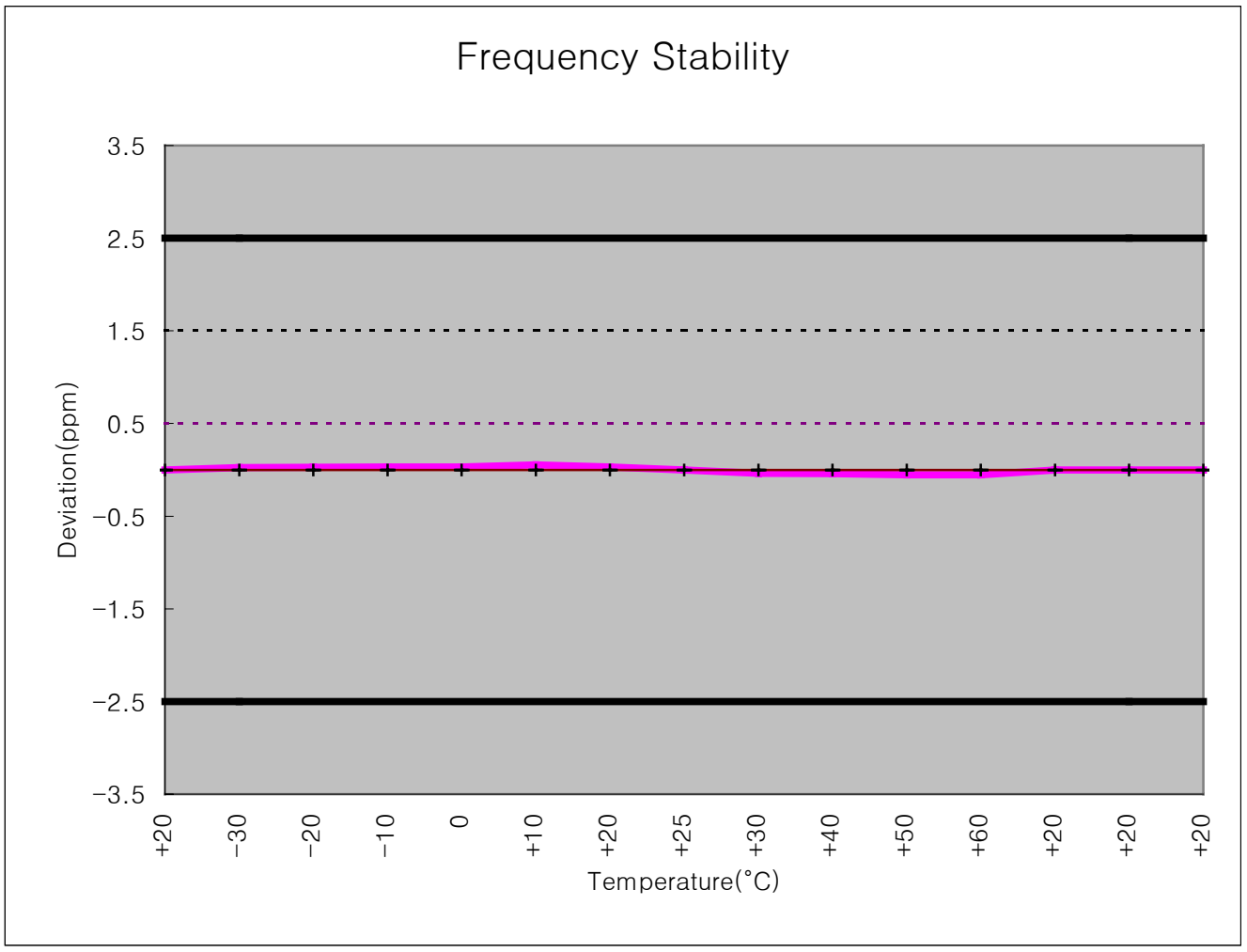
8.2 FREQUENCY STABILITY (CDMA)

OPERATING FREQUENCY: 836,520,005 Hz
CHANNEL: 384
REFERENCE VOLTAGE: 3.7 VDC
DEVIATION LIMIT: ± 0.00025 % or 2.5ppm

VOLTAGE (%)	**POWER** (VDC)	TEMP (dB)	**FREQ** (H/A)	**Deviation** (%)
100%	3.70	+20(Ref)	836,520,005	0.000000
100%		-30	836,519,985	0.000002
100%		-20	836,519,981	0.000003
100%		-10	836,519,979	0.000003
100%		0	836,519,980	0.000003
100%		+10	836,519,961	0.000005
100%		+20	836,520,005	0.000000
100%		+25	836,520,005	0.000000
100%		+30	836,520,035	-0.000004
100%		+40	836,520,039	-0.000004
100%		+50	836,520,050	-0.000005
100%		+60	836,520,050	-0.000005
85%	3.17	+20	836,520,005	0.000000
115%	4.26	+20	836,520,005	0.000000
BATT.ENDPOINT	2.97	+20	836,520,005	0.000000

8.1 Test Data(Continued)

8.3 FREQUENCY STABILITY (CDMA)



8.1 Test Data (Continued)

8.4 § 2.995 FREQUENCY STABILITY(PCS CDMA)

OPERATING FREQUENCY: 1,880,000,006 MHz

CHANNEL: 600

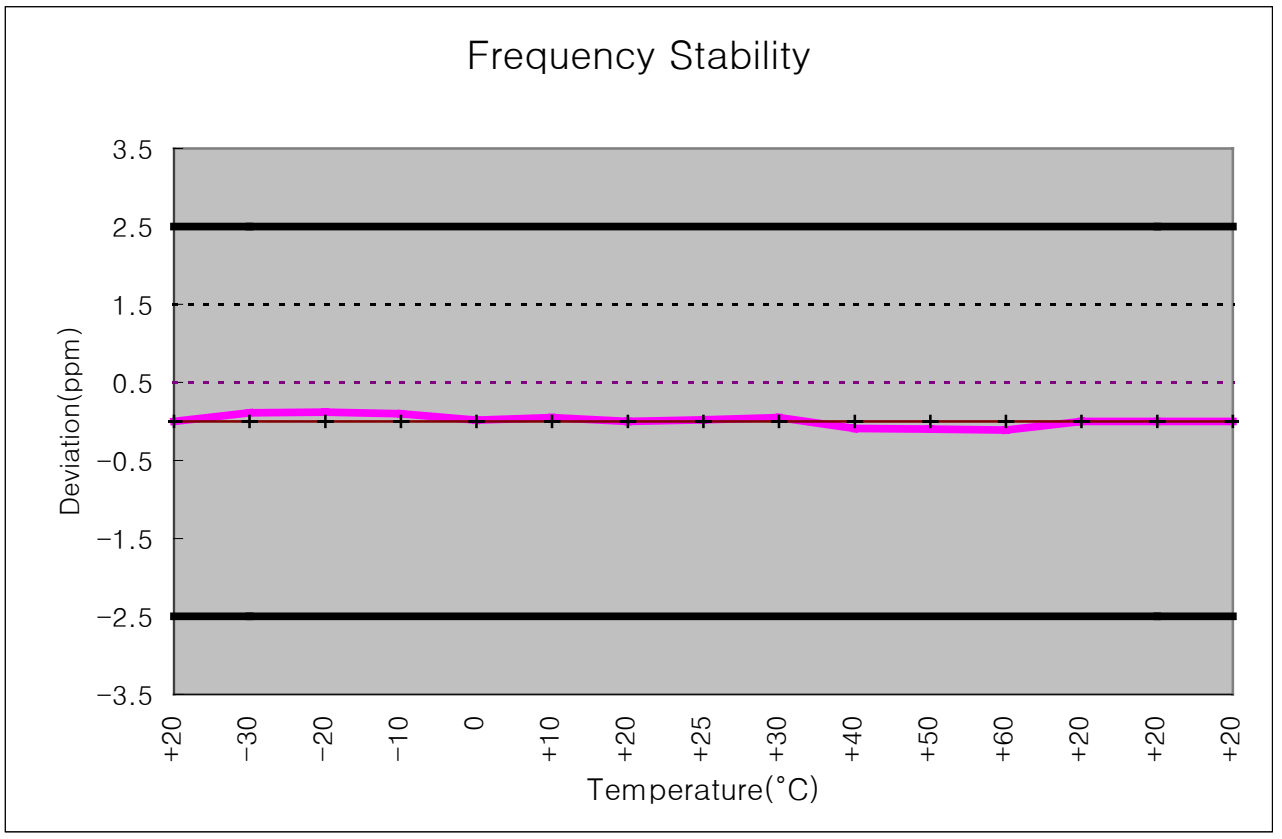
REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5ppm

VOLTAGE (%)	**POWER** (VDC)	TEMP (dB)	**FREQ** (H/A)	**Deviation** (dBc)
100%	3.70	+20(Ref)	1,880,000,006	0.000000
100%		-30	1,879,999,799	0.000011
100%		-20	1,879,999,780	0.000012
100%		-10	1,879,999,818	0.000010
100%		0	1,879,999,974	0.000007
100%		+10	1,879,999,912	0.000005
100%		+20	1,880,000,006	0.000000
100%		+25	1,879,999,968	0.000002
100%		+30	1,879,999,912	0.000005
100%		+40	1,880,000,175	-0.000009
100%		+50	1,880,000,194	-0.000010
100%		+60	1,880,000,213	-0.000011
85%	3.17	+20	1,880,000,006	0.000000
115%	4.26	+20	1,880,000,006	0.000000
BATT.ENDPOINT	2.97	+20	1,880,000,006	0.000000

8.1 Test Data (Continued)

8.5 § FREQUENCY STABILITY(PCS CDMA)



9.1 TEST EQUIPMENT

Type	Model	Cal.Due.Date	S/N
CDMA MOBILE STATION TEST SET	8924C (500KHz-1GHz)	09/09/03	US35360688
PCS INTERRACE	83236B(1.7-2GHz)	09/09/03	3711J03014
SIGNAL GENERATOR	ESG-3000A(250KHz-3000MHz)	28/02/03	US37230529
PRE AMPLIFIER	8449B(1-26.5GHz)	16/07/03	3008A01590
Horn ANTENNA	3115	22/02/03	6419
SPECTRUM ANALYZER	E4404B(9KHz-6.7GHz)	12/11/03	30601-01-6025569
SPECTRUM ANALYZER	8563E(9KHz-26.5GHz)	10/02/03	3551A04634
POSITION CONTROLLER	5901T		014173
DRIVER	5902T		014174
SPECTRUM ANALYZER	E4411B	30/04/03	US41062735
RFI/FIELD INTENSITY METER	KNW-2402	12/07/03	4N-170-3
LISN	KNW-407	01/07/03	8-317-8
LISN	KNW-242	01/07/03	8-654-15
RFI/FIELD INTENSITY METER	KNM-504D	25/07/03	SN-161-4
FREQUENCY CONVERTER	KCV-604C	25/07/03	4-230-3
BICONICAL ANTENNA	VHA9103	23/10/03	VHA91031946
LOG PERIODIC a ANTENNA	UHALP9108-A1	23/10/03	1098
AMPLIFIER	8447D	30/04/03	2944A10144
COAXIAL SWITCH UNIT	MP59B	04/12/03	6100097292
COAXIAL CABLE	RG-214	04/12/03	
COAXIAL CABLE	HFC 12D	04/12/03	
HORN ANTENNA	BBHA 9120A	19/03/03	322
DIPOLE (300MHz~1GHz)	UHA9105	04/10/03	91052261
DIPOLE (300MHz~1GHz)	UHA9105	04/10/03	91052262
BILOG ANTENNA	CBL6112B	26/01/03	2737
NETWORK ANALYZER	8753D(30KHz~3GHz)	27/02/03	3410J01204
POWER METER	EPM-442A	15/03/03	GB37170413
CONSTANT TEMP & HUMIDITY CHAMBER	J-RHC2	14/09/03	021031
SIGNAL GENERATOR	8673D	09/08/03	2844A00753
HORN ANTENNA(18GHz~40GHz)	SAS-574	14/11/03	154
HORN ANTENNA(18GHz~40GHz)	SAS-574	27/11/03	155

10.1 SAMPLE CALCULATIONS

A. Emission Designator

Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

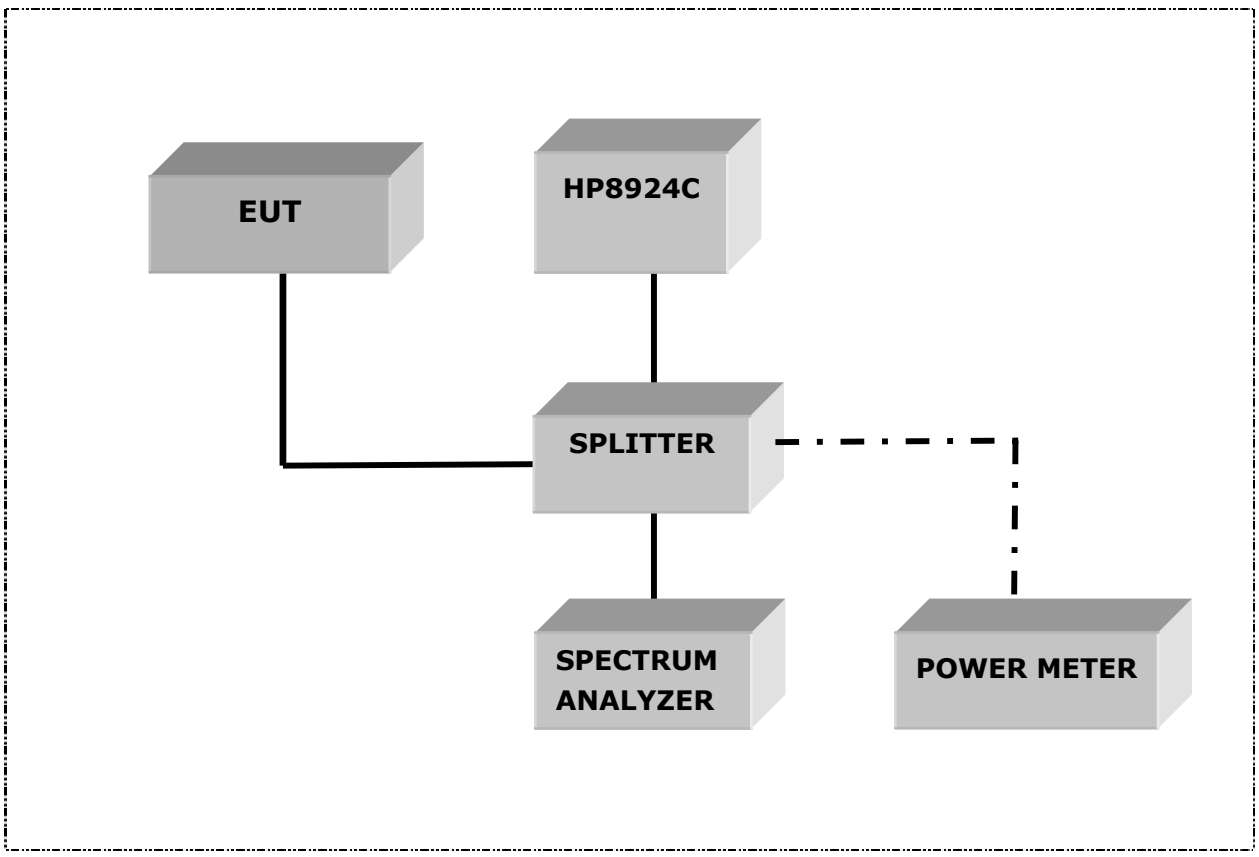
(Measured at the 99.75% power bandwidth)

B. Spurious Radiated Emission – PCS Band

Example: Channel 25 PCS Mode 2nd Harmonic(3702.50 MHz)

The receive analyzer reading at 3 meters with the EUT on the turntable was –48.0 dBm. The gain of the substituted antenna is 9.3dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –48.0 dBm on the receive analyzer The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.1 dB at 3702.50 MHz. So 7.2 dB is added to the signal generator reading of –44.0 dBm yielding –36.8 dBm. The fundamental EIRP was 23.52 dBm so this harmonic was 23.52 dBm –(-36.8)=60.32 dBc,.

11.1 BLOCK DIAGRAM-Conducted Measurements
(Base Station Simulating method)



12.1 BLOCK DIAGRAM-Radiated Measurements(Base Station Simulating method)