Elliott Laboratories Inc.
www.elliottlabs.com
684 West Maude Avenue
Sunnyvale, CA 94086-3518
408-245-7800 Phone
408-245-3499 Fax

Electromagnetic Emissions Test Report In Accordance With Industry Canada Radio Standards Specification 133 issue 2, FCC Part 24 Subpart E on the Way Systems, Inc. Model: way5000

FCC ID:	VLNWAY5000
GRANTEE:	Way Systems, Inc. 200 Unicorn Park Drive Woburn, MA 01801
TEST SITE:	Elliott Laboratories, Inc. 684 W. Maude Avenue Sunnyvale, CA 94086
REPORT DATE:	May 3, 2007
FINAL TEST DATE:	April 10 and April 16, 2007
AUTHORIZED SIGNATORY:	David W. Bare Chief Technical Officer

2016-01

REVISION HISTORY

Revision #	Date	Comments	Modified By
1	August 10, 2007	Initial Release	David Guidotti
2	September 21, 2007	Changed frequency error notation	David Bare

TABLE OF CONTENTS

FCC CERTIFICATION INFORMATION

The following information is in accordance with FCC Rules, 47CFR Part 2, Subpart J, Section 2.1033(C) & to Industry Canada RSP-100.

2.1033(c)(1) Grantee:
Way Systems, Inc.
200 Unicorn Park Drive
Woburn, MA 01801

2.1033(c)(2) & RSP-100 (4) FCC ID: VLNWAY5000

2.1033(c)(3) & RSP-100 (7.2(a)) Instructions/Installation Manual

Please refer to Exhibit 7: User Manual, Theory of Operation, and Tune-up Procedure

2.1033(c)(4) & RSP-100 (7.2(b)(iii)) Type of emissions

FCC 24E & RSS-133**: 317KGXW**

2.1033(c)(5) & RSP-100 (7.2(a)) Frequency Range

FCC 24E & RSS-133**:** 1850.4 - 1909.8 MHz (1900)

2.1033(c)(6) & RSP-100 (7.2(a)) Range of Operation Power

FCC 24E & RSS-133**:** 0.776 Watts

2.1033(c)(7) & RSP-100 (7.2(a)) Maximum FCC & IC Allowed Power Level

24.235(b) & RSS-133 (6.2): Mobile/portable stations are limited to 2 watts E.I.R.P. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

2.1033(c)(8) & RSP-100 (7.2(a)) Applied voltage and currents into the final transistor elements

Refer to Exhibit 6. The schematic diagram

2.1033(c)(9) & RSP-100 (7.2(a)) Tune-up Procedure

Please refer to Exhibit 7: User Manual, Theory of Operation, and Tune-up Procedure

2.1033(c)(10) & RSP 100 (7.2(a)) Schematic Diagram of the Transmitter

Refer to Exhibit 6. The schematic diagram

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Frequency Stabilization

Refer to Exhibit 6. The schematic diagram

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Suppression of Spurious radiation

Refer to Exhibit 6. The schematic diagram

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Limiting Modulation

For more information please refer to Exhibit 7: Theory of Operation

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Limiting Power

Refer to Exhibit 6. The schematic diagram

2.1033(c)(11) & RSP-100 (7.2(g)) Photographs or Drawing of the Equipment Identification Plate or Label

Refer to Exhibit 4

2.1033(c)(12) & RSP-100 (7.2(c)) Photographs of equipment

Refer to Exhibit 5

2.1033(c)(13) & RSP-100 (7.2(a)) Equipment Employing Digital Modulation

For more information please refer to Exhibit 7: Theory of Operation

2.1033(c)(14) & RSP-100 (7.2(b)(ii)) Data taken per Section 2.1046 to 2.1057 and RSS-133 issue 2, Rev. 1.

Refer to Exhibit 2

DECLARATIONS OF COMPLIANCE

Equipment Name and Model:
way5000

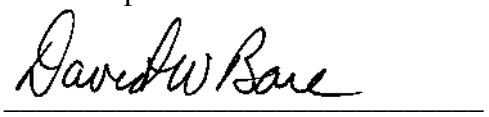
Manufacturer:
Way Systems, Inc.
200 Unicorn Park Drive
Woburn, MA 01801

Tested to applicable standards:
RSS-133 Issue 2, Rev. 1 November 6, 1999 (2GHz Personal Communications Services)
FCC Part 24 Subpart E

Measurement Facility Description Filed With Department of Industry:

Departmental Acknowledgement Number: IC2845 SV2 Dated August 16, 2007

I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above mentioned departmental standards (through the use of TIA/EIA-603 and the specific RSS standards applicable to this device); and that the equipment performed in accordance with the data submitted in this report.

Signature	
Name	David W. Bare
Title	Chief Technical Officer
Company	Elliott Laboratories Inc.
Address	684 W. Maude Ave Sunnyvale, CA 94086 USA
Date:	May 3, 2007

Maintenance of compliance with the above standards is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

SCOPE

FCC Part 24 Subpart E & IC RSS-133 testing was performed for the equipment mentioned in this report. The equipment was tested in accordance with the procedures specified in Sections 2.1046 to 2.1057 of the FCC Rules & IC RSS-133. TIA-603 was also used as a test procedure guideline to perform some of the required tests.

The intentional radiator above was tested in a simulated typical installation to demonstrate compliance with the relevant FCC & RSS performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

OBJECTIVE

The primary objective of the manufacturer is compliance with the FCC 24 Subpart E & IC RSS-133. Certification of these devices is required as a prerequisite to marketing as defined in Section 2.1033 & RSP-100.

Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to FCC & Industry Canada. FCC & Industry Canada issues a grant of equipment authorization and a certification number upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product that may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

SUMMARY OF TEST RESULTS

Part 24E and RSS-133 Test Summary

Part 2 Measurements Required Section	FCC Part 24 Subpart E Section	RSS-133 Section	Test Performed	Measured Value	Test Procedure Used	Result
Modulation Tested	GSM	GSM	-	-	-	-
2.1047: Modulation characteristics	24.238 (b)		26-dB Bandwidth	325 kHz	D	Complies
-	-	5.6	99% Bandwidth	252 kHz	D	Complies
2.1046: RF power output	24.232 (b)	6.2	Output Power Test	28.9dBm EIRP (0.78 Watts)	A	Complies
2.1046: RF power output	24.232 (b)	6.2	Conducted Output Power Test (**Antenna Conducted**)	28.8 dBm (0.76 Watts)	B	Complies
2.1051: Spurious emissions at antenna Port	24.238 (a) & (b)	6.3	Emission Limits and/or Unwanted Emission 30MHz – 25GHz (**Conducted Method**)	All spurious emissions < -13dBm	N	Complies
2.1049: Occupied Bandwidth	24.238 (a) & (b)	6.3	Bandedge (**Conducted Method**)	All spurious emissions < -13dBm	J	Complies
2.1053 Field strength of spurious radiation	24.238 (a) & (b)	6.3	Radiated Spurious Emissions 30MHz – 25GHz	54.8dBuV/m @ 3759.92 MHz (-27.6dB)	N	Complies
2.1055: Frequency stability	24.235	7(a)	Frequency Stability (Frequency Vs. Temperature)	-7.775 kHz		Complies
2.1055: Frequency stability	24.235	7(b)	Frequency Stability (Frequency Vs. Voltage)	0 Hz		Complies
2.1093: Exposure to portable devices	24.52	8	Exposure of Humans to RF Fields	SAR Report provided	N/A	-

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below were calculated using the approach described in CISPR 16-4-2:2003 using a coverage factor of k=2, which gives a level of confidence of approximately 95%. The levels were found to be below levels of *U*cispr and therefore no adjustment of the data for measurement uncertainty is required.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	30 to 1000	± 3.6

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Way Systems, Inc. model way5000 is a mobile transaction terminal, that is designed to facilitate sales transactions without the need for land line communications. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The input electrical rating of the EUT power supply is 100~240 Volts, 50/60 Hz, with an output of 5.0VDC, 0.4 Amps.

The sample was received on April 10, 2007 and tested on April 10 and April 16, 2007. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Way System	Mobile Transaction Terminal 5000	Point of Sale / Cell Phone	N/A	N/A
TCMTV3	TC-2050A	AC/ DC Adapter	N/A	N/A

ENCLOSURE

The EUT enclosure is primarily constructed of plastic . It measures approximately 5.5 cm wide by 2.5 cm deep by 12.0 cm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

No local support equipment was used during testing.

The following equipment was used as remote support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Agilent	E5515C	Test communication set	GB41450270	-

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
USB	AC Mains	AC/ DC Adapter	Unshielded	1.8
RF	Test Communication set	Coaxial	Shielded	3.0

Note: The Auxiliary Antenna and external audio ports were not connected during testing. The manufacturer stated that the Auxiliary Antenna Port is used for Manufacture test purposes and therefore would not normally be connected.

EUT OPERATION

During emissions testing the EUT was in standby / charging mode. During Radio testing the device was set to transmit continuously.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on April 10 and April 16, 2007 at the Elliott Laboratories Open Area Test Site #1 & 2 located at 684 West Maude Avenue, Sunnyvale, California. The test site contains separate areas for radiated and conducted emissions testing. Pursuant to section 2.948 of the Rules, construction, calibration, and equipment data has been filed with the Federal Communications Commission. In accordance with Industry Canada rules detailed in RSS 210 Issue 5 and RSS-212, construction, calibration, and equipment data for the test sites have been filed with the Federal Communications Commission.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing are performed in conformance with Section 2 of FCC Rules. Measurements are made with the EUT connected to a spectrum analyzer through an attenuator to prevent overloading the analyzer.

RADIATED EMISSIONS CONSIDERATIONS

Radiated measurements are performed in an open field environment or Anechoic Chamber. The test site is maintained free of conductive objects within the CISPR 16-1 defined elliptical area.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers are capable of measuring over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the particular detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. If average measurements above 1000MHz are performed, the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz is used.

INSTRUMENT CONTROL COMPUTER

A personal computer is utilized to record the receiver measurements of the field strength at the antenna, which is then compared directly with the appropriate specification limit. The receiver is programmed with appropriate factors to convert the received voltage into filed strength at the antenna. Results are printed in a graphic and/or tabular format, as appropriate.

The test receiver also provides a visual display of the signal being measured.

PEAK POWER METER

A peak power meter and thermister mount may be used for output power measurements from transmitters as they provide a broadband indication of the power output.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or EUT and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transmitters and transient events.

ANTENNAS

A biconical antenna is used to cover the range from 30 MHz to 300 MHz and a log periodic antenna is utilized from 300 MHz to 1000 MHz. Narrowband tuned dipole antennas are used over the 30 to 1000 MHz range for precision measurements of field strength. Above 1000 MHz, a horn antenna is used. The antenna calibration factors are included in site factors programmed into the test receivers

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor drive to vary the antenna height.

The requirements of ANSI C63.4:2003 were used for configuration of the equipment turntable. It specifies that the test height above ground for table-mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An appendix of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

General: For Transmitters with detachable antenna, direct measurements for output power, modulation characterization, occupied bandwidth, and frequency stability are performed with the antenna port of the EUT connected to either the power meter, modulation analyzer, or spectrum analyzer via a suitable attenuator and/or filter. The attenuators and/or filters are used to ensure that the transmitter fundamental will not overload the front end of the measurement instrument.

Procedure A – Power Measurement (Radiated Method): The following procedure was used for transmitters that do not use external antennas or with devices with test port were the output power can be measured directly, but Power must still be made with antenna attached.

1) Set the EUT to maximum power and to the lowest channel.
2) A spectrum analyzer was use to measure the power output. The search antenna was located 3 meter from the EUT.
3) The spectrum analyzer resolution and video bandwidth was set to 2 MHz to measure the power output. No amplifier was used since the fundamental will cause the amplifier to saturate.
4) The EUT was then rotated for a complete 360 degrees and the search antenna was raised and lowered to maximize the fundamental. Both vertical and horizontal polarization's were performed. All correction factors are applied to the fundamental.
5) Substitution is then performed. Substitution method is performed by replacing the EUT with a horn antenna and signal generator. The horn antenna factors can be reference to a half-wave dipole in dBi. The signal generator power level is adjusted until a similar level, which was measured, in step 4, is achieved on the spectrum analyzer. The level on the signal generator is than added to the antenna factor, in dBi, which will give the corrected value.
6) Steps 1 to 5 are repeated for the middle and the highest channel.

Procedure B – Power Measurement (Conducted Method): The following procedure was used for transmitters that do use external antennas.

1) Set the EUT to maximum power and to the lowest channel.
2) Either a power meter or a spectrum analyzer was used to measure the power output.
3) If a spectrum analyzer was used a resolution and video bandwidth 1MHz was used to measure the power output. Corrected for any external attenuation used for the protection of the input of analyzer. In addition, For CDMA or TDMA modulations set spectrum analyzer resolution to 1MHz and video to 30 kHz. Use video averaging with a 100-sample rate.
4) If a power meter was used, corrected for any external attenuation used for the protection of the input of the sensor head. Also set the power sensor correction by setting up the frequency range that will be measured.
5) Repeat this for the high channel and all modulations that will be used and all output ports used for transmission

Procedure D - Occupied Bandwidth (Conducted Method): Either for analog, digital, or data modulations, occupied bandwidth was performed. The EUT was set to transmit the appropriate modulation at maximum power. The bandwidth was measured using following methods:

1) The built-in 99% function of the spectrum analyzer was used.
2) If the built-in 99% is not available then the following method is used:

   26-dB was subtracted to the maximum peak of the emission. Then the display line function was used, in conjunction with the marker delta function, to measure the emissions bandwidth.

3) For the above two methods a resolution and video bandwidth of 10 or 30 kHz was used to measure the emission's bandwidth.

Procedure H - Other Types of Equipment: Either digital or data modulated signals were simulated, by software or external sources, to performed the required tests. The EUT was set to transmit the appropriate digital modulation.

Procedure I – Bandedge (Radiated): Where Bandedge measurements are specified the following procedure was performed:

1) Set the transmitting signal as close as possible to the edge of the frequency band/block as specified in the standard. Power is set to maximum
2) Set the spectrum analyzer display line function to 84.4 dBuV/m.
3) Set the spectrum analyzer bandwidth to the minimum 1% of the emission bandwidth. The emission bandwidth is determined by using **procedure D**.
4) A spectrum analyzer was use to measure the radiated field strength. The search antenna was located 3 meter from the EUT.
5) The spectrum analyzer resolution and video bandwidth was set to 1MHz to measure the total bandwidth power of the signal. No amplifier was used since the fundamental will cause the amplifier to saturate.
6) The EUT was then rotated for a complete 360 degrees and the search antenna was raised and lowered to maximize the fundamental. Both vertical and horizontal polarization's were performed. All correction factors are applied to the fundamental.
7) Set the marker function to the FCC or IC specified frequency band/block, which gave a field strength result in dBuV/m.
8) Substitution is then performed. Substitution method is performed by replacing the EUT with a horn antenna and signal generator. The horn antenna factors can be reference to a half-wave dipole in dBi. The signal generator power level is adjusted until a similar level, which was measured, in step 4, is achieved on the spectrum analyzer. The level on the signal generator is than added to the antenna factor, in dBi, which will give the corrected value.
9) Steps 1 to 8 were repeated for all modulations and output ports that will be used for transmission. Also, Bandedge is determined for blocks A (high edge), D, B, E, F, C (low edge).
10) Bandedge substitution level must not exceed the –13-dBm limit.

Procedure J – Bandedge (Conducted): Where Bandedge measurements are specified the following procedure was performed:

11) Set the transmitting signal as close as possible to the edge of the frequency band/block as specified in the standard. Power is set to maximum
12) Set the spectrum analyzer display line function to -13 /m.
13) Set the spectrum analyzer bandwidth to the minimum 1% of the emission bandwidth. The emission bandwidth is determined by using **procedure D**.
14) A spectrum analyzer was use to measure the conducted Bandedge.
15) The spectrum analyzer resolution and video bandwidth was set to 1MHz to measure the total bandwidth power of the signal.
16) Set the marker function to the FCC or IC specified frequency band/block, which gave a result value in dBm.
17) Steps 1 to 8 were repeated for all modulations and output ports that will be used for transmission. Also, Bandedge is determined for blocks A (high edge), D, B, E, F, C (low edge).
18) Bandedge substitution level must not exceed the –13-dBm limit.

Procedure K - Field Strength Measurement: The EUT was set on the turntable and the search antenna position 3 meters away. The output antenna terminal was terminated with a 50-ohm terminator. The EUT was set at the middle of the frequency band and set at maximum output power.

For the first scan, a pre-liminary measurement is performed. A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. One or more of these is with the antenna polarized vertically while the one or more of these are with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit.

For the final measurement, Substitution method is performed on spurious emissions not being 20-dB below the calculated radiated limit. Substitution method is performed by replacing the EUT with a horn antenna and signal generator. The horn antenna factors can be reference to a half-wave dipole in dBi. The signal generator power level was adjusted until a similar level, which was measured on the first scan, is achieved on the spectrum analyzer. The level on the signal generator is than added to the antenna factor, in dBi, which will give the corrected value.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

RADIATED EMISSIONS SPECIFICATION LIMITS

The limits for radiated emissions are based on the power of the transmitter at the operating frequency. Data is measured in the logarithmic form of decibels relative to one milliwatt (dBm) or one microvolt/meter (dBuV/m,). The field strength of the emissions from the EUT is measured on a test site with a receiver.

Below is a formula example used to calculate the attenuation requirement, relative to the transmitters power output, in dBuV/m. For this example an operating power range of 3 watts is used. The radiated emissions limit for spurious signals outside of the assigned frequency block is $43+10\text{Log}_{10}$ (mean output power in watts) dB below the measured amplitude at the operating power.

CALCULATIONS – EFFECTIVE RADIATED POWER

$$E(V/m) = \frac{\sqrt{30 * P * G}}{d}$$

E= Field Strength in V/m
P= Power in Watts (for this example we use 3 watts)
G= Gain of antenna in numeric gain (Assume 1.64 for ERP)
d= distance in meters

$$E(V/m) = \frac{\sqrt{30 * 3 \text{ watts} * 1.64 \text{ dB}}}{3 \text{ meters}}$$

20 * log (4.049 V/m * 1,000,000) = 132.14 dBuV/m @ 3 meters

FCC Rules request an attenuation of 43 + 10 log (3) or 47.8 dB for all emissions outside the assigned block, the limit for spurious and harmonic emissions is:

132.1 dBuV/m – 47.8 dB = 84.3 dBuV/m @ 3 meter.

Note: Substitution Method is performed for spurious emissions with less than 20dB of margin relative to the calculated field strength limit.

EXHIBIT 1: Test Equipment Calibration Data

1 Page

Conducted Emissions - AC Power Ports, 02-Apr-07
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	LISN, FCC / CISPR	LISN-4, OATS	362	30-Jun-07
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	21-Nov-07
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1398	05-Feb-08

Radiated Emissions, 30 - 1,000 MHz, 02-Apr-07
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Log Periodic Antenna, 0.2-1 GHz	3146	1294	25-May-07
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	21-Nov-07
EMCO	Biconical Antenna, 30-300 MHz	3110B	1497	26-Jun-07

Conducted Emissions - AC Power Ports, 14-Apr-07
Engineer: Chris Groat

Manufacturer	Description	Model #	Asset #	Cal Due
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	812	05-Feb-08
Solar Electronics	LISN	8028-50-TS-24-BNC support	904	19-Jan-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	17-Apr-07
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	25-Jul-07

Radiated Emissions, 30 - 20,000 MHz, 17-Apr-07
Engineer: David Bare

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	High Pass filter, 1.5 GHz (Red System)	P/N 84300-80037 (84125C)	1154	09-Jun-07
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	09-Jan-08
Hewlett Packard	High Pass filter, 3.5 GHz (Red System)	P/N 84300-80038 (84125C)	1403	09-Jun-07
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	15-Nov-07

Radiated Emissions, 30 - 1,000 MHz, 17-Apr-07
Engineer: Riaz Momand

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Log Periodic Antenna, 0.3-1 GHz	3146A	364	01-Dec-07
Elliott Laboratories	Biconical Antenna, 30-300 MHz	DM-105-T1	382	01-Dec-07
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	21-Dec-07
Hewlett Packard	Preamplifier	8447D OPT 010	1826	02-May-07

Radiated Emissions, 30 - 1,000 MHz, 17-Apr-07
Engineer: Riaz Momand

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Log Periodic Antenna, 0.2-1 GHz	3146	1294	25-May-07
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	21-Nov-07
EMCO	Biconical Antenna, 30-300 MHz	3110B	1497	26-Jun-07

Conducted Emissions - AC Power Ports, 17-Apr-07
Engineer: Riaz Momand

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	LISN, FCC / CISPR	LISN-4, OATS	362	30-Jun-07
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	21-Dec-07
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	21-Nov-07
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1398	05-Feb-08

EXHIBIT 2: Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS

TEST LOG SHEETS

AND

MEASUREMENT DATA

T67447_Part24 22 Pages

Elliott

EMC Test Data

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	Test-Log Number:	T67447
		Project Manager:	Susan Pelzl
Contact:	Ron Fridman		
Emissions Spec:	EN 55022, FCC	Class:	B
Immunity Spec:	EN301 489-7	Environment:	-

EMC Test Data

For The

Way System Inc.

Model

way5000

Date of Last Test: 9/21/2007

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	Test-Log Number:	T67447
		Project Manager:	Susan Pelzl
Contact:	Ron Fridman		
Emissions Spec:	EN 55022, FCC	Class:	B
Immunity Spec:	EN301 489-7	Environment:	-

EUT INFORMATION

The following information was collected during the test sessions(s).

General Description

The EUT is a mobile transaction terminal, that is designed to facilitate sales transactions without the need for land line communications. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The input electrical rating of the EUT power supply is 100~240 Volts , 50/60 Hz, with an output of 5.0VDC, 0.4 Amps.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Way System	Mobile Transaction Terminal 5000	Point of Sale / Cell Phone	N/A	N/A
TCMTV3	TC-2050A	AC/ DC Adapter	N/A	N/A

Other EUT Details

none

EUT Antenna (Intentional Radiators Only)

The antenna is integral to the device.

EUT Enclosure

The EUT enclosure is primarily constructed of plastic . It measures approximately 5.5 cm wide by 2.5 cm deep by 12.0 cm high.

Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Project Manager:	Susan Pelzl
Contact:	Ron Fridman		
Emissions Spec:	EN 55022, FCC	Class:	B
Immunity Spec:	EN301 489-7	Environment:	-

Test Configuration # 1 (Transmit and Receiver mode)

The following information was collected during the test sessions(s).

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Agilent	E5515C	Test communication set	GB41450270	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
USB	AC Mains	AC/ DC Adapter	Unshielded	1.8
RF	Test Communication set	Coaxial	Shielded	3.0

Note: The Auxiliary Antenna and external audio ports were not connected during testing. The manufacturer stated that the Auxiliary Antenna Port is used for Manufacture test purposes and therefore would not normally be connected.

EUT Operation During Emissions Tests

During emissions testing the EUT was in standby / charging mode. During Radio testing the device was set to transmit continuously.

EUT Operation During Immunity Tests

During immunity test the EUT will be exercised by leaving the EUT in Standby or in Transmit mode.
Normal operation is indicated by observing the screen of a Analyzer.

Performance Criteria for Immunity Tests in Standby mode

Criterion A:

During and after testing the EUT shall continue to be in standby mode. It can not transmit and this is monitored by observing the screen of a Analyzer which is set on max hold for the particular frequency. Also, the device shall continue to transmit with no user intervention.

Criterion B:

During and after testing the EUT shall continue to be in standby mode. It can not transmit and this is monitored by observing the screen of a Analyzer which is set on max hold for the particular frequency. Also, the device shall continue to transmit with no user intervention. EUT may loss display and audio, but radio will still function correctly. User intervention is allowed to recover display and audio.

Criterion C:

Loss of function is allowed provided that normal operation can be restored by Power Cycle .

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

FCC 22 & 24 Antenna Port Measurements
Power, Bandwidth and Spurious Emissions

Test standard(s)ifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/16/2007 15:30
Test Engineer: David Bare
Test Location: SVOATS #1
Config. Used: 1
Config Change: None
EUT Voltage: Battery

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 44 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	24.232(b)	Pass	28.8dBm
2	26dB and 99% Bandwidth	24.238(b)	Pass	325 kHz
3	Bandedges	24.238(b)	Pass	Refer to Plots
4	Spurious emissions	24.238(a) & (b)	Pass	All emissions < -13dBm

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

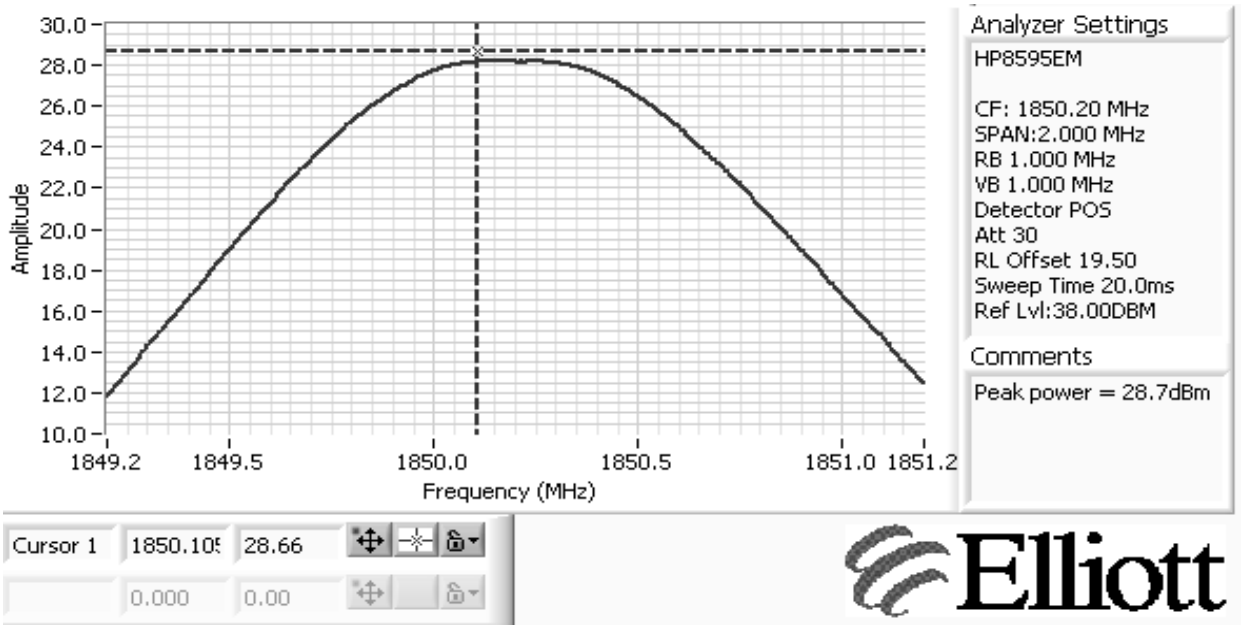
Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run #1: Output Power

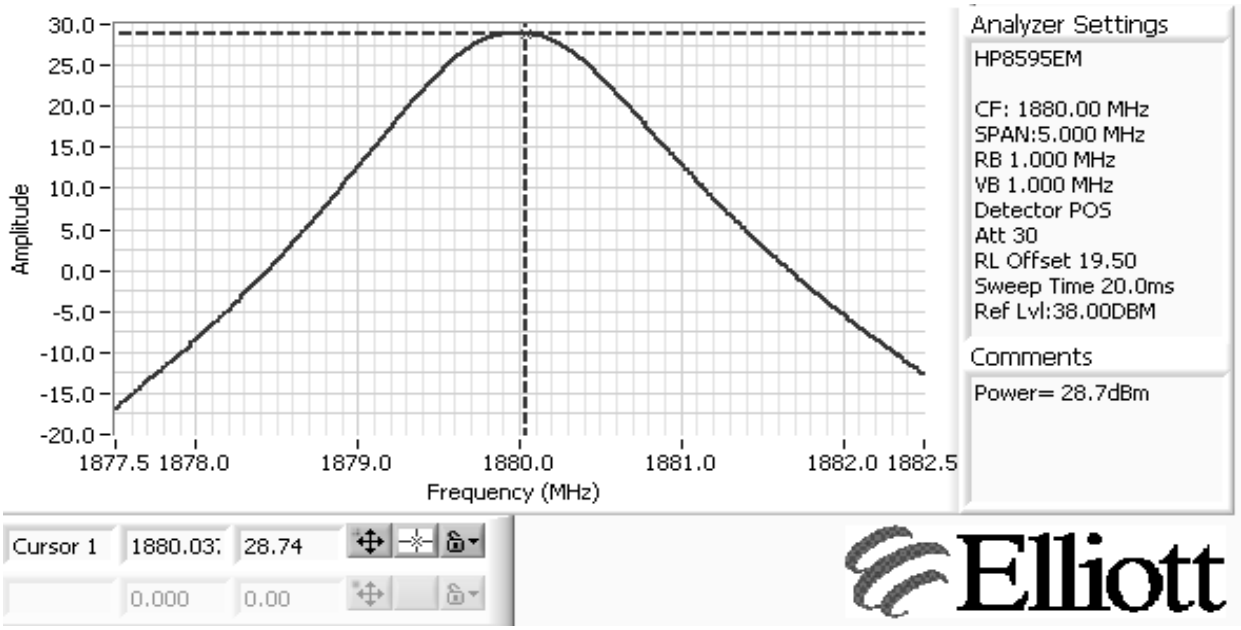
Summary (MS Power setting = 30)

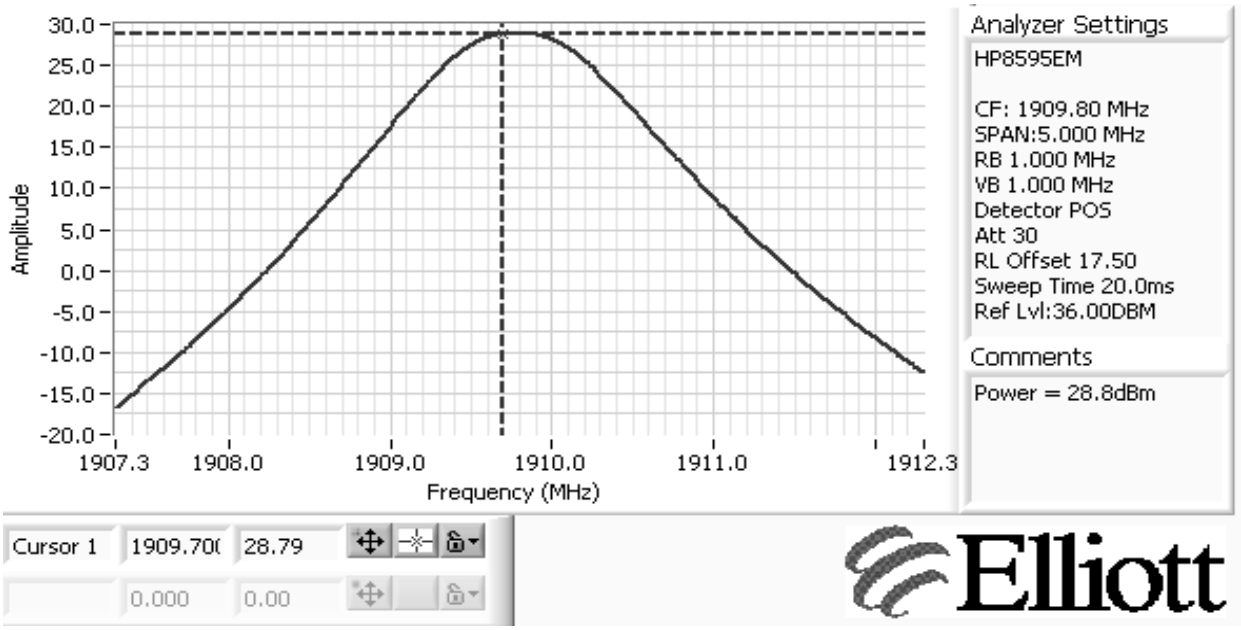
Freq. (MHz)	Gmax dBi	Power[1] (dBm)	BW (MHz)	Limit (eirp) (dBm)	PSD (dBm)	PSD limit (MHz)	Data Rate Mbps	Plot #
1850.2		28.7		33.0				
1880.0		28.7		33.0				
1909.8		28.8		33.0				

Note 1	Peak power measured using a spectrum analyzer
Note 2	N/A



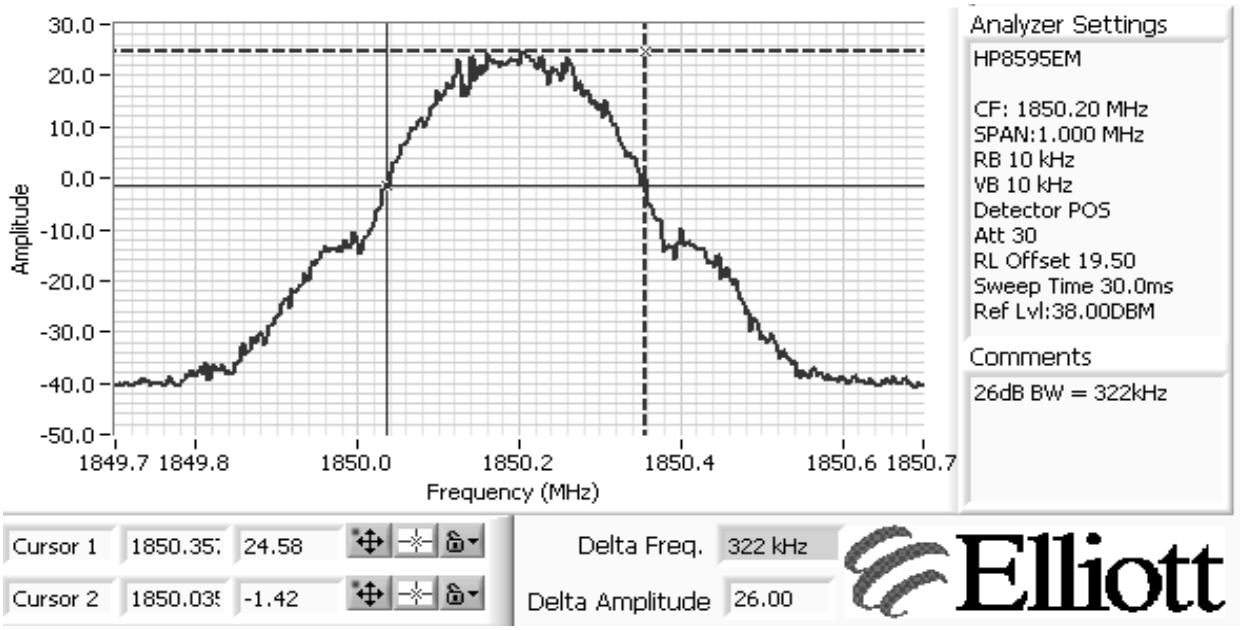
Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

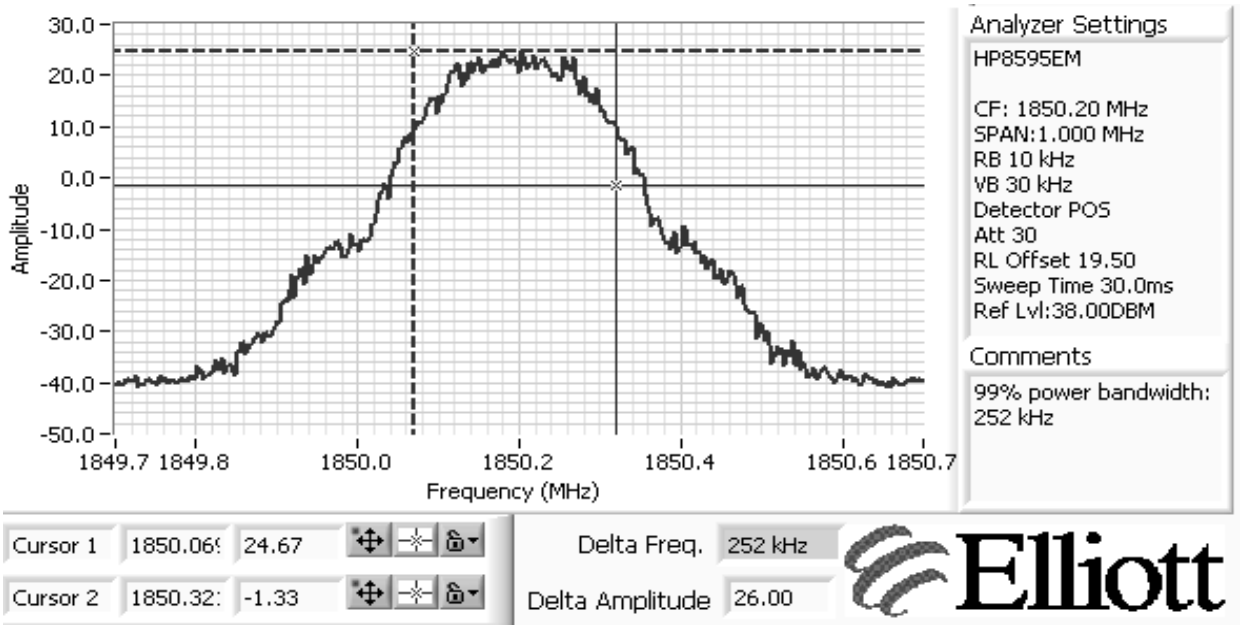




Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

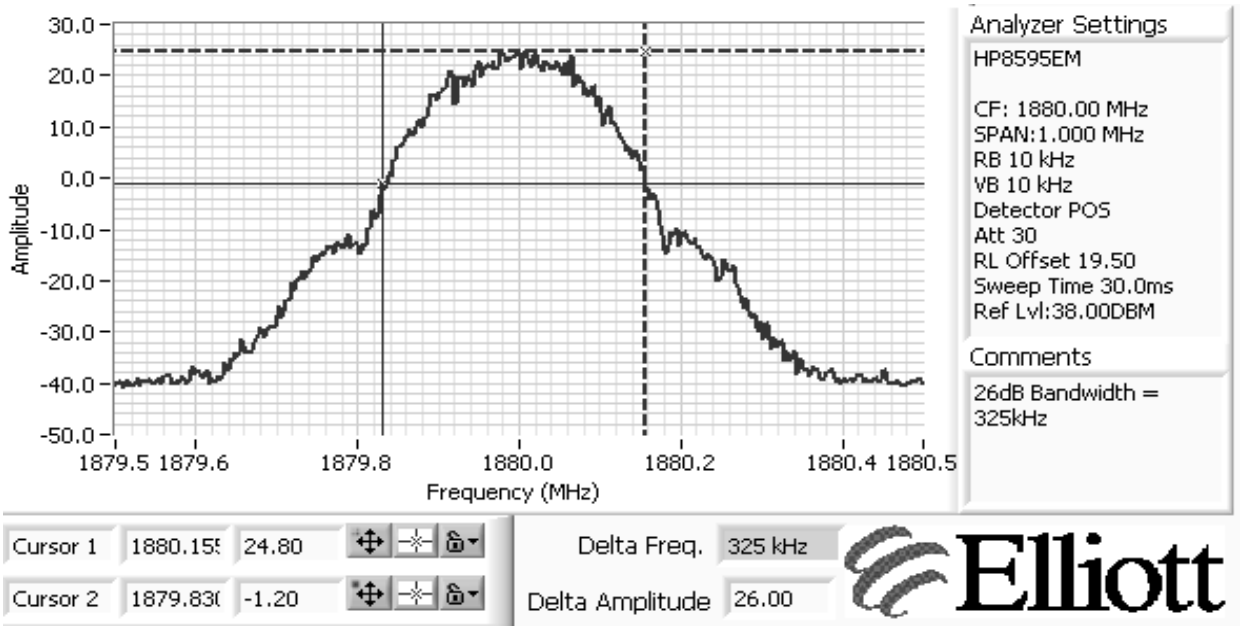
Run #2: 26-dB and 99% BW

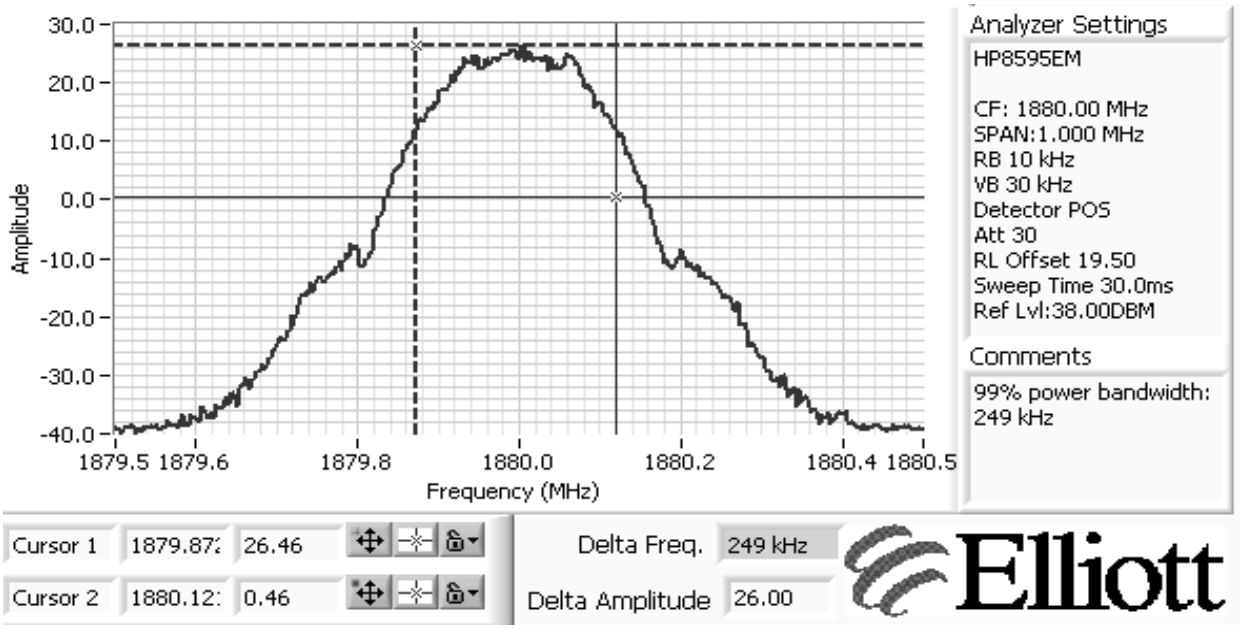




EMC Test Data

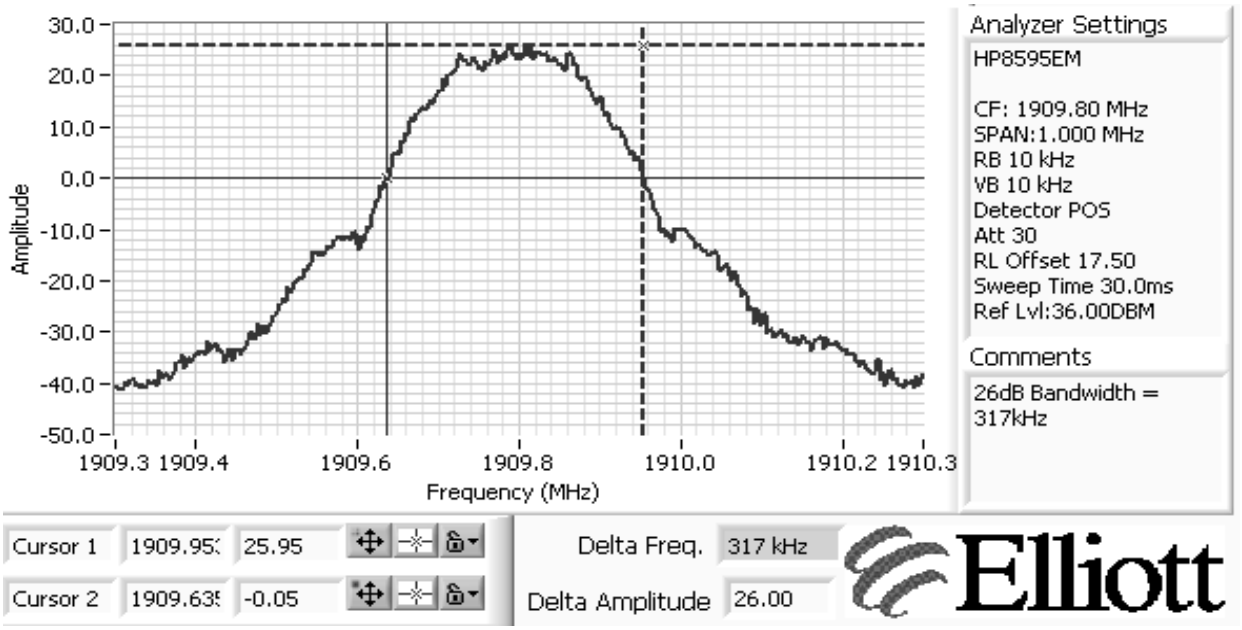
Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

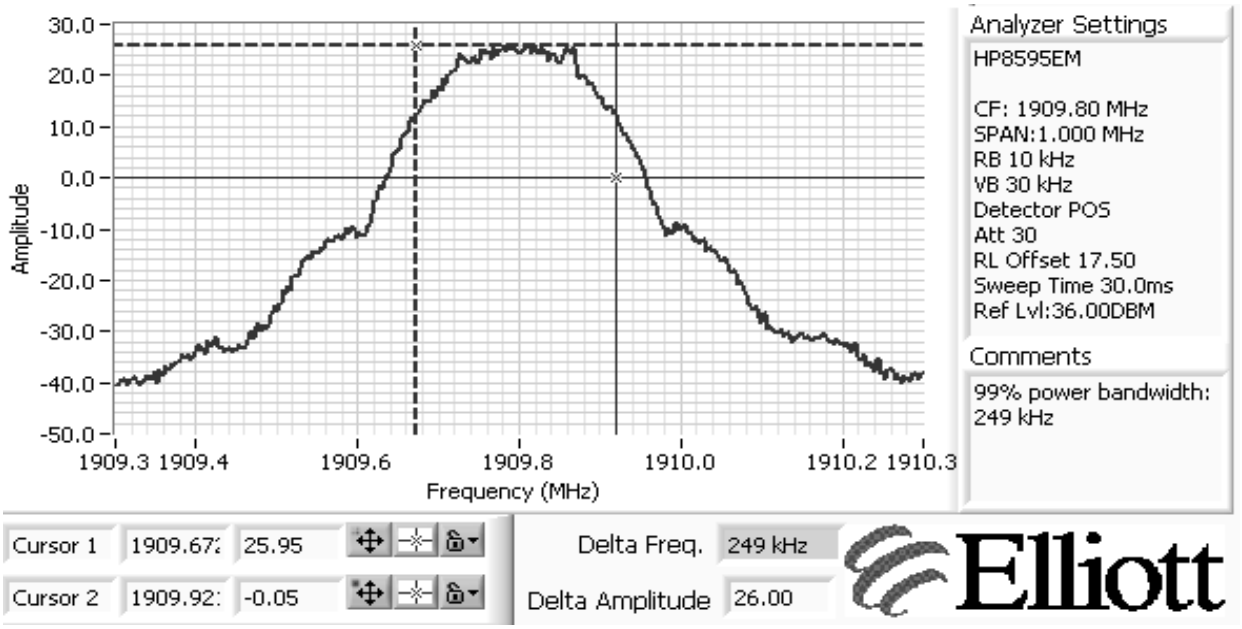




Elliott — EMC Test Data

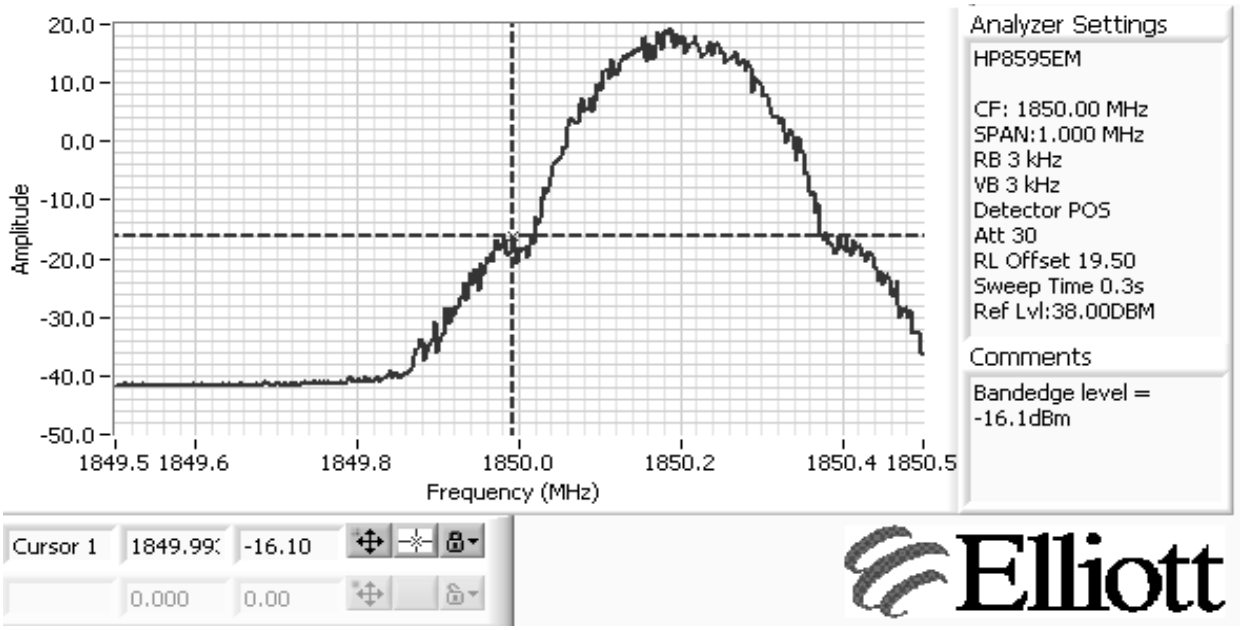
Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

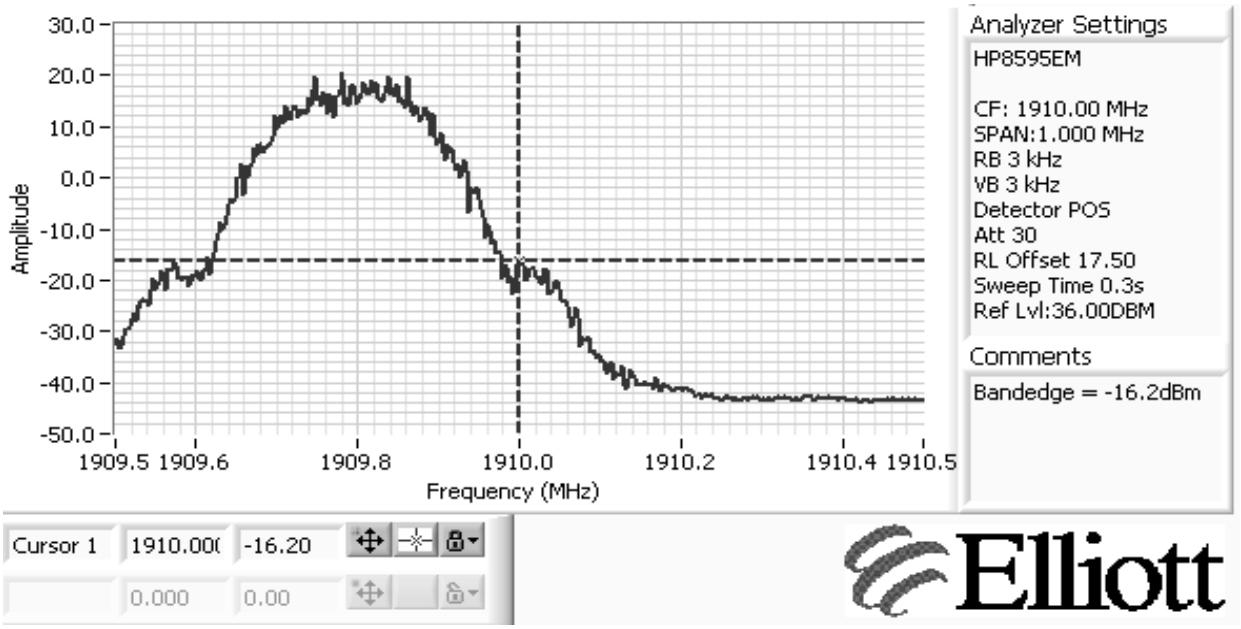




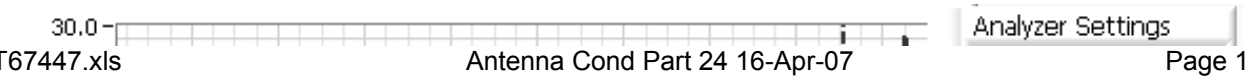
Run #3: Bandedges

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

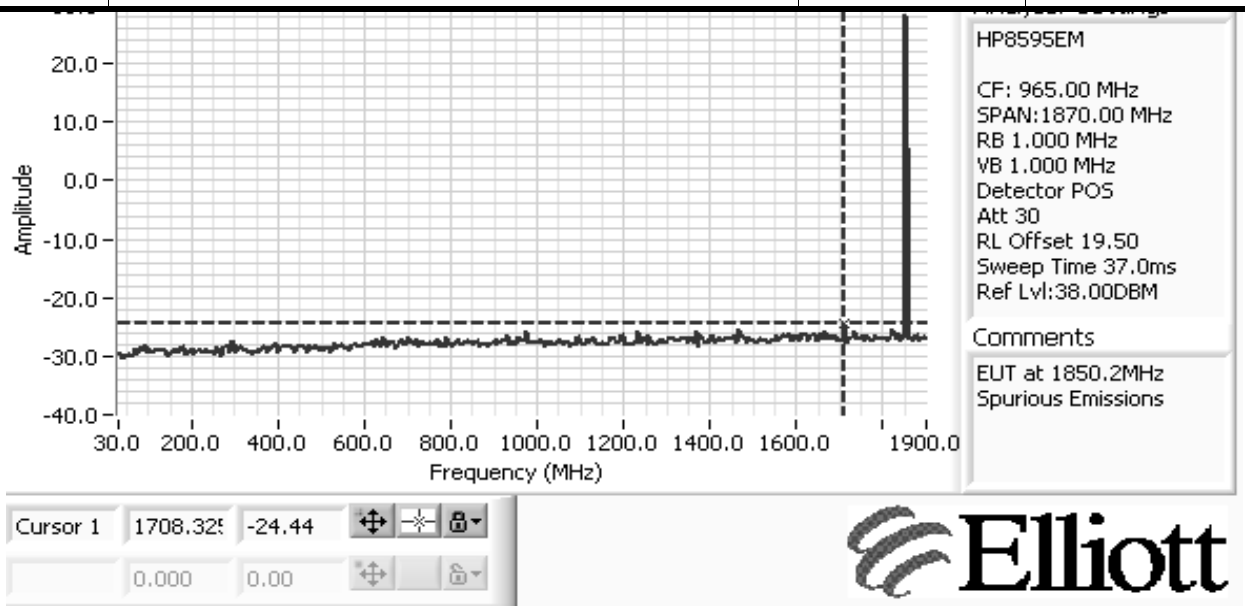


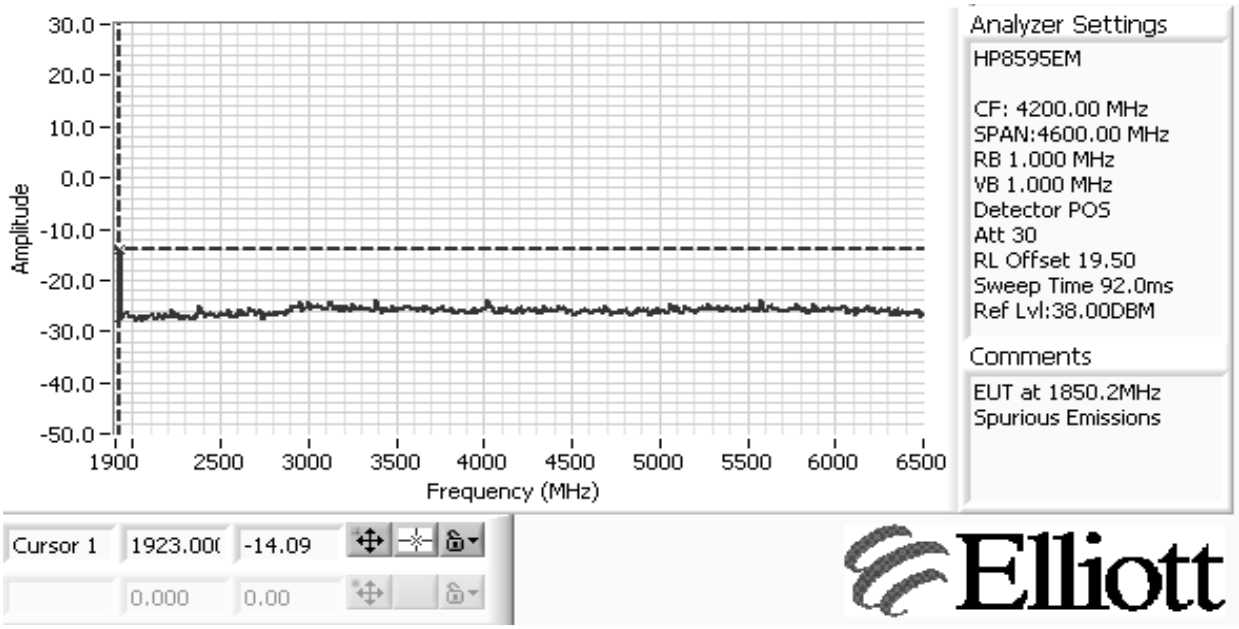


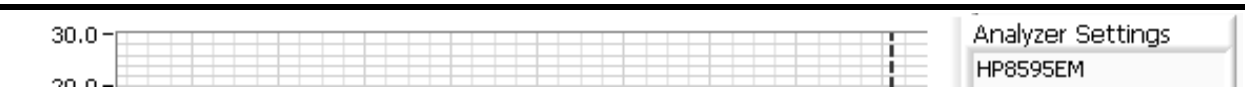
Run #4: Spuriuos Emissions



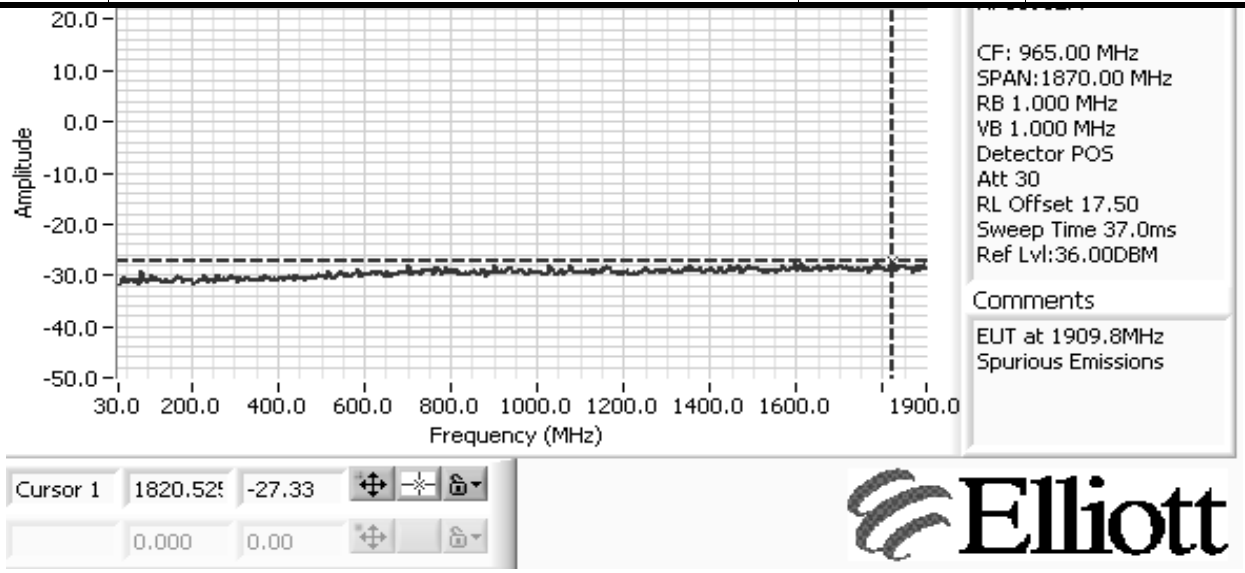
Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A



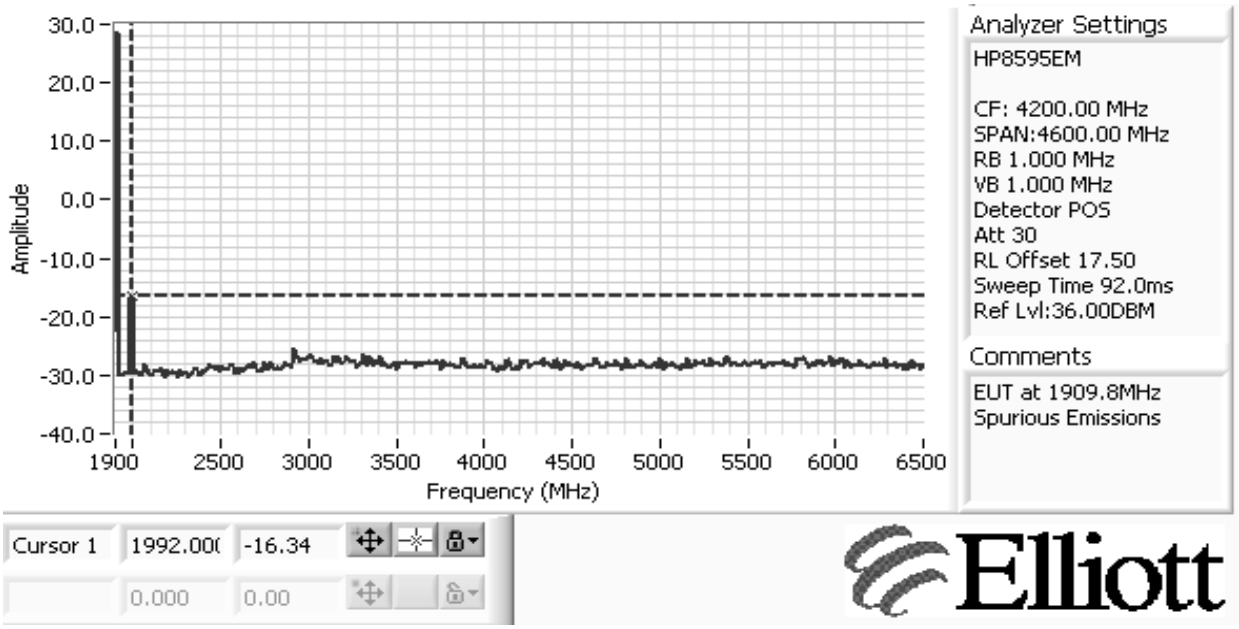




Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A



Elliott



Elliott

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

RSS 133 and FCC 24 Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/16/2007
Test Engineer: Rafael Varelas
Test Location: SVOATS #2
Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 12 °C
Rel. Humidity: 72 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1 (PCS)	RE, 30 - 20000 MHz - Spurious Emissions	FCC Part 24	Pass	54.8dBuV/m @ 3759.92 MHz (-27.6dB)

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run #1: Radiated Spurious Emissions

Run #1a: Low Channel 512 @ 1850.2 MHz

Frequency	Level	Pol	FCC 24		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3700.520	56.0	H	82.4	-26.4	PK	145	1.2	
5550.940	55.6	H	82.4	-26.8	PK	221	1.0	
3700.400	54.1	V	82.4	-28.3	PK	119	1.0	
5550.860	55.7	V	82.4	-26.7	PK	199	1.0	
7400.720	53.3	V	82.4	-29.1	PK	118	1.0	
9250.910	47.5	V	82.4	-34.9	PK	145	1.1	
11101.370	47.6	V	82.4	-34.8	PK	231	1.0	
7400.810	52.9	H	82.4	-29.5	PK	197	1.0	
9250.750	53.0	H	82.4	-29.4	PK	172	1.3	
11101.170	48.7	H	82.4	-33.7	PK	225	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Run #1b: Center Channel 661 @ 1880 MHz

Frequency	Level	Pol	FCC 24		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3759.920	54.8	V	82.4	-27.6	PK	179	1.0	
5640.090	57.0	V	82.4	-25.4	PK	196	1.0	
3760.440	55.9	H	82.4	-26.5	PK	155	1.0	
5640.130	57.0	H	82.4	-25.4	PK	134	1.0	
7520.060	53.5	H	82.4	-28.9	PK	128	1.0	
9400.040	52.4	H	82.4	-30.0	PK	154	1.1	
11279.660	48.0	H	82.4	-34.4	PK	269	1.0	
7519.890	57.0	V	82.4	-25.4	PK	188	1.0	
9399.780	49.5	V	82.4	-32.9	PK	198	1.2	
11280.370	46.6	V	82.4	-35.8	PK	201	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run #1c: High Channel 810 @ 1909.8 MHz

Frequency	Level	Pol	FCC 24		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3819.320	55.1	H	82.4	-27.3	PK	238	1.0	
5728.730	55.7	H	82.4	-26.7	PK	250	1.0	
3819.620	55.4	V	82.4	-27.0	PK	177	1.0	
5729.510	55.3	V	82.4	-27.1	PK	153	1.0	
7639.190	60.2	V	82.4	-22.2	PK	186	1.0	
9548.650	53.5	V	82.4	-28.9	PK	203	1.5	
11458.940	43.7	V	82.4	-38.7	PK	200	1.3	
7638.970	56.9	H	82.4	-25.5	PK	266	1.5	
9549.290	51.6	H	82.4	-30.8	PK	142	0.0	
11458.890	44.7	H	82.4	-37.7	PK	276	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Frequency Stability (FCC 24)

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/10/2007
Test Engineer: Mehran Birgani
Test Location: Environmental Chamber
Config. Used: 1
Config Change: None
EUT Voltage: Battery

General Test Configuration

EUT was place inside the Temperature Chamber and all local support equipment were located outside on a table for testing. The Eut was connected directly to Spectrum Analyzer.

Chamber was set to -30 to 50 degrees Celsius. Incremented 10 degress per temperature and let unit stabilized for every temperature.

Voltage stability was done at 20 degress Celsius. For battery operated units decrease DC voltage until battery end-point was found.

Voltage stability was done at 20 degress Celsius. For AC operated units varied voltage at 85% and 115% of the nomial AC voltage.

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Temperature Vs. Frequency	FCC 2.1055	Pass	-7.775 kHz
2	Temperature Vs. Power	IC RSS-133	Pass	< 1.0 dBm
3	Voltage Vs. Frequency (Battery)	FCC 2.1055	Pass	3.2Vdc
3	Voltage Vs. Frequency (AC)	FCC 2.1055	-	NR

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run# 1: Temperature Vs. Frequency

Temperature (Celsius)	Center Frequency		Frequency Error (kHz)	Frequency Drift Margin (Based on 10kHz margin)
	Normal Temp. (MHz)	Exterme Temp. (MHz)		
-30.00	1879.800750	1879.801862	-1.112	-8.888
-20.00	1879.800750	1879.800011	0.739	-9.261
-10.00	1879.800750	1879.799576	1.174	-8.826
0.00	1879.800750	1879.799614	1.136	-8.864
10.00	1879.800750	1879.798766	1.984	-8.016
20.00	1879.800750	1879.800750	0.000	-10.000
30.00	1879.800750	1879.800807	-0.057	-9.943
40.00	1879.800750	1879.800003	0.747	-9.253
50.00	1879.800750	1879.803305	-2.555	-7.445
			Worst case error (kHz):	-7.445

Note 1:	Spectrum Analyzer setting was as follow: RBW=10kHz, VBW=1MHz.
Note 2:	Per FCC part 24.235 (The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.) and using bandedge measurment done on low and high channel in order the unit stay within the authorized frequency (-13dBm limit line), the signal can not drift more than 10kHz on either side.

Run# 2: Temperature Vs. Power (For IC RSS-133)

Temperature (Celsius)	Power Level		Power Drift (dBm)
	Normal Temp. (dBm)	Exterme Temp. (dBm)	
-30.00	-17.80	-17.23	0.570
-20.00	-17.80	-17.23	0.570
-10.00	-17.80	-17.90	0.100
0.00	-17.80	-18.27	0.470
10.00	-17.80	-17.80	0.000
20.00	-17.80	-17.80	0.000
30.00	-17.80	-18.30	0.500
40.00	-17.80	-18.70	0.900
50.00	-17.80	-18.40	0.600

Note:	Spectrum Analyzer setting was as follow: RBW=300kHz, VBW=1MHz and Span=2MHz

Run# 3: Voltage Vs. Frequency

Test repeated September 21, 2007 to confirm original result of no drift prior to EUT shutoff

Battery end point was 3.2Vdc. EUT shutdown when it reached its battery end point with no change in operating frequency. Frequecy error was 0 Hz.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

RSS 132/133 and FCC 22/24 Fundamental Emission

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/16/2007
Test Engineer: Rafael Varelas
Test Location: SVOATS #2

Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 12 °C
Rel. Humidity: 72 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
2 (GSM)	RE, Fundamental Emission Substitutions	FCC Part 22	Pass	30.4 dBm @ 824.200MHz (-8.0dB)
4 (GSM)	RE, Fundamental Emission Substitutions	FCC Part 24	Pass	28.9 dBm @ 1909.800MHz (-4.1dB)

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run #1a: Low Channel 128 @ 824.2 MHz

Frequency	Level	Pol	FCC 22		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
824.200	128.0	H	133.7	-5.7	PK	108	1.1	
824.200	127.5	V	133.7	-6.2	PK	105	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Run #1b: Center Channel 189 @ 836.4 MHz

Frequency	Level	Pol	FCC 22		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
836.400	128.1	H	133.7	-5.6	PK	170	1.7	
836.400	127.2	V	133.7	-6.5	PK	181	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Run #1c: High Channel 251 @ 848.8 MHz

Frequency	Level	Pol	FCC 22		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
848.800	128.2	H	133.7	-5.5	PK	108	1.2	
848.800	127.4	V	133.7	-6.3	PK	107	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run #2: Substitution Measurements

Horizontal

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
824.200	-20.1	2.2	78.7	96.6	128.0	31.4	29.2		38.4	-9.2
836.400	-20.1	2.2	78.7	96.6	128.1	31.5	29.3		38.4	-9.1
848.800	-20.1	2.2	78.7	96.6	128.2	31.6	29.4		38.4	-9.0

Vertical

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
824.200	-20.1	2.2	77.0	94.9	127.5	32.6	30.4		38.4	-8.0
836.400	-20.1	2.2	77.0	94.9	127.2	32.3	30.1		38.4	-8.3
848.800	-20.1	2.2	77.0	94.9	127.4	32.5	30.3		38.4	-8.1

Note 1:	Pin is the input power (dBm) to the substitution antenna
Note 2:	Gain is the gain (dBi) for the substitution antenna. A dipole has a gain of 2.2dBi.
Note 3:	FS is the field strength (dBuV/m) measured from the substitution antenna.
Note 4:	Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.
Note 5:	EUT field strength as measured during initial run.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run #3a: Low Channel 512 @ 1850.2 MHz

Frequency	Level	Pol	FCC 24		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1850.210	125.0	H	128.2	-3.2	PK	108	1.1	
1850.210	123.7	V	128.2	-4.5	PK	105	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Run #3b: Center Channel 661 @ 1880 MHz

Frequency	Level	Pol	FCC 24		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1880.060	125.0	H	128.2	-3.2	PK	170	1.7	
1880.060	123.4	V	128.2	-4.8	PK	181	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Run #3c: High Channel 810 @ 1909.8 MHz

Frequency	Level	Pol	FCC 24		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1909.780	125.1	H	128.2	-3.1	PK	108	1.2	
1909.780	123.9	V	128.2	-4.3	PK	107	1.0	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E= (30PG)/d. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Way System Inc.	Job Number:	J65506
Model:	way5000	T-Log Number:	T67447
		Account Manager:	Susan Pelzl
Contact:	Ron Fridman		
Standard:	EN 55022, FCC	Class:	N/A

Run #4: Substitution Measurements

Horizontal

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
1850.200	-20.0	8.4	84.7	96.3	125.0	28.7	26.5	33.0		-4.3
1880.000	-20.0	8.4	84.7	96.3	125.0	28.7	26.5	33.0		-4.3
1909.800	-20.0	8.4	84.7	96.3	125.1	28.8	26.6	33.0		-4.2

Vertical

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
1850.200	-20.0	8.4	83.4	95.0	123.7	28.7	26.5	33.0		-4.3
1880.000	-20.0	8.4	83.4	95.0	123.4	28.4	26.2	33.0		-4.6
1909.800	-20.0	8.4	83.4	95.0	123.9	28.9	26.7	33.0		-4.1

Note 1:	Pin is the input power (dBm) to the substitution antenna
Note 2:	Gain is the gain (dBi) for the substitution antenna. A dipole has a gain of 2.2dBi.
Note 3:	FS is the field strength (dBuV/m) measured from the substitution antenna.
Note 4:	Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.
Note 5:	EUT field strength as measured during initial run.

EXHIBIT 3: Test Configuration Photographs

2 Pages

EXHIBIT 4: Proposed FCC ID Label & Label Location

EXHIBIT 5: Detailed Photographs of Way Systems, Inc. Model way5000Construction

Pages

EXHIBIT 6: Operator's Manual for Way Systems, Inc. Model way5000

Pages

EXHIBIT 7: Block Diagram of Way Systems, Inc. Model way5000

Pages

EXHIBIT 8: Schematic Diagrams for Way Systems, Inc. Model way5000

Pages

EXHIBIT 9: Theory of Operation for Way Systems, Inc. Model way5000

Pages

EXHIBIT 10: Advertising Literature

Pages

EXHIBIT 11: RF Exposure Information

Pages